

SECTION **EC**

ENGINE CONTROL SYSTEM

CONTENTS

QR25DE

PRECAUTION	19	
PRECAUTIONS	19	
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	19	
Precautions Necessary for Steering Wheel Rotation After Battery Disconnection	19	
Precaution for Procedure without Cowl Top Cover	20	
Service Notice or Precautions for Steering System	20	
On Board Diagnostic (OBD) System of Engine	20	
General Precautions	20	
PREPARATION	23	
PREPARATION	23	
Special Service Tools	23	
Commercial Service Tools	23	
SYSTEM DESCRIPTION	25	
COMPONENT PARTS	25	
Component Parts Location	25	
ECM	29	
Accelerator Pedal Position Sensor	29	
Electric Throttle Control Actuator	30	
Ignition Coil With Power Transistor	31	
Fuel Injector	31	
Fuel Pump	31	
Mass Air Flow Sensor (With Intake Air Temperature Sensor)	31	
Engine Coolant Temperature Sensor	32	
Crankshaft Position Sensor (POS)	33	
Camshaft Position Sensor (PHASE)	33	
Intake Valve Timing Control Solenoid Valve	33	
Exhaust Valve Timing Control Position Sensor	33	
Exhaust Valve Timing Control Solenoid Valve	34	
Air Fuel Ratio (A/F) Sensor 1	34	
Heated Oxygen Sensor 2	35	F
Knock Sensor	35	
Engine Oil Pressure Sensor	35	
Engine Oil Temperature Sensor	36	G
EVAP Canister	36	
EVAP Canister Purge Volume Control Solenoid Valve	36	H
Battery Current Sensor (With Battery Temperature Sensor)	36	
Atmospheric Pressure Sensor	37	
Refrigerant Pressure Sensor	38	I
Power Steering Pressure Sensor	38	
Stop Lamp Switch & Brake Pedal Position Switch	38	
Clutch Pedal Position Switch	38	J
Park/Neutral position Switch	38	
ASCD Steering Switch	39	
STRUCTURE AND OPERATION	40	K
Positive Crankcase Ventilation	40	
On Board Refueling Vapor Recovery (ORVR)	41	
SYSTEM	42	L
ENGINE CONTROL SYSTEM	42	
ENGINE CONTROL SYSTEM : System Description	42	M
ENGINE CONTROL SYSTEM : Fail Safe	43	
MULTIPORT FUEL INJECTION SYSTEM	47	N
MULTIPORT FUEL INJECTION SYSTEM : System Description	47	
ELECTRIC IGNITION SYSTEM	49	O
ELECTRIC IGNITION SYSTEM : System Description	49	
INTAKE VALVE TIMING CONTROL	50	P
INTAKE VALVE TIMING CONTROL : System Description	50	
EXHAUST VALVE TIMING CONTROL	51	
EXHAUST VALVE TIMING CONTROL : System Description	51	

ENGINE PROTECTION CONTROL AT LOW ENGINE OIL PRESSURE	52	ECU DIAGNOSIS INFORMATION	81
ENGINE PROTECTION CONTROL AT LOW ENGINE OIL PRESSURE : System Description	52	ECM	81
AIR CONDITIONING CUT CONTROL	53	Reference Value	81
AIR CONDITIONING CUT CONTROL : System Description	54	Fail Safe	93
EVAPORATIVE EMISSION SYSTEM	54	DTC Inspection Priority Chart	97
EVAPORATIVE EMISSION SYSTEM : System Description	54	DTC Index	98
AUTOMATIC SPEED CONTROL DEVICE (ASCD)..	55	Test Value and Test Limit	100
AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description	56	WIRING DIAGRAM	108
CAN COMMUNICATION	57	ENGINE CONTROL SYSTEM	108
CAN COMMUNICATION : System Description	57	Wiring Diagram	108
WARNING LAMPS/INDICATOR LAMPS	57	BASIC INSPECTION	124
WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp	57	DIAGNOSIS AND REPAIR WORKFLOW	124
WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)	58	Work Flow	124
INFORMATION DISPLAY (COMBINATION METER)	60	Diagnostic Work Sheet	127
INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator	60	BASIC INSPECTION	128
INFORMATION DISPLAY (COMBINATION METER) : Engine Oil Pressure Warning	60	Work Procedure	128
WARNING/INDICATOR/CHIME LIST	61	ADDITIONAL SERVICE WHEN REPLACING ECM	132
WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps	62	Description	132
WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)	62	Work Procedure	132
OPERATION	63	VIN REGISTRATION	134
AUTOMATIC SPEED CONTROL DEVICE (ASCD)..	63	Description	134
AUTOMATIC SPEED CONTROL DEVICE (ASCD) : Switch Name and Function	63	Work Procedure	134
ON BOARD DIAGNOSTIC (OBD) SYSTEM	64	ACCELERATOR PEDAL RELEASED POSITION LEARNING	135
Diagnosis Description	64	Description	135
GST (Generic Scan Tool)	64	Work Procedure	135
DIAGNOSIS SYSTEM (ECM)	65	THROTTLE VALVE CLOSED POSITION LEARNING	136
DIAGNOSIS DESCRIPTION	65	Description	136
DIAGNOSIS DESCRIPTION : 1st Trip Detection Logic and Two Trip Detection Logic	65	Work Procedure	136
DIAGNOSIS DESCRIPTION : DTC and Freeze Frame Data	65	IDLE AIR VOLUME LEARNING	137
DIAGNOSIS DESCRIPTION : Counter System	66	Description	137
DIAGNOSIS DESCRIPTION : Driving Pattern	69	Work Procedure	137
DIAGNOSIS DESCRIPTION : Malfunction Indicator Lamp (MIL)	70	MIXTURE RATIO SELF-LEARNING VALUE CLEAR	139
On Board Diagnosis Function	70	Description	139
CONSULT Function	73	Work Procedure	139
		FUEL PRESSURE	140
		Work Procedure	140
		DTC/CIRCUIT DIAGNOSIS	142
		TROUBLE DIAGNOSIS - SPECIFICATION VALUE	142
		Description	142
		Component Function Check	142
		Diagnosis Procedure	143

POWER SUPPLY AND GROUND CIRCUIT ...	150	DTC Description	192	
Diagnosis Procedure	150	Diagnosis Procedure	193	A
U1001 CAN COMM CIRCUIT	154	P0132 A/F SENSOR 1	195	
DTC Description	154	DTC Description	195	EC
Diagnosis Procedure	154	Diagnosis Procedure	196	
P0011 IVT CONTROL	155	P0137 HO2S2	198	
DTC Description	155	DTC Description	198	C
Diagnosis Procedure	156	Diagnosis Procedure	200	
Component Inspection	157	Component Inspection	201	
P0014 EVT CONTROL	159	P0138 HO2S2	204	D
DTC Description	159	DTC Description	204	
Diagnosis Procedure	160	Diagnosis Procedure	206	E
Component Inspection	162	Component Inspection	209	
P0031, P0032 A/F SENSOR 1 HEATER	163	P0139 HO2S2	212	
DTC Description	163	DTC Description	212	F
Diagnosis Procedure	163	Diagnosis Procedure	215	
Component Inspection	164	Component Inspection	216	
P0037, P0038 HO2S2 HEATER	166	P014C, P014D A/F SENSOR 1	219	G
DTC Description	166	DTC Description	219	
Diagnosis Procedure	167	Diagnosis Procedure	221	
Component Inspection	167	P0171 FUEL INJECTION SYSTEM FUNC-	224	H
P0075 INTAKE VALVE TIMING CONTROL ...	169	TION	224	
DTC Description	169	DTC Description	224	I
Diagnosis Procedure	169	Diagnosis Procedure	225	
Component Inspection	170	P0172 FUEL INJECTION SYSTEM FUNC-	229	J
P0078 EVT CONTROL SOLENOID VALVE ...	172	TION	229	
DTC Description	172	DTC Description	229	
Diagnosis Procedure	172	Diagnosis Procedure	230	
Component Inspection	173	P0197, P0198 EOT SENSOR	234	K
P0102, P0103 MAF SENSOR	175	DTC Description	234	
DTC Description	175	Diagnosis Procedure	234	L
Diagnosis Procedure	176	Component Inspection	235	
Component Inspection	177	P0222, P0223 TP SENSOR	237	
P0112, P0113 IAT SENSOR	180	DTC Description	237	M
DTC Description	180	Diagnosis Procedure	237	
Diagnosis Procedure	180	Component Inspection	239	
Component Inspection	181	P0300, P0301, P0302, P0303, P0304 MIS-	240	N
P0117, P0118 ECT SENSOR	182	FIRE	240	
DTC Description	182	DTC Description	240	O
Diagnosis Procedure	182	Diagnosis Procedure	242	
Component Inspection	183	P0327, P0328 KS	246	
P0122, P0123 TP SENSOR	185	DTC Description	246	P
DTC Description	185	Diagnosis Procedure	246	
Diagnosis Procedure	185	Component Inspection	247	
Component Inspection	187	P0335 CKP SENSOR (POS)	248	
P0130 A/F SENSOR 1	188	DTC Description	248	
DTC Description	188	Diagnosis Procedure	248	
Diagnosis Procedure	189	Component Inspection	250	
P0131 A/F SENSOR 1	192	P0340 CMP SENSOR (PHASE)	252	

DTC Description	252
Diagnosis Procedure	252
Component Inspection	254
P0420 THREE WAY CATALYST FUNCTION	256
DTC Description	256
Diagnosis Procedure	257
P0444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE	261
DTC Description	261
Diagnosis Procedure	261
Component Inspection	262
P0452, P0453 ATMOSPHERIC PRESSURE SENSOR	264
DTC Description	264
Diagnosis Procedure	264
Component Inspection	266
P0500 VSS	267
DTC Description	267
Diagnosis Procedure	268
P0520 EOP SENSOR	270
DTC Description	270
Diagnosis Procedure	270
Component Inspection	271
P0524 ENGINE OIL PRESSURE	273
DTC Description	273
Diagnosis Procedure	274
Component Inspection	275
P0550 PSP SENSOR	276
DTC Description	276
Diagnosis Procedure	276
Component Inspection	278
P0603 ECM	279
DTC Description	279
Diagnosis Procedure	279
P0604 ECM	281
DTC Description	281
Diagnosis Procedure	282
P0605 ECM	283
DTC Description	283
Diagnosis Procedure	284
P0606 ECM	285
DTC Description	285
Diagnosis Procedure	286
P0607 ECM	287
DTC Description	287
Diagnosis Procedure	287
P060A ECM	288
DTC Description	288
Diagnosis Procedure	289

P060B ECM	290
DTC Description	290
Diagnosis Procedure	291
P0643 SENSOR POWER SUPPLY	292
DTC Description	292
Diagnosis Procedure	293
P0850 PNP SWITCH	295
DTC Description	295
Diagnosis Procedure	296
Component Inspection	297
P1078 EVT CONTROL POSITION SENSOR	298
DTC Description	298
Diagnosis Procedure	298
Component Inspection	300
P1217 ENGINE OVER TEMPERATURE	301
DTC Description	301
Diagnosis Procedure	302
P1225 TP SENSOR	304
DTC Description	304
Diagnosis Procedure	304
P1226 TP SENSOR	305
DTC Description	305
Diagnosis Procedure	305
P1550 BATTERY CURRENT SENSOR	306
DTC Description	306
Diagnosis Procedure	306
Component Inspection	308
P1551, P1552 BATTERY CURRENT SENSOR	309
DTC Description	309
Diagnosis Procedure	309
Component Inspection	311
P1553 BATTERY CURRENT SENSOR	312
DTC Description	312
Diagnosis Procedure	312
Component Inspection	314
P1554 BATTERY CURRENT SENSOR	315
DTC Description	315
Diagnosis Procedure	316
Component Inspection	317
P1564 ASCD STEERING SWITCH	318
DTC Description	318
Diagnosis Procedure	318
Component Inspection	320
P1572 ASCD BRAKE SWITCH	321
DTC Description	321
Diagnosis Procedure	322
Component Inspection (Brake Pedal Position Switch)	325
Component Inspection (Stop Lamp Switch)	326

Component Inspection (Clutch Pedal Position Switch)	326	
P1574 ASCD VEHICLE SPEED SENSOR	328	
DTC Description	328	
Diagnosis Procedure	329	
P1805 BRAKE SWITCH	330	
DTC Description	330	
Diagnosis Procedure	330	
Component Inspection (Stop Lamp Switch)	331	
P2100, P2103 THROTTLE CONTROL MOTOR RELAY	332	
DTC Description	332	
Diagnosis Procedure	333	
P2101 ELECTRIC THROTTLE CONTROL FUNCTION	335	
DTC Description	335	
Diagnosis Procedure	335	
Component Inspection	337	
P2118 THROTTLE CONTROL MOTOR	338	
DTC Description	338	
Diagnosis Procedure	338	
Component Inspection	339	
P2119 ELECTRIC THROTTLE CONTROL ACTUATOR	340	
DTC Description	340	
Diagnosis Procedure	341	
P2122, P2123 APP SENSOR	342	
DTC Description	342	
Diagnosis Procedure	342	
Component Inspection	344	
P2127, P2128 APP SENSOR	345	
DTC Description	345	
Diagnosis Procedure	345	
Component Inspection	347	
P2135 TP SENSOR	348	
DTC Description	348	
Diagnosis Procedure	348	
Component Inspection	350	
P2138 APP SENSOR	351	
DTC Description	351	
Diagnosis Procedure	351	
Component Inspection	353	
BRAKE PEDAL POSITION SWITCH	355	
Component Function Check	355	
Diagnosis Procedure	355	
Component Inspection (Brake Pedal Position Switch)	357	
Component Inspection (Clutch Pedal Position Switch)	357	
CLUTCH PEDAL POSITION SWITCH	359	
Component Function Check	359	A
Diagnosis Procedure	359	
Component Inspection (Brake Pedal Position Switch)	361	EC
Component Inspection (Clutch Pedal Position Switch)	361	
ELECTRICAL LOAD SIGNAL	363	C
Description	363	
Component Function Check	363	
Diagnosis Procedure	363	D
FUEL INJECTOR	365	
Component Function Check	365	E
Diagnosis Procedure	365	
Component Inspection	366	
FUEL PUMP	368	F
Description	368	
Component Function Check	368	
Diagnosis Procedure	368	G
Component Inspection	370	
IGNITION SIGNAL	371	
Component Function Check	371	H
Diagnosis Procedure	371	
Component Inspection (Ignition Coil with Power Transistor)	374	I
Component Inspection (Condenser)	375	
INFORMATION DISPLAY (ASCD)	376	J
Component Function Check	376	
Diagnosis Procedure	376	
MALFUNCTION INDICATOR LAMP	377	K
Component Function Check	377	
Diagnosis Procedure	377	
REFRIGERANT PRESSURE SENSOR	378	L
Component Function Check	378	
Diagnosis Procedure	378	
SENSOR POWER SUPPLY 2 CIRCUIT	380	M
Description	380	
Diagnosis Procedure	380	N
SYMPTOM DIAGNOSIS	382	
ENGINE CONTROL SYSTEM	382	O
Symptom Table	382	
INFORMATION DISPLAY IS MALFUNCTIONING	386	P
Diagnosis Procedure	386	
NORMAL OPERATING CONDITION	387	
Description	387	
PERIODIC MAINTENANCE	388	
IDLE SPEED	388	

Inspection	388
IGNITION TIMING	389
Inspection	389
EVAPORATIVE EMISSION SYSTEM	390
Inspection	390
POSITIVE CRANKCASE VENTILATION	391
Inspection	391
REMOVAL AND INSTALLATION	392
ECM	392
Exploded View	392
Removal and Installation	392
ATMOSPHERIC PRESSURE SENSOR	393
Exploded View	393
Removal and Installation	393
SERVICE DATA AND SPECIFICATIONS (SDS)	394
SERVICE DATA AND SPECIFICATIONS (SDS)	394
Idle Speed	394
Ignition Timing	394
Calculated Load Value	394
Mass Air Flow Sensor	394
YS23DDT/YS23DDTT (M9T)	
PRECAUTION	395
PRECAUTIONS	395
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	395
Precautions Necessary for Steering Wheel Rotation After Battery Disconnection	395
Service Notice or Precautions for Steering System	396
On Board Diagnostic (OBD) System of Engine	396
SYSTEM DESCRIPTION	397
COMPONENT PARTS	397
YS23DDT	397
YS23DDT : Component Parts Location	397
YS23DDTT	401
YS23DDTT : Component Parts Location	401
Accelerator Pedal Position Sensor	407
Air Fuel Ratio (A/F) Sensor	407
ASCD Steering Switch	407
Camshaft Position Sensor	407
Clutch Pedal Position Switch	407
Crankshaft Position Sensor	408
DPF (Diesel Particulate Filter)	408
DPF (Diesel Particulate Filter) Differential Pressure Sensor	409

DPF (Diesel Particulate Filter) Manual Regeneration Switch	409
ECM	409
EGR Cooler Bypass Valve	410
EGR Cooler Bypass Valve Control Solenoid Valve	410
EGR Temperature Sensor	410
EGR Volume Control Valve (With EGR Volume Control Valve Position Sensor)	410
Electric EGR cooling water pump	411
Electric Throttle Control Actuator	411
Engine Coolant Temperature Sensor	411
Engine Oil Pump Control Valve	412
Exhaust Gas Pressure Sensor	412
Exhaust Gas Temperature Sensor 1	412
Exhaust Gas Temperature Sensor 2	413
Fuel Heater	413
Fuel Injector	413
Fuel Pump	414
Fuel Rail Pressure Sensor	414
Fuel Temperature Sensor	414
FPCM (Fuel Pump Control Module)	414
Glow Control Unit	415
Glow Plug	415
High Pressure Compressor Bypass Valve Control Solenoid Valve	415
High Pressure Fuel Pump	415
High Pressure Turbine Bypass Valve Control Solenoid Valve	416
Intake Air Temperature Sensor 1	416
Intake Air Temperature Sensor 2	416
Low Pressure Wastegate Valve Boost Control Solenoid Valve	417
Mass Air Flow Sensor	417
Park/Neutral position Switch	417
Refrigerant Pressure Sensor	417
Stop Lamp Switch & Brake Pedal Position Switch	417
Thermo Management Valve	418
Thermo Management Valve Control Solenoid Valve	418
Turbocharger Boost Control Solenoid Valve	418
Turbocharger Boost Sensor	418
Vacuum Pump	419
Water In Fuel Sensor	419

STRUCTURE AND OPERATION420

TURBOCHARGER BOOST CONTROL (YS23DDTT) 420

TURBOCHARGER BOOST CONTROL (YS23DDTT) : System Diagram	420
TURBOCHARGER BOOST CONTROL (YS23DDTT) : System Description	420

SYSTEM422

ENGINE CONTROL SYSTEM (YS23DDT) 422

ENGINE CONTROL SYSTEM (YS23DDT) : System Description	422
--	-----

ENGINE CONTROL SYSTEM (YS23DDT) : Fail-safe	423	
ENGINE CONTROL SYSTEM (YS23DDTT)	428	
ENGINE CONTROL SYSTEM (YS23DDTT) : System Description	429	
ENGINE CONTROL SYSTEM (YS23DDTT) : Fail-safe	430	
ENGINE SPEED CONTROL	436	
ENGINE SPEED CONTROL : System Description ..	436	
POWERTRAIN COORDINATION CONTROL	437	
POWERTRAIN COORDINATION CONTROL : System Description	437	
TURBOCHARGER BOOST CONTROL (YS23DDT)	437	
TURBOCHARGER BOOST CONTROL (YS23DDT) : System Description	437	
TURBOCHARGER BOOST CONTROL (YS23DDTT)	438	
TURBOCHARGER BOOST CONTROL (YS23DDTT) : System Description	438	
EGR SYSTEM	438	
EGR SYSTEM : System Description	438	
THROTTLE CONTROL	439	
THROTTLE CONTROL : System Description	439	
ENGINE TORQUE CONTROL	439	
ENGINE TORQUE CONTROL : System Description ..	439	
COMBUSTION CONTROL	441	
COMBUSTION CONTROL : System Description ..	441	
AFTER TREATMENT SYSTEM	442	
AFTER TREATMENT SYSTEM : System Description	443	
THERMOSTAT CONTROL	444	
THERMOSTAT CONTROL : System Description ..	444	
GLOW CONTROL	445	
GLOW CONTROL : System Description	445	
AUTOMATIC SPEED CONTROL DEVICE (ASCD). 445		
AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description	445	
WARNING LAMPS/INDICATOR LAMPS	446	
WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp	446	
WARNING LAMPS/INDICATOR LAMPS : Mal-function Indicator Lamp (MIL)	447	
WARNING LAMPS/INDICATOR LAMPS : Glow Indicator Lamp	448	
WARNING LAMPS/INDICATOR LAMPS : DPF (Diesel Particulate Filter) Warning Lamp	450	
INFORMATION DISPLAY (COMBINATION METER)	451	A
INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator	451	
INFORMATION DISPLAY (COMBINATION METER) : Engine Oil Pressure Warning	451	EC
WARNING/INDICATOR/CHIME LIST	453	
WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps	453	C
WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)	453	D
CAN COMMUNICATION	453	
CAN COMMUNICATION : System Description ..	453	E
OPERATION	455	
AUTOMATIC SPEED CONTROL DEVICE (ASCD). 455		
AUTOMATIC SPEED CONTROL DEVICE (ASCD) : Switch Name and Function	455	F
OIL CONTROL SYSTEM	455	
OIL CONTROL SYSTEM : Switch Name and Function	455	G
ON BOARD DIAGNOSTIC (OBD) SYSTEM .. 457		
Diagnosis Description	457	H
DIAGNOSIS SYSTEM (ECM)	458	
CONSULT Function	458	I
ECU DIAGNOSIS INFORMATION	470	
ECM	470	J
YS23DDT	470	
YS23DDT : Reference Value	470	K
YS23DDT : Fail-safe	487	
YS23DDT : DTC Inspection Priority Chart	492	
YS23DDT : DTC Index	494	L
YS23DDTT	496	
YS23DDTT : Reference Value	497	
YS23DDTT : Fail-safe	514	M
YS23DDTT : DTC Inspection Priority Chart	520	
YS23DDTT : DTC Index	521	N
WIRING DIAGRAM	525	
ENGINE CONTROL SYSTEM	525	
Wiring Diagram	525	O
BASIC INSPECTION	546	
BASIC INSPECTION	546	
Work Procedure	546	P
DIAGNOSIS AND REPAIR WORKFLOW	548	
Work Flow	548	
Diagnostic Work Sheet	550	

SERVICE AFTER REPLACING OR REMOVING ENGINE PARTS	552	U0121 CAN COMMUNICATION	573
Description	552	DTC Description	573
ADDITIONAL SERVICE WHEN REPLACING ECM	553	Diagnosis Procedure	573
Description	553	U0415 CAN COMMUNICATION	574
Work Procedure	553	DTC Description	574
INJECTOR ADJUSTMENT VALUE REGISTRATION	556	Diagnosis Procedure	574
Description	556	P0001 FUEL PUMP	575
Work Procedure	556	DTC Description	575
THROTTLE VALVE POSITION LEARNING ..	558	Diagnosis Procedure	575
Description	558	P0002 FUEL PRESSURE	577
Work Procedure	558	DTC Description	577
EGR VOLUME CONTROL VALVE POSITION LEARNING	559	Diagnosis Procedure	578
Description	559	Component Inspection (Fuel Flow Actuator)	579
Work Procedure	559	Component Inspection (Fuel Injector)	579
DIESEL PARTICULATE FILTER MANUAL REGENERATION	560	Component Inspection (Fuel Temperature Sensor)	579
Description	560	P0016 CKP - CMP CORRELATION	580
Work Procedure	560	DTC Description	580
SERVICE REGENERATION	561	Diagnosis Procedure	580
Description	561	Component Inspection (Crankshaft Position Sensor)	581
Work Procedure	561	Component Inspection (Camshaft Position Sensor)	581
DIESEL PARTICULATE FILTER DATA CLEAR	564	P0033 HP COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE	582
Description	564	DTC Description	582
Work Procedure	564	Diagnosis Procedure	582
ENGINE OIL DATA RESET	565	Component Inspection (HP Compressor Bypass Valve Control Solenoid Valve)	583
Description	565	P0045 TC BOOST CONTROL SOLENOID VALVE	584
Work Procedure	565	YS23DDT	584
VIN REGISTRATION	566	YS23DDT : DTC Description	584
Description	566	YS23DDT : Diagnosis Procedure	584
Work Procedure	566	YS23DDTT	585
FUEL PUMP FIRST PRIMING PROCEDURE ..	567	YS23DDTT : DTC Description	585
Description	567	YS23DDTT : Diagnosis Procedure	586
Work Procedure	567	YS23DDTT : Component Inspection (LP Waste-gate Valve Control Solenoid Valve)	587
INJECTOR CHECK	568	P004A HP TURBINE BYPASS VALVE CONTROL SOLENOID VALVE	588
Work Procedure (Fuel Injectors Leak Check)	568	DTC Description	588
Work Procedure (Fuel Injection Quantity Check) ..	569	Diagnosis Procedure	588
DTC/CIRCUIT DIAGNOSIS	570	Component Inspection (HP Turbine Bypass Valve Control Solenoid Valve)	589
POWER SUPPLY AND GROUND CIRCUIT ..	570	P0087 FUEL SYSTEM	590
Diagnosis Procedure	570	DTC Description	590
U0101 CAN COMMUNICATION	572	Diagnosis Procedure	590
DTC Description	572	Component Inspection (Fuel Pump)	592
Diagnosis Procedure	572	P0089 FUEL PRESSURE	593

DTC Description	593	DTC Description	620	
Diagnosis Procedure	593	Diagnosis Procedure	620	A
Component Inspection (Fuel flow actuator)	595	Component Inspection (Fuel Injector)	621	
Component Inspection (Fuel Injector)	596			
P0095 IAT SENSOR 2	597	P0201, P0202, P0203, P0204 FUEL INJECTOR	622	EC
DTC Description	597	DTC Description	622	
Diagnosis Procedure	597	Diagnosis Procedure	622	
Component Inspection (Intake Air Temperature Sensor 2)	598	Component Inspection (Fuel Injector)	624	C
P0100 MAF SENSOR	599	P0217 ENGINE OVER TEMPERATURE	625	
DTC Description	599	DTC Description	625	D
Diagnosis Procedure	599	Diagnosis Procedure	626	
P0101 MAF SENSOR	601	P0219 ENGINE OVER SPEED	628	
DTC Description	601	DTC Description	628	E
Diagnosis Procedure	601			
P0105 TC BOOST SENSOR	603	P0225 APP SENSOR	629	F
DTC Description	603	DTC Description	629	
Diagnosis Procedure	603	Diagnosis Procedure	629	
P0106 TC BOOST SENSOR	605	Component Inspection (Accelerator Pedal Position Sensor)	630	G
DTC Description	605	P0226 APP SENSOR	632	
Diagnosis Procedure	605	DTC Description	632	H
Component Inspection (Turbocharger Boost Sensor)	606	Diagnosis Procedure	632	
P0110 IAT SENSOR	608	Component Inspection (Accelerator Pedal Position Sensor)	633	
DTC Description	608	P025A FUEL PUMP	634	I
Diagnosis Procedure	608	DTC Description	634	
Component Inspection (Intake Air Temperature Sensor 1)	609	Diagnosis Procedure	634	
P0115 ECT SENSOR	610	P0263, P0266, P0269, P0272 COMBUSTION DISORDER	636	J
DTC Description	610	DTC Description	636	
Diagnosis Procedure	610	Diagnosis Procedure	636	K
Component Inspection (Engine Coolant Temperature Sensor)	611	Component Inspection (Fuel Injector)	638	
P0120 TP SENSOR	612	P0335 CKP SENSOR	639	L
DTC Description	612	DTC Description	639	
Diagnosis Procedure	612	Diagnosis Procedure	639	
Component Inspection (Throttle Position Sensor)	613	Component Inspection (Crankshaft Position Sensor)	640	M
P0135 A/F SENSOR HEATER	614	P0340 CMP SENSOR	641	
DTC Description	614	DTC Description	641	N
Diagnosis Procedure	614	Diagnosis Procedure	641	
Component Inspection (A/F Sensor Heater)	615	Component Inspection (Camshaft Position Sensor)	642	O
P0180 FUEL TEMPERATURE SENSOR	616	P0380 GLOW CONTROL SYSTEM	643	
DTC Logic	616	DTC Description	643	
Diagnosis Procedure	616	Diagnosis Procedure	643	P
Component Inspection (Fuel Temperature Sensor)	617	Component Inspection (Glow Plug)	645	
P0190 FRP SENSOR	618	P0402 EGR VOLUME CONTROL VALVE	646	
DTC Description	618	DTC Description	646	
Diagnosis Procedure	618	Diagnosis Procedure	646	
P0200 FUEL INJECTOR	620	Component Inspection (EGR Volume Control Valve Motor)	647	

P0403 EGR VOLUME CONTROL VALVE	648	DTC Description	672
DTC Description	648	Diagnosis Procedure	672
Diagnosis Procedure	648		
Component Inspection (EGR Volume Control Valve Motor)	649		
P0409 EGR VOLUME CONTROL VALVE POSITION SENSOR	651	P0560 BATTERY VOLTAGE	674
DTC Description	651	DTC Description	674
Diagnosis Procedure	651	Diagnosis Procedure	675
P040A EGR TEMPERATURE SENSOR	653	P0564 ASCD STEERING SWITCH	676
DTC Description	653	DTC Description	676
Diagnosis Procedure	653	Diagnosis Procedure	676
Component Inspection (EGR Temperature Sensor)	655	Component Inspection (ASCD Steering Switch) ..	677
P0470 EXHAUST GAS PRESSURE SENSOR	656	P0571 BRAKE SWITCH	678
DTC Description	656	DTC Description	678
Diagnosis Procedure	656	Diagnosis Procedure	678
Component Inspection (Exhaust Gas Pressure Sensor)	658	Component Inspection (Brake Pedal Position Switch)	679
P0471 EXHAUST PRESSURE SENSOR	659	P0575 ASCD STEERING SWITCH	680
DTC Description	659	DTC Description	680
Diagnosis Procedure	659	Diagnosis Procedure	680
Component Inspection (Exhaust Gas Pressure Sensor)	661	P0606 ECM	682
P0487 EGR VOLUME CONTROL VALVE	662	DTC Description	682
DTC Description	662	Diagnosis Procedure	682
Diagnosis Procedure	662	P060A ECM	683
Component Inspection (EGR Volume Control Valve Motor)	663	DTC Description	683
P0488 EGR SYSTEM	664	Diagnosis Procedure	683
DTC Description	664	P060B ECM	684
Diagnosis Procedure	664	DTC Description	684
Component Inspection (EGR Volume Control Valve Motor)	665	Diagnosis Procedure	684
P0500 VEHICLE SPEED SIGNAL	666	P061A ECM	685
DTC Logic	666	DTC Description	685
Diagnosis Procedure	666	Diagnosis Procedure	685
P0504 STOP LAMP SWITCH	667	P062B ECM	686
DTC Description	667	DTC Description	686
Diagnosis Procedure	667	Diagnosis Procedure	686
Component Inspection (Brake Pedal Position Switch)	668	P0638 ELECTRIC THROTTLE CONTROL ACTUATOR FUNCTION	688
P0525 ASCD SYSTEM	669	DTC Description	688
DTC Description	669	Diagnosis Procedure	688
Diagnosis Procedure	669	P0641 SENSOR POWER SUPPLY	690
P0530 REFRIGERANT PRESSURE SENSOR	670	DTC Description	690
DTC Description	670	Diagnosis Procedure	690
Diagnosis Procedure	670	P0651 SENSOR POWER SUPPLY	693
P0544 EGT SENSOR 1	672	DTC Description	693
		Diagnosis Procedure	693
		P0657 ECM RELAY	695
		DTC Description	695
		Diagnosis Procedure	695
		P0697 SENSOR POWER SUPPLY	697
		DTC Description	697
		Diagnosis Procedure	697

P0703 BRAKE SWITCH B	699	P2002 DIESEL PARTICULATE FILTER	726	A
DTC Description	699	DTC Description	726	
Diagnosis Procedure	699	Diagnosis Procedure	726	
Component Inspection (Brake Pedal Position Switch)	700	Component Inspection (Diesel Particulate Filter) ..	727	EC
P0833 CPP SWITCH	702	P2080 EGT SENSOR 1	728	C
DTC Description	702	DTC Description	728	
Diagnosis Procedure	702	Diagnosis Procedure	728	
Component Inspection (Clutch Pedal Position Switch)	703	P2100 THROTTLE CONTROL MOTOR	730	D
P1130 A/F SENSOR	705	DTC Description	730	
DTC Description	705	Diagnosis Procedure	730	
Diagnosis Procedure	705	P2119 ELECTRIC THROTTLE CONTROL FUNCTION	732	E
P1131 A/F SENSOR HEATER	707	DTC Description	732	
DTC Description	707	Diagnosis Procedure	732	
Diagnosis Procedure	707	P2120 APP SENSOR	734	F
Component Inspection (A/F Sensor Heater)	708	DTC Description	734	
P1453 DIESEL PARTICULATE FILTER PRESSURE SENSOR	709	Diagnosis Procedure	734	
DTC Description	709	Component Inspection (Accelerator Pedal Position Sensor)	735	G
Diagnosis Procedure	709	P2226 ATMOSPHERIC PRESSURE [BARO SEN]	737	H
P1525 ASCD SYSTEM	711	DTC Description	737	
DTC Description	711	Diagnosis Procedure	737	
Diagnosis Procedure	711	P2244 A/F SENSOR	738	I
P1544 EGT SENSOR 2	712	DTC Description	738	
DTC Description	712	Diagnosis Procedure	738	J
Diagnosis Procedure	712	P2263 TC SYSTEM	740	K
P1546 EXHAUST GAS TEMPERATURE	715	DTC Description	740	
DTC Description	715	Diagnosis Procedure	740	
Diagnosis Procedure	715	P2264 WATER IN FUEL SENSOR	742	L
P1560 ENGINE OIL PUMP CONTROL	716	DTC Description	742	
DTC Description	716	Diagnosis Procedure	742	
Diagnosis Procedure	716	P2452 DIESEL PARTICULATE FILTER PRESSURE SENSOR	744	M
Component Inspection (Engine Oil Pump Control Valve)	717	DTC Description	744	
P160C ECM	718	Diagnosis Procedure	744	
DTC Description	718	P245A EGR COOLER BYPASS CONTROL SOLENOID VALVE	747	N
Diagnosis Procedure	718	DTC Logic	747	
P1620 ECM	720	Diagnosis Procedure	747	
DTC Description	720	Component Inspection (EGR Cooler Bypass Valve Control Solenoid Valve)	748	O
Diagnosis Procedure	720	P24A7 ELECTRIC EGR COOLING WATER PUMP 1	750	P
P1656 CAN COMMUNICATION	722	DTC Description	750	
DTC Description	722	Diagnosis Procedure	750	
Diagnosis Procedure	722	P24A8 ELECTRIC EGR COOLING WATER PUMP 2	754	
P1675 ENGINE COOLANT TEMPERATURE ..	723	DTC Description	754	
DTC Description	723			
Diagnosis Procedure	723			
Component Inspection (Thermo Management Valve Control Solenoid Valve)	725			

Diagnosis Procedure	754	GLOW INDICATOR	781
P253F ENGINE OIL DETERIORATED	758	Component Function Check	781
DTC Description	758	Diagnosis Procedure	781
Diagnosis Procedure	758	REFRIGERANT PRESSURE SENSOR	782
P2626 A/F SENSOR	760	Component Function Check	782
DTC Description	760	Diagnosis Procedure	782
Diagnosis Procedure	760	MALFUNCTION INDICATOR LAMP	784
P2681 THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE	762	Component Function Check	784
DTC Description	762	Diagnosis Procedure	784
Diagnosis Procedure	762	SYMPTOM DIAGNOSIS	785
Component Inspection (Thermo Management Valve Control Solenoid Valve)	763	ENGINE CONTROL SYSTEM SYMPTOMS ...	785
P2688 FUEL HEATER	765	YS23DDT	785
DTC Description	765	YS23DDT : Symptom Table	785
Diagnosis Procedure	765	YS23DDTT	787
Component Inspection (Fuel Heater Relay)	766	YS23DDTT : Symptom Table	787
P2A06 A/F SENSOR	768	PERIODIC MAINTENANCE	791
DTC Description	768	IDLE SPEED	791
Diagnosis Procedure	768	Inspection	791
FUEL PUMP	770	REMOVAL AND INSTALLATION	792
Component Function Check	770	VACUUM LINES	792
Diagnosis Procedure	770	YS23DDT	792
Component Inspection (Fuel Pump)	771	YS23DDT : Vacuum Layout	792
BRAKE SWITCH	772	YS23DDTT	794
Component Function Check	772	YS23DDTT : Vacuum Layout	795
Diagnosis Procedure	772	ECM	798
Component Inspection (Brake Pedal Position Switch)	773	Exploded View	798
CLUTCH PEDAL POSITION SWITCH	774	Removal and Installation	798
Component Function Check	774	GLOW CONTROL UNIT	799
Diagnosis Procedure	774	Exploded View	799
Component Inspection (Clutch Pedal Position Switch)	775	Removal and Installation	799
DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH	776	FUEL PUMP CONTROL MODULE (FPCM) ...	800
Description	776	Exploded View	800
Component Function Check	776	Removal and Installation	800
Diagnosis Procedure	776	DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH	801
Component Inspection (DPF Manual Regenera- tion Switch)	777	Removal and Installation	801
DIESEL PARTICULATE FILTER WARNING LIGHT	778	SERVICE DATA AND SPECIFICATIONS (SDS)	802
Description	778	SERVICE DATA AND SPECIFICATIONS (SDS)	802
Component Function Check	778	Idle Speed	802
Diagnosis Procedure	778	YD25DDTi	
GLOW CONTROL SYSTEM	779	HOW TO USE THIS MANUAL	803
Diagnosis Procedure	779		
Component Inspection (Glow Plug)	779		

APPLICATION NOTICE	803	STRUCTURE AND OPERATION	823	
How to Check Vehicle Type	803	Crankcase Ventilation System	823	A
PRECAUTION	804	SYSTEM	824	
PRECAUTIONS	804	ENGINE CONTROL SYSTEM	824	EC
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	804	ENGINE CONTROL SYSTEM : System Description	824	
Precautions Necessary for Steering Wheel Rotation After Battery Disconnection	804	ENGINE CONTROL SYSTEM : Fail safe	826	C
Service Notice or Precautions for Steering System	805	FUEL INJECTION CONTROL SYSTEM	827	
Precaution for Procedure without Cowl Top Cover	805	FUEL INJECTION CONTROL SYSTEM : System Description	827	D
Precautions for Removing Battery Terminal	805	TURBOCHARGER BOOST CONTROL	830	
On Board Diagnosis (OBD) System of Engine and A/T	806	TURBOCHARGER BOOST CONTROL : System Description	830	E
Precaution	806	GLOW CONTROL	831	
PREPARATION	809	GLOW CONTROL : System Description	832	F
PREPARATION	809	EGR SYSTEM	832	
Special Service Tool	809	EGR SYSTEM : System Description	832	G
Commercial Service Tool	809	AIR CONDITIONING CUT CONTROL	834	
SYSTEM DESCRIPTION	810	AIR CONDITIONING CUT CONTROL : System Description	835	H
COMPONENT PARTS	810	AUTOMATIC SPEED CONTROL DEVICE (ASCD)	835	
Component Parts Location	810	AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description	836	I
ECM	814	THROTTLE CONTROL	836	
Accelerator Pedal Position Sensor	814	THROTTLE CONTROL : System Description	837	J
ASCD Steering Switch	814	CAN COMMUNICATION	837	
Barometric Pressure Sensor	814	CAN COMMUNICATION : System Description	837	K
Battery Current Sensor (With Battery Temperature Sensor)	814	WARNING LAMPS/INDICATOR LAMPS	837	
Camshaft Position Sensor	815	WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp	837	L
Clutch Pedal Position Switch	815	WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)	838	
Crankshaft Position Sensor	816	WARNING LAMPS/INDICATOR LAMPS : Glow Indicator Lamp	840	M
EGR Cooler Bypass Valve	816	INFORMATION DISPLAY (COMBINATION METER)	841	
EGR Cooler Bypass Valve Control Solenoid Valve	816	INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator	841	N
EGR Volume Control Valve	816	INFORMATION DISPLAY (COMBINATION METER) : Engine Oil Pressure Warning	841	O
Engine Coolant Temperature Sensor	816	WARNING/INDICATOR/CHIME LIST	843	
Exhaust Gas Pressure Sensor 1	817	WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps	843	P
Exhaust Gas Temperature Sensor 1	817	WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)	843	
Fuel Filter Pressure Switch	818	OPERATION	844	
Fuel Injector	818	AUTOMATIC SPEED CONTROL DEVICE (ASCD)	844	
Fuel Temperature Sensor	818			
Fuel Pump (With fuel pump suction control valve)	818			
Fuel Rail Pressure Sensor	819			
Glow Control Unit	819			
Glow Plug	819			
Intake air control Valve actuator	819			
Intake Air Temperature Sensor 2	819			
Mass Air Flow Sensor (With Intake Air Temperature Sensor 1)	820			
Refrigerant Pressure Sensor	820			
Stop Lamp Switch & Brake Pedal Position Switch	821			
Turbocharger Boost Control Actuator	821			
Turbocharger Boost Sensor	821			

AUTOMATIC SPEED CONTROL DEVICE (AS- CD) : Switch Name and Function	844
DIAGNOSIS SYSTEM (ECM)	845
DIAGNOSIS DESCRIPTION	845
DIAGNOSIS DESCRIPTION : Introduction	845
DIAGNOSIS DESCRIPTION : Three Trip Detec- tion Logic And One Trip Detection Logic	845
DIAGNOSIS DESCRIPTION : DTC And Freeze Frame Data	845
DIAGNOSIS DESCRIPTION : Malfunction Indica- tor Lamp (MIL)	846
On Board Diagnosis Function	847
CONSULT Function	849
ECU DIAGNOSIS INFORMATION	855
ECM	855
Reference Value	855
Fail safe	866
DTC Inspection Priority Chart	867
DTC Index	869
WIRING DIAGRAM	873
ENGINE CONTROL SYSTEM	873
Wiring Diagram	873
BASIC INSPECTION	892
DIAGNOSIS AND REPAIR WORK FLOW	892
Work Flow	892
Diagnostic Work Sheet	894
TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT	896
Description	896
Diagnosis Procedure	896
SERVICE AFTER REPLACING OR REMOV- ING ENGINE PARTS	897
Description	897
ADDITIONAL SERVICE WHEN REPLACING ECM	898
Description	898
Work Procedure	898
EGR VOLUME CONTROL VALVE CLOSED POSITION LEARNING VALUE CLEAR	900
Description	900
Work Procedure	900
EGR VOLUME CONTROL VALVE CLOSED POSITION LEARNING	901
Description	901
Work Procedure	901
FUEL INJECTION QUANTITY LEARNING	902
Description	902
Work Procedure	902

FUEL PUMP LEARNING VALUE CLEARING..	904
Description	904
Work Procedure	904
INJECTOR ADJUSTMENT VALUE REGIS- TRATION	905
Description	905
Work Procedure	905
BASIC INSPECTION	907
Work Procedure	907
DTC/CIRCUIT DIAGNOSIS	909
POWER SUPPLY AND GROUND CIRCUIT ...	909
Diagnosis Procedure	909
U1000 CAN COMM CIRCUIT	913
DTC Description	913
Diagnosis Procedure	913
U1025 ENG COMMUNICATION	914
Description	914
DTC Description	914
Diagnosis Procedure	914
P0016 CKP - CMP CORRELATION	917
DTC Description	917
Diagnosis Procedure	917
Component Inspection (Crankshaft Position Sen- sor)	918
Component Inspection (Camshaft Position Sen- sor)	919
P0088 FUEL SYSTEM	920
DTC Description	920
Diagnosis Procedure	920
Component Inspection (Fuel Rail Pressure Sen- sor)	921
Component Inspection (Fuel Injector)	922
Component Inspection (Fuel Pump Suction Con- trol Valve)	922
P0089 FUEL PUMP	923
DTC Description	923
Diagnosis Procedure	923
Component Inspection (Fuel Rail Pressure Sen- sor)	924
Component Inspection (Fuel Pump Suction Con- trol Valve)	924
P0093 FUEL SYSTEM	926
DTC Description	926
Diagnosis Procedure	927
Component Inspection (Fuel Rail Pressure Relief Valve)	928
P0097, P0098 IAT SENSOR 2	929
DTC Description	929
Diagnosis Procedure	929
Component Inspection (IAT sensor 2)	931

P0102, P0103 MAF SENSOR	932	DTC Description	932	DTC Description	957	
DTC Description	932	Diagnosis Procedure	932	Diagnosis Procedure	958	A
Diagnosis Procedure	932					
Component Inspection (Mass Air Flow Sensor) ...	933	P0222, P0223 APP SENSOR	959	DTC Description	959	EC
		Diagnosis Procedure	959	Diagnosis Procedure	959	
P0112, P0113 IAT SENSOR1	935	Component Inspection (Accelerator Pedal Position Sensor)	960			C
DTC Description	935			P0234 TC SYSTEM	962	
Diagnosis Procedure	935	DTC Description	962	DTC Description	962	D
Component Inspection (Intake Air Temperature Sensor 1)	936	Diagnosis Procedure	962			
				P0237, P0238 TC BOOST SENSOR	964	E
P0117, P0118 ECT SENSOR	937	DTC Description	964	Diagnosis Procedure	964	
DTC Description	937					
Diagnosis Procedure	937	P0301, P0302, P0303, P0304 MISFIRE	966	Description	966	F
Component Inspection (Engine Coolant Temperature Sensor)	938	DTC Description	966	DTC Description	966	
		Diagnosis Procedure	966	Diagnosis Procedure	966	
P0122, P0123 APP SENSOR	939			P0335, P0336 CRANKSHAFT POSITION SENSOR	968	G
DTC Description	939			DTC Description	968	
Diagnosis Procedure	939			Diagnosis Procedure	968	H
Component Inspection (Accelerator Pedal Position Sensor)	940			Component Inspection (Crankshaft Position Sensor)	969	
		P0340, P0341 CAMSHAFT POSITION SENSOR	971	DTC Description	971	I
P012B INTAKE AIR SYSTEM	942	DTC Description	971	Diagnosis Procedure	971	J
DTC Description	942	Diagnosis Procedure	971	Component Inspection (Camshaft Position Sensor)	973	
Diagnosis Procedure	942					
Component Inspection (Turbocharger Boost Sensor)	943	P0380, P0670 GLOW CONTROL UNIT	974	DTC Description	974	K
		DTC Description	974	Diagnosis Procedure	974	
P0182, P0183 FUEL TEMPERATURE SENSOR	944	Component Inspection (Glow Plug)	975			L
DTC Description	944			P0403 EGR VOLUME CONTROL VALVE	977	
Diagnosis Procedure	944	DTC Description	977	DTC Description	977	M
		Diagnosis Procedure	977	Diagnosis Procedure	977	
P018C FUEL FILTER PRESSURE SWITCH ..	946	Component Inspection	978	Component Inspection	978	
DTC Logic	946			P0405, P0406 EGR VOLUME CONTROL VALVE POSITION SENSOR	979	N
Diagnosis Procedure	946			DTC Description	979	
Component Inspection	947			Diagnosis Procedure	979	O
		P0409 EGR VOLUME CONTROL VALVE	981	DTC Description	981	P
P018D FUEL FILTER PRESSURE SWITCH ..	949	DTC Description	981	Diagnosis Procedure	981	
DTC Logic	949					
Diagnosis Procedure	949	P0473 EXHAUST GAS PRESSURE SENSOR 1	983	DTC Description	983	
Component Inspection	950	DTC Description	983	Diagnosis Procedure	983	
		Component Inspection (Exhaust Gas Pressure Sensor 1)	985			
P0192, P0193 FRP SENSOR	952					
DTC Description	952					
Diagnosis Procedure	952					
Component Inspection (Fuel Rail Pressure Sensor)	953					
P0200 FUEL INJECTOR	955					
Description	955					
DTC Description	955					
Diagnosis Procedure	955					
P0201, P0202, P0203, P0204 FUEL INJECTOR	956					
DTC Description	956					
Diagnosis Procedure	956					
P0217 ENGINE OVER TEMPERATURE	957					

P0488 EGR SYSTEM	986	P1028 EXHAUST GAS PRESSURE SENSOR	
DTC Description	986	1	1008
Diagnosis Procedure	986	Description	1008
P0501, P0502, P0503 VEHICLE SPEED SIG-		DTC Description	1008
NAL	987	Diagnosis Procedure	1008
Description	987	P1029 TC BOOST SENSOR	1010
DTC Description	987	Description	1010
Diagnosis Procedure	987	DTC Description	1010
P0545, P0546 EGT SENSOR 1	989	Diagnosis Procedure	1010
DTC Description	989	Component Inspection (Turbocharger Boost Sen-	
Diagnosis Procedure	989	sor)	1011
Component Inspection (EGT Sensor 1)	991	P102A BARO SENSOR	1013
P0563 BATTERY VOLTAGE	992	Description	1013
DTC Description	992	DTC Description	1013
Diagnosis Procedure	992	Diagnosis Procedure	1013
P0580, P0581 ASCD STEERING SWITCH	993	P102B EXHAUST GAS PRESSURE SENSOR	
DTC Description	993	1	1015
Diagnosis Procedure	993	DTC Description	1015
Component Inspection (ASCD Steering Switch) ..	995	Diagnosis Procedure	1015
P0605, P0606 ECM	996	P1268 P1269, P1270, P1271 FUEL INJEC-	
DTC Description	996	TOR	1017
Diagnosis Procedure	996	DTC Description	1017
P0607 ECM	997	Diagnosis Procedure	1018
Description	997	Component Inspection (Fuel Injector)	1019
DTC Description	997	P1272 FUEL PUMP	1020
Diagnosis Procedure	997	DTC Description	1020
P0628, P0629 FUEL PUMP	998	Diagnosis Procedure	1020
DTC Description	998	Component Inspection (Fuel Pump Suction Con-	
Diagnosis Procedure	998	trol Valve)	1022
Component Inspection (Fuel Pump Suction Con-		Component Inspection (Fuel Rail Pressure Sen-	
trol Valve)	999	sor)	1022
P0642, P0643 SENSOR POWER SUPPLY ...	1000	Component Inspection (Fuel Rail Pressure Relief	
DTC Description	1000	Valve)	1023
Diagnosis Procedure	1000	P1273 FUEL PUMP	1024
P0652, P0653 SENSOR POWER SUPPLY ...	1002	DTC Description	1024
DTC Description	1002	Diagnosis Procedure	1024
Diagnosis Procedure	1002	Component Inspection (Fuel Pump Suction Con-	
P0668, P0669 BAROMETRIC PRESSURE		trol Valve)	1026
SENSOR	1004	P1274 FUEL PUMP	1027
DTC Description	1004	DTC Description	1027
Diagnosis Procedure	1004	Diagnosis Procedure	1027
P0686 ECM RELAY	1005	Component Inspection (Fuel Pump Suction Con-	
DTC Description	1005	trol Valve)	1028
Diagnosis Procedure	1005	Component Inspection (Fuel Rail Pressure Sen-	
P1020, P1022, P1023, P1024, P1025, P1026		sor)	1028
TC BOOST CONTROL ACTUATOR	1007	P1275 FUEL PUMP	1030
DTC Description	1007	DTC Description	1030
Diagnosis Procedure	1007	Diagnosis Procedure	1030
		Component Inspection (Fuel Pump Suction Con-	
		trol Valve)	1031
		Component Inspection (Fuel Rail Pressure Sen-	
		sor)	1031

P1409 EGR COOLER BYPASS VALVE	1033	P2554 INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE	1058	A
DTC Description	1033	DTC Logic	1058	
Diagnosis Procedure	1033	Diagnosis Procedure	1058	
P1572 ASCD BRAKE SWITCH	1035	Component Inspection	1060	EC
DTC Description	1035	P2555 INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE	1061	C
Diagnosis Procedure	1036	DTC Logic	1061	
Component Inspection (Brake Pedal Position Switch)	1039	Diagnosis Procedure	1061	
Component Inspection (Stop Lamp Switch)	1039	Component Inspection	1063	D
Component Inspection (Clutch Pedal Position Switch)	1040	BATTERY CURRENT SENSOR	1064	
P1616 ECM	1041	Diagnosis Procedure	1064	E
DTC Description	1041	Component Inspection (Battery Current Sensor)	1065	
Diagnosis Procedure	1041	EGR COOLER BYPASS SYSTEM	1067	F
P1622 INJECTOR ADJUSTMENT VALUE	1042	Component Function Check	1067	
DTC Description	1042	Diagnosis Procedure	1067	
Diagnosis Procedure	1042	Component Inspection (EGR Cooler Bypass Valve Control Solenoid Valve)	1068	G
P1623 INJECTOR ADJUSTMENT VALUE	1043	Component Inspection (EGR Cooler Bypass Valve)	1068	
DTC Description	1043	FUEL INJECTOR	1069	H
Diagnosis Procedure	1043	Diagnosis Procedure	1069	
P1805 BRAKE SWITCH	1045	Component Inspection (Fuel Injector)	1071	
DTC Description	1045	GLOW CONTROL SYSTEM	1072	I
Diagnosis Procedure	1046	Diagnosis Procedure	1072	
Component Inspection (Stop Lamp Switch)	1046	Component Inspection (Glow Plug)	1072	J
P2135 APP SENSOR	1048	GLOW INDICATOR	1074	
DTC Description	1048	Component Function Check	1074	K
Diagnosis Procedure	1048	Diagnosis Procedure	1074	
Component Inspection (Accelerator Pedal Position Sensor)	1049	MALFUNCTION INDICATOR LAMP	1075	L
P2146, P2149 FUEL INJECTOR POWER SUPPLY	1051	Component Function Check	1075	
DTC Description	1051	Diagnosis Procedure	1075	M
Diagnosis Procedure	1051	PARK/NEUTRAL POSITION SWITCH	1076	
P2147, P2148 FUEL INJECTOR	1052	Component Function Check	1076	N
DTC Description	1052	Diagnosis Procedure (M/T Models)	1076	
Diagnosis Procedure	1052	Diagnosis Procedure (A/T Models)	1078	O
P2228, P2229 BARO SENSOR	1053	Component Inspection [Park/Neutral Position (PNP) Switch]	1079	
DTC Description	1053	Component Inspection (Park/Neutral Position Relay)	1079	P
Diagnosis Procedure	1053	REFRIGERANT PRESSURE SENSOR	1080	
P2426, P2427 EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE	1054	Component Function Check	1080	
DTC Description	1054	Diagnosis Procedure	1080	
Diagnosis Procedure	1054	START SIGNAL	1082	
Component Inspection (EGR Cooler Bypass Valve Control Solenoid Valve)	1055	Component Function Check	1082	
Diagnosis Procedure	1055	Diagnosis Procedure	1082	
P2478 EGT SENSOR 1	1056	STOP LAMP SWITCH	1083	
DTC Description	1056	Component Function Check	1083	
Diagnosis Procedure	1057	Diagnosis Procedure	1083	
		Component Inspection (Stop Lamp Switch)	1084	

SYMPTOM DIAGNOSIS	1085	Removal and Installation	1095
ENGINE CONTROL SYSTEM	1085	VACUUM LINES	1096
Symptom Table	1085	Hydraulic Layout	1096
NORMAL OPERATING CONDITION	1091	SERVICE DATA AND SPECIFICATIONS	
Description	1091	(SDS)	1097
PERIODIC MAINTENANCE	1092	SERVICE DATA AND SPECIFICATIONS	
IDLE SPEED	1092	(SDS)	1097
Inspection	1092	General Specification	1097
CRANKCASE VENTILATION SYSTEM	1093	Mass Air Flow Sensor	1097
Inspection	1093	Intake Air Temperature Sensor 1	1097
REMOVAL AND INSTALLATION	1094	Engine Coolant Temperature Sensor	1097
ECM	1094	Fuel Rail Pressure Sensor	1097
Exploded View	1094	Fuel Injector	1097
Removal and Installation	1094	Glow Plug	1098
GLOW CONTROL UNIT	1095	EGR Volume Control Valve	1098
Exploded View	1095	Crankshaft Position Sensor	1098
		Camshaft Position Sensor	1098
		Fuel Pump	1098

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:0000000014267441

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.

Precautions Necessary for Steering Wheel Rotation After Battery Disconnection

INFOID:0000000014267442

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Before removing and installing any control units, first turn the ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.

NOTE:

Supply power using jumper cables if battery is discharged.

2. Turn the ignition switch to ACC position.
(At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

PRECAUTIONS

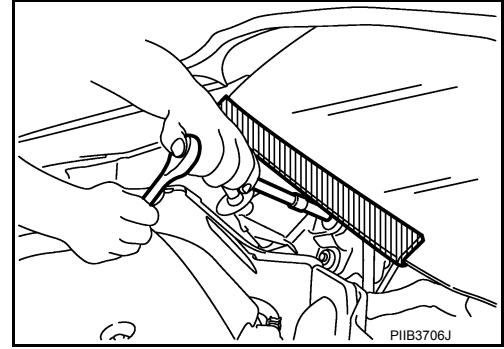
< PRECAUTION >

[QR25DE]

Precaution for Procedure without Cowl Top Cover

INFOID:0000000014267443

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



Service Notice or Precautions for Steering System

INFOID:0000000014267444

- In case of removing steering gear, make the final tightening with grounded and unloaded vehicle condition, and then check wheel alignment.
- Observe the following precautions when disassembling.
 - Before disassembly, thoroughly clean the outside of the unit.
 - Disassembly should be done in a clean work area. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
 - For easier and proper assembly, place disassembled parts in order on a parts rack.
 - Use nylon cloth or paper towels to clean the parts; common shop rags can leave lint that might interfere with their operation.
 - Do not reuse non-reusable parts.
 - Before assembling, apply the specified grease to the directed parts.

On Board Diagnostic (OBD) System of Engine

INFOID:0000000014267445

The ECM has an on board diagnostic system. It will illuminate the malfunction indicator (MIL) to warn the driver of a malfunction causing emission deterioration.

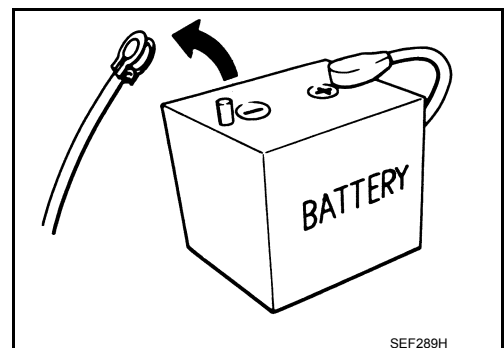
CAUTION:

- **Be sure to turn the ignition switch OFF and disconnect the negative battery cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to illuminate.**
- **Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to illuminate due to the open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)**
- **Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to [PG-9, "Harness Connector"](#).**
- **Be sure to route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to illuminate due to the short circuit.**
- **Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to illuminate due to the malfunction of the EVAP system or fuel injection system, etc.**

General Precautions

INFOID:0000000014267446

- **Always use a 12 volt battery as power source.**
- **Do not attempt to disconnect battery cables while engine is running.**
- **Before connecting or disconnecting the ECM harness connector, turn ignition switch OFF and disconnect negative battery cable. Failure to do so may damage the ECM because battery voltage is applied to ECM even if ignition switch is turned OFF.**
- **Before removing parts, turn ignition switch OFF and then disconnect battery ground cable.**



PRECAUTIONS

< PRECAUTION >

[QR25DE]

- Do not disassemble ECM.
- If a battery cable is disconnected, the memory will return to the ECM value.

The ECM will now start to self-control at its initial value. Engine operation can vary slightly when the terminal is disconnected. However, this is not an indication of a malfunction. Do not replace parts because of a slight variation.

- If the battery is disconnected, the following emission-related diagnostic information will be lost within 24 hours.

- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- Test values

- When connecting or disconnecting pin connectors into or from ECM, take care not to damage pin terminals (bend or break).

Make sure that there are not any bends or breaks on ECM pin terminal, when connecting pin connectors.

- Securely connect ECM harness connectors.

A poor connection can cause an extremely high (surge) voltage to develop in coil and condenser, thus resulting in damage to ICs.

- Keep engine control system harness at least 10 cm (4 in) away from adjacent harness, to prevent engine control system malfunctions due to receiving external noise, degraded operation of ICs, etc.

- Keep engine control system parts and harness dry.

- Before replacing ECM, perform ECM Terminals and Reference Value inspection and make sure ECM functions properly. Refer to [EC-81, "Reference Value"](#).

- Handle mass air flow sensor carefully to avoid damage.

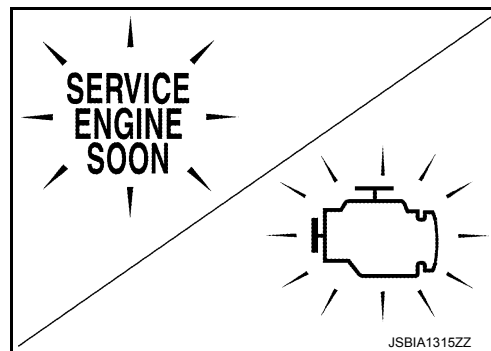
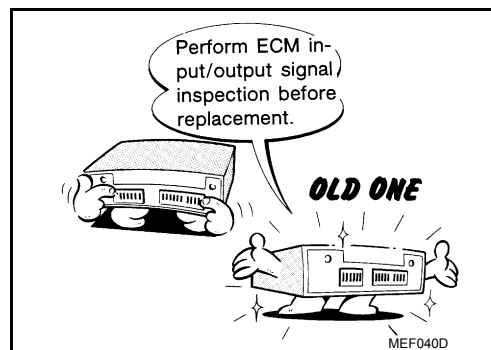
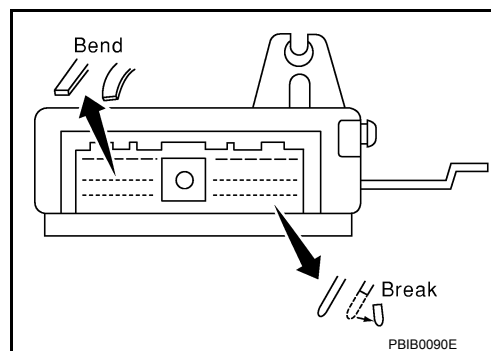
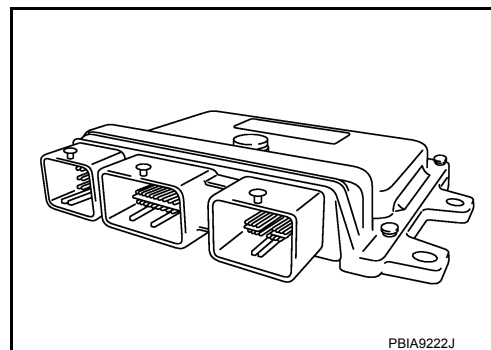
- Do not clean mass air flow sensor with any type of detergent.

- Do not disassemble electric throttle control actuator.

- Even a slight leak in the air intake system can cause serious incidents.

- Do not shock or jar the camshaft position sensor (PHASE), crankshaft position sensor (POS).

- After performing each TROUBLE DIAGNOSIS, perform DTC CONFIRMATION PROCEDURE or Component Function Check. The DTC should not be displayed in the DTC Confirmation Procedure if the repair is completed. The Component Function Check should be a good result if the repair is completed.

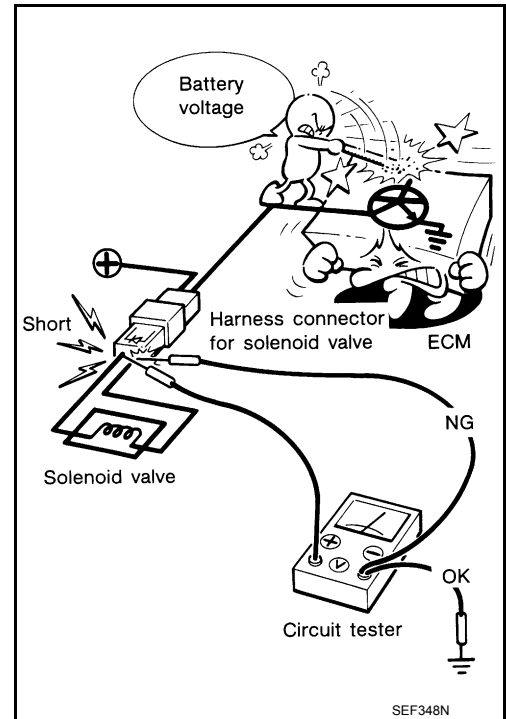


PRECAUTIONS

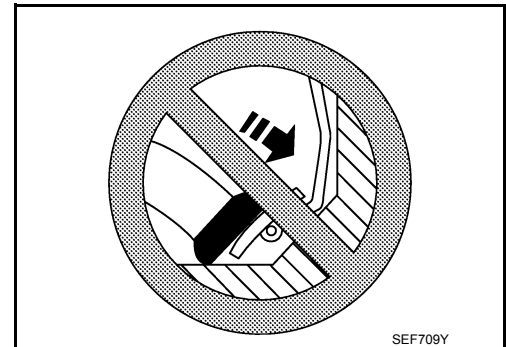
[QR25DE]

< PRECAUTION >

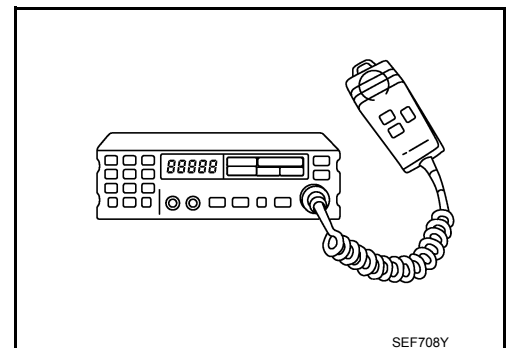
- When measuring ECM signals with a circuit tester, never allow the two tester probes to contact. Accidental contact of probes will cause a short circuit and damage the ECM power transistor.



- Do not operate fuel pump when there is no fuel in lines.
- Tighten fuel hose clamps to the specified torque.
- Do not depress accelerator pedal when starting.
- Immediately after starting, do not rev up engine unnecessarily.
- Do not rev up engine just prior to shutdown.



- When installing C.B. ham radio or a mobile phone, be sure to observe the following as it may adversely affect electronic control systems depending on installation location.
 - Keep the antenna as far as possible from the electronic control units.
 - Keep the antenna feeder line more than 20 cm (8 in) away from the harness of electronic controls. Do not let them run parallel for a long distance.
 - Adjust the antenna and feeder line so that the standing-wave ratio can be kept smaller.
 - Be sure to ground the radio to vehicle body.



PREPARATION

< PREPARATION >

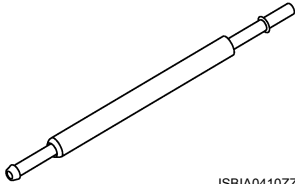
[QR25DE]

PREPARATION

PREPARATION

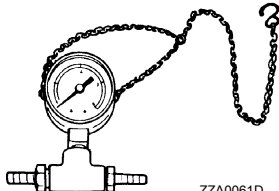
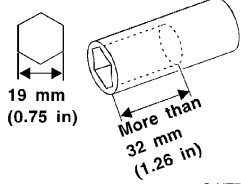
Special Service Tools

INFOID:0000000014267447

Tool number Tool name	Description
KV10120000 Fuel tube adapter	Measures fuel pressure
 JSBIA0410ZZ	

Commercial Service Tools

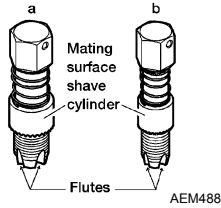
INFOID:0000000014267448

Tool name	Description
Fuel pressure gauge	Measuring fuel pressure
 ZZA0061D	
Quick connector re-lease	Removing fuel tube quick connectors in engine room (Available in SEC. 164 of PARTS CATALOG: Par No. 16441 6N210)
 PBIC0198E	
Fuel filler cap adapter i.e.: (MLR-8382)	Checks fuel tank vacuum relief valve opening pressure
 S-NT815	
Socket wrench	Removes and installs engine coolant temperature sensor
 S-NT705	

PREPARATION

< PREPARATION >

[QR25DE]

Tool name	Description
Oxygen sensor thread cleaner i.e.: (J-43897-18) (J-43897-12) 	Reconditions the exhaust system threads before installing a new oxygen sensor. Use with anti-seize lubricant shown below. a: 18 mm diameter with pitch 1.5 mm for Zirconia Oxygen Sensor b: 12 mm diameter with pitch 1.25 mm for Titania Oxygen Sensor
Anti-seize lubricant i.e.: (Permatex™ 133AR or equivalent meeting MIL specification MIL-A-907) 	Lubricates oxygen sensor thread cleaning tool when reconditioning exhaust system threads.

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[QR25DE]

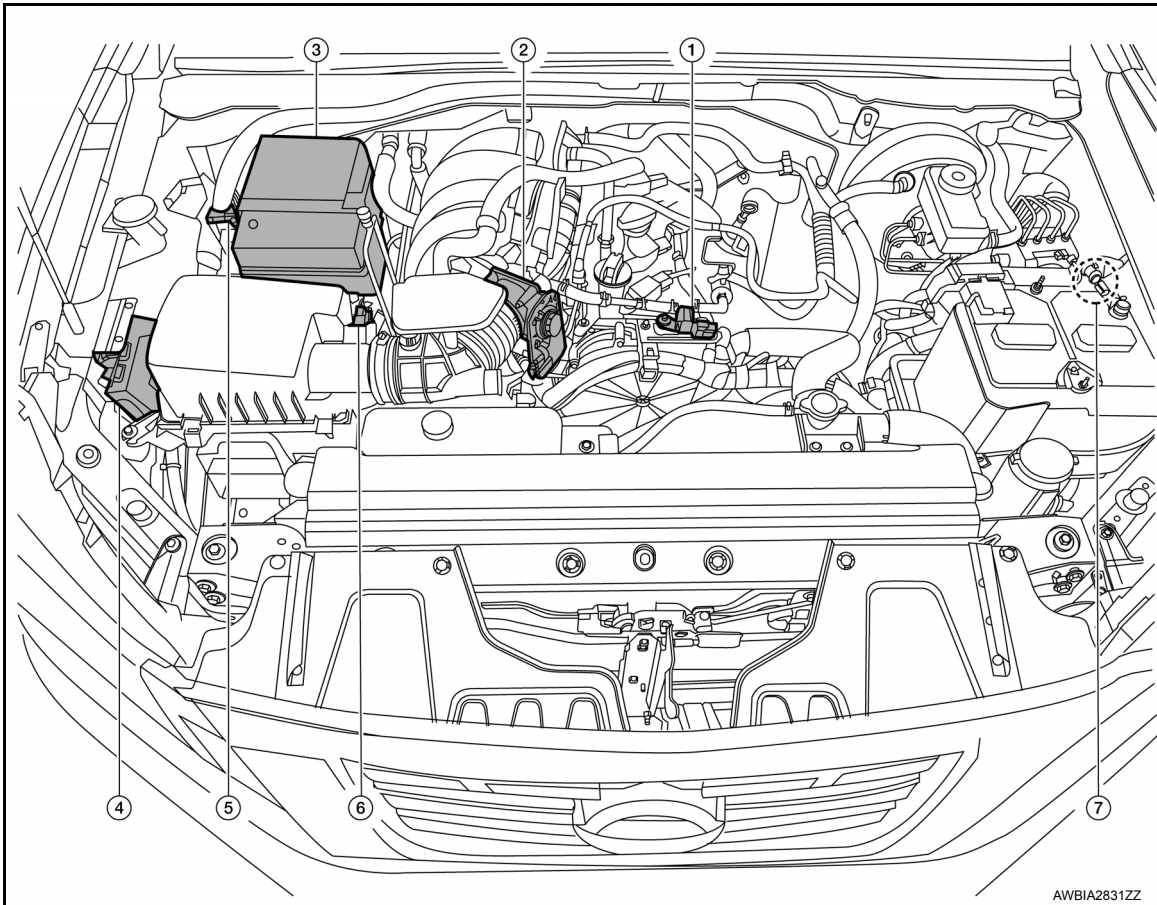
SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000014267449

ENGINE ROOM COMPARTMENT



No.	Component	Function
①	EVAP canister purge volume control solenoid valve	EC-36. "EVAP Canister Purge Volume Control Solenoid Valve"
②	Electric throttle control actuator (with built in throttle position sensor and throttle control motor)	EC-30. "Electric Throttle Control Actuator"
③	IPDM E/R	• IPDM E/R control the internal relays and the actuators. Refer to PCS-8. "RELAY CONTROL SYSTEM : System Description". • When CAN communication with ECM is impossible, IPDM E/R performs fail-safe control. Refer to PCS-24. "Fail-safe".
④	ECM	EC-29. "ECM"
⑤	Atmospheric pressure sensor	EC-37. "Atmospheric Pressure Sensor"
⑥	Mass air flow sensor (with intake air temperature sensor)	EC-31. "Mass Air Flow Sensor (With Intake Air Temperature Sensor)"
⑦	Battery current sensor* (with battery temperature sensor)	EC-36. "Battery Current Sensor (With Battery Temperature Sensor)"

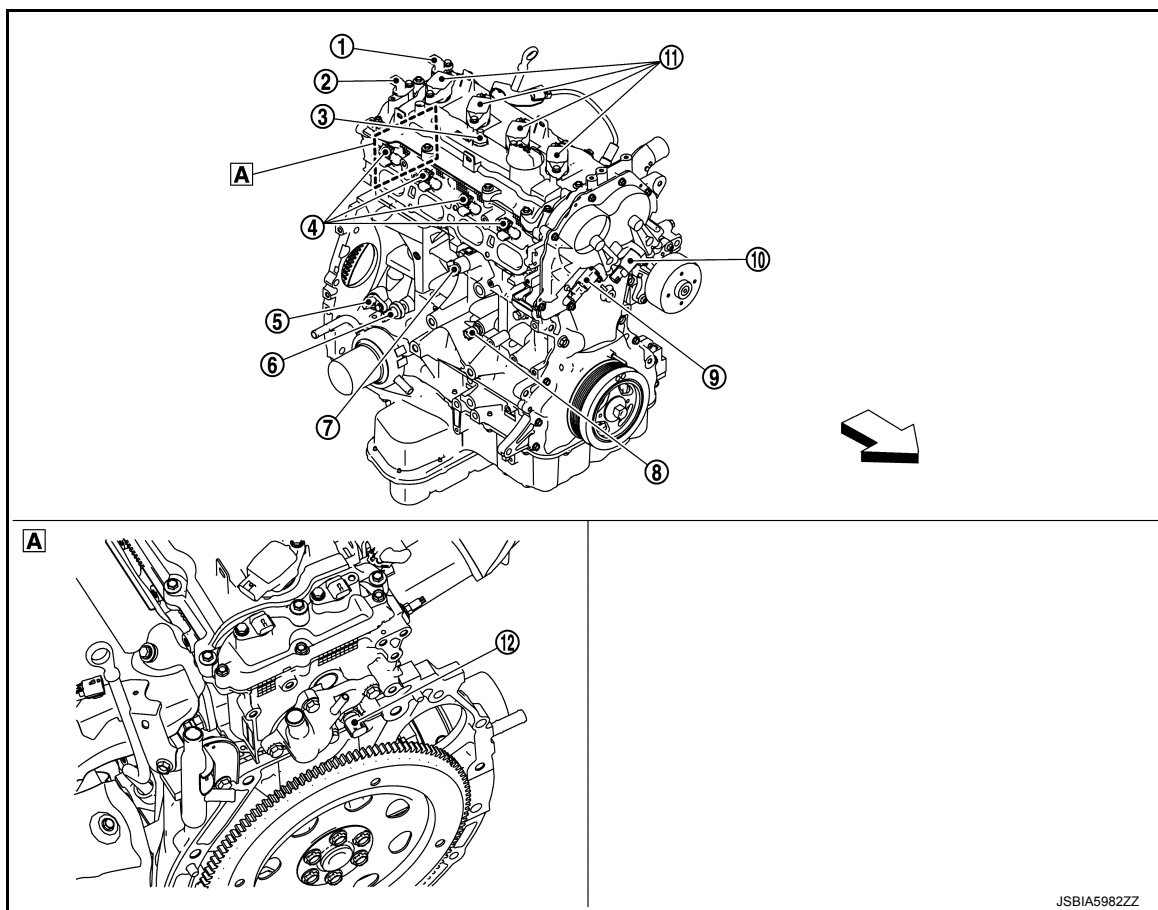
*:For CHILE

ENGINE COMPARTMENT

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[QR25DE]



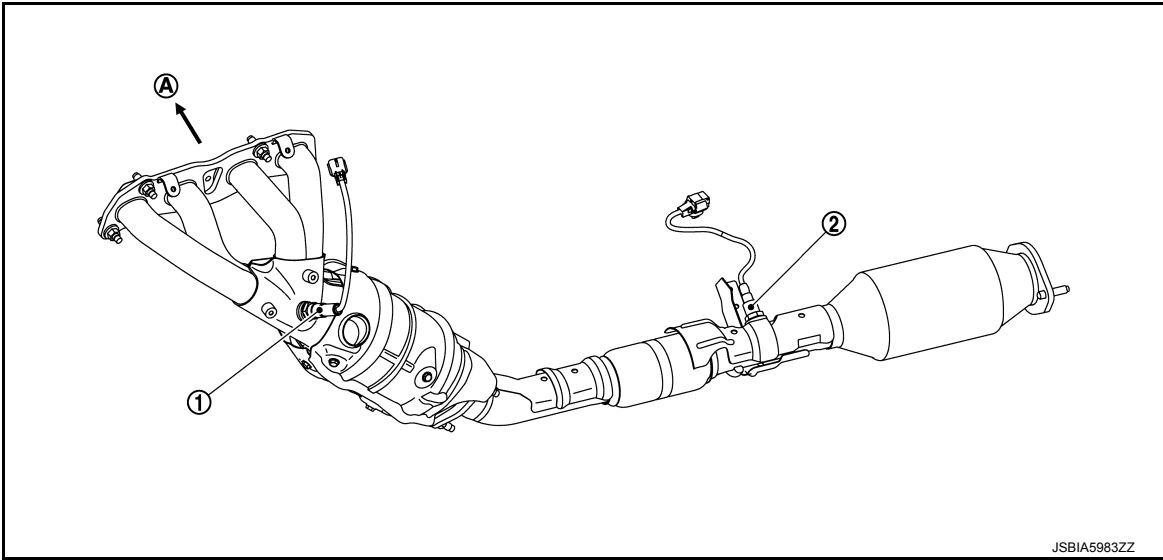
A Engine rear side

↩ : Vehicle front

No.	Component	Function
①	Exhaust valve timing control position sensor* (Exhaust camshaft position sensor)*	EC-33. "Exhaust Valve Timing Control Position Sensor"
②	Camshaft position sensor (PHASE) (Intake camshaft position sensor)	EC-33. "Camshaft Position Sensor (PHASE)"
③	PCV valve	The positive crankcase ventilation (PCV) valve is provided to conduct crankcase blow-by gas to the intake manifold.
④	Fuel injector	EC-31. "Fuel Injector"
⑤	Crankshaft position sensor (POS)	EC-33. "Crankshaft Position Sensor (POS)"
⑥	Engine oil pressure sensor*	EC-35. "Engine Oil Pressure Sensor"
⑦	Knock sensor	EC-35. "Knock Sensor"
⑧	Engine oil temperature sensor*	EC-36. "Engine Oil Temperature Sensor"
⑨	Intake valve timing control solenoid valve*	EC-33. "Intake Valve Timing Control Solenoid Valve"
⑩	Exhaust valve timing control solenoid valve*	EC-34. "Exhaust Valve Timing Control Solenoid Valve"
⑪	Ignition coil (with power transistor)	EC-31. "Ignition Coil With Power Transistor"
⑫	Engine coolant temperature sensor	EC-32. "Engine Coolant Temperature Sensor"

*:For CHILE

EXHAUST COMPARTMENT



Ⓐ To engine assembly

No.	Component	Function
①	Air fuel ratio (A/F) sensor 1	EC-34. "Air Fuel Ratio (A/F) Sensor 1"
②	Heated oxygen sensor 2	EC-35. "Heated Oxygen Sensor 2"

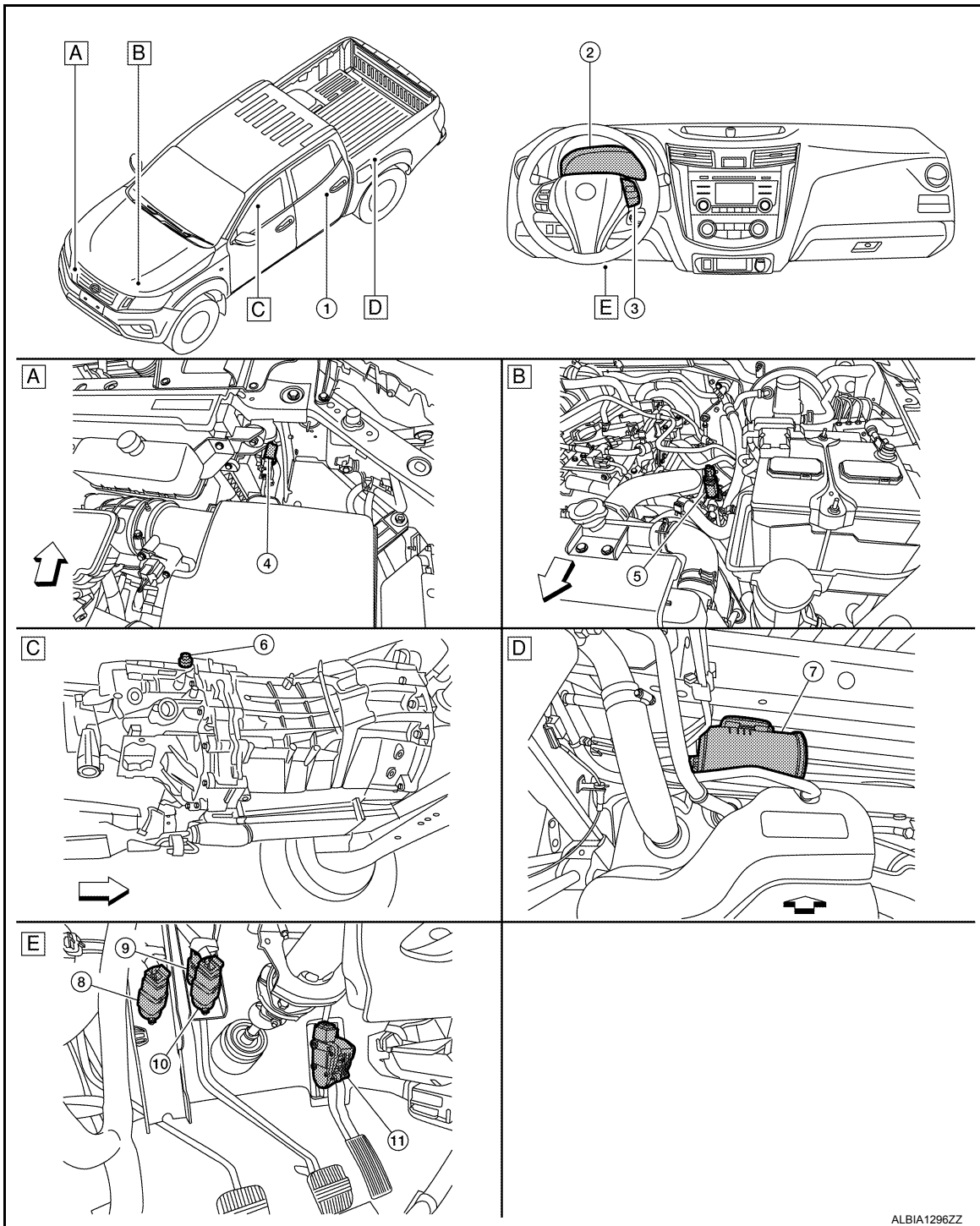
BODY COMPARTMENT

A
EC
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M
N
O
P

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[QR25DE]



ALBIA1296ZZ

A Right front side of engine room

B Left front side of engine room

C Right side of transmission

D Rear of fuel tank area

E Pedal periphery

↖ : Vehicle front

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[QR25DE]

No.	Component	Function
①	Fuel pump	EC-31. "Fuel Pump"
②	Combination meter	Mainly transmits the following signal to ECM via CAN communication. • Vehicle speed • A/C ON signal*2 • Blower fan ON signal
③	ASCD steering switch*1	EC-39. "ASCD Steering Switch"
④	Refrigerant pressure sensor*2	EC-38. "Refrigerant Pressure Sensor"
⑤	Power steering pressure sensor	EC-38. "Power Steering Pressure Sensor"
⑥	Park/neutral position (PNP) switch	EC-38. "Park/Neutral position Switch"
⑦	EVAP canister	EC-36. "EVAP Canister"
⑧	Clutch pedal position switch	EC-38. "Clutch Pedal Position Switch"
⑨	Brake pedal position switch	EC-38. "Stop Lamp Switch & Brake Pedal Position Switch"
⑩	Stop lamp switch	
⑪	Accelerator pedal position switch	EC-29. "Accelerator Pedal Position Sensor"

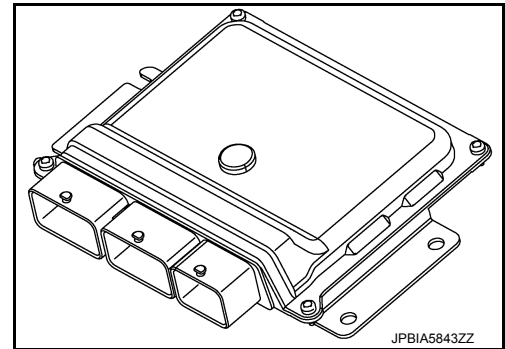
*1: With ASCD

*2: With A/C

ECM

INFOID:0000000014267450

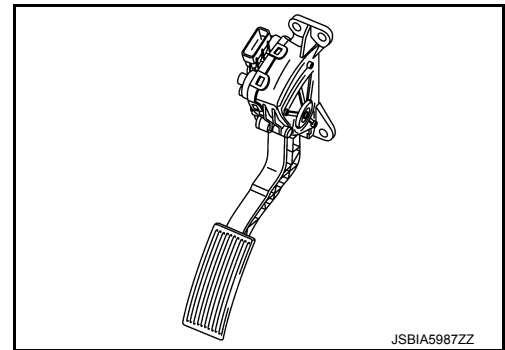
The ECM consists of a microcomputer and connectors for signal input and output and for power supply. The ECM controls the engine.



INFOID:0000000014267451

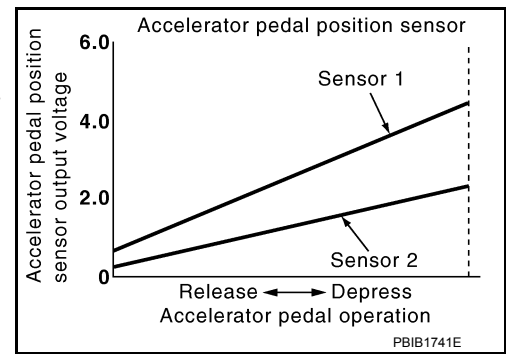
Accelerator Pedal Position Sensor

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.



Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometers which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and feed the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.

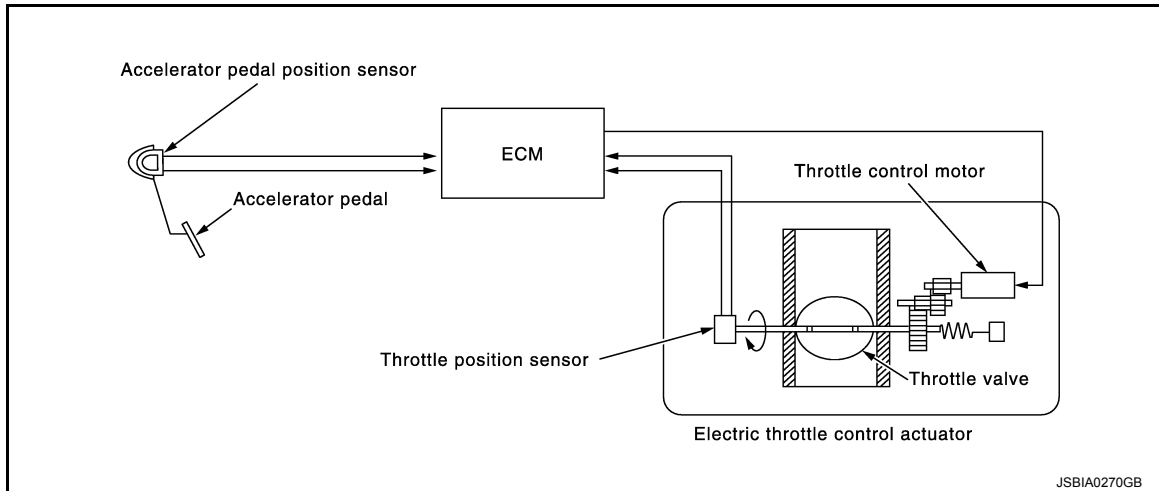
Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for the engine operation such as fuel cut.



Electric Throttle Control Actuator

INFOID:0000000014267452

Electric throttle control actuator consists of throttle body, throttle valve, throttle control motor and throttle position sensor.



THROTTLE CONTROL MOTOR RELAY

Power supply for the throttle control motor is provided to the ECM via throttle control motor relay. The throttle control motor relay is ON/OFF controlled by the ECM. When the ignition switch is turned ON, the ECM sends an ON signal to throttle control motor relay and battery voltage is provided to the ECM. When the ignition switch is turned OFF, the ECM sends an OFF signal to throttle control motor relay and battery voltage is not provided to the ECM.

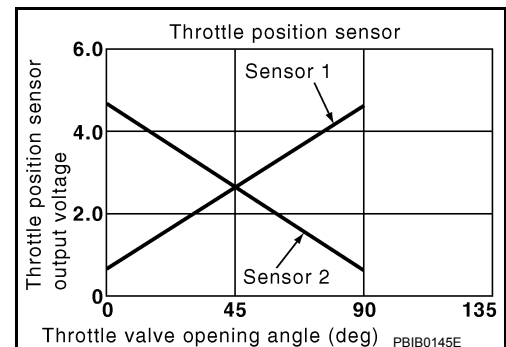
THROTTLE CONTROL MOTOR

The throttle control motor is operated by the ECM and it opens and closes the throttle valve.

The current opening angle of the throttle valve is detected by the throttle position sensor and it provides feedback to the ECM to control the throttle control motor to make the throttle valve opening angle properly in response to driving condition.

THROTTLE POSITION SENSOR

The throttle position sensor responds to the throttle valve movement. The throttle position sensor has two sensors. These sensors are a kind of potentiometers which transform the throttle valve position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the throttle valve and feed the voltage signals to the ECM. The ECM judges the current opening angle of the throttle valve from these signals and the ECM controls the throttle control motor to make the throttle valve opening angle properly in response to driving condition.



COMPONENT PARTS

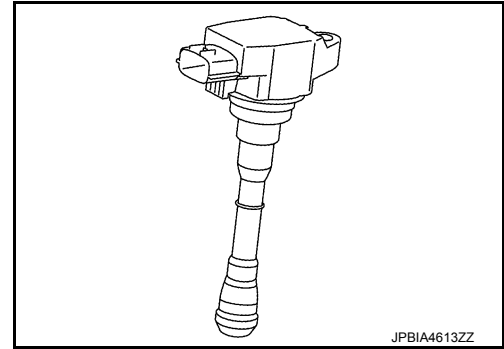
< SYSTEM DESCRIPTION >

[QR25DE]

Ignition Coil With Power Transistor

INFOID:0000000014267453

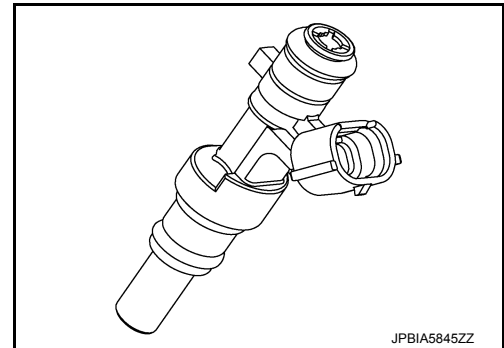
The ignition signal from the ECM is sent to and amplified by the power transistor. The power transistor turns ON and OFF the ignition coil primary circuit. This ON/OFF operation induces the proper high voltage in the coil secondary circuit.



Fuel Injector

INFOID:0000000014267454

The fuel injector is a small, precise solenoid valve. When the ECM supplies a ground to the fuel injector circuit, the coil in the fuel injector is energized. The energized coil pulls the ball valve back and allows fuel to flow through the fuel injector into the intake manifold. The amount of fuel injected depends upon the injection pulse duration. Pulse duration is the length of time the fuel injector remains open. The ECM controls the injection pulse duration based on engine fuel needs.

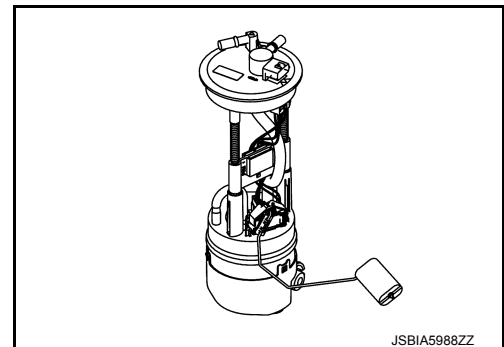


Fuel Pump

INFOID:0000000014267455

FUEL PUMP

The ECM activates the fuel pump for 1 second after the ignition switch is turned ON to improve engine start ability. If the ECM receives a engine speed signal from the camshaft position sensor (PHASE), it knows that the engine is rotating, and causes the pump to operate. If the engine speed signal is not received when the ignition switch is ON, the engine stalls. The ECM stops pump operation and prevents battery discharging, thereby improving safety. The ECM does not directly drive the fuel pump. It sends the control signal to the fuel pump control module, which in turn controls the fuel pump.



Condition	Fuel pump operation
Ignition switch is turned to ON.	Operates for 1 second.
Engine running and cranking	Operates.
When engine is stopped	Stops in 1.5 seconds.
Except as shown above	Stops.

Mass Air Flow Sensor (With Intake Air Temperature Sensor)

INFOID:0000000014267456

MASS AIR FLOW SENSOR

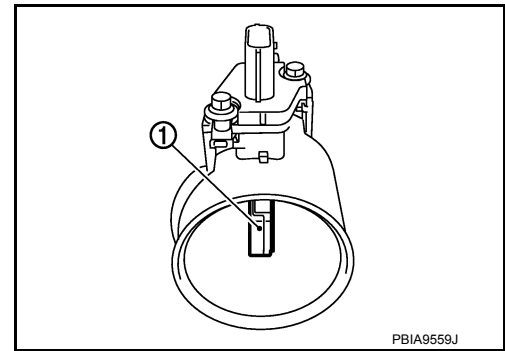
COMPONENT PARTS

< SYSTEM DESCRIPTION >

[QR25DE]

The mass air flow sensor ① is installed in the passage of intake air and measures the intake flow rate. The mass air flow sensor controls the temperature of the hot wire to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The greater air flow, the greater the heat loss.

Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



PBIA9559J

INTAKE AIR TEMPERATURE SENSOR

The intake air temperature (IAT) sensor is built-into the mass air flow sensor. The sensor detects intake air temperature and transmits a signal to the ECM.

The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the rise in temperature.

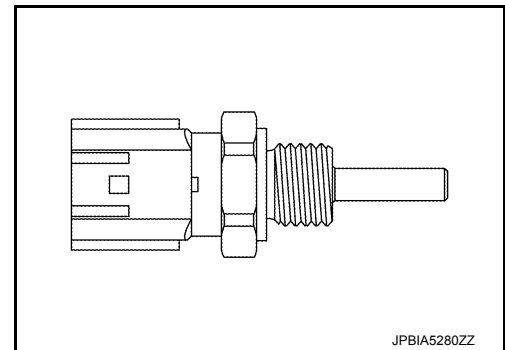
<Reference data>

Intake air temperature °C (°F)	Resistance (Approx.) kΩ
-10 (14)	8.628 – 9.577
10 (50)	3.524 – 3.841
20 (68)	2.342 – 2.531
30 (86)	1.585 – 1.715
50 (122)	0.769 – 0.844

Engine Coolant Temperature Sensor

INFOID:0000000014267457

The engine coolant temperature sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.

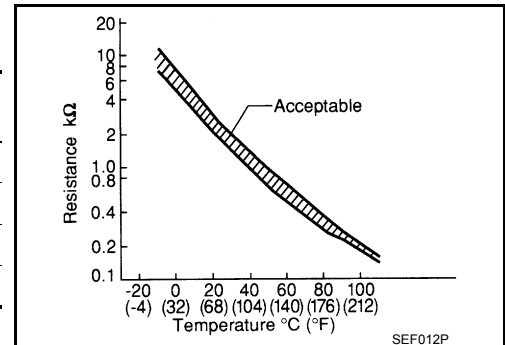


JPBIA5280ZZ

<Reference data>

Engine coolant temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	1.0	0.236 - 0.260

*: These data are reference values and are measured between ECM terminals.



Crankshaft Position Sensor (POS)

INFOID:000000014267458

The crankshaft position sensor (POS) is located on the oil pan facing the gear teeth (cogs) of the signal plate. It detects the fluctuation of the engine revolution.

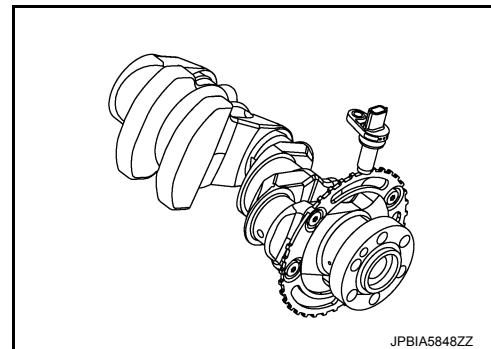
The sensor consists of a permanent magnet and Hall IC.

When the engine is running, the high and low parts of the teeth cause the gap with the sensor to change.

The changing gap causes the magnetic field near the sensor to change.

Due to the changing magnetic field, the voltage from the sensor changes.

The ECM receives the voltage signal and detects the fluctuation of the engine revolution.



Camshaft Position Sensor (PHASE)

INFOID:000000014267459

The camshaft position sensor (PHASE) senses the retraction of intake camshaft to identify a particular cylinder. The camshaft position sensor (PHASE) senses the piston position.

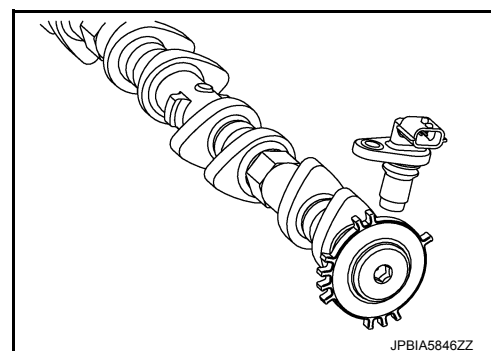
When the crankshaft position sensor (POS) system becomes inoperative, the camshaft position sensor (PHASE) provides various controls of engine parts instead, utilizing timing of cylinder identification signals.

The sensor consists of a permanent magnet and Hall IC.

When engine is running, the high and low parts of the teeth cause the gap with the sensor to change.

The changing gap causes the magnetic field near the sensor to change.

Due to the changing magnetic field, the voltage from the sensor changes.



Intake Valve Timing Control Solenoid Valve

INFOID:000000014267460

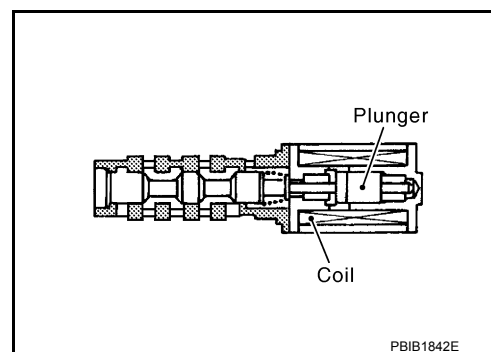
Intake valve timing control solenoid valve is activated by ON/OFF pulse duty (ratio) signals from the ECM.

The intake valve timing control solenoid valve changes the oil amount and direction of flow through intake valve timing control unit or stops oil flow.

The longer pulse width advances valve angle.

The shorter pulse width retards valve angle.

When ON and OFF pulse widths become equal, the solenoid valve stops oil pressure flow to fix the intake valve angle at the control position.



Exhaust Valve Timing Control Position Sensor

INFOID:000000014267461

Exhaust valve timing control position sensor detects the protrusion of the signal plate installed to the exhaust camshaft front end.

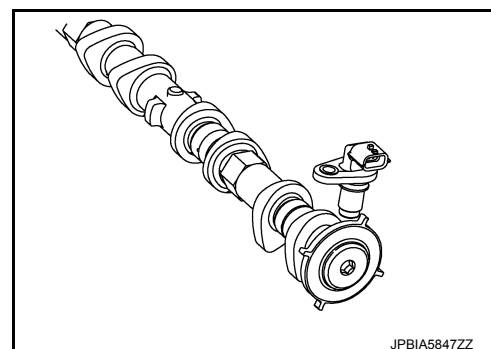
This sensor signal is used for sensing a position of the exhaust camshaft.

The sensor consists of a permanent magnet and Hall IC.

When engine is running, the high and low parts of the teeth cause the gap with the sensor to change.

The changing gap causes the magnetic field near the sensor to change.

Due to the changing magnetic field, the voltage from the sensor changes.



Exhaust Valve Timing Control Solenoid Valve

INFOID:0000000014267462

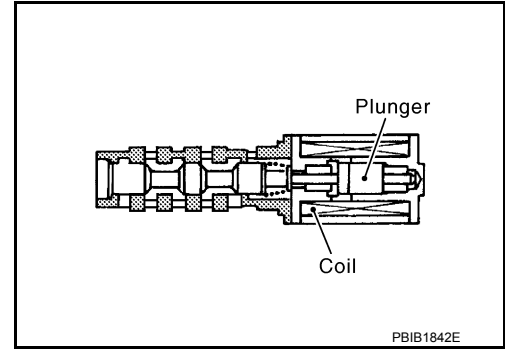
Exhaust valve timing control solenoid valve is activated by ON/OFF pulse duty (ratio) signals from the ECM.

The exhaust valve timing control solenoid valve changes the oil amount and direction of flow through exhaust valve timing control unit or stops oil flow.

The longer pulse width retards valve angle.

The shorter pulse width advances valve angle.

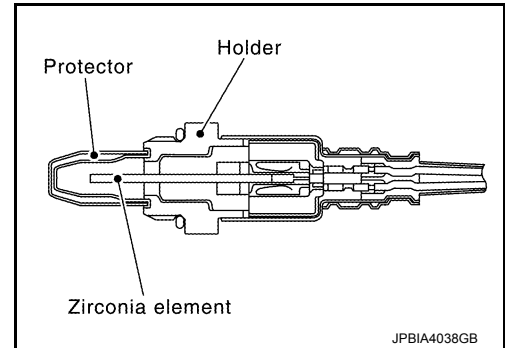
When ON and OFF pulse widths become equal, the solenoid valve stops oil pressure flow to fix the exhaust valve angle at the control position.



Air Fuel Ratio (A/F) Sensor 1

INFOID:0000000014267463

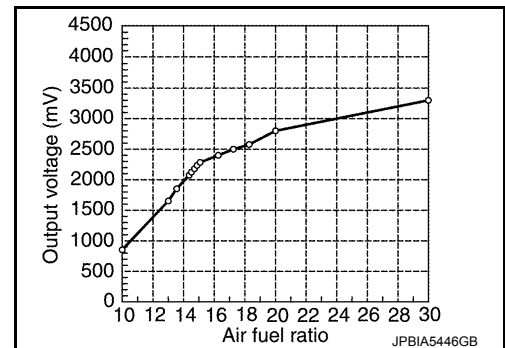
The sensor element of the A/F sensor 1 is composed an electrode layer, which transports ions. It has a heater in the element.



The sensor is capable of precise measurement $\lambda = 1$, but also in the lean and rich range. Together with its control electronics, the sensor outputs a clear, continuous signal throughout a wide λ range.

The exhaust gas components diffuse through the diffusion layer at the sensor cell. An electrode layer is applied voltage, and this current relative oxygen density in lean. Also this current relative hydrocarbon density in rich.

Therefore, the A/F sensor 1 is able to indicate air fuel ratio by this electrode layer of current. In addition, a heater is integrated in the sensor to ensure the required operating temperature of approximately 760°C (1,400°F).



A/F SENSOR 1 HEATER

A/F sensor 1 heater is integrated in the sensor.

The ECM performs ON/OFF duty control of the A/F sensor 1 heater corresponding to the engine operating condition to keep the temperature of A/F sensor 1 element within the specified range.

Heated Oxygen Sensor 2

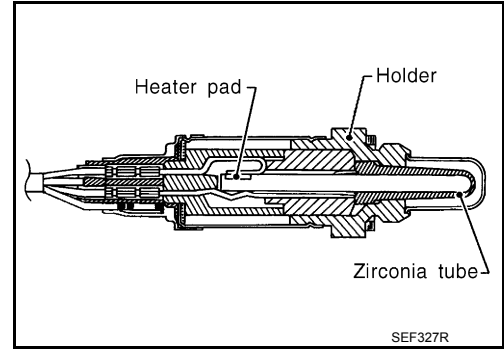
INFOID:0000000014267464

The heated oxygen sensor 2, after three way catalyst (manifold), monitors the oxygen level in the exhaust gas.

Even if switching characteristics of the air fuel ratio (A/F) sensor 1 are shifted, the air fuel ratio is controlled to stoichiometric, by the signal from the heated oxygen sensor 2.

This sensor is made of ceramic zirconia. The zirconia generates voltage from approximately 1 V in richer conditions to 0 V in leaner conditions.

Under normal conditions the heated oxygen sensor 2 is not used for engine control operation.



HEATED OXYGEN SENSOR 2 HEATER

Heated oxygen sensor 2 heater is integrated in the sensor.

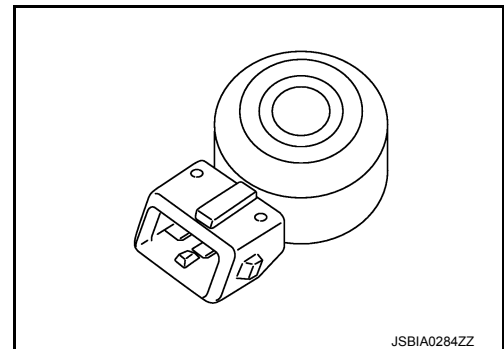
The ECM performs ON/OFF control of the heated oxygen sensor 2 heater corresponding to the engine speed, amount of intake air and engine coolant temperature.

Engine speed	Heated oxygen sensor 2 heater
Above 3,600 rpm	OFF
Below 3,600 rpm after the following conditions are met. • Engine: After warming up • Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	ON

Knock Sensor

INFOID:0000000014267465

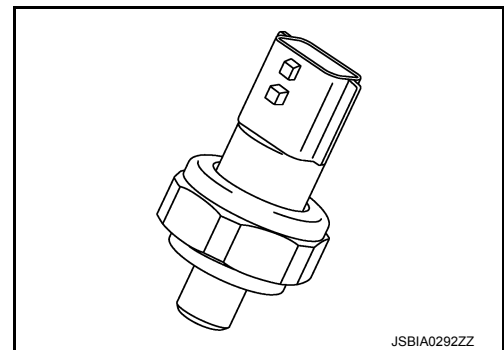
The knock sensor is attached to the cylinder block. It senses engine knocking using a piezoelectric element. A knocking vibration from the cylinder block is sensed as vibrational pressure. This pressure is converted into a voltage signal and sent to the ECM.



Engine Oil Pressure Sensor

INFOID:0000000014267466

The engine oil pressure (EOP) sensor detects engine oil pressure and transmits a voltage signal to the ECM.



COMPONENT PARTS

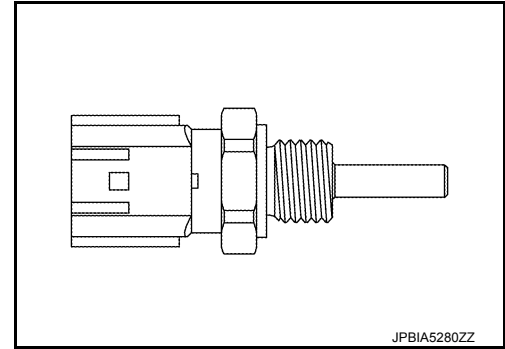
< SYSTEM DESCRIPTION >

[QR25DE]

Engine Oil Temperature Sensor

INFOID:0000000014267467

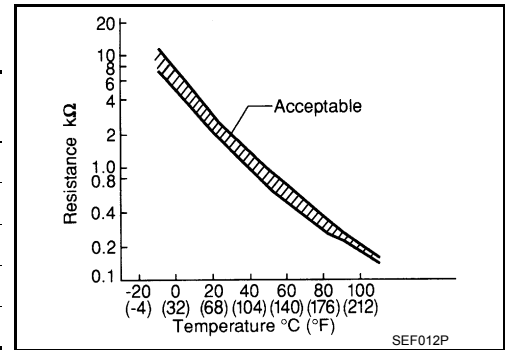
The engine oil temperature sensor is used to detect the engine oil temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine oil temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



<Reference data>

Engine oil temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 - 11.4
20 (68)	3.5	2.37 - 2.63
50 (122)	2.2	0.68 - 1.00
90 (194)	1.0	0.236 - 0.260
110 (230)	0.6	0.143 - 0.153

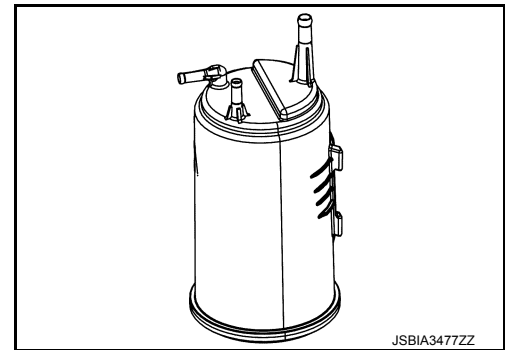
*: These data are reference values and are measured between ECM terminals.



EVAP Canister

INFOID:0000000014267468

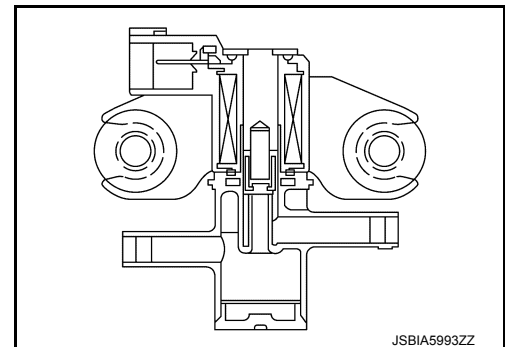
EVAP canister stores the generated fuel vapors in the sealed fuel tank to activated charcoals of EVAP canister when the engine is not operating or when refueling to the fuel tank.



EVAP Canister Purge Volume Control Solenoid Valve

INFOID:0000000014267469

The EVAP canister purge volume control solenoid valve uses a ON/OFF duty to control the flow rate of fuel vapor from the EVAP canister. The EVAP canister purge volume control solenoid valve is moved by ON/OFF pulses from the ECM. The longer the ON pulse, the greater the amount of fuel vapor that will flow through the valve.



Battery Current Sensor (With Battery Temperature Sensor)

INFOID:0000000014267470

OUTLINE

COMPONENT PARTS

< SYSTEM DESCRIPTION >

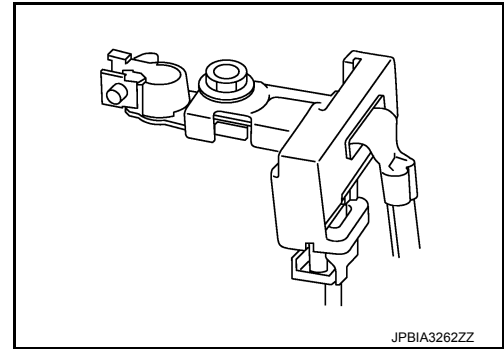
[QR25DE]

The power generation voltage variable control enables fuel consumption to be decreased by reducing the engine load which is caused by the power generation of the generator.

Based on sensor signals, ECM judges whether or not the power generation voltage variable control is performed. When performing the power generation voltage variable control, ECM calculates the target power generation voltage based on the sensor signal. And ECM sends the calculated value as the power generation command value to IPDM E/R. For the details of the power generation voltage variable control, refer to [CHG-10. "POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : System Description"](#).

CAUTION:

Never connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power generation voltage variable control, and then the battery discharge may occur.



BATTERY CURRENT SENSOR

The battery current sensor is installed to the battery negative cable. The sensor measures the charging/discharging current of the battery.

BATTERY TEMPERATURE SENSOR

Battery temperature sensor is integrated in battery current sensor.

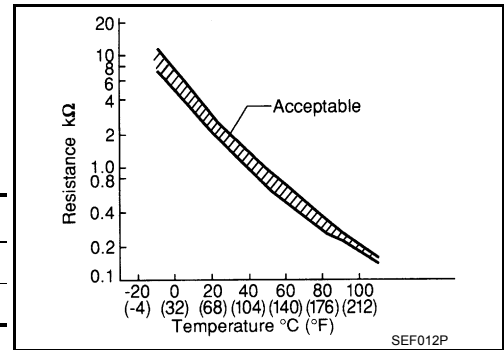
The sensor measures temperature around the battery.

The electrical resistance of the thermistor decreases as temperature increases.

<Reference data>

Temperature [°C (°F)]	Voltage* (V)	Resistance (kΩ)
25 (77)	3.333	1.9 - 2.1
90 (194)	0.969	0.222 - 0.258

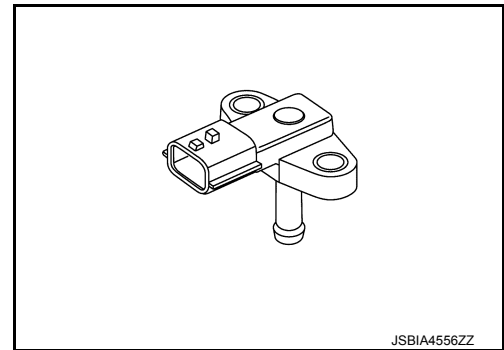
*: These data are reference values and are measured between battery temperature sensor signal terminal and sensor ground.



Atmospheric Pressure Sensor

INFOID:0000000014267471

The atmospheric pressure sensor detects atmospheric pressure and send the voltage signal to the ECM. The sensor uses a silicon diaphragm which is sensitive to the change in pressure. As the pressure increases, the voltage rises.



COMPONENT PARTS

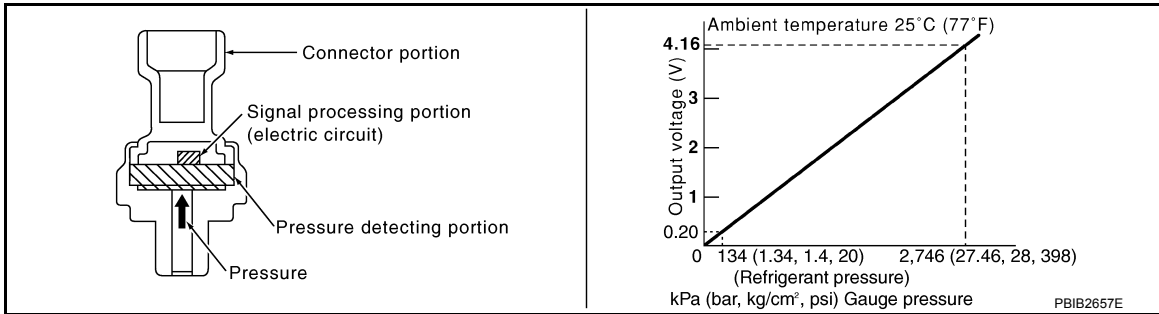
< SYSTEM DESCRIPTION >

[QR25DE]

Refrigerant Pressure Sensor

INFOID:0000000014267472

The refrigerant pressure sensor is installed at the condenser of the air conditioner system. The sensor uses an electrostatic volume pressure transducer to convert refrigerant pressure to voltage. The voltage signal is sent to ECM.



Power Steering Pressure Sensor

INFOID:0000000014267473

Power steering pressure (PSP) sensor is installed to the power steering high-pressure tube and detects a power steering load.

This sensor is a potentiometer which transforms the power steering load into output voltage, and emits the voltage signal to the ECM. The ECM controls the electric throttle control actuator and adjusts the throttle valve opening angle to increase the engine speed and adjusts the idle speed for the increased load.

Stop Lamp Switch & Brake Pedal Position Switch

INFOID:0000000014267474

Stop lamp switch and brake pedal position switch are installed to brake pedal bracket. ECM detects the state of the brake pedal by those two types of input (ON/OFF signal).

Brake pedal	Brake pedal position switch	Stop lamp switch
Released	ON	OFF
Depressed	OFF	ON

Clutch Pedal Position Switch

INFOID:0000000014267475

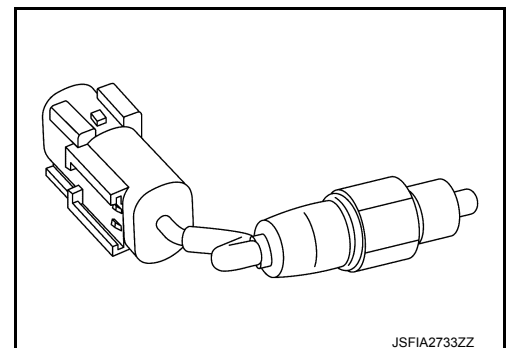
Clutch pedal position switch are installed to clutch pedal bracket. ECM detects the state of the clutch pedal by those two types of input signal (ON/OFF).

Clutch pedal	Clutch pedal position switch
Released	ON
Depressed	OFF

Park/Neutral position Switch

INFOID:0000000014267476

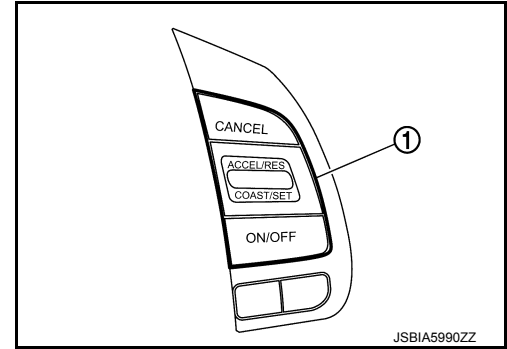
Park/neutral position switch detects that the transmission is in neutral position and transmits a park/neutral signal to ECM.



ASCD Steering Switch

INFOID:0000000014267477

ASCD steering switch ① has variant values of electrical resistance for each button. ECM reads voltage variation of switch, and determines which button is operated.



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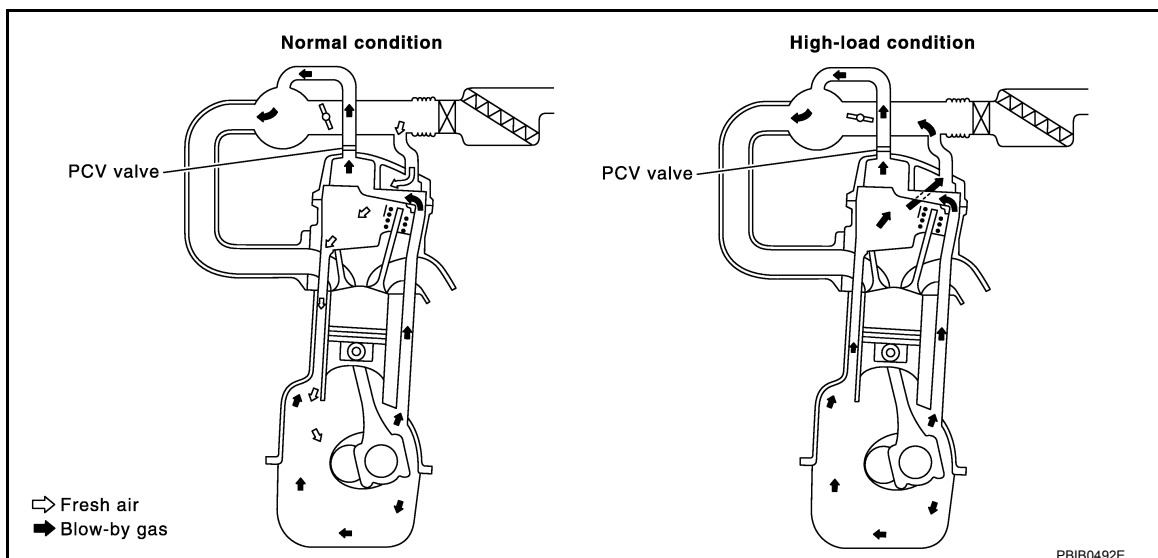
O

P

STRUCTURE AND OPERATION

Positive Crankcase Ventilation

INFOID:000000014267478



This system returns blow-by gas to the intake manifold.

The positive crankcase ventilation (PCV) valve is provided to conduct crankcase blow-by gas to the intake manifold.

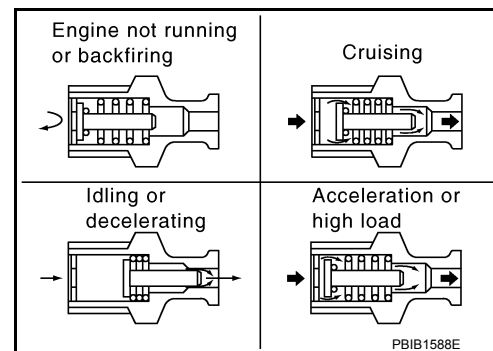
During partial throttle operation of the engine, the intake manifold sucks the blow-by gas through the PCV valve.

Normally, the capacity of the valve is sufficient to handle any blow-by and a small amount of ventilating air.

The ventilating air is then drawn from the air inlet tubes into the crankcase. In this process the air passes through the hose connecting air inlet tubes to rocker cover.

Under full-throttle condition, the manifold vacuum is insufficient to draw the blow-by flow through the valve. The flow goes through the hose connection in the reverse direction.

On vehicles with an excessively high blow-by, the valve does not meet the requirement. This is because some of the flow will go through the hose connection to the air inlet tubes under all conditions.



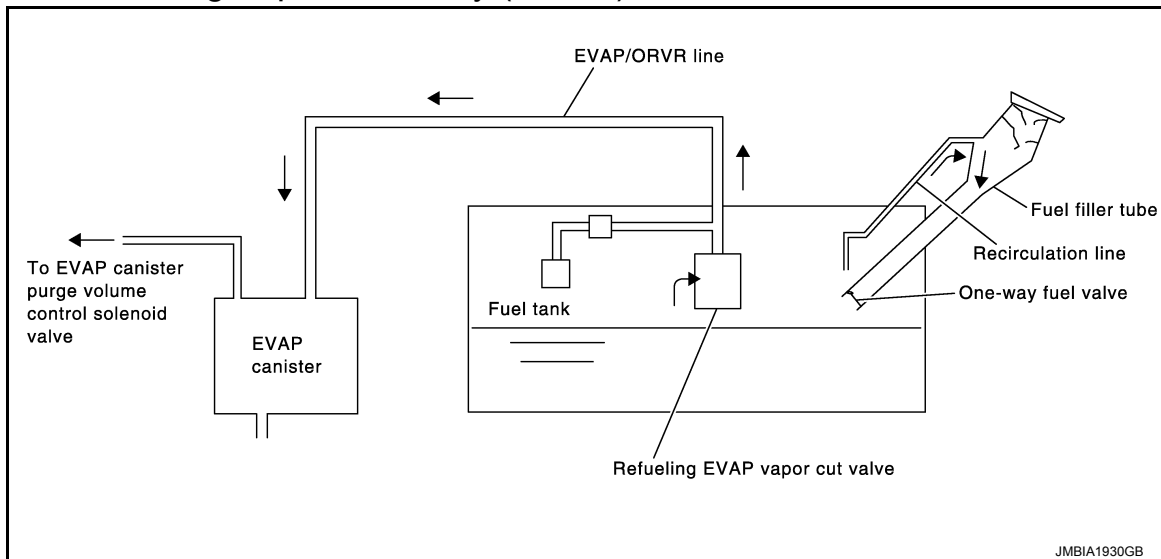
STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[QR25DE]

On Board Refueling Vapor Recovery (ORVR)

INFOID:000000014267479



From the beginning of refueling, the air and vapor inside the fuel tank go through refueling EVAP vapor cut valve and EVAP/ORVR line to the EVAP canister. The vapor is absorbed by the EVAP canister and the air is released to the atmosphere.

When the refueling has reached the full level of the fuel tank, the refueling EVAP vapor cut valve is closed and refueling is stopped because of auto shut-off. The vapor which was absorbed by the EVAP canister is purged during driving.

WARNING:

When conducting inspections below, be sure to observe the following:

- Put a "CAUTION: FLAMMABLE" sign in workshop.
- Do not smoke while servicing fuel system. Keep open flames and sparks away from work area.
- Be sure to furnish the workshop with a CO₂ fire extinguisher.

CAUTION:

- Before removing fuel line parts, carry out the following procedures:
 - Put drained fuel in an explosion-proof container and put lid on securely.
 - Release fuel pressure from fuel line. Refer to [EC-390, "Inspection"](#).
 - Disconnect battery ground cable.
- Always replace O-ring when the fuel gauge retainer is removed.
- Do not kink or twist hose and tube when they are installed.
- Do not tighten hose and clamps excessively to avoid damaging hoses.
- After installation, run engine and check for fuel leaks at connection.
- Do not attempt to top off the fuel tank after the fuel pump nozzle shuts off automatically. Continued refueling may cause fuel overflow, resulting in fuel spray and possibly a fire.

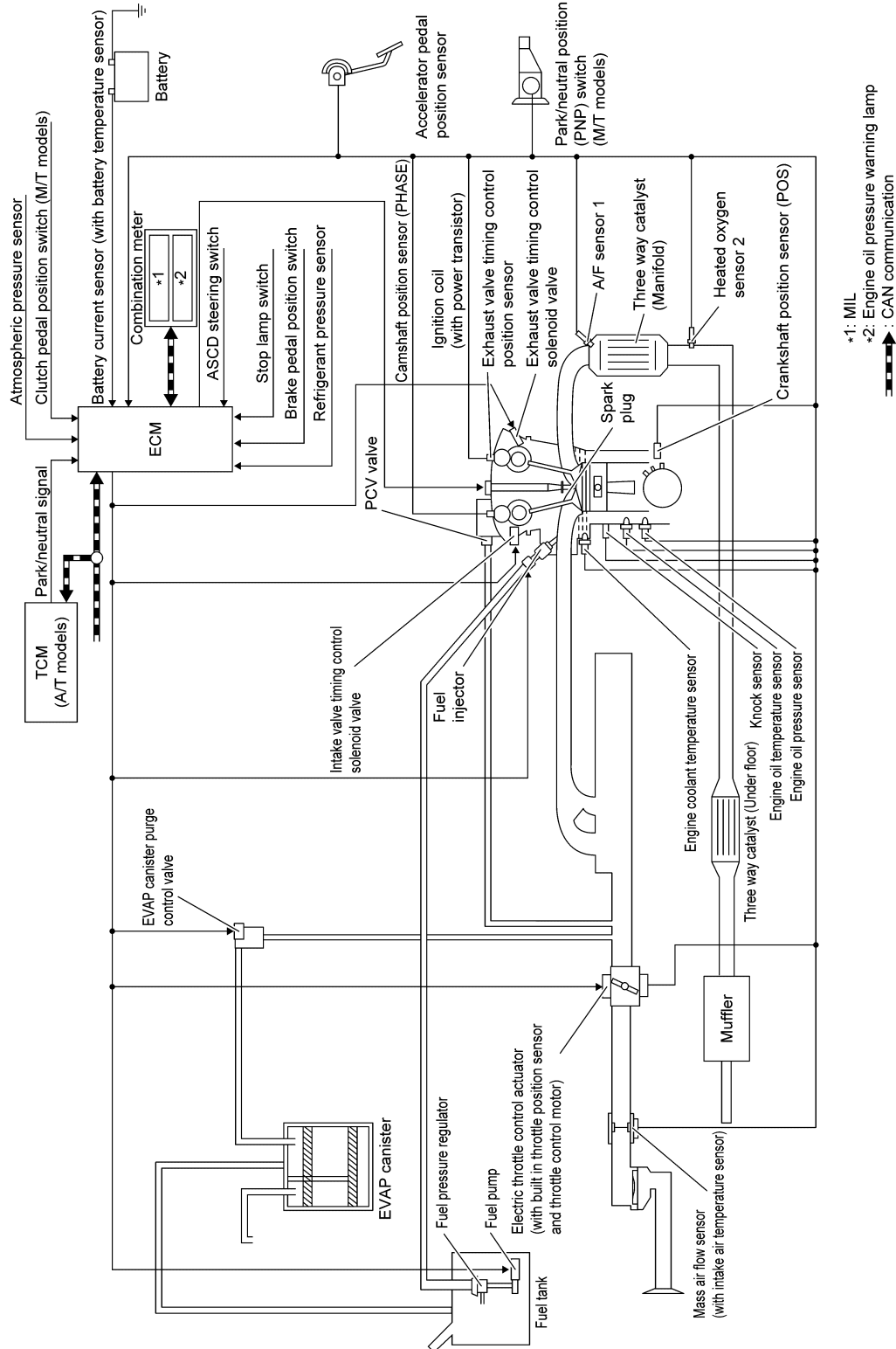
SYSTEM

ENGINE CONTROL SYSTEM

ENGINE CONTROL SYSTEM : System Description

INFOID:0000000014267480

SYSTEM DIAGRAM



NOTE:

Following items are used only for Chile models

JSBIA5979GB

SYSTEM

[QR25DE]

< SYSTEM DESCRIPTION >

- Battery Current Sensor (With Battery Temperature Sensor)
- Intake Valve Timing Control Solenoid Valve
- Exhaust Valve Timing Control Solenoid Valve
- Engine Oil Pressure Sensor
- Engine Oil Temperature Sensor

SYSTEM DESCRIPTION

ECM controls the engine by various functions.

Function	Reference
Multiport fuel injection system	EC-47, "MULTIPORT FUEL INJECTION SYSTEM : System Description"
Electric ignition system	EC-49, "ELECTRIC IGNITION SYSTEM : System Description"
Air conditioning cut control*1	EC-54, "AIR CONDITIONING CUT CONTROL : System Description"
Evaporative emission system	EC-54, "EVAPORATIVE EMISSION SYSTEM : System Description"
Automatic speed control device (ASCD)*2	EC-56, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description"
Warning/Indicator/Chime	• EC-62, "WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps" • EC-62, "WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)"
CAN communication	EC-57, "CAN COMMUNICATION : System Description"

*1: With A/C

*2: With ASCD

ENGINE CONTROL SYSTEM : Fail Safe

INFOID:0000000014632962

EXCEPT FOR CHILE

DESCRIPTION

When a DTC is detected, ECM executes a mode (in the Fail-safe mode) applicable to the DTC. The fail-safe mode has the preset traveling control mode (accelerator angle variation and engine output limit).

Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
	Engine output control	ECM reduces the engine output, according to the rise in engine speed. This reduces the vehicle speed to encourage the driver to repair malfunction.

FAIL SAFE PATTERN

Pattern	Fail safe mode	
A	Traveling control mode	Accelerator angle variation control
B		Engine output control

FAIL SAFE LIST

SYSTEM

< SYSTEM DESCRIPTION >

[QR25DE]

×:Applicable —: Not applicable

DTC No.	Detected items	Vehicle behavior		
		Pattern		Others
		A	B	
P0102 P0103	Mass air flow sensor circuit	×	×	—
P0122 P0123 P0222 P0223 P2135	Throttle position sensor	—	—	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.
P0171 P0172	Fuel injection system	×	—	—
P0300 P0301 P0302 P0303 P0304	Misfire	×	—	—
P0500	Vehicle speed sensor	×	—	—
P0603	ECM	—	—	—
		—	×	ASCD operation may be deactivated.
P0604	ECM	×	—	ASCD operation may be deactivated.
P0605 P060B	ECM	—	—	—
		×	—	ASCD operation may be deactivated.
P0606	ECM	—	—	ASCD operation may be deactivated.
		×	—	ASCD operation may be deactivated.
P0607	ECM	—	—	—
		—	×	—
P060A	ECM	×	—	—
		×	×	ASCD operation may be deactivated.
P0643	ECM	×	—	—
P1805	Brake switch	—	—	ECM controls the electric throttle control actuator by regulating the throttle opening to a small range. Therefore, acceleration will be poor.
				Vehicle condition
				Driving condition
				When engine is idling
P2100 P2103	Throttle control motor relay	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
				When accelerating
P2101	Electric throttle control function	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P2118	Throttle control motor	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

SYSTEM

< SYSTEM DESCRIPTION >

[QR25DE]

DTC No.	Detected items	Vehicle behavior		
		Pattern		Others
		A	B	
P2119	Electric throttle control actuator	—	×	—
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	—	—	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

FOR CHILE

DESCRIPTION

When a DTC is detected, ECM executes a mode (in the Fail-safe mode) applicable to the DTC. The fail-safe mode has the preset traveling control mode (accelerator angle variation and engine output limit) and device fix mode.

Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
	Engine output control	ECM reduces the engine output, according to the rise in engine speed. This reduces the vehicle speed to encourage the driver to repair malfunction.
Device fix mode		This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.

FAIL SAFE PATTERN

Pattern	Fail safe mode	
A	Traveling control mode	Accelerator angle variation control
B		Engine output control
C	Device fix mode	

FAIL SAFE LIST

×:Applicable —: Not applicable

DTC No.	Detected items	Vehicle behavior			
		Pattern			Others
		A	B	C	
P0011	Intake valve timing control	—	—	×	—
P0014 P0078	Exhaust valve timing control	—	—	×	—
P0102 P0103	Mass air flow sensor circuit	×	×	×	—
P0122 P0123 P0222 P0223 P2135	Throttle position sensor	—	—	—	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.
P0171 P0172	Fuel injection system	×	—	—	—
P0197 P0198	Engine oil temperature sensor	—	—	—	Exhaust valve timing control does not function.

SYSTEM

< SYSTEM DESCRIPTION >

[QR25DE]

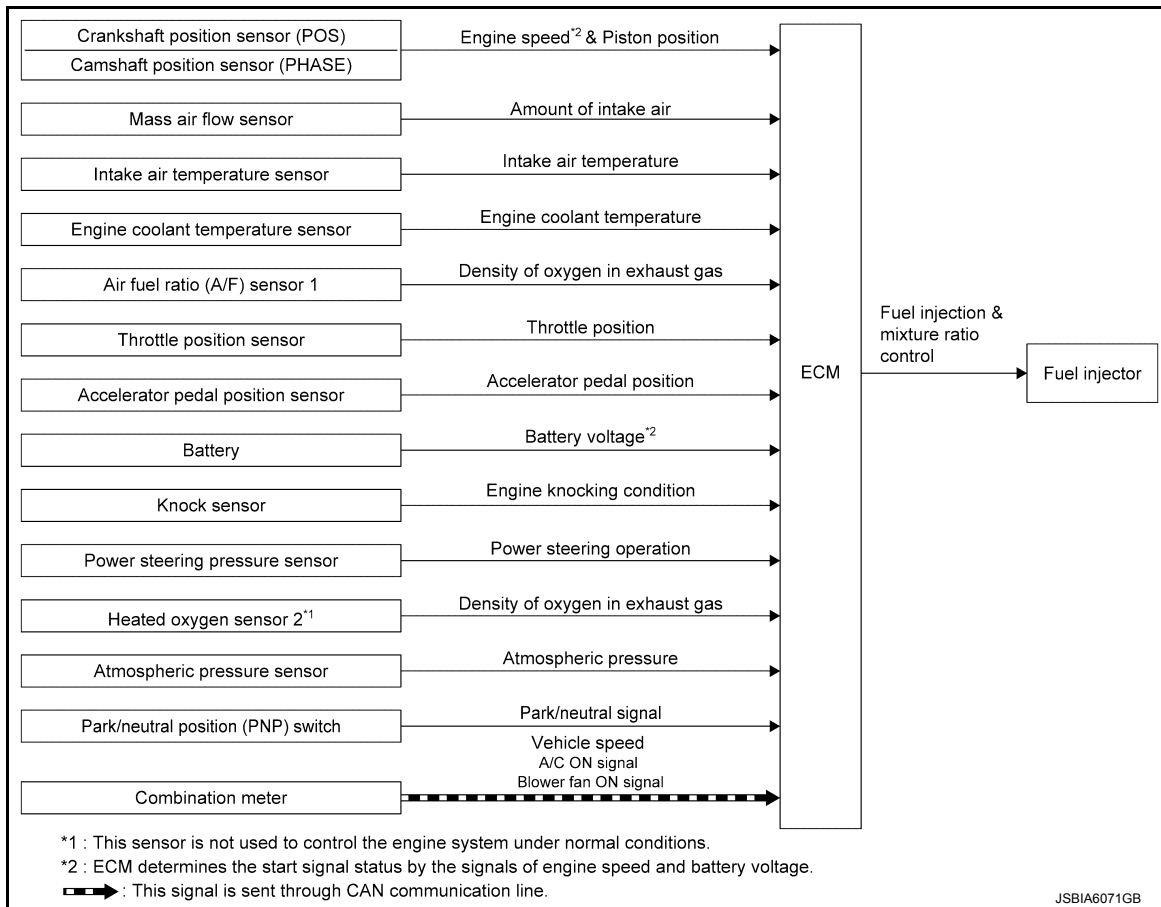
DTC No.	Detected items	Vehicle behavior			
		Pattern			Others
		A	B	C	
P0300 P0301 P0302 P0303 P0304	Misfire	×	—	—	—
P0500	Vehicle speed sensor	×	—	—	—
P0524	Engine oil pressure	—	—	—	- ECM illuminates oil pressure warning lamp on the combination meter. - Engine speed will not rise more than 4,000rpm due to the fuel cut. - Fail-safe is canceled when ignition switch OFF → ON.
P0603	ECM	—	—	—	—
		—	×	—	ASCD operation may be deactivated.
P0604	ECM	×	—	×	ASCD operation may be deactivated.
P0605 P060B	ECM	—	—	—	—
		×	—	×	ASCD operation may be deactivated.
P0606	ECM	—	—	—	ASCD operation may be deactivated.
		×	—	×	ASCD operation may be deactivated.
P0607	ECM	—	—	—	—
		—	×	—	—
P060A	ECM	×	—	×	—
		×	×	×	ASCD operation may be deactivated.
P0643	Sensor power supply	—	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P1078	Exhaust valve timing control position sensor circuit	×	—	×	—
P1805	Brake switch	—	—	—	ECM controls the electric throttle control actuator by regulating the throttle opening to a small range. Therefore, acceleration will be poor.
					Vehicle condition
					Driving condition
					When engine is idling
P2100 P2103	Throttle control motor relay	—	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
					When accelerating
					Poor acceleration
P2101	Electric throttle control function	—	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P2118	Throttle control motor	—	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P2119	Electric throttle control actuator	—	×	—	—
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	—	—	—	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

MULTIPOINT FUEL INJECTION SYSTEM

MULTIPOINT FUEL INJECTION SYSTEM : System Description

INFOID:0000000014267482

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

The amount of fuel injected from the fuel injector is determined by the ECM. The ECM controls the length of time the valve remains open (injection pulse duration). The amount of fuel injected is a program value in the ECM memory. The program value is preset by engine operating conditions. These conditions are determined by input signals (for engine speed and intake air) from the crankshaft position sensor (POS), camshaft position sensor (PHASE) and the mass air flow sensor.

VARIOUS FUEL INJECTION INCREASE/DECREASE COMPENSATION

In addition, the amount of fuel injected is compensated to improve engine performance under various operating conditions as listed below.

<Fuel increase>

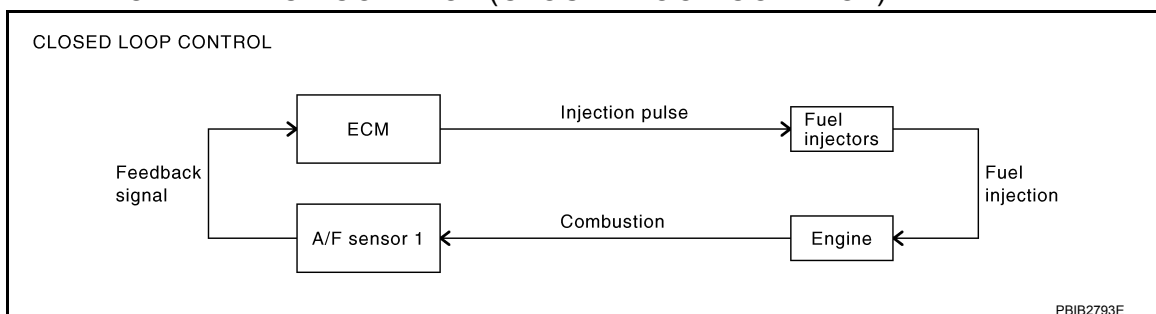
- During warm-up
- When starting the engine
- During acceleration
- Hot-engine operation
- High-load, high-speed operation

<Fuel decrease>

- During deceleration
- During high engine speed operation

< SYSTEM DESCRIPTION >

MIXTURE RATIO FEEDBACK CONTROL (CLOSED LOOP CONTROL)



The mixture ratio feedback system provides the best air-fuel mixture ratio for driveability and emission control. The three way catalyst (manifold) can then better reduce CO, HC and NOx emissions. This system uses A/F sensor 1 in the exhaust manifold to monitor whether the engine operation is rich or lean. The ECM adjusts the injection pulse width according to the sensor voltage signal. For more information about A/F sensor 1, refer to [EC-34. "Air Fuel Ratio \(A/F\) Sensor 1"](#). This maintains the mixture ratio within the range of stoichiometric (ideal air-fuel mixture).

This stage is referred to as the closed loop control condition.

Heated oxygen sensor 2 is located downstream of the three way catalyst (manifold). Even if the switching characteristics of A/F sensor 1 shift, the air-fuel ratio is controlled to stoichiometric by the signal from heated oxygen sensor 2.

- Open Loop Control

The open loop system condition refers to when the ECM detects any of the following conditions. Feedback control stops in order to maintain stabilized fuel combustion.

- Deceleration and acceleration
- High-load, high-speed operation
- Malfunction of A/F sensor 1 or its circuit
- Insufficient activation of A/F sensor 1 at low engine coolant temperature
- High engine coolant temperature
- During warm-up
- When starting the engine

MIXTURE RATIO SELF-LEARNING CONTROL

The mixture ratio feedback control system monitors the mixture ratio signal transmitted from A/F sensor 1. This feedback signal is then sent to the ECM. The ECM controls the basic mixture ratio as close to the theoretical mixture ratio as possible. However, the basic mixture ratio is not necessarily controlled as originally designed. Both manufacturing differences (i.e., mass air flow sensor hot wire) and characteristic changes during operation (i.e., fuel injector clogging) directly affect mixture ratio.

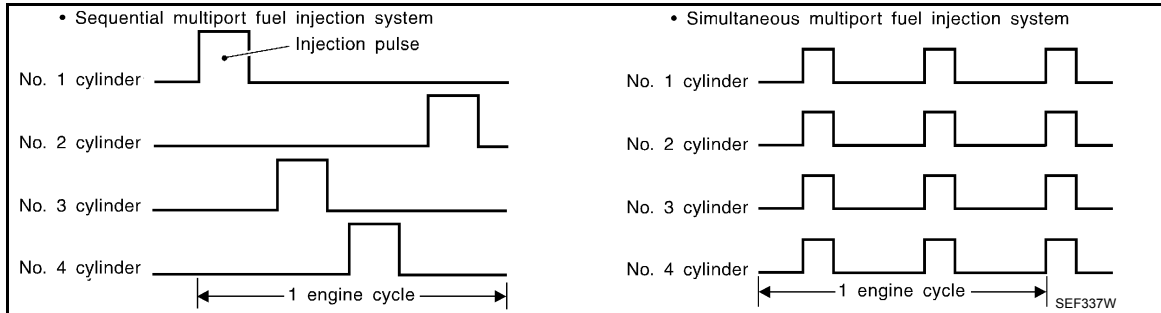
Accordingly, the difference between the basic and theoretical mixture ratios is monitored in this system. This is then computed in terms of "injection pulse duration" to automatically compensate for the difference between the two ratios.

"Fuel trim" refers to the feedback compensation value compared against the basic injection duration. Fuel trim includes short term fuel trim and long term fuel trim.

"Short term fuel trim" is the short-term fuel compensation used to maintain the mixture ratio at its theoretical value. The signal from A/F sensor 1 indicates whether the mixture ratio is RICH or LEAN compared to the theoretical value. The signal then triggers a reduction in fuel volume if the mixture ratio is rich, and an increase in fuel volume if it is lean.

"Long term fuel trim" is overall fuel compensation carried out long-term to compensate for continual deviation of the short term fuel trim from the central value. Such deviation will occur due to individual engine differences, wear over time and changes in the usage environment.

FUEL INJECTION TIMING



Two types of systems are used.

- Sequential Multiport Fuel Injection System
Fuel is injected into each cylinder during each engine cycle according to the firing order. This system is used when the engine is running.
- Simultaneous Multiport Fuel Injection System
Fuel is injected simultaneously into all four cylinders twice each engine cycle. In other words, pulse signals of the same width are simultaneously transmitted from the ECM.
The four injectors will then receive the signals two times for each engine cycle.
This system is used when the engine is being started and/or if the fail-safe system (CPU) is operating.

FUEL SHUT-OFF

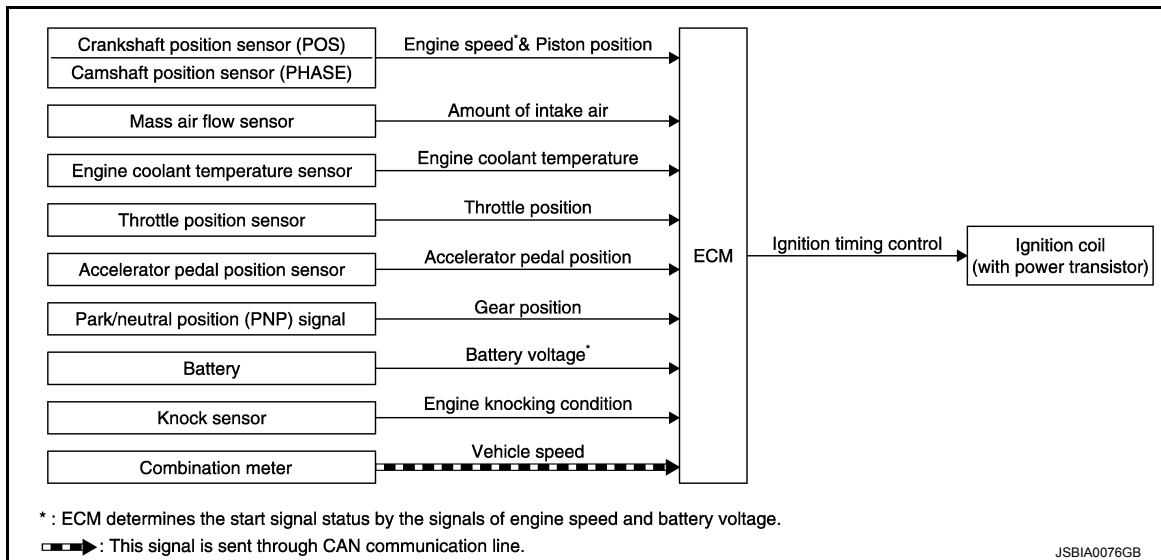
Fuel to each cylinder is cut off during deceleration, operation of the engine at excessively high speeds or operation of the vehicle at excessively high speeds.

ELECTRIC IGNITION SYSTEM

ELECTRIC IGNITION SYSTEM : System Description

INFOID:0000000014267483

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

Firing order: 1 - 3 - 4 - 2

The ignition timing is controlled by the ECM to maintain the best air-fuel ratio for every running condition of the engine. The ignition timing data is stored in the ECM.

The ECM receives information such as the injection pulse width and camshaft position sensor (PHASE) signal. Computing this information, ignition signals are transmitted to the power transistor.

During the following conditions, the ignition timing is revised by the ECM according to the other data stored in the ECM.

- At starting
- During warm-up
- At idle
- At low battery voltage
- During acceleration

SYSTEM

< SYSTEM DESCRIPTION >

[QR25DE]

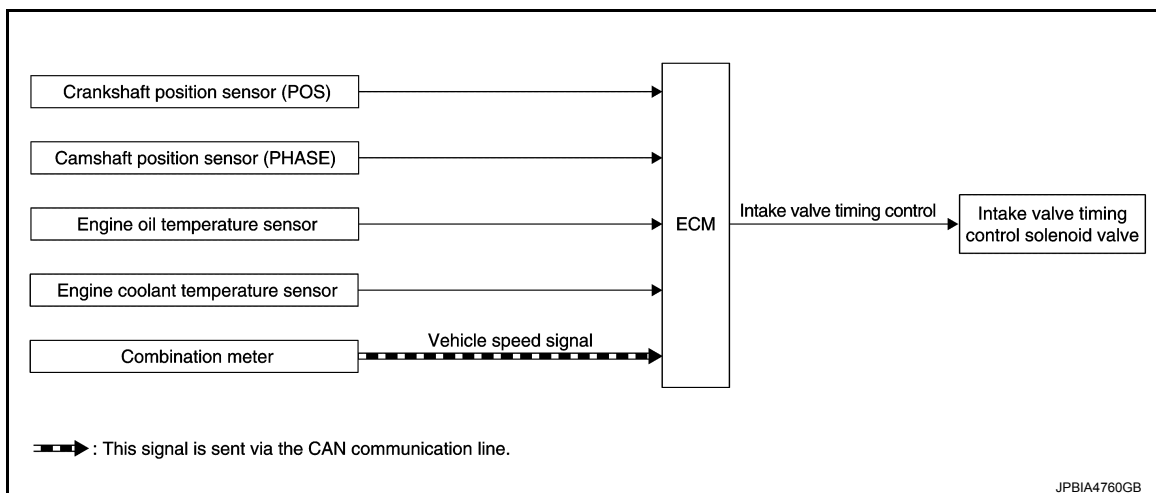
The knock sensor retard system is designed only for emergencies. The basic ignition timing is programmed within the anti-knocking zone, if recommended fuel is used under dry conditions. The retard system does not operate under normal driving conditions. If engine knocking occurs, the knock sensor monitors the condition. The signal is transmitted to the ECM. The ECM retards the ignition timing to eliminate the knocking condition.

INTAKE VALVE TIMING CONTROL

INTAKE VALVE TIMING CONTROL : System Description

INFOID:000000014267484

SYSTEM DIAGRAM



NOTE:

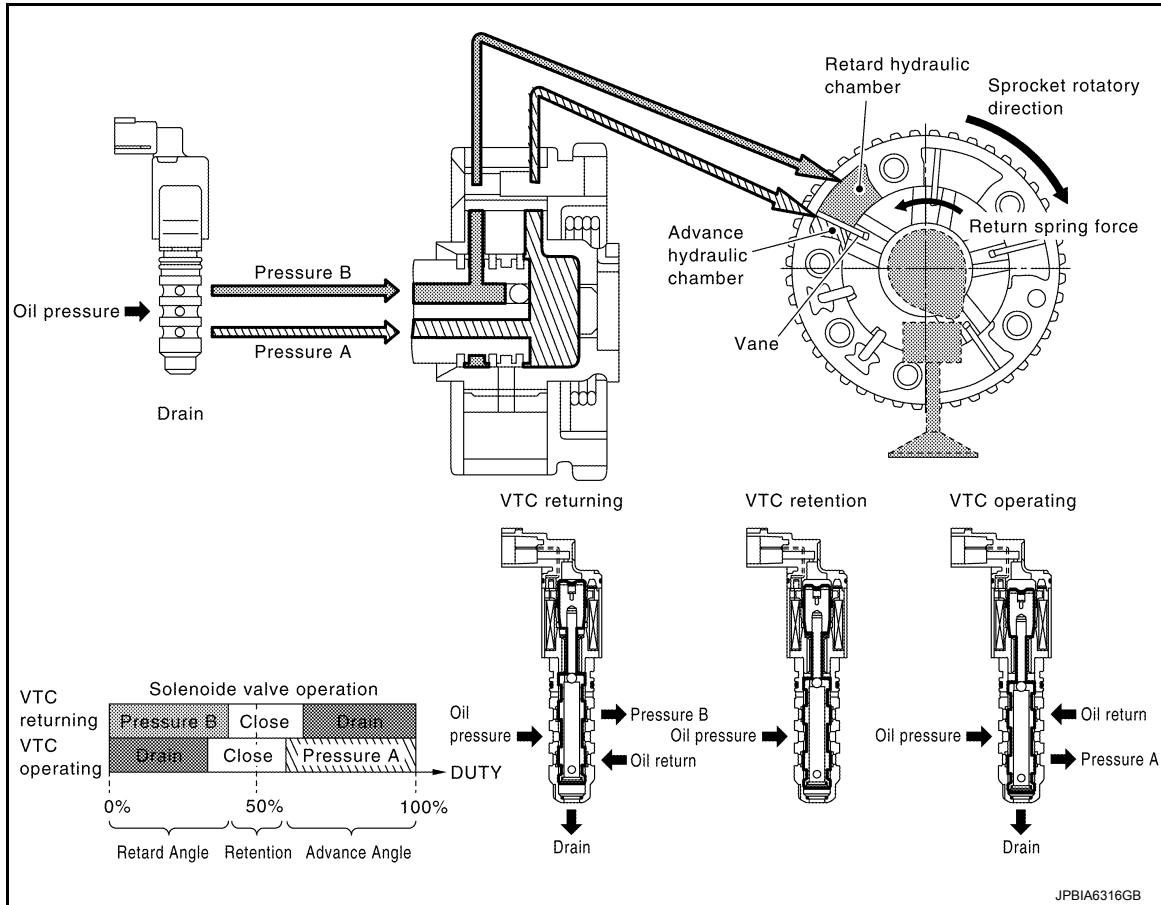
Intake valve timing control system is used only for Chile models

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed and piston position	Intake valve timing control	Intake valve timing control solenoid valve
Camshaft position sensor (PHASE)			
Engine oil temperature sensor	Engine oil temperature		
Engine coolant temperature sensor	Engine coolant temperature		
Combination meter	Vehicle speed*		

*: This signal is sent to the ECM through CAN communication line

SYSTEM DESCRIPTION



This mechanism hydraulically controls cam phases continuously with the fixed operating angle of the intake valve.

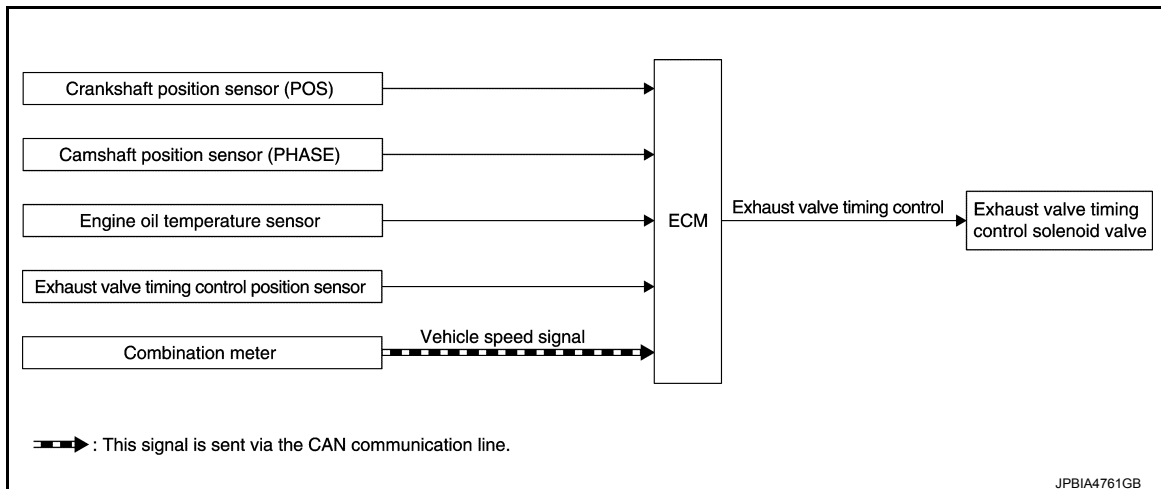
The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine coolant temperature. Then, the ECM sends ON/OFF pulse duty signals to the intake valve timing (IVT) control solenoid valve depending on driving status. This makes it possible to control the shut/open timing of the intake valve to increase engine torque in low/mid speed range and output in high-speed range.

EXHAUST VALVE TIMING CONTROL

EXHAUST VALVE TIMING CONTROL : System Description

INFOID:000000014267485

SYSTEM DIAGRAM



NOTE:

Exhaust valve timing control system is used only for Chile models

INPUT/OUTPUT SIGNAL CHART

SYSTEM

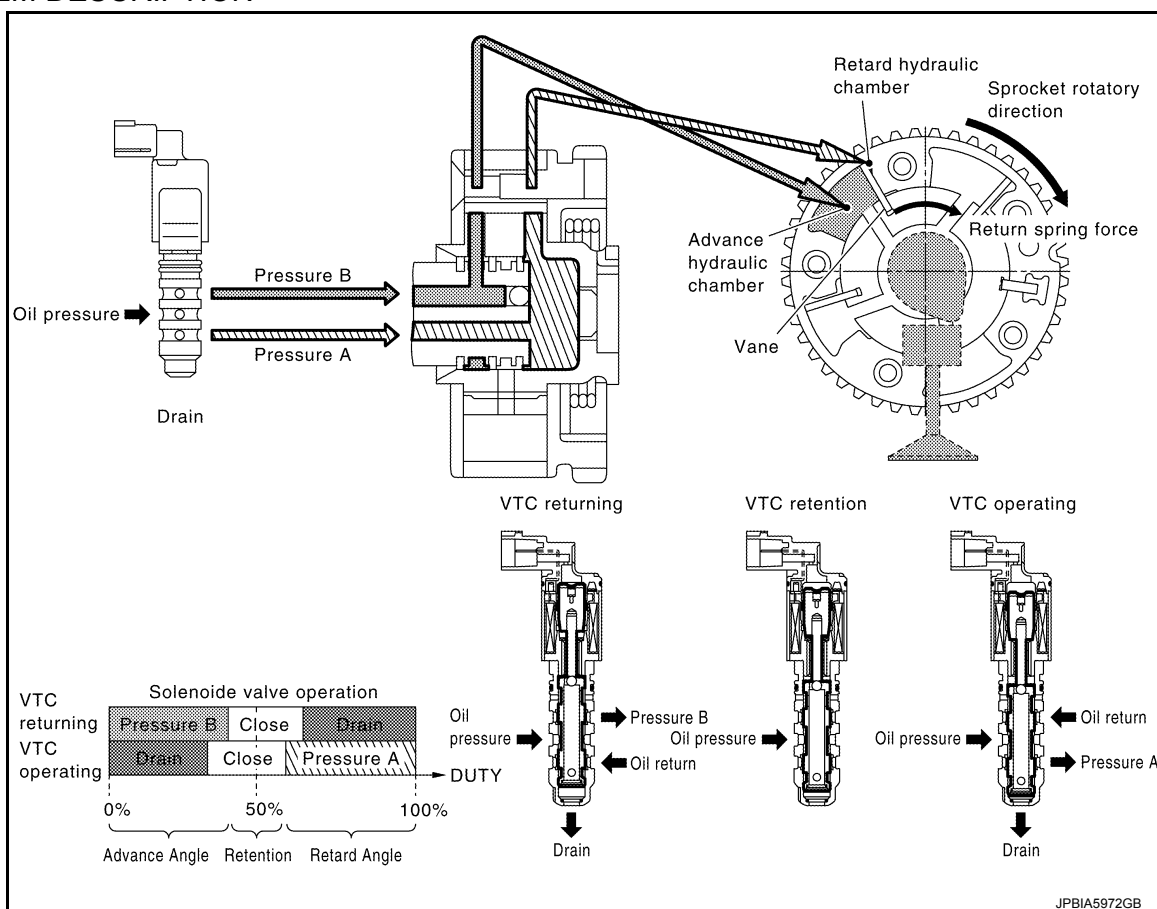
< SYSTEM DESCRIPTION >

[QR25DE]

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed and piston position	Exhaust valve timing control	Exhaust valve timing control solenoid valve
Camshaft position sensor (PHASE)			
Engine oil temperature sensor	Engine oil temperature		
Exhaust valve timing control position sensor	Exhaust valve timing signal		
Combination meter	Vehicle speed*		

*: This signal is sent to the ECM through CAN communication line

SYSTEM DESCRIPTION



This mechanism hydraulically controls cam phases continuously with the fixed operating angle of the exhaust valve.

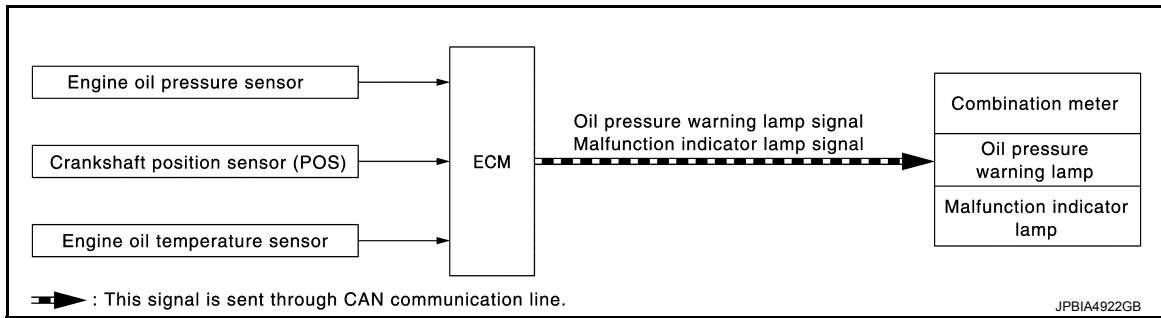
The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine oil temperature. Then, the ECM sends ON/OFF pulse duty signals to the exhaust valve timing (EVT) control solenoid valve depending on driving status. This makes it possible to control the shut/open timing of the exhaust valve to increase engine torque and output in a range of high engine speed.

ENGINE PROTECTION CONTROL AT LOW ENGINE OIL PRESSURE

ENGINE PROTECTION CONTROL AT LOW ENGINE OIL PRESSURE : System De-

scription

SYSTEM DIAGRAM



NOTE:

Engine protection control at low engine oil pressure system is used only for Chile models

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Engine oil pressure sensor	Engine pressure	Engine protection control • Oil pressure warning lamp signal • Fuel cut control	Combination meter • Oil pressure warning lamp
Crankshaft position sensor (POS)	Engine speed		
Engine oil temperature sensor	Engine oil temperature		

SYSTEM DESCRIPTION

- The engine protection control at low engine oil pressure warns the driver of a decrease in engine oil pressure by the oil pressure warning lamp a before the engine becomes damaged.
- When detecting a decrease in engine oil pressure at an engine speed less than 1,000 rpm, ECM transmits an oil pressure warning lamp signal to the combination meter. The combination meter turns ON the oil pressure warning lamp, according to the signal.

Decrease in engine oil pressure	Engine speed	Combination meter	Fuel cut
		Oil pressure warning lamp	
Detection	Less than 1,000 rpm	ON*	NO
	1,000 rpm or more	ON	YES

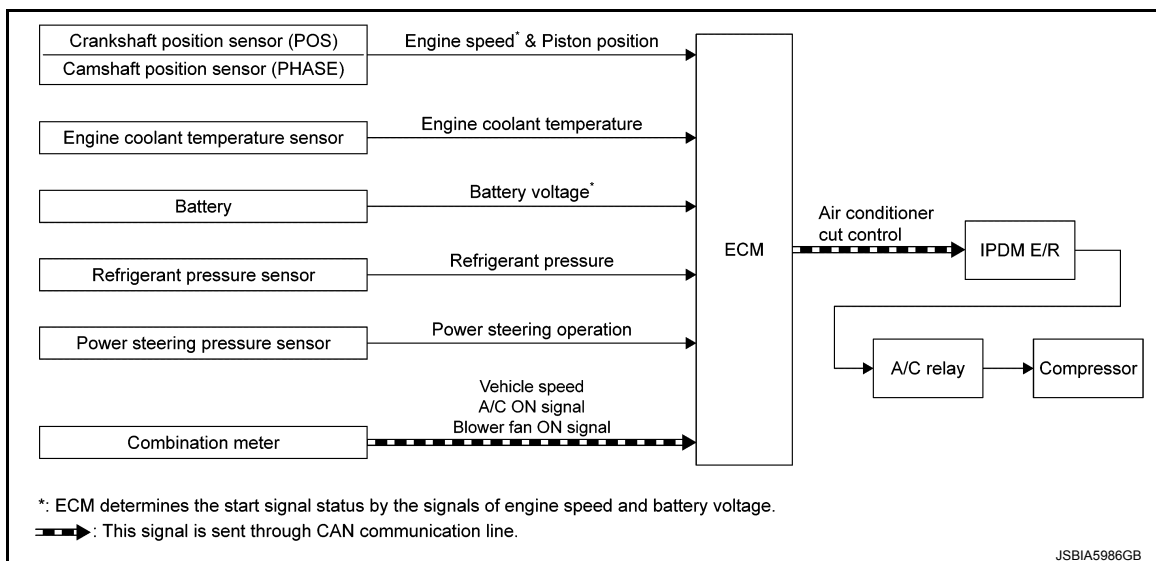
*: When detecting a normal engine oil pressure, ECM turns OFF the oil pressure warning lamp.

AIR CONDITIONING CUT CONTROL

AIR CONDITIONING CUT CONTROL : System Description

INFOID:000000014267487

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

This system improves engine operation when the air conditioner is used.

Under the following conditions, the air conditioner is turned off.

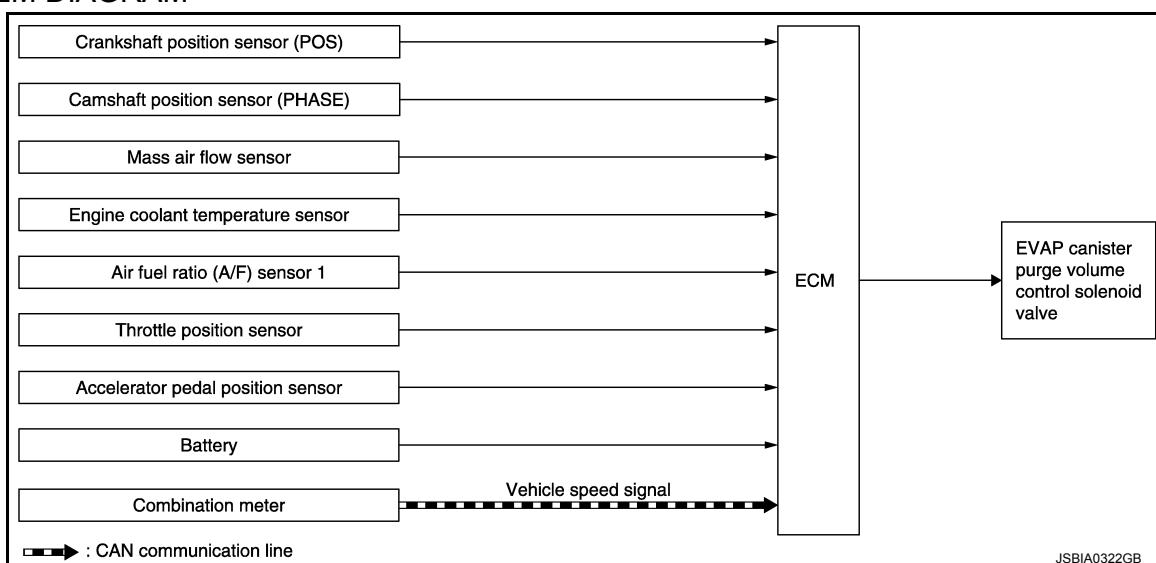
- When the accelerator pedal is fully depressed.
- When cranking the engine.
- At high engine speeds.
- When the engine coolant temperature becomes excessively high.
- When operating power steering during low engine speed or low vehicle speed.
- When engine speed is excessively low.
- When refrigerant pressure is excessively low or high.

EVAPORATIVE EMISSION SYSTEM

EVAPORATIVE EMISSION SYSTEM : System Description

INFOID:000000014267488

SYSTEM DIAGRAM



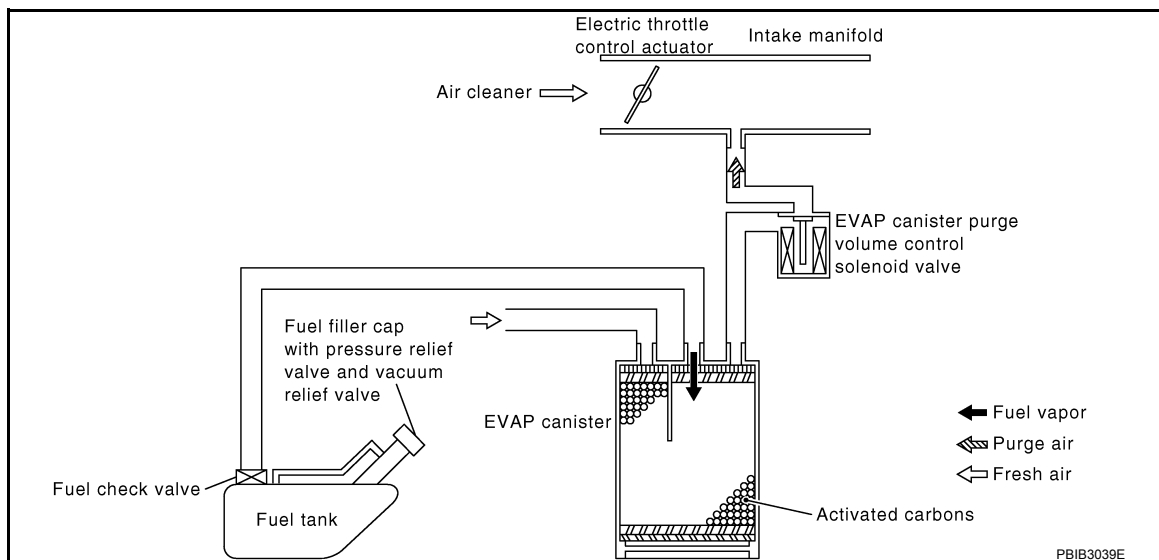
INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*1	EVAP canister purge flow control	EVAP canister purge vol- ume control solenoid valve
Mass air flow sensor	Amount of intake air		
Engine coolant temperature sensor	Engine coolant temperature		
Battery	Battery voltage*1		
Throttle position sensor	Throttle position		
Accelerator pedal position sensor	Accelerator pedal position		
Air fuel ratio (A/F) sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)		
Combination meter	Vehicle speed*2		

*1: ECM determines the start signal status by the signals of engine speed and battery voltage.

*2: This signal is sent to the ECM through CAN communication line.

SYSTEM DESCRIPTION



The evaporative emission system is used to reduce hydrocarbons emitted into the atmosphere from the fuel system. This reduction of hydrocarbons is accomplished by activated charcoals in the EVAP canister.

The fuel vapor in the sealed fuel tank is led into the EVAP canister which contains activated carbon and the vapor is stored there when the engine is not operating or when refueling to the fuel tank.

The vapor in the EVAP canister is purged by the air through the purge line to the intake manifold when the engine is operating. EVAP canister purge volume control solenoid valve is controlled by ECM. When the engine operates, the flow rate of vapor controlled by EVAP canister purge volume control solenoid valve is proportionally regulated as the air flow increases.

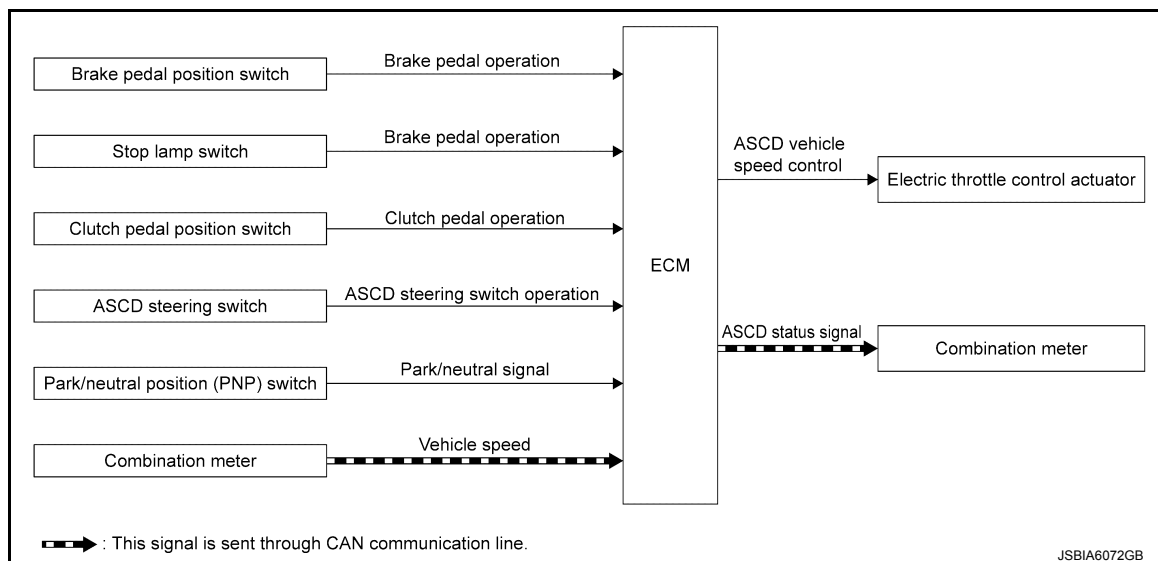
EVAP canister purge volume control solenoid valve also shuts off the vapor purge line during decelerating.

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description

INFOID:0000000014267489

SYSTEM DIAGRAM



BASIC ASCD SYSTEM

Refer to Owner's Manual for ASCD operating instructions.

Automatic Speed Control Device (ASCD) allows a driver to keep vehicle at predetermined constant speed without depressing accelerator pedal. Driver can set vehicle speed in advance between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH).

ECM controls throttle angle of electric throttle control actuator to regulate engine speed.

The ASCD operation status is indicated by two indicators (CRUISE and SET on the information display) on the combination meter. If any malfunction occurs in ASCD system, SET indicator blinks and ASCD control is deactivated.

NOTE:

Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws.

SET OPERATION

Press MAIN switch. (CRUISE is indicated on the information display.)

When vehicle speed reaches a desired speed between approximately 40 km/h (25 MPH) and 144 km/h (89 MPH), press COAST/SET switch. (Then SET is indicated on the information display.)

ACCELERATE OPERATION

If the ACCEL/RES switch is pressed during cruise control driving, increase the vehicle speed until the switch is released or vehicle speed reaches maximum speed controlled by the system.

And then ASCD will keep the new set speed.

CANCEL OPERATION

When any of following conditions exist, cruise operation will be canceled.

- CANCEL switch is pressed
- More than 2 switches at ASCD steering switch are pressed at the same time (Set speed will be cleared)
- Brake pedal is depressed
- Clutch pedal is depressed or gear position is changed to neutral position
- Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed

When the ECM detects any of the following conditions, the ECM will cancel the cruise operation and inform the driver by blinking indicators.

- Engine coolant temperature is slightly higher than the normal operating temperature, CRUISE indicator may blink slowly.

When the engine coolant temperature decreases to the normal operating temperature, CRUISE indicator will stop blinking and the cruise operation will be able to work by pressing COAST/SET switch or ACCEL/RES switch.

- Malfunction for some self-diagnoses regarding ASCD control: SET indicator will blink quickly.

If MAIN switch is turned to OFF during ASCD is activated, all of ASCD operations will be canceled and vehicle speed memory will be erased.

COAST OPERATION

When the COAST/SET switch is pressed during cruise control driving, decrease vehicle set speed until the switch is released. And then ASCD will keep the new set speed.

RESUME OPERATION

When the ACCEL/RES switch is pressed after cancel operation other than pressing MAIN switch is performed, vehicle speed will return to last set speed. To resume vehicle set speed, vehicle condition must meet following conditions.

- Brake pedal is released
- Clutch pedal is released
- Vehicle speed is greater than 40 km/h (25 MPH) and less than 144 km/h (89 MPH)

CAN COMMUNICATION**CAN COMMUNICATION : System Description**

INFOID:0000000014267490

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

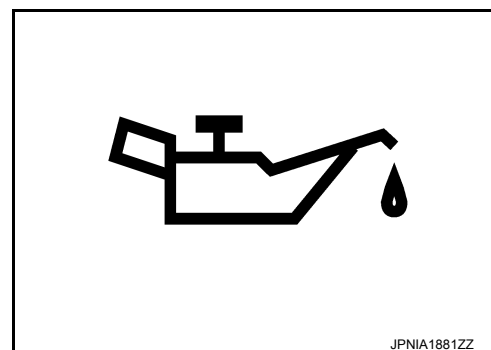
Refer to [LAN-42. "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart"](#), about CAN communication for detail.

WARNING LAMPS/INDICATOR LAMPS**WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp**

INFOID:0000000014267491

DESIGN/PURPOSE

When engine oil pressure is low, the oil pressure warning lamp informs the driver of low oil pressure to prevent damage to the engine.

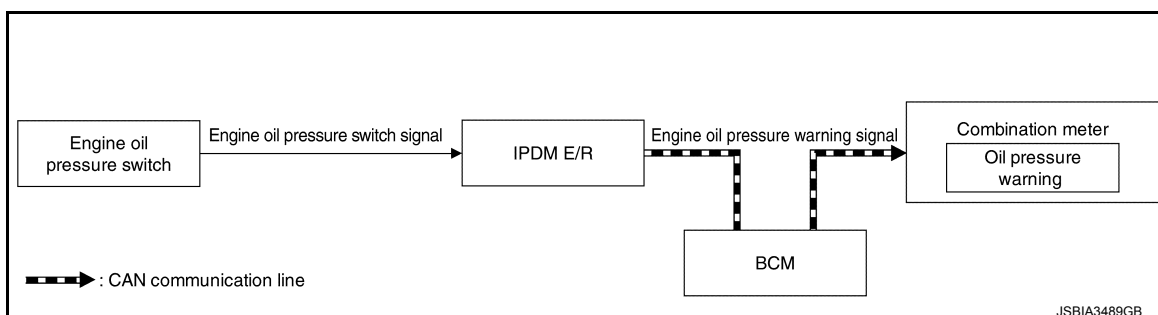
**BULB CHECK**

Not applicable

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communications blackout or abnormal signal reception, refer to [MWI-38. "Fail-Safe"](#) (with color display and I-key), [MWI-170. "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with color display and without I-key), [MWI-170. "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with monochrome display).

SYSTEM DIAGRAM



NOTE:

BCM is included in combination meter.

SIGNAL PATH

IPDM E/R received the engine oil pressure switch status from the oil pressure switch. After engine running when the oil pressure switch is OFF and at least 5 seconds, IPDM E/R transmits the engine oil pressure warning signal to combination meter via CAN communication through BCM. Then the engine oil pressure warning displays.

LIGHTING CONDITION

When any of the following conditions is satisfied:

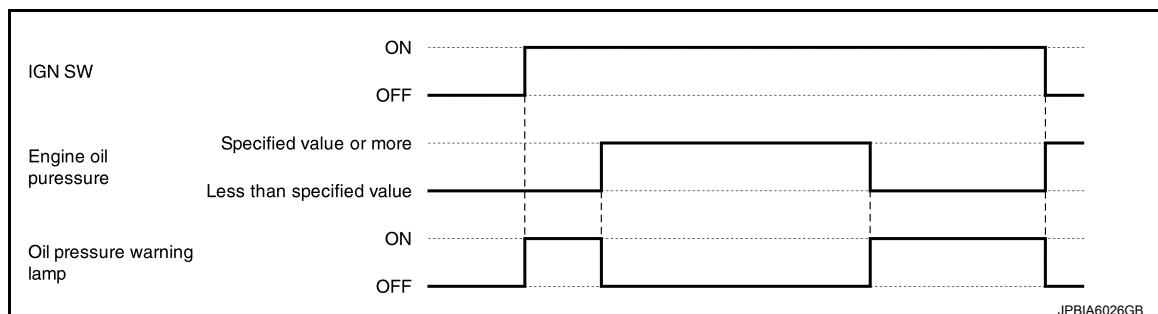
- Ignition switch: OFF
- Engine oil pressure is the specified value or more.

SHUTOFF CONDITION

When any of the following conditions is satisfied:

- Ignition switch: OFF
- Engine oil pressure is the specified value or more.

TIMING CHART



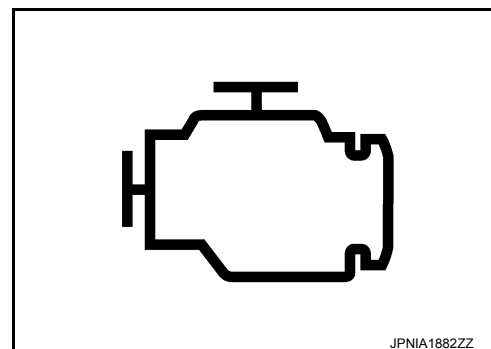
WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)

INFOID:0000000014267492

DESIGN/PURPOSE

When a malfunction which increases exhaust gases is detected, ECM turns ON MIL and informs the driver of the necessity of inspection and repair.

When a malfunction which causes damage to the catalyst is detected, ECM immediately blinks MIL to alert the driver.



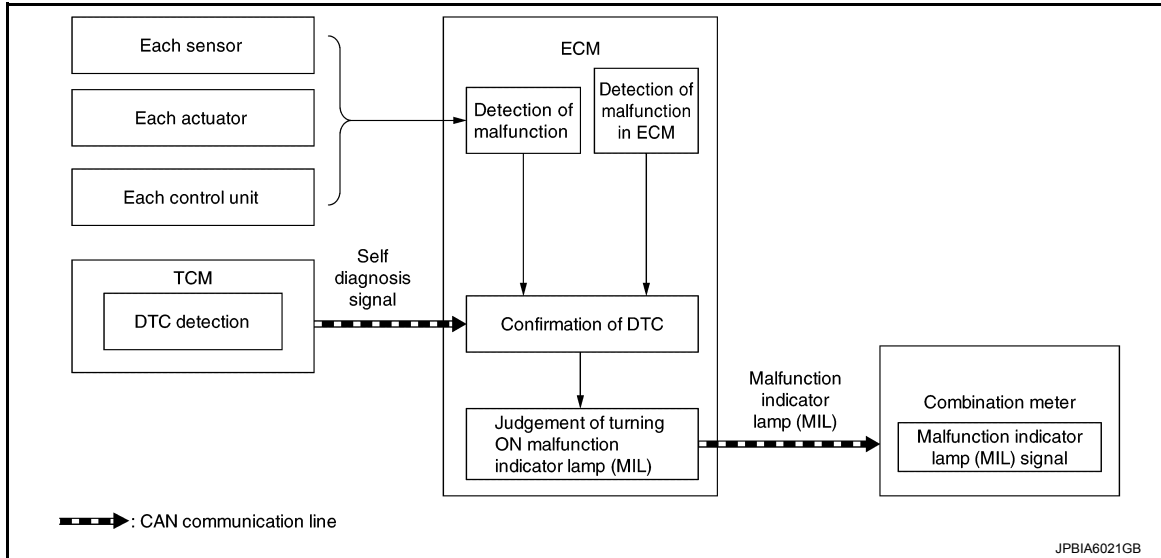
BULB CHECK

The bulb turns ON after turning ON the ignition switch (engine stop) and turns OFF after restarting the engine.

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communication blackout in the combination meter, refer to [MWI-38, "Fail-Safe"](#) (with color display and I-key), [MWI-45, "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with color display and without I-key), [MWI-170, "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with monochrome display).

SYSTEM DIAGRAM



SIGNAL PATH

- When the lighting conditions of the malfunction indicator lamp (MIL) are satisfied, ECM transmits a malfunction indicator lamp (MIL) signal to the combination meter via CAN communication.
- The combination meter turns ON or blinks the malfunction indicator lamp (MIL), according to a signal received from ECM.

LIGHTING CONDITION

When all of the following conditions are satisfied:

- Ignition switch: ON
- DTC which influences on exhaust gasses is judged.

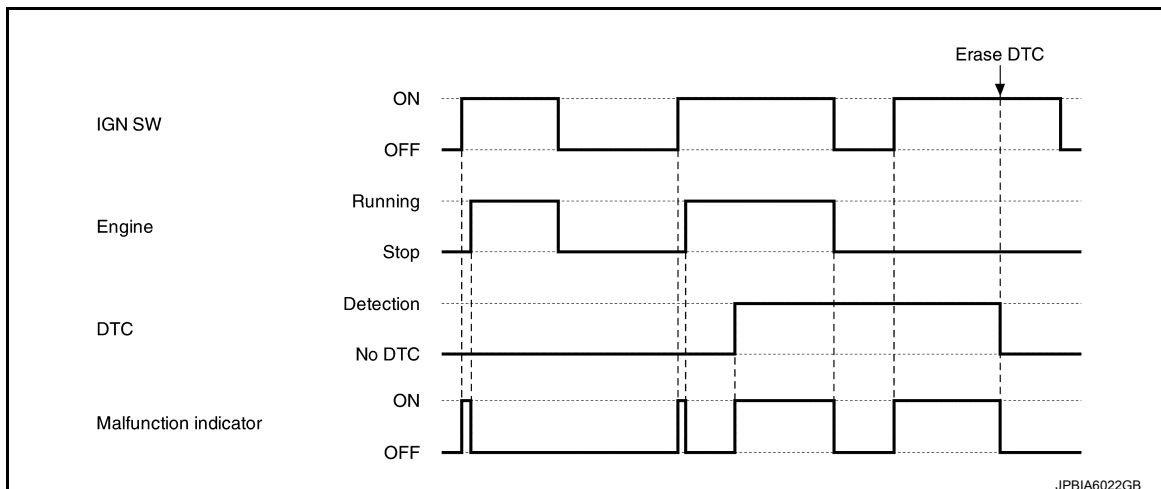
For DTCs that the malfunction indicator lamp turns ON and the number of DTC diagnosis trips, refer to [EC-98, "DTC Index"](#).

SHUTOFF CONDITION

When any of the following conditions is satisfied:

- Ignition switch: OFF
- Erase DTC

TIMING CHART



SYSTEM

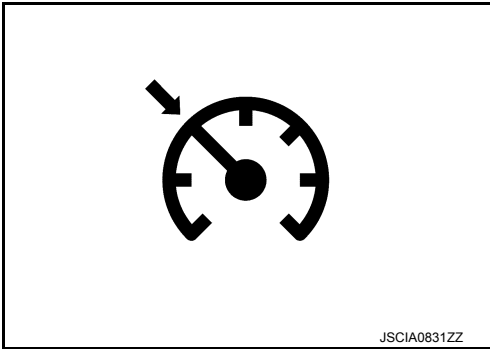
< SYSTEM DESCRIPTION >

[QR25DE]

INFORMATION DISPLAY (COMBINATION METER)

INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator

INFOID:0000000014267493

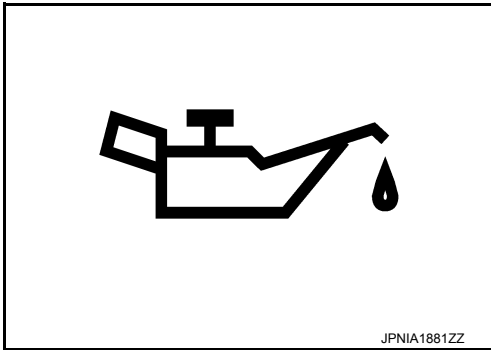
Item	Symbol	Function
ASCD indicator	 Message: - - Km/h / - - MPH	For detail of ASCD function, refer to EC-56. "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description" .

INFORMATION DISPLAY (COMBINATION METER) : Engine Oil Pressure Warning

INFOID:0000000014267494

DESIGN/PURPOSE

When engine oil pressure is low, the engine oil pressure warning informs the driver of low oil pressure to prevent damage to the engine.

Symbol	Message
	• Low Oil Pressure • Stop Vehicle

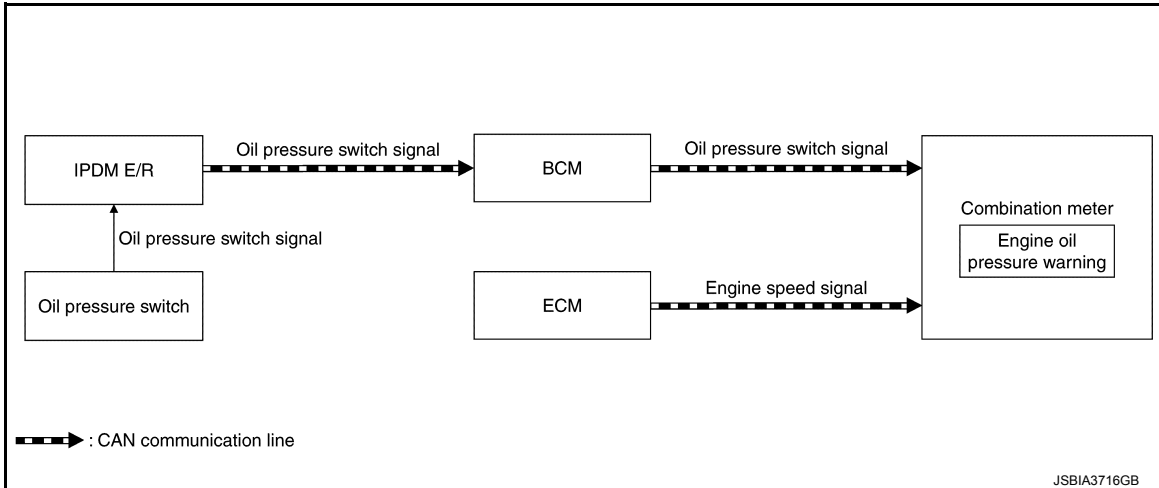
BULB CHECK

Not applicable

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communications blackout or abnormal signal reception, refer to [MWI-38. "Fail-Safe"](#) (with color display and I-key), [MWI-170. "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with color display and without I-key), [MWI-170. "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with monochrome display).

SYSTEM DIAGRAM



NOTE:

BCM is included in combination meter.

SIGNAL PATH

- IPDM E/R receives a signal from the engine oil pressure switch and transmits an oil pressure switch signal to BCM via CAN communication.
- BCM transmits the received oil pressure switch signal to the combination meter via CAN communication.
- The information display (on combination meter) is SHOWN/HIDDEN the engine oil pressure warning, according to the oil pressure switch signal received from BCM.

LIGHTING CONDITION

When all of the following conditions for at least 5 seconds are satisfied:

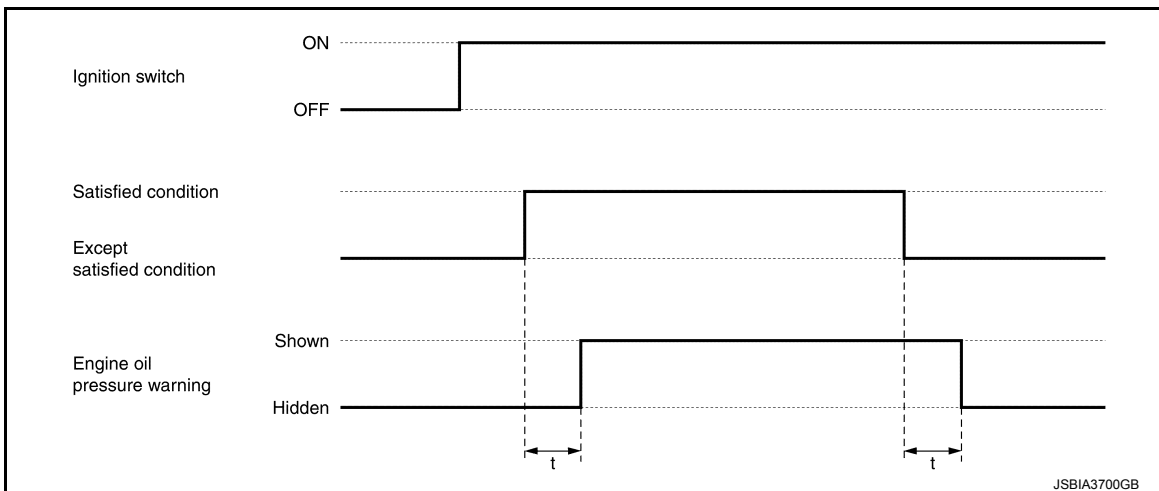
- Ignition switch: ON
- Engine oil pressure is less than specified value. (Oil pressure switch signal: ON)
- Engine speed is more than 500 rpm.

SHUTOFF CONDITION

When any of the following conditions is satisfied:

- Ignition switch: OFF
- Engine oil pressure is the specified value or more. (Oil pressure switch signal: OFF)
- Engine speed is less than 500 rpm.

TIMING CHART



t: 100 ms

WARNING/INDICATOR/CHIME LIST

SYSTEM

< SYSTEM DESCRIPTION >

[QR25DE]

WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps

INFOID:0000000014267495

Name	Design	Arrangement/Function
Oil pressure warning lamp		Regarding the arrangement. Refer to MWI-10, "METER SYSTEM : Design" . Regarding the function. Refer to EC-57, "WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp" .
Malfunction indicator lamp (MIL)		Regarding the arrangement. Refer to MWI-10, "METER SYSTEM : Design" (with color display), MWI-145, "METER SYSTEM : Design" (with monochrome display). Regarding the function. Refer to EC-58, "WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)" .

WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)

INFOID:0000000014267496

Name	Function
ASCD indicator	Refer to EC-60, "INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator" .
Oil pressure warning	Refer to EC-60, "INFORMATION DISPLAY (COMBINATION METER) : Engine Oil Pressure Warning" .

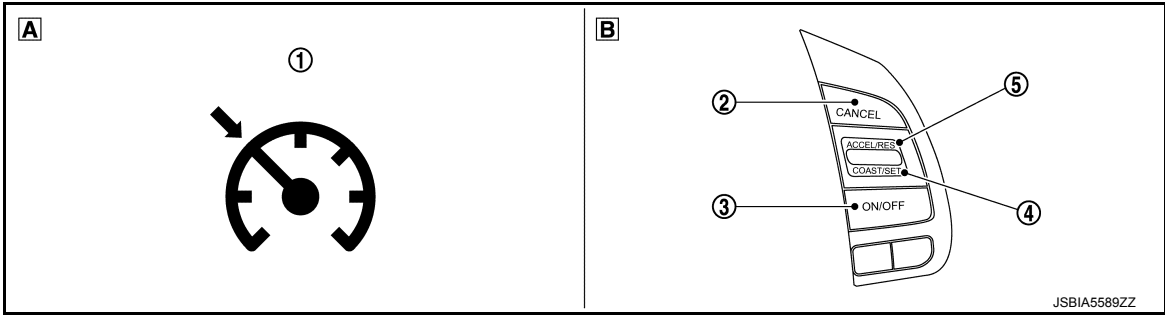
OPERATION

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

AUTOMATIC SPEED CONTROL DEVICE (ASCD) : Switch Name and Function

INFOID:000000014267497

SWITCHES AND INDICATORS



- A** On the information display

① ASCD indicator

④ COAST/SET switch
- B** On the steering wheel

② CANCEL switch

⑤ ACCEL/RES switch

③ MAIN switch

SET SPEED RANGE

ASCD system can be set the following vehicle speed.

Minimum speed (Approx.)	Maximum speed (Approx.)
40 km/h (25 MPH)	144 km/h (89 MPH)

SWITCH OPERATION

Item	Function
CANCEL switch	Cancels the cruise control driving.
ACCEL/RES switch	- Resumes the set speed. - Increases speed incrementally during cruise control driving.
COAST/SET switch	- Sets desired cruise speed. - Decreases speed incrementally during cruise control driving.
MAIN switch	Master switch to activate the ASCD system.

Refer to [EC-56. "AUTOMATIC SPEED CONTROL DEVICE \(ASCD\) : System Description"](#) for ASCD operating instructions.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Diagnosis Description

INFOID:0000000014267498

This system is an on board diagnostic system that records exhaust emission-related diagnostic information and detects a sensors/actuator-related malfunction. A malfunction is indicated by the malfunction indicator lamp (MIL) and stored in control module memory as a DTC. The diagnostic information can be obtained with the diagnostic tool (GST: Generic Scan Tool).

GST (Generic Scan Tool)

INFOID:0000000014267499

When GST is connected with a data link connector equipped on the vehicle side, it will communicate with the control module equipped in the vehicle and then enable various kinds of diagnostic tests. Refer to [GI-53, "Description"](#).

NOTE:

Service \$0A is not applied for regions where it is not mandated.

DIAGNOSIS SYSTEM (ECM)

DIAGNOSIS DESCRIPTION

DIAGNOSIS DESCRIPTION : 1st Trip Detection Logic and Two Trip Detection Logic

INFOID:0000000014267500

When a malfunction is detected for the first time, 1st trip DTC and 1st trip Freeze Frame data are stored in the ECM memory. The MIL will not illuminate at this stage. <1st trip>

If the same malfunction is detected again during the next drive, the DTC and Freeze Frame data are stored in the ECM memory, and the MIL illuminates. The MIL illuminates at the same time when the DTC is stored. <2nd trip> The "trip" in the "Two Trip Detection Logic" means a driving mode in which self-diagnosis is performed during vehicle operation. Specific on board diagnostic items will cause the ECM to illuminate or blink the MIL, and store DTC and Freeze Frame data, even in the 1st trip, as shown below.

×: Applicable —: Not applicable

Items	MIL				DTC		1st trip DTC	
	1st trip		2nd trip		1st trip displaying	2nd trip displaying	1st trip displaying	2nd trip displaying
	Blinking	Illuminated	Blinking	Illuminated				
Misfire (Possible three way catalyst damage) — DTC: P0300 – P0304 is being detected	×	—	—	—	—	—	×	—
Misfire (Possible three way catalyst damage) — DTC: P0300 – P0304 is being detected	—	—	×	—	—	×	—	—
One trip detection diagnoses (Refer to EC-98, "DTC Index" .)	—	×	—	—	×	—	—	—
Except above	—	—	—	×	—	×	×	—

DIAGNOSIS DESCRIPTION : DTC and Freeze Frame Data

INFOID:0000000014267501

DTC AND 1ST TRIP DTC

The 1st trip DTC (whose number is the same as the DTC number) is displayed for the latest self-diagnostic result obtained. If the ECM memory was cleared previously, and the 1st trip DTC did not recur, the 1st trip DTC will not be displayed.

If a malfunction is detected during the 1st trip, the 1st trip DTC is saved in the ECM memory. The MIL will not light up (two trip detection logic). If the same malfunction is not detected in the 2nd trip (meeting the required driving pattern), the 1st trip DTC is cleared from the ECM memory. If the same malfunction is detected in the 2nd trip, both the 1st trip DTC and DTC are saved in the ECM memory and the MIL lights up. In other words, the DTC is stored in the ECM memory and the MIL lights up when the same malfunction occurs in two consecutive trips. If a 1st trip DTC is stored and a non-diagnostic operation is performed between the 1st and 2nd trips, only the 1st trip DTC will continue to be stored. For malfunctions that blink or light up the MIL during the 1st trip, the DTC and 1st trip DTC are stored in the ECM memory.

For malfunctions in which 1st trip DTCs are displayed, refer to [EC-98, "DTC Index"](#). These items are required by legal regulations to continuously monitor the system/component. In addition, the items monitored non-continuously are also displayed on CONSULT.

1st trip DTC is specified in Service \$07 of SAE J1979/ISO 15031-5. 1st trip DTC detection occurs without illuminating the MIL and therefore does not warn the driver of a malfunction.

When a 1st trip DTC is detected, check, print out or write down and erase (1st trip) DTC and Freeze Frame data as specified in Work Flow procedure Step 2, refer to [EC-124, "Work Flow"](#). Then perform DTC Confirmation Procedure or Component Function Check to try to duplicate the malfunction. If the malfunction is duplicated, the item requires repair.

FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA

The ECM records the driving conditions such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed, vehicle speed, absolute throttle position, base fuel schedule and intake air temperature at the moment a malfunction is detected.

Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data. The data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT or GST. The 1st trip freeze frame data can only be displayed on the CONSULT screen.

DIAGNOSIS SYSTEM (ECM)

[QR25DE]

< SYSTEM DESCRIPTION >

Only one set of freeze frame data (either 1st trip freeze frame data or freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MIL on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

Priority	Items	
1	Freeze frame data	Misfire — DTC: P0300 – P0304 Fuel Injection System Function — DTC: P0171, P0172
2		Except the above items
3	1st trip freeze frame data	

For example, the EGR malfunction (Priority: 2) was detected and the freeze frame data was saved in the 2nd trip. After that when the misfire (Priority: 1) is detected in another trip, the freeze frame data will be updated from the EGR malfunction to the misfire. The 1st trip freeze frame data is updated each time a different malfunction is detected. There is no priority for 1st trip freeze frame data. However, once freeze frame data is stored in the ECM memory, 1st trip freeze data is no longer stored (because only one freeze frame data or 1st trip freeze frame data can be stored in the ECM). If freeze frame data is stored in the ECM memory and freeze frame data with the same priority occurs later, the first (original) freeze frame data remains unchanged in the ECM memory.

Both 1st trip freeze frame data and freeze frame data (along with the DTCs) are cleared when the ECM memory is erased.

DIAGNOSIS DESCRIPTION : Counter System

INFOID:0000000014267502

RELATIONSHIP BETWEEN MIL, 1ST TRIP DTC, DTC, AND DETECTABLE ITEMS

- When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data are stored in the ECM memory.
- When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data are stored in the ECM memory, and the MIL will come on.
- The MIL will turn OFF after the vehicle is driven 3 times (driving pattern B) with no malfunction. The drive is counted only when the recorded driving pattern is met (as stored in the ECM). If another malfunction occurs while counting, the counter will reset.
- The DTC and the freeze frame data will be stored until the vehicle is driven 40 times (driving pattern A) without the same malfunction recurring (except for Misfire and Fuel Injection System). For Misfire and Fuel Injection System, the DTC and freeze frame data will be stored until the vehicle is driven 80 times (driving pattern C) without the same malfunction recurring. The “TIME” in “SELF-DIAGNOSTIC RESULTS” mode of CONSULT will count the number of times the vehicle is driven.
- The 1st trip DTC is not displayed when the self-diagnosis results in OK for the 2nd trip.

COUNTER SYSTEM CHART

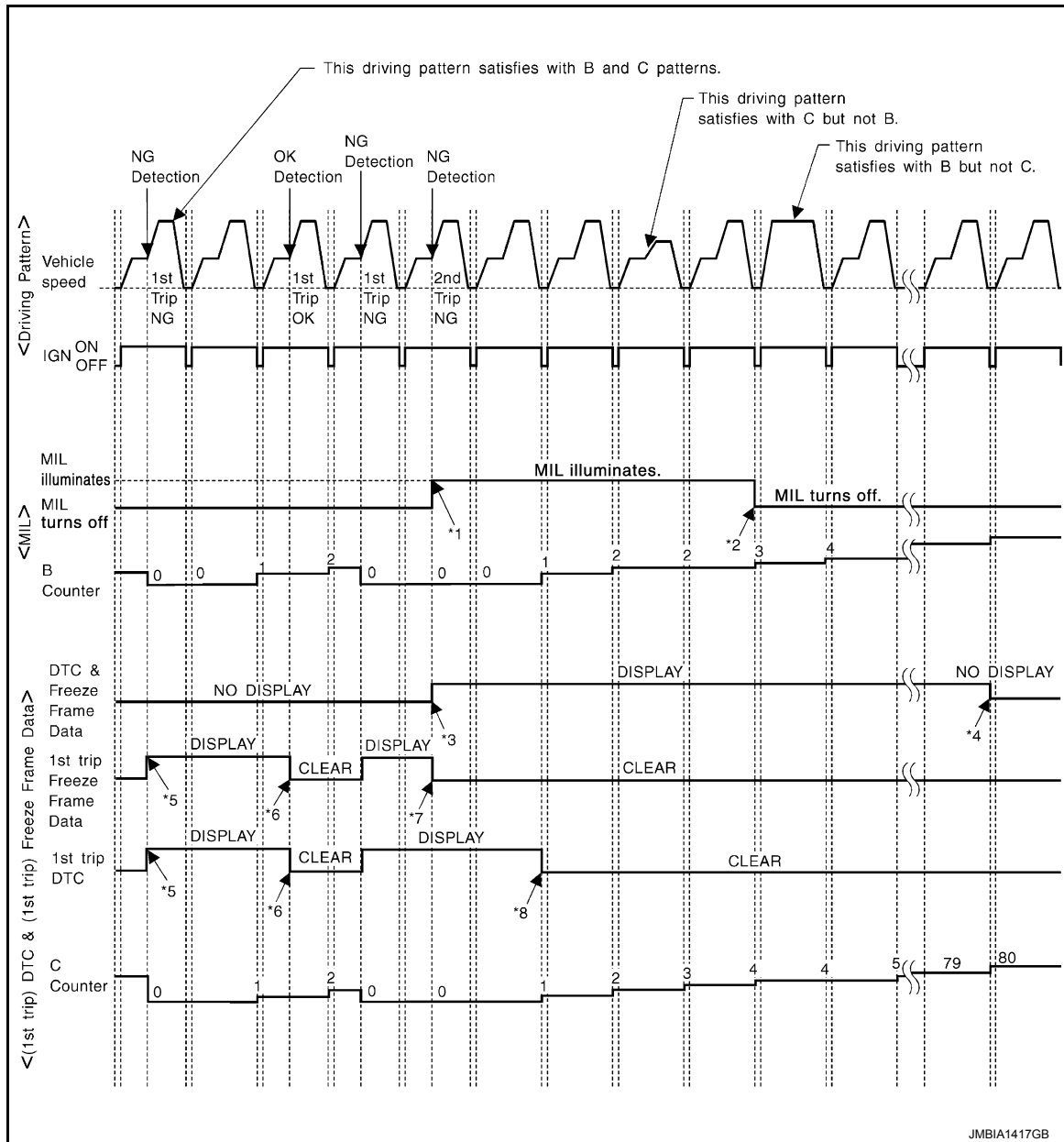
Items	Fuel Injection System	Misfire	Other
MIL (turns OFF)	3 (pattern B)	3 (pattern B)	3 (pattern B)
DTC, Freeze Frame Data (no display)	80 (pattern C)	80 (pattern C)	40 (pattern A)
1st Trip DTC (clear)	1 (pattern C), *1	1 (pattern C), *1	1 (pattern B)
1st Trip Freeze Frame Data (clear)	*1, *2	*1, *2	1 (pattern B)

For details about patterns B and C under “Fuel Injection System” and “Misfire”, see “EXPLANATION FOR DRIVING PATTERNS FOR “MISFIRE <EXHAUST QUALITY DETERIORATION>”, “FUEL INJECTION SYSTEM”.

For details about patterns A and B under Other, see “EXPLANATION FOR DRIVING PATTERNS FOR “MISFIRE <EXHAUST QUALITY DETERIORATION>”, “FUEL INJECTION SYSTEM”.

- *1: Clear timing is at the moment OK is detected.
- *2: Clear timing is when the same malfunction is detected in the 2nd trip.

Relationship Between MIL, DTC, 1st Trip DTC and Driving Patterns for “Misfire <Exhaust Quality Deterioration>”, “Fuel Injection System”



*1: When the same malfunction is detected in two consecutive trips, MIL will light up.

*2: MIL will turn OFF after vehicle is driven 3 times (pattern B) without any malfunctions.

*3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM.

*4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 80 times (pattern C) without the same malfunction. (The DTC and the freeze frame data still remain in ECM.)

*5: When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM.

*6: The 1st trip DTC and the 1st trip freeze frame data will be cleared at the moment OK is detected.

*7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared.

*8: 1st trip DTC will be cleared when vehicle is driven once (pattern C) without the same malfunction after DTC is stored in ECM.

Explanation for Driving Patterns for "Misfire <Exhaust Quality Deterioration>", "Fuel Injection System"

Driving Pattern B

Refer to [EC-69, "DIAGNOSIS DESCRIPTION : Driving Pattern"](#).

[QR25DE]

- | | | |
|---|---|--|
| *1: When the same malfunction is detected in two consecutive trips, MIL will light up. | *2: MIL will turn OFF after vehicle is driven 3 times (pattern B) without any malfunctions. | *3: When the same malfunction is detected in two consecutive trips, the DTC and the freeze frame data will be stored in ECM. |
| *4: The DTC and the freeze frame data will not be displayed any longer after vehicle is driven 40 times (pattern A) without the same malfunction.
(The DTC and the freeze frame data still remain in ECM.) | *5: When a malfunction is detected for the first time, the 1st trip DTC and the 1st trip freeze frame data will be stored in ECM. | *6: 1st trip DTC will be cleared after vehicle is driven once (pattern B) without the same malfunction. |
| *7: When the same malfunction is detected in the 2nd trip, the 1st trip freeze frame data will be cleared. | | |

Explanation for Driving Patterns Except for “Misfire <Exhaust Quality Deterioration>”, “Fuel Injection System”

Driving Pattern A

Refer to [EC-69, "DIAGNOSIS DESCRIPTION : Driving Pattern"](#).

Driving Pattern B

Refer to [EC-69, "DIAGNOSIS DESCRIPTION : Driving Pattern"](#).

DIAGNOSIS DESCRIPTION : Driving Pattern

INFOID:0000000014267503

CAUTION:

Always drive at a safe speed.

DRIVING PATTERN A

Driving pattern A means a trip satisfying the following conditions.

- Engine speed reaches 400 rpm or more.
- Engine coolant temperature rises by 20°C (36°F) or more after starting the engine.
- Engine coolant temperature reaches 70°C (158°F) or more.
- The ignition switch is turned from ON to OFF.

NOTE:

- When the same malfunction is detected regardless of driving conditions, reset the counter of driving pattern A.
- When the above conditions are satisfied without detecting the same malfunction, reset the counter of driving pattern A.

DRIVING PATTERN B

Driving pattern B means a trip satisfying the following conditions.

- Engine speed reaches 400 rpm or more.
- Engine coolant temperature reaches 70°C (158°F) or more.
- Vehicle speed of 70 – 120 km/h (44 – 75 MPH) is maintained for 60 seconds or more under the control of closed loop.
- Vehicle speed of 30 – 60 km/h (19 – 37 MPH) is maintained for 10 seconds or more under the control of closed loop.
- Under the closed loop control condition, the following state reaches 12 seconds or more in total: Vehicle speed of 4 km/h (2 MPH) or less with idling condition.
- The state of driving at 10 km/h (7 MPH) or more reaches 10 minutes or more in total.
- A lapse of 22 minutes or more after engine start.

NOTE:

- Drive the vehicle at a constant velocity.
- When the same malfunction is detected regardless of driving conditions, reset the counter of driving pattern B.
- When the above conditions are satisfied without detecting the same malfunction, reset the counter of driving pattern B.

DRIVING PATTERN C

Driving pattern C means operating vehicle as per the following:

The following conditions should be satisfied at the same time:

Engine speed: (Engine speed in the freeze frame data) ± 375 rpm

< SYSTEM DESCRIPTION >

Calculated load value: (Calculated load value in the freeze frame data) x (1±0.1) [%]

Engine coolant temperature condition:

- When the freeze frame data shows lower than 70°C (158°F), engine coolant temperature should be lower than 70°C (158°F).
- When the freeze frame data shows higher than or equal to 70°C (158°F), engine coolant temperature should be higher than or equal to 70°C (158°F).

NOTE:

- When the same malfunction is detected regardless of the above vehicle conditions, reset the counter of driving pattern C.
- When the above conditions are satisfied without detecting the same malfunction, reset the counter of driving pattern C.
- The 1st trip DTC will be cleared when C counter is counted once without the same malfunction after DTC is stored in ECM.

DRIVING PATTERN D

Driving pattern D means a trip satisfying the following conditions.

- The state of driving at 40 km/h (25 MPH) reaches 300 seconds or more in total.
- Idle speed lasts 30 seconds or more.
- A lapse of 600 seconds or more after engine start.

NOTE:

- When the same malfunction is detected regardless of driving conditions, reset the counter of driving pattern D.
- When the above conditions are satisfied without detecting the same malfunction, reset the counter of driving pattern D.

DIAGNOSIS DESCRIPTION : Malfunction Indicator Lamp (MIL)

INFOID:0000000014267504

When emission-related ECU detects a malfunction in the emission control systems components and/or the powertrain control components (which affect vehicle emissions), it turns on/blinks MIL to inform the driver that a malfunction has been detected.

1. The MIL illuminates when ignition switch is turned ON (engine is not running).

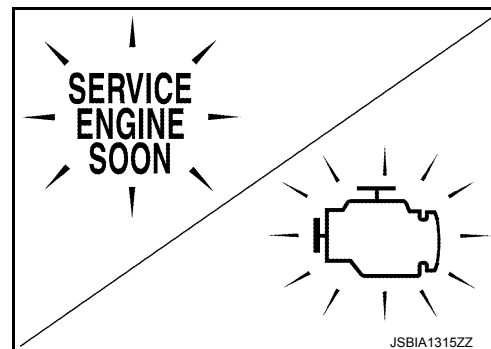
NOTE:

Check the MIL circuit if MIL does not illuminate. Refer to [EC-377, "Diagnosis Procedure"](#).

2. When the engine is started, the MIL should go off.

NOTE:

If MIL continues to illuminate/blink, perform self-diagnoses and inspect/repair accordingly because an emission-related ECU has detected a malfunction in the emission control systems components and/or the powertrain control components (which affect vehicle emissions).



On Board Diagnosis Function

INFOID:0000000014267505

ON BOARD DIAGNOSIS ITEM

The on board diagnostic system has the following functions.

Diagnostic test mode	Function
Bulb check	MIL can be checked.
Malfunction warning	If ECM detects a malfunction, it illuminates or blinks MIL to inform the driver that a malfunction has been detected.
Self-diagnostic results	DTCs or 1st trip DTCs stored in ECM can be read.
Accelerator pedal released position learning	ECM can learn the accelerator pedal released position. Refer to EC-135, "Description" .
Throttle valve closed position learning	ECM can learn the throttle valve closed position. Refer to EC-136, "Description" .
Idle air volume learning	ECM can learn the idle air volume. Refer to EC-137, "Description" .
Mixture ratio self-learning value clear	Mixture ratio self-learning value can be erased. Refer to EC-139, "Description" .

< SYSTEM DESCRIPTION >

BULB CHECK MODE

Description

This function allows damage inspection in the MIL bulb (blown, open circuit, etc.).

Operation Procedure

1. Turn ignition switch ON.
2. The MIL on the instrument panel should stay ON.
If it remains OFF, check MIL circuit. Refer to [EC-377. "Diagnosis Procedure"](#).

MALFUNCTION WARNING MODE

Description

In this function ECM turns on or blinks MIL when it detects a malfunction in the emission control system components and/or the powertrain control components (which affect vehicle emissions) to inform the driver that a malfunction has been detected.

Operation Procedure

1. Turn ignition switch ON.
2. Check that MIL illuminates.
If it remains OFF, check MIL circuit. Refer to [EC-377. "Diagnosis Procedure"](#).
3. Start engine and let it idle.
 - For two trip detection logic diagnoses, ECM turns on MIL when it detects the same malfunction twice in the two consecutive driving cycles.
 - For 1st trip detection logic diagnoses, ECM turns on MIL when it detects a malfunction in one driving cycle.
 - ECM blinks MIL when it detects a malfunction that may damage the three way catalyst (misfire).

SELF-DIAGNOSTIC RESULTS MODE

Description

This function allows to indicate DTCs or 1st trip DTCs stored in ECM according to the number of times MIL is blinking.

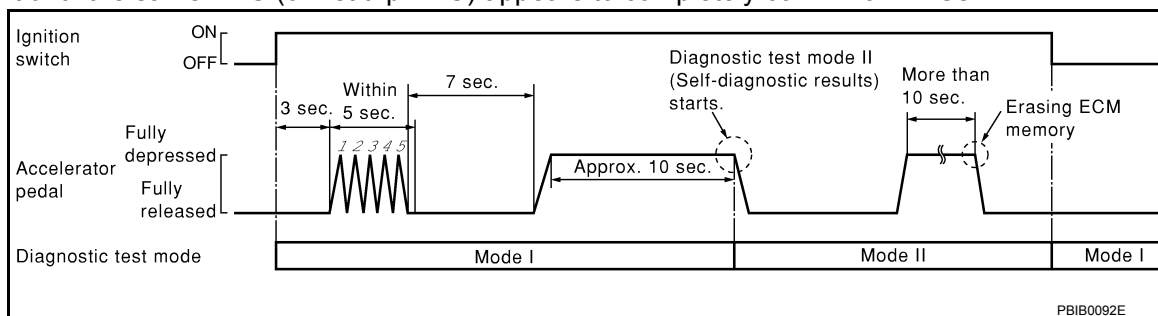
How to Set Self-diagnostic Results Mode

NOTE:

- It is better to count the time accurately with a clock.
 - It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.
 - After ignition switch is turned off, ECM is always released from the "self-diagnostic results" mode.
1. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
 2. Repeat the following procedure quickly five times within 5 seconds.
 - Fully depress the accelerator pedal.
 - Fully release the accelerator pedal.
 3. Wait 7 seconds, fully depress the accelerator pedal and keep it depressed for approx. 10 seconds until the MIL starts blinking.
 4. Fully release the accelerator pedal.
ECM has entered to "Self-diagnostic results" mode.

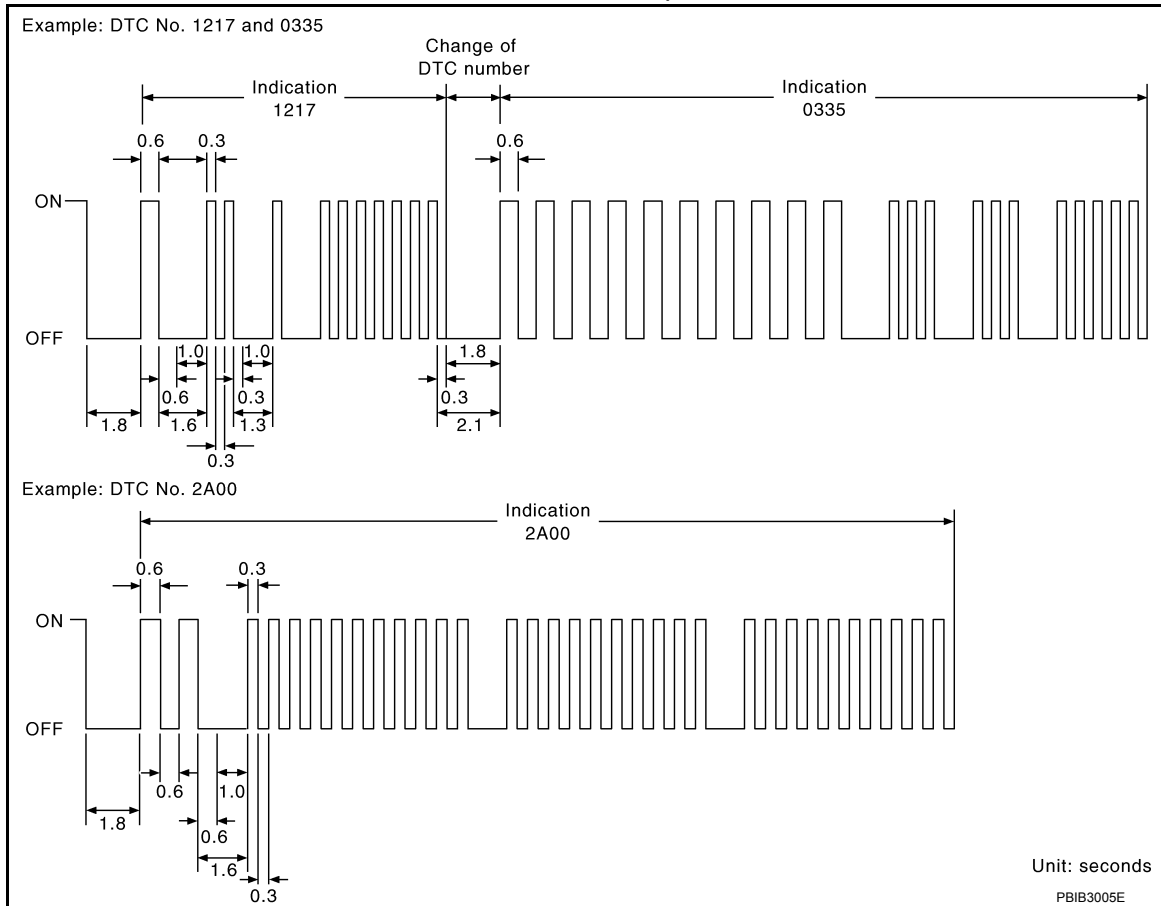
NOTE:

Wait until the same DTC (or 1st trip DTC) appears to completely confirm all DTCs.



How to Read Self-diagnostic Results

The DTC and 1st trip DTC are indicated by the number of blinks of the MIL as shown below. The DTC and 1st trip DTC are displayed at the same time. If the MIL does not illuminate in diagnostic test mode I (Malfunction warning), all displayed items are 1st trip DTCs. If only one code is displayed when the MIL illuminates in "malfunction warning" mode, it is a DTC; if two or more codes are displayed, they may be either DTCs or 1st trip DTCs. DTC No. is same as that of 1st trip DTC. These unidentified codes can be identified by using the CONSULT or GST. A DTC will be used as an example for how to read a code.



A particular trouble code can be identified by the number of four-digit numeral flashes per the following.

Number	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Flashes	10	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16

The length of time the 1,000th-digit numeral flashes on and off is 1.2 seconds consisting of an ON (0.6-seconds) - OFF (0.6-seconds) cycle.

The 100th-digit numeral and lower digit numerals consist of a 0.3-seconds ON and 0.3-seconds OFF cycle. A change from one digit numeral to another occurs at an interval of 1.0-second OFF. In other words, the later numeral appears on the display 1.3 seconds after the former numeral has disappeared.

A change from one trouble code to another occurs at an interval of 1.8-seconds OFF.

In this way, all the detected malfunctions are classified by their DTC numbers. The DTC 0000 refers to no malfunction. Refer to [EC-98. "DTC Index"](#).

How to Erase Self-diagnostic Results

By performing this procedure, ECM memory is erased and the following diagnostic information is erased as well.

- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- Test values

NOTE:

Also, if a battery terminal is disconnected, ECM memory is erased and the diagnostic information as listed above is erased. (The amount of time required for erasing may vary from a few seconds to several hours.)

1. Turn ignition switch OFF and wait at least 10 seconds.

< SYSTEM DESCRIPTION >

2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON.
5. Set ECM in "self-diagnostic results" mode.
6. The diagnostic information has been erased from the backup memory in the ECM.
Fully depress the accelerator pedal and keep it depressed for more than 10 seconds.
7. Fully release the accelerator pedal, and confirm the DTC 0000 is displayed.

CONSULT Function

INFOID:0000000014267506

FUNCTION

Diagnostic test mode	Function
Self Diagnostic Result	Self-diagnostic results such as 1st trip DTC, DTC and 1st trip freeze frame data or freeze frame data can be read and erased quickly.*
Data Monitor	Input/Output data in the ECM can be read.
Work Support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on the CONSULT screen.
Active Test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ECMs and also shifts some parameters in a specified range.
ECU Identification	ECM part number can be read.
DTC Work Support	The use of this mode enables quick and accurate performance of Confirmation Procedure.

*: The following emission-related diagnostic information is cleared when the ECM memory is erased.

- Diagnostic trouble codes
- 1st trip diagnostic trouble codes
- Freeze frame data
- 1st trip freeze frame data
- Test values

SELF-DIAGNOSTIC RESULT MODE

Self Diagnostic Item

Regarding items of DTC and 1st trip DTC, refer to [EC-98, "DTC Index"](#).

How to Erase DTC and 1st Trip DTC

NOTE:

If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.

Freeze Frame Data and 1st Trip Freeze Frame Data

Freeze frame data item*	Description
DIAG TROUBLE CODE [PXXXX]	• The engine control component part/control system has a trouble code that is displayed as PXXXX. (Refer to EC-98, "DTC Index".)
FUEL SYS-B1	• "Fuel injection system status" at the moment a malfunction is detected is displayed. - One of the following mode is displayed. - Mode2: Open loop due to detected system malfunction - Mode3: Open loop due to driving conditions (power enrichment, deceleration enrichment) - Mode4: Closed loop - using oxygen sensor(s) as feedback for fuel control - Mode5: Open loop - has not yet satisfied condition to go to closed loop
CAL/LD VALUE [%]	• The calculated load value at the moment a malfunction is detected is displayed.
COOLANT TEMP [°C] or [°F]	• The engine coolant temperature at the moment a malfunction is detected is displayed.
L-FUEL TRM-B1 [%]	• "Long-term fuel trim" at the moment a malfunction is detected is displayed. • The long-term fuel trim indicates much more gradual feedback compensation to the base fuel schedule than short-term fuel trim.

DIAGNOSIS SYSTEM (ECM)

[QR25DE]

< SYSTEM DESCRIPTION >

Freeze frame data item*	Description
S-FUEL TRM-B1 [%]	• "Short-term fuel trim" at the moment a malfunction is detected is displayed. • The short-term fuel trim indicates dynamic or instantaneous feedback compensation to the base fuel schedule.
ENGINE SPEED [rpm]	• The engine speed at the moment a malfunction is detected is displayed.
VEHICL SPEED [km/h] or [mph]	• The vehicle speed at the moment a malfunction is detected is displayed.
ABSOL TH-P/S [%]	• The throttle valve opening angle at the moment a malfunction is detected is displayed.
B/FUEL SCHDL [msec]	• The base fuel schedule at the moment a malfunction is detected is displayed.
INT/A TEMP SE [°C] or [°F]	• The intake air temperature at the moment a malfunction is detected is displayed.
FUEL SYS-B2	• There items are displayed but are not applicable to this model.
L-FUEL TRM-B2 [%]	
S-FUEL TRM-B2 [%]	
INT MANI PRES [kPa]	
COMBUST CONDITION	

*: The items are the same as those of 1st trip freeze frame data.

DATA MONITOR MODE

NOTE:

- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- For reference values of the following items, refer to [EC-81, "Reference Value"](#).

Monitored Item

Monitored item	Unit	Monitor Item Selection		Description	Remarks
		ECU IN-PUT SIG-NALS	MAIN SIG-NALS		
COOLAN TEMP/S	°C or °F	×	×	The engine coolant temperature (determined by the signal voltage of the engine coolant temperature sensor) is displayed.	• When the engine coolant temperature sensor circuit is open or shorted, ECM enters fail-safe mode. The engine coolant temperature determined by the ECM is displayed.
VHCL SPEED SE	km/h or mph	×	×	The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed.	
BATTERY VOLT	V	×	×	The power supply voltage of ECM is displayed.	
INT/A TEMP SE	°C or °F	×	×	The intake air temperature (determined by the signal voltage of the intake air temperature sensor) is indicated.	
IGN TIMING	BTDC		×	Indicates the ignition timing computed by ECM according to the input signals.	• When the engine is stopped, a certain value is indicated.
HO2S2 (B1)	V	×	×	The signal voltage of the heated oxygen sensor 2 is displayed.	

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[QR25DE]

Monitored item	Unit	Monitor Item Selection		Description	Remarks
		ECU IN-PUT SIG-NALS	MAIN SIG-NALS		
A/F ALPHA-B1	%		×	The mean value of the air-fuel ratio feedback correction factor per cycle is indicated.	- When the engine is stopped, a certain value is indicated. - When engine is running, specification range is indicated in "SPEC". - This data also includes the data for the air-fuel ratio learning control.
INT/V SOL (B1)	%		×	- The control value of the intake valve timing control solenoid valve (determined by ECM according to the input signals) is indicated. - The advance angle becomes larger as the value increases.	
A/F S1 HTR (B1)	%		×	- Air fuel ratio (A/F) sensor 1 heater control value computed by ECM according to the input signals. - The current flow to the heater becomes larger as the value increases.	
EXH/V TIM (B1)	°CA	×	×	Indicates [°CA] of exhaust camshaft advance angle.	
ENG SPEED	rpm	×	×	Indicates the engine speed computed from the signal of the crankshaft position sensor (POS) and camshaft position sensor (PHASE).	- Accuracy becomes poor if engine speed drops below the idle rpm. - If the signal is interrupted while the engine is running, an abnormal value may be indicated.
INJ PULSE-B1	msec		×	Indicates the actual fuel injection pulse width compensated by ECM according to the input signals.	When the engine is stopped, a certain computed value is indicated.
B/FUEL SCHDL	msec		×	"Base fuel schedule" indicates the fuel injection pulse width programmed into ECM, prior to any learned on board correction.	When engine is running, specification range is indicated in "SPEC".
ACCEL SEN 1	V	×	×	The accelerator pedal position sensor signal voltage is displayed.	ACCEL SEN 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.
ACCEL SEN 2		×			
TP SEN 1-B1	V	×	×	The throttle position sensor signal voltage is displayed.	TP SEN 2-B1 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.
TP SEN 2-B1		×	×		
A/F SEN1 (B1)	V	×	×	The A/F signal computed from the input signal of the air fuel ratio (A/F) sensor 1 is displayed.	
LOAD SIGNAL	On/Off	×	×	- Indicates [ON/OFF] condition from the electrical load signal. - On: Rear window defogger switch is ON and/or lighting switch is in 2nd position. - Off: Both rear window defogger switch and lighting switch are OFF.	

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[QR25DE]

Monitored item	Unit	Monitor Item Selection		Description	Remarks
		ECU IN-PUT SIG-NALS	MAIN SIG-NALS		
AIR COND SIG	On/Off	×	×	Indicates [ON/OFF] condition of the air conditioner switch as determined by the air conditioner signal.	
PW/ST SIGNAL	On/Off	×	×	[ON/OFF] condition of the power steering system (determined by the signal sent from EPS control unit) is indicated.	
P/N POSI SW	On/Off	×	×	Indicates [ON/OFF] condition from the park/neutral position (PNP) signal.	
START SIGNAL	On/Off	×	×	Indicates start signal status [ON/OFF] computed by the ECM according to the signals of engine speed and battery voltage.	• After starting the engine, [OFF] is displayed regardless of the starter signal.
CLSD THL POS	On/Off	×	×	Indicates idle position [ON/OFF] computed by ECM according to the accelerator pedal position sensor signal.	
HO2S2 MNTR(B1)	RICH/LEAN		×	• Display of heated oxygen sensor 2 signal. - RICH: means the amount of oxygen after three way catalyst is relatively small. - LEAN: means the amount of oxygen after three way catalyst is relatively large.	• When the engine is stopped, a certain value is indicated.
IGNITION SW	On/Off	×	×	Indicates [ON/OFF] condition from ignition switch signal.	
AIR COND RLY	On/Off		×	The air conditioner relay control condition (determined by ECM according to the input signals) is indicated.	
FUEL PUMP RLY	On/Off		×	Indicates the fuel pump relay control condition determined by ECM according to the input signals.	
THRTL RELAY	On/Off		×	Indicates the throttle control motor relay control condition determined by the ECM according to the input signals.	
COOLING FAN	Hi/Mid/Low/Off		×	• Indicates the condition of the cooling fan (determined by ECM according to the input signals). - Hi: High speed operation - Mid: Middle speed operation - Low: Low speed operation - Off: Stop	
CAL/LD VALUE	%	×		"Calculated load value" indicates the value of the current air flow divided by peak air flow.	
ATOM PRES SEN	V	×		The atmospheric pressure sensor signal voltage is displayed.	
VEHICLE SPEED	km/h or mph	×		The vehicle speed computed from the vehicle speed signal sent from TCM is displayed.	
INT/V TIM(B1)	°CA	×		Indicates [°CA] of intake camshaft advance angle.	
BAT TEMP SEN	V	×		The signal voltage of battery temperature sensor is displayed.	

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[QR25DE]

Monitored item	Unit	Monitor Item Selection		Description	Remarks
		ECU IN-PUT SIG-NALS	MAIN SIG-NALS		
I/P PULLY SPD	rpm	×		Indicates the engine speed computed from the input speed sensor signal.	
AC PRESS SEN	V	×		The signal voltage from the refrigerant pressure sensor is displayed.	
VHCL SPEED SE	km/h or mph	×		The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed.	
SET VHCL SPD	km/h or mph	×		The preset vehicle speed is displayed.	
MASS AIR FLOW SENSOR (Hz)	Hz	×		The signal frequency of the mass air flow sensor is displayed.	- When the engine is stopped, a certain value is indicated. - When engine is running, specification range is indicated in "SPEC".
HEATER FAN SW	On/Off	×		Indicates [ON/OFF] condition from the heater fan switch signal.	
BRAKE SW	On/Off	×		Indicates [ON/OFF] condition from the stop lamp switch signal.	
BRAKE SW2	On/Off	×		Indicates [ON/OFF] condition of stop lamp switch signal.	
BRAKE SW1	On/Off	×		- Indicates [ON/OFF] condition from brake pedal position switch signal. - Indicates [ON/OFF] condition from clutch pedal position switch signal.	
SET SW	On/Off	×		Indicates [ON/OFF] condition from COAST/SET switch signal.	
RESUME/ACC SW	On/Off	×		Indicates [ON/OFF] condition from ACCEL/RES switch signal.	
CANCEL SW	On/Off	×		Indicates [ON/OFF] condition from CANCEL switch signal.	
MAIN SW	On/Off	×		Indicates [ON/OFF] condition from MAIN switch signal.	
PURG VOL C/V	%			- Indicates the EVAP canister purge volume control solenoid valve control value computed by the ECM according to the input signals. - The opening becomes larger as the value increases.	
THRTL STK CNT B1*	—			—	
TRVL AFTER MIL	km or mile			Distance traveled while MIL is activated.	
MASS AIRFLOW	g/s			Indicates the mass air flow computed by ECM according to the signal voltage of the mass air flow sensor.	
VTC DTY EX B1	%			- The control value of the exhaust valve timing control solenoid valve (determined by ECM according to the input signals) is indicated. - The advance angle becomes larger as the value increases.	

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[QR25DE]

Monitored item	Unit	Monitor Item Selection		Description	Remarks
		ECU INPUT SIGNALS	MAIN SIGNALS		
A/F ADJ-B1	—			Indicates the correction of factor stored in ECM. The factor is calculated from the difference between the target air-fuel ratio stored in ECM and the air-fuel ratio calculated from A/F sensor 1 signal.	
IDL A/V LEARN	YET/CMPLT			- Displays the condition of Idle Air Volume Learning - YET: Idle air volume learning has not been performed yet. - CMPLT: Idle air volume learning has already been performed successfully.	
HO2S2 HTR (B1)	On/Off			Indicates [ON/OFF] condition of heated oxygen sensor 2 heater determined by ECM according to the input signals.	
SET LAMP	On/Off			Indicates [ON/OFF] condition of SET lamp determined by the ECM according to the input signals.	
AT OD CANCEL	On/Off			Indicates [ON/OFF] condition of A/T O/D cancel request signal.	
AT OD MONITOR	On/Off			Indicates [ON/OFF] condition of A/T O/D according to the input signal from the TCM.	
CRUISE LAMP	On/Off			Indicates [ON/OFF] condition of CRUISE lamp determined by the ECM according to the input signals.	
LO SPEED CUT	Non/Cut			- Indicates the vehicle cruise condition. - Non: Vehicle speed is maintained at the ASCD set speed. - Cut: Vehicle speed decreased to excessively low, and ASCD operation is cut off.	
VHCL SPD CUT	Non/Cut			- Indicates the vehicle cruise condition. - Non: Vehicle speed is maintained at the ASCD set speed. - Cut: Vehicle speed decreased to excessively low compared with the ASCD set speed, and ASCD operation is cut off.	
ALT DUTY SIG	On/Off			- The control condition of the power generation voltage variable control (determined by ECM according to the input signals) is indicated. - On: Power generation voltage variable control is active. - Off: Power generation voltage variable control is inactive.	
ALT DUTY	%			Indicates the duty ratio of the power generation command value. The ratio is calculated by ECM based on the battery current sensor signal.	
HO2 S2 DIAG2 (B1)	INCOMP/CMPLT			- Indicates DTC P0139 self-diagnosis (slow response) condition. - INCOMP: Self-diagnosis is incomplete. - CMPLT: Self-diagnosis is complete.	
BAT CUR SEN	mV			The signal voltage of battery current sensor is displayed.	

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[QR25DE]

Monitored item	Unit	Monitor Item Selection		Description	Remarks
		ECU IN-PUT SIG-NALS	MAIN SIG-NALS		
EOP SENSOR	mV			The signal voltage of engine oil pressure sensor is displayed.	
A/F SEN1 DIAG2(B1)	INCMP/CM-PLT			- Indicates DTC P014C or P014D self-diagnosis condition. - INCMP: Self-diagnosis is incomplete. - CMPLT: Self-diagnosis is complete.	
A/F SEN1 DIAG3(B1)	ABSNT/PRSNT			- Indicates DTC P014C, P014D, P015A or P015B self-diagnosis condition. - ABSNT: The vehicle condition is not within the diagnosis range. - PRSNT: The vehicle condition is within the diagnosis range.	

*: The item is indicated, but not used.

NOTE:

Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

WORK SUPPORT MODE

Work Item

Work item	Condition	Usage
IDLE AIR VOL LEARN	The idle air volume that keeps the engine within the specified range is memorized in ECM.	When learning the idle air volume
FUEL PRESSURE RELEASE	Fuel pump will stop by touching "START" during idling. Crank a few times after engine stalls.	When releasing fuel pressure from fuel line
TARGET IGN TIM ADJ*	Idle condition	When adjusting target ignition timing
TARGET IDLE RPM ADJ*	Idle condition	When setting target idle speed
VIN REGISTRATION	In this mode, VIN is registered in ECM.	When registering VIN in ECM
SELF-LEARNING CONT	The coefficient of self-learning control mixture ratio returns to the original coefficient.	When clearing mixture ratio self-learning value
CLSD THL POS LEARN	Ignition on and engine stopped.	When learning the throttle valve closed position
SAVING DATA FOR REPLC CPU	In this mode, save data that is in ECM.	When ECM is replaced.
WRITING DATA FOR REPLC CPU	In this mode, write data stored by "SAVE DATA FOR CPU REPLC" in work support mode to ECM.	When ECM is replaced.

*: This function is not necessary in the usual service procedure.

ACTIVE TEST MODE

Test Item

Test item	Condition	Judgment	Check item (Remedy)
FUEL INJECTION	- Engine: Return to the original trouble condition - Change the amount of fuel injection using CONSULT.	If trouble symptom disappears, see CHECK ITEM.	- Harness and connectors - Fuel injector - Air fuel ratio (A/F) sensor 1
ENG COOLANT TEMP	- Engine: Return to the original trouble condition - Change the engine coolant temperature using CONSULT.	If trouble symptom disappears, see CHECK ITEM.	- Harness and connectors - Engine coolant temperature sensor - Fuel injector

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[QR25DE]

Test item	Condition	Judgment	Check item (Remedy)
PURG VOL CONT/V	- Engine: After warming up, run engine at 1,500 rpm. - Change the EVAP canister purge volume control solenoid valve opening percent using CONSULT.	Engine speed changes according to the opening percent.	- Harness and connectors - Solenoid valve
COOLING FAN*	- Ignition switch: ON - Turn the cooling fan "LOW", "HI" and "OFF" using CONSULT.	Cooling fan moves and stops.	- Harness and connectors - IPDM E/R (Cooling fan relay) - Cooling fan motor
FUEL PUMP RELAY	- Ignition switch: ON (Engine stopped) - Turn the fuel pump relay "ON" and "OFF" using CONSULT and listen to operating sound.	Fuel pump relay makes the operating sound.	- Harness and connectors - Fuel pump relay
IGNITION TIMING	- Engine: Return to the original trouble condition - Timing light: Set - Retard the ignition timing using CONSULT.	If trouble symptom disappears, see CHECK ITEM.	Perform Idle Air Volume Learning.
POWER BALANCE	- Engine: After warming up, idle the engine. - A/C switch OFF - Shift lever position: Neutral - Cut off each fuel injector signal one at a time using CONSULT.	Engine runs rough or stops.	- Harness and connectors - Compression - Fuel injector - Power transistor - Spark plug - Ignition coil
INT V/T ASSIGN ANGLE	- Engine: Return to the original trouble condition - Change intake valve timing using CONSULT.	If trouble symptom disappears, see CHECK ITEM.	- Harness and connectors - Intake valve timing control solenoid valve
EXH V/T ASSIGN ANGLE	- Engine: Return to the original trouble condition - Change exhaust valve timing using CONSULT.	If trouble symptom disappears, see CHECK ITEM.	- Harness and connectors - Exhaust valve timing control solenoid valve

*: Leaving cooling fan OFF with CONSULT while engine is running may cause the engine to overheat.

DTC WORK SUPPORT MODE

Test Item

Test mode	Test item	Corresponding DTC No.	Reference page
A/F SEN1	A/F SEN1(B1) P1276	P0130	EC-188
	A/F SENSOR(B1) P014C/P014D	P014C, P014D	EC-219
HO2S2	HO2S2(B1) P1146	P0138	EC-204
	HO2S2(B1) P1147	P0137	EC-198
	HO2S2(B1) P0139	P0139	EC-212

SRT & P-DTC MODE

SRT STATUS Mode

For items whose SRT codes are set, "CMPLT" is displayed on the CONSULT screen; for items whose SRT codes are not set, "INCMP" is displayed.

SRT WORK SUPPORT Mode

This mode enables a technician to drive a vehicle to set the SRT while monitoring the SRT status.

ECU DIAGNOSIS INFORMATION

ECM

Reference Value

INFOID:0000000014267507

EC

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- Numerical values in the following table are reference values.
- These values are input/output values that ECM receives/transmits and may differ from actual operations.
Example: The ignition timing shown by the timing light may differ from the ignition timing displayed on the data monitor.
This occurs because the timing light shows a value calculated by ECM according to signals received from the camshaft position sensor and other sensors related to ignition timing.
- For outlines of following items, refer to [EC-73. "CONSULT Function"](#).

Monitor Item	Condition		Values/Status
ENG SPEED	• Run engine and compare CONSULT value with the tachometer indication.		Almost the same speed as the tachometer indication.
MASS AIR FLOW SENSOR (Hz)	See EC-143. "Diagnosis Procedure" .		
B/FUEL SCHDL	See EC-143. "Diagnosis Procedure" .		
A/F ALPHA-B1	See EC-143. "Diagnosis Procedure" .		
COOLAN TEMP/S	• Engine: After warming up		More than 70°C (158°F)
A/F SEN1 (B1)	• Engine: After warming up	Maintaining engine speed at 2,000 rpm	Fluctuates around 2.2 V
HO2S2 (B1)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - Engine: After warming up - After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load		0 – 0.3 V ↔ Approx. 0.6 – 1.0 V
HO2S2 MNTR(B1)	• Revving engine from idle up to 3,000 rpm quickly after the following conditions are met. - Engine: After warming up - After keeping engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load		LEAN ↔ RICH
VHCL SPEED SE	• Turn drive wheels and compare CONSULT value with the speedometer indication.		Almost the same speed as speedometer indication
BATTERY VOLT	• Ignition switch: ON (Engine stopped)		11 – 14 V
ACCEL SEN 1	• Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 – 1.0 V
		Accelerator pedal: Fully depressed	4.2 – 4.8 V
ACCEL SEN 2	• Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.5 – 1.0 V
		Accelerator pedal: Fully depressed	4.2 – 4.8 V
TP SEN 1-B1	• Ignition switch: ON (Engine stopped) • Shift lever position: 1st	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
TP SEN 2-B1*1	• Ignition switch: ON (Engine stopped) • Shift lever position: 1st	Accelerator pedal: Fully released	More than 0.36 V
		Accelerator pedal: Fully depressed	Less than 4.75 V
START SIGNAL	• Ignition switch: ON → START → ON		Off → On → Off
CLSD THL POS	• Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	On
		Accelerator pedal: Slightly depressed	Off

ECM

< ECU DIAGNOSIS INFORMATION >

[QR25DE]

Monitor Item	Condition		Values/Status
AIR COND SIG	Engine: After warming up, idle the engine	Air conditioner switch: OFF	Off
		Air conditioner switch: ON (Compressor operates.)	On
PW/ST SIGNAL	Engine: After warming up, idle the engine	Steering wheel: Not being turned	Off
		Steering wheel: Being turned	On
LOAD SIGNAL	Ignition switch: ON	Rear window defogger switch: ON and/or Lighting switch: 2nd position	On
		Rear window defogger switch and lighting switch: OFF	Off
IGNITION SW	Ignition switch: ON → OFF → ON		On → Off → On
HEATER FAN SW	Engine: After warming up, idle the engine	Heater fan switch: ON	On
		Heater fan switch: OFF	Off
BRAKE SW	Ignition switch: ON	Brake pedal: Fully released	Off
		Brake pedal: Slightly depressed	On
INJ PULSE-B1	- Engine: After warming up - Shift lever position: Neutral - Air conditioner switch: OFF - No load	Idle	2.0 – 3.0 msec
		2,000 rpm	1.9 – 2.9 msec
IGN TIMING	- Engine: After warming up - Shift lever position: Neutral - Air conditioner switch: OFF - No load	Idle	10° BTDC
		2,000 rpm	7° – 50° BTDC
CAL/LD VALUE	- Engine: After warming up - Shift lever position: Neutral - Air conditioner switch: OFF - No load	Idle	22%
		2,500 rpm	10% – 20%
MASS AIRFLOW	- Engine: After warming up - Shift lever position: Neutral - Air conditioner switch: OFF - No load	Idle	11.6 – 13.3 g/s
		2,500 rpm	39.6 g/s
PURG VOL C/V	- Engine: After warming up - Shift lever position: Neutral - Air conditioner switch: OFF - No load	Idle (Accelerator pedal: Not depressed even slightly, after engine starting.)	0%
		2,000 rpm	20% – 90%
INT/V TIM (B1)	- Engine: After warming up - Shift lever position: Neutral - Air conditioner switch: OFF - No load	Idle	–5° – 5°C
		4,000 rpm	Approx. 0° – 20°C
EXH/V TIM (B1)	- Engine: After warming up - Shift lever position: Neutral - Air conditioner switch: OFF - No load	Idle	–5° – 5°C
		2,000 rpm	Approx. 0° – 40°C
INT/V SOL (B1)	- Engine: Idle speed - Shift lever position: Neutral - Air conditioner switch: OFF - No load	After warming up	Approx. 50% – 100%
		Cold condition [Engine coolant temperature below 60°C (140°F)]	0%
AIR COND RLY	Engine: After warming up, idle the engine	Air conditioner switch: OFF	Off
		Air conditioner switch: ON (Compressor operates)	On

ECM

< ECU DIAGNOSIS INFORMATION >

[QR25DE]

Monitor Item	Condition		Values/Status
FUEL PUMP RLY	- For 1 second after turning ignition switch: ON - Engine running or cranking		On
	Except above		Off
THRTL RELAY	Ignition switch: ON		On
HO2S2 HTR (B1)	Engine: Running		On
ALT DUTY SIG	Power generation voltage variable control: Operating		On
	Power generation voltage variable control: Not operating		Off
I/P PULLY SPD	Vehicle speed: More than 20 km/h (12 MPH)		Almost the same speed as the tachometer indication
VEHICLE SPEED	Turn drive wheels and compare CONSULT value with the speedometer indication.		Almost the same speed as the speedometer indication
IDL A/V LEARN	Engine: running	Idle air volume learning has not been performed yet.	YET
		Idle air volume learning has already been performed successfully.	CMPLT
TRVL AFTER MIL	Ignition switch: ON	Vehicle has traveled after MIL has turned ON.	0 – 65,535 km (0 – 40,723 miles)
A/F S1 HTR(B1)	Engine: After warming up, idle the engine (More than 140 seconds after starting engine.)		4 – 100%
SET VHCL SPD	Engine: Running	ASCD: Operating	The preset vehicle speed is displayed
MAIN SW	Ignition switch: ON	MAIN switch: Pressed	On
		MAIN switch: Released	Off
CANCEL SW	Ignition switch: ON	CANCEL switch: Pressed	On
		CANCEL switch: Released	Off
RESUME/ACC SW	Ignition switch: ON	ACCEL/RES switch: Pressed	On
		ACCEL/RES switch: Released	Off
SET SW	Ignition switch: ON	COAST/SET switch: Pressed	On
		COAST/SET switch: Released	Off
BRAKE SW1	Ignition switch: ON	Brake pedal and clutch pedal: Fully released	On
		Brake pedal or clutch pedal: Slightly depressed	Off
BRAKE SW2	Ignition switch: ON	Brake pedal: Fully released	Off
		Brake pedal: Slightly depressed	On
VHCL SPD CUT	Ignition switch: ON		Non
LO SPEED CUT	Ignition switch: ON		Non
AT OD MONITOR	Ignition switch: ON		On
AT OD CANCEL	Ignition switch: ON		Off
CRUISE LAMP	Ignition switch: ON	MAIN switch: Pressed at the 1st time → at the 2nd time	On → Off
SET LAMP	- MAIN switch: ON - When vehicle speed: Between 40 km/h (25 MPH) and 144 km/h (89 MPH)	ASCD: Operating	On
		ASCD: Not operating	Off
ALT DUTY	Engine speed: Idle		0 – 80%

ECM

< ECU DIAGNOSIS INFORMATION >

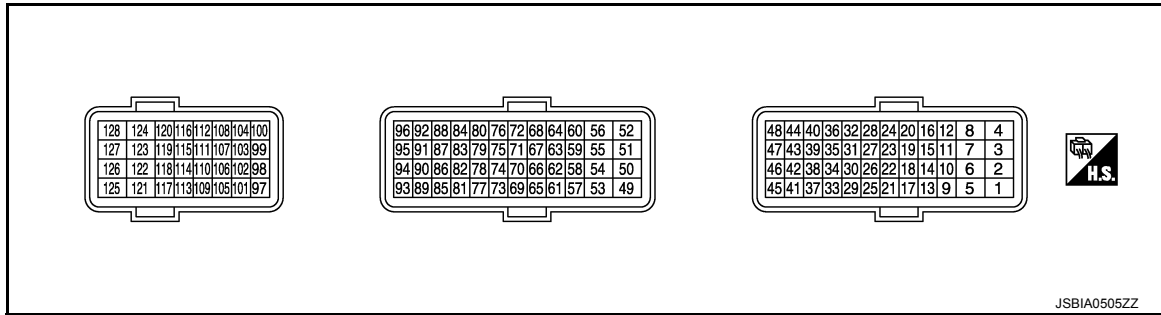
[QR25DE]

Monitor Item	Condition		Values/Status
BAT CUR SEN	- Engine speed: Idle - Battery: Fully charged*2 - Selector lever position: - P or N (A/T) - Neutral (M/T) - Air conditioner switch: OFF - No load		Approx. 2,600 - 3,500 mV
A/F ADJ-B1	Engine: running		-0.330 – 0.330
P/N POSI SW	Ignition switch: ON	Shift lever position: Neutral	On
		Shift lever position: Except above	Off
INT/A TEMP SE	Ignition switch: ON		Indicates intake air temperature
AC PRESS SEN	- Engine speed: Idle - Both A/C switch and blower fan switch: ON (Compressor operates)		1.0 – 4.0 V
VTC DTY EX B1	- Engine: After warming up - Shift lever position: - Neutral - Air conditioner switch: OFF - No load	Idle	0 – 2%
		2,000 rpm	Approx. 0 – 90%
BAT TEMP SEN	- Engine: After warming up, idle the engine - Shift lever position: - Neutral - Air conditioner switch: OFF - No load		Indicates the temperature around the battery.
EOP SENSOR	- Engine: After warming up - Shift lever position: - Neutral - Air conditioner switch: OFF - No load	Idle	1,000 – 2,000 mV
		2,000 rpm	1,500 – 3,500 mV
ATOM PRES SEN	Ignition switch: ON		0.512 – 4.608 V (Refer to EC-266, "Component Inspection")
COOLING FAN	Ignition switch: ON		Off
THRTL STK CNT B1	NOTE: The item is indicated, but not used.		—
A/F SEN1 DIAG2 (B1)	DTC P014C and P014D self-diagnosis is incomplete.		INCMP
	DTC P014C and P014D self-diagnosis is complete.		CMPLT
A/F SEN1 DIAG3 (B1)	The vehicle condition is not within the diagnosis range of DTC P014C, P014D, P015A or P015B.		ABSNT
	The vehicle condition is within the diagnosis range of DTC P014C, P014D, P015A or P015B.		PRSNT
HO2 S2 DIAG2 (B1)	DTC P0139 self-diagnosis (slow response) is incomplete.		INCMP
	DTC P0139 self-diagnosis (slow response) is complete.		CMPLT

*1: Accelerator pedal position sensor 2 signal and throttle position sensor 2 signal are converted by ECM internally. Thus, they differ from ECM terminals voltage signal.

*2: Before measuring the voltage, confirm that the battery is fully charged. Refer to [PG-140, "How to Handle Battery"](#).

TERMINAL LAYOUT

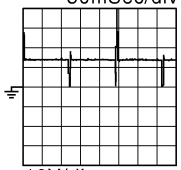
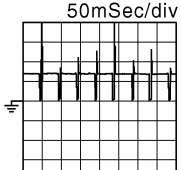
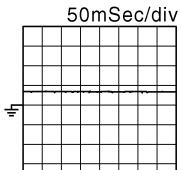
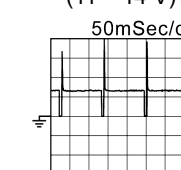


PHYSICAL VALUES

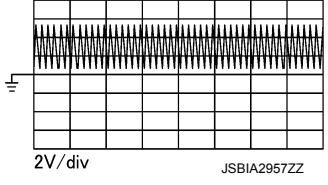
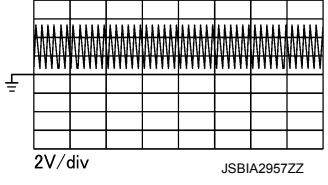
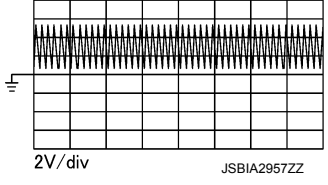
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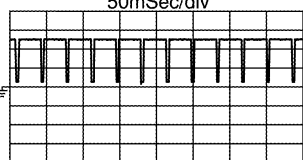
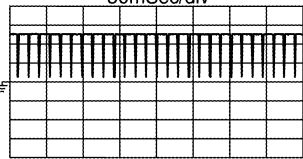
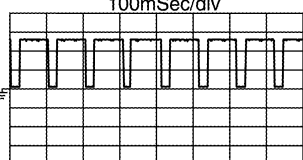
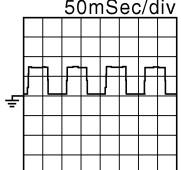
- ECM is located in the engine room left side near battery.
- Specification data are reference values and are measured between each terminal and ground.
- Pulse signal is measured by CONSULT.

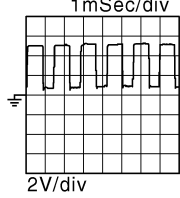
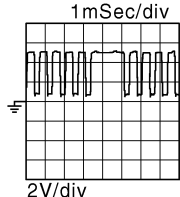
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
1 (G)	128 (B)	Throttle control motor (Close)	Output	[Ignition switch: ON] • Engine stopped • Shift lever position: 1st • Accelerator pedal: Fully released	2.2 V★ 1mSec/div 5V/div JMBIA0324GB
2 (W)	128 (B)	Throttle control motor power supply	Input	[Ignition switch: ON]	Battery voltage (11 – 14 V)
3 (L)	128 (B)	Throttle control motor (Open)	Output	[Ignition switch: ON] • Engine stopped • Shift lever position: 1st • Accelerator pedal: Fully depressed	1.9 V★ 1mSec/div 5V/div JMBIA0324GB
4 (W)	8 (B)	Knock sensor	Input	[Engine is running] • Idle speed	2.5 V
8 (B)	—	Sensor ground (Knock sensor)	—	—	—

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
9 (P) 10 (W) 13 (Y) 14 (SB)	128 (B)	Fuel injector No. 4 Fuel injector No. 3 Fuel injector No. 1 Fuel injector No. 2	Output	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	Battery voltage (11 – 14 V)★ 50mSec/div  10V/div JMBIA0089GB
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	Battery voltage (11 – 14 V)★ 50mSec/div  10V/div JMBIA0090GB
12 (GR)	—	ECM ground	—	—	—
16 (B)	—	ECM ground	—	—	—
17 (BG)	128 (B)	EVAP canister purge volume control solenoid valve	Output	[Engine is running] • Idle speed • Accelerator pedal: Not depressed even slightly, after engine starting	Battery voltage (11 – 14 V)★ 50mSec/div  20V/div JMBIA0087GB
				[Engine is running] • Engine speed: About 2,000 rpm (More than 100 seconds after starting engine.)	Battery voltage (11 – 14 V)★ 50mSec/div  10V/div JSBIA6030GB
18 (V)	128 (B)	Fuel pump relay	Output	[Ignition switch: ON] • For 1 second after turning ignition switch ON [Engine is running]	0 – 1.0 V
				[Ignition switch: ON] • More than 1 second after turning ignition switch ON	Battery voltage (11 – 14 V)
21 (LG)	128 (B)	Throttle control motor relay	Output	[Ignition switch: OFF]	Battery voltage (11 – 14 V)
				[Ignition switch: ON]	0 – 1.0 V

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
22 (L)	23 (B)	Heated oxygen sensor 2	Input	[Engine is running] • Revving engine from idle to 3,000 rpm quickly after the following conditions are met - Engine: after warming up - Keeping the engine speed between 3,500 and 4,000 rpm for 1 minute and at idle for 1 minute under no load	0 – 1.0 V
23 (B)	—	Sensor ground (Heated oxygen sensor 2)	—	—	—
25*4 (P)	26*4 (GR)	Engine oil temperature sensor	Input	[Engine is running]	0 – 4.8 V Output voltage varies with engine oil temperature.
26*4 (GR)	—	Sensor ground (Engine oil temperature sensor)	—	—	—
27 (G)	—	Sensor ground (Engine coolant temperature sensor)	—	—	—
28 (BR)	27 (G)	Engine coolant temperature sensor	Input	[Engine is running]	0 – 4.8 V Output voltage varies with engine coolant temperature.
30 (B)	—	Sensor ground [Camshaft position sensor (PHASE)]	—	—	—
31 (R)	30 (B)	Camshaft position sensor (PHASE)	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	4.0★ 10mSec/div 2V/div JP BIA4726ZZ
				[Engine is running] • Engine speed is 2,000 rpm	4.0★ 10mSec/div 2V/div JP BIA4727ZZ
32 (W)	128 (B)	Sensor power supply [Camshaft position sensor (PHASE)]	Output	[Ignition switch: ON]	5.0 V
33 (SB)	34 (G)	Intake air temperature sensor	Input	[Engine is running]	0 – 4.8 V Output voltage varies with intake air temperature.
34 (G)	—	Sensor ground (Mass air flow sensor, intake air temperature sensor)	—	—	—

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
35 (Y)	34 (G)	Mass air flow sensor	Input	[Ignition switch: ON] • Engine stopped	3,333 Hz 2mSec/div 
				[Engine is running] • Warm-up condition • Idle speed	2,340 – 3,280 Hz 2mSec/div 
				[Engine is running] • Warm-up condition • Engine is revving from idle to about 4,000 rpm NOTE: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.	2,340 – 3,280 Hz → 1,100 Hz 2mSec/div 
36 (P)	128 (B)	Sensor power supply (Mass air flow sensor, intake air temperature sensor)	Output	[Ignition switch: ON]	5.0 V
37 (B)	—	Shield	—	—	—
38*4 (V)	—	Sensor ground (Engine oil pressure sensor)	—	—	—
39*4 (LG)	38*4 (V)	Engine oil pressure sensor	Input	[Engine is running] • Warm-up condition • Idle speed	3.9 V
				[Engine is running] • Warm-up condition • Engine speed is 2,000 rpm	4.5 V
40*4 (Y)	38*4 (V)	Sensor power supply (Engine oil pressure sensor)	Output	[Ignition switch: ON]	5.0 V
41 (BR)	128 (B)	A/F sensor 1	Input	[Ignition switch: ON]	2.6 V
42*4 (R)	—	Sensor ground [Exhaust valve timing control position sensor]	—	—	—

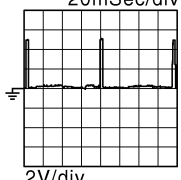
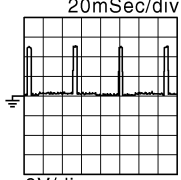
Terminal No. (Wire color)		Description	Input/ Output	Condition	Value (Approx.)
+	—				
43*4 (BR)	42*4 (R)	Exhaust valve timing control position sensor	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	4.5 V★ 50mSec/div  2V/div JPBIA4730ZZ
				[Engine is running] • Engine speed is 2,000 rpm	4.5 V★ 50mSec/div  2V/div JPBIA4731ZZ
44*4 (W)	128 (B)	Sensor power supply [Exhaust valve timing control position sensor]	Output	[Ignition switch: ON]	5 V
45 (Y)	128 (B)	A/F sensor 1	Input	[Engine is running] • Engine speed is 2,000 rpm	1.8 V Output voltage varies with air fuel ratio.
52 (B)	—	ECM ground	—	—	—
53 (R)	128 (B)	A/F sensor 1 heater	Input	[Engine is running] • Warm-up condition • Idle speed (More than 140 seconds after starting engine)	11 V★ 100mSec/div  5V/div JPBIA4732ZZ
54 (SB)	128 (B)	Heated oxygen sensor 2 heater	Output	[Engine is running]	10 V★ 50mSec/div  10V/div JMBIA0325GB
				[Ignition switch: ON] • Engine stopped	Battery voltage (11 – 14 V)
61*4 (G)	62*4 (Y)	Battery temperature sensor	Input	[Engine is running] • Battery temperature: 25°C (77°F) • Idle speed	3.3 V
62*4 (Y)	—	Sensor ground (Battery current sensor, battery temperature sensor)	—	—	—
63*4 (W)	62*4 (Y)	Battery current sensor	Input	[Engine is running] • Battery: Fully charged*1 • Idle speed	2.6 – 3.5 V

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
64 ^{*4} (SB)	128 (B)	Sensor power supply (Battery current sensor)	Output	[Ignition switch: ON]	5.0 V
70 (W)	—	Sensor ground [Crankshaft position sensor (POS)]	—	—	—
71 (BR)	70 (W)	Crankshaft position sensor (POS)	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	3.5 V★ 
				[Engine is running] • Engine speed: 2,000 rpm	3.5 V★ 
72 (R)	128 (B)	Sensor power supply [Crankshaft position sensor (POS)]	Output	[Ignition switch: ON]	5.0 V
73 (BR)	—	Shield	—	—	—
74 (P)	—	Sensor ground [Power steering pressure sensor]	—	—	—
75 (Y)	74 (P)	Power steering pressure sensor	Input	[Engine is running] • Steering wheel: Being turned	0.5 – 4.0 V
				[Engine is running] • Steering wheel: Not being turned	0.4 – 0.8 V
76 (V)	128 (B)	Sensor power supply (Power steering pressure sensor)	Output	[Ignition switch: ON]	5.0 V
77 (R)	78 (B)	Throttle position sensor 2	Input	[Ignition switch: ON] • Engine stopped • Shift lever position: 1st • Accelerator pedal: Fully released	Less than 4.75 V
				[Ignition switch: ON] • Engine stopped • Shift lever position: 1st • Accelerator pedal: Fully depressed	More than 0.36 V
78 (B)	—	Sensor ground (Throttle position sensor 1, 2)	—	—	—

ECM

< ECU DIAGNOSIS INFORMATION >

[QR25DE]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
79 (W)	78 (B)	Throttle position sensor 1	Input	[Ignition switch: ON] • Engine stopped • Shift lever position: 1st • Accelerator pedal: Fully released [Ignition switch: ON] • Engine stopped • Shift lever position: 1st • Accelerator pedal: Fully depressed	More than 0.36 V Less than 4.75 V
80 (G)	128 (B)	Sensor power supply (Throttle position sensor)	Output	[Ignition switch: ON]	5.0 V
81 (BR)	128 (B)	Power supply for ECM (Backup)	Input	[Ignition switch: OFF]	Battery voltage (11 – 14 V)
86 (P)	128 (B)	Ignition signal No. 1	Output	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	0 – 0.2 V★ 
87 (LG)		Ignition signal No. 2		[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	0 – 0.4 V★ 
90 (Y)		Ignition signal No. 3			0 V Battery voltage (11 – 14 V)
91 (SB)		Ignition signal No. 4			
89 (BG)	128 (B)	ECM relay (Self shut-off)	Output	[Engine is running] [Ignition switch: OFF] • A few seconds after turning ignition switch OFF [Ignition switch: OFF] • More than a few seconds after turn- ing ignition switch OFF	0 – 1.0 V Battery voltage (11 – 14 V)
93*4 (R)	128 (B)	Intake valve timing control solenoid valve	Output	[Engine is running] • Warm-up condition • Idle speed [Engine is running] • Warm-up condition • When revving engine up to 2,000 rpm Quickly	0 V Battery voltage (11 – 14 V)
94*4 (W)	128 (B)	Exhaust valve timing con- trol solenoid valve	Output	[Engine is running] • Warm-up condition • Idle speed [Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	0 V Battery voltage (11 – 14 V)
99 (P)	—	CAN-L	Input/ Output	—	—
100 (L)	—	CAN-H	Input/ Output	—	—

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
103* ¹ (W)	124 (BR)* ¹	Refrigerant pressure sensor	Input	[Engine is running] • Warm-up condition • Both A/C switch and blower fan motor switch: ON (Compressor operates)	1.0 – 4.0 V
104* ¹ (B)	128 (B)	Sensor power supply (Refrigerant pressure sensor)	Output	[Ignition switch: ON]	5.0 V
109 (LG)	128 (B)	Ignition switch	Input	[Ignition switch: OFF]	0 V
				[Ignition switch: ON]	Battery voltage (11 – 14 V)
110* ³ (SB)	111* ³ (B)	ASCD steering switch	Input	[Ignition switch: ON] • ASCD steering switch: OFF	4 V
				[Ignition switch: ON] • MAIN switch: Pressed	0 V
				[Ignition switch: ON] • CANCEL switch: Pressed	1 V
				[Ignition switch: ON] • ACCEL/RES switch: Pressed	3 V
				[Ignition switch: ON] • COAST/SET switch: Pressed	2 V
111* ³ (B)	—	ASCD steering switch ground	—	—	—
113 (BR)	128 (B)	Sensor power supply (Atmospheric pressure sensor)	Output	[Ignition switch: ON]	5.0 V
114 (W)	124 (BR)* ¹ (B)* ²	Atmospheric pressure sensor	Input	[Ignition switch: ON]	1.8 – 4.8 V Output voltage varies with atmospheric pressure.
115 (Y)	128 (B)	Stop lamp switch	Input	[Ignition switch: OFF] • Brake pedal: Fully released	0 V
				[Ignition switch: OFF] • Brake pedal: Slightly depressed	Battery voltage (11 – 14 V)
116 (LG)	128 (B)	Brake/Clutch pedal position switch	Input	[Ignition switch: OFF] Brake pedal and clutch pedal: Fully released	Battery voltage (11 – 14 V)
				[Ignition switch: OFF] Brake pedal or clutch pedal: Slightly depressed	0 V
117 (G/Y)	128 (B)	PNP signal	Input	[Ignition switch: ON] • Shift lever position: Neutral	Battery voltage (11 – 14 V)
				[Ignition switch: ON] • Shift lever position: Except above	0 V
118 (GR)	128 (B)	Sensor power supply (Accelerator pedal position sensor 2)	Output	[Ignition switch: ON]	5.0 V

ECM

< ECU DIAGNOSIS INFORMATION >

[QR25DE]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
119 (P)	120 (G)	Accelerator pedal position sensor 2	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released	0.25 – 0.5 V
				[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	2.0 – 2.5 V
120 (G)	—	Sensor ground (Accelerator pedal position sensor 2)	—	—	—
121 (R)	128 (B)	Power supply for ECM	Input	[Ignition switch: ON]	Battery voltage (11 – 14 V)
122 (V)	128 (B)	Sensor power supply (Accelerator pedal position sensor 1)	Output	[Ignition switch: ON]	5.0 V
123 (B)	—	ECM ground	—	—	—
124 (BR)*1 (B)*2	—	Sensor ground (Atmospheric pressure sensor, refrigerant pressure sensor)	—	—	—
126 (SB)	127 (L)	Accelerator pedal position sensor 1	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released	0.5 – 1.0 V
				[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	4.2 – 4.8 V
127 (L)	—	Sensor ground (Accelerator pedal position sensor 1)	—	—	—
128 (B)	—	ECM ground	—	—	—

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

*1: With A/C

*2: Without A/C

*3: With ASCD

*4: Models for Chile

Fail Safe

INFOID:0000000014267508

EXCEPT FOR CHILE

DESCRIPTION

When a DTC is detected, ECM executes a mode (in the Fail-safe mode) applicable to the DTC. The fail-safe mode has the preset traveling control mode (accelerator angle variation and engine output limit).

Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
	Engine output control	ECM reduces the engine output, according to the rise in engine speed. This reduces the vehicle speed to encourage the driver to repair malfunction.

FAIL SAFE PATTERN

Pattern	Fail safe mode	
A	Traveling control mode	Accelerator angle variation control
B		Engine output control

FAIL SAFE LIST

×:Applicable —: Not applicable

DTC No.	Detected items	Vehicle behavior		
		Pattern		Others
		A	B	
P0102 P0103	Mass air flow sensor circuit	×	×	—
P0122 P0123 P0222 P0223 P2135	Throttle position sensor	—	—	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.
P0171 P0172	Fuel injection system	×	—	—
P0300 P0301 P0302 P0303 P0304	Misfire	×	—	—
P0500	Vehicle speed sensor	×	—	—
P0603	ECM	—	—	—
		—	×	ASCD operation may be deactivated.
P0604	ECM	×	—	ASCD operation may be deactivated.
P0605 P060B	ECM	—	—	—
		×	—	ASCD operation may be deactivated.
P0606	ECM	—	—	ASCD operation may be deactivated.
		×	—	ASCD operation may be deactivated.
P0607	ECM	—	—	—
		—	×	—
P060A	ECM	×	—	—
		×	×	ASCD operation may be deactivated.
P0643	ECM	×	—	—
P1805	Brake switch	—	—	ECM controls the electric throttle control actuator by regulating the throttle opening to a small range. Therefore, acceleration will be poor.
				Vehicle condition
				Driving condition
				When engine is idling
P2100 P2103	Throttle control motor relay	—	—	Normal
				When accelerating
P2101	Electric throttle control function	—	—	Poor acceleration
				ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P2101	Electric throttle control function	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC No.	Detected items	Vehicle behavior		
		Pattern		Others
		A	B	
P2118	Throttle control motor	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P2119	Electric throttle control actuator	—	×	—
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	—	—	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

FOR CHILE

DESCRIPTION

When a DTC is detected, ECM executes a mode (in the Fail-safe mode) applicable to the DTC. The fail-safe mode has the preset traveling control mode (accelerator angle variation and engine output limit) and device fix mode.

Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
	Engine output control	ECM reduces the engine output, according to the rise in engine speed. This reduces the vehicle speed to encourage the driver to repair malfunction.
Device fix mode		This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.

FAIL SAFE PATTERN

Pattern	Fail safe mode	
A	Traveling control mode	Accelerator angle variation control
B		Engine output control
C	Device fix mode	

FAIL SAFE LIST

×:Applicable —: Not applicable

DTC No.	Detected items	Vehicle behavior			
		Pattern			Others
		A	B	C	
P0011	Intake valve timing control	—	—	×	—
P0014 P0078	Exhaust valve timing control	—	—	×	—
P0102 P0103	Mass air flow sensor circuit	×	×	×	—
P0122 P0123 P0222 P0223 P2135	Throttle position sensor	—	—	—	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.
P0171 P0172	Fuel injection system	×	—	—	—
P0197 P0198	Engine oil temperature sensor	—	—	—	Exhaust valve timing control does not function.

ECM

< ECU DIAGNOSIS INFORMATION >

[QR25DE]

DTC No.	Detected items	Vehicle behavior			
		Pattern			Others
		A	B	C	
P0300 P0301 P0302 P0303 P0304	Misfire	×	—	—	—
P0500	Vehicle speed sensor	×	—	—	—
P0524	Engine oil pressure	—	—	—	- ECM illuminates oil pressure warning lamp on the combination meter. - Engine speed will not rise more than 4,000rpm due to the fuel cut. - Fail-safe is canceled when ignition switch OFF → ON.
P0603	ECM	—	—	—	—
		—	×	—	ASCD operation may be deactivated.
P0604	ECM	×	—	×	ASCD operation may be deactivated.
P0605 P060B	ECM	—	—	—	—
		×	—	×	ASCD operation may be deactivated.
P0606	ECM	—	—	—	ASCD operation may be deactivated.
		×	—	×	ASCD operation may be deactivated.
P0607	ECM	—	—	—	—
		—	×	—	—
P060A	ECM	×	—	×	—
		×	×	×	ASCD operation may be deactivated.
P0643	Sensor power supply	—	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P1078	Exhaust valve timing control position sensor circuit	×	—	×	—
P1805	Brake switch	—	—	—	ECM controls the electric throttle control actuator by regulating the throttle opening to a small range. Therefore, acceleration will be poor.
					Vehicle condition
					When engine is idling
					When accelerating
P2100 P2103	Throttle control motor relay	—	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P2101	Electric throttle control function	—	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P2118	Throttle control motor	—	—	—	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.
P2119	Electric throttle control actuator	—	×	—	—
P2122 P2123 P2127 P2128 P2138	Accelerator pedal position sensor	—	—	—	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Inspection Priority Chart

INFOID:0000000014267509

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

Priority	DTC	Detected items	
1	U1001	CAN communication line	A
	P0102, P0103	Mass air flow sensor	C
	P0112, P0113	Intake air temperature sensor	
	P0117, P0118	Engine coolant temperature sensor	D
	P0122, P0123, P0222, P0223, P1225, P1226, P2135	Throttle position sensor	
	P0327, P0328	Knock sensor	
	P0335	Crankshaft position sensor (POS)	E
	P0340	Camshaft position sensor (PHASE)	
	P0500	Vehicle speed sensor	
	P0520	Engine oil pressure sensor	F
	P0603, P0604, P0605, P0606, P0607, P060A, P060B	ECM	
	P0643	Sensor power supply	G
	P0850	Park/neutral position switch	
	P1078	Exhaust valve timing control position sensor	
	P1550, P1551, P1552, P1553, P1554	Battery current sensor	H
	P1610, P1611, P1612, P1614, P1615	NATS	
	P2122, P2123, P2127, P2128, P2138	Accelerator pedal position sensor	I
2	P0031, P0032	Air fuel ratio (A/F) sensor 1 heater	
	P0037, P0038	Heated oxygen sensor 2 heater	
	P0075	Intake valve timing control solenoid valve	J
	P0078	Exhaust valve timing control solenoid valve	
	P0130, P0131, P0132, P014C, P014D	Air fuel ratio (A/F) sensor 1	
	P0137, P0138, P0139	Heated oxygen sensor 2	K
	P0444	EVAP canister purge volume control solenoid valve	
	P0452, P0453	Atmospheric pressure sensor	L
	P0550	Power steering pressure sensor	
	P1217	Engine over temperature (OVERHEAT)	
	P1805	Brake switch	M
	P2100, P2103	Throttle control motor relay	
	P2101	Electric throttle control function	N
	P2118	Throttle control motor	
3	P0011	Intake valve timing control	
	P0014	Exhaust valve timing control	O
	P0171, P0172	Fuel injection system function	
	P0300, P0301, P0302, P0303, P0304	Misfire	P
	P0420	Three way catalyst function	
	P0524	Engine oil pressure	
	P1564	ASCD steering switch	
	P1574	ASCD vehicle speed sensor	
	P1572	ASCD brake switch	
	P2119	Electric throttle control actuator	

DTC Index

INFOID:000000014267510

×:Applicable —: Not applicable

DTC*1		Items (CONSULT screen terms)	Trip	MIL	Reference page
CONSULT GST*2	ECM*3				
U1001	1001*4	CAN COMM CIRCUIT	2	—	EC-154
P0000	0000	NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	—	Flashing	—
P0011	0011	INT/V TIM CONT-B1	2	—	EC-155
P0014	0014	EXH/V TIM CONT-B1	2	—	EC-159
P0031	0031	A/F SEN1 HTR (B1)	2	×	EC-163
P0032	0032	A/F SEN1 HTR (B1)	2	×	EC-163
P0037	0037	HO2S2 HTR (B1)	2	×	EC-166
P0038	0038	HO2S2 HTR (B1)	2	×	EC-166
P0075	0075	INT/V TIM V/CIR-B1	2	×	EC-169
P0078	0078	EX V/T ACT/CIRC-B1	2	×	EC-172
P0102	0102	MAF SEN/CIRCUIT-B1	1	×	EC-175
P0103	0103	MAF SEN/CIRCUIT-B1	1	×	EC-175
P0112	0112	IAT SEN/CIRCUIT-B1	2	×	EC-180
P0113	0113	IAT SEN/CIRCUIT-B1	2	×	EC-180
P0117	0117	ECT SEN/CIRC	1 or 2	×	EC-182
P0118	0118	ECT SEN/CIRC	1 or 2	×	EC-182
P0122	0122	TP SEN 2/CIRC-B1	1	× or —	EC-185
P0123	0123	TP SEN 2/CIRC-B1	1	× or —	EC-185
P0130	0130	A/F SENSOR1 (B1)	2	×	EC-188
P0131	0131	A/F SENSOR1 (B1)	2	×	EC-192
P0132	0132	A/F SENSOR1 (B1)	2	×	EC-195
P0137	0137	HO2S2 (B1)	2	×	EC-198
P0138	0138	HO2S2 (B1)	2	×	EC-204
P0139	0139	HO2S2 (B1)	2	×	EC-212
P014C	014C	A/F SENSOR1 (B1)	2	×	EC-219
P014D	014D	A/F SENSOR1 (B1)	2	×	EC-219
P0171	0171	FUEL SYS-LEAN-B1	2	×	EC-224
P0172	0172	FUEL SYS-RICH-B1	2	×	EC-229
P0197	0197	EOT SEN/CIRC	2	×	EC-234
P0198	0198	EOT SEN/CIRC	2	×	EC-234
P0222	0222	TP SEN 1/CIRC-B1	1	× or —	EC-237
P0223	0223	TP SEN 1/CIRC-B1	1	× or —	EC-237
P0300	0300	MULTI CYL MISFIRE	1 or 2	×	EC-240
P0301	0301	CYL 1 MISFIRE	1 or 2	×	EC-240
P0302	0302	CYL 2 MISFIRE	1 or 2	×	EC-240
P0303	0303	CYL 3 MISFIRE	1 or 2	×	EC-240
P0304	0304	CYL 4 MISFIRE	1 or 2	×	EC-240
P0327	0327	KNOCK SEN/CIRC-B1	2	—	EC-246
P0328	0328	KNOCK SEN/CIRC-B1	2	—	EC-246

ECM

< ECU DIAGNOSIS INFORMATION >

[QR25DE]

DTC*1		Items (CONSULT screen terms)	Trip	MIL	Reference page
CONSULT GST*2	ECM*3				
P0335	0335	CKP SEN/CIRCUIT	2	×	EC-248
P0340	0340	CMP SEN/CIRC-B1	2	×	EC-252
P0420	0420	TW CATALYST SYS-B1	2	×	EC-256
P0444	0444	PURG VOLUME CONT/V	2	×	EC-261
P0452	0452	EVAP SYS PRES SEN*5	2	×	EC-264
P0453	0453	EVAP SYS PRES SEN*5	2	×	EC-264
P0500	0500	VEH SPEED SEN/CIRC*6	2	×	EC-267
P0520	0520	EOP SENSOR/SWITCH	2	—	EC-270
P0524	0524	ENGINE OIL PRESSURE	1	—	EC-273
P0550	0550	PW ST P SEN/CIRC	2	—	EC-276
P0603	0603	ECM BACK UP/CIRCUIT*7	2	×	EC-279
P0604	0604	ECM/PCM INTERNAL ENG OFF TIMER	1	×	EC-281
P0605	0605	ECM	1	×	EC-283
P0606	0606	CONTROL MODULE	1	×	EC-285
P0607	0607	ECM	1 or 2	×	EC-287
P060A	060A	CONTROL MODULE	1 or 2	×	EC-288
P060B	060B	CONTROL MODULE	1	×	EC-290
P0643	0643	SENSOR POWER/CIRC	1	×	EC-292
P0850	0850	P-N POS SW/CIRCUIT	2	×	EC-295
P1078	1078	EXH TIM SEN/CIRC-B1	2	×	EC-298
P1217	1217	ENG OVER TEMP	1	×	EC-301
P1225	1225	CTP LEARNING-B1	2	—	EC-304
P1226	1226	CTP LEARNING-B1	2	—	EC-305
P1550	1550	BAT CURRENT SENSOR	2	—	EC-306
P1551	1551	BAT CURRENT SENSOR	2	—	EC-309
P1552	1552	BAT CURRENT SENSOR	2	—	EC-309
P1553	1553	BAT CURRENT SENSOR	2	—	EC-312
P1554	1554	BAT CURRENT SENSOR	2	—	EC-315
P1564	1564	ASCD SW	1	—	EC-318
P1572	1572	ASCD BRAKE SW	1	—	EC-321
P1574	1574	ASCD VHL SPD SEN	1	—	EC-321
P1610	1610	LOCK MODE	2	—	SEC-74 (With I-key) SEC-242 (Without I-key)
P1611	1611	ID DISCORD,IMMU-ECM	2	—	SEC-242 (With I-key) SEC-244 (Without I-key)
P1612	1612	CHAIN OF ECM-IMMU	2	—	SEC-78 (With I-key) SEC-246 (Without I-key)

DTC*1		Items (CONSULT screen terms)	Trip	MIL	Reference page
CONSULT GST*2	ECM*3				
P1614	1614	CHAIN OF ECM-IMMU	2	—	SEC-80 (With I-key) SEC-248 (Without I-key)
P1615	1615	DIFFERENCE OF KEY	2	—	SEC-82 (With I-key) SEC-251 (Without I-key)
P1805	1805	BRAKE SW/CIRCUIT	1 or 2	—	EC-330
P2100	2100	ETC MOT PWR-B1	1	× or —	EC-332
P2101	2101	ETC FNCTN/CIRC-B1	1	× or —	EC-335
P2103	2103	ETC MOT PWR	1	× or —	EC-332
P2118	2118	ETC MOT-B1	1	× or —	EC-338
P2119	2119	ETC ACTR-B1	1	× or —	EC-340
P2122	2122	APP SEN 1/CIRC	1	× or —	EC-342
P2123	2123	APP SEN 1/CIRC	1	× or —	EC-342
P2127	2127	APP SEN 2/CIRC	1	× or —	EC-345
P2128	2128	APP SEN 2/CIRC	1	× or —	EC-345
P2135	2135	TP SENSOR-B1	1	× or —	EC-348
P2138	2138	APP SENSOR	1	× or —	EC-351

*1: 1st trip DTC No. is the same as DTC No.

*2: This number is prescribed by SAE J1979/ ISO 15031-5.

*3: In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.

*4: The troubleshooting for this DTC needs CONSULT.

*5: This item indicates the atmospheric pressure sensor.

*6: When the fail-safe operations for both self-diagnoses occur, the MIL illuminates.

*7: This self-diagnosis is not for ECM power supply circuit, even though “ECM BACK UP/CIRCUIT” is displayed on CONSULT screen.

Test Value and Test Limit

INFOID:0000000014632023

The following is the information specified in Service \$06 of SAE J1979/ISO 15031-5.

The test value is a parameter used to determine whether a system/circuit diagnostic test is OK or NG while being monitored by the ECM during self-diagnosis. The test limit is a reference value which is specified as the maximum or minimum value and is compared with the test value being monitored.

These data (test value and test limit) are specified by On Board Monitor ID (OBDMID), Test ID (TID), Unit and Scaling ID and can be displayed on the GST screen.

The items of the test value and test limit will be displayed with GST screen which items are provided by the ECM. (e.g., if bank 2 is not applied on this vehicle, only the items of bank 1 are displayed)

Item	OBD-MID	Self-diagnostic test item	DTC	Test value and Test limit (GST display)		Description
				TID	Unit and Scaling ID	
HO2S	01H	Air fuel ratio (A/F) sensor 1 (Bank 1)	P0131	83H	0BH	Minimum sensor output voltage for test cycle
			P0131	84H	0BH	Maximum sensor output voltage for test cycle
			P0130	85H	0BH	Minimum sensor output voltage for test cycle
			P0130	86H	0BH	Maximum sensor output voltage for test cycle
			P0133	87H	04H	Response rate: Response ratio (lean to rich)
			P0133	88H	04H	Response rate: Response ratio (rich to lean)
			P2A00 or P2096	89H	84H	The amount of shift in air fuel ratio (too lean)
			P2A00 or P2097	8AH	84H	The amount of shift in air fuel ratio (too rich)
			P0130	8BH	0BH	Difference in sensor output voltage
			P0133	8CH	83H	Response gain at the limited frequency
			P014C	8DH	04H	O2 sensor slow response - Rich to lean bank 1 sensor 1
			P014C	8EH	04H	O2 sensor slow response - Rich to lean bank 1 sensor 1
			P014D	8FH	84H	O2 sensor slow response - Lean to rich bank 1 sensor 1
			P014D	90H	84H	O2 sensor slow response - Lean to rich bank 1 sensor 1
			P015A	91H	01H	O2 sensor delayed response - Rich to lean bank 1 sensor 1
			P015A	92H	01H	O2 sensor delayed response - Rich to lean bank 1 sensor 1
			P015B	93H	01H	O2 sensor delayed response - Lean to rich bank 1 sensor 1
			P015B	94H	01H	O2 sensor delayed response - Lean to rich bank 1 sensor 1
			P0133	95H	04H	Response rate: Response ratio (lean to rich)
			P0133	96H	84H	Response rate: Response ratio (rich to lean)

Item	OBD-MID	Self-diagnostic test item	DTC	Test value and Test limit (GST display)		Description
				TID	Unit and Scaling ID	
HO2S	02H	Heated oxygen sensor 2 (Bank 1)	P0138	07H	0CH	Minimum sensor output voltage for test cycle
			P0137	08H	0CH	Maximum sensor output voltage for test cycle
			P0138	80H	0CH	Sensor output voltage
			P0139	81H	0CH	Difference in sensor output voltage
			P0139	82H	11H	Rear O2 sensor delay response diagnosis
	03H	Heated oxygen sensor 3 (Bank 1)	P0143	07H	0CH	Minimum sensor output voltage for test cycle
			P0144	08H	0CH	Maximum sensor output voltage for test cycle
			P0146	80H	0CH	Sensor output voltage
			P0145	81H	0CH	Difference in sensor output voltage
	05H	Air fuel ratio (A/F) sensor 1 (Bank 2)	P0151	83H	0BH	Minimum sensor output voltage for test cycle
			P0151	84H	0BH	Maximum sensor output voltage for test cycle
			P0150	85H	0BH	Minimum sensor output voltage for test cycle
			P0150	86H	0BH	Maximum sensor output voltage for test cycle
			P0153	87H	04H	Response rate: Response ratio (lean to rich)
			P0153	88H	04H	Response rate: Response ratio (rich to lean)
			P2A03 or P2098	89H	84H	The amount of shift in air fuel ratio (too lean)
			P2A03 or P2099	8AH	84H	The amount of shift in air fuel ratio (too rich)
			P0150	8BH	0BH	Difference in sensor output voltage
			P0153	8CH	83H	Response gain at the limited frequency
			P014E	8DH	04H	O2 sensor slow response - Rich to lean bank 2 sensor 1
			P014E	8EH	04H	O2 sensor slow response - Rich to lean bank 2 sensor 1
			P014F	8FH	84H	O2 sensor slow response - Lean to rich bank 2 sensor 1
			P014F	90H	84H	O2 sensor slow response - Lean to rich bank 2 sensor 1
			P015C	91H	01H	O2 sensor delayed response - Rich to lean bank 2 sensor 1
			P015C	92H	01H	O2 sensor delayed response - Rich to lean bank 2 sensor 1
			P015D	93H	01H	O2 sensor delayed response - Lean to rich bank 2 sensor 1

Item	OBD-MID	Self-diagnostic test item	DTC	Test value and Test limit (GST display)		Description
				TID	Unit and Scaling ID	
HO2S	05H	Air fuel ratio (A/F) sensor 1 (Bank 2)	P015D	94H	01H	O2 sensor delayed response - Lean to rich bank 2 sensor 1
			P0153	95H	04H	Response rate: Response ratio (lean to rich)
			P0153	96H	84H	Response rate: Response ratio (rich to lean)
	06H	Heated oxygen sensor 2 (Bank 2)	P0158	07H	0CH	Minimum sensor output voltage for test cycle
			P0157	08H	0CH	Maximum sensor output voltage for test cycle
			P0158	80H	0CH	Sensor output voltage
			P0159	81H	0CH	Difference in sensor output voltage
			P0159	82H	11H	Rear O2 sensor delay response diagnosis
	07H	Heated oxygen sensor 3 (Bank2)	P0163	07H	0CH	Minimum sensor output voltage for test cycle
			P0164	08H	0CH	Maximum sensor output voltage for test cycle
			P0166	80H	0CH	Sensor output voltage
			P0165	81H	0CH	Difference in sensor output voltage
CATA- LYST	21H	Three way catalyst function (Bank1)	P0420	80H	01H	O2 storage index
			P0420	82H	01H	Switching time lag engine exhaust index value
			P2423	83H	0CH	Difference in 3rd O2 sensor output voltage
			P2423	84H	84H	O2 storage index in HC trap catalyst
	22H	Three way catalyst function (Bank2)	P0430	80H	01H	O2 storage index
			P0430	82H	01H	Switching time lag engine exhaust index value
			P2424	83H	0CH	Difference in 3rd O2 sensor output voltage
			P2424	84H	84H	O2 storage index in HC trap catalyst
EGR SYSTEM	31H	EGR function	P0400	80H	96H	Low flow faults: EGR temp change rate (short term)
			P0400	81H	96H	Low flow faults: EGR temp change rate (long term)
			P0400	82H	96H	Low flow faults: Difference between max EGR temp and EGR temp under idling condition
			P0400	83H	96H	Low flow faults: Max EGR temp
			P1402	84H	96H	High Flow Faults: EGR temp increase rate
			P0402	85H	FCH	EGR differential pressure high flow
			P0401	86H	37H	EGR differential pressure low flow
			P2457	87H	96H	EGR temperature

Item	OBD-MID	Self-diagnostic test item	DTC	Test value and Test limit (GST display)		Description
				TID	Unit and Scaling ID	
VVT SYSTEM	35H	VVT Monitor (Bank1)	P0011	80H	9DH	VTC intake function diagnosis (VTC alignment check diagnosis)
			P0014	81H	9DH	VTC exhaust function diagnosis (VTC alignment check diagnosis)
			P0011	82H	9DH	VTC intake function diagnosis (VTC drive failure diagnosis)
			P0014	83H	9DH	VTC exhaust function diagnosis (VTC drive failure diagnosis)
			P100A	84H	10H	VEL slow response diagnosis
			P1090	85H	10H	VEL servo system diagnosis
			P0011	86H	9DH	VTC intake intermediate lock function diagnosis (VTC intermediate position alignment check diagnosis)
			Advanced: P052A Retarded: P052B	87H	9DH	VTC intake intermediate lock system diagnosis (VTC intermediate lock position check diagnosis)
	36H	VVT Monitor (Bank2)	P0021	80H	9DH	VTC intake function diagnosis (VTC alignment check diagnosis)
			P0024	81H	9DH	VTC exhaust function diagnosis (VTC alignment check diagnosis)
			P0021	82H	9DH	VTC intake function diagnosis (VTC drive failure diagnosis)
			P0024	83H	9DH	VTC exhaust function diagnosis (VTC drive failure diagnosis)
			P100B	84H	10H	VEL slow response diagnosis
			P1093	85H	10H	VEL servo system diagnosis
			P0021	86H	9DH	VTC intake intermediate lock function diagnosis (VTC intermediate position alignment check diagnosis)
			Advanced: P052C Retarded: P052D	87H	9DH	VTC intake intermediate lock system diagnosis (VTC intermediate lock position check diagnosis)
EVAP SYSTEM	39H	EVAP control system leak (Cap Off)	P0455	80H	0CH	Difference in pressure sensor output voltage before and after pull down
	3BH	EVAP control system leak (Small leak)	P0442	80H	05H	Leak area index (for more than 0.04 inch)
	3CH	EVAP control system leak (Very small leak)	P0456	80H	05H	Leak area index (for more than 0.02 inch)
			P0456	81H	FDH	Maximum internal pressure of EVAP system during monitoring
			P0456	82H	FDH	Internal pressure of EVAP system at the end of monitoring
	3DH	Purge flow system	P0441	83H	0CH	Difference in pressure sensor output voltage before and after vent control valve close

Item	OBD-MID	Self-diagnostic test item	DTC	Test value and Test limit (GST display)		Description
				TID	Unit and Scaling ID	
O2 SENSOR HEATER	41H	A/F sensor 1 heater (Bank 1)	Low Input: P0031 High Input: P0032	81H	0BH	Converted value of heater electric current to voltage
			P0030	83H	0BH	A/F sensor heater circuit malfunction
	42H	Heated oxygen sensor 2 heater (Bank 1)	Low Input: P0037 High Input: P0038	80H	0CH	Converted value of heater electric current to voltage
			P0141	81H	14H	Rear O2 sensor internal impedance
	43H	Heated oxygen sensor 3 heater (Bank 1)	P0043	80H	0CH	Converted value of heater electric current to voltage
	45H	A/F sensor 1 heater (Bank 2)	Low Input: P0051 High Input: P0052	81H	0BH	Converted value of heater electric current to voltage
			P0050	83H	0BH	A/F sensor heater circuit malfunction
	46H	Heated oxygen sensor 2 heater (Bank 2)	Low Input: P0057 High Input: P0058	80H	0CH	Converted value of heater electric current to voltage
			P0161	81H	14CH	Rear O2 sensor internal impedance
	47H	Heated oxygen sensor 3 heater (Bank 2)	P0063	80H	0CH	Converted value of heater electric current to voltage
SECONDARY AIR	71H	Secondary air system	P0411	80H	01H	Secondary air injection system incorrect flow detected
			Bank1: P0491 Bank2: P0492	81H	01H	Secondary air injection system insufficient flow
			P2445	82H	01H	Secondary air injection system pump stuck off
			P2448	83H	01H	Secondary air injection system high airflow
			Bank1: P2440 Bank2: P2442	84H	01H	Secondary air injection system switching valve stuck open
			P2440	85H	01H	Secondary air injection system switching valve stuck open
			P2444	86H	01H	Secondary air injection system pump stuck on

Item	OBD-MID	Self-diagnostic test item	DTC	Test value and Test limit (GST display)		Description
				TID	Unit and Scaling ID	
MISFIRE	A1H	Multiple cylinder misfires	P0301	80H	24H	Misfiring counter at 1000 revolution of the first cylinder
			P0302	81H	24H	Misfiring counter at 1000 revolution of the second cylinder
			P0303	82H	24H	Misfiring counter at 1000 revolution of the third cylinder
			P0304	83H	24H	Misfiring counter at 1000 revolution of the fourth cylinder
			P0305	84H	24H	Misfiring counter at 1000 revolution of the fifth cylinder
			P0306	85H	24H	Misfiring counter at 1000 revolution of the sixth cylinder
			P0307	86H	24H	Misfiring counter at 1000 revolution of the seventh cylinder
			P0308	87H	24H	Misfiring counter at 1000 revolution of the eighth cylinder
			P0300	88H	24H	Misfiring counter at 1000 revolution of the multiple cylinders
			P0301	89H	24H	Misfiring counter at 200 revolution of the first cylinder
			P0302	8AH	24H	Misfiring counter at 200 revolution of the second cylinder
			P0303	8BH	24H	Misfiring counter at 200 revolution of the third cylinder
			P0304	8CH	24H	Misfiring counter at 200 revolution of the fourth cylinder
			P0305	8DH	24H	Misfiring counter at 200 revolution of the fifth cylinder
			P0306	8EH	24H	Misfiring counter at 200 revolution of the sixth cylinder
			P0307	8FH	24H	Misfiring counter at 200 revolution of the seventh cylinder
			P0308	90H	24H	Misfiring counter at 200 revolution of the eighth cylinder
			P0300	91H	24H	Misfiring counter at 1000 revolution of the single cylinder
			P0300	92H	24H	Misfiring counter at 200 revolution of the single cylinder
			P0300	93H	24H	Misfiring counter at 200 revolution of the multiple cylinders

Item	OBD-MID	Self-diagnostic test item	DTC	Test value and Test limit (GST display)		Description
				TID	Unit and Scaling ID	
MISFIRE	A2H	No. 1 cylinder misfire	P0301	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0301	0CH	24H	Misfire counts for last/current driving cycles
	A3H	No. 2 cylinder misfire	P0302	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0302	0CH	24H	Misfire counts for last/current driving cycles
	A4H	No. 3 cylinder misfire	P0303	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0303	0CH	24H	Misfire counts for last/current driving cycles
	A5H	No. 4 cylinder misfire	P0304	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0304	0CH	24H	Misfire counts for last/current driving cycles
	A6H	No. 5 cylinder misfire	P0305	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0305	0CH	24H	Misfire counts for last/current driving cycles
	A7H	No. 6 cylinder misfire	P0306	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0306	0CH	24H	Misfire counts for last/current driving cycles
	A8H	No. 7 cylinder misfire	P0307	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0307	0CH	24H	Misfire counts for last/current driving cycles
	A9H	No. 8 cylinder misfire	P0308	0BH	24H	EWMA (Exponential Weighted Moving Average) misfire counts for last 10 driving cycles
			P0308	0CH	24H	Misfire counts for last/current driving cycles

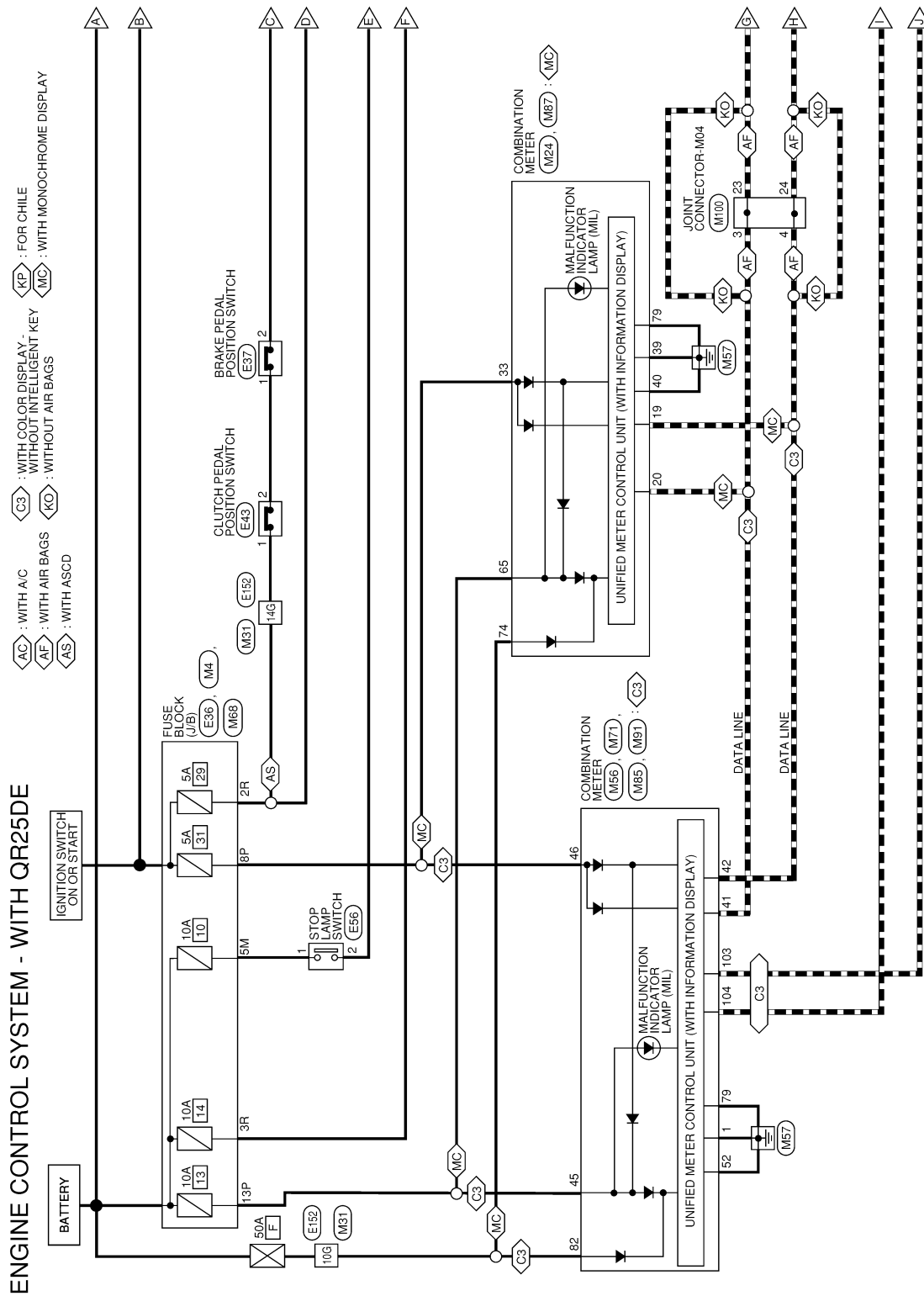
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WIRING DIAGRAM

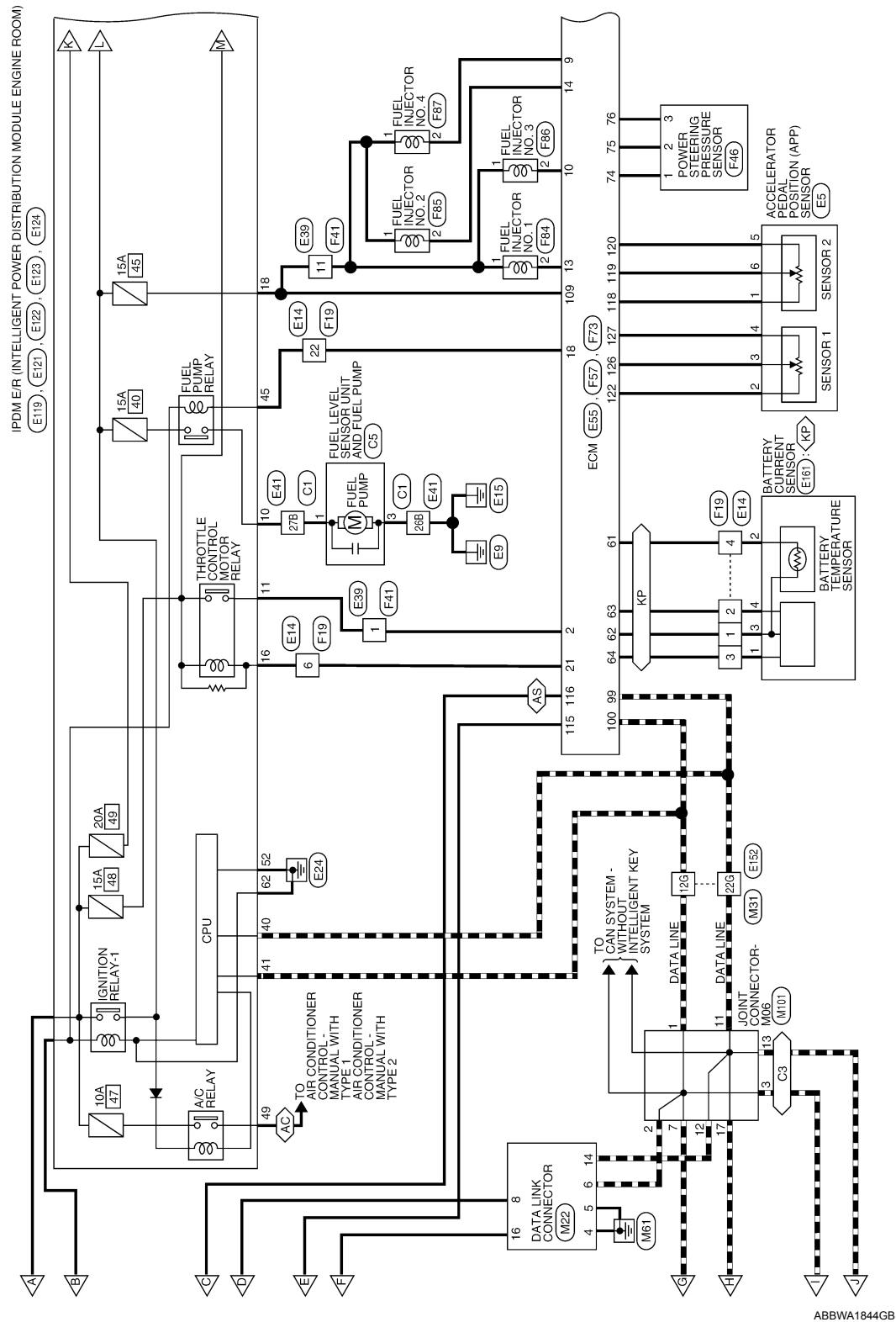
ENGINE CONTROL SYSTEM

Wiring Diagram

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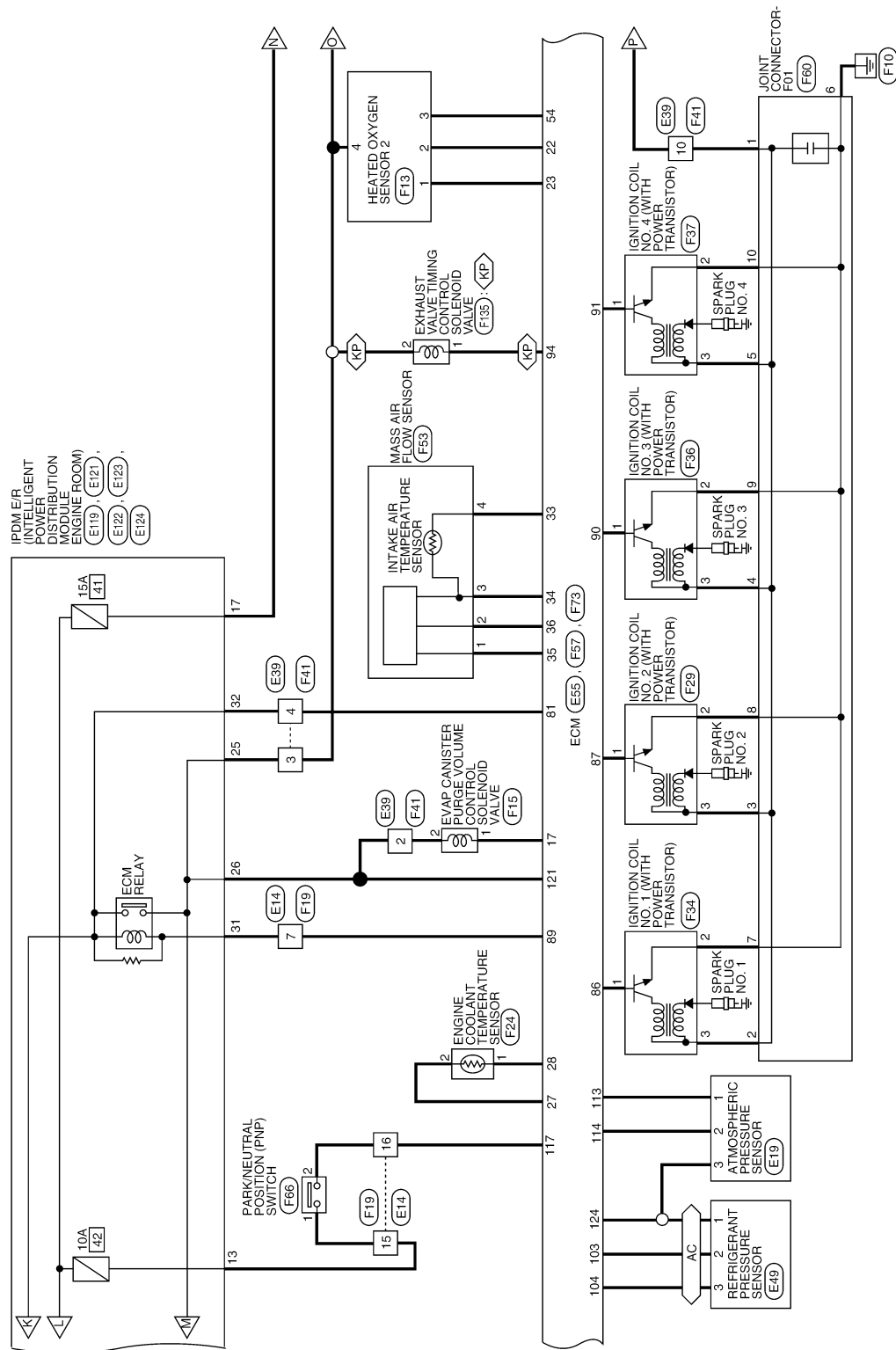


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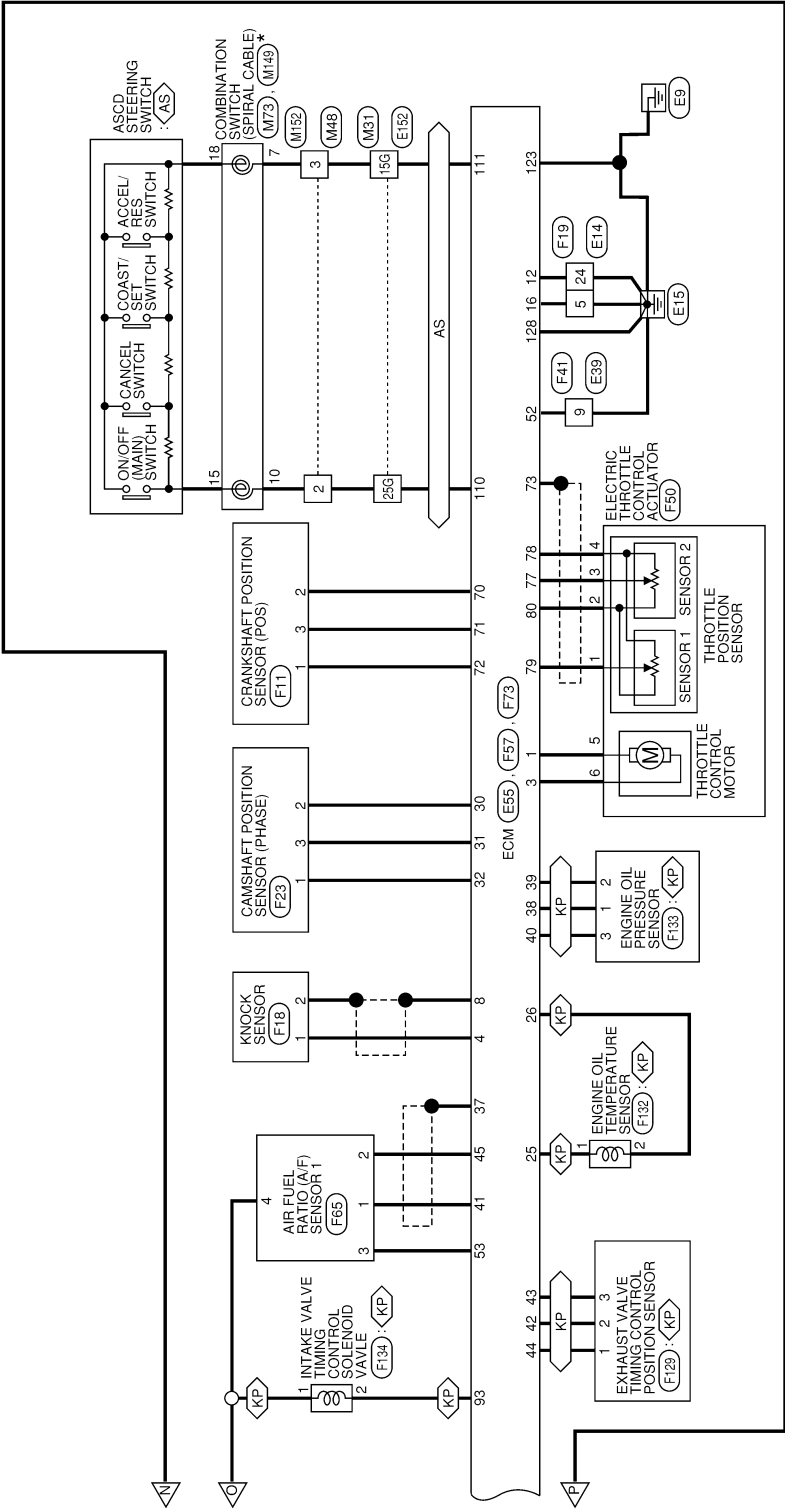
ENGINE CONTROL SYSTEM

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[QR25DE]



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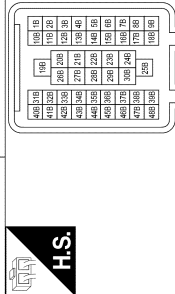


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ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Type	SAA36FB-RS10-SJ22
Connector Color	BLACK

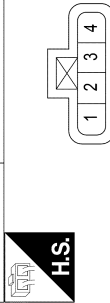


Terminal No.	Color of Wire	Signal Name
1B	B	TO ENGINE ROOM HARNESS
2B	Y	TO ENGINE ROOM HARNESS
3B	SB	TO ENGINE ROOM HARNESS
4B	L	TO ENGINE ROOM HARNESS
5B	GR	TO ENGINE ROOM HARNESS
6B	W	TO ENGINE ROOM HARNESS
7B	V	TO ENGINE ROOM HARNESS
8B	B	TO ENGINE ROOM HARNESS
9B	SB	TO ENGINE ROOM HARNESS
10B	SHIELD	TO ENGINE ROOM HARNESS
11B	W	TO ENGINE ROOM HARNESS
12B	B	TO ENGINE ROOM HARNESS
13B	R	TO ENGINE ROOM HARNESS
14B	L	TO ENGINE ROOM HARNESS
15B	G	TO ENGINE ROOM HARNESS
16B	P	TO ENGINE ROOM HARNESS
17B	R	TO ENGINE ROOM HARNESS
18B	BR	TO ENGINE ROOM HARNESS
19B	-	TO ENGINE ROOM HARNESS
20B	B	TO ENGINE ROOM HARNESS
21B	L	TO ENGINE ROOM HARNESS
22B	B	TO ENGINE ROOM HARNESS
23B	Y	TO ENGINE ROOM HARNESS
24B	GR	TO ENGINE ROOM HARNESS
25B	Y	TO ENGINE ROOM HARNESS
26B	B	TO ENGINE ROOM HARNESS
27B	L	TO ENGINE ROOM HARNESS
28B	B	TO ENGINE ROOM HARNESS
29B	BR	TO ENGINE ROOM HARNESS
30B	G	TO ENGINE ROOM HARNESS (EXCEPT FOR CHASSIS CAB)
30B	R	TO ENGINE ROOM HARNESS (CHASSIS CAB)
31B	W	TO ENGINE ROOM HARNESS
32B	Y	TO ENGINE ROOM HARNESS
33B	GR	TO ENGINE ROOM HARNESS
34B	R	TO ENGINE ROOM HARNESS
35B	P	TO ENGINE ROOM HARNESS

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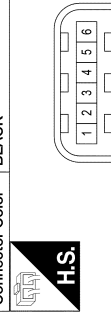
36B	-	TO ENGINE ROOM HARNESS
37B	-	TO ENGINE ROOM HARNESS
38B	GR	TO ENGINE ROOM HARNESS
39B	R	TO ENGINE ROOM HARNESS
40B	P	TO ENGINE ROOM HARNESS
41B	LG	TO ENGINE ROOM HARNESS
42B	BR	TO ENGINE ROOM HARNESS
43B	G	TO ENGINE ROOM HARNESS
44B	B	TO ENGINE ROOM HARNESS
45B	V	TO ENGINE ROOM HARNESS
46B	L	TO ENGINE ROOM HARNESS
47B	Y	TO ENGINE ROOM HARNESS
48B	B	TO ENGINE ROOM HARNESS

Connector No.	C5
Connector Name	FUEL LEVEL SENSOR UNIT AND FUEL PUMP (WITH YD25DDTI)
Connector Type	E04FGY-RS
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	L	FUEL PUMP
2	BR	FUEL SENSOR
3	B	GROUND
4	R	FUEL SENSOR GND

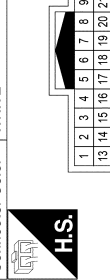
Connector No.	E5
Connector Name	ACCELERATOR PEDAL POSITION SENSOR (APP) SENSOR
Connector Type	AEY06FB-RH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	GR	SENSOR POWER SUPPLY (WITH QR25DE)

1	W	SENSOR POWER SUPPLY (EXCEPT FOR QR25DE)
2	V	SENSOR POWER SUPPLY (WITH QR25DE)
2	L/W	SENSOR POWER SUPPLY (WITH YD25DDTI)
2	L	SENSOR POWER SUPPLY (WITH M9T)
3	SB	ACCELERATOR PEDAL POSITION SENSOR 1 (WITH QR25DE)
3	L/R	ACCELERATOR PEDAL POSITION SENSOR 1 (WITH YD25DDTI)
3	P	ACCELERATOR PEDAL POSITION SENSOR 1 (WITH M9T)
4	L	SENSOR GROUND (WITH YD25DDTI)
4	B	GND PEDAL POS1 (WITH M9T)
5	G	SENSOR GROUND (WITH QR25DE)
5	B	SENSOR GROUND (WITH YD25DDTI)
5	GR	SENSOR GROUND (WITH M9T)
6	P	ACCELERATOR PEDAL POSITION SENSOR 2 (WITH QR25DE)
6	R	ACCELERATOR PEDAL POSITION SENSOR 2 (EXCEPT FOR QR25DE)

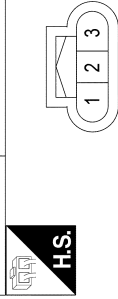
Connector No.	E14
Connector Name	WIRE TO WIRE
Connector Type	TH24MW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
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2	V	TO ENGINE CONTROL HARNESS
3	SB/R	TO ENGINE CONTROL HARNESS
4	G/B	TO ENGINE CONTROL HARNESS
5	B	TO ENGINE CONTROL HARNESS
6	V/R	TO ENGINE CONTROL HARNESS
7	BR/R	TO ENGINE CONTROL HARNESS
8	-	TO ENGINE CONTROL HARNESS
9	-	TO ENGINE CONTROL HARNESS
10	BR/Y	TO ENGINE CONTROL HARNESS
11	V/W	TO ENGINE CONTROL HARNESS
12	SB/R	TO ENGINE CONTROL HARNESS
13	G/B	TO ENGINE CONTROL HARNESS
14	R/B	TO ENGINE CONTROL HARNESS
15	GR	TO ENGINE CONTROL HARNESS
16	G/Y	TO ENGINE CONTROL HARNESS

17	-	TO ENGINE CONTROL HARNESS
18	-	TO ENGINE CONTROL HARNESS
19	GR/R	TO ENGINE CONTROL HARNESS
20	-	TO ENGINE CONTROL HARNESS
21	-	TO ENGINE CONTROL HARNESS
22	R/Y	TO ENGINE CONTROL HARNESS
23	-	TO ENGINE CONTROL HARNESS
24	B	TO ENGINE CONTROL HARNESS

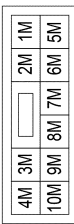
Connector No.	E19
Connector Name	ATMOSPHERIC PRESSURE SENSOR
Connector Type	RH03FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	BR	SENSOR POWER SUPPLY
2	W	ATMOSPHERIC PRESSURE SENSOR
3	B	SENSOR GROUND

ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

Connector No.	E36
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FW-CS
Connector Color	WHITE

Connector No.	E39
Connector Name	WIRE TO WIRE
Connector Type	NS12MW-CS
Connector Color	WHITE



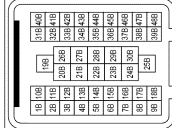

Terminal No.	Color of Wire	Signal Name
1M	W/B	IGNITION
2M	-	-
3M	-	-
4M	-	-
5M	LG	BATTERY
6M	-	-
7M	-	-
8M	-	-
9M	-	-
10M	W	IGNITION

Terminal No.	Color of Wire	Signal Name
1	W	TO ENGINE CONTROL HARNESS
2	W	TO ENGINE CONTROL HARNESS
3	G	TO ENGINE CONTROL HARNESS
4	Y	TO ENGINE CONTROL HARNESS
5	-	TO ENGINE CONTROL HARNESS
6	V/R	TO ENGINE CONTROL HARNESS
7	-	TO ENGINE CONTROL HARNESS
8	-	TO ENGINE CONTROL HARNESS
9	B	TO ENGINE CONTROL HARNESS
10	R	TO ENGINE CONTROL HARNESS
11	LG	TO ENGINE CONTROL HARNESS
12	W	TO ENGINE CONTROL HARNESS

Connector No.	E37
Connector Name	BRAKE PEDAL POSITION SWITCH
Connector Type	M02BR-LC
Connector Color	BROWN




Connector No.	E41
Connector Name	WIRE TO WIRE
Connector Type	SAA36MB-RS10-SJZ2
Connector Color	BLACK

Terminal No.	Color of Wire	Signal Name
1	G	IGNITION (EXCEPT QR25DE)
1	R	CLUTCH PEDAL POSITION SWITCH OUTPUT (WITH QR25DE)
2	LG/O	BRAKE/CLUTCH PEDAL POSITION SWITCH (FOR YD25DDT1 WITH A/T)
2	LG	BRAKE PEDAL POSITION SWITCH (WITH M9T)
2	LG	BRAKE/CLUTCH PEDAL POSITION SWITCH (WITH QR25DE)
2	R	BRAKE/CLUTCH PEDAL POSITION SWITCH (FOR YD25DDT1 WITH M/T)

Terminal No.	Color of Wire	Signal Name
1B	B	TO CHASSIS HARNESS
2B	Y	TO CHASSIS HARNESS
3B	SB/R	TO CHASSIS HARNESS
4B	L	TO CHASSIS HARNESS
5B	B	TO CHASSIS HARNESS
6B	W	TO CHASSIS HARNESS
7B	R	TO CHASSIS HARNESS
8B	O	TO CHASSIS HARNESS
9B	SB	TO CHASSIS HARNESS
10B	SHIELD	TO CHASSIS HARNESS

11B	W	TO CHASSIS HARNESS
12B	B	TO CHASSIS HARNESS
13B	R	TO CHASSIS HARNESS
14B	L	TO CHASSIS HARNESS
15B	GR	TO CHASSIS HARNESS
16B	P	TO CHASSIS HARNESS
17B	B	TO CHASSIS HARNESS
18B	Y/L	TO CHASSIS HARNESS
19B	-	TO CHASSIS HARNESS
20B	B	TO CHASSIS HARNESS
21B	L	TO CHASSIS HARNESS
22B	B	TO CHASSIS HARNESS
23B	Y	TO CHASSIS HARNESS
24B	B	TO CHASSIS HARNESS
25B	-	TO CHASSIS HARNESS
26B	B	TO CHASSIS HARNESS
27B	L	TO CHASSIS HARNESS
28B	-	TO CHASSIS HARNESS
29B	B	TO CHASSIS HARNESS
30B	B	TO CHASSIS HARNESS
31B	W	TO CHASSIS HARNESS
32B	Y	TO CHASSIS HARNESS
33B	GR	TO CHASSIS HARNESS
34B	R	TO CHASSIS HARNESS
35B	-	TO CHASSIS HARNESS
36B	-	TO CHASSIS HARNESS
37B	-	TO CHASSIS HARNESS
38B	-	TO CHASSIS HARNESS
39B	-	TO CHASSIS HARNESS
40B	P	TO CHASSIS HARNESS
41B	LG	TO CHASSIS HARNESS
42B	BR	TO CHASSIS HARNESS
43B	G	TO CHASSIS HARNESS
44B	B	TO CHASSIS HARNESS
45B	V	TO CHASSIS HARNESS
46B	LW	TO CHASSIS HARNESS
47B	Y	TO CHASSIS HARNESS
48B	-	TO CHASSIS HARNESS

Connector No.	E43
Connector Name	CLUTCH PEDAL POSITION SWITCH
Connector Type	S02FL
Connector Color	BLUE




Terminal No.	Color of Wire	Signal Name
1	R	CLUTCH PEDAL POSITION SWITCH OUTPUT
2	LGW	ASC/D BRAKE SWITCH AND ASC/D CLUTCH SWITCH

Connector No.	E49
Connector Name	REFRIGERANT PRESSURE SENSOR
Connector Type	RK03FB
Connector Color	BLACK




Terminal No.	Color of Wire	Signal Name
1	BR	SENSOR GROUND (WITH QR25DE)
1	BR/W	SENSOR GROUND (WITHOUT QR25DE)
2	W/G	REFRIGERANT PRESSURE SENSOR (WITHOUT QR25DE)
2	W	REFRIGERANT PRESSURE SENSOR (WITH QR25DE)
3	B	SENSOR POWER SUPPLY

ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

Connector No.	E55
Connector Name	ECM (WITH QR25DE)
Connector Type	RH24FGY-RZ8-L-RH
Connector Color	GRAY

H.S.

97	101	105	109	113	117	121	125
98	102	106	110	114	118	122	126
99	103	107	111	115	119	123	127
100	104	108	112	116	120	124	128

Terminal No.	Color of Wire	Signal Name
97	-	-
98	-	-
99	P	CAN-L
100	L	CAN-H
101	-	-
102	-	-
103	W	REFRIGERANT PRESSURE SENSOR
104	B	SENSOR POWER SUPPLY
105	-	-
106	-	-
107	-	-
108	-	-
109	LG	IGNITION SWITCH
110	SB	ASCD STEERING SWITCH
111	B	ASCD STEERING SWITCH GROUND
112	-	-
113	BR	SENSOR POWER SUPPLY
114	W	ATMOSPHERIC PRESSURE SENSOR
115	Y	STOP LAMP SWITCH
116	LG	BRAKE/CLUTCH PEDAL POSITION SWITCH
117	GY	PNP SIGNAL
118	GR	SENSOR POWER SUPPLY
119	P	ACCELERATOR PEDAL POSITION SENSOR 2
120	G	SENSOR GROUND
121	R	POWER SUPPLY FOR ECM
122	V	SENSOR POWER SUPPLY
123	B	ECM GROUND
124	B	SENSOR GROUND (WITHOUT A/C)
124	BR	SENSOR GROUND (WITH A/C)
125	-	-
126	SB	ACCELERATOR PEDAL POSITION SENSOR 1
127	L	SENSOR GROUND

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128	B	ECM GROUND
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Connector No.	E56
Connector Name	STOP LAMP SWITCH
Connector Type	M04FW-LC
Connector Color	WHITE

H.S.

3	4
1	2

Terminal No.	Color of Wire	Signal Name
1	LG	BATTERY
2	Y	BRAKE SW1
3	G	IGNITION
4	LG/O	STOP LAMP SWITCH OUTPUT

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS16FW-CS
Connector Color	WHITE

H.S.

9	8	7	6	5	4	3
18	17	16	15	14	13	12
11	10	9	8	7	6	5
4	3	2	1	0	-	-

Terminal No.	Color of Wire	Signal Name
3	-	-
4	BR	NP SW (WITH A/T)
4	G	NP SW (WITH M/T)
5	Y	H/LAMP HI RH
6	R/Y	H/LAMP HI LH
7	L	H/LAMP LO LH
8	L/W	H/LAMP LO RH
9	W	FR FOG/LH
10	L	FUEL PUMP
11	W	ETC VB
12	V	FR FOG/L RH
13	R/W	A/T ECU (WITH A/T)
13	GR	A/T ECU (WITH M/T)
14	V/W	REVERSE LAMP
15	BR	ABS ECU

16	V/R	ETC RLY CONT
17	R	IGN COIL
18	LG	INJECTOR (EXCEPT M9T)
18	EG	INJECTOR (WITH M9T)

Connector No.	E121
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FBR-CS
Connector Color	BROWN

H.S.

29	28	27	26	25
36	35	34	33	32
31	30	29	28	27
26	25	24	23	22

Terminal No.	Color of Wire	Signal Name
25	G	ECM VB
26	R	O2 SENS
27	R/W	CLEARANCE RH
28	-	-
29	L	FR WIPER HI
30	-	-
31	BR/R	ECM RLY CONT (WITH M9T)
32	Y	ECM BAT (EXCEPT M9T)
32	V	ECM BAT (WITH M9T)
33	R	CLEARANCE LH
34	O	TAIL 1
35	GR	FR WIPER LO
36	O	ESCL

Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH12FW-NH
Connector Color	WHITE

H.S.

42	41	40	39	38	37
48	47	46	45	44	43

Terminal No.	Color of Wire	Signal Name
37	-	-
38	GR/R	OIL PRESSURE SW

39	G	WIPER AUTO STOP
40	P	CAN-L
41	L	CAN-H
42	G/B	DRL RLY
43	-	-
44	SB/R	START CONT
45	R/Y	FUEL RLY CONT
46	-	-
47	O	ALT C
48	BR	HORN RLY CONT

Connector No.	E123
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS08FBR-CS
Connector Color	BROWN

H.S.

51	50	49
56	55	54
53	52	51

Terminal No.	Color of Wire	Signal Name
49	W	A/C COMP
50	-	-
51	-	-
52	B/W	S-GND
53	-	-
54	-	-
55	-	-
56	R	IGN SW (IG1)

ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	M06FB-LC
Connector Color	BLACK



SH

59	58	57
62	61	60

Terminal No.	Color of Wire	Signal Name
57	Y	RR DEF
58	-	-
59	-	-
60	-	-
61	-	-
62	BAW	P-GND



Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4
Connector Color	WHITE

56	46	36	26	16	
96	86	76	66		
100					

21620	16181	7145	3114	126116	
302	309	366	710	362	369
362	369	366	710	362	369

506	460	380	710	465	430
460	460	380	710	465	430
460	460	380	710	465	430

618	600	560	360	710	560
710	618	600	560	360	710
710	618	600	560	360	710

818	800	716	710	716	710
800	800	716	710	716	710
800	800	716	710	716	710

960	940	900	316	
100	960	970	960	

95G	94G	93G	92G	91G
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Terminal No.	Color of Wire	Signal Name
1G	V	TO MAIN HARNESS
2G	SHIELD	TO MAIN HARNESS
3G	R	TO MAIN HARNESS

57G	58B	TO MAIN HARNESS
58G	L	TO MAIN HARNESS
59G	W	TO MAIN HARNESS
60G	GR/R	TO MAIN HARNESS
61G	R	TO MAIN HARNESS
62G	L	TO MAIN HARNESS
63G	GR	TO MAIN HARNESS
64G	P	TO MAIN HARNESS
65G	G	TO MAIN HARNESS
66G	BR	TO MAIN HARNESS
67G	O	TO MAIN HARNESS
68G	O	TO MAIN HARNESS
69G	P/B	TO MAIN HARNESS
70G	R	TO MAIN HARNESS
71G	-	TO MAIN HARNESS
72G	LG	TO MAIN HARNESS
73G	P	TO MAIN HARNESS
74G	BR	TO MAIN HARNESS
75G	G	TO MAIN HARNESS
76G	W	TO MAIN HARNESS
77G	V	TO MAIN HARNESS
78G	Y	TO MAIN HARNESS
79G	W	TO MAIN HARNESS
80G	-	TO MAIN HARNESS
81G	-	TO MAIN HARNESS
82G	Y	TO MAIN HARNESS
83G	W	TO MAIN HARNESS
84G	GR	TO MAIN HARNESS
85G	R	TO MAIN HARNESS
86G	B	TO MAIN HARNESS
87G	BR	TO MAIN HARNESS
88G	L/W	TO MAIN HARNESS
89G	BR	TO MAIN HARNESS
90G	-	TO MAIN HARNESS
91G	-	TO MAIN HARNESS
92G	-	TO MAIN HARNESS
93G	P	TO MAIN HARNESS
94G	-	TO MAIN HARNESS
95G	-	TO MAIN HARNESS
96G	G	TO MAIN HARNESS
97G	-	TO MAIN HARNESS
98G	R/W	TO MAIN HARNESS
99G	-	TO MAIN HARNESS
100G	B	TO MAIN HARNESS

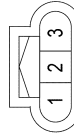
Connector No.	E161
Connector Name	BATTERY CURRENT SENSOR
Connector Type	SAZ04FGY
Connector Color	GRAY



SH



Terminal No.	Color of Wire	Signal Name
1	SB/R	SENSOR POWER SUPPLY (FOR CHILE) (WITH QR25DE)
1	SB	SENSOR POWER SUPPLY (WITH YD55DIT1)
2	G/B	BATTERY TEMPERATURE SENSOR
3	W	SENSOR GROUND
4	V	BATTERY CURRENT SENSOR

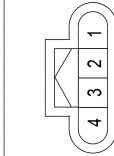


Connector No.	F11
Connector Name	CRANKSHAFT POSITION SENSOR (POS)
Connector Type	RH03FB
Connector Color	BLACK

Terminal No.	Color of Wire	Signal Name
1	R	SENSOR POWER SUPPLY
2	W	SENSOR GROUND
3	BR	CRANKSHAFT POSITION SENSOR

ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

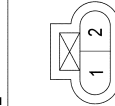
Connector No.	F13
Connector Name	HEATED OXYGEN SENSOR 2
Connector Type	RH04FDGY-P
Connector Color	GRAY



H.S.

Terminal No.	Color of Wire	Signal Name
1	B	SENSOR GROUND
2	L	HEATED OXYGEN SENSOR 2
3	SB	HEATED OXYGEN SENSOR 2 HEATER
4	G	ECM VB

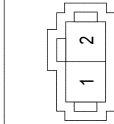
Connector No.	F15
Connector Name	EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE
Connector Type	E02FL-RS
Connector Color	BLUE



H.S.

Terminal No.	Color of Wire	Signal Name
1	BG	EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE
2	V	O2 SENS

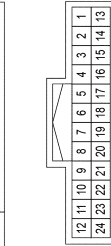
Connector No.	F18
Connector Name	KNOCK SENSOR
Connector Type	BS02FGY_B-AHY
Connector Color	GRAY



H.S.

Terminal No.	Color of Wire	Signal Name
1	W	KNOCK SENSOR
2	B	SENSOR GROUND

Connector No.	F19
Connector Name	WIRE TO WIRE
Connector Type	TH24FW-NH
Connector Color	WHITE

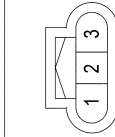


H.S.

Terminal No.	Color of Wire	Signal Name
1	Y	TO ENGINE ROOM HARNESS
2	W	TO ENGINE ROOM HARNESS
3	SB	TO ENGINE ROOM HARNESS
4	G	TO ENGINE ROOM HARNESS
5	B	TO ENGINE ROOM HARNESS
6	LG	TO ENGINE ROOM HARNESS
7	BG	TO ENGINE ROOM HARNESS
8	-	TO ENGINE ROOM HARNESS
9	-	TO ENGINE ROOM HARNESS
10	BR	TO ENGINE ROOM HARNESS
11	P	TO ENGINE ROOM HARNESS
12	SB	TO ENGINE ROOM HARNESS
13	BG	TO ENGINE ROOM HARNESS
14	R	TO ENGINE ROOM HARNESS
15	W	TO ENGINE ROOM HARNESS
16	G	TO ENGINE ROOM HARNESS
17	-	TO ENGINE ROOM HARNESS
18	-	TO ENGINE ROOM HARNESS
19	GR	TO ENGINE ROOM HARNESS
20	-	TO ENGINE ROOM HARNESS
21	-	TO ENGINE ROOM HARNESS

22	V	TO ENGINE ROOM HARNESS
23	-	TO ENGINE ROOM HARNESS
24	GR	TO ENGINE ROOM HARNESS

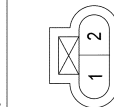
Connector No.	F23
Connector Name	CAMSHAFT POSITION SENSOR (PHASE)
Connector Type	RH03FB
Connector Color	BLACK



H.S.

Terminal No.	Color of Wire	Signal Name
1	W	SENSOR POWER SUPPLY
2	B	SENSOR GROUND
3	R	CAMSHAFT POSITION SENSOR (PHASE)

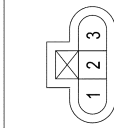
Connector No.	F24
Connector Name	ENGINE COOLANT TEMPERATURE SENSOR (WITH QR25DE)
Connector Type	E02FGY-RS
Connector Color	GRAY



H.S.

Terminal No.	Color of Wire	Signal Name
1	BR	ENGINE COOLANT TEMPERATURE SENSOR
2	G	SENSOR GROUND

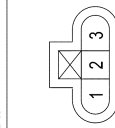
Connector No.	F29
Connector Name	IGNITION COIL NO.2 (WITH POWER TRANSISTOR)
Connector Type	E03FGY-RS
Connector Color	GRAY



H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	IGNITION SWITCH NO.2
2	B	GROUND
3	BR	IGNITION

Connector No.	F34
Connector Name	IGNITION COIL NO.1 (WITH POWER TRANSISTOR)
Connector Type	E03FGY-RS
Connector Color	GRAY



H.S.

Terminal No.	Color of Wire	Signal Name
1	P	IGNITION SWITCH NO.1
2	B	GROUND
3	R	IGNITION

ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[QR25DE]

ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

Connector No.	F36
Connector Name	IGNITION COIL NO.3 (WITH POWER TRANSISTOR)
Connector Type	E03FGY-RS
Connector Color	GRAY



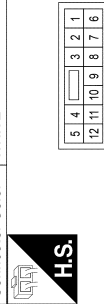
Terminal No.	Color of Wire	Signal Name
1	Y	IGNITION SWITCH NO.3
2	B	GROUND
3	L	IGNITION

Connector No.	F37
Connector Name	IGNITION COIL NO.4 (WITH POWER TRANSISTOR)
Connector Type	E03FGY-RS
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	SB	IGNITION SWITCH NO.4
2	B	GROUND
3	G	IGNITION

Connector No.	F41
Connector Name	WIRE TO WIRE
Connector Type	NS12FW-CS
Connector Color	WHITE



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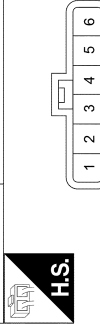
1	W	TO ENGINE ROOM HARNESS
2	V	TO ENGINE ROOM HARNESS
3	G	TO ENGINE ROOM HARNESS
4	BR	TO ENGINE ROOM HARNESS
5	-	TO ENGINE ROOM HARNESS
6	LG	TO ENGINE ROOM HARNESS
7	-	TO ENGINE ROOM HARNESS
8	-	TO ENGINE ROOM HARNESS
9	B	TO ENGINE ROOM HARNESS
10	R	TO ENGINE ROOM HARNESS
11	LG	TO ENGINE ROOM HARNESS
12	SB	TO ENGINE ROOM HARNESS
13	-	TO ENGINE ROOM HARNESS
14	-	TO ENGINE ROOM HARNESS
15	-	TO ENGINE ROOM HARNESS
16	-	TO ENGINE ROOM HARNESS
17	-	TO ENGINE ROOM HARNESS
18	-	TO ENGINE ROOM HARNESS
19	-	TO ENGINE ROOM HARNESS
20	-	TO ENGINE ROOM HARNESS
21	-	TO ENGINE ROOM HARNESS
22	-	TO ENGINE ROOM HARNESS
23	-	TO ENGINE ROOM HARNESS
24	-	TO ENGINE ROOM HARNESS
25	-	TO ENGINE ROOM HARNESS
26	-	TO ENGINE ROOM HARNESS
27	-	TO ENGINE ROOM HARNESS
28	-	TO ENGINE ROOM HARNESS
29	-	TO ENGINE ROOM HARNESS
30	-	TO ENGINE ROOM HARNESS
31	-	TO ENGINE ROOM HARNESS
32	-	TO ENGINE ROOM HARNESS
33	-	TO ENGINE ROOM HARNESS
34	-	TO ENGINE ROOM HARNESS
35	-	TO ENGINE ROOM HARNESS
36	-	TO ENGINE ROOM HARNESS
37	-	TO ENGINE ROOM HARNESS
38	-	TO ENGINE ROOM HARNESS
39	-	TO ENGINE ROOM HARNESS
40	-	TO ENGINE ROOM HARNESS

Connector No.	F46
Connector Name	POWER STEERING PRESSURE SENSOR
Connector Type	RK03FB
Connector Color	BLACK



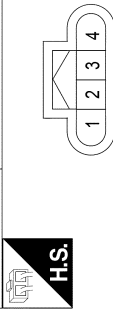
Terminal No.	Color of Wire	Signal Name
1	P	SENSOR GROUND
2	Y	POWER STEERING PRESSURE SENSOR
3	V	SENSOR POWER SUPPLY

Connector No.	F50
Connector Name	ELECTRIC THROTTLE CONTROL ACTUATOR
Connector Type	HS06FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	W	THROTTLE POSITION SENSOR 1
2	G	SENSOR POWER SUPPLY
3	R	THROTTLE POSITION SENSOR 2
4	B	SENSOR GROUND
5	G	THROTTLE CONTROL MOTOR (CLOSE)
6	L	THROTTLE CONTROL MOTOR (OPEN)

Connector No.	F53
Connector Name	MASS AIR FLOW SENSOR (WITH QR25DE)
Connector Type	RH04FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	MASS AIR FLOW SENSOR
2	P	SENSOR POWER SUPPLY
3	G	SENSOR GROUND
4	SB	INTAKE AIR TEMPERATURE SENSOR

A
EC
C
D
E
F
G
H
I
J
K
L
M
N
O
P

ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

Connector No.	F57
Connector Name	ECM (WITH QR25DE)
Connector Type	RH40FBR-RZ8-R-RH
Connector Color	BROWN



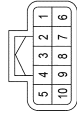
H.S.

Terminal No.	Color of Wire	Signal Name
49	-	-
50	-	-
51	-	-
52	B	ECM GROUND
53	R	A/F SENSOR 1 HEATER
54	SB	HEATED OXYGEN SENSOR 2 HEATER
55	-	-
56	-	-
57	-	-
58	-	-
59	-	-
60	-	-
61	G	BATTERY TEMPERATURE SENSOR (FOR CHILE)
62	Y	SENSOR GROUND (FOR CHILE)
63	W	BATTERY CURRENT SENSOR (FOR CHILE)
64	SB	SENSOR POWER SUPPLY CURSEN (FOR CHILE)
65	-	-
66	-	-
67	-	-
68	-	-
69	-	-
70	W	SENSOR GROUND
71	BR	CRANKSHAFT POSITION SENSOR (POS)
72	R	SENSOR POWER SUPPLY
73	BR	SHIELD
74	P	SENSOR GROUND
75	Y	POWER STEERING PRESSURE SENSOR
76	V	SENSOR POWER SUPPLY
77	R	THROTTLE POSITION SENSOR 2
78	B	SENSOR GROUND
79	W	THROTTLE POSITION SENSOR 1
80	G	SENSOR POWER SUPPLY
81	BR	POWER SUPPLY FOR ECM (BACK-UP)
82	-	-

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83	-	-
84	-	-
85	-	-
86	P	IGNITION SWITCH NO.1
87	LG	IGNITION SWITCH NO.2
88	-	-
89	BG	ECM RELAY
90	Y	IGNITION SWITCH NO.3
91	SB	IGNITION SWITCH NO.4
92	-	-
93	R	INTAKE VALVE TIMING CONTROL SOLENOID VALVE (FOR CHILE)
94	W	EXHAUST VALVE TIMING CONTROL SOLENOID VALVE (FOR CHILE)
95	-	-
96	-	-

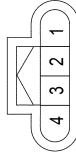
Connector No.	F60
Connector Name	JOINT CONNECTOR-F01
Connector Type	RH10FB
Connector Color	BLACK



H.S.

Terminal No.	Color of Wire	Signal Name
1	R	IGN COIL
2	R	IGN COIL
3	BR	IGN COIL
4	L	IGN COIL
5	G	IGN COIL
6	B	GROUND
7	B	GROUND
8	B	GROUND
9	B	GROUND
10	B	GROUND

Connector No.	F65
Connector Name	AIR FUEL RATIO (A/F) SENSOR 1
Connector Type	RH04FDGY-P
Connector Color	GRAY



H.S.

Terminal No.	Color of Wire	Signal Name
1	BR	A/F SENSOR 1
2	Y	A/F SENSOR 1
3	R	A/F SENSOR 1 HEATER
4	G	ECM VB

Connector No.	F66
Connector Name	PARK NEUTRAL POSITION (PNP) SWITCH
Connector Type	W02FB
Connector Color	BLACK

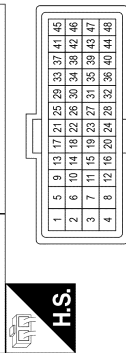


H.S.

Terminal No.	Color of Wire	Signal Name
1	W	IGNITION
2	G	PNP SIGNAL (WITH QR25DE)
2	V	PARK/NEUTRAL POSITION (PNP) SWITCH OUTPUT (WITH Y25BDDT)
2	L	PARK/NEUTRAL POSITION (PNP) SWITCH OUTPUT (WITH M9T)

ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

Connector No.	F73
Connector Name	ECM (WITH QR25DE)
Connector Type	RH40FB-RZ8-R-RH
Connector Color	BLACK



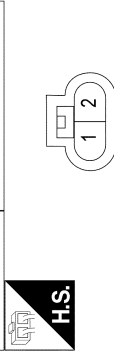
33	SB	INTAKE AIR TEMPERATURE SENSOR
34	G	SENSOR GROUND
35	Y	MASS AIR FLOW SENSOR
36	P	SENSOR POWER SUPPLY
37	B	SHIELD
38	V	SENSOR GROUND (FOR CHILE)
39	LG	ENGINE OIL PRESSURE SENSOR (FOR CHILE)
40	Y	SENSOR POWER SUPPLY OIL PRES (FOR CHILE)
41	BR	AFV SENSOR 1
42	R	SENSOR GROUND (FOR CHILE)
43	BR	EXHAUST VALVE TIMING CONTROL POSITION SENSOR (FOR CHILE)
44	W	SENSOR POWER SUPPLY (FOR CHILE)
45	Y	AFV SENSOR 1
46	-	-
47	-	-
48	-	-

Terminal No.	Color of Wire	Signal Name
1	G	THROTTLE CONTROL MOTOR (CLOSE)
2	W	THROTTLE CONTROL MOTOR POWER SUPPLY
3	L	THROTTLE CONTROL MOTOR (OPEN)
4	W	KNOCK SENSOR
5	-	-
6	-	-
7	-	-
8	B	SENSOR GROUND
9	P	FUEL INJECTOR NO.4
10	W	FUEL INJECTOR NO.3
11	-	-
12	GR	ECM GROUND
13	Y	FUEL INJECTOR NO.1
14	SB	FUEL INJECTOR NO.2
15	-	-
16	B	ECM GROUND
17	BG	EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE
18	V	FUEL PUMP RELAY
19	-	-
20	-	-
21	LG	THROTTLE CONTROL MOTOR RELAY
22	L	HEATED OXYGEN SENSOR 2
23	B	SENSOR GROUND
24	-	-
25	P	ENGINE OIL TEMPERATURE SENSOR (FOR CHILE)
26	GR	SENSOR GROUND (FOR CHILE)
27	G	SENSOR GROUND
28	BR	ENGINE COOLANT TEMPERATURE SENSOR
29	-	-
30	B	SENSOR GROUND
31	R	CAMSHAFT POSITION SENSOR (PHASE)
32	W	SENSOR POWER SUPPLY

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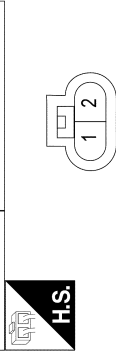
1	G	INJECTOR
2	SB	FUEL INJECTOR NO.2

Connector No.	F86
Connector Name	FUEL INJECTOR NO.3
Connector Type	HS02FGY
Connector Color	GRAY



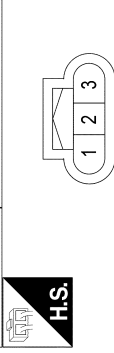
Terminal No.	Color of Wire	Signal Name
1	L	INJECTOR
2	W	FUEL INJECTOR NO.3

Connector No.	F87
Connector Name	FUEL INJECTOR NO.4
Connector Type	HS02FGY
Connector Color	GRAY



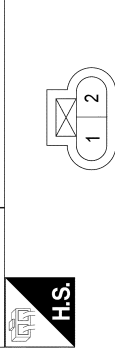
Terminal No.	Color of Wire	Signal Name
1	V	INJECTOR
2	P	FUEL INJECTOR NO.4

Connector No.	F129
Connector Name	EXHAUST VALVE TIMING CONTROL POSITION SENSOR
Connector Type	RH03FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	W	SENSOR POWER SUPPLY (FOR CHILE)
2	R	SENSOR GROUND (FOR CHILE)
3	BR	EXHAUST VALVE TIMING CONTROL POSITION SENSOR (FOR CHILE)

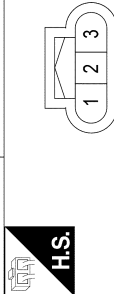
Connector No.	F132
Connector Name	ENGINE OIL TEMPERATURE SENSOR
Connector Type	E02FGY-RS
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	P	ENGINE OIL TEMPERATURE SENSOR (FOR CHILE)
2	GR	SENSOR GROUND (FOR CHILE)

ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

Connector No.	F133
Connector Name	ENGINE OIL PRESSURE SENSOR
Connector Type	RH03FB
Connector Color	BLACK



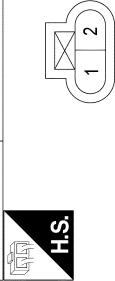
Terminal No.	Color of Wire	Signal Name
1	V	SENSOR GROUND (FOR CHILE)
2	LG	ENGINE OIL PRESSURE SENSOR (FOR CHILE)
3	Y	SENSOR POWER SUPPLY OIL PRES (FOR CHILE)

Connector No.	F134
Connector Name	INTAKE VALVE TIMING INTERMEDIATE LOCK CONTROL SOLENOID VALVE
Connector Type	E02FG-RS-LGY
Connector Color	GRAY



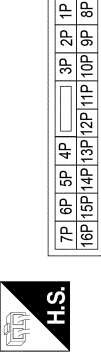
Terminal No.	Color of Wire	Signal Name
1	V	ECM VB (FOR CHILE)
2	R	INTAKE VALVE TIMING CONTROL SOLENOID VALVE (FOR CHILE)

Connector No.	F135
Connector Name	EXHAUST VALVE TIMING CONTROL SOLENOID VALVE
Connector Type	E02FBR-RS-GY
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	W	EXHAUST VALVE TIMING CONTROL SOLENOID VALVE (FOR CHILE)
2	G	ECM VB

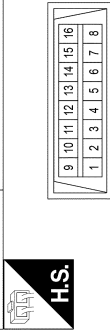
Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1P	R	IGNITION
2P	G	IGNITION
3P	W	IGNITION (WITHOUT INTELLIGENT KEY SYSTEM)
3P	R	IGNITION (WITH INTELLIGENT KEY SYSTEM)
4P	-	-
5P	-	-
6P	G	RELAY CONTROL
7P	-	-
8P	BG	IGNITION
9P	BG	BATTERY
10P	SB	IGNITION
11P	-	-
12P	-	-
13P	R	BATTERY
14P	-	-
15P	-	-

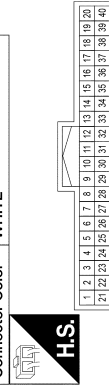
16P	GR	RELAY CONTROL (WITHOUT INTELLIGENT KEY SYSTEM)
16P	Y	RELAY CONTROL (WITH INTELLIGENT KEY SYSTEM)

Connector No.	M22
Connector Name	DATA LINK CONNECTOR
Connector Type	BD16FW
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	-	-
4	B	GROUND
5	B	GROUND
6	L	CAN-H
7	LG	K-LINE
8	G	IGNITION
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	P	CAN-L
15	-	-
16	GR	BATTERY

Connector No.	M24
Connector Name	COMBINATION METER (WITH MONOCHROME DISPLAY)
Connector Type	TH40FW-NH
Connector Color	WHITE

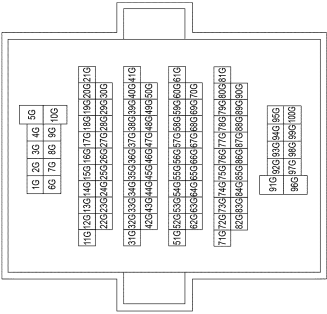


Terminal No.	Color of Wire	Signal Name
1	-	-

2	-	-
3	-	-
4	V	WASHER LEVEL SW
5	R	FILTER
6	R	ACC
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12	W	DR BELT SW
13	-	-
14	B	AIR BAG (WITH OUT AIR BAGS)
14	BR	AIR BAG (WITH AIR BAGS)
15	Y	FUEL SENSOR
16	G	SPEED SENS +
17	SB	8P/R OUTPUT
18	-	-
19	P	CAN-H
20	L	CAN-L
21	-	-
22	-	-
23	SB	OIL LEVEL GND
24	L	OIL LEVEL
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	W	BRAKE OIL SW
32	G	PKB SW
33	BG	IGN
34	Y	BRAKE SW
35	R	SPEED SENS -
36	BR	CHG
37	B	FUEL SENSOR GND
38	-	-
39	B	GND (POWER)
40	B	GND (SENS)

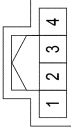
ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE



80G	BR	TO ENGINE ROOM HARNESS
81G	-	TO ENGINE ROOM HARNESS
82G	Y	TO ENGINE ROOM HARNESS
83G	W	TO ENGINE ROOM HARNESS
84G	GR	TO ENGINE ROOM HARNESS
85G	R	TO ENGINE ROOM HARNESS
86G	B	TO ENGINE ROOM HARNESS
87G	BR	TO ENGINE ROOM HARNESS
88G	L	TO ENGINE ROOM HARNESS
89G	BR	TO ENGINE ROOM HARNESS
90G	-	TO ENGINE ROOM HARNESS
91G	-	TO ENGINE ROOM HARNESS
92G	-	TO ENGINE ROOM HARNESS
93G	P	TO ENGINE ROOM HARNESS
94G	-	TO ENGINE ROOM HARNESS
95G	-	TO ENGINE ROOM HARNESS
96G	G	TO ENGINE ROOM HARNESS
97G	-	TO ENGINE ROOM HARNESS
98G	L	TO ENGINE ROOM HARNESS
99G	-	TO ENGINE ROOM HARNESS
100G	R	TO ENGINE ROOM HARNESS

Connector No.	M48
Connector Name	WIRE TO WIRE
Connector Type	TH04FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	GR	TO MAIN HARNESS
2	SB	TO MAIN HARNESS
3	B	TO MAIN HARNESS
4	BR	TO MAIN HARNESS
5	-	TO MAIN HARNESS
6	-	TO MAIN HARNESS
7	B	TO MAIN HARNESS
8	V	TO MAIN HARNESS

Terminal No.	Color of Wire	Signal Name
1G	V	TO ENGINE ROOM HARNESS
2G	SHIELD	TO ENGINE ROOM HARNESS
3G	R	TO ENGINE ROOM HARNESS
4G	BR	TO ENGINE ROOM HARNESS
5G	SB	TO ENGINE ROOM HARNESS
6G	Y	TO ENGINE ROOM HARNESS
7G	-	TO ENGINE ROOM HARNESS
8G	-	TO ENGINE ROOM HARNESS
9G	-	TO ENGINE ROOM HARNESS
10G	Y	TO ENGINE ROOM HARNESS
11G	W	TO ENGINE ROOM HARNESS
12G	L	TO ENGINE ROOM HARNESS
13G	R	TO ENGINE ROOM HARNESS
14G	G	TO ENGINE ROOM HARNESS
15G	B	TO ENGINE ROOM HARNESS
16G	V	TO ENGINE ROOM HARNESS
17G	W	TO ENGINE ROOM HARNESS
18G	Y	TO ENGINE ROOM HARNESS
19G	SB	TO ENGINE ROOM HARNESS
20G	R	TO ENGINE ROOM HARNESS
21G	BR	TO ENGINE ROOM HARNESS
22G	P	TO ENGINE ROOM HARNESS
23G	W	TO ENGINE ROOM HARNESS
24G	GR	TO ENGINE ROOM HARNESS
25G	SB	TO ENGINE ROOM HARNESS
26G	-	TO ENGINE ROOM HARNESS

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ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[QR25DE]

ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

Connector No.	M68
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FBR-CS
Connector Color	BROWN

7R 6R 5R 4R 3R 2R 1R
 16R 15R 14R 13R 12R 11R 10R 9R 8R

Terminal No.	Color of Wire	Signal Name
1R	-	-
2R	G	IGNITION
3R	GR	BATTERY
4R	-	-
5R	Y	BATTERY
6R	R	ACCESSORY
7R	-	-
8R	-	-
9R	-	-
10R	-	-
11R	-	-
12R	P	BATTERY
13R	B	IGNITION
14R	-	-
15R	BR	BATTERY
16R	R	ACCESSORY

Connector No.	M71
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITHOUT INTELLIGENT KEY)
Connector Type	TH40FW-NH
Connector Color	WHITE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Terminal No.	Color of Wire	Signal Name
1	B	GND (STRG/SATELLITE SW GND)
2	-	-
3	-	-
4	-	-

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5	-	-
6	-	-
7	R	SECURITY
8	-	-
9	-	-
10	-	-
11	BR	CHG
12	-	-
13	-	-
14	R	ACC
15	-	-
16	BR	AIR BAG
17	-	-
18	P	TRIP RESET SW
19	-	-
20	-	-
21	R	FILTER
22	V	STRG SW A
23	BG	STRG SW B
24	V	WASHER SW
25	W	BRAKE OIL SW
26	G	PKB SW
27	-	-
28	W	DR BELT SW
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	R	ILL UP SW
37	G	ILL DOWN SW
38	SB	8PR OUTPUT
39	-	-
40	-	-

Connector No.	M73
Connector Name	COMBINATION SWITCH (SPIRAL CABLE)
Connector Type	TK08FGY-1V
Connector Color	GRAY

10 9 8 7
 14 13 12 11

Terminal No.	Color of Wire	Signal Name
-	-	-

7	B	ASC D STEERING SWITCH GROUND
8	BG	STRG SW B
9	V	STRG SW A
10	SB	ASC D STEERING SWITCH
11	B	GND (STRG/SATELLITE SW GND)
12	-	-
13	-	-
14	-	-

Connector No.	M85
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITHOUT INTELLIGENT KEY)
Connector Type	TH12FW-NH
Connector Color	WHITE

41 42 43 44 45 46
 47 48 49 50 51 52

Terminal No.	Color of Wire	Signal Name
41	L	CAN-H
42	P	CAN-L
43	-	-
44	B	FUEL SENSOR GND
45	R	BAT
46	BG	IGN
47	SB	M-CAN H
48	LG	M-CAN L
49	L	OIL LEVEL
50	SB	OIL LEVEL GND
51	Y	FUEL SENSOR
52	B	G1

Connector No.	M87
Connector Name	COMBINATION METER (WITH MONOCHROME DISPLAY)
Connector Type	FEA09FW-FHAG-SA
Connector Color	WHITE

65 66 67 68 69 70 71 72 73
 74 75 76 77 78 79

Terminal No.	Color of Wire	Signal Name
65	R	BATTERY (FUSE)
66	-	-
67	-	-
68	-	-
69	L	AIRCON SW
70	R	BLOWER FAN SW
71	-	-
72	-	-
73	BR	ROOM LAMP OUTPUT (GND)
74	Y	BAT(F/L)
75	-	-
76	-	-
77	P	FLASHER OUTPUT (LEFT)
78	GR	FLASHER OUTPUT (RIGHT)
79	B	GND

ENGINE CONTROL SYSTEM CONNECTORS - WITH QR25DE

Connector No.	M91
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITHOUT INTELLIGENT KEY)
Connector Type	TH40FB-NH
Connector Color	BLACK

100	101	100	99	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83
102	121	120	119	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103

116	R	COMBINATION SW INPUT 2
117	V	COMBINATION SW INPUT 3
118	Y	COMBINATION SW INPUT 4
119	LG	COMBINATION SW INPUT 5
120	W	COMBINATION SW OUTPUT 1
121	G	COMBINATION SW OUTPUT 2
122	SB	COMBINATION SW OUTPUT 3

Connector No.	M100
Connector Name	JOINT CONNECTOR-M04
Connector Type	NH24FGY-J
Connector Color	GRAY

4	3	2	1
8	7	6	5
12	11	10	9
16	15	14	13
20	19	18	17
24	23	22	21

Terminal No.	Color of Wire	Signal Name
83	V	KEYLESS & AUTO LIGHT SENSOR GND
84	-	-
85	BG	AUTO LIGHT SENSOR INPUT 1
86	Y	AUTO LIGHT SENSOR POWER SUPPLY OUTPUT
87	R	SECURITY INDICATOR OUTPUT
88	G	KEY SW
89	-	-
90	-	-
91	LG	KEYLESS TUNER SIGNAL
92	BG	KEYLESS TUNER POWER SUPPLY
93	BG	IGN SW
94	-	-
95	-	-
96	Y	BRAKE SW
97	-	-
98	V	HAZARD SW
99	Y	AIR CON SW
100	LG	BLOWER FAN SW
101	L	COMBINATION SW OUTPUT 5
102	GR	COMBINATION SW OUTPUT 4
103	P	CAN-L
104	L	CAN-H
105	R	ACC SW
106	-	-
107	-	-
108	G	IMMOBILIZER ONE WAY COMMUNICATION (CLOCK)
109	W	IMMOBILIZER TWO WAY COMMUNICATION
110	R	DOOR LOCK STATUS SW (DR)
111	BR	REAR DEFROGGER SW
112	G	CENTRAL DOOR UNLOCK SW
113	Y	CENTRAL DOOR LOCK SW
114	-	-
115	SB	COMBINATION SW INPUT 1

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Connector No.	M101
Connector Name	JOINT CONNECTOR-M06
Connector Type	NH20FL-DC
Connector Color	BLUE

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Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
2	L	CAN-H
3	L	CAN-H
4	L	CAN-H
5	L	CAN-H
6	-	-
7	L	CAN-H
8	-	-
9	-	-
10	-	-
11	P	CAN-L
12	P	CAN-L
13	P	CAN-L
14	P	CAN-L
15	P	CAN-L
16	-	-
17	P	CAN-L
18	LG	BATTERY SAVER OUTPUT
19	LG	BATTERY SAVER OUTPUT
20	LG	BATTERY SAVER OUTPUT

Connector No.	M149
Connector Name	COMBINATION SWITCH (SPIRAL CABLE)
Connector Type	TK08FGY-X
Connector Color	GRAY

22	21	20	19	18	17	16	15
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Terminal No.	Color of Wire	Signal Name
15	R	ASCD STEERING SWITCH
16	W	STRG SW A

17	L	HORN RELAY OUTPUT
18	B	ASCD STEERING SWITCH GROUND
19	R	GND (STRG/SATELLITE SW GND)
20	G	STRG SW B
21	P	GROUND
22	Y	CLEARANCE LH

Connector No.	M152
Connector Name	WIRE TO WIRE
Connector Type	TH04MW-NH
Connector Color	WHITE

4	3	2	1
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Terminal No.	Color of Wire	Signal Name
1	GR	TO MAIN HARNESS
2	SB	TO MAIN HARNESS
3	B	TO MAIN HARNESS
4	BR	TO MAIN HARNESS

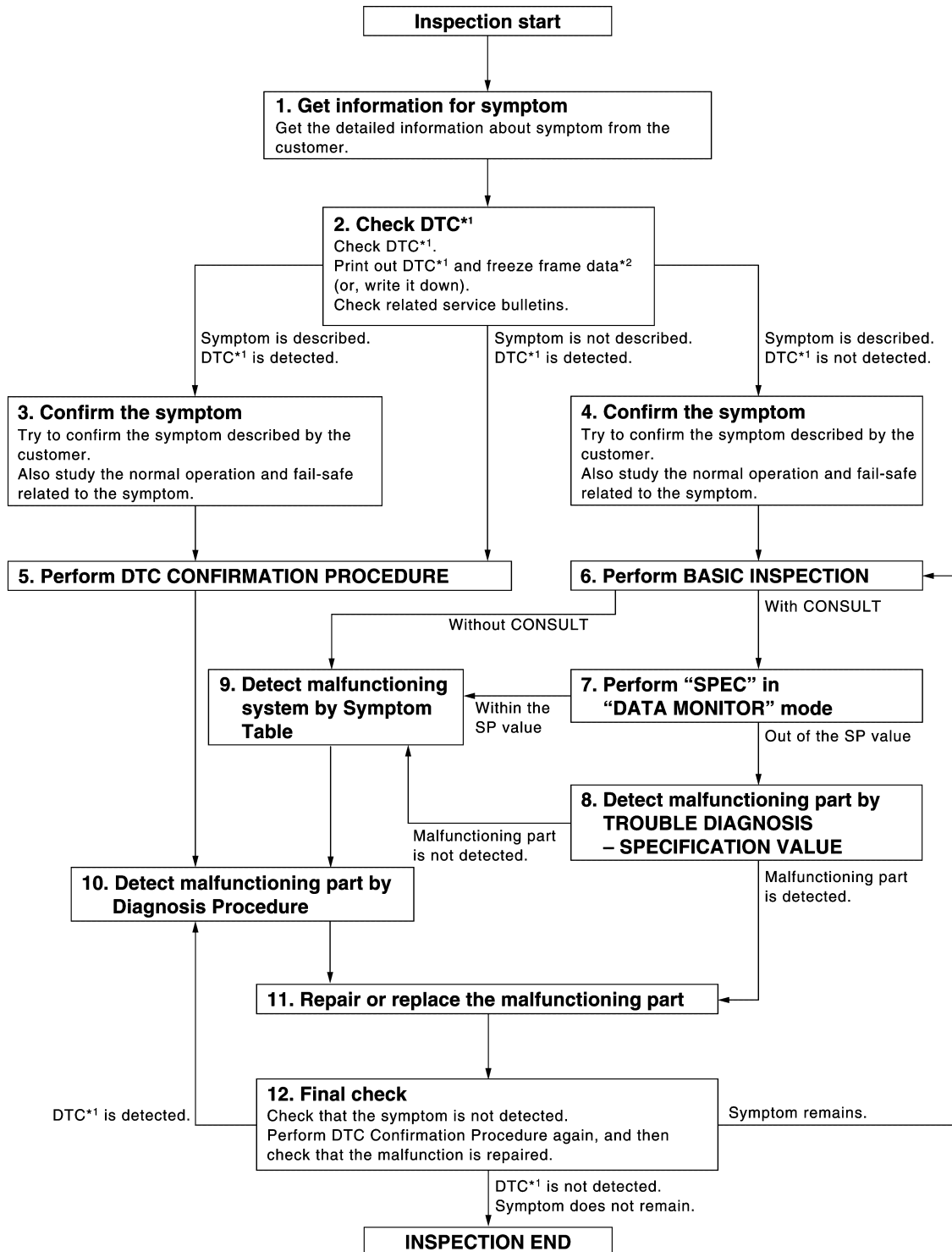
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000014267513

OVERALL SEQUENCE



*1: Include 1st trip DTC.

*2: Include 1st trip freeze frame data.

JSBIA1228GB

DETAILED FLOW

1. GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the "Diagnostic Work Sheet". (Refer to [EC-127, "Diagnostic Work Sheet"](#).)

>> GO TO 2.

2. CHECK DTC

1. Check DTC.
2. Perform the following procedure if DTC is displayed.
 - Record DTC and freeze frame data. (Print them out with CONSULT or GST.)
 - Erase only DTC of "ENGINE".
 - Ⓜ With CONSULT: "How to Erase DTC and 1st Trip DTC" in [EC-73, "CONSULT Function"](#).
 - ⓧ Without CONSULT: "How to Erase Self-diagnostic Results" in [EC-70, "On Board Diagnosis Function"](#).
 - Study the relationship between the cause detected by DTC and the symptom described by the customer. (Symptom Matrix Chart is useful. Refer to [EC-382, "Symptom Table"](#).)
3. Check related service bulletins for information.

Are any symptoms described and any DTCs detected?

- Symptom is described, DTC is detected>>GO TO 3.
- Symptom is described, DTC is not detected>>GO TO 4.
- Symptom is not described, DTC is detected>>GO TO 5.

3. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer (except MIL ON).
Also study the normal operation and fail-safe related to the symptom. Refer to [EC-387, "Description"](#) and [EC-93, "Fail Safe"](#).
Diagnosis Work Sheet is useful to verify the incident.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

4. CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Also study the normal operation and fail-safe related to the symptom. Refer to [EC-387, "Description"](#) and [EC-93, "Fail Safe"](#).
Diagnosis Work Sheet is useful to verify the incident.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

5. PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the displayed DTC, and then check that DTC is detected again.
If two or more DTCs are detected, refer to [EC-97, "DTC Inspection Priority Chart"](#) and determine trouble diagnosis order.

NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.
If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIRMATION PROCEDURE.

Is DTC detected?

- YES >> GO TO 10.
- NO >> Check according to [GI-45, "Intermittent Incident"](#).

6. PERFORM BASIC INSPECTION

< BASIC INSPECTION >

Perform [EC-128, "Work Procedure"](#).

Do you have CONSULT?

- YES >> GO TO 7.
- NO >> GO TO 9.

7.PERFORM SPEC IN DATA MONITOR MODE

 With CONSULT

Check that "MAS A/F SE-B1", "MASS AIR FLOW SENSOR (Hz)", "B/FUEL SCHDL", "A/F ALPHA-B1" and "A/F ALPHA-B2" are within the SP value using "SPEC" in "DATA MONITOR" mode with CONSULT. Refer to [EC-142, "Component Function Check"](#).

Is the measurement value within the SP value?

- YES >> GO TO 9.
- NO >> GO TO 8.

8.DETECT MALFUNCTIONING PART BY TROUBLE DIAGNOSIS - SPECIFICATION VALUE

Detect malfunctioning part according to [EC-143, "Diagnosis Procedure"](#).

Is a malfunctioning part detected?

- YES >> GO TO 11.
- NO >> GO TO 9.

9.DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE

Detect malfunctioning system according to [EC-382, "Symptom Table"](#) based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptoms.

>> GO TO 10.

10.DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

NOTE:

The Diagnosis Procedure in EC section described based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnosis Procedure. For details, refer to [GI-47, "Circuit Inspection"](#).

Is a malfunctioning part detected?

- YES >> GO TO 11.
- NO >> Monitor input data from related sensors or check voltage of related ECM terminals using CONSULT. Refer to [EC-81, "Reference Value"](#).

11.REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement.
3. Check DTC. If DTC is displayed, erase it. Refer to the following.
 -  With CONSULT: "How to Erase DTC and 1st Trip DTC" in [EC-73, "CONSULT Function"](#).
 -  Without CONSULT: "How to Erase Self-diagnostic Results" in [EC-70, "On Board Diagnosis Function"](#).

>> GO TO 12.

12.FINAL CHECK

When DTC was detected in step 2, perform DTC CONFIRMATION PROCEDURE or Component Function Check again, and then check that the malfunction have been completely repaired.

When symptom was described from the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected.

Is DTC detected and does symptom remain?

- YES-1 >> DTC is detected: GO TO 10.
- YES-2 >> Symptom remains: GO TO 6.
- NO >> Before returning the vehicle to the customer, always erase unnecessary DTC in ECM ( With CONSULT: Refer to "How to Erase DTC and 1st Trip DTC" in [EC-73, "CONSULT Function"](#)).

[QR25DE]

Diagnostic Work Sheet

INFOID:0000000014267514

EC

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MTBL0017

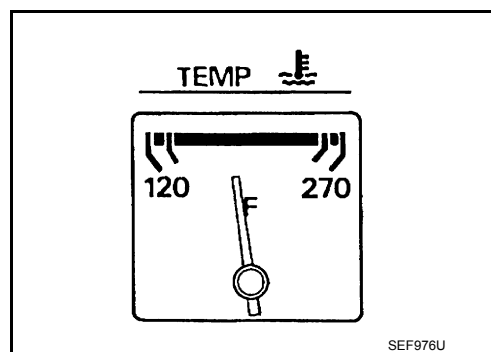
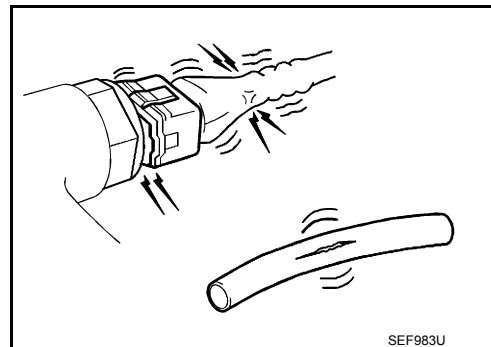
BASIC INSPECTION

Work Procedure

INFOID:000000014267515

1.INSPECTION START

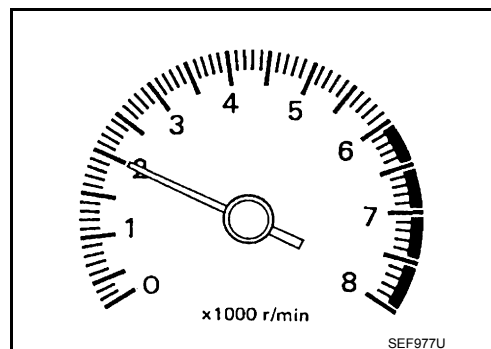
1. Check service records for any recent repairs that may indicate a related malfunction, or a current need for scheduled maintenance.
2. Open engine hood and check the following:
 - Harness connectors for improper connections
 - Wiring harness for improper connections, pinches and cut
 - Vacuum hoses for splits, kinks and improper connections
 - Hoses and ducts for leaks
 - Air cleaner clogging
 - Gasket
3. Confirm that electrical or mechanical loads are not applied.
 - Headlamp switch is OFF.
 - Air conditioner switch is OFF.
 - Rear window defogger switch is OFF.
 - Steering wheel is in the straight-ahead position, etc.
4. Start engine and warm it up until engine coolant temperature indicator points the middle of gauge. Ensure engine stays below 1,000 rpm.



5. Run engine at about 2,000 rpm for about 2 minutes under no load.
6. Make sure that no DTC is displayed with CONSULT or GST.

Is any DTC detected?

- YES >> GO TO 2.
NO >> GO TO 3.



2.REPAIR OR REPLACE

Repair or replace components as necessary according to corresponding Diagnostic Procedure.

>> GO TO 3.

3.CHECK TARGET IDLE SPEED

1. Run engine at about 2,000 rpm for about 2 minutes under no load.

BASIC INSPECTION

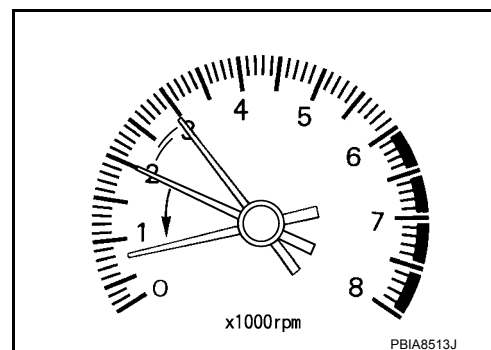
[QR25DE]

< BASIC INSPECTION >

- Rev engine (2,000 to 3,000 rpm) two or three times under no load, then run engine at idle speed for about 1 minute.
- Check idle speed.
For procedure, refer to [EC-388, "Inspection"](#).
For specification, refer to [EC-394, "Idle Speed"](#).

Is the inspection result normal?

- YES >> GO TO 10.
NO >> GO TO 4.



4.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

- Stop engine.
- Perform Accelerator Pedal Released Position Learning. Refer to [EC-135, "Description"](#).

>> GO TO 5.

5.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform Throttle Valve Closed Position Learning. Refer to [EC-136, "Description"](#).

>> GO TO 6.

6.PERFORM IDLE AIR VOLUME LEARNING

Perform Idle Air Volume Learning. Refer to [EC-137, "Description"](#).

Is Idle Air Volume Learning carried out successfully?

- YES >> GO TO 7.
NO >> Follow the instruction of Idle Air Volume Learning. Then GO TO 4.

7.CHECK TARGET IDLE SPEED AGAIN

- Start engine and warm it up to normal operating temperature.
- Check idle speed.
For procedure, refer to [EC-388, "Inspection"](#).
For specification, refer to [EC-394, "Idle Speed"](#).

Is the inspection result normal?

- YES >> GO TO 10.
NO >> GO TO 8.

8.DETECT MALFUNCTIONING PART

Check the Following.

- Check camshaft position sensor (PHASE) and circuit. Refer to [EC-252, "DTC Description"](#).
- Check crankshaft position sensor (POS) and circuit. Refer to [EC-248, "DTC Description"](#).

Is the inspection result normal?

- YES >> GO TO 9.
NO >> Repair or replace. Then GO TO 4

9.CHECK ECM FUNCTION

- Substitute another known-good ECM to check ECM function. (ECM may be the cause of an incident, but this is a rare case.)
- Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to [SEC-72, "Description"](#) (with I-key) or [SEC-241, "Description"](#) (without I-key).

>> GO TO 4.

10.CHECK IGNITION TIMING

- Run engine at idle.

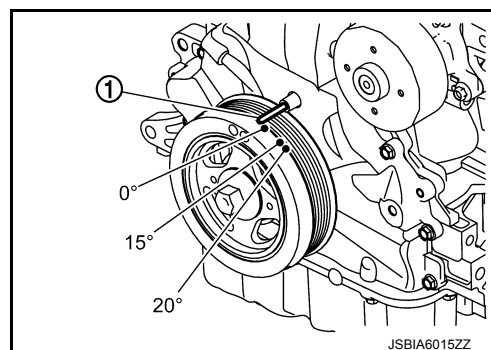
< BASIC INSPECTION >

2. Check ignition timing with a timing light.
For procedure, refer to [EC-389, "Inspection"](#).
For specification, refer to [EC-394, "Ignition Timing"](#).

① Timing indicator

Is the inspection result normal?

YES >> INSPECTION END.
NO >> GO TO 11.



11.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

1. Stop engine.
2. Perform Accelerator Pedal Released Position Learning. Refer to [EC-135, "Description"](#).

>> GO TO 12.

12.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform Throttle Valve Closed Position Learning. Refer to [EC-136, "Description"](#).

>> GO TO 13.

13.PERFORM IDLE AIR VOLUME LEARNING

Perform Idle Air Volume Learning. Refer to [EC-137, "Description"](#).

Is Idle Air Volume Learning carried out successfully?

YES >> GO TO 14.
NO >> Follow the instruction of Idle Air Volume Learning. Then GO TO 4.

14.CHECK TARGET IDLE SPEED AGAIN

1. Start engine and warm it up to normal operating temperature.
2. Check idle speed.
For procedure, refer to [EC-388, "Inspection"](#).
For specification, refer to [EC-394, "Idle Speed"](#).

Is the inspection result normal?

YES >> GO TO 15.
NO >> GO TO 17.

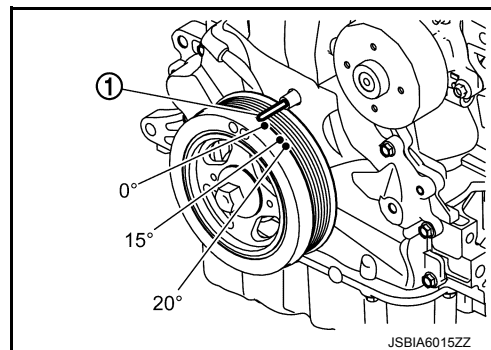
15.CHECK IGNITION TIMING AGAIN

1. Run engine at idle.
2. Check ignition timing with a timing light.
For procedure, refer to [EC-389, "Inspection"](#).
For specification, refer to [EC-394, "Ignition Timing"](#).

① Timing indicator

Is the inspection result normal?

YES >> INSPECTION END.
NO >> GO TO 16.



16.CHECK TIMING CHAIN INSTALLATION

Check timing chain installation. Refer to [EM-51, "Removal and Installation"](#).

Is the inspection result normal?

YES >> GO TO 17.
NO >> Repair the timing chain installation. Then GO TO 4.

< BASIC INSPECTION >

17.DETECT MALFUNCTIONING PART

Check the following.

- Check camshaft position sensor (PHASE) and circuit. Refer to [EC-252, "DTC Description"](#).
- Check crankshaft position sensor (POS) and circuit. Refer to [EC-248, "DTC Description"](#).

Is the inspection result normal?

YES >> GO TO 18.

NO >> Repair or replace. Then GO TO 4

18.CHECK ECM FUNCTION

1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of an incident, but this is a rare case.)
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to [SEC-72, "Description"](#) (with I-key) or [SEC-241, "Description"](#) (without I-key).

>> GO TO 4.

A

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C

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ADDITIONAL SERVICE WHEN REPLACING ECM

Description

INFOID:0000000014267516

When replacing ECM, the following procedure must be performed. (For details, refer to [EC-132, "Work Procedure."](#))

PROGRAMMING OPERATION

NOTE:

After replacing with a blank ECM, programming is required to write ECM information. Be sure to follow the procedure to perform the programming.

Work Procedure

INFOID:0000000014267517

1. SAVE ECM DATA

Ⓟ With CONSULT

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Select "SAVING DATA FOR REPLC CPU" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
5. Follow the instruction of CONSULT display.

NOTE:

- Necessary data in ECM is copied and saved to CONSULT.
- Go to Step 2 regardless of with or without success in saving data.

>> GO TO 2.

2. CHECK ECM PART NUMBER

Check ECM part number to see whether it is blank ECM or not.

NOTE:

- Part number of blank ECM is 23703 - xxxxxx.
- Check part number when ordering ECM or the one included in the label on the container box.

Is the ECM a blank ECM?

- YES >> GO TO 3.
NO >> GO TO 5.

3. SAVE ECM PART NUMBER

Read out the part number from the old ECM and save the number, following the programming instructions. Refer to CONSULT Operation Manual.

NOTE:

- The ECM part number is saved in CONSULT.
- Even when ECM part number is not saved in CONSULT, go to 4.

>> GO TO 4.

4. PERFORM ECM PROGRAMMING

After replacing ECM, perform the ECM programming. Refer to CONSULT Operation Manual.

NOTE:

- Refer to [EC-392, "Removal and Installation"](#) for replacement of ECM.
- During programming, maintain the following conditions:
 - Ignition switch: ON
 - Electric load: OFF
 - Brake pedal: Not depressed
 - Battery voltage: 12 – 13.5 V (Be sure to check the value of battery voltage by selecting "BATTERY VOLT" in "Data monitor" of CONSULT.)

>> GO TO 6.

5. REPLACE ECM

ADDITIONAL SERVICE WHEN REPLACING ECM

< BASIC INSPECTION >

[QR25DE]

Replace ECM. Refer to [EC-392, "Removal and Installation"](#).

>> GO TO 6.

6.PERFORM INITIALIZATION OF NATS SYSTEM AND REGISTRATION OF ALL NATS IGNITION KEY IDS

Perform Initialization of NATS System and Registration of All NATS Ignition Key IDS. Refer to [SEC-72, "Description"](#) (with I-key) or [SEC-241, "Description"](#) (without I-key).

>> GO TO 7.

7.CHECK ECM DATA STATUS

Check if the data is successfully copied from the ECM at Step 1 (before replacement) and saved in CONSULT.
Is the data saved successfully?

YES >> GO TO 8.

NO >> GO TO 9.

8.WRITE ECM DATA

 With CONSULT

1. Select "WRITING DATA FOR REPLC CPU" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
2. Follow the instruction of CONSULT display.

NOTE:

The data saved by "SAVING DATA FOR REPLC CPU" is written to ECM.

>> GO TO 10.

9.PERFORM VIN REGISTRATION

Perform VIN Registration. Refer to [EC-134, "Description"](#).

>> GO TO 10.

10.PERFORM ACCELERATOR PEDAL RELEASED POSITION LEARNING

Perform Accelerator Pedal Released Position Learning. Refer to [EC-135, "Description"](#).

>> GO TO 11.

11.PERFORM THROTTLE VALVE CLOSED POSITION LEARNING

Perform Throttle Valve Closed Position Learning. Refer to [EC-136, "Description"](#).

>> GO TO 12.

12.PERFORM IDLE AIR VOLUME LEARNING

Perform Idle Air Volume Learning. Refer to [EC-137, "Description"](#).

>> END

VIN REGISTRATION

Description

INFOID:0000000014267518

VIN Registration is an operation to registering VIN in ECM. (For details, refer to [EC-134. "Work Procedure"](#).)
It must be performed each time ECM is replaced.

Work Procedure

INFOID:0000000014267519

1. CHECK VIN

Check the VIN of the vehicle and note it. Refer to [GI-36. "Identification Number"](#).

>> GO TO 2.

2. PERFORM VIN REGISTRATION

Ⓟ With CONSULT

1. Turn ignition switch ON and engine stopped.
2. Select "VIN REGISTRATION" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
3. Follow the instruction of CONSULT display.

>> END

ACCELERATOR PEDAL RELEASED POSITION LEARNING

< BASIC INSPECTION >

[QR25DE]

ACCELERATOR PEDAL RELEASED POSITION LEARNING

Description

INFOID:0000000014267520

Accelerator Pedal Released Position Learning is a function of ECM to learn the fully released position of the accelerator pedal by monitoring the accelerator pedal position sensor output signal. (For details, refer to [EC-135, "Work Procedure"](#).)

It must be performed each time harness connector of accelerator pedal position sensor or ECM is disconnected.

Work Procedure

INFOID:0000000014267521

1.START

1. Make sure that accelerator pedal is fully released.
2. Turn ignition switch ON and wait at least 2 seconds.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON and wait at least 2 seconds.
5. Turn ignition switch OFF and wait at least 10 seconds.

>> END

THROTTLE VALVE CLOSED POSITION LEARNING

< BASIC INSPECTION >

[QR25DE]

THROTTLE VALVE CLOSED POSITION LEARNING

Description

INFOID:0000000014267522

Throttle Valve Closed Position Learning is a function of ECM to learn the fully closed position of the throttle valve by monitoring the throttle position sensor output signal. (For details, refer to [EC-136. "Work Procedure"](#).) It must be performed each time the harness connector of the electric throttle control actuator or ECM is disconnected or electric throttle control actuator inside is cleaned.

Work Procedure

INFOID:0000000014267523

1. START

Ⓐ With CONSULT

1. Turn ignition switch ON.
2. Select "CLSD THL POS LEARN" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
3. Follow the instructions on the CONSULT display.
4. Turn ignition switch OFF and wait at least 10 seconds.
Check that throttle valve moves during the above 10 seconds by confirming the operating sound.

Ⓑ Without CONSULT

1. Start the engine.
NOTE:
Engine coolant temperature is 25°C (77°F) or less before engine starts.
2. Warm up the engine.
NOTE:
Raise engine coolant temperature until it reaches 65°C (149°F) or more.
3. Turn ignition switch OFF and wait at least 10 seconds.
Check that throttle valve moves during the above 10 seconds by confirming the operating sound.

>> END

IDLE AIR VOLUME LEARNING

Description

INFOID:0000000014267524

Idle Air Volume Learning is a function of ECM to learn the idle air volume that keeps each engine idle speed within the specific range. (For details, refer to [EC-137, "Work Procedure"](#).)

It must be performed under any of the following conditions:

- Each time electric throttle control actuator or ECM is replaced.
- Idle speed or ignition timing is out of specification.

Work Procedure

INFOID:0000000014267525

1. PRECONDITIONING

Make sure that all of the following conditions are satisfied.

Learning will be cancelled if any of the following conditions are missed for even a moment.

- Battery voltage: More than 12.9 V (At idle)
- Engine coolant temperature: 70 - 100°C (158 - 212°F)
- Selector lever: P or N
- Electric load switch: OFF
(Air conditioner, headlamp, rear window defogger)

On vehicles equipped with daytime running light systems, set lighting switch to the 1st position to light only small lamps.

- Steering wheel: Neutral (Straight-ahead position)
- Vehicle speed: Stopped
- Transmission: Warm-up (Drive vehicle for 10 minutes.)

Do you have CONSULT?

YES >> GO TO 2.

NO >> GO TO 3.

2. IDLE AIR VOLUME LEARNING

 With CONSULT

1. Perform Accelerator Pedal Released Position Learning. Refer to [EC-135, "Description"](#).
2. Perform Throttle Valve Closed Position Learning. Refer to [EC-136, "Description"](#).
3. Start engine and warm it up to normal operating temperature.
4. Select "IDLE AIR VOL LEARN" in "WORK SUPPORT" mode of "ENGINE".
5. Touch "START" and wait 20 seconds.

Is "CMPLT" displayed on CONSULT screen?

YES >> GO TO 4.

NO >> GO TO 5.

3. IDLE AIR VOLUME LEARNING

 Without CONSULT**NOTE:**

- It is better to count the time accurately with a clock.
- It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.

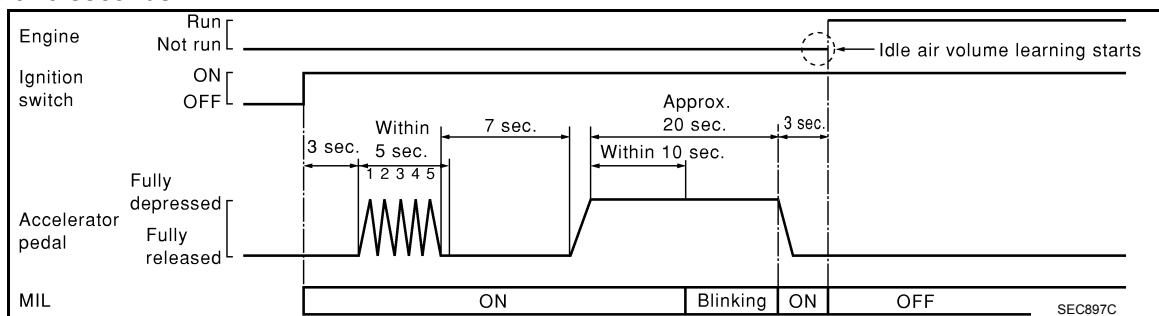
1. Perform Accelerator Pedal Released Position Learning. Refer to [EC-135, "Description"](#).
2. Perform Throttle Valve Closed Position Learning. Refer to [EC-136, "Description"](#).
3. Start engine and warm it up to normal operating temperature.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
6. Repeat the following procedure quickly five times within 5 seconds.
 - Fully depress the accelerator pedal.
 - Fully release the accelerator pedal.
7. Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 20 seconds until the MIL stops blinking and turned ON.
8. Fully release the accelerator pedal within 3 seconds after the MIL turned ON.
9. Start engine and let it idle.

IDLE AIR VOLUME LEARNING

[QR25DE]

< BASIC INSPECTION >

10. Wait 20 seconds.



>> GO TO 4

4. CHECK IDLE SPEED AND IGNITION TIMING

Rev up the engine two or three times and make sure that idle speed and ignition timing are within the specifications. For specification, refer to [EC-394, "Idle Speed"](#) and [EC-394, "Ignition Timing"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check the following

- Check that throttle valve is fully closed.
- Check PCV valve operation.
- Check that downstream of throttle valve is free from air leakage.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace malfunctioning part.

6. DETECT MALFUNCTIONING PART

Engine component parts and their installation condition are questionable. Check and eliminate the cause of the incident.

It is useful to perform "TROUBLE DIAGNOSIS - SPECIFICATION VALUE". Refer to [EC-142, "Description"](#).

If any of the following conditions occur after the engine has started, eliminate the cause of the incident and perform Idle Air Volume Learning all over again:

- Engine stalls.
- Erroneous idle.

>> INSPECTION END

MIXTURE RATIO SELF-LEARNING VALUE CLEAR

< BASIC INSPECTION >

[QR25DE]

MIXTURE RATIO SELF-LEARNING VALUE CLEAR

Description

INFOID:0000000014267526

This describes how to erase the mixture ratio self-learning value. (For details, refer to [EC-139. "Work Procedure"](#).)

For the actual procedure, follow the instructions in "Diagnosis Procedure".

Work Procedure

INFOID:0000000014267527

1. START

With CONSULT

1. Start engine and warm it up to normal operating temperature.
2. Select "SELF-LEARNING CONT" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
3. Clear mixture ratio self-learning value by touching "CLEAR".

With GST

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF.
3. Disconnect mass air flow sensor harness connector.
4. Restart engine and let it idle for at least 5 seconds.
5. Stop engine and reconnect mass air flow sensor harness connector.
6. Select Service \$03 with GST. Make sure DTC P0102 is detected.
7. Select Service \$04 with GST to erase the DTC P0102.

>> END

FUEL PRESSURE

Work Procedure

INFOID:000000014267528

FUEL PRESSURE RELEASE

1. FUEL PRESSURE RELEASE

① With CONSULT

1. Turn ignition switch ON.
2. Perform "FUEL PRESSURE RELEASE" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
3. Start engine.
4. After engine stalls, crank it two or three times to release all fuel pressure.
5. Turn ignition switch OFF.

② Without CONSULT

1. Remove fuel pump fuse located in IPDM E/R. For the fuse number, refer to [EC-108, "Wiring Diagram"](#). For the fuse arrangement, refer to [PG-137, "Fuse, Connector and Terminal Arrangement"](#).
2. Start engine.
3. After engine stalls, crank it two or three times to release all fuel pressure.
4. Turn ignition switch OFF.
5. Reinstall fuel pump fuse after servicing fuel system.

>> END

FUEL PRESSURE CHECK

CAUTION:

- Before disconnecting fuel line, release fuel pressure from fuel line to eliminate danger.
- The fuel hose connection method used when taking fuel pressure check must not be used for other purposes.
- Be careful not to scratch or put debris around connection area when servicing, so that the quick connector maintains sealability with O-rings inside.
- Do not perform fuel pressure check with electrical systems operating (i.e. lights, rear defogger, A/C, etc.) Fuel pressure gauge may indicate false readings due to varying engine load and changes in manifold vacuum.

NOTE:

Prepare pans or saucers under the disconnected fuel line because the fuel may spill out. The fuel pressure cannot be completely released because this models do not have fuel return system.

1. FUEL PRESSURE CHECK

1. Release fuel pressure to zero.
2. Prepare fuel hose for fuel pressure check (B) and fuel tube adapter (SST: KV10120000) (D), then connect fuel pressure gauge (A).

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FUEL PRESSURE

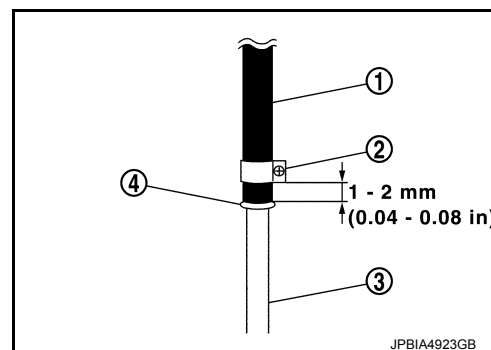
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[QR25DE]

4. Connect fuel hose ① for fuel pressure check to fuel tube (engine side) ③ with clamp ② as shown in the figure.

CAUTION:

- Wipe off oil or dirt from hose insertion part using cloth moistened with gasoline.
- Apply proper amount of gasoline between top of the fuel tube and spool ④.
- Insert fuel hose for fuel pressure check until it touches the spool on fuel tube.
- Use NISSAN genuine hose clamp (part number: 16439 N4710 or 16439 40U00).
- When reconnecting fuel line, always use new clamps.
- Use a torque driver to tighten clamps.
- Install hose clamp to the position within 1 - 2 mm (0.04 - 0.08 in).

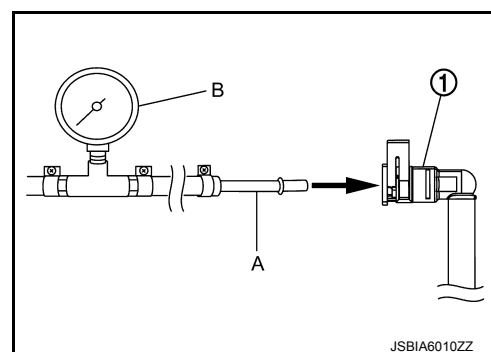


Tightening torque : 1 - 1.5 N·m (0.1 - 0.15 kg-m, 9 - 13 in-lb)

- Make sure that clamp screw does not contact adjacent parts.

5. Connect fuel tube adapter (SST: KV10120000) (A) to quick connector ①.

B : Fuel pressure gauge



6. After connecting fuel hose for fuel pressure check, pull the hose with a force of approximately 98 N (10 kg, 22 lb) to confirm fuel tube does not come off.
7. Reinstall the part removed at Step 3.

NOTE:

Install the part to allow smooth engine starts.

8. Turn ignition switch ON and check for fuel leakage.
9. Start the engine and check for fuel leakage.
10. Read the indication of fuel pressure gauge.

CAUTION:

- Do not perform fuel pressure check with system operating. Fuel pressure gauge may indicate false readings.
- During fuel pressure check, confirm for fuel leakage from fuel connection every 3 minutes.

At idling : Approximately 350 kPa (3.5 bar, 3.57 kg/cm², 51 psi)

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 2.

2. CHECK FUEL HOSES AND FUEL TUBES

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

- YES >> Replace "fuel level sensor unit, fuel filter and fuel pump assembly". Refer to [FL-7. "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

DTC/CIRCUIT DIAGNOSIS

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

Description

INFOID:0000000014267529

The specification (SP) value indicates the tolerance of the value that is displayed in "SPEC" of "DATA MONITOR" mode of CONSULT during normal operation of the Engine Control System. When the value in "SPEC" of "DATA MONITOR" mode is within the SP value, the Engine Control System is confirmed OK. When the value in "SPEC" of "DATA MONITOR" mode is NOT within the SP value, the Engine Control System may have one or more malfunctions.

The SP value is used to detect malfunctions that may affect the Engine Control System, but will not light the MIL.

The SP value will be displayed for the following three items:

- B/FUEL SCHDL (The fuel injection pulse width programmed into ECM prior to any learned on board correction)
- A/F ALPHA-B1 (The mean value of air-fuel ratio feedback correction factor per cycle)
- MAS AIR FLOW SENSOR (Hz) (The signal frequency of the mass air flow sensor)

Component Function Check

INFOID:0000000014267530

1.START

Make sure that all of the following conditions are satisfied.

- Vehicle driven distance: More than 5,000 km (3,107 miles)
- Barometric pressure: 98.3 - 104.3 kPa (0.983 - 1.043 bar, 1.003 - 1.064 kg/cm², 14.25 - 15.12 psi)
- Atmospheric temperature: 20 - 30°C (68 - 86°F)
- Engine coolant temperature: 75 - 95°C (167 - 203°F)
- Transmission: Warmed-up (After the engine is warmed up to normal operating temperature, drive vehicle for 5 minutes.)
- Electrical load: Not applied*
- Engine speed: Idle

*: Rear window defogger switch, air conditioner switch, lighting switch are OFF. Steering wheel is straight ahead.

>> GO TO 2.

2.PERFORM "SPEC" OF "DATA MONITOR" MODE

With CONSULT

NOTE:

Perform "SPEC" in "DATA MONITOR" mode in maximum scale display.

1. Perform [EC-128, "Work Procedure"](#).
2. Select "B/FUEL SCHDL", "A/F ALPHA-B1" and "MASS AIR FLOW SENSOR (Hz)" in "SPEC" of "DATA MONITOR" mode with CONSULT.
3. Make sure that monitor items are within the SP value.

Is the inspection result normal?

YES >> END

NO >> Proceed to [EC-143, "Diagnosis Procedure"](#).

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

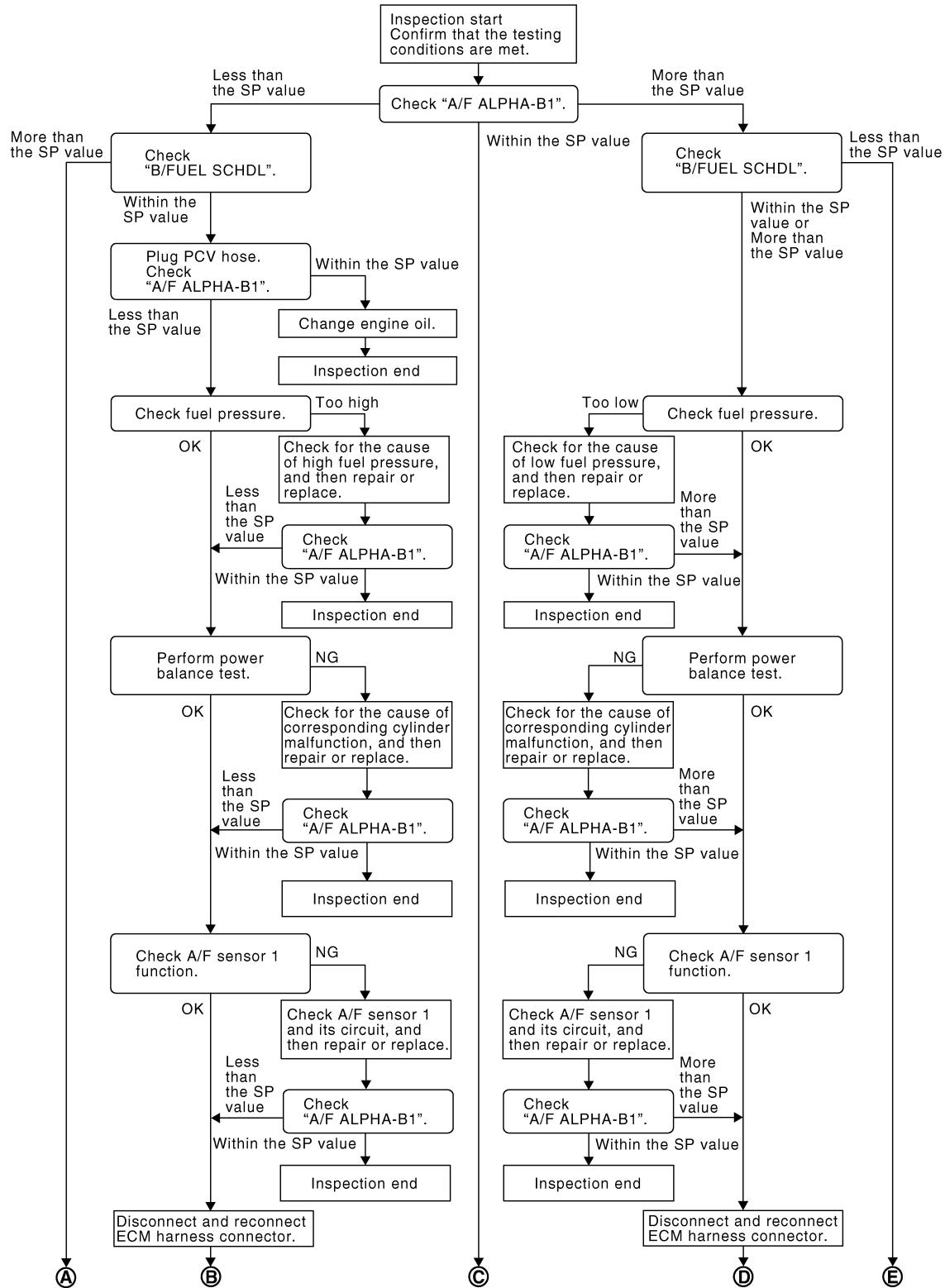
< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Diagnosis Procedure

INFOID:000000014267531

OVERALL SEQUENCE

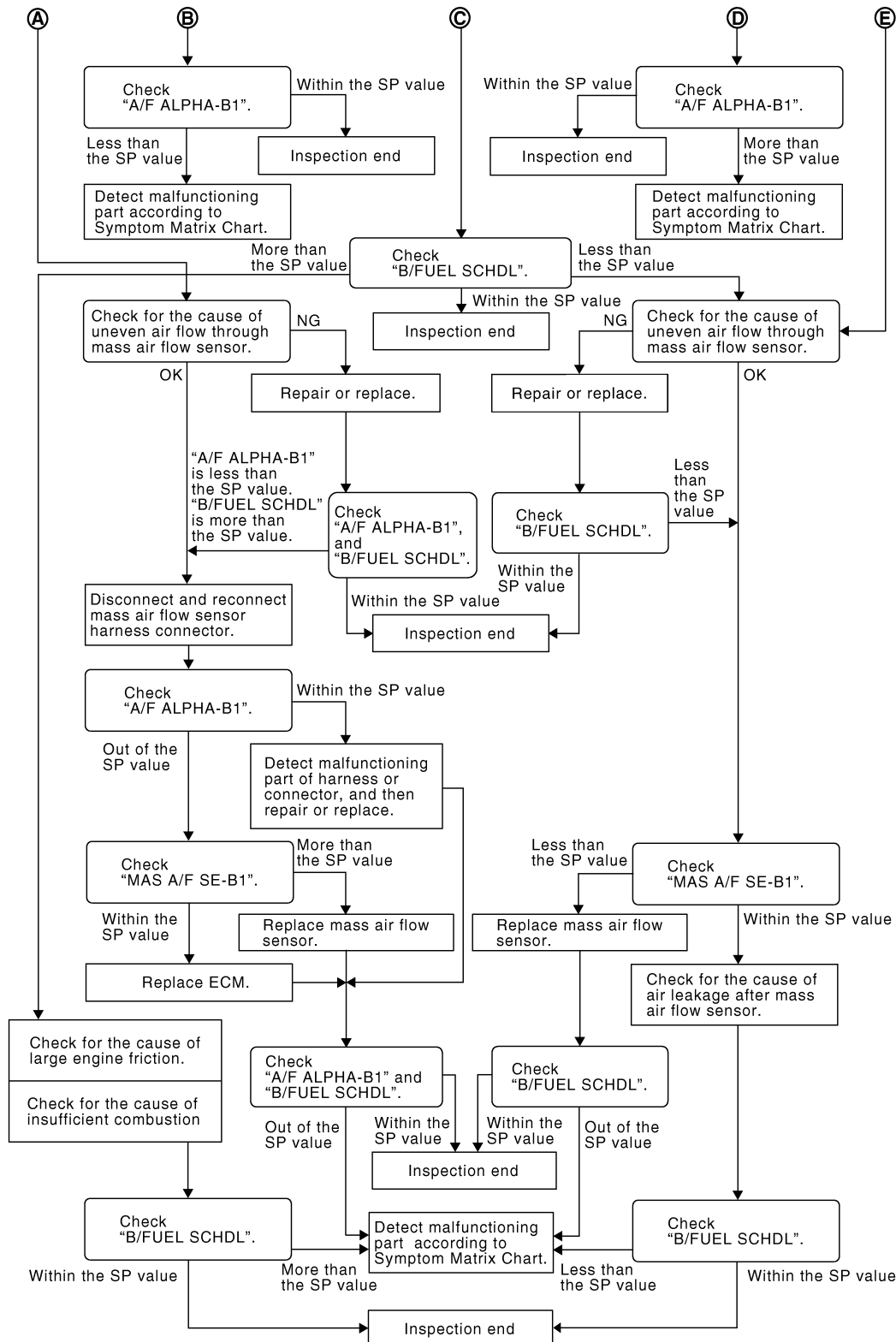


PBIB2318E

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]



PBIB3213E

DETAILED PROCEDURE

1. CHECK "A/F ALPHA-B1"

With CONSULT

1. Start engine.
2. Confirm that the testing conditions are met. Refer to [EC-142, "Component Function Check"](#).
3. Select "A/F ALPHA-B1" in "SPEC" of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

NOTE:

Check "A/F ALPHA-B1" for approximately 1 minute because they may fluctuate. It is NG if the indication is out of the SP value even a little.

Is the measurement value within the SP value?

- YES >> GO TO 17.
NO-1 >> Less than the SP value: GO TO 2.
NO-2 >> More than the SP value: GO TO 3.

2.CHECK "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

- YES >> GO TO 4.
NO >> More than the SP value: GO TO 19.

3.CHECK "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

- YES >> GO TO 6.
NO-1 >> More than the SP value: GO TO 6.
NO-2 >> Less than the SP value: GO TO 25.

4.CHECK "A/F ALPHA-B1"

1. Stop the engine.
2. Disconnect PCV hose, and then plug it.
3. Start engine.
4. Select "A/F ALPHA-B1" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

- YES >> GO TO 5.
NO >> GO TO 6.

5.CHANGE ENGINE OIL

1. Stop the engine.
2. Change engine oil.

NOTE:

This symptom may occur when a large amount of gasoline is mixed with engine oil because of driving conditions (such as when engine oil temperature does not rise enough since a journey distance is too short during winter). The symptom will not be detected after changing engine oil or changing driving condition.

>> **INSPECTION END**

6.CHECK FUEL PRESSURE

Check fuel pressure. (Refer to [EC-140. "Work Procedure".](#))

Is the inspection result normal?

- YES >> GO TO 9.
NO-1 >> Fuel pressure is too high: Replace "fuel level sensor unit, fuel filter and fuel pump assembly", refer to [FL-7. "Removal and Installation"](#), and then GO TO 8.
NO-2 >> Fuel pressure is too low: GO TO 7.

7.DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging

Is the inspection result normal?

- YES >> Replace "fuel level sensor unit, fuel filter and fuel pump assembly", refer to [FL-7. "Removal and Installation"](#), and then GO TO 8.
NO >> Repair or replace and then GO TO 8.

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

8.CHECK "A/F ALPHA-B1"

1. Start engine.
2. Select "A/F ALPHA-B1" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

- YES >> INSPECTION END
NO >> GO TO 9.

9.PERFORM POWER BALANCE TEST

1. Perform "POWER BALANCE" in "ACTIVE TEST" mode.
2. Make sure that the each cylinder produces a momentary engine speed drop.

Is the inspection result normal?

- YES >> GO TO 12.
NO >> GO TO 10.

10.DETECT MALFUNCTIONING PART

Check the following.

1. Ignition coil and its circuit (Refer to [EC-371, "Component Function Check".](#))
2. Fuel injector and its circuit (Refer to [EC-365, "Component Function Check".](#))
3. Intake air leakage
4. Low compression pressure (Refer to [EM-19, "Inspection".](#))

Is the inspection result normal?

- YES >> Replace fuel injector, refer to [EM-42, "Removal and Installation"](#), and then GO TO 11.
NO >> Repair or replace malfunctioning part and then GO TO 11.

11.CHECK "A/F ALPHA-B1"

1. Start engine.
2. Select "A/F ALPHA-B1" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

- YES >> INSPECTION END
NO >> GO TO 12.

12.CHECK A/F SENSOR 1 FUNCTION

Perform all DTC CONFIRMATION PROCEDURE related with A/F sensor 1.

- For DTC P0130, refer to [EC-188, "DTC Description".](#)
- For DTC P0131, refer to [EC-192, "DTC Description".](#)
- For DTC P0132, refer to [EC-195, "DTC Description".](#)
- For DTC P014C and P014D, refer to [EC-219, "DTC Description".](#)

Is any DTC detected?

- YES >> GO TO 15.
NO >> GO TO 13.

13.CHECK A/F SENSOR 1 CIRCUIT

Perform DIAGNOSTIC PROCEDURE according to corresponding DTC.

>> GO TO 14.

14.CHECK "A/F ALPHA-B1"

1. Start engine.
2. Select "A/F ALPHA-B1" in "SPEC" of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

Is the measurement value within the SP value?

- YES >> INSPECTION END
NO >> GO TO 15.

15.DISCONNECT AND RECONNECT ECM HARNESS CONNECTOR

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

1. Stop the engine.
2. Disconnect ECM harness connector. Check pin terminal and connector for damage, and then reconnect it.

>> GO TO 16.

16.CHECK "A/F ALPHA-B1"

1. Start engine.
2. Select "A/F ALPHA-B1" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Detect malfunctioning part according to [EC-382. "Symptom Table"](#).

17.CHECK "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO-1 >> More than the SP value: GO TO 18.

NO-2 >> Less than the SP value: GO TO 25.

18.DETECT MALFUNCTIONING PART

1. Check for the cause of large engine friction. Refer to the following.
 - Engine oil level is too high
 - Engine oil viscosity
 - Belt tension of power steering, alternator, A/C compressor, etc. is excessive
 - Noise from engine
 - Noise from transmission, etc.
2. Check for the cause of insufficient combustion. Refer to the following.
 - Valve clearance malfunction
 - Camshaft sprocket installation malfunction, etc.

>> Repair or replace malfunctioning part, and then GO TO 30.

19.CHECK INTAKE SYSTEM

Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.

- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system

Is the inspection result normal?

YES >> GO TO 21.

NO >> Repair or replace malfunctioning part, and then GO TO 20.

20.CHECK "A/F ALPHA-B1", AND "B/FUEL SCHDL"

Select "A/F ALPHA-B1" and "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and make sure that the each indication is within the SP value.

Is the measurement value within the SP value?

YES >> **INSPECTION END**

NO >> "B/FUEL SCHDL" is more, "A/F ALPHA-B1" is less than the SP value: GO TO 21.

21.DISCONNECT AND RECONNECT MASS AIR FLOW SENSOR HARNESS CONNECTOR

1. Stop the engine.
2. Disconnect mass air flow sensor harness connector. Check pin terminal and connector for damage and then reconnect it again.

>> GO TO 22.

< DTC/CIRCUIT DIAGNOSIS >

22.CHECK "A/F ALPHA-B1"

1. Start engine.
2. Select "A/F ALPHA-B1" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> Detect malfunctioning part of mass air flow sensor circuit and repair it. Refer to [EC-175, "DTC Description"](#). Then GO TO 29.

NO >> GO TO 23.

23.CHECK "MAS AIR FLOW SENSOR (HZ)"

Select "MAS AIR FLOW SENSOR (Hz)" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> GO TO 24.

NO >> More than the SP value: Replace mass air flow sensor, refer to [EM-25, "Exploded View"](#), and then GO TO 29.

24.REPLACE ECM

Replace ECM. Refer to [EC-392, "Removal and Installation"](#).

>> GO TO 29.

25.CHECK INTAKE SYSTEM

Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.

- Crushed air ducts
- Malfunctioning seal of air cleaner element
- Uneven dirt of air cleaner element
- Improper specification of intake air system

Is the inspection result normal?

YES >> GO TO 27.

NO >> Repair or replace malfunctioning part, and then GO TO 26.

26.CHECK "B/FUEL SCHDL"

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> INSPECTION END

NO >> Less than the SP value: GO TO 27.

27.CHECK "MAS AIR FLOW SENSOR (HZ)"

Select "MAS AIR FLOW SENSOR (Hz)" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

YES >> GO TO 28.

NO >> Less than the SP value: Replace mass air flow sensor, refer to [EM-25, "Exploded View"](#), and then GO TO 30.

28.CHECK INTAKE SYSTEM

Check for the cause of air leak after the mass air flow sensor. Refer to the following.

- Disconnection, looseness, and cracks in air duct
- Looseness of oil filler cap
- Disconnection of oil level gauge
- Open stuck, breakage, hose disconnection, or cracks of PCV valve
- Disconnection or cracks of EVAP purge hose, open stuck of EVAP canister purge volume control solenoid valve
- Malfunctioning seal of rocker cover gasket
- Disconnection, looseness, or cracks of hoses, such as vacuum hose, connecting to intake air system parts

TROUBLE DIAGNOSIS - SPECIFICATION VALUE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

- Malfunctioning seal of intake air system, etc.

A

>> GO TO 30.

29.CHECK "A/F ALPHA-B1" AND "B/FUEL SCHDL"

EC

Select "A/F ALPHA-B1" and "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and make sure that the indication is within the SP value.

Is the measurement value within the SP value?

C

YES >> INSPECTION END

NO >> Detect malfunctioning part according to [EC-382, "Symptom Table"](#).

30.CHECK "B/FUEL SCHDL"

D

Select "B/FUEL SCHDL" in "SPEC" of "DATA MONITOR" mode, and then make sure that the indication is within the SP value.

Is the measurement value within the SP value?

E

YES >> INSPECTION END

NO >> Detect malfunctioning part according to [EC-382, "Symptom Table"](#).

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POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000014267532

1.CHECK FUSE

Check that the following fuse is not blowing.

Location	Fuse No.	Capacity
IPDM E/R	#45	15 A
	#49	20 A

Is the fuse blown (open)?

YES >> Replace the fuse after repairing the applicable circuit. (If the replaced fuse is blown again, check IPDM E/R power supply circuit.)

NO >> GO TO 2.

2.CHECK GROUND CONNECTION

1. Turn ignition switch OFF.
2. Check ground connection E9 and E15. Refer to [GI-47, "Circuit Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace ground connection.

3.CHECK ECM GROUND CIRCUIT

1. Disconnect ECM harness connectors.
2. Check the continuity between ECM harness connector and ground.

+		-	Continuity
ECM			
Connector	Terminal		
F73	12	Ground	Existed
	16		
F57	52		
E55	123		
	128		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK ECM POWER SUPPLY (MAIN)-1

1. Reconnect ECM harness connector.
2. Turn ignition switch ON.
3. Check the voltage between ECM harness connector terminals.

ECM			Voltage
Connector	+	–	
	Terminal		
E55	121	128	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 6.

5.CHECK ECM POWER SUPPLY (MAIN)--2

POWER SUPPLY AND GROUND CIRCUIT

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Check the voltage between ECM harness connector terminals as per the following.

ECM			Condition	Voltage (Approx.)
Connector	+	–		
	Terminal			
E55	121	128	After turning ignition switch OFF, battery voltage will exist for a few seconds	Drop to 0 V

Is the inspection result normal?

- YES >> GO TO 9.
NO >> GO TO 7.

6.CHECK ECM POWER SUPPLY (MAIN) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connectors.
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ECM harness connector and IPDM E/R harness connector.

+		-		Continuity
ECM		IPDM E/R		
Connector	Terminal	Connector	Terminal	
E55	121	E121	26	Existed

5. Also check harness for short to ground.

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit.
NO >> Repair or replace error-detected parts.

7.CHECK ECM RELAY CONTROL SIGNAL

Check the voltage between ECM harness connector terminals as per the following.

ECM				Condition	Voltage (Approx.)
+		-			
Connector	Terminal	Connector	Terminal		
F57	89	E55	128	Ignition switch ON	0 V
				Turn ignition switch OFF and wait at least 10 sec- onds.	Battery voltage

Is the inspection result normal?

- YES >> Check Intermittent Incident. Refer to [GI-45. "Intermittent Incident"](#).
NO >> GO TO 8.

8.CHECK ECM RELAY CONTROL SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ECM harness connector and IPDM E/R harness connector.

+		-		Continuity
ECM		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F57	89	E121	31	Existed

POWER SUPPLY AND GROUND CIRCUIT

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

5. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-40. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

9.CHECK IGNITION SWITCH SIGNAL

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage (Approx.)
Connector	+	–		
	Terminal			
E55	109	128	Ignition switch OFF	0 V
			Ignition switch ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 10.

10.CHECK IGNITION SWITCH SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ECM harness connector and IPDM E/R harness connector.

+		-		Continuity
ECM		IPDM E/R		
Connector	Terminal	Connector	Terminal	
E55	109	E119	18	Existed

5. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

11.CHECK ECM POWER SUPPLY (BACK-UP)

Check the voltage between ECM harness connector terminals.

ECM				Voltage
+		−		
Connector	Terminal	Connector	Terminal	
F57	81	E55	128	Battery voltage

Is the inspection result normal?

YES >> Check Intermittent Incident. Refer to [GI-45. "Intermittent Incident"](#).

NO >> GO TO 12.

12.CHECK ECM POWER SUPPLY (BACK-UP) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ECM harness connector and IPDM E/R harness connector.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
ECM		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F57	81	E121	32	Existed

5. Also check harness for short to ground.

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit.
NO >> Repair or replace error-detected parts.

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U1001 CAN COMM CIRCUIT

DTC Description

INFOID:0000000014267533

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
U1001	CAN COMM CIRCUIT (CAN communication circuit)	When ECM is not transmitting or receiving CAN communication signal other than OBD (emission related diagnosis) for 2 seconds or more.

POSSIBLE CAUSE

Harness or connectors (CAN communication line is open or shorted)

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 3 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-154, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267534

Perform the trouble diagnosis for CAN communication system. Refer to [LAN-24, "Trouble Diagnosis Flow Chart"](#).

P0011 IVT CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0011 IVT CONTROL

DTC Description

INFOID:0000000014267535

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0011	INT/V TIM CONT-B1 ("A" Camshaft position - timing over-advanced or system performance bank 1)	There is a gap between angle of target and phase-control angle degree.

POSSIBLE CAUSE

- Crankshaft position sensor (POS)
- Camshaft position sensor (PHASE)
- Intake valve control solenoid valve
- Accumulation of debris to the signal pick-up portion of the camshaft
- Timing chain installation
- Foreign matter caught in the oil groove for intake valve timing control

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Device fix mode	This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0011 is displayed with DTC P0075, first perform the trouble diagnosis for DTC P0075.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-169. "DTC Description"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 11 V and 16 V at idle.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-1

Ⓐ With CONSULT

1. Turn ignition switch ON and select "DATA MONITOR" mode of "ENGINE" using CONSULT.
2. Start engine and warm it up to normal operating temperature.
3. Maintain the following conditions for at least 6 consecutive seconds. Hold the accelerator pedal as steady as possible.

ENG SPEED	1,200 - 2,000 rpm
COOLAN TEMP/S	More than 60°C (140°F)
Shift lever	Neutral

< DTC/CIRCUIT DIAGNOSIS >

4. Stop vehicle with engine running and let engine idle for 20 seconds.
5. Check 1st trip DTC.

 With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to [EC-156, "Diagnosis Procedure"](#).

NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE-2

 With CONSULT

1. Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,200 - 3,175 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 64°C (148°F)
Shift lever	1st or 2nd position
Driving location	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)

CAUTION:

Always drive at a safe speed.

2. Check 1st trip DTC.

 With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to [EC-156, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267536

1.CHECK DTC PRIORITY

If DTC P0011 is displayed with DTC P0075, first perform the trouble diagnosis for DTC P0075.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-169, "DTC Description"](#).

NO >> GO TO 2.

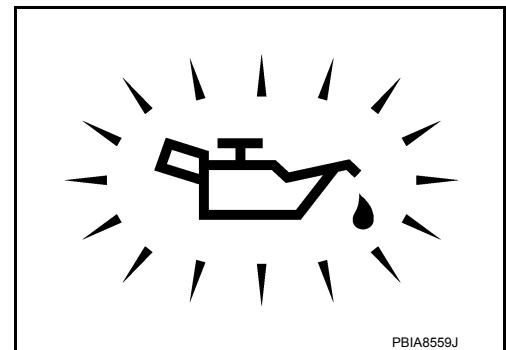
2.CHECK OIL PRESSURE WARNING LAMP

1. Start engine.
2. Check oil pressure warning lamp and confirm it is not illuminated.

Is oil pressure warning lamp illuminated?

YES >> Check the engine oil level. Refer to [LU-9, "Inspection"](#).

NO >> GO TO 3.



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3.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE

Check the intake valve timing control solenoid valve. Refer to [EC-157, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace intake valve timing control solenoid valve. Refer to [EM-50, "Exploded View"](#).

4.CHECK CRANKSHAFT POSITION SENSOR (POS)

Check the crankshaft position sensor (POS). Refer to [EC-250, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace crankshaft position sensor (POS). Refer to [EM-90, "Exploded View"](#).

5.CHECK CAMSHAFT POSITION SENSOR (PHASE)

Check the camshaft position sensor (PHASE). Refer to [EC-254, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace camshaft position sensor (PHASE). Refer to [EM-61, "Exploded View"](#).

6.CHECK INTAKE CAMSHAFT

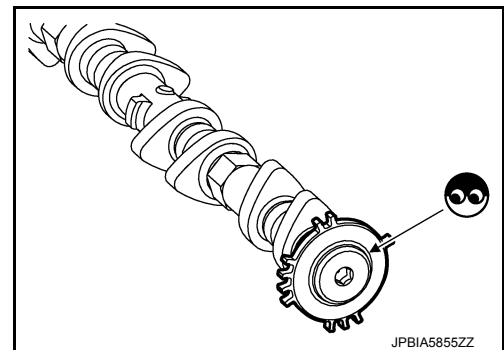
Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

Is the inspection result normal?

YES >> GO TO 7.

NO >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to [EM-62, "Removal and Installation"](#).

**7.CHECK TIMING CHAIN INSTALLATION**

Check service records for any recent repairs that may cause timing chain misaligned.

Are there any service records that may cause timing chain misaligned?

YES >> Check timing chain installation. Refer to [EM-51, "Removal and Installation"](#).

NO >> GO TO 8.

8.CHECK LUBRICATION CIRCUIT

Refer to [LU-7, "Lubrication Circuit"](#), "INSPECTION AFTER INSTALLATION".

Is the inspection result normal?

YES >> INSPECTION END

NO >> Clean lubrication line.

Component Inspection

INFOID:0000000014267537

1.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-1

1. Turn ignition switch OFF.
2. Disconnect intake valve timing control solenoid valve harness connector.
3. Check resistance between intake valve timing control solenoid valve terminals as per the following.

Intake valve timing control solenoid valve		Resistance
+	−	
Terminal		
1	2	6.7 - 7.7 Ω [at 20°C (68°F)]
1	Ground	$\infty \Omega$ (Continuity should not exist)
2		

Is the inspection result normal?

YES >> GO TO 2.

P0011 IVT CONTROL

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace intake valve timing control solenoid valve. Refer to [EM-50, "Exploded View"](#).

2. CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-2

1. Remove intake valve timing control solenoid valve. Refer to [EM-50, "Exploded View"](#).

2. Provide 12 V DC between intake valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Make sure that the plunger moves as shown in the figure.

CAUTION:

Do not apply 12 V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in intake valve timing control solenoid valve.

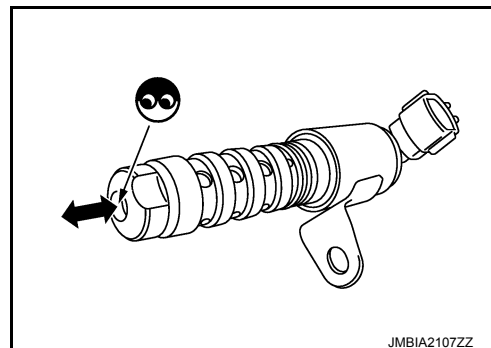
NOTE:

Always replace O-ring when intake valve timing control solenoid valve is removed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace intake valve timing control solenoid valve. Refer to [EM-50, "Exploded View"](#).



P0014 EVT CONTROL

DTC Description

INFOID:0000000014267538

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0014	EXH/V TIM CONT-B1 ("B" Camshaft position - timing over-advanced or system performance bank 1)	There is a gap between angle of target and phase-control angle degree.

POSSIBLE CAUSE

- Crankshaft position sensor (POS)
- Camshaft position sensor (PHASE)
- Exhaust valve timing control position sensor
- Exhaust valve control solenoid valve
- Accumulation of debris to the signal pick-up portion of the camshaft
- Timing chain installation
- Foreign matter caught in the oil groove for exhaust valve timing control

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Device fix mode	This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0014 is displayed with DTC P0078 or P1078, first perform the trouble diagnosis for DTC P0078 or P1078.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).
 NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is between 10 V and 16 V at idle.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-1

④With CONSULT

1. Turn ignition switch ON and select "DATA MONITOR" mode of "ENGINE" using CONSULT.
2. Start engine and warm it up to the normal operating temperature.
3. Maintain the following conditions for at least 6 consecutive seconds. Hold the accelerator pedal as steady as possible.

ENG SPEED	1,200 - 2,000 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 60°C (140°F)
Shift lever	Neutral

4. Let engine idle for 10 seconds.

5. Check 1st trip DTC.

 With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to [EC-160, "Diagnosis Procedure"](#)

NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE-2

 With CONSULT

1. Select "DATA MONITOR" mode of "ENGINE" using CONSULT.

2. Maintain the following conditions for at least 20 consecutive seconds.

ENG SPEED	1,200 - 3,175 rpm (A constant rotation is maintained.)
COOLAN TEMP/S	More than 64°C (148°F)
Shift lever	1st or 2nd position
Driving location uphill	Driving vehicle uphill (Increased engine load will help maintain the driving conditions required for this test.)

CAUTION:

Always drive at a safe speed.

3. Check 1st trip DTC.

 With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to [EC-160, "Diagnosis Procedure"](#)

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267539

1.CHECK DTC PRIORITY

If DTC P0014 is displayed with DTC P0078 or P1078, first perform the trouble diagnosis for DTC P0078 or P1078.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK OIL PRESSURE WARNING LAMP

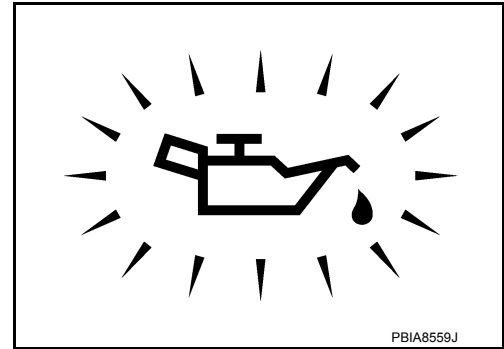
1. Start engine.

< DTC/CIRCUIT DIAGNOSIS >

2. Check oil pressure warning lamp and confirm it is not illuminated.

Is oil pressure warning lamp illuminated?

- YES >> Check the engine oil level. Refer to [LU-9, "Inspection"](#).
NO >> GO TO 3.



3. CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE

Check the exhaust valve timing control solenoid valve. Refer to [EC-162, "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Replace exhaust valve timing control solenoid valve. Refer to [EM-50, "Exploded View"](#).

4. CHECK CRANKSHAFT POSITION SENSOR (POS)

Check the crankshaft position sensor (POS). Refer to [EC-250, "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Replace crankshaft position sensor (POS). Refer to [EM-90, "Exploded View"](#).

5. CHECK EXHAUST VALVE TIMING CONTROL POSITION SENSOR

Check the exhaust valve timing control position sensor. Refer to [EC-300, "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Replace exhaust valve timing control position sensor. Refer to [EM-61, "Exploded View"](#).

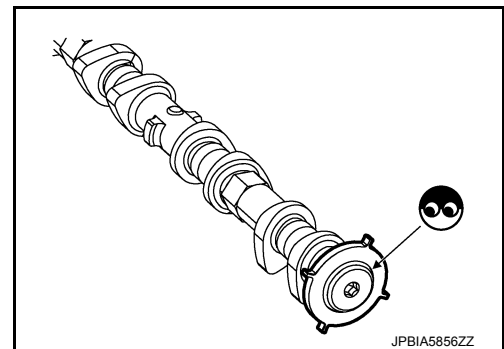
6. CHECK CAMSHAFT (EXH)

Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to [EM-62, "Removal and Installation"](#).



7. CHECK TIMING CHAIN INSTALLATION

Check service records for any recent repairs that may cause timing chain misaligned.

Are there any service records that may cause timing chain misaligned?

- YES >> Check timing chain installation. Refer to [EM-51, "Removal and Installation"](#).
NO >> GO TO 8.

8. CHECK LUBRICATION CIRCUIT

Refer to [LU-7, "Lubrication Circuit"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Clean lubrication line.

Component Inspection

INFOID:0000000014267540

1. CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE-1

1. Turn ignition switch OFF.
2. Disconnect exhaust valve timing control solenoid valve harness connector.
3. Check resistance between exhaust valve timing control solenoid valve terminals as per the following.

Exhaust valve timing control solenoid valve		Resistance
+	−	
Terminal		
1	2	7.0 - 7.7 Ω [at 20°C (68°F)]
1	Ground	$\infty \Omega$ (Continuity should not exist)
2		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace exhaust valve timing control solenoid valve. Refer to [EM-50. "Exploded View"](#).

2. CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE-2

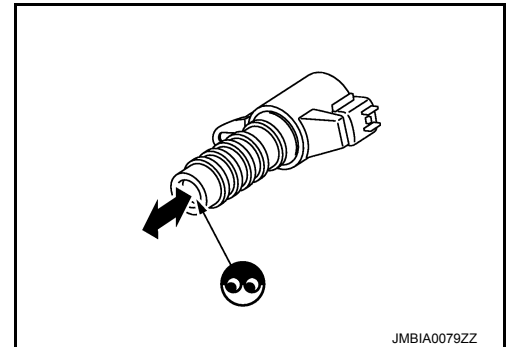
1. Remove exhaust valve timing control solenoid valve. Refer to [EM-50. "Exploded View"](#).
2. Provide 12 V DC between exhaust valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure.

CAUTION:

Do not apply 12 V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in exhaust valve timing control solenoid valve.

NOTE:

Always replace O-ring when exhaust valve timing control solenoid valve is removed.



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace exhaust valve timing control solenoid valve. Refer to [EM-50. "Exploded View"](#).

P0031, P0032 A/F SENSOR 1 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0031, P0032 A/F SENSOR 1 HEATER

DTC Description

INFOID:0000000014267541

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0031	A/F SEN1 HTR (B1) (HO2S heater control circuit low bank 1 sensor 1)	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the A/F sensor 1 heater.)
P0032	A/F SEN1 HTR (B1) (HO2S heater control circuit high bank 1 sensor 1)	The current amperage in the A/F sensor 1 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the A/F sensor 1 heater.)

POSSIBLE CAUSE

DTC P0031

- Harness or connectors (A/F sensor 1 heater circuit is open or shorted.)
- A/F sensor 1 heater

DTC P0032

- Harness or connectors (A/F sensor 1 heater circuit is shorted.)
- A/F sensor 1 heater

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than between 11 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 10 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-163, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267542

1. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.
2. Turn ignition switch ON.
3. Check the voltage between A/F sensor 1 harness connector and ground.

P0031, P0032 A/F SENSOR 1 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-	Voltage
A/F sensor 1			
Connector	Terminal		
F65	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK A/F SENSOR 1 HEATER OUTPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

+		-		Continuity
A/F sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F65	3	F57	53	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3. CHECK A/F SENSOR 1 HEATER

Check the A/F sensor 1 heater. Refer to [EC-164, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace malfunctioning air fuel ratio (A/F) sensor 1. Refer to [EM-39, "Exploded View"](#).

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J-43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

Component Inspection

INFOID:0000000014267543

1. CHECK AIR FUEL RATIO (A/F) SENSOR 1

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.
3. Check resistance between A/F sensor 1 terminals as per the following.

P0031, P0032 A/F SENSOR 1 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

A/F sensor 1		Resistance
+	−	
Terminal		
3	4	1.8 - 2.44 Ω [at 20°C (68°F)]
	1	∞ Ω (Continuity should not exist)
	2	
4	1	
	2	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace air fuel ratio (A/F) sensor 1. Refer to [EM-39, "Exploded View"](#).

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

P0037, P0038 HO2S2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0037, P0038 HO2S2 HEATER

DTC Description

INFOID:0000000014267544

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0037	HO2 HTR (B1) (HO2S heater control circuit low bank 1 sensor 2)	- The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively low voltage signal is sent to ECM through the heated oxygen sensor 2 heater.) - ECM detects the heated oxygen sensor 2 heater circuit is short to ground.
P0038	HO2 HTR (B1) (HO2S heater control circuit high bank 1 sensor 2)	The current amperage in the heated oxygen sensor 2 heater circuit is out of the normal range. (An excessively high voltage signal is sent to ECM through the heated oxygen sensor 2 heater.)

POSSIBLE CAUSE

DTC P0037

- Harness or connectors (Heated oxygen sensor 2 heater circuit is open or shorted.)
- Heated oxygen sensor 2 heater

DTC P0038

- Harness or connectors (Heated oxygen sensor 2 heater circuit is shorted.)
- Heated oxygen sensor 2 heater

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

- Turn ignition switch ON and select "DATA MONITOR" mode of "ENGINE" using CONSULT.
- Start engine and warm it up to normal operating temperature.
- Turn ignition switch OFF and wait at least 10 seconds.
- Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
- Let engine idle for 1 minute.
- Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-167, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

P0037, P0038 HO2S2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Diagnosis Procedure

INFOID:0000000014267545

1.CHECK HO2S2 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect heated oxygen sensor 2 (HO2S2) harness connector.
3. Turn ignition switch ON.
4. Check the voltage between HO2S2 harness connector and ground.

+		-	Voltage
HO2S2			
Connector	Terminal		
F13	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK HO2S2 OUTPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between HO2S2 harness connector and ECM harness connector.

+		-		Continuity
HO2S2		ECM		
Connector	Terminal	Connector	Terminal	
F13	3	F57	54	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK HEATED OXYGEN SENSOR 2 HEATER

Check the heated oxygen sensor 2 heater. Refer to [EC-167, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4.REPLACE HEATED OXYGEN SENSOR 2

Replace heated oxygen sensor 2. Refer to [EX-6, "Exploded View"](#).

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

Component Inspection

INFOID:0000000014267546

1.CHECK HEATED OXYGEN SENSOR 2 HEATER

1. Turn ignition switch OFF.
2. Disconnect heated oxygen sensor 2 (HO2S2) harness connector.
3. Check resistance between HO2S2 terminals as per the following.

P0037, P0038 HO2S2 HEATER

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Heated oxygen sensor 2		Resistance
+	–	
Terminal		
4	3	3.3 - 4.4 Ω [at 25°C (77°F)]
1	2	∞ Ω (Continuity should not exist)
	3	
	4	
2	3	
	4	

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2. REPLACE HEATED OXYGEN SENSOR 2

Replace heated oxygen sensor 2. Refer to [EX-6. "Exploded View"](#).

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

P0075 INTAKE VALVE TIMING CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0075 INTAKE VALVE TIMING CONTROL

DTC Description

INFOID:0000000014267547

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0075	INT/V TIM V/CIR-B1 (Intake valve control solenoid circuit bank 1)	ECM detects an abnormal voltage in the intake valve timing control solenoid valve control circuit.

POSSIBLE CAUSE

- Harness or connectors (Intake valve timing control solenoid valve circuit is open or shorted.)
- Intake valve timing control solenoid valve

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-169, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267548

1. CHECK INTAKE VALVE TIMING (IVT) CONTROL SOLENOID VALVE POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect IVT control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check the voltage between intake valve timing control solenoid valve harness connector and ground.

+		–	Voltage
IVT control solenoid valve			
Connector	Terminal		
F134	1	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 3.
NO >> GO TO 2.

2. CHECK IVT CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.

P0075 INTAKE VALVE TIMING CONTROL

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

3. Check the continuity between IVT control solenoid valve harness connector and IPDM E/R harness connector.

+		-		Continuity
IVT control solenoid valve		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F134	1	E121	25	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit.
NO >> Repair or replace error-detected parts.

3.CHECK IVT CONTROL SOLENOID VALVE GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between IVT control solenoid valve harness connector and ECM harness connector.

+		-		Continuity
IVT control solenoid valve		ECM		
Connector	Terminal	Connector	Terminal	
F134	2	F57	93	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4.CHECK IVT CONTROL SOLENOID VALVE

Check the IVT control solenoid valve. Refer to [EC-170, "Component Inspection"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace IVT control solenoid valve. Refer to [EM-50, "Exploded View"](#).

Component Inspection

INFOID:0000000014267549

1.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-1

1. Turn ignition switch OFF.
2. Disconnect intake valve timing control solenoid valve harness connector.
3. Check resistance between intake valve timing control solenoid valve terminals as per the following.

Intake valve timing control solenoid valve		Resistance
+	−	
Terminal		
1	2	6.7 - 7.7 Ω [at 20°C (68°F)]
1	Ground	$\infty \Omega$ (Continuity should not exist)
2		

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Replace intake valve timing control solenoid valve. Refer to [EM-50, "Exploded View"](#).

2.CHECK INTAKE VALVE TIMING CONTROL SOLENOID VALVE-2

1. Remove intake valve timing control solenoid valve. Refer to [EM-50, "Exploded View"](#).

P0075 INTAKE VALVE TIMING CONTROL

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

2. Provide 12 V DC between intake valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Make sure that the plunger moves as shown in the figure.

CAUTION:

Do not apply 12 V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in intake valve timing control solenoid valve.

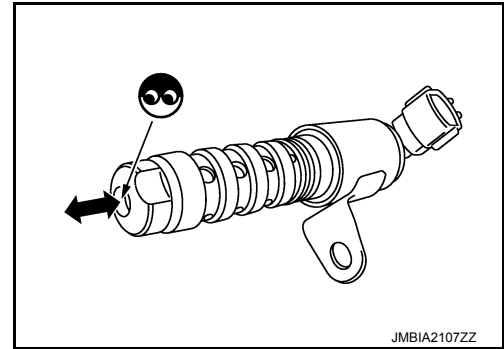
NOTE:

Always replace O-ring when intake valve timing control solenoid valve is removed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace intake valve timing control solenoid valve. Refer to [EM-50, "Exploded View"](#).



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P0078 EVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0078 EVT CONTROL SOLENOID VALVE

DTC Description

INFOID:0000000014267550

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0078	EX V/T ACT/CIRC-B1 (Exhaust valve control solenoid circuit bank 1)	An improper voltage is sent to the ECM through exhaust valve timing control solenoid valve.

POSSIBLE CAUSE

- Harness or connectors (Exhaust valve timing control solenoid valve circuit is open or shorted.)
- Exhaust valve timing control solenoid valve

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Device fix mode	This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-172, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267551

1.CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect exhaust valve timing (EVT) control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check the voltage between exhaust valve timing control solenoid valve harness connector and ground.

+		-	Voltage
EVT control solenoid valve			
Connector	Terminal		
F135	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

P0078 EVT CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

NO >> GO TO 2.

2.CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between EVT control solenoid valve harness connector and IPDM E/R harness connector.

+		+		Continuity
EVT control solenoid valve		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F135	2	E121	25	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3.CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EVT control solenoid valve harness connector and ECM harness connector.

+		+		Continuity
EVT control solenoid valve		ECM		
Connector	Terminal	Connector	Terminal	
F135	1	F57	94	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE

Check the exhaust valve timing control solenoid valve. Refer to [EC-173, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace exhaust valve timing control solenoid valve. Refer to [EM-50, "Exploded View"](#).

Component Inspection

INFOID:0000000014267552

1.CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE-1

1. Turn ignition switch OFF.
2. Disconnect exhaust valve timing control solenoid valve harness connector.
3. Check resistance between exhaust valve timing control solenoid valve terminals as per the following.

Exhaust valve timing control solenoid valve		Resistance
+	−	
Terminal		
1	2	7.0 - 7.7 Ω [at 20°C (68°F)]
1	Ground	$\infty \Omega$ (Continuity should not exist)
2		

Is the inspection result normal?

P0078 EVT CONTROL SOLENOID VALVE

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

YES >> GO TO 2.

NO >> Replace exhaust valve timing control solenoid valve. Refer to [EM-50. "Exploded View"](#).

2. CHECK EXHAUST VALVE TIMING CONTROL SOLENOID VALVE-2

1. Remove exhaust valve timing control solenoid valve. Refer to [EM-50. "Exploded View"](#).

2. Provide 12 V DC between exhaust valve timing control solenoid valve terminals 1 and 2, and then interrupt it. Check that the plunger moves as shown in the figure.

CAUTION:

Do not apply 12 V DC continuously for 5 seconds or more. Doing so may result in damage to the coil in exhaust valve timing control solenoid valve.

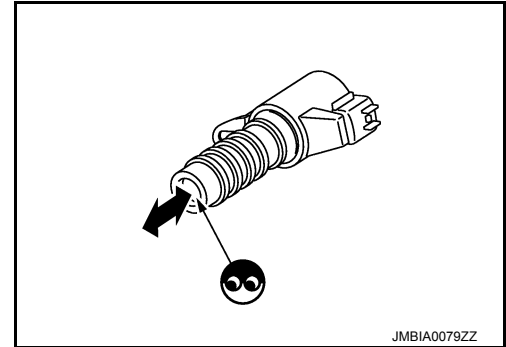
NOTE:

Always replace O-ring when exhaust valve timing control solenoid valve is removed.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace exhaust valve timing control solenoid valve. Refer to [EM-50. "Exploded View"](#).



P0102, P0103 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0102, P0103 MAF SENSOR

DTC Description

INFOID:0000000014267553

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0102	MAF SEN/CIRCUIT-B1 (Mass or volume air flow "A" circuit low)	An excessively low voltage from the mass air flow sensor is sent to ECM.
P0103	MAF SEN/CIRCUIT-B1 (Mass or volume air flow "A" circuit high)	An excessively high voltage from the mass air flow sensor is sent to ECM.

POSSIBLE CAUSE

DTC P0102

- Harness or connectors (Mass air flow sensor circuit is open or shorted.)
- Intake air leaks
- Mass air flow sensor
- Sensor power supply 2 circuit

DTC P0103

- Harness or connectors (Mass air flow sensor circuit is open or shorted.)
- Mass air flow sensor
- Sensor power supply 2 circuit

FAIL-SAFE

EXCEPT FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
	Engine output control	ECM reduces the engine output, according to the rise in engine speed. This reduces the vehicle speed to encourage the driver to repair malfunction.

FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
	Engine output control	ECM reduces the engine output, according to the rise in engine speed. This reduces the vehicle speed to encourage the driver to repair malfunction.
Device fix mode		This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

P0102, P0103 MAF SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

Which DTC is detected?

- P0102 >> GO TO 2.
- P0103 >> GO TO 3.

2.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0102

1. Start engine and wait at least 5 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-176, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

3.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0103-1

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-176, "Diagnosis Procedure"](#).
- NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P0103-2

1. Start engine and wait at least 5 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-176, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267554

1.INSPECTION START

Confirm the detected DTC.

Which DTC is detected?

- P0102 >> GO TO 2.
- P0103 >> GO TO 3.

2.CHECK INTAKE SYSTEM

Check the following for connection.

- Air duct
- Vacuum hoses
- Intake air passage between air duct to intake manifold

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Reconnect the parts. Refer to [EM-30, "Exploded View"](#).

3.CHECK MAF SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect mass air flow (MAF) sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between MAF sensor harness connector and ground.

+		-	Voltage
MAF sensor			
Connector	Terminal		
F53	2	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 5.

P0102, P0103 MAF SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

NO >> GO TO 4.

4.CHECK MAF SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between MAF sensor harness connector and ECM harness connector.

+		-		Continuity
MAF sensor		ECM		
Connector	Terminal	Connector	Terminal	
F53	2	F73	36	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> Check sensor power supply 2 circuit. Refer to [EC-380, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

5.CHECK MAF SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between MAF sensor harness connector and ECM harness connector.

+		-		Continuity
MAF sensor		ECM		
Connector	Terminal	Connector	Terminal	
F53	3	F73	34	Existed

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK MAF SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between MAF sensor harness connector and ECM harness connector.

+		-		Continuity
MAF sensor		ECM		
Connector	Terminal	Connector	Terminal	
F53	1	F73	35	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

7.CHECK MAF SENSOR

Check the MAF sensor. Refer to [EC-177, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor. Refer to [EM-30, "Exploded View"](#).

Component Inspection

INFOID:0000000014267555

1.CHECK MASS AIR FLOW SENSOR-1

Ⓔ With CONSULT

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.

P0102, P0103 MAF SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

3. Start engine and warm it up to normal operating temperature.
4. Connect CONSULT and select "DATA MONITOR" mode of "ENGINE".
5. Select "MASS AIR FLOW SENSOR (Hz)" and check indication.

Monitor item	Condition	Value
MASS AIR FLOW SENSOR (Hz)	Ignition switch ON (Engine stopped.)	Approx. 3,333 Hz
	Idle (Engine is warmed-up to normal operating temperature.)	2,340 - 3,280 Hz
	Idle to about 4,000 rpm	2,340 - 3,280 Hz to Approx. 1.100 Hz*

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK FOR THE CAUSE OF UNEVEN AIR FLOW THROUGH MASS AIR FLOW SENSOR

1. Turn ignition switch OFF.
2. Check for the cause of uneven air flow through mass air flow sensor. Refer to the following.
 - Crushed air ducts
 - Malfunctioning seal of air cleaner element
 - Uneven dirt of air cleaner element
 - Intake valve deposits
 - Improper specification of intake air system parts

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK MASS AIR FLOW SENSOR-2

With CONSULT

1. Repair or replace malfunctioning part.
2. Start engine and warm it up to normal operating temperature.
3. Connect CONSULT and select "DATA MONITOR" mode of "ENGINE".
4. Select "MASS AIR FLOW SENSOR (Hz)" and check indication.

Monitor item	Condition	Value
MASS AIR FLOW SENSOR (Hz)	Ignition switch ON (Engine stopped.)	Approx. 3,333 Hz
	Idle (Engine is warmed-up to normal operating temperature.)	2,340 - 3,280 Hz
	Idle to about 4,000 rpm	2,340 - 3,280 Hz to Approx. 1.100 Hz*

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4.CHECK MASS AIR FLOW SENSOR-3

With CONSULT

1. Turn ignition switch OFF.
2. Disconnect mass air flow sensor harness connector and reconnect it again.
3. Start engine and warm it up to normal operating temperature.
4. Connect CONSULT and select "DATA MONITOR" mode of "ENGINE".
5. Select "MASS AIR FLOW SENSOR (Hz)" and check indication.

P0102, P0103 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Monitor item	Condition	Value
MASS AIR FLOWSENSOR (Hz)	Ignition switch ON (Engine stopped.)	Approx. 3,333 Hz
	Idle (Engine is warmed-up to normal operating temperature.)	2,340 - 3,280 Hz
	Idle to about 4,000 rpm	2,340 - 3,280 Hz to Approx. 1.100 Hz*

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Clean or replace mass air flow sensor. Refer to [EM-30, "Exploded View"](#).

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P0112, P0113 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0112, P0113 IAT SENSOR

DTC Description

INFOID:0000000014267556

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0112	IAT SEN/CIRCUIT- B1 (Intake air temperature sensor 1 circuit low bank 1)	An excessively low voltage from the intake air temperature sensor is sent to ECM.
P0113	IAT SEN/CIRCUIT- B1 (Intake air temperature sensor 1 circuit high bank 1)	An excessively high voltage from the intake air temperature sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (Intake air temperature sensor circuit is open or shorted.)
- Intake air temperature sensor
- Sensor power supply 2 circuit

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-180, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267557

1.CHECK INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect mass air flow sensor (with intake air temperature sensor) harness connector.
3. Turn ignition switch ON.
4. Check the voltage between mass air flow sensor harness connector and ground.

+		-	Voltage (Approx.)
MAF sensor			
Connector	Terminal		
F53	4	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 3.
NO >> GO TO 2.

P0112, P0113 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

2.CHECK INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between mass air flow sensor harness connector and ECM harness connector.

+		-		Continuity
MAF sensor		ECM		
Connector	Terminal	Connector	Terminal	
F53	4	F73	33	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3.CHECK INTAKE AIR TEMPERATURE SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between mass air flow sensor harness connector and ECM harness connector.

+		-		Continuity
MAF sensor		ECM		
Connector	Terminal	Connector	Terminal	
F53	3	F73	34	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK INTAKE AIR TEMPERATURE SENSOR

Check the intake air temperature sensor. Refer to [EC-181, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (with intake air temperature sensor). Refer to [EM-30, "Exploded View"](#).

Component Inspection

INFOID:0000000014267558

1.CHECK INTAKE AIR TEMPERATURE SENSOR

1. Disconnect mass air flow sensor harness connector.
2. Check resistance between mass air flow sensor terminals under the following conditions.

MAF sensor		Condition		Resistance
+	-			
Terminal				
4	3	Temperature° C (°F)	20 (68)	2.342 – 2.531 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (with intake air temperature sensor). Refer to [EM-30, "Exploded View"](#).

P0117, P0118 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0117, P0118 ECT SENSOR

DTC Description

INFOID:0000000014267559

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0117	ECT SEN/CIRC (Engine coolant temperature sensor 1 circuit low)	An excessively low voltage from the engine coolant temperature sensor is sent to ECM.
P0118	ECT SEN/CIRC (Engine coolant temperature sensor 1 circuit high)	An excessively high voltage from the engine coolant temperature sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (Engine coolant temperature sensor circuit is open or shorted.)
- Engine coolant temperature sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-182, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267560

1. CHECK ENGINE COOLANT TEMPERATURE SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect engine coolant temperature (ECT) sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between ECT sensor harness connector and ground.

+		-	Voltage (Approx.)
ECT sensor			
Connector	Terminal		
F24	1	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 3.
NO >> GO TO 2.

2.CHECK ENGINE COOLANT TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between ECT sensor harness connector and ECM harness connector.

+		-		Continuity
ECT sensor		ECM		
Connector	Terminal	Connector	Terminal	
F24	1	F73	28	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3.CHECK ENGINE COOLANT TEMPERATURE SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between ECT sensor harness connector and ECM harness connector.

+		-		Continuity
ECT sensor		ECM		
Connector	Terminal	Connector	Terminal	
F24	2	F73	27	Existed

4. Also check harness for short to ground to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Check the engine coolant temperature sensor. Refer to [EC-183. "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor. Refer to [EM-70. "Exploded View"](#).

Component Inspection

INFOID:0000000014267561

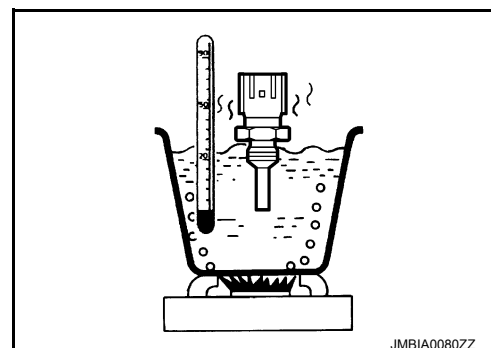
1.CHECK ENGINE COOLANT TEMPERATURE (ECT) SENSOR

1. Turn ignition switch OFF.
2. Disconnect ECT sensor harness connector.
3. Remove ECT sensor.
4. Check resistance between ECT sensor terminals by heating with hot water as shown in the figure.

ECT sensor		Condition		Resistance (kΩ)
+	−			
Terminal				
1	2	Temperature [°C (°F)]	20 (68)	2.37 - 2.63
			50 (122)	0.68 - 1.00
			90 (194)	0.236 - 0.260

Is the inspection result normal?

YES >> INSPECTION END



P0117, P0118 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

NO >> Replace engine coolant temperature sensor. Refer to [EM-70. "Exploded View"](#).

P0122, P0123 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0122, P0123 TP SENSOR

DTC Description

INFOID:0000000014267562

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0122	TP SEN 2/CIRC-B1 (Throttle/pedal position sensor/switch "A" circuit low)	An excessively low voltage from the TP sensor 2 is sent to ECM.
P0123	TP SEN 2/CIRC-B1 (Throttle/pedal position sensor/switch "A" circuit high)	An excessively high voltage from the TP sensor 2 is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (TP sensor 2 circuit is open or shorted.)
- Electric throttle control actuator (TP sensor 2)

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Other	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0122 or P0123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-185, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267563

1.CHECK DTC PRIORITY

P0122, P0123 TP SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

If DTC P0122 or P0123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292. "DTC Description"](#).
NO >> GO TO 2.

2.CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect electric throttle control actuator harness connector.
3. Turn ignition switch ON.
4. Check the voltage between electric throttle control actuator harness connector and ground.

+		-	Voltage (Approx.)
Electric throttle control actuator			
Connector	Terminal		
F50	2	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3.CHECK THROTTLE POSITION SENSOR 2 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

+		-		Continuity
Electric throttle control actuator		ECM		
Connector	Terminal	Connector	Terminal	
F50	2	F57	80	Existed

4. Also check harness for short to power.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

4.CHECK THROTTLE POSITION SENSOR 2 GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

+		-		Continuity
Electric throttle control actuator		ECM		
Connector	Terminal	Connector	Terminal	
F50	4	F57	78	Existed

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5.CHECK THROTTLE POSITION SENSOR 2 INPUT SIGNAL CIRCUIT

1. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

P0122, P0123 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
Electric throttle control actuator		ECM		
Connector	Terminal	Connector	Terminal	
F50	3	F57	77	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK THROTTLE POSITION SENSOR

Check the throttle position sensor. Refer to [EC-187, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to [EM-36, "Exploded View"](#).

Component Inspection

INFOID:0000000014267564

1.CHECK THROTTLE POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Perform " Throttle Valve Closed Position Learning". Refer to [EC-136, "Description"](#).
4. Turn ignition switch ON.
5. Set shift lever to 1st position.
6. Check the voltage between ECM harness connector terminals as per the following conditions.

ECM				Condition		Voltage	
Connector		+	–				
		Terminal					
Sensor 1	F57	79	78	Accelerator pedal	Fully released	More than 0.36 V	
					Fully depressed	Less than 4.75 V	
Sensor 2		77				Fully released	Less than 4.75 V
						Fully depressed	More than 0.36 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to [EM-36, "Exploded View"](#).

P0130 A/F SENSOR 1

DTC Description

INFOID:000000014267565

DTC DETECTION LOGIC

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal fluctuates according to fuel feedback control.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P0130	A/F SENSOR1 (B1) (O2 sensor circuit bank 1 sensor 1)	A)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly in the range other than approx. 2.2 V.
		B)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 2.2 V.

POSSIBLE CAUSE

- Harness or connectors (A/F sensor 1 circuit is open or shorted.)
- A/F sensor 1

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A

④ With CONSULT

1. Start engine and warm it up to normal operating temperature.
2. Let it idle for 2 minutes.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-189, "Diagnosis Procedure"](#).

NO-1 >> With CONSULT: GO TO 3.

NO-2 >> Without CONSULT: GO TO 7.

3. CHECK AIR FUEL RATIO (A/F) SENSOR 1 FUNCTION

1. Select "A/F SEN1 (B1)" in "DATA MONITOR" mode of "ENGINE" using CONSULT.
2. Check "A/F SEN1 (B1)" indication.

Does the indication fluctuates around 2.2 V?

YES >> GO TO 4.

NO >> Proceed to [EC-189, "Diagnosis Procedure"](#).

4. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B-1

1. Select "A/F SEN1 (B1) P1276" of "A/F SEN1" in "DTC WORK SUPPORT" mode of "ENGINE" using CONSULT.
2. Touch "START".
3. When the following conditions are met, "TESTING" will be displayed on the CONSULT screen.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 64 km/h (40 mph)
B/FUEL SCHDL	1.0 - 8.0 msec
Shift lever	5th position

If "TESTING" is not displayed after 20 seconds, retry from step 2.

CAUTION:

Always drive vehicle at a safe speed.

Is "TESTING" displayed on CONSULT screen?

YES >> GO TO 5.

NO >> Check A/F sensor 1 function again. GO TO 3.

5.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B-2

Release accelerator pedal fully.

NOTE:

Never apply brake during releasing the accelerator pedal.

Which does "TESTING" change to?

COMPLETED>>GO TO 6.

OUT OF CONDITION>>Retry DTC CONFIRMATION PROCEDURE. GO TO 4.

6.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B-3

Touch "SELF-DIAG RESULT"

Which is displayed on CONSULT screen?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to [EC-189, "Diagnosis Procedure"](#).

7.PERFORM COMPONENT FUNCTION CHECK FOR MALFUNCTION B

⊗ Without CONSULT

NOTE:

Use component function check to check the overall function of the A/F sensor 1 circuit. During this check, a 1st trip DTC might not be confirmed.

1. Start engine and warm it up to normal operating temperature.
2. Drive the vehicle at a speed of 80 km/h (50 MPH) for a few minutes in the suitable gear position.
3. Shift the shift lever to the 5th position, then release the accelerator pedal fully until the vehicle speed decreases to 50 km/h (31 MPH).

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

Never apply brake during releasing the accelerator pedal.

4. Repeat steps 2 to 3 for five times.
5. Stop the vehicle and turn ignition switch OFF.
6. Wait at least 10 seconds and restart engine.
7. Repeat steps 2 to 3 for five times.
8. Stop the vehicle.
9. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-189, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267566

1.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.
3. Turn ignition switch ON.

P0130 A/F SENSOR 1

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

4. Check the voltage between A/F sensor 1 harness connector and ground.

+		-	Voltage
A/F sensor 1			
Connector	Terminal		
F65	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between A/F sensor 1 harness connector and IPDM E/R harness connector.

+		-		Continuity
A/F sensor 1		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F65	4	E121	25	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

+		-		Continuity
A/F sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F65	1	F73	41	Existed
	2		45	

4. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

+		-	Continuity
A/F sensor 1			
Connector	Terminal		
F65	1	Ground	Not existed
	2		

+		-	Continuity
ECM			
Connector	Terminal		
F73	41	Ground	Not existed
	45		

5. Also check harness for short to power.

Is the inspection result normal?

P0130 A/F SENSOR 1

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

A

4.CHECK INTERMITTENT INCIDENT

Perform [GI-45. "Intermittent Incident"](#).

EC

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

C

5.REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace air fuel ratio (A/F) sensor 1. Refer to [EM-39. "Exploded View"](#).

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

D

E

>> INSPECTION END

F

G

H

I

J

K

L

M

N

O

P

P0131 A/F SENSOR 1

DTC Description

INFOID:0000000014267567

DTC DETECTION LOGIC

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal is not inordinately low.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0131	A/F SENSOR1 (B1) (O2 sensor circuit low voltage bank 1 sensor 1)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 0 V.

POSSIBLE CAUSE

- Harness or connectors (A/F sensor 1 circuit is open or shorted.)
- A/F sensor 1

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle.

>> GO TO 2.

2. CHECK A/F SENSOR FUNCTION

① With CONSULT

1. Start engine and warm it up to normal operating temperature.
2. Select "A/F SEN1 (B1)" in "DATA MONITOR" mode of "ENGINE" using CONSULT.
3. Check "A/F SEN1 (B1)" indication.

② With GST

Follow the procedure "With CONSULT" above.

Is the indication constantly approx. 0 V?

YES >> Proceed to [EC-193, "Diagnosis Procedure"](#).

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

① With CONSULT

1. Turn ignition switch OFF, wait at least 10 seconds and then restart engine.
2. Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine.

CAUTION:

Always drive vehicle at a safe speed.

3. Maintain the following conditions for about 20 consecutive seconds.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 mph)
B/FUEL SCHDL	1.5 - 9.0 msec
Selector/Shift lever	Suitable position

P0131 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

NOTE:

- Keep the accelerator pedal as steady as possible during the cruising.
- If this procedure is not completed within 1 minute after restarting engine at step 1, return to step 1.

4. Check 1st trip DTC.

 With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC detected?

YES >> Proceed to [EC-193, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267568

1.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.
3. Turn ignition switch ON.
4. Check the voltage between A/F sensor 1 harness connector and ground.

+		-	Voltage
A/F sensor 1			
Connector	Terminal		
F65	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between A/F sensor 1 harness connector and IPDM E/R harness connector.

+		-		Continuity
A/F sensor 1		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F65	4	E121	25	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

+		-		Continuity
A/F sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F65	1	F73	41	Existed
	2		45	

P0131 A/F SENSOR 1

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

4. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

+		-	Continuity
A/F sensor 1			
Connector	Terminal		
F65	1	Ground	Not existed
	2		

+		-	Continuity
ECM			
Connector	Terminal		
F73	41	Ground	Not existed
	45		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK INTERMITTENT INCIDENT

Perform [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace air fuel ratio (A/F) sensor 1. Refer to [EM-39, "Exploded View"](#).

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

P0132 A/F SENSOR 1

DTC Description

INFOID:000000014267569

DTC DETECTION LOGIC

To judge the malfunction, the diagnosis checks that the A/F signal computed by ECM from the A/F sensor 1 signal is not inordinately high.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0132	A/F SENSOR1 (B1) (O2 sensor circuit high voltage bank 1 sensor 1)	The A/F signal computed by ECM from the A/F sensor 1 signal is constantly approx. 5 V.

POSSIBLE CAUSE

- Harness or connectors (A/F sensor 1 circuit is open or shorted.)
- A/F sensor 1

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V at idle.

>> GO TO 2.

2. CHECK A/F SENSOR FUNCTION

① With CONSULT

1. Start engine and warm it up to normal operating temperature.
2. Select "A/F SEN1 (B1)" in "DATA MONITOR" mode of "ENGINE" using CONSULT.
3. Check "A/F SEN1 (B1)" indication.

② With GST

Follow the procedure "With CONSULT" above.

Is the indication constantly approx. 5 V?

YES >> Proceed to [EC-196, "Diagnosis Procedure"](#).

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

① With CONSULT

1. Turn ignition switch OFF, wait at least 10 seconds and then restart engine.
2. Drive and accelerate vehicle to more than 40 km/h (25 MPH) within 20 seconds after restarting engine.

CAUTION:

Always drive vehicle at a safe speed.

3. Maintain the following conditions for about 20 consecutive seconds.

ENG SPEED	1,000 - 3,200 rpm
VHCL SPEED SE	More than 40 km/h (25 mph)
B/FUEL SCHDL	1.5 - 9.0 msec
Selector/Shift lever	Suitable position

P0132 A/F SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

NOTE:

- Keep the accelerator pedal as steady as possible during the cruising.
- If this procedure is not completed within 1 minute after restarting engine at step 1, return to step 1.

4. Check 1st trip DTC.

 With GST

Follow the procedure "With CONSULT" above.

Is 1st trip DTC is detected?

YES >> Proceed to [EC-196, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267570

1.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.
3. Turn ignition switch ON.
4. Check the voltage between A/F sensor 1 harness connector and ground.

+		-	Voltage
A/F sensor 1			
Connector	Terminal		
F65	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between A/F sensor 1 harness connector and IPDM E/R harness connector.

+		-		Continuity
A/F sensor 1		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F65	4	E121	25	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

+		-		Continuity
A/F sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F65	1	F73	41	Existed
	2		45	

P0132 A/F SENSOR 1

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

4. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

+		-	Continuity
A/F sensor 1			
Connector	Terminal		
F65	1	Ground	Not existed
	2		

+		-	Continuity
ECM			
Connector	Terminal		
F73	41	Ground	Not existed
	45		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK INTERMITTENT INCIDENT

Perform [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace air fuel ratio (A/F) sensor 1. Refer to [EM-39, "Exploded View"](#).

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

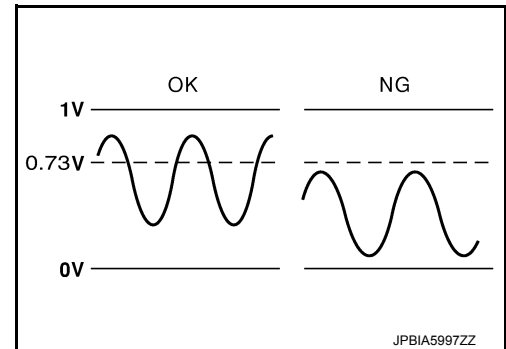
P0137 HO2S2

DTC Description

INFOID:0000000014267571

DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst (manifold) causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the maximum voltage of the sensor is sufficiently high during the various driving condition such as fuel-cut.



DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0137	HO2S2 (B1) (O2 sensor circuit low voltage bank 1 sensor 2)	- The maximum voltage from the heated oxygen sensor 2 is not reached to the specified voltage. - ECM detects the heated oxygen sensor 2 heater circuit is short to ground.

POSSIBLE CAUSE

- Harness or connectors (Heated oxygen sensor 2 circuit is open or shorted)
- Heated oxygen sensor 2
- Fuel pressure
- Fuel injector
- Intake air leaks

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Do you have CONSULT?

Do you have CONSULT?

YES >> GO TO 2.

NO >> GO TO 5.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30°C (32 to 86°F).

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

Ⓢ With CONSULT

1. Turn ignition switch ON and select "DATA MONITOR" mode of "ENGINE" using CONSULT.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.

< DTC/CIRCUIT DIAGNOSIS >

4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Make sure that "COOLAN TEMP/S" indicates more than 70°C (158°F).
If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches 70°C (158°F).
7. Open engine hood.
8. Select "HO2S2 (B1) P1147" of "HO2S2" in "DTC WORK SUPPORT" mode of "ENGINE" using CONSULT.
9. Follow the instruction of CONSULT.

NOTE:

It will take at most 10 minutes until "COMPLETED" is displayed.

10. Touch "SELF-DIAG RESULT".

Which is displayed on CONSULT screen?

- OK >> INSPECTION END
 NG >> Proceed to [EC-200, "Diagnosis Procedure"](#).
 CAN NOT BE DIAGNOSED>>GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

1. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
2. Perform DTC CONFIRMATION PROCEDURE again.

>> GO TO 3.

5.PERFORM COMPONENT FUNCTION CHECK-1

⊗ Without CONSULT

NOTE:

Use component function check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	-		
	Terminal			
F73	22	23	Revving up to 4,000 rpm under no load at least 10 times	The voltage should be above 0.73 V at least once during this procedure.

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> GO TO 6.

6.PERFORM COMPONENT FUNCTION CHECK-2

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	-		
	Terminal			
F73	22	23	Keeping engine speed at idle for 10 minutes	The voltage should be above 0.73 V at least once during this procedure.

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> GO TO 7.

7.PERFORM COMPONENT FUNCTION CHECK-3

< DTC/CIRCUIT DIAGNOSIS >

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	–		
	Terminal			
F73	22	23	Coasting from 80 km/h (50 MPH) in 5th position	The voltage should be above 0.73 V at least once during this procedure.

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to [EC-200, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267572

1. CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

1. Clear the mixture ratio self-learning value. Refer to [EC-139, "Description"](#).

2. Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0171. Refer to [EC-224, "DTC Description"](#).

NO >> GO TO 2.

2. CHECK HO2S2 GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect heated oxygen sensor 2 (HO2S2) harness connector.

3. Disconnect ECM harness connector.

4. Check the continuity between HO2S2 harness connector and ECM harness connector.

+		-		Continuity
HO2S2		ECM		
Connector	Terminal	Connector	Terminal	
F13	1	F73	23	Existed

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3. CHECK HO2S2 INPUT SIGNAL CIRCUIT

1. Check the continuity between HO2S2 harness connector and ECM harness connector.

+		-		Continuity
HO2S2		ECM		
Connector	Terminal	Connector	Terminal	
F13	2	F73	22	Existed

2. Check the continuity between HO2S2 harness connector and ground, or ECM harness connector and ground.

+		-	Continuity
HO2S2			
Connector	Terminal		
F13	2	Ground	Not existed

+		-	Continuity
ECM			
Connector	Terminal		
F73	22	Ground	Not existed

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4. CHECK HEATED OXYGEN SENSOR 2

Check the heated oxygen sensor 2. Refer to [EC-201, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5. REPLACE HEATED OXYGEN SENSOR 2

Replace heated oxygen sensor 2.

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

Component Inspection

INFOID:0000000014267573

1. INSPECTION START

Do you have CONSULT?

Do you have CONSULT?

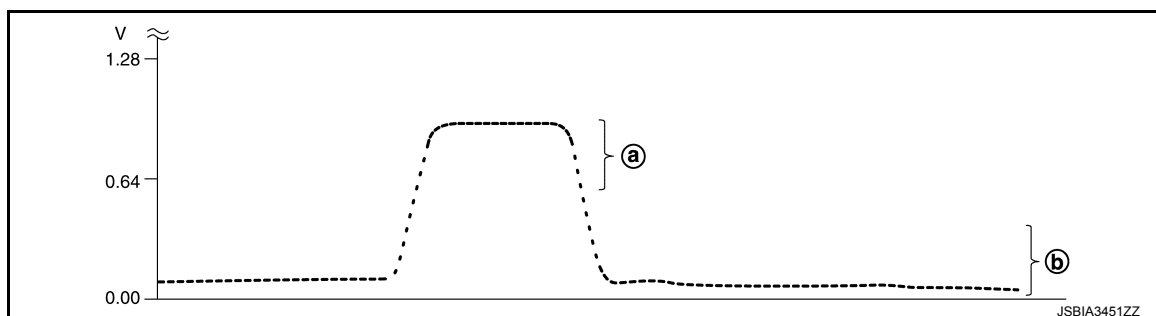
YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK HEATED OXYGEN SENSOR 2

Ⓔ With CONSULT

1. Turn ignition switch ON and select "DATA MONITOR" mode of "ENGINE" using CONSULT.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Select "FUEL INJECTION" in "ACTIVE TEST" mode of "ENGINE" using CONSULT, and select "HO2S2 (B1)" as the monitor item with CONSULT.
7. Check "HO2S2 (B1)" at idle speed when adjusting "FUEL INJECTION" to $\pm 25\%$.



Ⓐ : The voltage should be above 0.73 V at least on time.

Ⓑ : The voltage should be below 0.28 V at least on time.

“HO2S2 (B1)” should be above 0.73 V at least once when the “FUEL INJECTION” is + 25%.

“HO2S2 (B1)” should be below 0.28 V at least once when the “FUEL INJECTION” is – 25%.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

3.CHECK HEATED OXYGEN SENSOR 2-1

⊗ Without CONSULT

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	–		
	Terminal			
F73	22	23	Revving up to 4,000 rpm under no load at least 10 times	The voltage should be above 0.73 V at least once during this procedure The voltage should be below 0.28 V at least once during this procedure

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4.CHECK HEATED OXYGEN SENSOR 2-2

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	–		
	Terminal			
F73	22	23	Keeping engine speed at idle for 10 minutes	The voltage should be above 0.73 V at least once during this procedure. The voltage should be below 0.28 V at least once during this procedure.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5.CHECK HEATED OXYGEN SENSOR 2-3

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	–		
	Terminal			
F73	22	23	Coasting from 80 km/h (50 MPH) in 5th position	The voltage should be above 0.73 V at least once during this procedure The voltage should be below 0.28 V at least once during this procedure

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6. REPLACE HEATED OXYGEN SENSOR 2

Replace heated oxygen sensor 2. Refer to [EX-6, "Exploded View"](#).

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

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P0138 HO2S2

DTC Description

INFOID:000000014267574

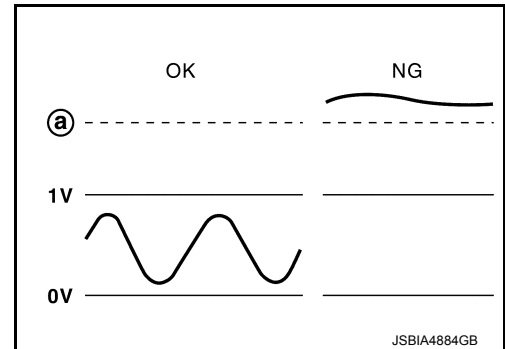
DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst (manifold) causes the longer switching time.

MAINFUNCTION A

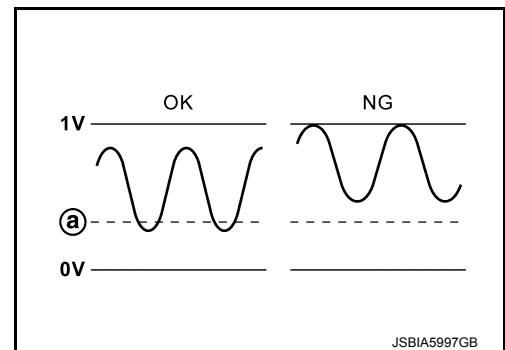
To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the voltage is unusually high during the various driving condition such as fuel-cut.

Ⓐ : 1.3 V

**MAINFUNCTION B**

To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the minimum voltage of sensor is sufficiently low during the various driving condition such as fuel-cut.

Ⓐ : 0.28 V



DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P0138	HO2S2 (B1) (O2 sensor circuit high voltage bank 1 sensor 2)	A)	An excessively high voltage from the heated oxygen sensor 2 is sent to ECM.
		B)	The minimum voltage from the heated oxygen sensor 2 is not reached to the specified voltage.

POSSIBLE CAUSE

DTC P0138 – A

- Harness or connectors (The sensor circuit is open or shorted)
- Heated oxygen sensor 2

DTC P0138 – B

- Harness or connectors (The sensor circuit is open or shorted)
- Heated oxygen sensor 2
- Fuel pressure
- Fuel injector

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 2 minutes.
5. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-206, "Diagnosis Procedure"](#).

NO-1 >> With CONSULT: GO TO 3.

NO-2 >> Without CONSULT: GO TO 5.

3.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B

NOTE:

For better results, perform "DTC WORK SUPPORT" at a temperature of 0 to 30°C (32 to 86°F).

1. Turn ignition switch ON and select "DATA MONITOR" mode of "ENGINE" using CONSULT.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Make sure that "COOLAN TEMP/S" indication is more than 70°C (158°F).
If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches 70°C (158°F).
7. Open engine hood.
8. Select "HO2S2 (B1) P1146" of "HO2S2" in "DTC WORK SUPPORT" mode of "ENGINE" using CONSULT.
9. Follow the instruction of CONSULT.

NOTE:

It will take at most 10 minutes until "COMPLETED" is displayed.

10. Touch "SELF-DIAG RESULT".

Which is displayed on CONSULT

OK >> INSPECTION END

NG >> Proceed to [EC-206, "Diagnosis Procedure"](#).

CAN NOT BE DIAGNOSED>>GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B AGAIN

1. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
2. Perform DTC confirmation procedure again.

>> GO TO 3.

5.PERFORM COMPONENT FUNCTION CHECK-1

⊗ Without CONSULT

NOTE:

Use component function check the overall function of the heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	–		
	Terminal			
F73	22	23	Revving up to 4,000 rpm under no load at least 10 times	The voltage should be below 0.28 V at least once during this procedure.

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> GO TO 6.

6.PERFORM COMPONENT FUNCTION CHECK-2

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	–		
	Terminal			
F73	22	23	Keeping engine speed at idle for 10 minutes	The voltage should be below 0.28 V at least once during this procedure.

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> GO TO 7.

7.PERFORM COMPONENT FUNCTION CHECK-3

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	–		
	Terminal			
F73	22	23	Coasting from 80 km/h (50 MPH) in 5th position	The voltage should be below 0.28 V at least once during this procedure.

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to [EC-206, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267575

1.INSPECTION START

Confirm the detected malfunction (A or B). Refer to [EC-204, "DTC Description"](#).

Which malfunction is detected?

A >> GO TO 2.

B >> GO TO 7.

2.CHECK HO2S2 CONNECTOR FOR WATER

1. Turn ignition switch OFF.
2. Disconnect heated oxygen sensor 2 harness connector.
3. Check connectors for water.

Water should not exist.

Is the inspection result normal?

YES >> GO TO 3.

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

3.CHECK HO2S2 GROUND CIRCUIT

1. Disconnect ECM harness connector.
2. Check the continuity between HO2S2 harness connector and ECM harness connector.

+		-		Continuity
HO2S2		ECM		
Connector	Terminal	Connector	Terminal	
F13	1	F73	23	Existed

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK HO2S2 INPUT SIGNAL CIRCUIT

1. Check the continuity between HO2S2 harness connector and ECM harness connector.

+		-		Continuity
HO2S2		ECM		
Connector	Terminal	Connector	Terminal	
F13	2	F73	22	Existed

2. Check the continuity between HO2S2 harness connector and ground, or ECM harness connector and ground.

+		-	Continuity
HO2S2			
Connector	Terminal		
F13	2	Ground	Not existed

+		-	Continuity
ECM			
Connector	Terminal		
F73	22	Ground	Not existed

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK HEATED OXYGEN SENSOR 2

Check the heated oxygen sensor 2. Refer to [EC-209, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6.REPLACE HEATED OXYGEN SENSOR 2

Replace heated oxygen sensor 2. Refer to [EX-6, "Exploded View"](#).

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.

< DTC/CIRCUIT DIAGNOSIS >

- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

7. CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

1. Clear the mixture ratio self-learning value. Refer to [EC-139, "Description"](#).
2. Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0172 detected? Is it difficult to start engine?YES >> Perform trouble diagnosis for DTC P0172. Refer to [EC-229, "DTC Description"](#).

NO >> GO TO 8.

8. CHECK HO2S2 GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect heated oxygen sensor 2 harness connector.
3. Disconnect ECM harness connector.
4. Check the continuity between HO2S2 harness connector and ECM harness connector.

+		-		Continuity
HO2S2		ECM		
Connector	Terminal	Connector	Terminal	
F13	1	F73	23	Existed

5. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9. CHECK HO2S2 INPUT SIGNAL CIRCUIT

1. Check the continuity between HO2S2 harness connector and ECM harness connector.

+		-		Continuity
HO2S2		ECM		
Connector	Terminal	Connector	Terminal	
F13	2	F73	22	Existed

2. Check the continuity between HO2S2 harness connector and ground, or ECM harness connector and ground.

+		-	Continuity
HO2S2			
Connector	Terminal		
F13	2	Ground	Not existed

+		-	Continuity
ECM			
Connector	Terminal		
F73	22	Ground	Not existed

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

10. CHECK HEATED OXYGEN SENSOR 2

Check the heated oxygen sensor 2. Refer to [EC-209, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 11.

11. REPLACE HEATED OXYGEN SENSOR 2

Replace heated oxygen sensor 2. Refer to [EX-6, "Exploded View"](#).

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

Component Inspection

INFOID:0000000014267576

1. INSPECTION START

Do you have CONSULT?

Do you have CONSULT?

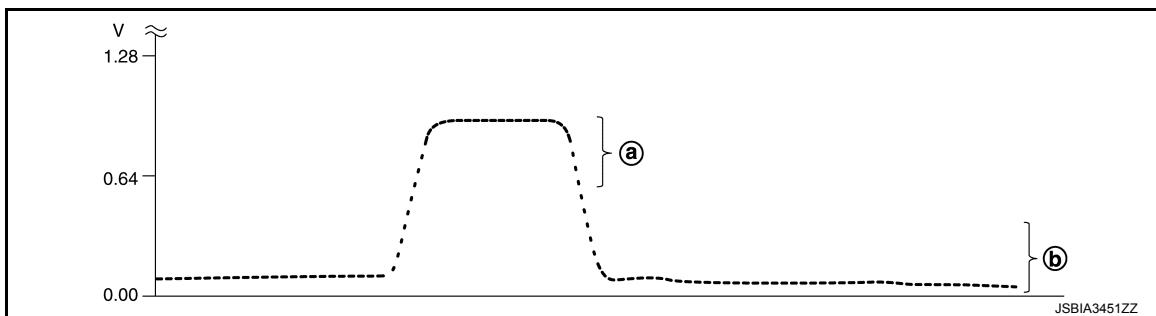
YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK HEATED OXYGEN SENSOR 2

Ⓐ With CONSULT

1. Turn ignition switch ON and select "DATA MONITOR" mode of "ENGINE" using CONSULT.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Select "FUEL INJECTION" in "ACTIVE TEST" mode of "ENGINE" using CONSULT, and select "HO2S2 (B1)" as the monitor item with CONSULT.
7. Check "HO2S2 (B1)" at idle speed when adjusting "FUEL INJECTION" to $\pm 25\%$.



Ⓐ : The voltage should be above 0.73 V at least on time.

Ⓑ : The voltage should be below 0.28 V at least on time.

"HO2S2 (B1)" should be above 0.73 V at least once when the "FUEL INJECTION" is + 25%.

"HO2S2 (B1)" should be below 0.28 V at least once when the "FUEL INJECTION" is - 25%.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

3. CHECK HEATED OXYGEN SENSOR 2-1

< DTC/CIRCUIT DIAGNOSIS >

⊗ Without CONSULT

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	–		
	Terminal			
F73	22	23	Revving up to 4,000 rpm under no load at least 10 times	The voltage should be above 0.73 V at least once during this procedure The voltage should be below 0.28 V at least once during this procedure

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 4.

4.CHECK HEATED OXYGEN SENSOR 2-2

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	−		
	Terminal			
F73	22	23	Keeping engine speed at idle for 10 minutes	The voltage should be above 0.73 V at least once during this procedure The voltage should be below 0.28 V at least once during this procedure

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5.CHECK HEATED OXYGEN SENSOR 2-3

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	–		
	Terminal			
F73	22	23	Coasting from 80 km/h (50 MPH) in 5th position	The voltage should be above 0.73 V at least once during this procedure The voltage should be below 0.28 V at least once during this procedure

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6.REPLACE HEATED OXYGEN SENSOR 2Replace heated oxygen sensor 2. Refer to [EX-6. "Exploded View"](#).**CAUTION:**

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

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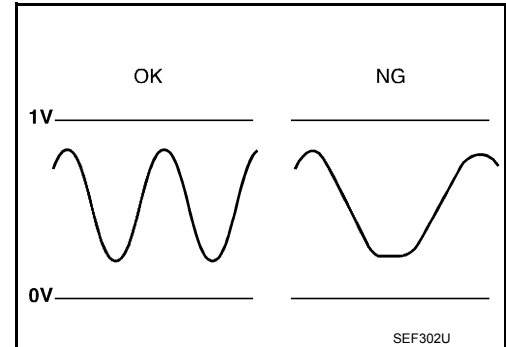
P0139 HO2S2

DTC Description

INFOID:0000000014267577

DTC DETECTION LOGIC

The heated oxygen sensor 2 has a much longer switching time between rich and lean than the air fuel ratio (A/F) sensor 1. The oxygen storage capacity of the three way catalyst 1 causes the longer switching time. To judge the malfunctions of heated oxygen sensor 2, ECM monitors whether the switching response of the sensor's voltage is faster than specified during various driving conditions such as fuel cut.



DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0139	HO2S2 (B1) (O2 sensor circuit slow response bank 1 sensor 2)	The switching time between rich and lean of a heated oxygen sensor 2 signal delays more than the specified time computed by ECM.

POSSIBLE CAUSE

- Harness or connectors (The sensor circuit is open or shorted)
- Heated oxygen sensor 2
- Fuel system
- EVAP system
- Intake air system

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.DTC PRIORITY

If DTC P0139 or P0159 is detected with DTC P0137, P0138, P0157 or P0158, perform trouble diagnosis for DTC P0137, P0138, P0157 or P0158.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).
 NO >> GO TO 2.

2.INSPECTION START

Do you have CONSULT?

Do you have CONSULT?

- YES >> GO TO 3.
 NO >> GO TO 12.

3.PRECONDITIONING

NOTE:

- If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds.
- **For the best results, perform DTC WORK SUPPORT at a temperature of 0 to 30°C (32 to 86°F)**
- **"COMPLETED" will appear on CONSULT screen when all tests "COND1", "COND2" and "COND3" are completed.**

TESTING CONDITION:

Never stop engine during this procedure. If the engine is stopped, retry this procedure from PERFORM PROCEDURE FOR COND1 - 2.

>> GO TO 4.

4.PERFORM PROCEDURE FOR COND1 - 1

Start engine and warm it up to normal operating temperature.

>> GO TO 5.

5.PERFORM PROCEDURE FOR COND1 - 2

Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 6.

6.PERFORM PROCEDURE FOR COND1 - 3

1. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
2. Let engine idle for 1 minute.
3. Select "HO2S2 (B1) P0139" of "HO2S2" in "DTC WORK SUPPORT" mode with CONSULT.
4. Touch "START".
5. Rev engine up to 2,000 rpm two or three times quickly under no load.

Is "COMPLETED" appears on CONSULT screen?

YES >> GO TO 10.

NO >> GO TO 7.

7.PERFORM PROCEDURE FOR COND1 - 4

When the following conditions are met, "TESTING" will be displayed at "COND1" on the CONSULT screen. Maintain the condition continuously until "TESTING" changes to "COMPLETED". (It will take approximately 60 seconds.)

ENG SPEED	More than 1,000 rpm
B/FUEL SCHDL	More than 1.0 msec
COOLAN TEMP/S	70 – 105°C (158 – 221°F)
Shift/Shift lever	Suitable position

Which is displayed on CONSULT screen?

COND1: OUT OF CONDITION>>GO TO 5.

COND1: COMPLETED, COND2: INCOMPLETED>>GO TO 8.

COND1: COMPLETED, COND2: COMPLETED>>GO TO 9.

8.PERFORM PROCEDURE FOR COND2

While driving, release accelerator pedal completely from the above condition until "INCOMPLETED" at "COND2" on CONSULT screen has turned to "COMPLETED". (It will take approximately 4 seconds.)

Which is displayed on CONSULT screen?

COND2: COMPLETED, COND3: INCOMPLETED>>GO TO 9.

COND2: COMPLETED, COND3: COMPLETED>>GO TO 10.

9.PERFORM PROCEDURE FOR COND3 - 1

Stop vehicle and let it idle until "INCOMPLETED" of "COND3" on CONSULT screen has turned to "COMPLETED". (It will take a maximum of approximately 6 minutes.)

>> GO TO 10.

10.PERFORM PROCEDURE FOR COND3 - 2

Touch "SELF DIAGRESULTS".

Which is displayed on CONSULT screen?

"OK"-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

"OK"-2 >> Confirmation after repair: INSPECTION END

"NG" >> Proceed to [EC-215, "Diagnosis Procedure"](#).

< DTC/CIRCUIT DIAGNOSIS >

"CAN NOT BE DIAGNOSED">>GO TO 11.

11.PERFORM PROCEDURE FOR COND3 - 3

1. Turn ignition switch OFF and leave the vehicle in a cool place (soak the vehicle).
2. Turn ignition switch ON and select "COOLAN TEMP/S" in "DATA MONITOR" mode with CONSULT.
3. Start engine and warm it up until "COOLAN TEMP/S" indication reaches to 70°C (158°F).

>> GO TO 6.

12.PERFORM COMPONENT FUNCTION CHECK-1

⊗Without CONSULT

NOTE:

Use Component Function Check to check the overall function of heated oxygen sensor 2 circuit. During this check, a 1st trip DTC might not be confirmed.

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	-		
	Terminal			
F73	22	23	Revving up to 4,000 rpm under no load at least 10 times	The voltage should be above 0.12 V at least once during this procedure.

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> GO TO 13.

13.PERFORM COMPONENT FUNCTION CHECK-2

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	-		
	Terminal			
F73	22	23	Keeping engine speed at idle for 10 minutes	The voltage should be above 0.12 V at least once during this procedure.

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> GO TO 14.

14.PERFORM COMPONENT FUNCTION CHECK-3

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	-		
	Terminal			
F73	22	23	Coasting from 80 km/h (50 MPH) in 5th position	The voltage should be above 0.12 V at least once during this procedure.

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to [EC-215, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000014267578

1.DTC PRIORITY

If DTC P0139 or P0159 is detected with DTC P0137, P0138, P0157 or P0158, perform trouble diagnosis for DTC P0137, P0138, P0157 or P0158.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).

NO >> GO TO 2.

2.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

1. Clear the mixture ratio self-learning value. Refer to [EC-139, "Description"](#).

2. Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171 detected? Is it difficult to start engine?

YES >> Perform trouble diagnosis for DTC P0171. Refer to [EC-224, "DTC Description"](#).

NO >> GO TO 3.

3.CHECK HO2S2 GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect heated oxygen sensor 2 (HO2S2) harness connector.

3. Disconnect ECM harness connector.

4. Check the continuity between HO2S2 harness connector and ECM harness connector.

+		-		Continuity
HO2S2		ECM		
Connector	Terminal	Connector	Terminal	
F13	1	F73	23	Existed

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK HO2S2 INPUT SIGNAL CIRCUIT

1. Check the continuity between HO2S2 harness connector and ECM harness connector.

+		-		Continuity
HO2S2		ECM		
Connector	Terminal	Connector	Terminal	
F13	2	F73	22	Existed

2. Check the continuity between HO2S2 harness connector and ground, or ECM harness connector and ground.

+		-	Continuity
HO2S2			
Connector	Terminal		
F13	2	Ground	Not existed

+		-	Continuity
ECM			
Connector	Terminal		
F73	22	Ground	Not existed

< DTC/CIRCUIT DIAGNOSIS >

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. CHECK HEATED OXYGEN SENSOR 2

Check the heated oxygen sensor 2. Refer to [EC-216, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6. REPLACE HEATED OXYGEN SENSOR 2

Replace heated oxygen sensor 2.

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

Component Inspection

INFOID:0000000014267579

1. INSPECTION START

Do you have CONSULT?

Do you have CONSULT?

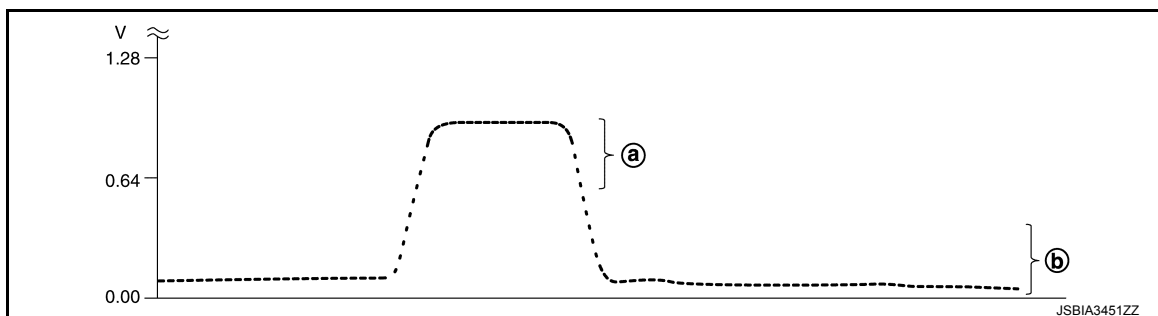
YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK HEATED OXYGEN SENSOR 2

Ⓟ With CONSULT

1. Turn ignition switch ON and select "DATA MONITOR" mode of "ENGINE" using CONSULT.
2. Start engine and warm it up to normal operating temperature.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
5. Let engine idle for 1 minute.
6. Select "FUEL INJECTION" in "ACTIVE TEST" mode of "ENGINE" using CONSULT, and select "HO2S2 (B1)" as the monitor item with CONSULT.
7. Check "HO2S2 (B1)" at idle speed when adjusting "FUEL INJECTION" to $\pm 25\%$.



Ⓐ : The voltage should be above 0.73 V at least on time.

Ⓑ : The voltage should be below 0.28 V at least on time.

"HO2S2 (B1)" should be above 0.73 V at least once when the "FUEL INJECTION" is + 25%.

"HO2S2 (B1)" should be below 0.28 V at least once when the "FUEL INJECTION" is - 25%.

Is the inspection result normal?

YES >> INSPECTION END
 NO >> GO TO 6.

3. CHECK HEATED OXYGEN SENSOR 2-1

⊗ Without CONSULT

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	–		
	Terminal			
F73	22	23	Revving up to 4,000 rpm under no load at least 10 times	The voltage should be above 0.73 V at least once during this procedure The voltage should be below 0.28 V at least once during this procedure

Is the inspection result normal?

YES >> INSPECTION END
 NO >> GO TO 4.

4. CHECK HEATED OXYGEN SENSOR 2-2

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	−		
	Terminal			
F73	22	23	Keeping engine speed at idle for 10 minutes	The voltage should be above 0.73 V at least once during this procedure The voltage should be below 0.28 V at least once during this procedure

Is the inspection result normal?

YES >> INSPECTION END
 NO >> GO TO 5.

5. CHECK HEATED OXYGEN SENSOR 2-3

Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	–		
	Terminal			
F73	22	23	Coasting from 80 km/h (50 MPH) in 5th position	The voltage should be above 0.73 V at least once during this procedure The voltage should be below 0.28 V at least once during this procedure

Is the inspection result normal?

YES >> INSPECTION END
 NO >> GO TO 6.

6. REPLACE HEATED OXYGEN SENSOR 2

Replace heated oxygen sensor 2. Refer to [EX-6, "Exploded View"](#).

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.

P0139 HO2S2

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

P014C, P014D A/F SENSOR 1

DTC Description

INFOID:0000000014267580

DTC DETECTION LOGIC

To judge malfunctions, this diagnosis measures response time of the A/F signal computed by ECM from the A/F sensor 1 signal. The time is compensated by engine operating (speed and load), fuel feedback control constant, and the A/F sensor 1 temperature index. Judgment is based on whether the compensated time (the A/F signal cycling time index) is inordinately long or not.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P014C	A/F SENSOR1 (B1) (O2 sensor slow response - rich to lean bank 1 sensor 1)	The response time of a A/F sensor 1 signal delays more than the specified time computed by ECM.
P014D	A/F SENSOR1 (B1) (O2 sensor slow response - lean to rich bank 1 sensor 1)	

POSSIBLE CAUSE

- Harness or connectors (The A/F sensor 1 circuit is open or shorted.)
- A/F sensor 1

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V at idle.

Do you have CONSULT?

- YES >> GO TO 2.
NO >> GO TO 6.

2. PERFORM DTC CONFIRMATION PROCEDURE-1

 With CONSULT

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
6. Let engine idle for 1 minute.
7. Increase the engine speed up to about 3,600 rpm and keep it for 10 seconds.
8. Fully release accelerator pedal and then let engine idle for about 1 minute.
9. Check the items status of "DATA MONITOR" as follows.

NOTE:

If "PRSENT" changed to "ABSNT", refer to [EC-142, "Component Function Check"](#).

Data monitor item	Status
A/F SEN1 DIAG3 (B1)	PRSENT

Is "PRSENT" displayed on CONSULT screen?

- YES >> GO TO 4.
NO >> GO TO 3.

< DTC/CIRCUIT DIAGNOSIS >

3.PERFORM DTC CONFIRMATION PROCEDURE-2 **With CONSULT**

Perform DTC confirmation procedure-1 again.

Is "PRSENT" displayed on CONSULT screen?

YES >> GO TO 4.

NO >> Refer to [EC-142, "Component Function Check"](#).

4.PERFORM DTC CONFIRMATION PROCEDURE-2 **With CONSULT**

1. Wait for about 20 seconds at idle.

2. Check the items status of "DATA MONITOR" as follows.

NOTE:

If "CMPLT" changed to "INCMP", refer to [EC-142, "Component Function Check"](#).

Data monitor item	Status
A/F SEN1 DIAG2 (B1)	CMPLT

Is "CMPLT" displayed on CONSULT screen?

YES >> GO TO 5.

NO >> Refer to [EC-142, "Component Function Check"](#).

5.PERFORM SELF-DIAGNOSIS **With CONSULT**

Check the "SELF-DIAG RESULT".

Is any DTC detected?

YES >> Proceed to [EC-221, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

6.CHECK AIR-FUEL RATIO SELF-LEARNING VALUE **With GST**

1. Start engine and warm it up to normal operating temperature.

2. Select Service \$01 with GST.

3. Calculate the total value of "Short term fuel trim" and "Long term fuel trim" indications.

Is the total percentage within $\pm 15\%$?

YES >> GO TO 8.

NO >> GO TO 7.

7.DETECT MALFUNCTIONING PART

Check the following.

- Intake air leaks
- Exhaust gas leaks
- Incorrect fuel pressure
- Lack of fuel
- Fuel injector
- Incorrect PCV hose connection
- PCV valve
- Mass air flow sensor

>> Repair or replace malfunctioning part.

8.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch OFF and wait at least 10 seconds.

2. Turn ignition switch ON.

3. Turn ignition switch OFF and wait at least 10 seconds.

4. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.

5. Let engine idle for 1 minute.

P014C, P014D A/F SENSOR 1

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

6. Increase the engine speed up to about 3,600 rpm and keep it for 10 seconds.
7. Fully release accelerator pedal and then let engine idle for about 1 minute.
8. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-221, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267581

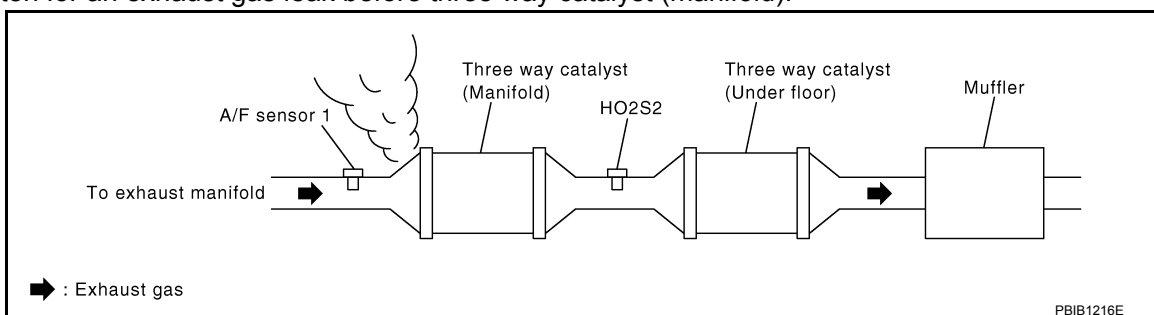
1.RETIGHTEN A/F SENSOR 1

Loosen and retighten the A/F sensor 1. Refer to [EM-39, "Exploded View"](#).

>> GO TO 2.

2.CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst (manifold).



Is exhaust gas leak detected?

- YES >> Repair or replace.
- NO >> GO TO 3.

3.CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

Is intake air leak detected?

- YES >> Repair or replace.
- NO >> GO TO 4.

4.CLEAR THE MIXTURE RATIO SELF-LEARNING VALUE

1. Clear the mixture ratio self-learning value. Refer to [EC-139, "Description"](#).
2. Run engine for at least 10 minutes at idle speed.

Is the 1st trip DTC P0171 or P172 detected? Is it difficult to start engine?

- YES >> Perform trouble diagnosis for DTC P0171 or P0172. Refer to [EC-224, "DTC Description"](#) or [EC-229, "DTC Description"](#).
- NO >> GO TO 5.

5.CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect A/F sensor 1 harness connector.
2. Turn ignition switch ON.
3. Check the voltage between A/F sensor 1 harness connector and ground.

+		-	Voltage
A/F sensor 1			
Connector	Terminal		
F65	4	Ground	Battery voltage

P014C, P014D A/F SENSOR 1

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

+		-		Continuity
A/F sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F65	1	F73	41	Existed
	2		45	

4. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

+		-	Continuity
A/F sensor 1			
Connector	Terminal		
F65	1	Ground	Not existed
	2		

+		-	Continuity
ECM			
Connector	Terminal		
F73	41	Ground	Not existed
	45		

5. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK AIR FUEL RATIO (A/F) SENSOR 1 HEATER

Refer to [EC-164, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 11.

8.CHECK MASS AIR FLOW SENSOR

Refer to [EC-177, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace mass air flow sensor. Refer to [EM-30, "Exploded View"](#).

9.CHECK PCV VALVE

Refer to [EC-391, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace PCV valve. Refer to [EM-32, "Exploded View"](#).

10.CHECK INTERMITTENT INCIDENT

P014C, P014D A/F SENSOR 1

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

Perform [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace.

11. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace air fuel ratio (A/F) sensor 1. Refer to [EM-39, "Exploded View"](#).

CAUTION:

- Discard any sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner [commercial service tool (J-43897-18 or J43897-12)] and approved Anti-seize Lubricant (commercial service tool).

>> INSPECTION END

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P0171 FUEL INJECTION SYSTEM FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0171 FUEL INJECTION SYSTEM FUNCTION

DTC Description

INFOID:0000000014267582

DTC DETECTION LOGIC

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from the A/F sensors 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios.

In case the amount of the compensation value is extremely large (The actual mixture ratio is too lean.), the ECM judges the condition as the fuel injection system malfunction and lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
A/F sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0171	FUEL SYS-LEAN-B1 (System too lean bank 1)	- Fuel injection system does not operate properly. - The amount of mixture ratio compensation is too large. (The mixture ratio is too lean.)

POSSIBLE CAUSE

- Intake air leaks
- A/F sensor 1
- Exhaust gas leaks
- Incorrect fuel pressure
- Lack of fuel
- Mass air flow sensor
- Incorrect PCV hose connection

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-1

1. Clear the mixture ratio self-learning value. Refer to [EC-139, "Description"](#).
2. Start engine.

Is it difficult to start engine?

YES >> GO TO 3.

NO >> GO TO 4.

3. RESTART ENGINE

If it is difficult to start engine, the fuel injection system has a malfunction, too.

P0171 FUEL INJECTION SYSTEM FUNCTION

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

Crank engine while depressing accelerator pedal.

NOTE:

When depressing accelerator pedal three-fourths (3/4) or more, the control system does not start the engine. Do not depress accelerator pedal too much.

Does engine start?

YES >> Proceed to [EC-225, "Diagnosis Procedure"](#).

NO >> Check exhaust and intake air leak visually.

4.PERFORM DTC CONFIRMATION PROCEDURE-2

1. Start engine and let it idle for at least 5 minutes.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-225, "Diagnosis Procedure"](#).

NO >> GO TO 5.

5.PERFORM DTC CONFIRMATION PROCEDURE-3

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Start engine.
3. Maintain the following conditions for at least 10 consecutive minutes.
Hold the accelerator pedal as steady as possible.

VHCL SPEED SE	50 - 120 km/h (31 - 75 MPH)
---------------	-----------------------------

CAUTION:

Always drive vehicle at a safe speed.

4. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-225, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

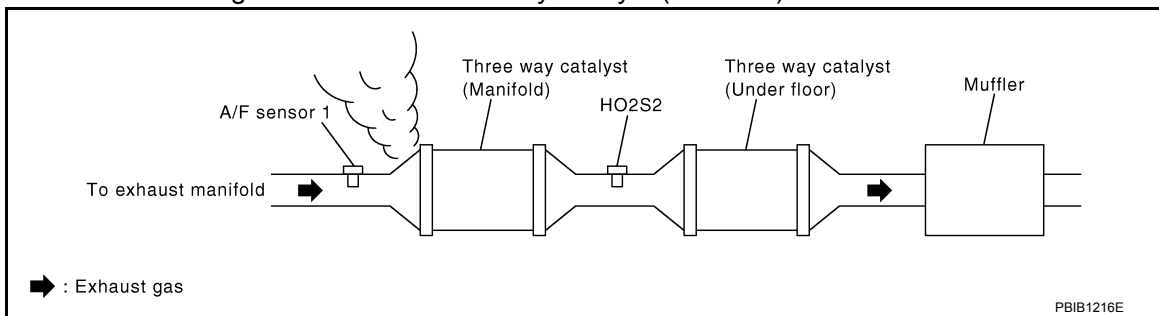
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267583

1.CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst (manifold).



Is exhaust gas leak detected?

YES >> Repair or replace error-detected parts.

NO >> GO TO 2.

2.CHECK FOR INTAKE AIR LEAK

1. Listen for an intake air leak after the mass air flow sensor.
2. Check PCV hose connection.

Intake air leak detected?

YES >> Repair or replace error-detected parts.

NO >> GO TO 3.

3.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

P0171 FUEL INJECTION SYSTEM FUNCTION

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect corresponding A/F sensor 1 harness connector.
3. Disconnect ECM harness connector.
4. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

+		-		Continuity
A/F sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F65	1	F73	41	Existed
	2		45	

5. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

+		-	Continuity
A/F sensor 1			
Connector	Terminal		
F65	1	Ground	Not existed
	2		

+		-	Continuity
ECM			
Connector	Terminal		
F73	41	Ground	Not existed
	45		

6. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK FUEL PRESSURE

Check fuel pressure. Refer to [EC-140, "Work Procedure"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging. Refer to [EM-42, "Exploded View"](#).

Is the inspection result normal?

YES >> Replace "fuel level sensor unit, fuel filter and fuel pump assembly". Refer to [FL-7, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

6.CHECK MASS AIR FLOW SENSOR

Ⓔ With CONSULT

1. Install all removed parts.
2. Start engine and warm it up to normal operating temperature.
3. Check "MASS AIR FLOW SENSOR (Hz)" in "DATA MONITOR" mode of "ENGINE" using CONSULT.

P0171 FUEL INJECTION SYSTEM FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Monitor item	Condition	Value
MASS AIR FLOWSENSOR (Hz)	Ignition switch ON (Engine stopped.)	Approx. 3,333 Hz
	Idle (Engine is warmed-up to normal operating temperature.)	2,340 - 3,280 Hz
	Idle to about 4,000 rpm	2,340 - 3,280 Hz to Approx. 1.100 Hz*

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

⊗ Without CONSULT

1. Install all removed parts.
2. Start engine and warm it up to normal operating temperature.
3. Check mass air flow sensor signal in Service \$01 with GST.

ECM			Condition	Value
Connector	+	-		
	Terminal			
F73	35	34	Ignition switch ON (Engine stopped.)	Approx. 3,333 Hz
			Idle (Engine is warmed-up to normal operating temperature.)	2,340 - 3,280 Hz
			Idle to about 4,000 rpm	2,340 - 3,280 Hz to Approx. 1.100 Hz*

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Is the measurement value within the specification?

YES >> GO TO 7.

NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or grounds. Refer to [EC-175, "DTC Description"](#).

7. CHECK FUNCTION OF FUEL INJECTOR

Ⓜ With CONSULT

1. Start engine.
2. Perform "POWER BALANCE" in "ACTIVE TEST" mode of "ENGINE" using CONSULT.
3. Make sure that each circuit produces a momentary engine speed drop.

⊗ Without CONSULT

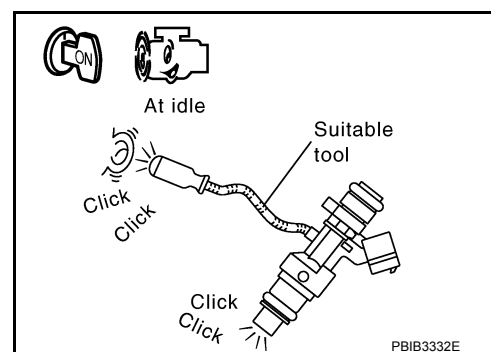
1. Let engine idle.
2. Listen to each fuel injector operating sound.

Clicking noise should be heard.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Perform trouble diagnosis for "FUEL INJECTOR", refer to [EC-365, "Component Function Check"](#).



8. CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
3. Disconnect all fuel injector harness connectors.
4. Remove fuel tube assembly. Refer to [EM-42, "Removal and Installation"](#). Keep fuel hose and all fuel injectors connected to fuel tube.
5. Disconnect all ignition coil harness connectors.
6. Prepare pans or saucers under each fuel injector.

P0171 FUEL INJECTION SYSTEM FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

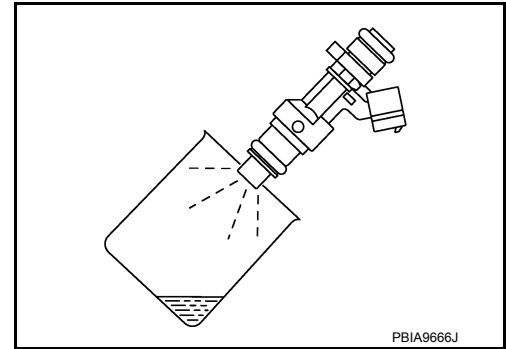
7. Crank engine for about 3 seconds.

Fuel should be sprayed evenly for each fuel injector.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel injectors from which fuel does not spray out. Always replace O-ring with new ones. Refer to [EM-42, "Removal and Installation"](#).



P0172 FUEL INJECTION SYSTEM FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0172 FUEL INJECTION SYSTEM FUNCTION

DTC Description

INFOID:0000000014267584

DTC DETECTION LOGIC

With the Air/Fuel Mixture Ratio Self-Learning Control, the actual mixture ratio can be brought closely to the theoretical mixture ratio based on the mixture ratio feedback signal from the A/F sensors 1. The ECM calculates the necessary compensation to correct the offset between the actual and the theoretical ratios.

In case the amount of the compensation value is extremely large (The actual mixture ratio is too rich.), the ECM judges the condition as the fuel injection system malfunction and lights up the MIL (2 trip detection logic).

Sensor	Input signal to ECM	ECM function	Actuator
A/F sensor 1	Density of oxygen in exhaust gas (Mixture ratio feedback signal)	Fuel injection control	Fuel injector

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0172	FUEL SYS-RICH-B1 (System too rich bank 1)	- Fuel injection system does not operate properly. - The amount of mixture ratio compensation is too large. (The mixture ratio is too rich.)

POSSIBLE CAUSE

- A/F sensor 1
- Fuel injector
- Exhaust gas leaks
- Incorrect fuel pressure
- Mass air flow sensor

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-1

1. Clear the mixture ratio self-learning value. Refer to [EC-139, "Description"](#).
2. Start engine.

Is it difficult to start engine?

YES >> GO TO 3.

NO >> GO TO 4.

3.RESTART ENGINE

If it is difficult to start engine, the fuel injection system has a malfunction, too.

Crank engine while depressing accelerator pedal.

NOTE:

P0172 FUEL INJECTION SYSTEM FUNCTION

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

When depressing accelerator pedal three-fourths (3/4) or more, the control system does not start the engine. Do not depress accelerator pedal too much.

Does engine start?

- YES >> Proceed to [EC-230, "Diagnosis Procedure"](#).
- NO >> Check exhaust and intake air leak visually.

4.PERFORM DTC CONFIRMATION PROCEDURE-2

1. Start engine and let it idle for at least 5 minutes.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-230, "Diagnosis Procedure"](#).
- NO >> GO TO 5.

5.PERFORM DTC CONFIRMATION PROCEDURE-3

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Start engine.
3. Maintain the following conditions for at least 10 consecutive minutes.
Hold the accelerator pedal as steady as possible.

VHCL SPEED SE	50 - 120 km/h (31 - 75 MPH)
---------------	-----------------------------

CAUTION:

Always drive vehicle at a safe speed.

4. Check 1st trip DTC.

Is 1st trip DTC detected?

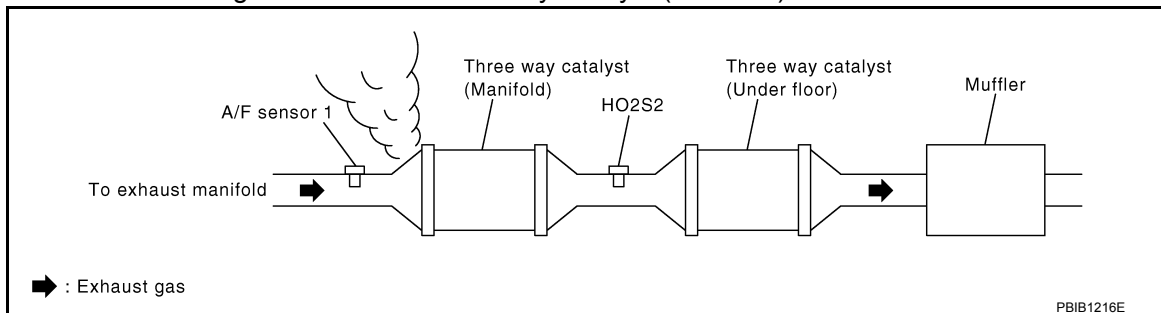
- YES >> Proceed to [EC-230, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267585

1.CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.
2. Listen for an exhaust gas leak before three way catalyst (manifold).



Is exhaust gas leak detected?

- YES >> Repair or replace error-detected parts.
- NO >> GO TO 2.

2.CHECK FOR INTAKE AIR LEAK

1. Listen for an intake air leak after the mass air flow sensor.
2. Check PCV hose connection.

Intake air leak detected?

- YES >> Repair or replace error-detected parts.
- NO >> GO TO 3.

3.CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect corresponding A/F sensor 1 harness connector.

P0172 FUEL INJECTION SYSTEM FUNCTION

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

3. Disconnect ECM harness connector.
4. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

+		-		Continuity
A/F sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F65	1	F73	41	Existed
	2		45	

5. Check the continuity between A/F sensor 1 harness connector and ground, or ECM harness connector and ground.

+		-	Continuity
A/F sensor 1			
Connector	Terminal		
F65	1	Ground	Not existed
	2		

+		-	Continuity
ECM			
Connector	Terminal		
F73	41	Ground	Not existed
	45		

6. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK FUEL PRESSURE

Check fuel pressure. Refer to [EC-140, "Work Procedure"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5. DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging. Refer to [EM-42, "Exploded View"](#).

Is the inspection result normal?

YES >> Replace "fuel level sensor unit, fuel filter and fuel pump assembly". Refer to [FL-7, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

6.CHECK MASS AIR FLOW SENSOR

Ⓔ With CONSULT

1. Install all removed parts.
2. Start engine and warm it up to normal operating temperature.
3. Check "MASS AIR FLOW SENSOR (Hz)" in "DATA MONITOR" mode of "ENGINE" using CONSULT.

Monitor item	Condition	Value
MASS AIR FLOW SENSOR (Hz)	Ignition switch ON (Engine stopped.)	Approx. 3,333 Hz
	Idle (Engine is warmed-up to normal operating temperature.)	2,340 - 3,280 Hz
	Idle to about 4,000 rpm	2,340 - 3,280 Hz to Approx. 1.100 Hz*

P0172 FUEL INJECTION SYSTEM FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

⊗ Without CONSULT

1. Install all removed parts.
2. Start engine and warm it up to normal operating temperature.
3. Check mass air flow sensor signal in Service \$01 with GST.

ECM			Condition	Value
Connector	+	-		
	Terminal			
F73	35	34	Ignition switch ON (Engine stopped.)	Approx. 3,333 Hz
			Idle (Engine is warmed-up to normal operating temperature.)	2,340 - 3,280 Hz
			Idle to about 4,000 rpm	2,340 - 3,280 Hz to Approx. 1.100 Hz*

*: Check for linear frequency rise in response to engine being increased to about 4,000 rpm.

Is the measurement value within the specification?

YES >> GO TO 7.

NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or grounds. Refer to [EC-175, "DTC Description"](#).

7.CHECK FUNCTION OF FUEL INJECTOR

Ⓟ With CONSULT

1. Start engine.
2. Perform "POWER BALANCE" in "ACTIVE TEST" mode of "ENGINE" using CONSULT.
3. Make sure that each circuit produces a momentary engine speed drop.

⊗ Without CONSULT

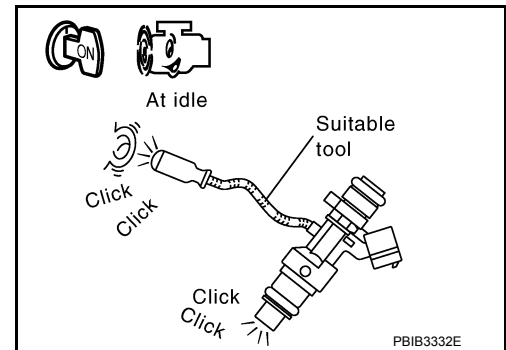
1. Let engine idle.
2. Listen to each fuel injector operating sound.

Clicking noise should be heard.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Perform trouble diagnosis for "FUEL INJECTOR", refer to [EC-365, "Component Function Check"](#).



8.CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
3. Disconnect all fuel injector harness connectors.
4. Remove fuel tube assembly. Refer to [EM-42, "Removal and Installation"](#).
Keep fuel hose and all fuel injectors connected to fuel tube.
5. Disconnect all ignition coil harness connectors.
6. Prepare pans or saucers under each fuel injector.

P0172 FUEL INJECTION SYSTEM FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

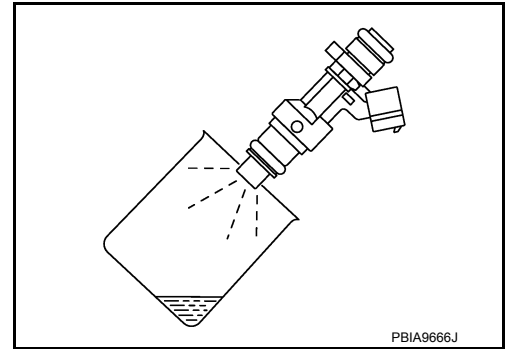
7. Crank engine for about 3 seconds.

Fuel should be sprayed evenly for each fuel injector.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel injectors from which fuel does not spray out. Always replace O-ring with new ones. Refer to [EM-42, "Removal and Installation"](#).



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P0197, P0198 EOT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0197, P0198 EOT SENSOR

DTC Description

INFOID:0000000014267586

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0197	EOT SEN/CIRC (Engine oil temperature sensor low)	An excessively low voltage from the engine oil temperature sensor is sent to ECM.
P0198	EOT SEN/CIRC (Engine oil temperature sensor high)	An excessively high voltage from the engine oil temperature sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (EOT sensor circuit is open or shorted.)
- Engine oil temperature sensor

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Other	Exhaust valve timing control does not function.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-234, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267587

1.CHECK ENGINE OIL TEMPERATURE SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect engine oil temperature (EOT) sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between EOT sensor harness connector and ground.

+		-	Voltage (Approx.)
EOT sensor			
Connector	Terminal		
F132	1	Ground	5 V

Is the inspection result normal?

YES >> GO TO 3.

P0197, P0198 EOT SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

NO >> GO TO 2.

2.CHECK ENGINE OIL TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EOT sensor harness connector and ECM harness connector.

+		-		Continuity
EOT sensor		ECM		
Connector	Terminal	Connector	Terminal	
F132	1	F73	25	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3.CHECK EOT SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EOT sensor harness connector and ECM harness connector.

+		-		Continuity
EOT sensor		ECM		
Connector	Terminal	Connector	Terminal	
F132	2	F73	26	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK ENGINE OIL TEMPERATURE SENSOR

Check the engine oil temperature sensor. Refer to [EC-235, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine oil temperature sensor. Refer to [EM-90, "Exploded View"](#).

Component Inspection

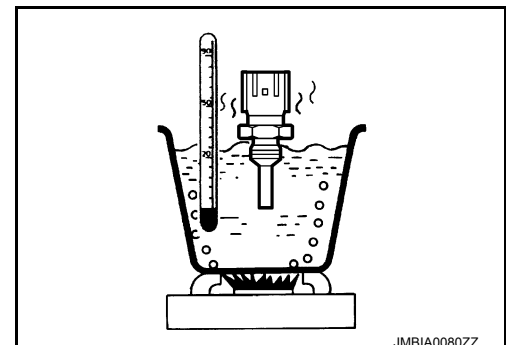
INFOID:0000000014267588

1.CHECK ENGINE OIL TEMPERATURE SENSOR

1. Turn ignition switch OFF.
2. Disconnect engine oil temperature sensor harness connector.
3. Remove engine oil temperature sensor.
4. Check resistance between engine oil temperature sensor terminals by heating with hot water as shown in the figure.

Engine oil temperature sensor		Condition		Resistance (kΩ)
+	−			
Terminal				
1	2	Temperature [°C (°F)]	20 (68)	2.37 - 2.63
			50 (122)	0.68 - 1.00
			90 (194)	0.236 - 0.260

Is the inspection result normal?



P0197, P0198 EOT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

YES >> INSPECTION END

NO >> Replace engine oil temperature sensor. Refer to [EM-90, "Exploded View"](#).

P0222, P0223 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0222, P0223 TP SENSOR

DTC Description

INFOID:0000000014267589

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0222	TP SEN 1/CIRC-B1 (Throttle/pedal position sensor/switch "B" circuit low)	An excessively low voltage from the TP sensor 1 is sent to ECM.
P0223	TP SEN 1/CIRC-B1 (Throttle/pedal position sensor/switch "B" circuit high)	An excessively high voltage from the TP sensor 1 is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (TP sensor 1 circuit is open or shorted.)
- Electric throttle control actuator (TP sensor 1)

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Other	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0222 or P0223 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-237, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267590

1.CHECK DTC PRIORITY

P0222, P0223 TP SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

If DTC P0222 or P0223 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292. "DTC Description"](#).
NO >> GO TO 2.

2.CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect electric throttle control actuator harness connector.
3. Turn ignition switch ON.
4. Check the voltage between electric throttle control actuator harness connector and ground.

+		-	Voltage (Approx.)
Electric throttle control actuator			
Connector	Terminal		
F50	2	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3.CHECK THROTTLE POSITION SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

+		-		Continuity
Electric throttle control actuator		ECM		
Connector	Terminal	Connector	Terminal	
F50	2	F57	80	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

4.CHECK THROTTLE POSITION SENSOR 1 GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

+		-		Continuity
Electric throttle control actuator		ECM		
Connector	Terminal	Connector	Terminal	
F50	4	F57	78	Existed

4. Also check harness for short to power.

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5.CHECK THROTTLE POSITION SENSOR 1 INPUT SIGNAL CIRCUIT

1. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

P0222, P0223 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
Electric throttle control actuator		ECM		
Connector	Terminal	Connector	Terminal	
F50	1	F57	79	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

6.CHECK THROTTLE POSITION SENSOR

Check the throttle position sensor. Refer to [EC-239, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to [EM-36, "Exploded View"](#).

Component Inspection

INFOID:0000000014267591

1.CHECK THROTTLE POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Perform "Throttle Valve Closed Position Learning". Refer to [EC-136, "Description"](#).
4. Turn ignition switch ON.
5. Set shift lever to 1st position.
6. Check the voltage between ECM harness connector terminals as per the following conditions.

ECM				Condition		Voltage	
Connector		+	–				
		Terminal					
Sensor 1	F57	79	78	Accelerator pedal	Fully released	More than 0.36V	
					Fully depressed	Less than 4.75V	
Sensor 2		77				Fully released	Less than 4.75V
						Fully depressed	More than 0.36V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to [EM-36, "Exploded View"](#).

P0300, P0301, P0302, P0303, P0304 MISFIRE**DTC Description**

INFOID:0000000014267592

DTC DETECTION LOGIC

When a misfire occurs, engine speed will fluctuate. If the engine speed fluctuates enough to cause the crankshaft position (CKP) sensor (POS) signal to vary, ECM can determine that a misfire is occurring.

Sensor	Input signal to ECM	ECM function
Crankshaft position sensor (POS)	Engine speed	On board diagnosis of misfire

The misfire detection logic consists of the following two conditions.

1. One Trip Detection Logic (Three Way Catalyst Damage)
On the 1st trip, when a misfire condition occurs that can damage the three way catalyst (TWC) due to overheating, the MIL will blink.
When a misfire condition occurs, the ECM monitors the CKP sensor signal every 200 engine revolutions for a change.
When the misfire condition decreases to a level that will not damage the TWC, the MIL will turn off.
If another misfire condition occurs that can damage the TWC on a second trip, the MIL will blink.
When the misfire condition decreases to a level that will not damage the TWC, the MIL will remain on.
If another misfire condition occurs that can damage the TWC, the MIL will begin to blink again.
2. Two Trip Detection Logic (Exhaust quality deterioration)
For misfire conditions that will not damage the TWC (but will affect vehicle emissions), the MIL will only light when the misfire is detected on a second trip. During this condition, the ECM monitors the CKP sensor signal every 1,000 engine revolutions.
A misfire malfunction can be detected on any one cylinder or on multiple cylinders.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0300	MULTI CYL MISFIRE (Random/multiple cylinder misfire detected)	Multiple cylinder misfire.
P0301	CYL 1 MISFIRE (Cylinder 1 Misfire Detected)	No. 1 cylinder misfires.
P0302	CYL 2 MISFIRE (Cylinder 2 Misfire Detected)	No. 2 cylinder misfires.
P0303	CYL 3 MISFIRE (Cylinder 3 Misfire Detected)	No. 3 cylinder misfires.
P0304	CYL 4 MISFIRE (Cylinder 4 Misfire Detected)	No. 4 cylinder misfires.

POSSIBLE CAUSE

- Improper spark plug
- Insufficient compression
- Incorrect fuel pressure
- Fuel Injector circuit is open or shorted
- Fuel injector
- Intake air leak
- Ignition signal circuit is open or shorted
- Lack of fuel
- Signal plate
- A/F sensor 1
- Incorrect PCV hose connection

FAIL-SAFE

P0300, P0301, P0302, P0303, P0304 MISFIRE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-1

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Restart engine and let it idle for about 15 minutes.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-242, "Diagnosis Procedure"](#).
NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE-2

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Start engine and drive the vehicle as per the similar conditions to (1st trip) Freeze Frame Data for a certain time. Refer to the table below.

Hold the accelerator pedal as steady as possible.

The similar conditions to (1st trip) Freeze Frame Data means the vehicle operation that the following conditions should be satisfied at the same time.

CAUTION:

Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws when driving.

Engine speed	Engine speed in the freeze frame data $\pm$ 400 rpm
Vehicle speed	Vehicle speed in the freeze frame data $\pm$ 10 km/h (6 MPH)
Engine coolant temperature (T) condition	When the freeze frame data shows lower than 70°C (158°F), T should be lower than 70°C (158°F).
	When the freeze frame data shows higher than or equal to 70°C (158°F), T should be higher than or equal to 70°C (158°F).

The time to driving varies according to the engine speed in the freeze frame data.

Engine speed	Time
Around 1,000 rpm	Approximately 23 minutes
Around 2,000 rpm	Approximately 12 minutes
More than 3,000 rpm	Approximately 8 minutes

3. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-242, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure**1.CHECK GROUND CONNECTION**

Check the following.

- Connection condition of the ground F9 and F15
- Connection condition of the ground harness between the engine assembly and vehicle body (if equipped)

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the error-detected parts.

2.CHECK FOR INTAKE AIR LEAK AND PCV HOSE

1. Start engine and run it at idle speed.
2. Listen for the sound of the intake air leak.
3. Check PCV hose connection.

Is intake air leak detected?

YES >> Discover air leak location and repair.

NO >> GO TO 3.

3.CHECK FOR EXHAUST SYSTEM CLOGGING

Stop engine and visually check exhaust tube, three way catalyst and muffler for dents.

Is the inspection result normal?

YES-1 >> With CONSULT: GO TO 4.

YES-2 >> Without CONSULT: GO TO 5.

NO >> Repair or replace it.

4.PERFORM POWER BALANCE TEST

 With CONSULT

1. Start engine.
2. Perform "POWER BALANCE" in "ACTIVE TEST" mode of "ENGINE" using CONSULT.
3. Make sure that each circuit produces a momentary engine speed drop.

Is the inspection result normal?

YES >> GO TO 10.

NO >> GO TO 5.

5.CHECK FUNCTION OF FUEL INJECTOR

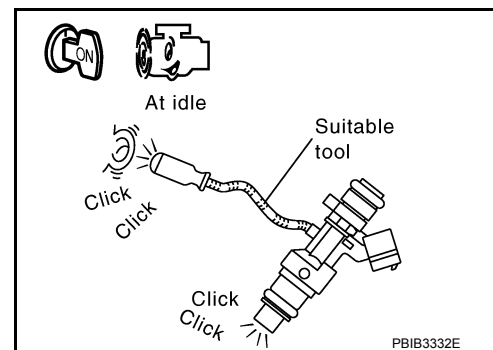
1. Start engine and let engine idle.
2. Listen to each fuel injector operating sound.

Clicking noise should be heard.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Perform trouble diagnosis for FUEL INJECTOR. Refer to [EC-365, "Diagnosis Procedure"](#).

**6.CHECK FUNCTION OF IGNITION COIL-1****CAUTION:**

Do the following procedure in the place where ventilation is good without the combustible.

1. Turn ignition switch OFF.
2. Remove fuel pump fuse in IPDM E/R to release fuel pressure.

NOTE:

Do not use CONSULT to release fuel pressure, or fuel pressure applies again during the following procedure.

3. Start engine.
4. After engine stalls, crank it two or three times to release all fuel pressure.

< DTC/CIRCUIT DIAGNOSIS >

5. Turn ignition switch OFF.
6. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
7. Remove ignition coil and spark plug of the cylinder to be checked.
8. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
9. Connect spark plug and harness connector to ignition coil.
10. Fix ignition coil using a rope etc. with gap of 13 - 17 mm (0.52 - 0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
11. Crank engine for about 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

Spark should be generated.

CAUTION:

- Do not approach to the spark plug and the ignition coil within 50 cm (19.7 in). Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20 kV or more.
- It might cause to damage the ignition coil if the gap of more than 17 mm (0.66 in) is taken.

NOTE:

When the gap is less than 13 mm (0.52 in), the spark might be generated even if the coil is malfunctioning.

Is the inspection result normal?

- YES >> GO TO 10.
NO >> GO TO 7.

7. CHECK FUNCTION OF IGNITION COIL-2

1. Turn ignition switch OFF.
2. Disconnect spark plug and connect a known-good spark plug.
3. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.

Spark should be generated.

Is the inspection result normal?

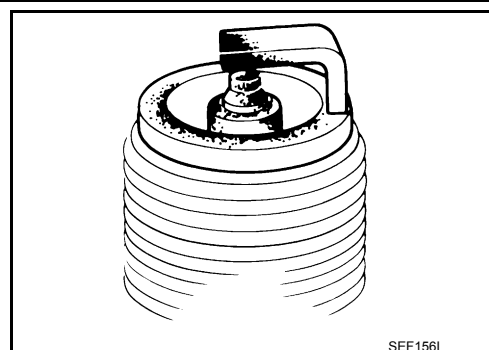
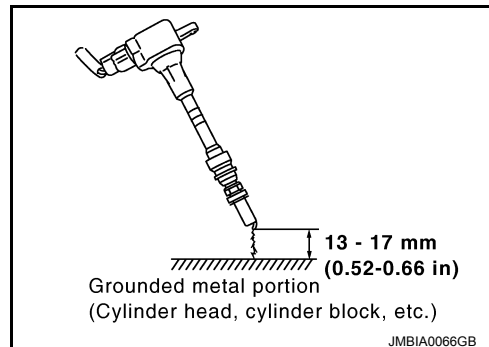
- YES >> GO TO 8.
NO >> Check ignition coil, power transistor and their circuits. Refer to [EC-371, "Diagnosis Procedure"](#).

8. CHECK SPARK PLUG

Check the initial spark plug for fouling, etc.

Is the inspection result normal?

- YES >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to [EM-117, "Spark Plug"](#).
NO >> Repair or clean spark plug. Then GO TO 9.



9. CHECK FUNCTION OF IGNITION COIL-3

1. Reconnect the initial spark plugs.
2. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

Is the inspection result normal?

- YES >> INSPECTION END

P0300, P0301, P0302, P0303, P0304 MISFIRE

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace spark plug(s) with standard type one(s). For spark plug type. Refer to [EM-117, "Spark Plug"](#).

10. CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to [EM-19, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

11. CHECK FUEL PRESSURE

1. Install all removed parts.
2. Release fuel pressure to zero.
3. Install fuel pressure gauge and check fuel pressure. Refer to [EC-140, "Work Procedure"](#).

At idling: Approximately 350 kPa (3.5 bar, 3.57 kg/cm², 51 psi)

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 12.

12. DETECT MALFUNCTIONING PART

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

YES >> Replace "fuel level sensor unit, fuel filter and fuel pump assembly". Refer to [FL-7, "Removal and Installation"](#).

NO >> Repair or replace.

13. CHECK IGNITION TIMING

Check the following items.

For procedure, refer to [EC-389, "Inspection"](#).

For specification, refer to [EC-394, "Ignition Timing"](#).

Is the inspection result normal?

YES >> GO TO 14.

NO >> Follow the [EC-128, "Work Procedure"](#).

14. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/F sensor 1 harness connector.
3. Disconnect ECM harness connector.
4. Check the continuity between A/F sensor 1 harness connector and ECM harness connector.

+		-		Continuity
A/F sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F65	1	F73	41	Existed

5. Check the continuity between A/F sensor 1 harness connector or ECM harness connector and ground.

+		-	Continuity
A/F sensor 1			
Connector	Terminal		
F65	1	Ground	Not existed

P0300, P0301, P0302, P0303, P0304 MISFIRE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-	Continuity
ECM			
Connector	Terminal		
F73	41	Ground	Not existed

6. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 15.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

15.CHECK A/F SENSOR 1 HEATER

Check the A/F sensor 1 heater. Refer to [EC-164, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 16.

NO >> Replace A/F sensor 1. Refer to [EM-39, "Exploded View"](#).

16.CHECK MASS AIR FLOW SENSOR

 With CONSULT

Check "MASS AIRFLOW" in "DATA MONITOR" mode of "ENGINE" using CONSULT.

11.6 - 13.3 g/s : at idling

39.6 g/s : at 2,500 rpm

 With GST

Check mass air flow sensor signal in Service \$01 with GST.

11.6 - 13.3 g/s : at idling

39.6 g/s : at 2,500 rpm

Is the measurement value within the specification?

YES >> GO TO 17.

NO >> Check connectors for rusted terminals or loose connections in the mass air flow sensor circuit or ground. Refer to [EC-175, "DTC Description"](#).

17.CHECK SYMPTOM TABLE

Check items on the rough idle symptom in [EC-382, "Symptom Table"](#).

Is the inspection result normal?

YES >> GO TO 18.

NO >> Repair or replace error-detected parts.

18.ERASE THE 1ST TRIP DTC

Some tests may cause a 1st trip DTC to be set.

Erase the 1st trip DTC from the ECM memory after performing the tests.

>> INSPECTION END

P0327, P0328 KS

DTC Description

INFOID:0000000014267594

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0327	KNOCK SEN/CIRC-B1 (Knock sensor 1 circuit low bank 1 or single sensor)	An excessively low voltage from the knock sensor is sent to ECM.
P0328	KNOCK SEN/CIRC-B1 (Knock sensor 1 circuit high bank 1 or single sensor)	An excessively high voltage from the knock sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (Knock sensor circuit is open or shorted.)
- Knock sensor

FAIL-SAFE

No applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and run it for at least 5 seconds at idle speed.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-246, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267595

1. CHECK KNOCK SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect knock sensor harness connector.
3. Disconnect ECM harness connector.
4. Check the continuity between knock sensor harness connector and ECM harness connector.

+		-		Continuity
Knock sensor		ECM		
Connector	Terminal	Connector	Terminal	
F18	2	F73	8	Existed

5. Also check harness for short to power.

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 2.
 NO >> Repair or replace error-detected parts.

2.CHECK KNOCK SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between knock sensor harness connector and ECM harness connector.

+		-		Continuity
Knock sensor		ECM		
Connector	Terminal	Connector	Terminal	
F18	1	F73	4	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK KNOCK SENSOR

Check the knock sensor. Refer to [EC-247, "Component Inspection"](#).

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Replace knock sensor. Refer to [EM-90, "Exploded View"](#).

Component Inspection

INFOID:0000000014267596

1.CHECK KNOCK SENSOR

1. Turn ignition switch OFF.
 2. Disconnect knock sensor harness connector.
 3. Check resistance between knock sensor terminals as per the following.

NOTE:

It is necessary to use an ohmmeter which can measure more than 10 MΩ.

Knock sensor		Resistance
+	-	
Terminals		
1	2	Approx. 532 - 588 kΩ [at 20°C (68°F)]

CAUTION:

Do not use any knock sensors that have been dropped or physically damaged. Use only new ones.

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Replace knock sensor. Refer to [EM-90, "Exploded View"](#).

P0335 CKP SENSOR (POS)

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0335 CKP SENSOR (POS)

DTC Description

INFOID:0000000014267597

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0335	CKP SEN/CIRCUIT (Crankshaft position sensor "A" circuit)	- The crankshaft position sensor (POS) signal is not detected by the ECM during the first few seconds of engine cranking. - The proper pulse signal from the crankshaft position sensor (POS) is not sent to ECM while the engine is running. - The crankshaft position sensor (POS) signal is not in the normal pattern during engine running.

POSSIBLE CAUSE

- Harness or connectors [Crankshaft position sensor (POS) circuit is open or shorted.]
- Crankshaft position sensor (POS)
- Signal plate

FAIL-SAFE

No applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0335 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V with ignition switch ON.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

- Start engine and let it idle for at least 5 seconds.
If engine does not start, crank engine for at least 2 seconds.
- Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-248, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267598

1.CHECK DTC PRIORITY

If DTC P0335 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).
NO >> GO TO 2.

P0335 CKP SENSOR (POS)

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

2. CHECK CRANKSHAFT POSITION (CKP) SENSOR (POS) POWER SUPPLY

1. Disconnect crankshaft position (CKP) sensor (POS) harness connector.
2. Turn ignition switch ON.
3. Check the voltage between CKP sensor (POS) harness connector and ground.

+		-	Voltage (Approx.)
CKP sensor (POS)			
Connector	Terminal		
F11	1	Ground	5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK CRANKSHAFT POSITION (CKP) SENSOR (POS) POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between CKP sensor (POS) harness connector and ECM harness connector.

+		-		Continuity
CKP sensor (POS)		ECM		
Connector	Terminal	Connector	Terminal	
F11	1	F57	72	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> INSPECTION END.

NO >> Repair or replace error-detected parts.

4. CHECK CKP SENSOR (POS) GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between CKP sensor (POS) harness connector and ECM harness connector.

+		-		Continuity
CKP sensor (POS)		ECM		
Connector	Terminal	Connector	Terminal	
F11	2	F57	70	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. CHECK CKP SENSOR (POS) INPUT SIGNAL CIRCUIT

1. Check the continuity between CKP sensor (POS) harness connector and ECM harness connector.

+		-		Continuity
CKP sensor (POS)		ECM		
Connector	Terminal	Connector	Terminal	
F11	3	F57	71	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

P0335 CKP SENSOR (POS)

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace error-detected parts.

6. CHECK CRANKSHAFT POSITION SENSOR (POS)

Check the crankshaft position sensor (POS). Refer to [EC-250, "Component Inspection"](#).

Is the inspection result normal?

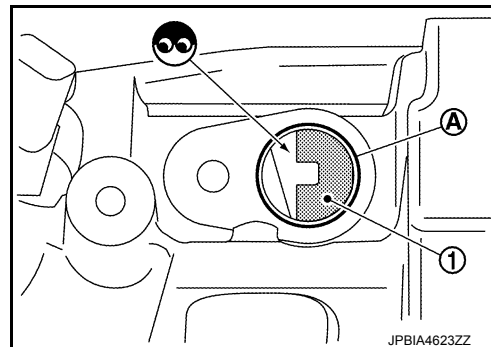
YES >> GO TO 7.

NO >> Replace crankshaft position sensor (POS). Refer to [EM-90, "Exploded View"](#).

7. CHECK GEAR TOOTH

1. Remove crankshaft position sensor (POS). Refer to [EM-90, "Exploded View"](#).

2. Look into the mounting hole^A of the crankshaft position sensor (POS) to check that there is no missing gear tooth in the signal plate^①.



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace the signal plate. Refer to [EM-90, "Exploded View"](#).

Component Inspection

INFOID:0000000014267599

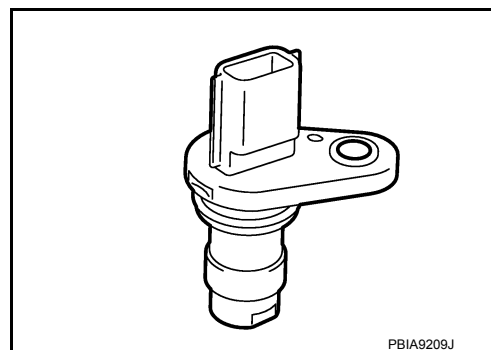
1. CHECK CRANKSHAFT POSITION SENSOR (POS)-1

1. Turn ignition switch OFF.
2. Loosen the fixing bolt of the sensor.
3. Disconnect crankshaft position sensor (POS) harness connector.
4. Remove the sensor.
5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace crankshaft position sensor (POS). Refer to [EM-90, "Exploded View"](#).



2. CHECK CRANKSHAFT POSITION SENSOR (POS)-2

Check the resistance between crankshaft position sensor (POS) terminals as per the following.

Crankshaft position sensor (POS)		Resistance [at 25°C (77°F)]
+	–	
Terminal (Polarity)		
1	2	Except 0 or ∞ Ω
	3	
2	3	

Is the inspection result normal?

YES >> INSPECTION END

P0335 CKP SENSOR (POS)

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

NO >> Replace crankshaft position sensor (POS). Refer to [EM-90, "Exploded View"](#).

A

EC

C

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P0340 CMP SENSOR (PHASE)

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0340 CMP SENSOR (PHASE)

DTC Description

INFOID:0000000014267600

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0340	CMP SEN/CIRC-B1 (Camshaft position sensor "A" circuit bank 1 or single sensor)	• The cylinder No. signal is not sent to ECM for the first few seconds during engine cranking. • The cylinder No. signal is not sent to ECM during engine running. • The cylinder No. signal is not in the normal pattern during engine running.

POSSIBLE CAUSE

- Harness or connectors (Camshaft position sensor circuit is open or shorted)
- Camshaft position sensor
- Camshaft (Intake)
- Starter motor
- Starting system circuit
- Dead (Weak) battery
- Sensor power supply 2 circuit

FAIL-SAFE

No applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10.5 V with ignition switch ON.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-1

1. Start engine and let it idle for at least 5 seconds.
If engine does not start, crank engine for at least 2 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-252, "Diagnosis Procedure"](#).

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE-2

1. Maintaining engine speed at more than 800 rpm for at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-252, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267601

1. CHECK STARTING SYSTEM

P0340 CMP SENSOR (PHASE)

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

Turn ignition switch to START position.

Does the engine turn over? Does the starter motor operate?

YES >> GO TO 2.

NO >> Check starting system. Refer to [STR-24, "Work Flow \(With GR8-1200 NI\)"](#) or [STR-28, "Work Flow \(Without GR8-1200 NI\)"](#).

2. CHECK CAMSHAFT POSITION (CMP) SENSOR (PHASE) POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect camshaft position (CMP) sensor (PHASE) harness connector.
3. Turn ignition switch ON.
4. Check the voltage between CMP sensor (PHASE) harness connector and ground.

+		-	Voltage (Approx.)
CMP sensor (PHASE)			
Connector	Terminal		
F23	1	Ground	5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK CAMSHAFT POSITION (CMP) SENSOR (PHASE) POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between CMP sensor (PHASE) harness connector and ECM harness connector.

+		-		Continuity
CMP sensor (PHASE)		ECM		
Connector	Terminal	Connector	Terminal	
F23	1	F73	32	Existed

4. Also check harness for short to ground and to power.

Is inspection result normal?

YES >> Check sensor power supply 2 circuit. Refer to [EC-380, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

4. CHECK CMP SENSOR (PHASE) GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between CMP sensor (PHASE) harness connector and ECM harness connector.

+		-		Continuity
CMP sensor (PHASE)		ECM		
Connector	Terminal	Connector	Terminal	
F23	2	F73	30	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. CHECK CMP SENSOR (PHASE) INPUT SIGNAL CIRCUIT

1. Check the continuity between CMP sensor (PHASE) harness connector and ECM harness connector.

P0340 CMP SENSOR (PHASE)

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
CMP sensor (PHASE)		ECM		
Connector	Terminal	Connector	Terminal	
F23	3	F73	31	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK CAMSHAFT POSITION SENSOR (PHASE)

Check the camshaft position sensor (PHASE). Refer to [EC-254, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace camshaft position sensor (PHASE). Refer to [EM-61, "Exploded View"](#).

7.CHECK CAMSHAFT (INT)

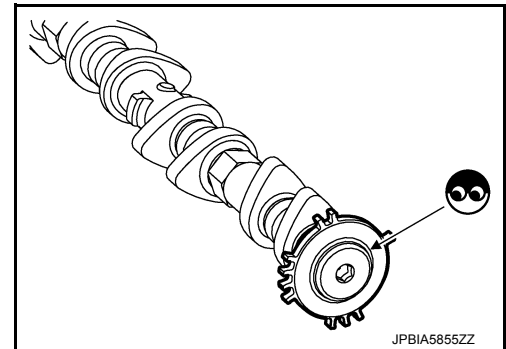
Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

Is the inspection result normal?

YES >> INSPECTION END

NO >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to [EM-61, "Exploded View"](#).



INFOID:0000000014267602

Component Inspection

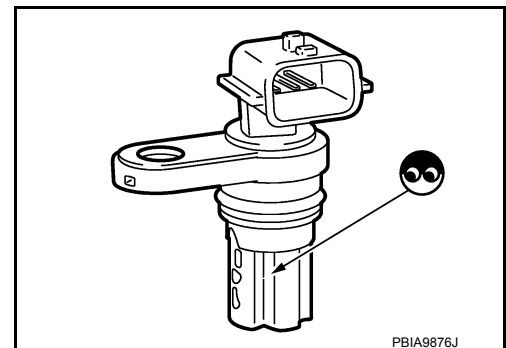
1.CHECK CAMSHAFT POSITION SENSOR (PHASE)-1

1. Turn ignition switch OFF.
2. Loosen the fixing bolt of the sensor.
3. Disconnect camshaft position sensor (PHASE) harness connector.
4. Remove the sensor.
5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace camshaft position sensor (PHASE). Refer to [EM-61, "Exploded View"](#).



2.CHECK CAMSHAFT POSITION SENSOR (PHASE)-2

Check the resistance camshaft position sensor (PHASE) terminals as per the following.

P0340 CMP SENSOR (PHASE)

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Camshaft position sensor (PHASE)		Resistance [Ω at 25°C (77°F)]
+	–	
Terminals (Polarity)		
1	2	Except 0 or ∞
	3	
2	3	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace camshaft position sensor (PHASE). Refer to [EM-61, "Exploded View"](#).

A

EC

C

D

E

F

G

H

I

J

K

L

M

N

O

P

P0420 THREE WAY CATALYST FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0420 THREE WAY CATALYST FUNCTION

DTC Description

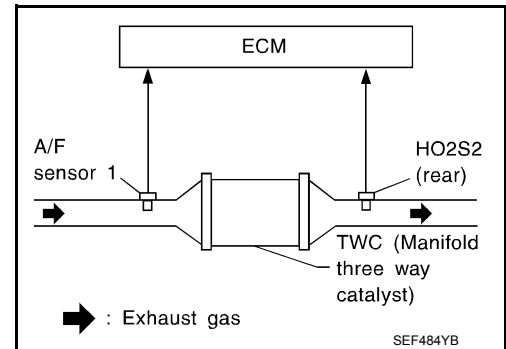
INFOID:0000000014267603

DTC DETECTION LOGIC

The ECM monitors the switching frequency ratio of air fuel ratio (A/F) sensor 1 and heated oxygen sensor 2.

A three way catalyst (manifold) with high oxygen storage capacity will indicate a low switching frequency of heated oxygen sensor 2. As oxygen storage capacity decreases, the heated oxygen sensor 2 switching frequency will increase.

When the frequency ratio of air fuel ratio (A/F) sensor 1 and heated oxygen sensor 2 approaches a specified limit value, the three way catalyst (manifold) malfunction is diagnosed.



DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0420	TW CATALYST SYS-B1 (Catalyst system efficiency below threshold bank 1)	- Three way catalyst (manifold) does not operate properly. - Three way catalyst (manifold) does not have enough oxygen storage capacity.

POSSIBLE CAUSE

- Three way catalyst (manifold)
- Exhaust tube
- Intake air leaks
- Fuel injector
- Spark plug
- Improper ignition timing

FAIL-SAFE

No applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

Will CONSULT be used?

- YES >> GO TO 2.
NO >> GO TO 6.

2. PERFORM DTC CONFIRMATION PROCEDURE-1

Ⓟ With CONSULT

TESTING CONDITION:

Do not hold engine speed for more than the specified minutes below.

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Start engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
6. Let engine idle for 1 minute.
7. Select "DATA MONITOR" mode of "ENGINE" using CONSULT.
8. Check that "COOLAN TEMP/S" indicates more than 70°C (158°F).
If not, warm up engine and go to next step when "COOLAN TEMP/S" indication reaches to 70°C (158°F).

P0420 THREE WAY CATALYST FUNCTION

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

9. Open engine hood.
10. Select "SRT & P-DTC" with CONSULT.
11. Rev engine up to 2,500 to 3,000 rpm and hold it for 3 consecutive minutes then release the accelerator pedal completely.
12. Check the indication of "CATALYST".

Which is displayed on CONSULT screen?

CMPLT >> GO TO 5.

INCMP >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-2

1. Wait 5 seconds at idle.
2. Rev engine up to 2,500 to 3,000 rpm and maintain it until "INCMP" of "CATALYST" changes to "CMPLT" (It will take approximately 5 minutes).

Does the indication change to "CMPLT"?

YES >> GO TO 5.

NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE AGAIN

1. Stop engine and cool it down to less than 70°C (158°F).
2. Perform DTC confirmation procedure again.

>> GO TO 2.

5.PERFORM DTC CONFIRMATION PROCEDURE-3

Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-257, "Diagnosis Procedure"](#).

NO >> INSPECTION END

6.PERFORM COMPONENT FUNCTION CHECK

⊗ Without CONSULT

NOTE:

Use component function check to check the overall function of the three way catalyst (manifold). During this check, a 1st trip DTC might not be confirmed.

1. Start engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Restart engine and keep the engine speed between 3,500 and 4,000 rpm for at least 1 minute under no load.
4. Let engine idle for 1 minute.
5. Open engine hood.
6. Check the voltage between ECM harness connector terminals as per the following condition.

ECM			Condition	Voltage (V)
Connector	+	−		
	Terminal			
F73	22	23	Keeping engine speed at 2500 rpm constant under no load	The voltage fluctuation cycle takes more than 5 seconds. • 1 cycle: 0.6 - 1.0 → 0 - 0.3 → 0.6 - 1.0

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to [EC-257, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267604

1.CHECK EXHAUST SYSTEM

Visually check exhaust tubes and muffler for dent.

P0420 THREE WAY CATALYST FUNCTION

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

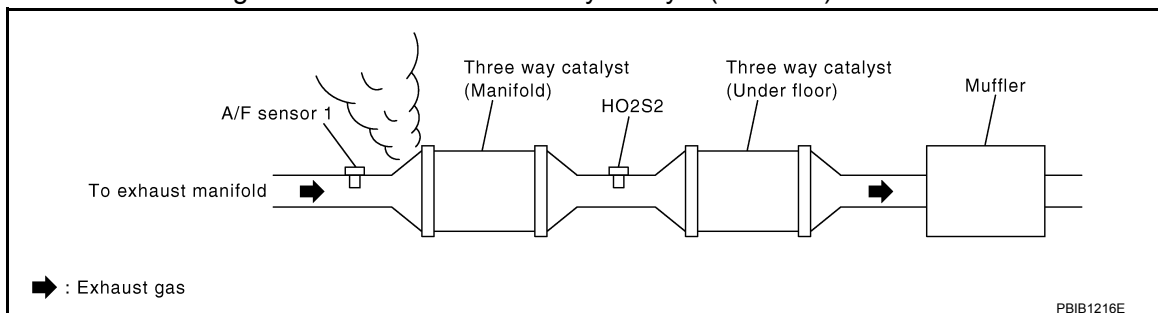
YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK EXHAUST GAS LEAK

1. Start engine and run it at idle.

2. Listen for an exhaust gas leak before the three way catalyst (manifold).



Is exhaust gas leak detected?

YES >> Repair or replace error-detected parts.

NO >> GO TO 3.

3.CHECK INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

Is intake air leak detected?

YES >> Repair or replace error-detected parts.

NO >> GO TO 4.

4.CHECK IGNITION TIMING AND IDLE SPEED

Check the following items. Refer to [EC-128, "Work Procedure"](#).

For specification, refer to [EC-394, "Ignition Timing"](#)

For specification, refer to [EC-394, "Idle Speed"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Follow the [EC-128, "Work Procedure"](#).

5.CHECK FUEL INJECTOR

Check the fuel injector. Refer to [EC-365, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Perform [EC-365, "Diagnosis Procedure"](#).

6.CHECK FUNCTION OF IGNITION COIL-1

CAUTION:

Do the following procedure in the place where ventilation is good without the combustible.

1. Turn ignition switch OFF.

2. Remove fuel pump fuse in IPDM E/R to release fuel pressure.

NOTE:

Do not use CONSULT to release fuel pressure, or fuel pressure applies again during the following procedure.

3. Start engine.

4. After engine stalls, crank it two or three times to release all fuel pressure.

5. Turn ignition switch OFF.

6. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.

7. Remove ignition coil and spark plug of the cylinder to be checked.

8. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.

9. Connect spark plug and harness connector to ignition coil.

P0420 THREE WAY CATALYST FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

10. Fix ignition coil using a rope etc. with gap of 13 - 17 mm (0.52 - 0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
11. Crank engine for about 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

Spark should be generated.

CAUTION:

- Do not approach to the spark plug and the ignition coil within 50 cm (19.7 in). Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20 kV or more.
- It might cause to damage the ignition coil if the gap of more than 17 mm (0.66 in) is taken.

NOTE:

When the gap is less than 13 mm (0.52 in), the spark might be generated even if the coil is malfunctioning.

Is the inspection result normal?

- YES >> GO TO 10.
NO >> GO TO 7.

7.CHECK FUNCTION OF IGNITION COIL-2

1. Turn ignition switch OFF.
2. Disconnect spark plug and connect a known-good spark plug.
3. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded metal portion.

Spark should be generated.

Is the inspection result normal?

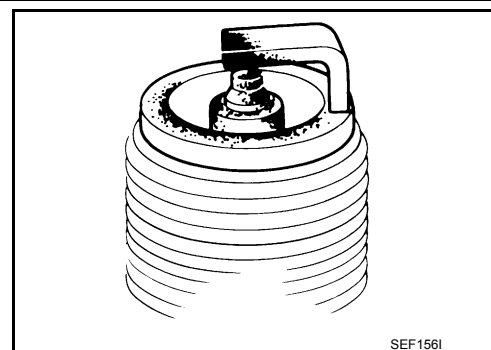
- YES >> GO TO 8.
NO >> Check ignition coil, power transistor and their circuits. Refer to [EC-371, "Diagnosis Procedure"](#).

8.CHECK SPARK PLUG

Check the initial spark plug for fouling, etc. Refer to [EM-27, "Removal and Installation"](#).

Is the inspection result normal?

- YES >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to [EM-117, "Spark Plug"](#).
NO >> Repair or clean spark plug. Refer to [EM-27, "Removal and Installation"](#). Then GO TO 9



9.CHECK FUNCTION OF IGNITION COIL-3

1. Reconnect the initial spark plugs.
2. Crank engine for about 3 seconds, and recheck whether spark is generated between the spark plug and the grounded portion.

Spark should be generated.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace spark plug(s) with standard type one(s). For spark plug type, refer to [EM-117, "Spark Plug"](#).

10.CHECK FUEL INJECTOR

1. Turn ignition switch OFF.

P0420 THREE WAY CATALYST FUNCTION

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

2. Remove fuel injector assembly.
Refer to [EM-42, "Removal and Installation"](#).
Keep fuel hose and all fuel injectors connected to fuel tube.
3. Disconnect all ignition coil harness connectors.
4. Reconnect all fuel injector harness connectors disconnected.
5. Turn ignition switch ON.

Does fuel drip from fuel injector?

YES >> GO TO 11.

NO >> Replace the fuel injector(s) from which fuel is dripping. Refer to [EM-42, "Removal and Installation"](#).

11. CHECK INTERMITTENT INCIDENT

Refer to [GI-45, "Intermittent Incident"](#).

Is the trouble fixed?

YES >> INSPECTION END

NO >> Replace three way catalyst assembly. Refer to [EM-39, "Exploded View"](#).

P0444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

DTC Description

INFOID:0000000014267605

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0444	PURG VOLUME CONT/V (Evaporative emission system purge control valve circuit open)	An excessively low voltage signal is sent to ECM through the EVAP canister purge volume control solenoid valve.

POSSIBLE CAUSE

- Harness or connectors (EVAP canister purge volume control solenoid valve circuit is open or shorted.)
- EVAP canister purge volume control solenoid valve

FAIL-SAFE

No applicable

DTC CONFIRMATION PROCEDURE

1.CONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm battery voltage is more than 11 V at idle.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 13 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-261, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267606

1.CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect EVAP canister purge volume control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check the voltage between EVAP canister purge volume control solenoid valve harness connector and ground.

+		-	Voltage
EVAP canister purge volume control solenoid valve			
Connector	Terminal		
F15	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

P0444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

2. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between EVAP canister purge volume control solenoid valve harness connector and IPDM E/R harness connector.

+		-		Continuity
EVAP canister purge volume control solenoid valve		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F15	2	E121	26	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit.
NO >> Repair or replace error-detected parts.

3. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EVAP canister purge volume control solenoid valve harness connector and ECM harness connector.

+		-		Continuity
EVAP canister purge volume control solenoid valve		ECM		
Connector	Terminal	Connector	Terminal	
F15	1	F73	17	Existed

4. Also check harness for short to power.

Is the inspection result normal?

- YES-1 >> With CONSULT: GO TO 4.
YES-2 >> Without CONSULT: GO TO 5.
NO >> Repair or replace error-detected parts.

4. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE OPERATION

Ⓔ With CONSULT

1. Reconnect all harness connectors disconnected.
2. Start the engine.
3. Perform "PURG VOL CONT/V" in "ACTIVE TEST" mode of "ENGINE" using CONSULT.
4. Check that engine speed varies according to the valve opening.

Does engine speed vary according to the valve opening?

- YES >> INSPECTION END
NO >> GO TO 5.

5. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Check the EVAP canister purge volume control solenoid valve. Refer to [EC-262, "Component Inspection"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace EVAP canister purge volume control solenoid valve. Refer to [EM-36, "Exploded View"](#).

Component Inspection

INFOID:0000000014267607

1. CHECK EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

Ⓔ With CONSULT

1. Turn ignition switch OFF.

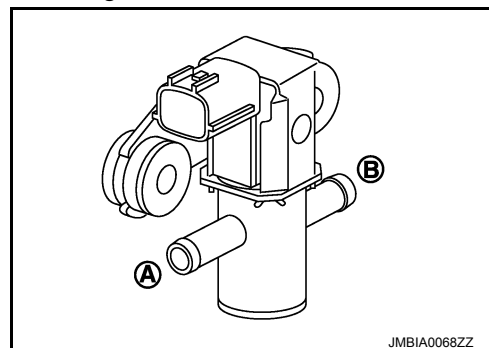
P0444 EVAP CANISTER PURGE VOLUME CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

- Reconnect all harness connectors disconnected.
- Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- Start the engine.
- Select "PURG VOL CONT/V" in "ACTIVE TEST" mode of "ENGINE" using CONSULT.
- Touch "Qd" and "Qu" on CONSULT screen to adjust "PURG VOL C/V" opening and check air passage continuity of EVAP canister purge volume control solenoid valve as per the following conditions.

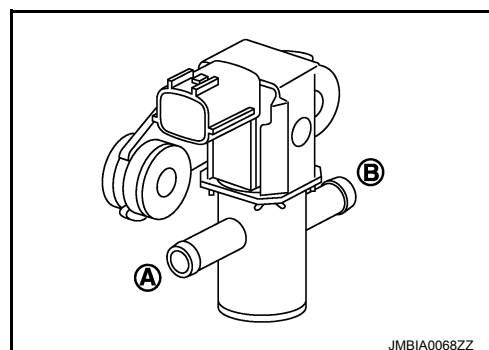
Condition (PURG VOL C/V value)	Air passage continuity between (A) and (B)
100%	Existed
0%	Not existed



⊗ Without CONSULT

- Turn ignition switch OFF.
- Disconnect EVAP canister purge volume control solenoid valve harness connector.
- Disconnect EVAP purge hoses connected to EVAP canister purge volume control solenoid valve.
- Check air passage continuity of EVAP canister purge volume control solenoid valve as per the following conditions.

Condition	Air passage continuity between (A) and (B)
12 V direct current supply between terminals 1 and 2	Existed
No supply	Not existed



Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVAP canister purge volume control solenoid valve. Refer to [EM-36, "Exploded View"](#).

P0452, P0453 ATMOSPHERIC PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0452, P0453 ATMOSPHERIC PRESSURE SENSOR

DTC Description

INFOID:0000000014267608

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0452	EVAP SYS PRES SEN (Atmospheric pressure sensor circuit low input)	An excessively low voltage from the sensor is sent to ECM.
P0453	EVAP SYS PRES SEN (Atmospheric pressure sensor circuit low input)	An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors
(Atmospheric pressure sensor circuit is open or shorted.)
- Atmospheric pressure sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0452 or P0453 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-264, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267609

1.CHECK DTC PRIORITY

If DTC P0452 or P0453 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).
NO >> GO TO 2.

2.CHECK ATMOSPHERIC PRESSURE SENSOR POWER SUPPLY

1. Turn ignition switch OFF.

P0452, P0453 ATMOSPHERIC PRESSURE SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect atmospheric pressure sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between atmospheric pressure sensor harness connector and ground.

+		−	Voltage (Approx.)
Atmospheric pressure sensor			
Connector	Terminal		
E19	1	Ground	5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK ATMOSPHERIC PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between atmospheric pressure sensor harness connector and ECM harness connector.

+		-		Continuity
Atmospheric pressure sensor		ECM		
Connector	Terminal	Connector	Terminal	
E19	1	E55	113	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

4.CHECK CMP SENSOR (PHASE) GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between atmospheric pressure sensor harness connector and ECM harness connector.

+		-		Continuity
Atmospheric pressure sensor		ECM		
Connector	Terminal	Connector	Terminal	
E19	3	E55	124	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK CMP SENSOR (PHASE) INPUT SIGNAL CIRCUIT

1. Check the continuity between atmospheric pressure sensor harness connector and ECM harness connector.

+		-		Continuity
Atmospheric pressure sensor		ECM		
Connector	Terminal	Connector	Terminal	
E19	2	E55	114	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

P0452, P0453 ATMOSPHERIC PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

6.CHECK ATMOSPHERIC PRESSURE SENSOR

Refer to [EC-266. "Component Inspection"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace atmospheric pressure sensor. Refer to [EC-393. "Removal and Installation"](#).

Component Inspection

INFOID:0000000014267610

1.CHECK ATMOSPHERIC PRESSURE SENSOR

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals as follows.

ECM		
Connector	+	-
	Terminal	
E55	114	124

NOTE:

Because the sensor is absolute pressure sensor, output value may differ depending on atmospheric pressure and altitude.

3. Measure the atmospheric pressure.

NOTE:

As the atmospheric pressure described on the synoptic chart is the value at sea level, compensate the pressure with the following chart.

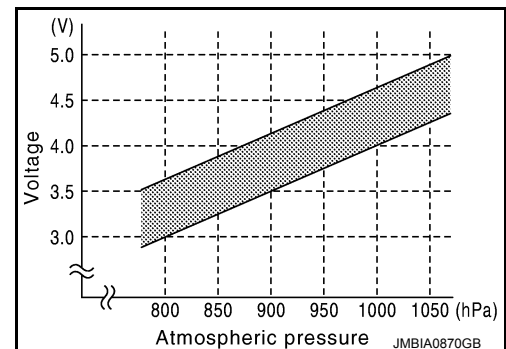
Altitude (m)	Compensated pressure (hPa)
0	0
200	-24
400	-47
600	-70
800	-92
1000	-114
1500	-168
2000	-218

4. Check the atmospheric pressure sensor value corresponding to the atmospheric pressure.

Atmospheric pressure (hPa)	Voltage (V)
800	3.1 – 3.7
850	3.3 – 3.9
900	3.5 – 4.1
950	3.8 – 4.3
1000	4.0 – 4.6
1050	4.2 – 4.8

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace atmospheric pressure sensor. Refer to [EC-393. "Removal and Installation"](#).



P0500 VSS

DTC Description

INFOID:0000000014267611

The vehicle speed signal is sent to the combination meter from the “ABS actuator and electric unit (control unit)” by CAN communication line. The combination meter then sends a signal to the ECM by CAN communication line.

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0500	VEH SPEED SEN/CIRC (Vehicle speed sensor “A”)	The almost 0 km/h (0 MPH) of vehicle speed signal is sent to ECM even when vehicle is being driven.

POSSIBLE CAUSE

- Harness or connectors
- CAN communication line is open or shorted.
- The vehicle speed signal circuit is open or shorted.
- Combination meter
- ABS actuator and electric unit (control unit)

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0500 is displayed with DTC UXXXX or P0607, first perform the trouble diagnosis for DTC UXXXX or P0607.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).
NO >> GO TO 2.

2.INSPECTION START

Do you have CONSULT?

Do you have CONSULT?

- YES >> GO TO 3.
NO >> GO TO 6.

3.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 4.

4.CHECK VEHICLE SPEED SENSOR FUNCTION

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

< DTC/CIRCUIT DIAGNOSIS >

 With CONSULT

1. Start the engine.
2. Read "VHCL SPEED SE" in "DATA MONITOR" mode with CONSULT. The vehicle speed on CONSULT should exceed 10 km/h (6 mph) when rotating wheels with suitable gear position.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Proceed to [EC-268, "Diagnosis Procedure"](#).

5.PERFORM DTC CONFIRMATION PROCEDURE

1. Select "DATA MONITOR" mode with CONSULT.
2. Warm engine up to normal operating temperature.
3. Maintain the following conditions for at least 30 consecutive seconds (For Mexico), 60 consecutive seconds (Except for Mexico).

CAUTION:

Always drive vehicle at a safe speed.

ENG SPEED	2,250 - 6,000 rpm (For Mexico) 1,800 - 6,000 rpm (Except for Mexico)
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	4.5 - 31.8 msec
Shift lever	Except Neutral position
PW/ST SIGNAL	OFF

4. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-268, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

6.PERFORM COMPONENT FUNCTION CHECK**NOTE:**

Use component function check to check the overall function of the vehicle speed signal circuit. During this check, a 1st trip DTC might not be confirmed.

 With GST

1. Lift up drive wheels.
2. Start the engine.
3. Read vehicle speed signal in Service \$01 with GST.
The vehicle speed signal on GST should be able to exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.

 Without CONSULT

1. Lift up drive wheels.
2. Start the engine.
3. Check vehicle speed of speedometer.
The vehicle speed should be able to exceed 10 km/h (6 MPH) when rotating wheels with suitable gear position.

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to [EC-268, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267612

1.CHECK DTC PRIORITY

If DTC P0500 is displayed with DTC UXXXX or P0607, first perform the trouble diagnosis for DTC UXXXX or P0607.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK DTC WITH COMBINATION METER

Check DTC with combination meter. Refer to [MWI-29, "CONSULT Function \(METER/M&A\)"](#) (with color display), [MWI-161, "CONSULT Function \(METER/M&A\)"](#) (with monochrome display).

Is the inspection result normal?

YES-1 (With ABS)>>GO TO 3.

YES-2 (Without ABS)>>INSPECTION END

NO >> Repair or replace.

3. CHECK DTC WITH ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Check DTC with ABS actuator and electric unit (control unit). Refer to [BRC-153, "CONSULT Function"](#) (with VDC) or [BRC-25, "CONSULT Function"](#) (without VDC).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace.

A

EC

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P

P0520 EOP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0520 EOP SENSOR

DTC Description

INFOID:0000000014267613

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0520	EOP SENSOR/SWITCH (Engine oil pressure sensor/switch circuit)	Signal voltage from the EOP sensor remains at more than 5.02 V / less than 0.3 V for 5 seconds or more.

POSSIBLE CAUSE

- Harness or connectors (EOP sensor circuit is open or shorted.)
- Engine oil level abnormality
- EOP sensor
- Sensor power supply 2 circuit

FAIL-SAFE

No applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-270. "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267614

1.CHECK ENGINE OIL

1. Turn ignition switch OFF.
2. Check engine oil level and pressure. Refer to [LU-9. "Inspection"](#).

Is inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK ENGINE OIL PRESSURE SENSOR POWER SUPPLY

1. Disconnect engine oil pressure (EOP) sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between EOP sensor harness connector and ground.

+		-	Voltage (Approx.)
EOP sensor			
Connector	terminal		
F133	3	Ground	5 V

P0520 EOP SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

Inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3.CHECK EOP SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EOP sensor harness connector and ECM harness connector.

+		-		Continuity
EOP sensor		ECM		
Connector	terminal	Connector	terminal	
F133	3	F73	40	Existed

4. Also check harness for short to ground and to power.

Is inspection result normal?

- YES >> Check sensor power supply 2 circuit. Refer to [EC-380, "Diagnosis Procedure"](#).
NO >> Repair or replace error-detected parts.

4.CHECK EOP SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EOP sensor harness connector and ECM harness connector.

+		-		Continuity
EOP sensor		ECM		
Connector	Terminal	Connector	Terminal	
F133	1	F73	38	Existed

4. Also check harness for short to power.

Is inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5.CHECK EOP SENSOR SIGNAL CIRCUIT

1. Check the continuity between EOP sensor harness connector and ECM harness connector.

+		-		Continuity
EOP sensor		ECM		
Connector	Terminal	Connector	Terminal	
F133	2	F73	39	Existed

2. Also check harness for short to ground and to power.

Is inspection result normal?

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

6.CHECK EOP SENSOR

Refer to [EC-271, "Component Inspection"](#).

Is inspection result normal?

- YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

Component Inspection

1.CHECK ENGINE OIL PRESSURE SENSOR

INFOID:0000000014267615

P0520 EOP SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect engine oil pressure (EOP) sensor harness connector.
3. Check resistance between EOP sensor connector terminals.

EOP sensor		Condition	Resistance (k Ω)
+	-		
Terminal			
1	2	None	4 k Ω – 10 k Ω
	3		2 k Ω – 8 k Ω
2	1		4 k Ω – 10 k Ω
	3		1 k Ω – 3 k Ω
3	1		2 k Ω – 8 k Ω
	2		1 k Ω – 3 k Ω

Is the inspection result normal?

YES >> INSPECTION END.

NO >> Replace EOP sensor. Refer to [EM-90, "Exploded View"](#).

P0524 ENGINE OIL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0524 ENGINE OIL PRESSURE

DTC Description

INFOID:0000000014267616

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0524	ENGINE OIL PRESSURE (Engine oil pressure too low)	An EOP sensor signal voltage applied to ECM remains lower than the specified value continuously for 10 seconds or more when the engine speed is 1,000 rpm or more.

POSSIBLE CAUSE

- Decrease in engine oil pressure
- Decrease in engine oil level
- Engine oil condition
- EOP sensor
- Engine body

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Other	• ECM illuminates oil pressure warning lamp on the combination meter. • Engine speed will not rise more than 4,000rpm due to the fuel cut. • Fail-safe is canceled when ignition switch OFF → ON.

DTC CONFIRMATION PROCEDURE

CAUTION:

If **"EC-274, "Diagnosis Procedure"** is unfinished, be sure to perform Step 3 and 4.

1.PRECONDITIONING-1

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TEST CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more at idle.

>> GO TO 2.

2.PRECONDITIONING-2

Is "Diagnosis Procedure" of DTC P0524 finished?

YES >> GO TO 3.

NO >> GO TO 4.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and warm it up to normal operating temperature.
2. Maintain the following conditions for about 10 consecutive seconds.

Shift lever	Neutral
Engine coolant temperature	70°C (158°F) or more
Engine speed	1,000 rpm or more

NOTE:

With engine speed set around 4,000 rpm, the phenomenon can be reproduced more easily.

< DTC/CIRCUIT DIAGNOSIS >

3. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-274, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

4.CHECK ENGINE OIL LEVEL

Check engine oil level. Refer to [LU-9, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Proceed to [EC-274, "Diagnosis Procedure"](#).

5.CHECK ENGINE OIL PRESSURE

 With CONSULT

1. Turn ignition switch ON.

2. Select "DATA MONITOR" mode of "ENGINE" using CONSULT.

3. Start the engine and check that "EOP SENSOR" changes, according to engine speeds.

Monitor item	Condition	Value
EOP SENSOR	• Engine oil temperature: 80°C (176°F) • Shift lever: Neutral • Air conditioner switch: OFF • No load	Engine speed: Idle 1,000 – 2,000 mV
		Engine speed: 2,000 rpm 1,500 – 3,500 mV

 Without CONSULT

Check engine oil level. Refer to [LU-9, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Proceed to [EC-274, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267617

1.CHECK ENGINE OIL LEVEL

1. Turn ignition switch OFF.

2. Check engine oil level. Refer to [LU-9, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

2.CHECK ENGINE OIL PRESSURE

 With CONSULT

1. Turn ignition switch ON.

2. Select "DATA MONITOR" mode of "ENGINE" using CONSULT.

3. Start the engine and check that "EOP SENSOR" changes, according to engine speeds.

Monitor item	Condition	Value
EOP SENSOR	• Engine oil temperature: 80°C (176°F) • Shift lever: Neutral • Air conditioner switch: OFF • No load	Engine speed: Idle 1,000 – 2,000 mV
		Engine speed: 2,000 rpm 1,500 – 3,500 mV

 Without CONSULT

Check engine oil level. Refer to [LU-9, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check oil pump. Refer to [LU-7, "Lubrication Circuit"](#).

P0524 ENGINE OIL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

3.CHECK EOP SENSOR

Check EOP sensor. Refer to [EC-275, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

4.CHECK ENGINE OIL LEAKAGE

Check engine oil leakage. Refer to [LU-7, "Lubrication Circuit"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK CAUSE OF ENGINE OIL CONSUMPTION

Check the following item.

Step	Inspection item	Equipment	Standard	Reference
1	PCV valve	EC-391, "Inspection"		
2	Exhaust front tube	Visual	- No blocking - No abnormal sounds	—
3	Oil pump	Visual	- No blocking - No abnormal sounds	—
		LU-7, "Lubrication Circuit"		
4	- Piston - Piston pin - Piston ring	- Piston to piston pin oil clearance - Piston ring side clearance - Piston ring end gap		EM-98, "Inspection"
5	Cylinder block	- Cylinder block top surface distortion - Piston to cylinder bore clearance		EM-98, "Inspection"

>> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000014267618

1.CHECK EOP SENSOR

- Turn ignition switch OFF.
- Disconnect EOP sensor harness connector.
- Check resistance between EOP sensor connector terminals.

EOP sensor		Condition	Resistance (kΩ)
+	—		
Terminal			
1	2	None	4 kΩ – 10 kΩ
	3		2 kΩ – 8 kΩ
2	1		4 kΩ – 10 kΩ
	3		1 kΩ – 3 kΩ
3	1		2 kΩ – 8 kΩ
	2		1 kΩ – 3 kΩ

Is the inspection result normal?

YES >> INSPECTION END.

NO >> Replace EOP sensor. Refer to [EM-90, "Exploded View"](#).

P0550 PSP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0550 PSP SENSOR

DTC Description

INFOID:0000000014267619

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0550	PW ST P SEN/CIRC (Power steering pressure sensor/switch circuit)	An excessively low or high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (Power steering pressure sensor circuit is open or shorted)
- Power steering pressure sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0550 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to [EC-276, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267620

1.CHECK DTC PRIORITY

If DTC P0550 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).

NO >> GO TO 2.

2.CHECK POWER STEERING PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect power steering pressure (PSP) sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between PSP sensor harness connector and ground.

P0550 PSP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-	Voltage (Approx.)
PSP sensor			
Connector	Terminal		
F46	3	Ground	5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK PSP SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between PSP sensor harness connector and ECM harness connector.

+		-		Continuity
PSP sensor		ECM		
Connector	Terminal	Connector	Terminal	
F46	3	F57	76	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

4.CHECK PSP SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between PSP sensor harness connector and ECM harness connector.

+		-		Continuity
PSP sensor		ECM		
Connector	Terminal	Connector	Terminal	
F46	1	F57	74	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK PSP SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between PSP sensor harness connector and ECM harness connector.

+		-		Continuity
PSP sensor		ECM		
Connector	Terminal	Connector	Terminal	
F46	2	F57	75	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK PSP SENSOR

Refer to [EC-278, "Component Inspection"](#).

Is the inspection result normal?

P0550 PSP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

YES >> INSPECTION END
NO >> Replace PSP sensor (with high pressure piping).

Component Inspection

INFOID:0000000014267621

1. CHECK POWER STEERING PRESSURE SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Start engine and let it idle.
4. Check the voltage between ECM harness connector terminals under the following conditions.

ECM			Condition		Voltage (V)
Connector	+	-			
	Terminal				
F57	75	74	Steering wheel	Being turned	0.5 - 4.5
				Not being turned	0.4 - 0.8

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace power steering pressure sensor (with high pressure piping).

P0603 ECM

DTC Description

INFOID:0000000014267622

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0603	ECM BACK UP CIRCUIT [Internal control module keep alive memory (KAM) error]	- Malfunction in the internal back up RAM of ECM. - Malfunction in the internal EEPROM system of ECM.

POSSIBLE CAUSE

- ECM power supply
- ECM

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Engine output control	ECM reduces the engine output, according to the rise in engine speed. This reduces the vehicle speed to encourage the driver to repair malfunction.
Other		ASCD operation may be deactivated.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 1 second.
- Turn ignition switch OFF and wait at least 10 seconds.
- Repeat step 1 and 2 for 10 times.
- Turn ignition switch ON.
- Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-279, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267623

1. CHECK ECM POWER SUPPLY AND GROUND CIRCUIT

Perform trouble diagnosis for ECM power supply and ground circuit. Refer to [EC-150, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

P0603 ECM

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

3. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure. Refer to [EC-279, "DTC Description"](#).

Is the 1st trip DTC P0603 displayed again?

- YES >> Replace ECM. Refer to [EC-392, "Removal and Installation"](#).
NO >> INSPECTION END

P0604 ECM

DTC Description

INFOID:0000000014267624

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0604	ECM [Internal control module random access memory (RAM) error]	Malfunction in the internal RAM of ECM.

POSSIBLE CAUSE

ECM

FAIL-SAFE

EXCEPT FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
Other		ASCD operation may be deactivated.

FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
Device fix mode		This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.
Other		ASCD operation may be deactivated.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON (engine stopped) and wait least 20 minutes.

CAUTION:

Never start engine during this procedure.

2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Check 1st trip DTC.

< DTC/CIRCUIT DIAGNOSIS >

Is 1st trip DTC detected?

- YES >> Proceed to [EC-282, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267625

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure. Refer to [EC-281, "DTC Description"](#).

Is the 1st trip DTC P0604 displayed again?

- YES >> Replace ECM. Refer to [EC-392, "Removal and Installation"](#).
NO >> INSPECTION END

P0605 ECM

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P0605 ECM

DTC Description

INFOID:0000000014267626

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0605	ECM [Internal control module read only memory (ROM) error]	Malfunction in the internal ROM of ECM.

POSSIBLE CAUSE

ECM

FAIL-SAFE

EXCEPT FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
Other		ASCD operation may be deactivated.

FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
Device fix mode		This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.
Other		ASCD operation may be deactivated.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON (engine stopped) and wait least 20 minutes.

CAUTION:

Never start engine during this procedure.

2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.

< DTC/CIRCUIT DIAGNOSIS >

4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-284, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267627

1. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure. Refer to [EC-283, "DTC Description"](#).

Is the 1st trip DTC P0605 displayed again?

- YES >> Replace ECM. Refer to [EC-392, "Removal and Installation"](#).
NO >> INSPECTION END

P0606 ECM

DTC Description

INFOID:0000000014267628

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0606	CONTROL MODULE (Control module processor)	Malfunction in ECM processor.

POSSIBLE CAUSE

ECM

FAIL-SAFE

EXCEPT FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
Other		ASCD operation may be deactivated.

FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
Device fix mode		This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.
Other		ASCD operation may be deactivated.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-1

1. Turn ignition switch ON (engine stopped) and wait at least 10 seconds.

CAUTION:

Never start engine during this procedure.

2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Check 1st trip DTC.

< DTC/CIRCUIT DIAGNOSIS >

Is 1st trip DTC detected?

- YES >> Proceed to [EC-286, "Diagnosis Procedure"](#).
NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-2

1. Start engine.
2. Rev up the engine quickly to approximately 3,000 rpm under unloaded condition and completely release the accelerator pedal.
3. Let the engine idle and wait at least 10 seconds.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Turn ignition switch ON.
6. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-286, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267629

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure for 3 times. Refer to [EC-285, "DTC Description"](#).

Is the 1st trip DTC P0606 displayed again?

- YES >> Replace ECM. Refer to [EC-392, "Removal and Installation"](#).
NO >> INSPECTION END

P0607 ECM

DTC Description

INFOID:0000000014267630

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0607	ECM (Control module performance)	ECM internal communication system is malfunctioning.

POSSIBLE CAUSE

ECM

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Engine output control	ECM reduces the engine output, according to the rise in engine speed. This reduces the vehicle speed to encourage the driver to repair malfunction.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON (engine stopped) and wait at least 10 seconds.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-287, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267631

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure. Refer to [EC-287, "DTC Description"](#).

Is the 1st trip DTC P0607 displayed again?

- YES >> Replace ECM. Refer to [EC-392, "Removal and Installation"](#).
NO >> INSPECTION END

P060A ECM

DTC Description

INFOID:0000000014267632

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P060A	CONTROL MODULE (Internal control module monitoring processor performance)	ECM internal monitoring processor is malfunctioning.

POSSIBLE CAUSE

ECM

FAIL-SAFE

EXCEPT FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
	Engine output control	ECM reduces the engine output, according to the rise in engine speed. This reduces the vehicle speed to encourage the driver to repair malfunction.
Other		ASCD operation may be deactivated.

FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
	Engine output control	ECM reduces the engine output, according to the rise in engine speed. This reduces the vehicle speed to encourage the driver to repair malfunction.
Device fix mode		This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.
Other		ASCD operation may be deactivated.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and wait at least 10 seconds.

< DTC/CIRCUIT DIAGNOSIS >

2. Turn ignition switch OFF and wait at least 10 seconds.
3. Repeat step 1 and 2 for 5 times.
4. Turn ignition switch ON.
5. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-289, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267633

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure. Refer to [EC-288, "DTC Description"](#).

Is the 1st trip DTC P060A displayed again?

YES >> Replace ECM. Refer to [EC-392, "Removal and Installation"](#).

NO >> INSPECTION END

P060B ECM

DTC Description

INFOID:0000000014267634

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P060B	CONTROL MODULE (Internal control module A/D processing performance)	ECM internal analog/digital conversion processing system is malfunctioning.

POSSIBLE CAUSE

ECM

FAIL-SAFE

EXCEPT FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
Other		ASCD operation may be deactivated.

FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
Device fix mode		This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.
Other		ASCD operation may be deactivated.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is 11 V or more with ignition switch ON.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON (engine stopped) and wait at least 10 seconds.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-291, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

A

Diagnosis Procedure

INFOID:0000000014267635

EC

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure. Refer to [EC-290, "DTC Description"](#).

C

Is the 1st trip DTC P060B displayed again?

D

- YES >> Replace ECM. Refer to [EC-392, "Removal and Installation"](#).
 NO >> INSPECTION END

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P0643 SENSOR POWER SUPPLY

DTC Description

INFOID:0000000014267636

ECM supplies a voltage of 5 V to some of the sensors systematically divided into 2 groups, respectively. Accordingly, when a short circuit develops in a sensor power source, a malfunction may occur simultaneously in the sensors belonging to the same group as the short-circuited sensor.

Sensor power supply 1

- APP sensor 1
- Atmospheric pressure sensor
- Battery current sensor^{*1}
- Crankshaft position (CKP) sensor (POS)
- PSP sensor
- Refrigerant pressure sensor^{*2}
- TP sensor

*1: For Chile

*2: With A/C

NOTE:

If sensor power supply 1 circuit is malfunctioning, DTC P0643 is displayed.

Sensor power supply 2

- APP sensor 2
- CMP sensor (PHASE)
- MAF sensor

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0643	SENSOR POWER/CIRC (Sensor reference voltage "A" circuit high)	ECM detects that the voltage of sensor power supply 1 is excessively low or high.

POSSIBLE CAUSE

- Harness or connectors
- APP sensor 1 circuit is shorted.
- Atmospheric pressure sensor circuit is shorted.
- Battery current sensor^{*1}
- CKP sensor (POS) circuit is shorted.
- PSP sensor circuit is shorted.
- Refrigerant pressure sensor circuit is shorted.^{*2}
- TP sensor circuit is shorted.
- APP sensor
- Atmospheric pressure sensor
- Battery current sensor^{*1}
- CKP sensor (POS)
- PSP sensor
- Refrigerant pressure sensor^{*2}
- TP sensor

*1: For Chile

*2: With A/C

FAIL-SAFE

EXCEPT FOR CHILE

P0643 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.

FOR CHILE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Other		ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Refer to [EC-293, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267637

1. CHECK GROUND CONNECTION

1. Turn ignition switch OFF.
2. Check ground connection E9 and E15. Refer to Ground Inspection in [GI-47, "Circuit Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace ground connection.

2. CHECK ACCELERATOR PEDAL POSITION SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between APP sensor harness connector and ground.

+		-	Voltage (Approx.)
APP sensor			
Connector	Terminal		
E5	2	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 5.

P0643 SENSOR POWER SUPPLY

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

NO >> GO TO 3.

3.CHECK SENSOR POWER SUPPLY CIRCUITS

Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor		
Connector	Terminal	Name	Connector	Terminal
F57	64	Battery current sensor*1	E161	1
	72	CKP sensor (POS)	F11	1
	76	PSP sensor	F46	3
	80	Electric throttle control actuator	F50	2
E55	104	Refrigerant pressure sensor*2	E49	3
	113	Atmospheric pressure sensor	E19	1
	122	APP sensor 1	E5	2

*1: For Chile models

*2: With A/C

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair short to ground or short to power in harness or connectors.

4.CHECK COMPONENTS

Check the following.

- Atmospheric pressure sensor (Refer to [EC-266, "Component Inspection".](#))
- Battery current sensor*1
- CKP sensor (POS) (Refer to [EC-250, "Component Inspection".](#))
- PSP sensor (Refer to [EC-278, "Component Inspection".](#))
- Refrigerant pressure sensor*2 (Refer to [EC-378, "Diagnosis Procedure".](#))
- TP sensor (Refer to [EC-187, "Component Inspection".](#))

*1: For Chile models

*2: With A/C

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning component.

5.CHECK APP SENSOR

Refer to [EC-344, "Component Inspection".](#)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3, "Removal and Installation".](#)

P0850 PNP SWITCH

DTC Description

INFOID:0000000014267638

When the shift lever position is Neutral position, park/neutral position (PNP) signal is ON.
ECM detects the position because the continuity of the line (the ON) exists.

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0850	P-N POS SW/CIRCUIT (Park/neutral switch input circuit)	The signal of park/neutral signal is not changed in the process of engine starting and driving.

POSSIBLE CAUSE

- Harness or connectors (The park/neutral signal circuit is open or shorted.)
- Park/neutral position (PNP) switch

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.INSPECTION START

Do you have CONSULT?

Do you have CONSULT?

YES >> GO TO 2.

NO >> GO TO 5.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 3.

3.CHECK PNP SIGNAL FUNCTION

④With CONSULT

1. Turn ignition switch ON.
2. Select "P/N POSI SW" in "DATA MONITOR" mode with CONSULT. Then check "P/N POSI SW" signal under the following conditions.

Shift lever position	Known-good signal
Neutral position	ON
Except above position	OFF

Is the inspection result normal?

YES >> GO TO 4.

NO >> Go to [EC-296. "Diagnosis Procedure"](#).

4.PERFORM DTC CONFIRMATION PROCEDURE

1. Select "DATA MONITOR" mode with CONSULT.
2. Start engine and warm it up to normal operating temperature.
3. Maintain the following conditions for at least 50 consecutive seconds.

CAUTION:

Always drive vehicle at a safe speed.

P0850 PNP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

ENG SPEED	1,600 - 6,375 rpm (For Mexico) 1,400 - 6,375 rpm (Except for Mexico)
COOLAN TEMP/S	More than 70°C (158°F)
B/FUEL SCHDL	2.5 - 31.8 msec (For Mexico) 3.25 - 31.8 msec (Except for Mexico)
VHCL SPEED SE	More than 64 km/h (40 mph)
Shift lever	Suitable position

4. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Go to [EC-296, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

5.PERFORM COMPONENT FUNCTION CHECK

NOTE:

Use component function check the overall function of the park/neutral signal circuit. During this check, a 1st trip DTC might not be confirmed.

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector and ground.

ECM			Condition		Voltage (Approx.)
Connector	+	−			
	Terminal				
E55	117	128	Shift lever	Neutral	Battery voltage
				Except above	0 V

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Go to [EC-296, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267639

1.CHECK PARK/NEUTRAL POSITION (PNP) SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect PNP switch harness connector.
3. Turn ignition switch ON.
4. Check the voltage between PNP switch harness connector and ground.

+		-	Voltage
PNP switch			
Connector	Terminal		
F66	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform the trouble diagnosis for power supply circuit.

2.CHECK PNP SWITCH INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between PNP switch harness connector and ECM harness connector.

P0850 PNP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
PNP switch		ECM		
Connector	Terminal	Connector	Terminal	
F66	2	E55	117	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK PNP SWITCH

Refer to [EC-297, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace PNP switch. Refer to [TM-20, "Removal and Installation"](#).

Component Inspection

INFOID:0000000014267640

1.CHECK PARK/NEUTRAL POSITION (PNP) SWITCH

1. Turn ignition switch OFF.
2. Disconnect PNP switch harness connector.
3. Check the continuity between PNP switch harness connector terminals.

PNP switch		Condition		Continuity
+	—			
Terminal				
1	2	Shift lever	Neutral	Existed
			Except above	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace PNP switch. Refer to [TM-20, "Removal and Installation"](#).

P1078 EVT CONTROL POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P1078 EVT CONTROL POSITION SENSOR

DTC Description

INFOID:0000000014267641

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1078	EXH TIM SEN/CIRC-B1 (Exhaust timing sensor circuit bank 1)	An excessively high or low voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (Exhaust valve timing control position sensor circuit is open or shorted.)
- Accumulation of debris to the signal pick-up portion of the camshaft
- Exhaust valve timing control position sensor
- Sensor power supply 2 circuit

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Accelerator angle variation control	ECM controls the accelerator pedal depression speed to make it slower than actual speed. This causes a drop in accelerating performance and encourages the driver to repair malfunction. NOTE: ECM does not control the accelerator pedal releasing speed.
Device fix mode		This mode fixes the IVT control solenoid valve and the EVT control solenoid valve in the reference position.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 10 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-298, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267642

1. CHECK EXHAUST VALVE TIMING (EVT) CONTROL POSITION SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect exhaust valve timing (EVT) control position sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between EVT control position sensor harness connector and ground.

P1078 EVT CONTROL POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-	Voltage (Approx.)
EVT sensor			
Connector	Terminal		
F129	1	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 3.
NO >> GO TO 2.

2.CHECK EVT CONTROL POSITION SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EVT control position sensor harness connector and ECM harness connector.

+		-		Continuity
EVT control position sensor		ECM		
Connector	Terminal	Connector	Terminal	
F129	1	F73	44	Existed

4. Also check harness for short to ground and to power.

Is inspection result normal?

- YES >> Check sensor power supply 2 circuit. Refer to [EC-380. "Diagnosis Procedure"](#).
NO >> Repair or replace error-detected parts.

3.CHECK EVT CONTROL POSITION SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EVT control position sensor harness connector and ECM harness connector.

+		-		Continuity
EVT control position sensor		ECM		
Connector	Terminal	Connector	Terminal	
F129	2	F73	42	Existed

4. Also check harness for short to power.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4.CHECK EVT CONTROL POSITION SENSOR INPUT SIGNAL CIRCUIT

1. Disconnect ECM harness connector.
2. Check the continuity between EVT control position sensor harness connector and ECM harness connector.

+		-		Continuity
EVT control position sensor		ECM		
Connector	Terminal	Connector	Terminal	
F129	3	F73	43	Existed

3. Also check harness for short to ground and to power.

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

P1078 EVT CONTROL POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

5.CHECK EVT CONTROL POSITION SENSOR

Check the EVT control position sensor. Refer to [EC-300, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace EVT control position sensor. Refer to [EM-61, "Exploded View"](#).

6.CHECK EXHAUST CAMSHAFT

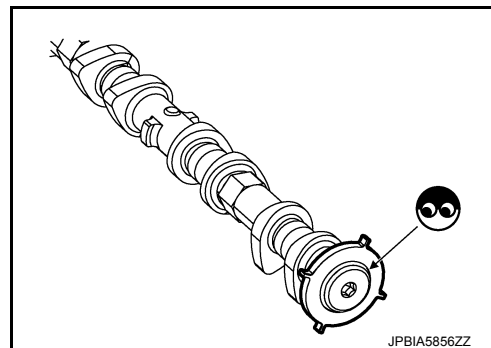
Check the following.

- Accumulation of debris to the signal plate of camshaft rear end
- Chipping signal plate of camshaft rear end

Is the inspection result normal?

YES >> INSPECTION END

NO >> Remove debris and clean the signal plate of camshaft rear end or replace camshaft. Refer to [EM-62, "Removal and Installation"](#).



INFOID:0000000014267643

Component Inspection

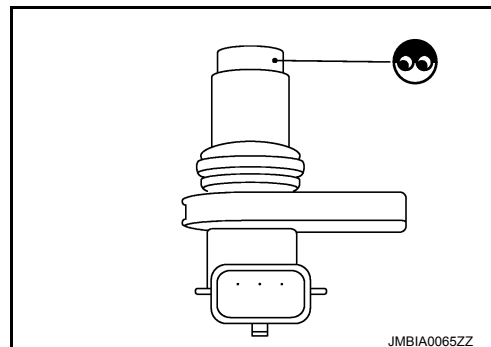
1.EXHAUST VALVE TIMING (EVT) CONTROL POSITION SENSOR-1

1. Turn ignition switch OFF.
2. Disconnect EVT control position sensor harness connector.
3. Loosen the fixing bolt of the sensor.
4. Remove the sensor.
5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace EVT control position sensor. Refer to [EM-61, "Exploded View"](#).



2.EVT CONTROL POSITION SENSOR-2

Check resistance EVT control position sensor terminals as shown below.

EVT control position sensor		Resistance
+	–	
Terminal		
1	2	Except 0 or ∞ Ω [at 25°C (77°F)]
	3	
2	3	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EVT control position sensor. Refer to [EM-61, "Exploded View"](#).

P1217 ENGINE OVER TEMPERATURE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P1217 ENGINE OVER TEMPERATURE

DTC Description

INFOID:0000000014267644

DTC DETECTION LOGIC

If the cooling fan or another component in the cooling system malfunctions, engine coolant temperature will rise.

When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1217	ENG OVER TEMP (Engine over temperature)	- Cooling fan does not operate properly (Overheat). - Cooling fan system does not operate properly (Overheat). - Engine coolant was not added to the system using the proper filling method. - Engine coolant is not within the specified range.

CAUTION:

When a malfunction is indicated, be sure to replace the coolant. Refer to [CO-10, "Changing Engine Coolant"](#). Also, replace the engine oil. Refer to [LU-10, "Changing Engine Oil"](#).

1. Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Be sure to use coolant with the proper mixture ratio.
2. After refilling coolant, run engine to ensure that no water-flow noise is emitted.

POSSIBLE CAUSE

- Cooling fan
- Radiator hose
- Radiator
- Radiator cap
- Reservoir tank
- Water pump
- Thermostat

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1217 is displayed with DTC UXXXX or P0607, first perform the trouble diagnosis for DTC UXXXX or P0607.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).
NO >> GO TO 2.

2.PERFORM COMPONENT FUNCTION CHECK-1

NOTE:

Use component function check to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

WARNING:

Never remove the radiator cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator.

Wrap a thick cloth around cap. Carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then turn the cap all the way off.

P1217 ENGINE OVER TEMPERATURE

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

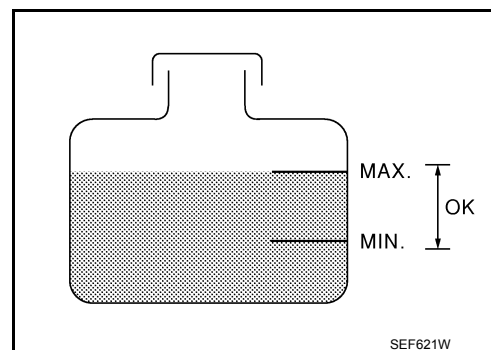
Check the coolant level in the reservoir tank and radiator.

Allow engine to cool before checking coolant level.

Is the coolant level in the reservoir tank and/or radiator below the proper range?

YES >> Proceed to [EC-302, "Diagnosis Procedure"](#).

NO >> GO TO 3.



3.PERFORM COMPONENT FUNCTION CHECK-2

Confirm whether customer filled the coolant or not.

Did customer fill the coolant?

YES >> Proceed to [EC-302, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267645

1.CHECK DTC PRIORITY

If DTC P1217 is displayed with DTC UXXXX or P0607, first perform the trouble diagnosis for DTC UXXXX or P0607.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK COOLING SYSTEM FOR LEAK-1

Check cooling system for leak. Refer to [CO-9, "System Inspection"](#).

Is leakage detected?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK COOLING SYSTEM FOR LEAK-2

Check the following for leak.

- Hose (Refer to [CO-9, "System Inspection"](#).)
- Radiator (Refer to [CO-18, "Inspection"](#).)
- Water pump (Refer to [CO-22, "Inspection"](#).)

>> Repair or replace malfunctioning part.

4.CHECK RADIATOR CAP

Check radiator cap. Refer to [CO-18, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace radiator cap. Refer to [CO-14, "Exploded View"](#).

5.CHECK THERMOSTAT

Check thermostat. Refer to [CO-25, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace thermostat. Refer to [CO-24, "Removal and Installation"](#).

6.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to [EC-183, "Component Inspection"](#).

Is the inspection result normal?

P1217 ENGINE OVER TEMPERATURE

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

YES >> GO TO 7.

NO >> Replace engine coolant temperature sensor. Refer to [EM-70. "Exploded View"](#).

7.OVERHEATING CAUSE ANALYSIS

If the cause cannot be isolated, check the [CO-7. "Troubleshooting Chart"](#).

>> INSPECTION END

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P1225 TP SENSOR

DTC Description

INFOID:0000000014267646

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1225	CTP LEARNING-B1 (Closed throttle position learning bank 1)	Closed throttle position learning value is excessively low.

POSSIBLE CAUSE

Electric throttle control actuator (TP sensor 1 and 2)

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-304, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267647

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Turn ignition switch OFF.
2. Remove the intake air duct. Refer to [EM-30, "Exploded View"](#).
3. Check if foreign matter is caught between the throttle valve and the housing.

Is the inspection result normal?

- YES >> Replace electric throttle control actuator. Refer to [EM-36, "Exploded View"](#).
 NO >> Remove the foreign matter and clean the electric throttle control actuator inside, then perform Throttle Valve Closed Position Learning. Refer to [EC-136, "Description"](#).

P1226 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P1226 TP SENSOR

DTC Description

INFOID:0000000014267648

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1226	CTP LEARNING-B1 (Closed throttle position learning bank 1)	Closed throttle position learning is not performed successfully, repeatedly.

POSSIBLE CAUSE

Electric throttle control actuator (TP sensor 1 and 2)

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 10 seconds.
3. Turn ignition switch ON.
4. Repeat steps 2 and 3 for 32 times.
5. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-305, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267649

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Turn ignition switch OFF.
2. Remove the intake air duct. Refer to [EM-30, "Exploded View"](#).
3. Check if foreign matter is caught between the throttle valve and the housing.

Is the inspection result normal?

- YES >> Replace electric throttle control actuator. Refer to [EM-36, "Exploded View"](#).
NO >> Remove the foreign matter and clean the electric throttle control actuator inside, then perform Throttle Valve Closed Position Learning. Refer to [EC-136, "Description"](#).

P1550 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P1550 BATTERY CURRENT SENSOR

DTC Description

INFOID:0000000014267650

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1550	BAT CURRENT SENSOR (Battery current sensor)	The output voltage of the battery current sensor remains within the specified range while engine is running.

POSSIBLE CAUSE

- Harness or connectors (Battery current sensor circuit is open or shorted.)
- Battery current sensor
- Camshaft position sensor
- Camshaft (Intake)
- Starter motor
- Starting system circuit
- Dead (Weak) battery

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1550 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and wait at least 10 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-306, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267651

1.CHECK DTC PRIORITY

If DTC P1550 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).
NO >> GO TO 2.

P1550 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

2.CHECK BATTERY CURRENT SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect battery current sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between battery current sensor harness connector and ground.

+		-	Voltage (Approx.)
Battery current sensor			
Connector	Terminal		
E161	1	Ground	5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	1	F57	64	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

4.CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	3	F57	62	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	4	F57	63	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

P1550 BATTERY CURRENT SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts

6.CHECK BATTERY CURRENT SENSOR

Check the battery current sensor. Refer to [EC-308. "Component Inspection"](#).

Is the inspection result normal?

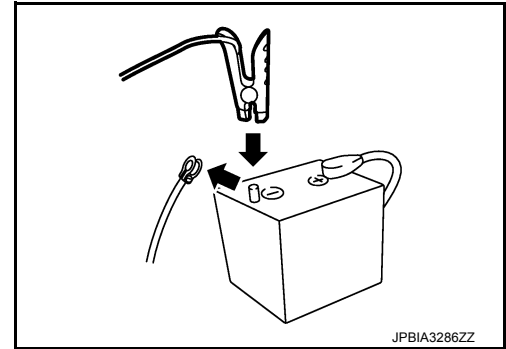
- YES >> INSPECTION END
NO >> Replace battery negative cable assembly.

Component Inspection

INFOID:0000000014267652

1.CHECK BATTERY CURRENT SENSOR

1. Turn ignition switch OFF.
2. Reconnect harness connectors disconnected.
3. Disconnect battery negative cable.
4. Install jumper cable between battery negative terminal and body ground.
5. Turn ignition switch ON.
6. Check the voltage between ECM harness connector and ground.



ECM			Voltage (Approx.)
Connector	+	-	
	Terminal		
F57	63	62	2.5 V

Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to [PG-140. "How to Handle Battery"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace battery negative cable assembly.

P1551, P1552 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P1551, P1552 BATTERY CURRENT SENSOR

DTC Description

INFOID:0000000014267653

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1551	BAT CURRENT SENSOR (Battery current sensor)	An excessively low voltage from the sensor is sent to ECM.
P1552	BAT CURRENT SENSOR (Battery current sensor)	An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (Battery current sensor circuit is open or shorted.)
- Battery current sensor
- Camshaft position sensor
- Camshaft (Intake)
- Starter motor
- Starting system circuit
- Dead (Weak) battery

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1551 or P1552 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292. "DTC Description"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V with ignition switch ON

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 10 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-309. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267654

1.CHECK DTC PRIORITY

If DTC P1551 or P1552 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

P1551, P1552 BATTERY CURRENT SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Perform diagnosis of applicable. Refer to [EC-292. "DTC Description"](#).
NO >> GO TO 2.

2.CHECK BATTERY CURRENT SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect battery current sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between battery current sensor harness connector and ground.

+		-	Voltage (Approx.)
Battery current sensor			
Connector	Terminal		
E161	1	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3.CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	1	F57	64	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

4.CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	3	F57	62	Existed

4. Also check harness for short to power.

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5.CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	4	F57	63	Existed

P1551, P1552 BATTERY CURRENT SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts

6.CHECK BATTERY CURRENT SENSOR

Check the battery current sensor. Refer to [EC-311, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

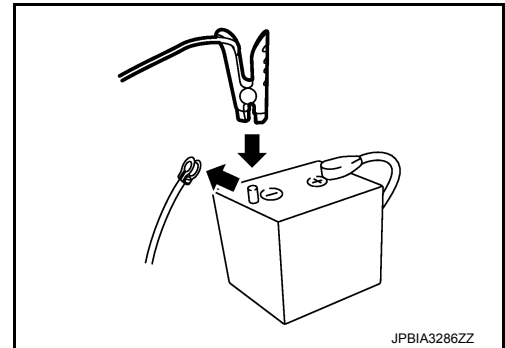
NO >> Replace battery negative cable assembly.

Component Inspection

INFOID:0000000014267655

1.CHECK BATTERY CURRENT SENSOR

1. Turn ignition switch OFF.
2. Reconnect harness connectors disconnected.
3. Disconnect battery negative cable.
4. Install jumper cable between battery negative terminal and body ground.
5. Turn ignition switch ON.
6. Check the voltage between ECM harness connector and ground.



ECM			Voltage (Approx.)
Connector	+	-	
	Terminal		
F57	63	62	2.5 V

Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to [PG-140, "How to Handle Battery"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

P1553 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P1553 BATTERY CURRENT SENSOR

DTC Description

INFOID:0000000014267656

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1553	BAT CURRENT SENSOR (Battery current sensor)	The signal voltage transmitted from the sensor to ECM is higher than the amount of the maximum power generation.

POSSIBLE CAUSE

- Harness or connectors (Battery current sensor circuit is open or shorted.)
- Battery current sensor
- Camshaft position sensor
- Camshaft (Intake)
- Starter motor
- Starting system circuit
- Dead (Weak) battery

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1553 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and wait at least 10 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-312, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267657

1.CHECK DTC PRIORITY

If DTC P1553 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).
NO >> GO TO 2.

P1553 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

2.CHECK BATTERY CURRENT SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect battery current sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between battery current sensor harness connector and ground.

+		-	Voltage (Approx.)
Battery current sensor			
Connector	Terminal		
E161	1	Ground	5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	1	F57	64	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

4.CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	3	F57	62	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	4	F57	63	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

P1553 BATTERY CURRENT SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts

6.CHECK BATTERY CURRENT SENSOR

Check the battery current sensor. Refer to [EC-314. "Component Inspection"](#).

Is the inspection result normal?

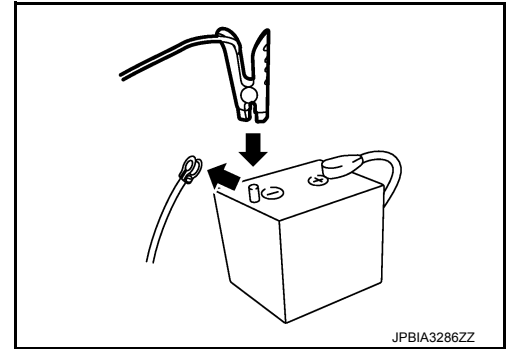
- YES >> INSPECTION END
NO >> Replace battery negative cable assembly.

Component Inspection

INFOID:0000000014267658

1.CHECK BATTERY CURRENT SENSOR

1. Turn ignition switch OFF.
2. Reconnect harness connectors disconnected.
3. Disconnect battery negative cable.
4. Install jumper cable between battery negative terminal and body ground.
5. Turn ignition switch ON.
6. Check the voltage between ECM harness connector and ground.



ECM			Voltage (Approx.)
Connector	+	-	
	Terminal		
F57	63	62	2.5 V

Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to [PG-140. "How to Handle Battery"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace battery negative cable assembly.

P1554 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P1554 BATTERY CURRENT SENSOR

DTC Description

INFOID:0000000014267659

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1554	BAT CURRENT SENSOR (Battery current sensor)	The output voltage of the battery current sensor is lower than the specified value while the battery voltage is high enough.

POSSIBLE CAUSE

- Harness or connectors (Battery current sensor circuit is open or shorted.)
- Battery current sensor
- Camshaft position sensor
- Camshaft (Intake)
- Starter motor
- Starting system circuit
- Dead (Weak) battery

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1554 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).
NO >> GO TO 2.

2.PRECONDITIONING

NOTE:

Use component function check to check the overall function of the battery current sensor circuit. During this check, a 1st trip DTC might not be confirmed.

TESTING CONDITION:

- **Before performing the following procedure, confirm that battery voltage is more than 12.8 V at idle.**
- **Before performing the following procedure, confirm that all load switches and A/C switch are turned OFF.**

>> GO TO 3.

3.PERFORM COMPONENT FUNCTION CHECK

With CONSULT

1. Start engine and let it idle.
2. Select "BAT CUR SEN" in "DATA MONITOR" mode of "ENGINE" using CONSULT.
3. Check "BAT CUR SEN" indication for 10 seconds.
"BAT CUR SEN" should be above 2,300 mV at least once.

Without CONSULT

1. Start engine and let it idle.
2. Check the voltage between ECM harness connector and ground.

ECM			Voltage
Connector	+	-	
	Terminal		
F57	63	62	Above 2.3 V at least once

Is the inspection result normal?

P1554 BATTERY CURRENT SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to [EC-316. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267660

1. CHECK DTC PRIORITY

If DTC P1554 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-292. "DTC Description"](#).

NO >> GO TO 2.

2. CHECK BATTERY CURRENT SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect battery current sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between battery current sensor harness connector and ground.

+		-	Voltage (Approx.)
Battery current sensor			
Connector	Terminal		
E161	1	Ground	5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3. CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	1	F57	64	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

4. CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	3	F57	62	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

P1554 BATTERY CURRENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

5.CHECK BATTERY CURRENT SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	4	F57	63	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts

6.CHECK BATTERY CURRENT SENSOR

Check the battery current sensor. Refer to [EC-317. "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

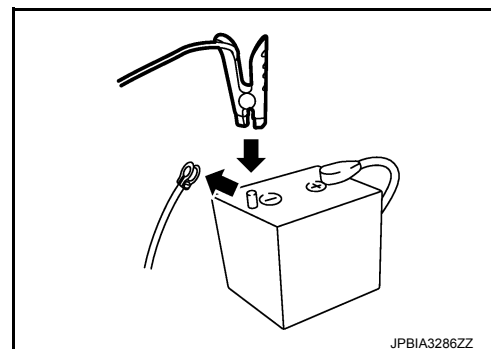
NO >> Replace battery negative cable assembly.

Component Inspection

INFOID:0000000014267661

1.CHECK BATTERY CURRENT SENSOR

1. Turn ignition switch OFF.
2. Reconnect harness connectors disconnected.
3. Disconnect battery negative cable.
4. Install jumper cable between battery negative terminal and body ground.
5. Turn ignition switch ON.
6. Check the voltage between ECM harness connector and ground.



ECM			Voltage (Approx.)
Connector	+	-	
	Terminal		
F57	63	62	2.5 V

Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to [PG-140. "How to Handle Battery"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

P1564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P1564 ASCD STEERING SWITCH

DTC Description

INFOID:0000000014267662

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1564	ASCD SW (ASCD switch)	- An excessively high voltage signal from the ASCD steering switch is sent to ECM. - ECM detects that input signal from the ASCD steering switch is out of the specified range. - ECM detects that the ASCD steering switch is stuck ON.

POSSIBLE CAUSE

- Harness or connectors (ASCD steering switch circuit is open or shorted.)
- ASCD steering switch
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1564 is displayed with DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B, first perform the trouble diagnosis for DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

- Turn ignition switch OFF and wait at least 10 seconds.
- Turn ignition switch ON.
- Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON.
- Wait at least 10 seconds.
- Press MAIN switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press ACCEL/RES switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press COAST/SET switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-318, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267663

1.CHECK DTC PRIORITY

If DTC P1564 is displayed with DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B, first perform the trouble diagnosis for DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B.

Is applicable DTC detected?

P1564 ASCD STEERING SWITCH

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Perform diagnosis of applicable. Refer to [EC-98. "DTC Index"](#).
NO >> GO TO 2.

2.CHECK ASCD STEERING SWITCH CIRCUIT

With CONSULT

1. Turn ignition switch ON.
2. Select "CANCEL SW", "RESUME/ACC SW" and "SET SW" in "DATA MONITOR" mode of "ENGINE" using CONSULT.
3. Check each item indication as per the following conditions.

Monitor item	Condition		Indication
MAIN SW	MAIN switch	Pressed	ON
		Released	OFF
CANCEL SW	CANCEL switch	Pressed	ON
		Released	OFF
RESUME/ACC SW	ACCEL/RES switch	Pressed	ON
		Released	OFF
SET SW	COAST/SET switch	Pressed	ON
		Released	OFF

Without CONSULT

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage (Approx.)
Connector	+	-		
	Terminal			
E55	110	111	MAIN switch: Pressed	0 V
			CANCEL switch: Pressed	1 V
			COAST/SET switch: Pressed	2 V
			ACCEL/RES switch: Pressed	3 V
			All ASCD steering switches: Released	4 V

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 3.

3.CHECK ASCD STEERING SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect combination switch (spiral cable) harness connector.
4. Check the continuity between combination switch (spiral cable) and ECM harness connector.

+		-		Continuity
Combination switch (Spiral cable)		ECM		
Connector	Terminal	Connector	Terminal	
M73	7	E55	111	Existed

5. Also check harness for short to ground and to power.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

P1564 ASCD STEERING SWITCH

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

4.CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT

1. Check the continuity between ECM harness connector and combination switch.

+		-		Continuity
Combination switch (Spiral cable)		ECM		
Connector	Terminal	Connector	Terminal	
M73	10	E55	110	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK ASCD STEERING SWITCH

Refer to [EC-320, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace steering switch. Refer to [ST-21, "WITH AIR BAG : Exploded View"](#).

Component Inspection

INFOID:0000000014267664

1.CHECK ASCD STEERING SWITCH

1. Disconnect combination switch (spiral cable) harness connector.
2. Check the resistance between combination switch harness connector terminals as per the following conditions.

Combination switch (Spiral cable)			Condition	Resistance (Approx.)
Connector	+	—		
	Terminals			
M149	15	18	MAIN switch: Pressed	0 Ω
			CANCEL switch: Pressed	250 Ω
			COAST/SET switch: Pressed	660 Ω
			ACCEL/RES switch: Pressed	1,480 Ω
			All ASCD steering switches: Released	4,000 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace steering switch. Refer to [ST-21, "WITH AIR BAG : Exploded View"](#).

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P1572 ASCD BRAKE SWITCH

DTC Description

INFOID:0000000014267665

DTC DETECTION LOGIC

NOTE:

This self-diagnosis has the one trip detection logic. When malfunction A is detected, DTC is not stored in ECM memory. And in that case, 1st trip DTC and 1st trip freeze frame data are displayed. 1st trip DTC is erased when ignition switch OFF. And even when malfunction A is detected in two consecutive trips, DTC is not stored in ECM memory.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P1572	ASCD BRAKE SW (ASCD brake switch)	A)	When the vehicle speed is above 30 km/h (19 MPH), ON signals from the stop lamp switch and the brake pedal position switch are sent to the ECM at the same time.
		B)	Brake pedal position switch signal is not sent to ECM for extremely long time while the vehicle is driving.

POSSIBLE CAUSE

- Harness or connectors
- Stop lamp switch circuit is shorted.
- Brake pedal position switch circuit is shorted.
- Clutch pedal position switch circuit is shorted.
- Stop lamp switch
- Brake pedal position switch
- Clutch pedal position switch
- Incorrect stop lamp switch installation
- Incorrect brake pedal position switch installation
- Incorrect clutch pedal position switch installation
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1572 is displayed with DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B, first perform the trouble diagnosis for DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

NOTE:

Procedure for malfunction B is not described here. It takes extremely long time to complete procedure for malfunction B. By performing procedure for malfunction A, the incident that causes malfunction B can be detected.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A

1. Start engine.
2. Press MAIN switch and make sure that CRUISE indicator is displayed in combination meter.

P1572 ASCD BRAKE SWITCH

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

3. Drive the vehicle for at least 5 consecutive seconds as per the following conditions.

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

**This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle.
If a road test is expected to be easier, it is unnecessary to lift the vehicle.**

Vehicle speed	More than 30 km/h (19 mph)
Selector lever	Suitable position

4. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-322, "Diagnosis Procedure"](#).

NO >> GO TO 4.

4.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION B

1. Drive the vehicle for at least 5 consecutive seconds as per the following conditions.

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

**This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle.
If a road test is expected to be easier, it is unnecessary to lift the vehicle.**

Vehicle speed	More than 30 km/h (19 mph)
Selector lever	Suitable position
Driving location	Depress the brake pedal for more than five seconds so as not to come off from the above-mentioned vehicle speed.

2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-322, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000014267666

1.CHECK DTC PRIORITY

If DTC P1572 is displayed with DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B, first perform the trouble diagnosis for DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK OVERALL FUNCTION-1

ⓅWith CONSULT

1. Turn ignition switch ON.
2. Select "BRAKE SW1" in "DATA MONITOR" mode of "ENGINE" using CONSULT.
3. Check "BRAKE SW1" indication as per the following conditions.

Monitor item	Condition		Indication
BRAKE SW1	Brake pedal	Slightly depressed	OFF
		Fully released	ON

ⓧWithout CONSULT

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals as per the following.

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

ECM			Condition		Voltage (Approx.)
Connector	+	−			
	Terminal				
E55	116	128	Brake pedal	Slightly depressed	0 V
				Fully released	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK OVERALL FUNCTION-2

 With CONSULT

Select "BRAKE SW2" and check indication as per the following conditions.

Monitor item	Condition		Indication
BRAKE SW2	Brake pedal	Slightly depressed	ON
		Fully released	OFF

 Without CONSULT

Check the voltage between ECM harness connector terminals as per the following conditions.

ECM			Condition		Voltage (Approx.)
Connector	+	−			
	Terminal				
E55	115	128	Brake pedal	Slightly depressed	Battery voltage
				Fully released	0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 10.

4.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY-1

1. Turn ignition switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Turn ignition switch ON.
4. Check the voltage between brake pedal position switch harness connector and ground.

+		-	Condition		Voltage
Brake pedal position switch					
Connector	Terminal				
E37	1	Ground	Clutch pedal	Slightly depressed	0 V
				Fully released	Battery voltage

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 5.

5.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY-2

1. Turn ignition switch OFF.
2. Disconnect clutch pedal position switch harness connector.
3. Turn ignition switch ON.
4. Check the voltage between clutch pedal position switch harness connector and ground.

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-	Voltage
Clutch pedal position switch			
Connector	Terminal		
E43	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 6.

NO >> Perform the trouble diagnosis for power supply circuit.

6.CHECK CIRCUIT BETWEEN BRAKE PEDAL POSITION SWITCH AND CLUTCH PEDAL POSITION SWITCH

1. Turn ignition switch OFF.
2. Check the continuity between brake pedal position switch harness connector and clutch pedal position switch harness connector.

+		-		Continuity
Brake pedal position switch		Clutch pedal position switch		
Connector	Terminal	Connector	Terminal	
E37	1	E43	2	Existed

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK CLUTCH PEDAL POSITION SWITCH

Check clutch pedal position switch. Refer to [EC-326, "Component Inspection \(Clutch Pedal Position Switch\)"](#)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace clutch pedal position switch. Refer to [CL-14, "Exploded View"](#).

8.CHECK BRAKE PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between brake pedal position switch harness connector and ECM harness connector.

+		-		Continuity
Brake pedal position switch		ECM		
Connector	Terminal	Connector	Terminal	
E37	2	E55	116	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9.CHECK BRAKE PEDAL POSITION SWITCH

Check brake pedal position switch. Refer to [EC-325, "Component Inspection \(Brake Pedal Position Switch\)"](#)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20, "Exploded View"](#).

10.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Disconnect stop lamp switch harness connector.
2. Check the voltage between stop lamp switch harness connector and ground.

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-	Voltage
Stop lamp switch			
Connector	Terminal		
E56	1	Ground	Battery voltage

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected part.

11.CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT-1

1. Disconnect ECM harness connector.
2. Check harness continuity between stop lamp switch harness connector and ECM harness connector.

+		-		Continuity
Stop lamp switch		ECM		
Connector	Terminal	Connector	Terminal	
E56	2	E55	115	Existed

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace error-detected part.

12.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to [EC-326, "Component Inspection \(Stop Lamp Switch\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to [BR-20, "Exploded View"](#).

Component Inspection (Brake Pedal Position Switch)

INFOID:0000000014267667

1.CHECK BRAKE PEDAL POSITION SWITCH-1

1. Turn ignition switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Check the continuity between brake pedal position switch terminals as per the following conditions.

Brake pedal position switch		Condition		Continuity
+	—			
Terminals				
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK BRAKE PEDAL POSITION SWITCH-2

1. Adjust brake pedal position switch installation. Refer to [BR-10, "Adjustment"](#).
2. Check the continuity between brake pedal position switch terminals as per the following conditions.

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Brake pedal position switch		Condition		Continuity
+	—			
Terminals				
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20, "Exploded View"](#).

Component Inspection (Stop Lamp Switch)

INFOID:0000000014267668

1.CHECK STOP LAMP SWITCH-1

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.
3. Check the continuity between stop lamp switch terminals as per the following conditions.

Stop lamp switch		Condition		Continuity
+	–			
Terminals				
1	2	Brake pedal	Fully released	Not existed
			Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH-2

1. Adjust stop lamp switch installation. Refer to [BR-10, "Adjustment"](#).
2. Check the continuity between stop lamp switch terminals as per the following conditions.

Stop lamp switch		Condition		Continuity
+	–			
Terminals				
1	2	Brake pedal	Fully released	Not existed
			Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to [BR-20, "Exploded View"](#).

Component Inspection (Clutch Pedal Position Switch)

INFOID:0000000014267669

1.CHECK CLUTCH PEDAL POSITION SWITCH-1

1. Turn ignition switch OFF.
2. Disconnect clutch pedal position switch harness connector.
3. Check the continuity between clutch pedal position switch terminals as per the following conditions.

Clutch pedal position switch		Condition		Continuity
+	–			
Terminals				
1	2	Clutch pedal	Fully released	Existed
			Slightly depressed	Not existed

P1572 ASCD BRAKE SWITCH

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK CLUTCH PEDAL POSITION SWITCH-2

1. Adjust clutch pedal position switch installation. Refer to [CL-9. "Inspection and Adjustment"](#).
2. Check the continuity between clutch pedal position switch terminals as per the following conditions.

Clutch pedal position switch		Condition	Continuity	
+	—			
Terminals				
1	2	Clutch pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace clutch pedal position switch. Refer to [CL-14. "Exploded View"](#).

P1574 ASCD VEHICLE SPEED SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P1574 ASCD VEHICLE SPEED SENSOR

DTC Description

INFOID:0000000014267671

The ECM receives two vehicle speed sensor signals via CAN communication line. One is sent from combination meter, and the other is from TCM (Transmission control module). The ECM uses these signals for ASCD control. Refer to [EC-56, "AUTOMATIC SPEED CONTROL DEVICE \(ASCD\) : System Description"](#) for ASCD functions.

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1574	ASCD VHL SPD SEN (ASCD vehicle speed sensor)	ECM detects a difference between two vehicle speed signals is out of the specified range.

POSSIBLE CAUSE

- Harness or connectors (CAN communication line is open or shorted.)
- ABS actuator and electric unit (control unit)
- Combination meter
- TCM
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

- If DTC P1574 is displayed with DTC U1001, first perform the trouble diagnosis for DTC U1001.
- If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500.
- If DTC P1574 is displayed with DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B, first perform the trouble diagnosis for DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine.
2. Drive the vehicle at more than 40 km/h (25 MPH).

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

3. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-329, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

P1574 ASCD VEHICLE SPEED SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Diagnosis Procedure

INFOID:0000000014267672

1.CHECK DTC PRIORITY

- If DTC P1574 is displayed with DTC U1001, first perform the trouble diagnosis for DTC U1001.
- If DTC P1574 is displayed with DTC P0500, first perform the trouble diagnosis for DTC P0500.
- If DTC P1574 is displayed with DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B, first perform the trouble diagnosis for DTC P0603, P0604, P0605, P0606, P0607, P060A, and P060B.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-98. "DTC Index"](#).
- NO >> GO TO 2.

2.CHECK DTC WITH "ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)"

Check DTC with ABS actuator and electric unit (control unit). Refer to [BRC-25. "CONSULT Function"](#).

Is DTC detected?

- YES >> Perform trouble shooting relevant to DTC indicated.
- NO >> GO TO 3.

3.CHECK DTC WITH COMBINATION METER

Check DTC with combination meter. Refer to [MWI-29. "CONSULT Function \(METER/M&A\)"](#).

Is DTC detected?

- YES >> Perform trouble shooting relevant to DTC indicated.
- NO >> GO TO 4.

4.CHECK DTC WITH TCM (FOR A/T MODELS)

Check DTC with TCM. Refer to [TM-165. "CONSULT Function"](#).

Is DTC detected?

- YES >> Perform trouble shooting relevant to DTC indicated.
- NO >> INSPECTION END

P1805 BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P1805 BRAKE SWITCH

DTC Description

INFOID:0000000014267673

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1805	BRAKE SW/CIRCUIT (Brake switch circuit)	A stop lamp switch signal is not sent to ECM for extremely long time while the vehicle is driving.

POSSIBLE CAUSE

- Harness or connectors
- Stop lamp switch circuit is open or shorted.
- Stop lamp switch

FAIL-SAFE

Engine operating condition in fail-safe mode			
Fail safe mode		Vehicle behavior	
Other		ECM controls the electric throttle control actuator by regulating the throttle opening to a small range. Therefore, acceleration will be poor.	
		Vehicle condition	Driving condition
		When engine is idling	Normal
		When accelerating	Poor acceleration

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Fully depress the brake pedal for at least 5 seconds.
3. Erase the DTC.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-330, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267674

1.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Disconnect stop lamp switch harness connector.
2. Check the voltage between stop lamp switch harness connector and ground.

+		-	Voltage
Stop lamp switch			
Connector	Terminal		
E56	1	Ground	Battery voltage

3. Also check harness for short to ground.

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace error-detected part.

2.CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT-1

1. Disconnect ECM harness connector.

P1805 BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

2. Check harness continuity between stop lamp switch harness connector and ECM harness connector.

+		-		Continuity
Stop lamp switch		ECM		
Connector	Terminal	Connector	Terminal	
E56	2	E55	115	Existed

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected part.

3.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to [EC-331, "Component Inspection \(Stop Lamp Switch\)".](#)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to [BR-20, "Exploded View".](#)

Component Inspection (Stop Lamp Switch)

INFOID:0000000014267675

1.CHECK STOP LAMP SWITCH-1

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.
3. Check the continuity between stop lamp switch terminals as per the following conditions.

Stop lamp switch		Condition		Continuity
+	–			
Terminals				
1	2	Brake pedal	Fully released	Not existed
			Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH-2

1. Adjust stop lamp switch installation. Refer to [BR-10, "Adjustment".](#)
2. Check the continuity between stop lamp switch terminals as per the following conditions.

Stop lamp switch		Condition		Continuity
+	–			
Terminals				
1	2	Brake pedal	Fully released	Not existed
			Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to [BR-20, "Exploded View".](#)

P2100, P2103 THROTTLE CONTROL MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P2100, P2103 THROTTLE CONTROL MOTOR RELAY

DTC Description

INFOID:0000000014267677

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2100	ETC MOT PWR-B1 (Throttle actuator "A" control motor circuit/ open)	ECM detects a voltage of power source for throttle control motor is excessively low.
P2103	ETC MOT PWR (Throttle actuator "A" control motor circuit high)	ECM detect the throttle control motor relay is stuck ON.

POSSIBLE CAUSE

DTC P2100

- Harness or connectors (Throttle control motor relay circuit is open)
- Throttle control motor relay

DTC P2103

- Harness or connectors (Throttle control motor relay circuit is shorted)
- Throttle control motor relay

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Other	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V.

With DTC is detected?

- P2100 >> GO TO 2.
- P2103 >> GO TO 3.

2. PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P2100

1. Turn ignition switch ON and wait at least 2 seconds.
2. Start engine and let it idle for 5 seconds.
3. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-333, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

3. PERFORM DTC CONFIRMATION PROCEDURE FOR DTC P2103

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

P2100, P2103 THROTTLE CONTROL MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

- YES >> Proceed to [EC-333, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267678

EC

1.CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY

1. Turn ignition switch OFF.
2. Check the voltage between ECM harness connector and ground.

+		-		Voltage
ECM				
Connector	Terminal	Connector	Terminal	
F73	2	E55	128	Battery voltage

Is the inspection result normal?

- YES >> GO TO 3.
NO >> GO TO 2.

2.CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between ECM harness connector and IPDM E/R harness connector.

+		-		Continuity
ECM		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F73	2	E119	11	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit.
NO >> Repair or replace error-detected parts.

3.CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL

Check the voltage between ECM harness connector and ground as per the following conditions.

ECM				Condition	Voltage (Approx.)
+		-			
Connector	Terminal	Connector	Terminal		
F73	21	E55	128	Ignition switch: OFF	0 V
				Ignition switch: ON	Battery voltage

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 4.

4.CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ECM harness connector and IPDM E/R harness connector.

P2100, P2103 THROTTLE CONTROL MOTOR RELAY

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
ECM		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F73	21	E119	16	Existed

5. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

P2101 ELECTRIC THROTTLE CONTROL FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P2101 ELECTRIC THROTTLE CONTROL FUNCTION

DTC Description

INFOID:0000000014267679

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P2101	ETC FNCTN/CIRC-B1 (Throttle actuator "A" control motor circuit range/performance)	Electric throttle control function does not operate properly.	• Harness or connectors (Throttle control motor circuit is open or shorted) • Electric throttle control actuator

POSSIBLE CAUSE

- Harness or connectors (Throttle control motor circuit is open or shorted)
- Electric throttle control actuator

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Other	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2101 is displayed with DTC P2100 or P2119, first perform the trouble diagnosis for DTC P2100 or P2119.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-98, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 11 V when engine is running.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 2 seconds.
2. Start engine and let it idle for 5 seconds.
3. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-335, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267680

1.CHECK DTC PRIORITY

P2101 ELECTRIC THROTTLE CONTROL FUNCTION

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

If DTC P2101 is displayed with DTC P2100 or P2119, first perform the trouble diagnosis for DTC P2100 or P2119.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-98. "DTC Index"](#).

NO >> GO TO 2.

2.CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL

Check the voltage between ECM harness connector terminals as per the following conditions.

ECM				Condition	Voltage (Approx.)
+		-			
Connector	Terminal	Connector	Terminal		
F73	2	E55	128	Ignition switch: OFF	0 V
				Ignition switch: ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 3.

3.CHECK THROTTLE CONTROL MOTOR RELAY INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ECM harness connector and IPDM E/R harness connector.

+		-		Continuity
ECM		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F73	2	E119	11	Existed

5. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK THROTTLE CONTROL MOTOR RELAY POWER SUPPLY CIRCUIT

1. Check the continuity between ECM harness connector and IPDM E/R harness connector.

+		-		Continuity
ECM		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F73	21	E119	16	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

5.CHECK THROTTLE CONTROL MOTOR OUTPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect electric throttle control actuator harness connector.
3. Disconnect ECM harness connector.
4. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

P2101 ELECTRIC THROTTLE CONTROL FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
Electric throttle control actuator		ECM		
Connector	Terminal	Connector	Terminal	
F50	5	F73	1	Existed
			3	Not existed
	6		1	Not existed
			3	Existed

5. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Remove the intake air duct. Refer to [EM-30. "Exploded View"](#).

2. Check if foreign matter is caught between the throttle valve and the housing.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Remove the foreign matter and clean the electric throttle control actuator inside, then perform Throttle Valve Closed Position Learning. Refer to [EC-136. "Description"](#).

7.CHECK THROTTLE CONTROL MOTOR

Check the throttle control motor. Refer to [EC-337. "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to [EM-36. "Removal and Installation"](#).

Component Inspection

INFOID:0000000014267681

1.CHECK THROTTLE CONTROL MOTOR

1. Turn ignition switch OFF.

2. Disconnect electric throttle control actuator harness connector.

3. Check the resistance between electric throttle control actuator terminals as per the following.

Electric throttle control actuator		Resistance (Approx.)
+	−	
Terminals		
5	6	1 - 15 Ω [at 25°C (77°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to [EM-36. "Removal and Installation"](#).

P2118 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P2118 THROTTLE CONTROL MOTOR

DTC Description

INFOID:0000000014267682

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2118	ETC MOT-B1 (Throttle actuator control motor current range/performance)	ECM detects short in both circuits between ECM and throttle control motor.

POSSIBLE CAUSE

- Harness or connectors (Throttle control motor circuit is shorted.)
- Electric throttle control actuator (Throttle control motor)

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Other	ECM stops the electric throttle control actuator control, throttle valve is maintained at a fixed opening (approx. 5 degrees) by the return spring.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 2 seconds.
2. Start engine and let it idle for 5 seconds.
3. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-338. "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267683

1.CHECK THROTTLE CONTROL MOTOR OUTPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect electric throttle control actuator harness connector.
3. Disconnect ECM harness connector.
4. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

P2118 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
Electric throttle control actuator		ECM		
Connector	Terminal	Connector	Terminal	
F50	5	F73	1	Existed
			3	Not existed
	6		1	Not existed
			3	Existed

5. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK THROTTLE CONTROL MOTOR

Check the throttle control motor. Refer to [EC-339. "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to [EM-36. "Removal and Installation"](#).

Component Inspection

INFOID:0000000014267684

1.CHECK THROTTLE CONTROL MOTOR

1. Turn ignition switch OFF.
2. Disconnect electric throttle control actuator harness connector.
3. Check the resistance between electric throttle control actuator terminals as per the following.

Electric throttle control actuator		Resistance (Approx.)
+	−	
Terminals		
5	6	1 - 15 Ω [at 25°C (77°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to [EM-36. "Removal and Installation"](#).

P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

DTC Description

INFOID:0000000014267685

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	
P2119	ETC ACTR-B1 (Throttle actuator control throttle body range/performance)	A)	Electric throttle control actuator does not function properly due to the return spring malfunction.
		B)	Throttle valve opening angle in fail-safe mode is not in specified range.
		C)	ECM detect the throttle valve is stuck open.

POSSIBLE CAUSE

Electric throttle control actuator

FAIL-SAFE

Engine operating condition in fail-safe mode		
Fail safe mode		Vehicle behavior
Traveling control mode	Engine output control	ECM reduces the engine output, according to the rise in engine speed. This reduces the vehicle speed to encourage the driver to repair malfunction.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION A AND B

1. Turn ignition switch ON and wait at least 1 second.
2. Set shift lever to 1st position and wait at least 3 seconds.
3. Set shift lever to neutral position.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Turn ignition switch ON and wait at least 1 second.
6. Set shift lever to 1st position and wait at least 3 seconds.
7. Set shift lever to neutral position.
8. Turn ignition switch OFF, wait at least 10 seconds and then turn ON.
9. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-341, "Diagnosis Procedure"](#).

NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION C

1. Turn ignition switch ON and wait at least 1 second.
2. Set shift lever to 1st position and wait at least 3 seconds.
3. Set shift lever to neutral position.
4. Start engine and let it idle for 3 seconds.
5. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-341, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

P2119 ELECTRIC THROTTLE CONTROL ACTUATOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267686

1. CHECK ELECTRIC THROTTLE CONTROL ACTUATOR VISUALLY

1. Remove the intake air duct. Refer to [EM-30, "Exploded View"](#).
2. Check if foreign matter is caught between the throttle valve and the housing.

Is the inspection result normal?

- YES >> Replace electric throttle control actuator. Refer to [EM-36, "Removal and Installation"](#).
- NO >> Remove the foreign matter and clean the electric throttle control actuator inside, then perform Throttle Valve Closed Position Learning. Refer to [EC-136, "Description"](#).

A

EC

C

D

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P

P2122, P2123 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P2122, P2123 APP SENSOR

DTC Description

INFOID:0000000014267687

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2122	APP SEN 1/CIRC (Throttle/pedal position sensor/switch "D" circuit low)	An excessively low voltage from the APP sensor 1 is sent to ECM.
P2123	APP SEN 1/CIRC (Throttle/pedal position sensor/switch "D" circuit high)	An excessively high voltage from the APP sensor 1 is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (APP sensor 1 circuit is open or shorted.)
- Accelerator pedal position sensor (APP sensor 1)

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Other	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2122 or P2123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-342, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267688

1.CHECK DTC PRIORITY

P2122, P2123 APP SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

If DTC P2122 or P2123 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292. "DTC Description"](#).
NO >> GO TO 2.

2.CHECK APP SENSOR 1 POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect accelerator pedal position (APP) sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between APP sensor harness connector and ground.

+		-	Voltage (Approx.)
APP sensor			
Connector	Terminal		
E5	2	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3.CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between APP sensor harness connector and ECM harness connector.

+		-		Continuity
APP sensor		ECM		
Connector	Terminal	Connector	Terminal	
E5	2	E55	122	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

4.CHECK APP SENSOR 1 GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between APP sensor harness connector and ECM harness connector.

+		-		Continuity
APP sensor		ECM		
Connector	Terminal	Connector	Terminal	
E5	4	E55	127	Existed

4. Also check harness for short to power.

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5.CHECK APP SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between APP sensor harness connector and ECM harness connector.

P2122, P2123 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
APP sensor		ECM		
Connector	Terminal	Connector	Terminal	
E5	3	E55	126	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK APP SENSOR

Check the APP sensor. Refer to [EC-347, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3, "Removal and Installation"](#).

Component Inspection

INFOID:0000000014267689

1.CHECK ACCELERATOR PEDAL POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Check the voltage between ECM harness connector terminals as per the following condition.

ECM				Condition		Voltage
Connector		+	—			
		Terminal				
Sensor 1	E55	126	127	Accelerator pedal	Fully released	0.5 - 1.0 V
					Fully depressed	4.2 - 4.8 V
Sensor 2		119	120		Fully released	0.25 - 0.5 V
					Fully depressed	2.0 - 2.5 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3, "Removal and Installation"](#).

P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P2127, P2128 APP SENSOR

DTC Description

INFOID:0000000014267690

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2127	APP SEN 2/CIRC (Throttle/pedal position sensor/switch "E" circuit low)	An excessively low voltage from the APP sensor 2 is sent to ECM.
P2128	APP SEN 2/CIRC (Throttle/pedal position sensor/switch "E" circuit high)	An excessively high voltage from the APP sensor 2 is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (APP sensor 2 circuit is open or shorted.)
- Accelerator pedal position sensor (APP sensor 2)
- Sensor power supply 2 circuit

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Other	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-345, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267691

1. CHECK APP SENSOR 2 POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect accelerator pedal position (APP) sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between APP sensor harness connector and ground.

P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-	Voltage (Approx.)
APP sensor			
Connector	Terminal		
E5	1	Ground	5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between APP sensor harness connector and ECM harness connector.

+		-		Continuity
APP sensor		ECM		
Connector	Terminal	Connector	Terminal	
E5	1	E55	118	Existed

4. Also check harness for short to ground and to power.

Is inspection result normal?

YES >> Check sensor power supply 2 circuit. Refer to [EC-380, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

3. CHECK APP SENSOR 2 GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between APP sensor harness connector and ECM harness connector.

+		-		Continuity
APP sensor		ECM		
Connector	Terminal	Connector	Terminal	
E5	5	E55	120	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4. CHECK APP SENSOR 2 INPUT SIGNAL CIRCUIT

1. Check the continuity between APP sensor harness connector and ECM harness connector.

+		-		Continuity
APP sensor		ECM		
Connector	Terminal	Connector	Terminal	
E5	6	E55	119	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts

5. CHECK APP SENSOR

Check the APP sensor. Refer to [EC-347, "Component Inspection"](#).

Is the inspection result normal?

P2127, P2128 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3, "Removal and Installation"](#).

A

Component Inspection

INFOID:0000000014267692

1. CHECK ACCELERATOR PEDAL POSITION SENSOR

EC

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Check the voltage between ECM harness connector terminals as per the following condition.

ECM				Condition		Voltage
Connector		+	−			
		Terminal				
Sensor 1	E55	126	127	Accelerator pedal	Fully released	0.5 - 1.0 V
					Fully depressed	4.2 - 4.8 V
Sensor 2		119	120		Fully released	0.25 - 0.5 V
					Fully depressed	2.0 - 2.5 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3, "Removal and Installation"](#).

C

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P2135 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P2135 TP SENSOR

DTC Description

INFOID:0000000014267693

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2135	TP SENSOR-B1 (Throttle/pedal position sensor/switch "A" / "B" voltage correlation)	Rationally incorrect voltage is sent to ECM compared with the signals from TP sensor 1 and TP sensor 2.

POSSIBLE CAUSE

- Harness or connectors (TP sensor 1 or 2 circuit is open or shorted.)
- Electric throttle control actuator (TP sensor 1 or 2)

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Other	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2135 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-348, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267694

1.CHECK DTC PRIORITY

If DTC P2135 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#).

P2135 TP SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

NO >> GO TO 2.

2.CHECK THROTTLE POSITION SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect electric throttle control actuator harness connector.
3. Turn ignition switch ON.
4. Check the voltage between electric throttle control actuator harness connector and ground.

+		-	Voltage (Approx.)
Electric throttle control actuator			
Connector	Terminal		
F50	2	Ground	5 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between electric throttle control actuator harness connector and ground.

+		-		Continuity
Electric throttle control actuator		ECM		
Connector	Terminal	Connector	Terminal	
F50	2	F57	80	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

4.CHECK THROTTLE POSITION SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

+		-		Continuity
Electric throttle control actuator		ECM		
Connector	Terminal	Connector	Terminal	
F50	4	F57	78	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK THROTTLE POSITION SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between electric throttle control actuator harness connector and ECM harness connector.

P2135 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
Electric throttle control actuator		ECM		
Connector	Terminal	Connector	Terminal	
F50	1	F57	79	Existed
	3		77	

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

6.CHECK THROTTLE POSITION SENSOR

Check the throttle position sensor. Refer to [EC-350, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to [EM-36, "Removal and Installation"](#).

Component Inspection

INFOID:0000000014267695

1.CHECK THROTTLE POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Perform "Throttle Valve Closed Position Learning". Refer to [EC-136, "Description"](#).
4. Turn ignition switch ON.
5. Set shift lever to 1st position.
6. Check the voltage between ECM harness connector terminals as per the following conditions.

ECM				Condition		Voltage	
Connector		+	—				
		Terminal					
Sensor 1	F57	79	78	Accelerator pedal	Fully released	More than 0.36 V	
					Fully depressed	Less than 4.75 V	
Sensor 2		77				Fully released	Less than 4.75 V
						Fully depressed	More than 0.36 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric throttle control actuator. Refer to [EM-36, "Removal and Installation"](#).

P2138 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

P2138 APP SENSOR

DTC Description

INFOID:0000000014267696

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2138	APP SENSOR (Throttle/pedal position sensor/switch "D" / "E" voltage correlation)	Rationally incorrect voltage is sent to ECM compared with the signals from APP sensor 1 and APP sensor 2.

POSSIBLE CAUSE

- Harness or connectors (APP sensor 1 or 2 circuit is open or shorted.)
- Accelerator pedal position sensor (APP sensor 1 or 2)
- Sensor power supply 2 circuit

FAIL-SAFE

Engine operating condition in fail-safe mode	
Fail safe mode	Vehicle behavior
Other	The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of the throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2138 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-292, "DTC Description"](#)
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 8 V at idle.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-351, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267697

1.CHECK DTC PRIORITY

If DTC P2138 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643.

Is applicable DTC detected?

P2138 APP SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Perform diagnosis of applicable. Refer to [EC-292. "DTC Description"](#)
NO >> GO TO 2.

2. CHECK APP SENSOR 1 POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect accelerator pedal position (APP) sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between APP sensor harness connector and ground.

+		-	Voltage (Approx.)
APP sensor			
Connector	Terminal		
E5	2	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3. CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between APP sensor harness connector and ECM harness connector.

+		-		Continuity
APP sensor		ECM		
Connector	Terminal	Connector	Terminal	
E5	2	E55	122	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

4. CHECK APP SENSOR 2 POWER SUPPLY

Check the voltage between APP sensor harness connector and ground.

+		-	Voltage (Approx.)
APP sensor			
Connector	Terminal		
E5	1	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 6.
NO >> GO TO 5.

5. CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between APP sensor harness connector and ECM harness connector.

+		-		Continuity
APP sensor		ECM		
Connector	Terminal	Connector	Terminal	
E5	1	E55	118	Existed

4. Also check harness for short to ground and to power.

P2138 APP SENSOR

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

Is inspection result normal?

YES >> Check sensor power supply 2 circuit. Refer to [EC-380, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

6.CHECK APP SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between APP sensor harness connector and ECM harness connector.

+		-		Continuity
APP sensor		ECM		
Connector	Terminal	Connector	Terminal	
E5	4	E55	127	Existed
	5		120	

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK APP SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between APP sensor harness connector and ECM harness connector.

+		-		Continuity
APP sensor		ECM		
Connector	Terminal	Connector	Terminal	
E5	3	E55	126	Existed
	6		119	

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts

8.CHECK APP SENSOR

Check the APP sensor. Refer to [EC-353, "Component Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3, "Removal and Installation"](#).

Component Inspection

INFOID:0000000014267698

1.CHECK ACCELERATOR PEDAL POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Check the voltage between ECM harness connector terminals as per the following condition.

P2138 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

ECM				Condition		Voltage
Connector		+	–			
		Terminal				
Sensor 1	E55	126	127	Accelerator pedal	Fully released	0.5 - 1.0 V
					Fully depressed	4.2 - 4.8 V
Sensor 2		119	120		Fully released	0.25 - 0.5 V
					Fully depressed	2.0 - 2.5 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3. "Removal and Installation"](#).

BRAKE PEDAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

BRAKE PEDAL POSITION SWITCH

Component Function Check

INFOID:0000000014267699

1.CHECK BRAKE PEDAL POSITION SWITCH FUNCTION

With CONSULT

1. Turn ignition switch ON.
2. Select "BRAKE SW1" in "DATA MONITOR" mode of "ENGINE" with CONSULT.
3. Check "BRAKE SW1" indication as per the following conditions.

Monitor item	Condition	Indication
BRAKE SW1	• Brake pedal: Slightly depressed • Clutch pedal: Fully released	OFF
	Brake pedal and clutch pedal: Fully released	ON

Without CONSULT

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	-		
	Terminal			
E55	116	128	• Brake pedal: Slightly depressed • Clutch pedal: Fully released	Approx. 0 V
			Brake pedal and clutch pedal: Fully released	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to [EC-355, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267700

1.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY-1

1. Turn ignition switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Turn ignition switch ON.
4. Check the voltage between brake pedal position switch harness connector and ground.

+		–	Condition		Voltage
Brake pedal position switch					
Connector	Terminal				
E37	1	Ground	Clutch pedal	Slightly depressed	0 V
				Fully released	Battery voltage

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 2.

2.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY-2

1. Turn ignition switch OFF.
2. Disconnect clutch pedal position switch harness connector.
3. Turn ignition switch ON.
4. Check the voltage between clutch pedal position switch harness connector and ground.

BRAKE PEDAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		–	Voltage
Clutch pedal position switch			
Connector	Terminal		
E43	1	Ground	Battery voltage

5. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform the trouble diagnosis for power supply circuit.

3.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY CIRCUIT-1

1. Turn ignition switch OFF.
2. Check the continuity between clutch pedal position switch harness connector and brake pedal position switch harness connector.

+		-		Continuity
Clutch pedal position switch		Brake pedal position switch		
Connector	Terminal	Connector	Terminal	
E43	2	E37	1	Existed

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK CLUTCH PEDAL POSITION SWITCH

Check clutch pedal position switch. Refer to [EC-357, "Component Inspection \(Clutch Pedal Position Switch\)"](#)

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace clutch pedal position switch. Refer to [CL-14, "Exploded View"](#).

5.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY CIRCUIT-2

1. Disconnect fuse block (J/B) harness connector.
2. Check the continuity between fuse block (J/B) harness connector and clutch pedal position switch harness connector.

+		-		Continuity
Fuse block (J/B)		Clutch pedal position switch		
Connector	Terminal	Connector	Terminal	
M68	2R	E43	1	Existed

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

6.CHECK BRAKE PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between brake pedal position switch harness connector and ECM harness connector.

BRAKE PEDAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
Brake pedal position switch		ECM		
Connector	Terminal	Connector	Terminal	
E37	2	E55	116	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK BRAKE PEDAL POSITION SWITCH

Check brake pedal position switch. Refer to [EC-357, "Component Inspection \(Brake Pedal Position Switch\)"](#)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20, "Exploded View"](#).

Component Inspection (Brake Pedal Position Switch)

INFOID:0000000014267701

1.CHECK BRAKE PEDAL POSITION SWITCH-1

1. Turn ignition switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Check the continuity between brake pedal position switch terminals as per the following conditions.

Brake pedal position switch		Condition		Continuity
+	–			
Terminals				
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK BRAKE PEDAL POSITION SWITCH-2

1. Adjust brake pedal position switch installation. Refer to [BR-10, "Inspection"](#).
2. Check the continuity between brake pedal position switch terminals as per the following conditions.

Brake pedal position switch		Condition		Continuity
+	—			
Terminals				
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20, "Exploded View"](#).

Component Inspection (Clutch Pedal Position Switch)

INFOID:0000000014267702

1.CHECK CLUTCH PEDAL POSITION SWITCH-1

1. Turn ignition switch OFF.
2. Disconnect clutch pedal position switch harness connector.
3. Check the continuity between clutch pedal position switch terminals as per the following conditions.

BRAKE PEDAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Clutch pedal position switch		Condition		Continuity
+	–			
Terminals				
1	2	Clutch pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK CLUTCH PEDAL POSITION SWITCH-2

1. Adjust clutch pedal position switch installation. Refer to [CL-9. "Inspection and Adjustment"](#).
2. Check the continuity between clutch pedal position switch terminals as per the following conditions.

Clutch pedal position switch		Condition	Continuity	
+	–			
Terminals				
1	2	Clutch pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace clutch pedal position switch. Refer to [CL-14. "Exploded View"](#).

CLUTCH PEDAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

CLUTCH PEDAL POSITION SWITCH

Component Function Check

INFOID:0000000014267703

1.CHECK CLUTCH PEDAL POSITION SWITCH FUNCTION

With CONSULT

1. Turn ignition switch ON.
2. Select "BRAKE SW1" in "DATA MONITOR" mode of "ENGINE" with CONSULT.
3. Check "BRAKE SW1" indication as per the following conditions.

Monitor item	Condition	Indication
BRAKE SW1	• Clutch pedal: Slightly depressed • Brake pedal: Fully released	OFF
	Brake pedal and clutch pedal: Fully released	ON

Without CONSULT

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	-		
	Terminal			
E55	116	128	• Clutch pedal: Slightly depressed • Brake pedal: Fully released	Approx. 0 V
			Brake pedal and clutch pedal: Fully released	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to [EC-359. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267704

1.CHECK CLUTCH PEDAL POSITION SWITCH POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect clutch pedal position switch harness connector.
3. Turn ignition switch ON.
4. Check the voltage between clutch pedal position switch harness connector and ground.

+		-	Voltage
Clutch pedal position switch			
Connector	Terminal		
E43	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK CLUTCH PEDAL POSITION SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect fuse block (J/B) harness connector.
3. Check the continuity between fuse block (J/B) harness connector and clutch pedal position switch harness connector.

CLUTCH PEDAL POSITION SWITCH

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

+		-		Continuity
Fuse block (J/B)		Clutch pedal position switch		
Connector	Terminal	Connector	Terminal	
M68	2R	E43	1	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3.CHECK CLUTCH PEDAL POSITION SWITCH SIGNAL CIRCUIT-1

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between clutch pedal position switch harness connector and ECM harness connector.

+		−		Condition	Continuity
Clutch pedal position switch		ECM			
Connector	Terminal	Connector	Terminal		
E43	2	E55	116	Brake pedal: Fully released	Existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 5

4.CHECK CLUTCH PEDAL POSITION SWITCH

Check clutch pedal position switch. Refer to [EC-361. "Component Inspection \(Clutch Pedal Position Switch\)"](#)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace clutch pedal position switch. Refer to [CL-14. "Exploded View"](#).

5.CHECK CLUTCH PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT-2

1. Disconnect brake pedal position switch harness connector.
2. Check the continuity between clutch pedal position switch harness connector and brake pedal position switch harness connector.

+		-		Continuity
Clutch pedal position switch		Brake pedal position switch		
Connector	Terminal	Connector	Terminal	
E43	2	E37	1	Existed

3. Also check harness for short to ground to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK CLUTCH PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT-3

1. Check the continuity between brake pedal position switch harness connector and ECM harness connector.

+		-		Continuity
Brake pedal position switch		ECM		
Connector	Terminal	Connector	Terminal	
E37	2	E55	116	Existed

CLUTCH PEDAL POSITION SWITCH

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK BRAKE PEDAL POSITION SWITCH

Check brake pedal position switch. Refer to [EC-361, "Component Inspection \(Brake Pedal Position Switch\)"](#)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20, "Exploded View"](#).

Component Inspection (Brake Pedal Position Switch)

INFOID:0000000014267705

1.CHECK BRAKE PEDAL POSITION SWITCH-1

1. Turn ignition switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Check the continuity between brake pedal position switch terminals as per the following conditions.

Brake pedal position switch		Condition		Continuity
+	-			
Terminals				
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK BRAKE PEDAL POSITION SWITCH-2

1. Adjust brake pedal position switch installation. Refer to [BR-10, "Inspection"](#).
2. Check the continuity between brake pedal position switch terminals as per the following conditions.

Brake pedal position switch		Condition		Continuity
+	-			
Terminals				
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20, "Exploded View"](#).

Component Inspection (Clutch Pedal Position Switch)

INFOID:0000000014267706

1.CHECK CLUTCH PEDAL POSITION SWITCH-1

1. Turn ignition switch OFF.
2. Disconnect clutch pedal position switch harness connector.
3. Check the continuity between clutch pedal position switch terminals as per the following conditions.

Clutch pedal position switch		Condition		Continuity
+	-			
Terminals				
1	2	Clutch pedal	Fully released	Existed
			Slightly depressed	Not existed

CLUTCH PEDAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2. CHECK CLUTCH PEDAL POSITION SWITCH-2

1. Adjust clutch pedal position switch installation. Refer to [CL-9, "Inspection and Adjustment"](#).
2. Check the continuity between clutch pedal position switch terminals as per the following conditions.

Clutch pedal position switch		Condition		Continuity
+	—			
Terminals				
1	2	Clutch pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace clutch pedal position switch. Refer to [CL-14, "Exploded View"](#).

ELECTRICAL LOAD SIGNAL

Description

INFOID:0000000014267707

The electrical load signal (Headlamp switch signal, rear window defogger switch signal, etc.) is transferred via the CAN communication.

Component Function Check

INFOID:0000000014267708

1. CHECK REAR WINDOW DEFOGGER SWITCH FUNCTION

1. Turn ignition switch ON.
2. Connect CONSULT and select "DATA MONITOR" mode.
3. Select "LOAD SIGNAL" and check indication under the following conditions.

Monitor item	Condition		Indication
LOAD SIGNAL	Rear window defogger switch	ON	ON
		OFF	OFF

Is the inspection result normal?

YES >> GO TO 2.

NO >> Proceed to [EC-363, "Diagnosis Procedure"](#).

2. CHECK LIGHTING SWITCH FUNCTION

Check "LOAD SIGNAL" indication under the following conditions.

Monitor item	Condition		Indication
LOAD SIGNAL	Lighting switch	ON at 2nd position	ON
		OFF	OFF

Is the inspection result normal?

YES >> GO TO 3.

NO >> Proceed to [EC-363, "Diagnosis Procedure"](#).

3. CHECK HEATER FAN CONTROL SWITCH FUNCTION

Select "HEATER FAN SW" and check indication under the following conditions.

Monitor item	Condition		Indication
HEATER FAN SW	Heater fan control switch	ON	ON
		OFF	OFF

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to [EC-363, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267709

1. INSPECTION START

Confirm the malfunctioning circuit (rear window defogger, headlamp or heater fan). Refer to [EC-363, "Component Function Check"](#).

Which circuit is related to the incident?

Rear window defogger>>GO TO 2.

Headlamp>>GO TO 3.

Heater fan>>GO TO 4.

2. CHECK REAR WINDOW DEFOGGER SYSTEM

Check rear window defogger system. Refer to [DEF-32, "Work Flow"](#).

>> INSPECTION END

3.CHECK HEADLAMP SYSTEM

Check headlamp system. Refer to [EXL-85, "Work Flow"](#) (LED HEAD LAMP), [EXL-251, "Work Flow"](#) (HALO-GEN HEAD LAMP).

>> INSPECTION END

4.CHECK HEATER FAN CONTROL SYSTEM

Check heater fan control system. Refer to [HAC-164, "Work Flow"](#) [MANUAL A/C (TYPE 1)], [HAC-249, "Work Flow"](#) [MANUAL A/C (TYPE 2)].

>> INSPECTION END

FUEL INJECTOR

Component Function Check

INFOID:0000000014267710

1.INSPECTION START

Turn ignition switch to START.

Are any cylinders ignited?

YES >> GO TO 2.

NO >> Proceed to [EC-365, "Diagnosis Procedure"](#).

2.CHECK FUEL INJECTOR FUNCTION

With CONSULT

1. Start engine.
2. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT.
3. Check that each circuit produces a momentary engine speed drop.

Without CONSULT

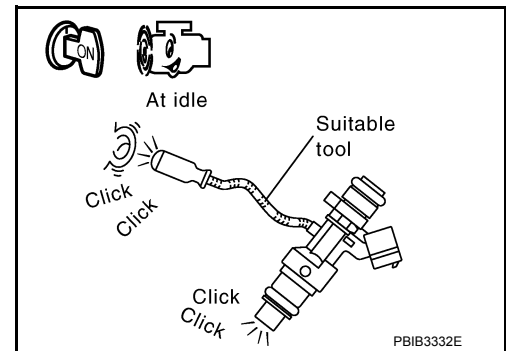
1. Start engine.
2. Listen to each fuel injector operating sound.

Clicking sound should be heard.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to [EC-365, "Diagnosis Procedure"](#).



Diagnosis Procedure

INFOID:0000000014267711

1.CHECK FUEL INJECTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect fuel injector harness connector.
3. Turn ignition switch ON.
4. Check the voltage between fuel injector harness connector and ground.

+			-	Voltage
Fuel injector				
Cylinder	Connector	Terminal	Ground	Battery voltage
1	F84	1		
2	F85	1		
3	F86	1		
4	F87	1		

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK FUEL INJECTOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between fuel injector harness connector and IPDM E/R harness connector.

FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+			-		Continuity
Fuel injector			IPDM E/R		
Cylinder	Connector	Terminal	Connector	Terminal	
1	F84	1	E119	18	Existed
2	F85	1			
3	F86	1			
4	F87	1			

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3.CHECK FUEL INJECTOR OUTPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between fuel injector harness connector and ECM harness connector.

+			-		Continuity
Fuel injector			ECM		
Cylinder	Connector	Terminal	Connector	Terminal	
1	F84	2	F73	13	Existed
2	F85	2		14	
3	F86	2		10	
4	F87	2		9	

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4.CHECK FUEL INJECTOR

Check fuel injector. Refer to [EC-366. "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning fuel injector. Refer to [EM-42. "Removal and Installation"](#).

5.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-40. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

Component Inspection

INFOID:0000000014267712

1.CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Disconnect fuel injector harness connector.
3. Check resistance between fuel injector terminals as per the following.

Fuel injector		Resistance
+	-	
Terminal		
1	2	
1	2	11.1 - 14.5 Ω [at 10 - 60°C (50 - 140°F)]

FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Is the inspection result normal?

- YES >> INSPECTION END
- NO >> Replace malfunctioning fuel injector. Refer to [EM-42. "Removal and Installation"](#).

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FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

FUEL PUMP

Description

INFOID:0000000014267713

Sensor	Input signal to ECM	ECM Function	Actuator
Crankshaft position sensor (POS) Camshaft position sensor (PHASE)	Engine speed*	Fuel pump control	Fuel pump relay ↓
Battery	Battery voltage*		Fuel pump

*: ECM determines the start signal status by the signals of engine speed and battery voltage.

The ECM activates the fuel pump for several seconds after the ignition switch is turned ON to improve engine start ability. If the ECM receives a engine speed signal from the camshaft position sensor (PHASE), it knows that the engine is rotating, and causes the pump to operate. If the engine speed signal is not received when the ignition switch is ON, the engine stalls. The ECM stops pump operation and prevents battery discharging, thereby improving safety. The ECM does not directly drive the fuel pump. It controls the ON/OFF fuel pump relay, which in turn controls the fuel pump.

Condition	Fuel pump operation
Ignition switch is turned to ON.	Operates for 1 second.
Engine running and cranking	Operates.
When engine is stopped	Stops in 1.5 seconds.
Except as shown above	Stops.

Component Function Check

INFOID:0000000014267714

1.CHECK FUEL PUMP FUNCTION

1. Turn ignition switch ON.
2. Pinch fuel feed hose with two fingers.

Fuel pressure pulsation should be felt on the fuel feed hose for 1 second after ignition switch is turned ON.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Proceed to [EC-368, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267715

1.CHECK FUEL PUMP RELAY CONTROL SIGNAL

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector.

ECM				Voltage
+		−		
Connector	Terminal	Connector	Terminal	
F73	18	E55	128	Battery voltage should exist 1 second after ignition switch is turn ON.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> GO TO 2.

2.CHECK FUEL PUMP RELAY CONTROL SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect IPDM E/R harness connector.

FUEL PUMP

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

4. Check the continuity between ECM harness connector and IPDM E/R harness connector.

+		-		Continuity
ECM		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F73	18	E122	45	Existed

5. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

3.CHECK FUEL PUMP POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect fuel pump harness connector.
3. Turn ignition switch ON.
4. Check the voltage between “fuel level sensor unit and fuel pump” harness connector and ground.

+		-	Voltage
Fuel level sensor unit and fuel pump			
Connector	Terminal		
C5	1	Ground	Battery voltage should exist 1 second after ignition switch is turn ON.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK FUEL PUMP POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between IPDM E/R harness connector and “fuel level sensor unit and fuel pump” harness connector.

+		-		Continuity
IPDM E/R		Fuel level sensor unit and fuel pump		
Connector	Terminal	Connector	Terminal	
E119	10	C5	1	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

5.CHECK FUEL PUMP GROUND CIRCUIT

1. Check the continuity between “fuel level sensor unit and fuel pump” harness connector and ground.

+		-	Continuity
Fuel level sensor unit and fuel pump			
Connector	Terminal		
C5	3	Ground	Existed

2. Also heck harness for short to power.

Is the inspection result normal?

FUEL PUMP

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

6.CHECK FUEL PUMP

Refer to [EC-370, "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Replace "fuel level sensor, fuel filter and fuel pump assembly". Refer to [FL-7, "Removal and Installation"](#).

7.CHECK INTERMITTENT INCIDENT

Perform [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace IPDM E/R. Refer to [PCS-40, "Removal and Installation"](#).
NO >> Repair or replace harness or connectors.

Component Inspection

INFOID:0000000014267716

1.CHECK FUEL PUMP

1. Turn ignition switch OFF.
2. Disconnect fuel pump harness connector.
3. Check resistance between "fuel level sensor unit and fuel pump" connector terminals as follows.

Fuel level sensor unit and fuel pump		Resistance
+	−	
Terminal		
1	3	0.2 - 5.0Ω [at 25°C (77°F)]

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace "fuel level sensor, fuel filter and fuel pump assembly". Refer to [FL-7, "Removal and Installation"](#).

IGNITION SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

IGNITION SIGNAL

Component Function Check

INFOID:000000014267717

1.INSPECTION START

Turn ignition switch OFF, and restart engine.

Does the engine start?

YES-1 >> With CONSULT: GO TO 2.

YES-2 >> Without CONSULT: GO TO 3.

NO >> Proceed to [EC-371, "Diagnosis Procedure"](#).

2.CHECK IGNITION SIGNAL FUNCTION

 With CONSULT

1. Perform "POWER BALANCE" in "ACTIVE TEST" mode with CONSULT.

2. Check that each circuit produces a momentary engine speed drop.

Is the inspection result normal?

YES >> INSPECTION END

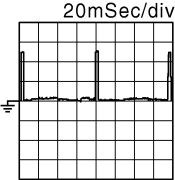
NO >> Proceed to [EC-371, "Diagnosis Procedure"](#).

3.CHECK IGNITION SIGNAL FUNCTION

 Without CONSULT

1. Let engine idle.

2. Read the voltage signal between ECM harness connector terminals with an oscilloscope.

ECM				Voltage signal
+		-		
Connector	Terminal	Connector	Terminal	
F57	86	E55	128	
	87			
	90			
	91			

NOTE:

The pulse cycle changes depending on rpm at idle.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to [EC-371, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000014267718

1.CHECK ECM POWER SUPPLY

1. Turn ignition switch OFF, wait at least 10 seconds and then turn it ON.

2. Check the voltage between ECM harness connector terminals.

ECM			Voltage
Connector	+	−	
	Terminal		
E55	121	128	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Refer to [EC-150, "Diagnosis Procedure"](#).

IGNITION SIGNAL

[QR25DE]

< DTC/CIRCUIT DIAGNOSIS >

2.CHECK CONDENSER POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect condenser harness connector.
3. Turn ignition switch ON.
4. Check the voltage between joint connector-F01 harness connector and ground.

+		-	Voltage
Joint connector-F01			
Connector	Terminal		
F60	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK CONDENSER POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between IPDM E/R harness connector and joint connector-F01 harness connector.

+		-		Continuity
IPDM E/R		Joint connector-F01		
Connector	Terminal	Connector	Terminal	
E119	17	F60	1	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> Refer to [EC-150, "Diagnosis Procedure"](#).

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4.CHECK CONDENSER GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check the continuity between joint connector-F01 harness connector and ground.

+		-	Continuity
Joint connector-F01			
Connector	Terminal		
F60	6	Ground	Existed

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to power in harness or connectors.

5.CHECK CONDENSER

Check condenser. Refer to [EC-375, "Component Inspection \(Condenser\)"](#)

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace condenser.

6.CHECK IGNITION COIL POWER SUPPLY

1. Reconnect all harness connectors disconnected.
2. Disconnect ignition coil harness connector.
3. Turn ignition switch ON.
4. Check the voltage between ignition coil harness connector and ground.

IGNITION SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+			-	Voltage
Ignition coil				
Cylinder	Connector	Terminal	Ground	Battery voltage
1	F34	3		
2	F29	3		
3	F36	3		
4	F37	3		

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace harness or connectors.

7.CHECK IGNITION COIL GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check the continuity between ignition coil harness connector and ground.

+			-	Continuity
Ignition coil				
Cylinder	Connector	Terminal	Ground	Existed
1	F34	2		
2	F29	2		
3	F36	2		
4	F37	2		

3. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair open circuit or short to power in harness or connectors.

8.CHECK IGNITION COIL OUTPUT SIGNAL CIRCUIT

1. Disconnect ECM harness connector.
2. Check the continuity between ignition coil harness connector and ECM harness connector.

+			-		Continuity
Ignition coil			ECM		
Cylinder	Connector	Terminal	Connector	Terminal	Existed
1	F34	1	F57	86	
2	F29	1		87	
3	F36	1		90	
4	F37	1		91	

3. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

9.CHECK IGNITION COIL WITH POWER TRANSISTOR

Check ignition coil with power transistor. Refer to [EC-374, "Component Inspection \(Ignition Coil with Power Transistor\)"](#).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

NO >> Replace malfunctioning ignition coil with power transistor. Refer to [EM-27, "Removal and Installation"](#).

IGNITION SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

Component Inspection (Ignition Coil with Power Transistor)

INFOID:000000014267719

1.CHECK IGNITION COIL WITH POWER TRANSISTOR-1

1. Turn ignition switch OFF.
2. Disconnect ignition coil harness connector.
3. Check resistance between ignition coil terminals as per the following.

Ignition coil		Resistance Ω [at 25°C (77°F)]
+	-	
Terminal No. (Polarity)		
1	2	Except 0 or ∞
	3	Except 0
2	3	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning ignition coil with power transistor. Refer to [EM-27, "Removal and Installation"](#).

2.CHECK IGNITION COIL WITH POWER TRANSISTOR-2

CAUTION:

Perform the following procedure in a place with no combustible objects and good ventilation.

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Remove fuel pump fuse in IPDM E/R to release fuel pressure.

NOTE:

Do not use CONSULT to release fuel pressure, or fuel pressure applies again during the following procedure.

4. Start engine.
5. After engine stalls, crank it 2 or 3 times to release all fuel pressure.
6. Turn ignition switch OFF.
7. Remove all ignition coil harness connectors to avoid the electrical discharge from the ignition coils.
8. Remove ignition coil and spark plug of the cylinder to be checked.
9. Crank engine for 5 seconds or more to remove combustion gas in the cylinder.
10. Connect spark plug and harness connector to ignition coil.
11. Fix ignition coil using a rope etc. with gap of 13 - 17 mm (0.52 - 0.66 in) between the edge of the spark plug and grounded metal portion as shown in the figure.
12. Crank engine for approximately 3 seconds, and check whether spark is generated between the spark plug and the grounded metal portion.

Spark should be generated.

CAUTION:

- During the operation, always stay 0.5 m (19.7 in) or more away from the spark plug and the ignition coil. Be careful not to get an electrical shock while checking, because the electrical discharge voltage becomes 20 kV or more.
- It might cause to damage the ignition coil if the gap of more than 17 mm (0.66 in) is taken.

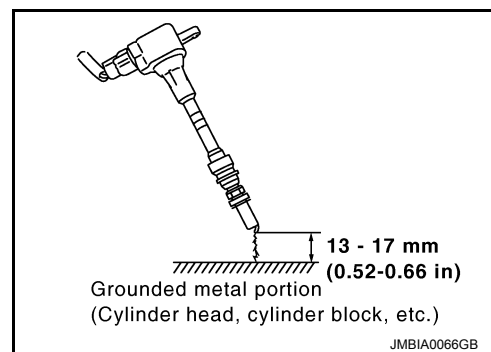
NOTE:

When the gap is less than 13 mm (0.52 in), the spark might be generated even if the coil is malfunctioning.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning ignition coil with power transistor. Refer to [EM-27, "Removal and Installation"](#).



Component Inspection (Condenser)

INFOID:0000000014267720

1.CHECK CONDENSER

1. Turn ignition switch OFF.
2. Disconnect condenser harness connector.
3. Check resistance between joint connector-F01 terminals as per the following.

Joint connector-F01		Resistance
+	-	
Terminal		
1	6	Above 1 MΩ [at 25C° (77C°)]

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Replace condenser.

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INFORMATION DISPLAY (ASCD)

Component Function Check

INFOID:0000000014267721

1. CHECK INFORMATION DISPLAY

1. Start engine.
2. Press MAIN switch on ASCD steering switch.
3. Drive the vehicle at more than 40 km/h (25 MPH).
CAUTION:
Always drive vehicle at a safe speed.
4. Press COAST/SET switch.
5. Check that the reading of the speedometer shows the same value as the set speed indicated in the information display while driving the vehicle on a flat road.

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Proceed to [EC-377, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267722

1. CHECK DTC

Check that DTC UXXXX or P0500 is not displayed.

Is the inspection result normal?

- YES >> GO TO 2.
 NO-1 >> Perform trouble diagnosis for DTC UXXXX.
 NO-2 >> Perform trouble diagnosis for DTC P0500. Refer to [EC-268, "Diagnosis Procedure"](#).

2. CHECK DTC WITH COMBINATION METER

Check DTC with combination meter. Refer to [MWI-39, "DTC Index"](#) (with color display and I-KEY system), [MWI-46, "EXCEPT BCM FUNCTION : DTC Index"](#) (with color display and without I-KEY system), [MWI-171, "EXCEPT BCM FUNCTION : DTC Index"](#) (with monochrome display).

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Perform trouble diagnosis for DTC indicated.

3. CHECK INTERMITTENT INCIDENT

Perform [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace combination meter. Refer to [MWI-137, "Removal and Installation"](#) (with color display), [MWI-217, "Removal and Installation"](#) (with monochrome display).
 NO >> Repair or replace error-detected parts.

MALFUNCTION INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

MALFUNCTION INDICATOR LAMP

Component Function Check

INFOID:0000000014267723

1.CHECK MIL FUNCTION

1. Turn ignition switch ON.
2. Check that MIL illuminates.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Proceed to [EC-377. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267724

1.CHECK DTC

Check that DTC UXXXX is not displayed.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Perform trouble diagnosis for DTC UXXXX.

2.CHECK COMBINATION METER FUNCTION

Check combination meter function. Refer to [MWI-82. "Work flow"](#) (with color display), [MWI-189. "Work flow"](#) (with monochrome display).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace.

3.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace combination meter. Refer to [MWI-137. "Removal and Installation"](#) (with color display), [MWI-217. "Removal and Installation"](#) (with monochrome display).
NO >> Repair or replace error-detected parts.

REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

REFRIGERANT PRESSURE SENSOR

Component Function Check

INFOID:0000000014267725

1.CHECK REFRIGERANT PRESSURE SENSOR FUNCTION

1. Start engine and warm it up to normal operating temperature.
2. Turn A/C switch and blower fan switch ON.
3. Check the voltage between ECM harness connector terminals under the following conditions.

ECM			Voltage (V)
Connector	+	–	
	Terminal		
E55	103	124	1.0 - 4.0

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to [EC-378, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267726

1.CHECK REFRIGERANT PRESSURE SENSOR POWER SUPPLY

1. Disconnect refrigerant pressure sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between refrigerant pressure sensor harness connector and ground.

+		-	Voltage (Approx.)
Refrigerant pressure sensor			
Connector	Terminal		
E49	3	Ground	5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK REFRIGERANT PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

+		-		Continuity
Refrigerant pressure sensor		ECM		
Connector	Terminal	Connector	Terminal	
E49	3	E55	104	Existed

Is the inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace error-detected parts.

3.CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

+		-		Continuity
Refrigerant pressure sensor		ECM		
Connector	Terminal	Connector	Terminal	
E49	1	E55	124	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT

1. Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

+		-		Continuity
Refrigerant pressure sensor		ECM		
Connector	Terminal	Connector	Terminal	
E49	2	E55	103	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace refrigerant pressure sensor. Refer to [HAC-120, "Removal and Installation"](#) (Auto A/C), [HAC-210, "Removal and Installation"](#) [Manual A/C (TYPE 1)], [HAC-273, "Removal and Installation"](#) [Manual A/C (TYPE 2)].

NO >> Repair or replace error-detected parts.

SENSOR POWER SUPPLY 2 CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

SENSOR POWER SUPPLY 2 CIRCUIT

Description

INFOID:0000000014267727

ECM supplies a voltage of 5 V to some of the sensors systematically divided into 2 groups, respectively. Accordingly, when a short circuit develops in a sensor power source, a malfunction may occur simultaneously in the sensors belonging to the same group as the short-circuited sensor.

Sensor power supply 1

- APP sensor 1
- Atmospheric pressure sensor
- Crankshaft position (CKP) sensor (POS)
- PSP sensor
- Refrigerant pressure sensor*
- TP sensor

*: With A/C

NOTE:

If sensor power supply 1 circuit is malfunctioning, DTC P0643 is displayed.

Sensor power supply 2

- APP sensor 2
- CMP sensor (PHASE)
- MAF sensor

Diagnosis Procedure

INFOID:0000000014267728

1.CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-1

1. Turn ignition switch OFF.
2. Disconnect accelerator pedal position (APP) sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between APP sensor harness connector and ground.

+		-	Voltage (Approx.)
APP sensor			
Connector	Terminal		
E5	1	Ground	5V

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT-2

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between APP sensor harness connector and ECM harness connector.

+		+		Continuity
APP sensor		ECM		
Connector	Terminal	Connector	Terminal	
E5	1	E55	118	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit.

3.CHECK SENSOR POWER SUPPLY 2 CIRCUIT

1. Disconnect following sensors harness connector.
2. Check harness for short to power and short to ground, between the following terminals.

SENSOR POWER SUPPLY 2 CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

ECM		Sensor		
Connector	Terminal	Name	Connector	Terminal
F73	32	CMP sensor (PHASE)	F23	1
	36	MAF sensor	F53	2
E55	118	APP sensor 2	E5	1

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair short to ground or short to power in harness or connectors.

4.CHECK COMPONENTS

Check the following.

- APP sensor 2 (Refer to [EC-347, "Component Inspection".](#))
- Camshaft position sensor (PHASE) (Refer to [EC-254, "Component Inspection".](#))
- MAF sensor (Refer to [EC-177, "Component Inspection".](#))

Is the inspection result normal?

YES >> Refer to [GI-45, "Intermittent Incident".](#)

NO >> Replace malfunctioning component.

SYMPTOM DIAGNOSIS

ENGINE CONTROL SYSTEM

Symptom Table

INFOID:0000000014267729

SYSTEM — BASIC ENGINE CONTROL SYSTEM

		SYMPTOM													Reference page
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Fuel	Fuel pump circuit	1	1	2	3	2		2	2			3		2	EC-368
	Fuel pressure regulator system	3	3	4	4	4	4	4	4	4		4			EC-140
	Fuel injector circuit	1	1	2	3	2		2	2			2			EC-365
	Evaporative emission system	3	3	4	4	4	4	4	4	4	4		4		
Air	Positive crankcase ventilation system	3	3	4	4	4	4	4	4	4		4	1		EC-391
	Incorrect idle speed adjustment						1	1	1	1		1			EC-137
	Electric throttle control actuator	1	1	2	3	3	2	2	2	2		2		2	EC-335 , EC-340
Ignition	Incorrect ignition timing adjustment	3	3	1	1	1		1	1			1			EC-389
	Ignition circuit	1	1	2	2	2		2	2			2			EC-371
Main power supply and ground circuit		2	2	3	3	3		3	3		2	3			EC-150
Mass air flow sensor circuit		1			2										EC-175
Intake air temperature sensor circuit														EC-180	
Engine coolant temperature sensor circuit											3			3	
Air fuel ratio (A/F) sensor 1 circuit			1	2	3	2		2	2			2			EC-188 , EC-192 , EC-195 , EC-219
Throttle position sensor circuit															
Accelerator pedal position sensor circuit				3	2	1									EC-342 , EC-345 , EC-351

ENGINE CONTROL SYSTEM

< SYMPTOM DIAGNOSIS >

[QR25DE]

	SYMPTOM													Reference page
	HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Heated oxygen sensor 2 circuit			6		6		6	5			5			EC-198 , EC-204 , EC-212
Knock sensor circuit			2								3			EC-246
Engine oil temperature sensor circuit			4		2						3			EC-234
Engine oil pressure sensor circuit			4		4	3	3	3			3			EC-270 , EC-273
Crankshaft position sensor (POS) circuit	2	2												EC-248
Camshaft position sensor (PHASE) circuit	3	2												EC-252
Vehicle speed signal circuit		2	3		3						3			EC-267
ECM	2	2	3	3	3	3	3	3	3	3	3			—
Intake valve timing control solenoid valve circuit		3	2		1	3	2	2	3		3			EC-155 , EC-169
Exhaust valve timing control solenoid valve circuit		3	2		1	3	2	2	3		3			EC-159 , EC-172
PNP signal circuit			3		3		3	3			3			EC-295
Refrigerant pressure sensor circuit		2				3			3		4			EC-378
Electrical load signal circuit							3							EC-363
Air conditioner circuit	2	2	3	3	3	3	3	3	3		3		2	HAC-56 , HAC-164 , HAC-249
Atmospheric pressure sensor circuit		5					5				3			EC-264
Battery current sensor circuit					4		5	5					3	EC-306 , EC-309 , EC-312 , EC-315
ASCD steering switch circuit														EC-318
ABS actuator and electric unit (control unit)			4											BRC-38 , BRC-183

1 - 6: The numbers refer to the order of inspection.

(continued on next table)

SYSTEM — ENGINE MECHANICAL & OTHER

ENGINE CONTROL SYSTEM

< SYMPTOM DIAGNOSIS >

[QR25DE]

		SYMPTOM													Reference page
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATSWATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA	
Fuel	Fuel tank	5	5												FL-13
	Fuel piping			5	5	5		5	5			5			FL-6
	Vapor lock														—
	Valve deposit														—
	Poor fuel (Heavy weight gasoline, Low octane)	5		5	5	5		5	5			5			—
Air	Air duct		5												EM-30
	Air cleaner														
	Air leakage from air duct (Mass air flow sensor — electric throttle control actuator)			5		5		5	5			5			
	Electric throttle control actuator	5			5		5			5					
	Air leakage from intake manifold/Collector/Gasket														
Cranking	Battery		1												PG-140
	Generator circuit	1		1		1		1	1					1	CHG-35, CHG-38
	Starter circuit	3										1			STR-24, STR-28
	Signal plate	6													EM-90
	PNP signal	4													EC-296
Engine	Cylinder head	5	5	5	5	5		5	5			5			EM-77
	Cylinder head gasket										4		3		
	Cylinder block														EM-98
	Piston												4		
	Piston ring														
	Connecting rod	6	6	6	6	6		6	6			6			
	Bearing														
	Crankshaft														

ENGINE CONTROL SYSTEM

< SYMPTOM DIAGNOSIS >

[QR25DE]

		SYMPTOM												Reference page		
		HARD/NO START/RESTART (EXCP. HA)	ENGINE STALL	HESITATION/SURGING/FLAT SPOT	SPARK KNOCK/DETONATION	LACK OF POWER/POOR ACCELERATION	HIGH IDLE/LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEATS/WATER TEMPERATURE HIGH	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION		BATTERY DEAD (UNDER CHARGE)	
Warranty symptom code		AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	HA		
Valve mecha- nism	Timing chain	5	5	5	5	5		5	5			5			EM-59	
	Camshaft														EM-61	
	Intake valve timing control														EM-59	
	Intake valve														3	EM-70
	Exhaust valve															
Exhaust	Exhaust manifold/Tube/Muf- fler/Gasket	5	5	5	5	5		5	5			5			EM-41 , EX-7	
	Three way catalyst															
Lubrica- tion	Oil pan/Oil strainer/Oil pump/ Oil filter/Oil gallery/Oil cooler	5	5	5	5	5		5	5			5			EM-49 , EM-59 , LU-14 , LU-12	
	Oil level (Low)/Filthy oil														LU-9	
Cooling	Radiator/Hose/Radiator filler cap	5	5	5	5	5	5	5		4	5				CO-18	
	Thermostat														5	CO-25
	Water pump															CO-22
	Water gallery															CO-5
	Cooling fan															CO-19
	Coolant level (Low)/Contami- nated coolant														5	CO-9
NVIS (NISSAN Vehicle Immobilizer Sys- tem — NATS)		1	1												SEC-69 , SEC-238	

1 - 6: The numbers refer to the order of inspection.

INFORMATION DISPLAY IS MALFUNCTIONING

< SYMPTOM DIAGNOSIS >

[QR25DE]

INFORMATION DISPLAY IS MALFUNCTIONING

Diagnosis Procedure

INFOID:0000000014267730

1.CHECK DTC WITH ECM

Check that DTC is not displayed.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform trouble diagnosis relevant to DTC indicated.

2.CHECK INFORMATION DISPLAY (ASCD)

Refer to [EC-376. "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning part.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-45. "Intermittent Incident"](#).

>> INSPECTION END

NORMAL OPERATING CONDITION

Description

INFOID:0000000014267731

FUEL CUT CONTROL (AT NO LOAD AND HIGH ENGINE SPEED)

If the engine speed is above 2,000 rpm under no load (for example, the selector lever position is neutral and engine speed is over 2,000 rpm) fuel will be cut off after some time. The exact time when the fuel is cut off varies based on engine speed.

Fuel cut will be operated until the engine speed reaches 1,500 rpm, then fuel cut will be cancelled.

NOTE:

This function is different from deceleration control listed under Multiport Fuel Injection (MFI) System, [EC-47](#), ["MULTIPOINT FUEL INJECTION SYSTEM : System Description"](#).

A

EC

C

D

E

F

G

H

I

J

K

L

M

N

O

P

PERIODIC MAINTENANCE

IDLE SPEED

Inspection

INFOID:0000000014267732

1. CHECK IDLE SPEED

 With CONSULT

Check idle speed in "DATA MONITOR" mode of "ENGINE" using CONSULT.

 With GST

Check idle speed with Service \$01 of GST.

>> INSPECTION END

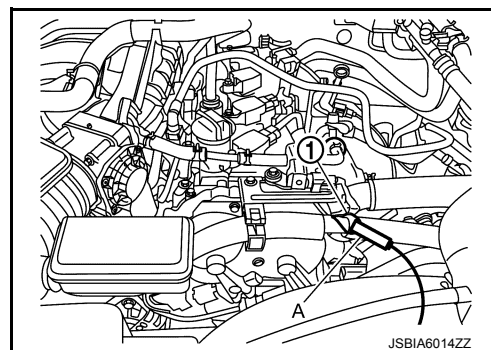
IGNITION TIMING

Inspection

INFOID:0000000014267733

1.CHECK IGNITION TIMING

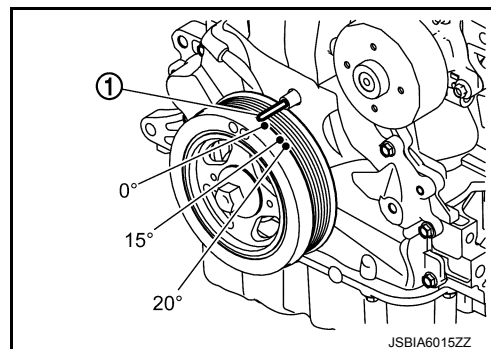
1. Attach timing light (A) to loop wire ①.



2. Check ignition timing.

① : Timing indicator

>> INSPECTION END



EVAPORATIVE EMISSION SYSTEM

< PERIODIC MAINTENANCE >

[QR25DE]

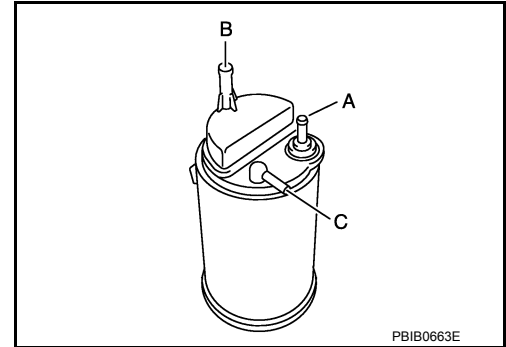
EVAPORATIVE EMISSION SYSTEM

Inspection

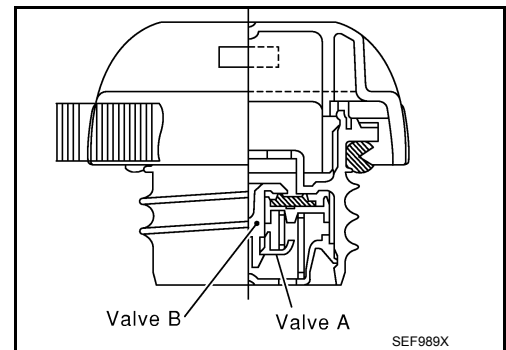
INFOID:000000014267734

EVAP CANISTER

1. Visually inspect EVAP vapor lines for improper attachment and for cracks, damage, loose connections, chafing and deterioration.
2. Check EVAP canister as follows:
 - a. Block port (A). Orally blow air through port (B). Check that air flows freely through port (C).
 - b. Block port (B). Orally blow air through port (A). Check that air flows freely through port (C).



3. Inspect fuel tank filler cap vacuum relief valve for clogging, sticking, etc.
 - a. Wipe clean valve housing.

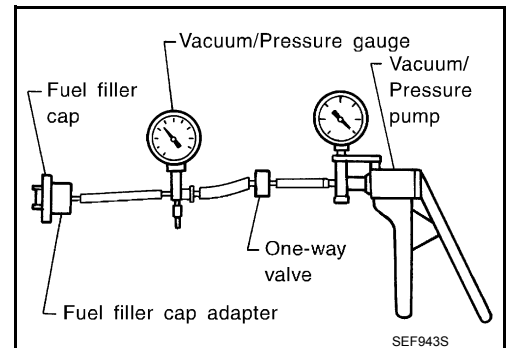


- b. Check valve opening pressure and vacuum.

Pressure: 15.3 - 20.0 kPa (0.153 - 0.200 bar, 0.156 - 0.204 kg/cm², 2.22 - 2.90 psi)

Vacuum: -6.0 to -3.4 kPa (-0.06 to -0.034 bar, -0.061 to -0.035 kg/cm², -0.87 to -0.49 psi)

- c. If out of specification, replace fuel filler cap as an assembly.



POSITIVE CRANKCASE VENTILATION

< PERIODIC MAINTENANCE >

[QR25DE]

POSITIVE CRANKCASE VENTILATION

Inspection

INFOID:0000000014267735

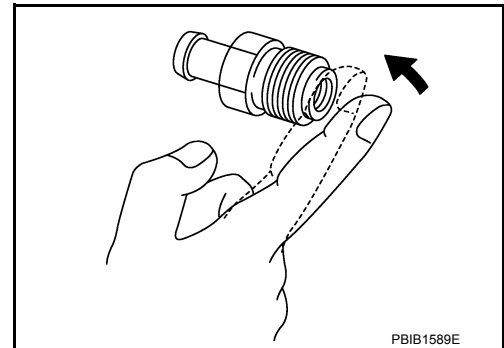
1.CHECK PCV VALVE

With engine running at idle, remove PCV valve from rocker cover. A properly working valve makes a hissing noise as air passes through it. A strong vacuum should be felt immediately when a finger is placed over valve inlet.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace PCV valve. Refer to [EM-32, "Exploded View"](#).

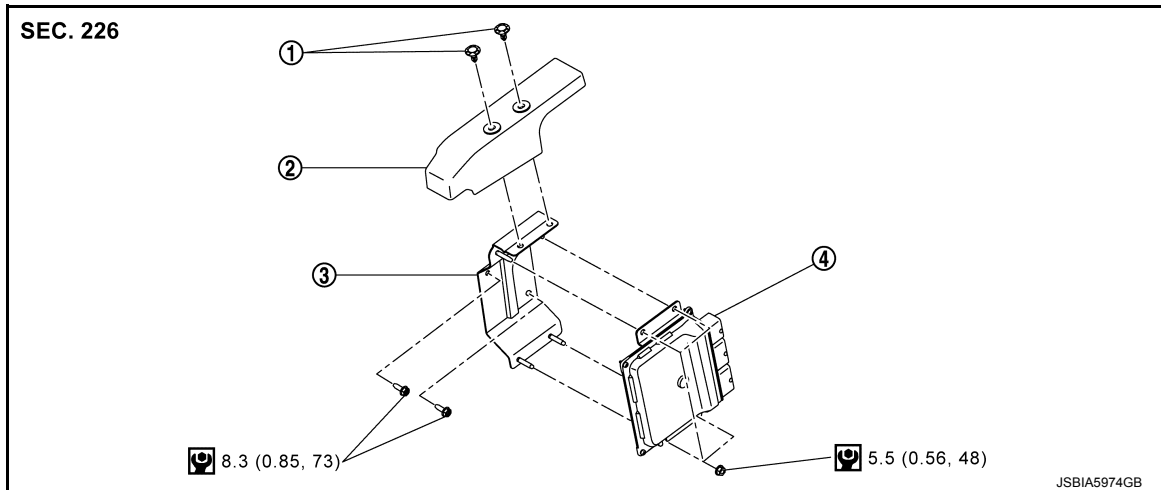


REMOVAL AND INSTALLATION

ECM

Exploded View

INFOID:0000000014267736



- | | | |
|---------|--------------|----------------|
| 1. Clip | 2. ECM cover | 3. ECM bracket |
| 4. ECM | | |

Removal and Installation

INFOID:0000000014267737

CAUTION:

Perform **ADDITIONAL SERVICE WHEN REPLACING ECM**. Refer to [EC-132, "Description"](#).

REMOVAL

1. Remove ECM cover.
2. Remove air cleaner case. Refer to [EM-30, "Removal and Installation"](#).
3. Disconnect the harness connectors from ECM. Refer to [PG-9, "Harness Connector"](#).
4. Remove ECM nuts.
5. Remove ECM from ECM bracket.

INSTALLATION

Installation is in the reverse order of removal.

ATMOSPHERIC PRESSURE SENSOR

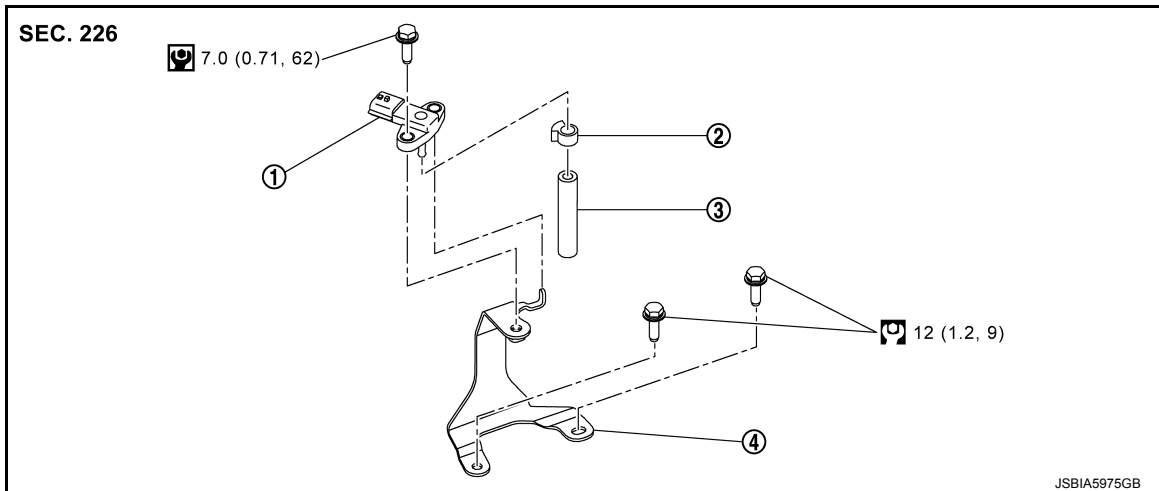
< REMOVAL AND INSTALLATION >

[QR25DE]

ATMOSPHERIC PRESSURE SENSOR

Exploded View

INFOID:000000014267738



1. Atmospheric pressure sensor
2. Clip
3. Hose
4. Bracket

Removal and Installation

INFOID:000000014267739

REMOVAL

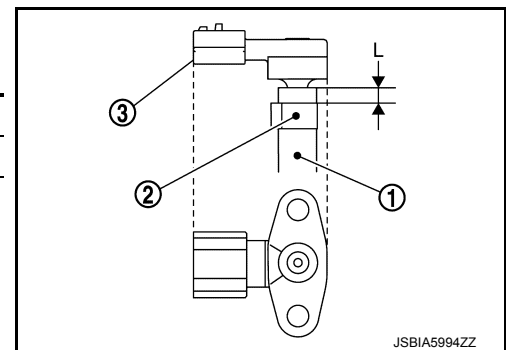
1. Disconnect the harness connector from atmospheric pressure sensor.
2. Remove atmospheric pressure sensor bolt.
3. Remove atmospheric pressure sensor from bracket.

INSTALLATION

Note the following, and install in the reverse order of removal.

- Never use dropped atmospheric pressure sensor.
- Never bend the hose to prevent damage to the hose.
- Refer to the following when installing hose (1) and clamp (2) to atmospheric pressure sensor (3).

Hose	Clamp	
Insertion depth	Direction of tab	Clamping position (L)
Insert the hose until its end reaches the stop end.	Atmospheric pressure sensor connector side	3 – 7 mm (0.12 – 0.28 in) from hose end CAUTION: Clamp should not interfere with the bulge of tube.



SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[QR25DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Idle Speed

INFOID:0000000014267740

Condition	Specification
No load* (in Neutral position)	625 ± 50 rpm

*: Under the following conditions

- A/C switch: OFF
- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Ignition Timing

INFOID:0000000014267741

Condition	Specification
No load* (in Neutral position)	10 ± 2° BTDC

*: Under the following conditions

- A/C switch: OFF
- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Calculated Load Value

INFOID:0000000014267742

Condition	Specification (Using CONSULT or GST)
At idle	22 %
At 2,500 rpm	10 – 20 %

Mass Air Flow Sensor

INFOID:0000000014267743

Supply voltage	Approx. 5 V
Output frequency at idle	2,340 – 3,280 Hz*
Mass air flow (Using CONSULT or GST)	11.6 – 13.3 g/s at idle* 39.6 g/s at 2,500 rpm*

*: Engine is warmed up to normal operating temperature and running under no load.

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:0000000014267744

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.

Precautions Necessary for Steering Wheel Rotation After Battery Disconnection

INFOID:0000000014267745

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Before removing and installing any control units, first turn the ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
NOTE:
Supply power using jumper cables if battery is discharged.
2. Turn the ignition switch to ACC position.
(At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

PRECAUTIONS

< PRECAUTION >

[YS23DDT/YS23DDTT (M9T)]

Service Notice or Precautions for Steering System

INFOID:0000000014267746

- In case of removing steering gear, make the final tightening with grounded and unloaded vehicle condition, and then check wheel alignment.
- Observe the following precautions when disassembling.
 - Before disassembly, thoroughly clean the outside of the unit.
 - Disassembly should be done in a clean work area. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
 - For easier and proper assembly, place disassembled parts in order on a parts rack.
 - Use nylon cloth or paper towels to clean the parts; common shop rags can leave lint that might interfere with their operation.
 - Do not reuse non-reusable parts.
 - Before assembling, apply the specified grease to the directed parts.

On Board Diagnostic (OBD) System of Engine

INFOID:0000000014267747

The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

CAUTION:

- **Be sure to turn the ignition switch OFF and disconnect the negative battery cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to light up.**
- **Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to light up due to the open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)**
- **Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to [PG-9, "Harness Connector"](#).**
- **Be sure to route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to light up due to the short circuit.**
- **Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to light up due to the malfunction of the fuel injection system, etc.**
- **Be sure to erase the unnecessary malfunction information (repairs completed) from the ECM before returning the vehicle to the customer.**

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

SYSTEM DESCRIPTION

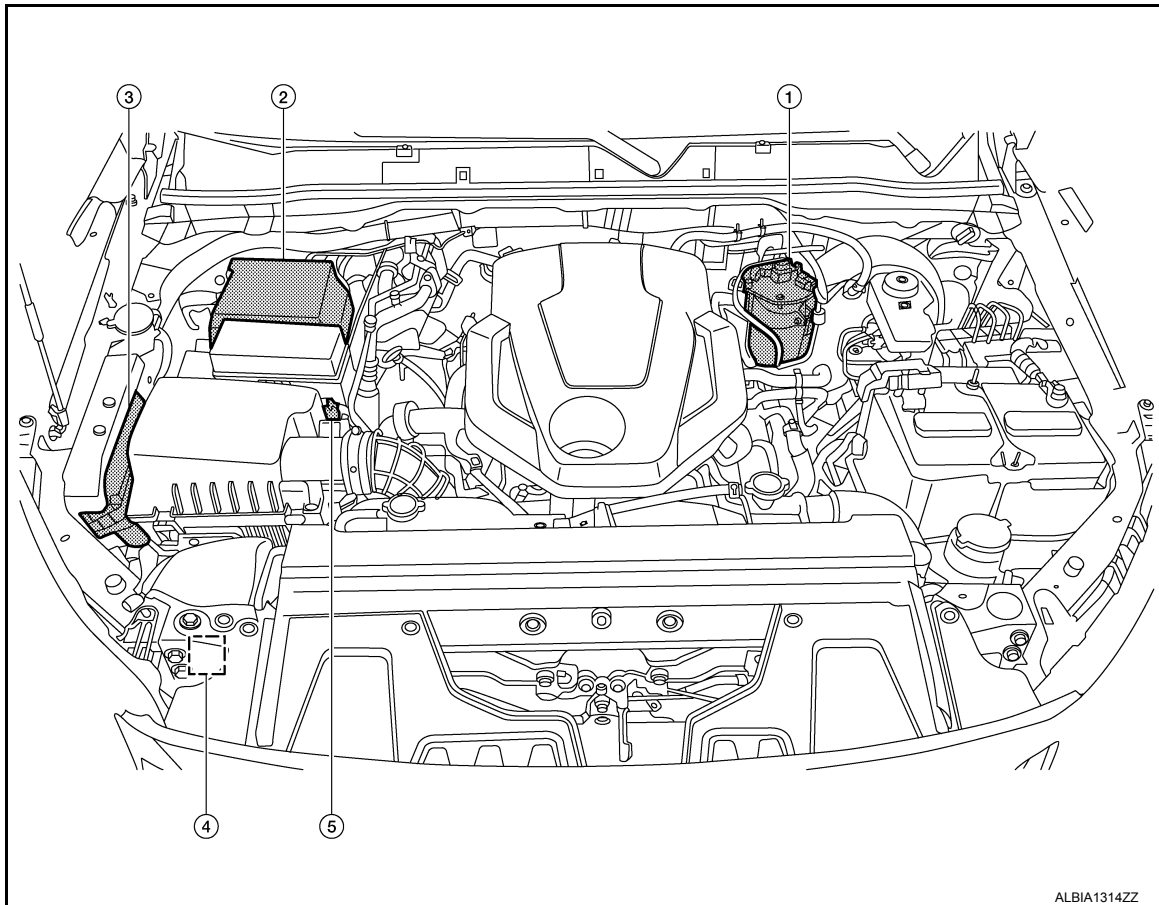
COMPONENT PARTS

YS23DDT

YS23DDT : Component Parts Location

INFOID:0000000014267748

ENGINE ROOM COMPARTMENT



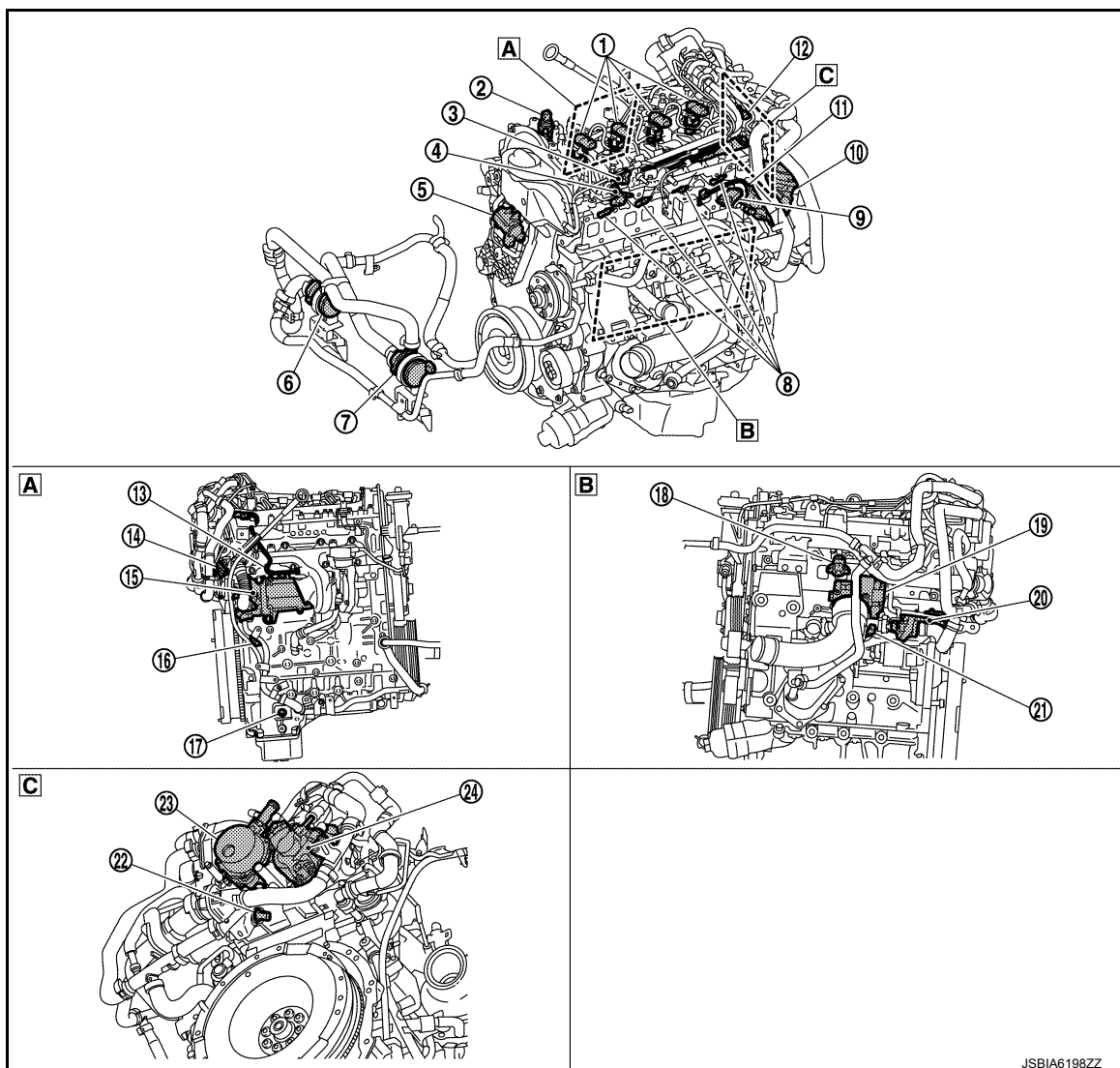
No.	Component parts	Function
①	Fuel filter (Fuel heater and water in fuel sensor)	• EC-413. "Fuel Heater" • EC-419. "Water In Fuel Sensor"
②	IPDM E/R	IPDM E/R activates the internal control circuit to perform the relay ON-OFF control according to the input signals from various sensors and the request signals received from control units via CAN communication. Refer to PCS-7. "Component Parts Location" for detailed installation location.
③	ECM	EC-409. "ECM"
④	Glow control unit	EC-415. "Glow Control Unit"
⑤	Mass air flow (MAF) sensor (with intake air temperature sensor 1)	• EC-417. "Mass Air Flow Sensor" • EC-416. "Intake Air Temperature Sensor 1"

ENGINE COMPARTMENT

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]



A Right side of engine

B Left side of engine

C Backward of engine

No.	Component parts	Function
①	Fuel injector	EC-413. "Fuel Injector"
②	Exhaust gas pressure sensor	EC-412. "Exhaust Gas Pressure Sensor"
③	Fuel rail pressure sensor	EC-414. "Fuel Rail Pressure Sensor"
④	Fuel temperature sensor	EC-414. "Fuel Temperature Sensor"
⑤	Turbocharger boost control solenoid valve	EC-418. "Turbocharger Boost Control Solenoid Valve"
⑥	Electric EGR cooling water pump 1	EC-411. "Electric EGR cooling water pump"
⑦	Electric EGR cooling water pump 2	
⑧	Glow plug	EC-415. "Glow Plug"
⑨	Turbocharger boost sensor	EC-418. "Turbocharger Boost Sensor"
⑩	EGR volume control valve (With EGR volume control valve position sensor)	EC-410. "EGR Volume Control Valve (With EGR Volume Control Valve Position Sensor)"
⑪	EGR temperature sensor	EC-410. "EGR Temperature Sensor"
⑫	Camshaft position sensor	EC-407. "Camshaft Position Sensor"

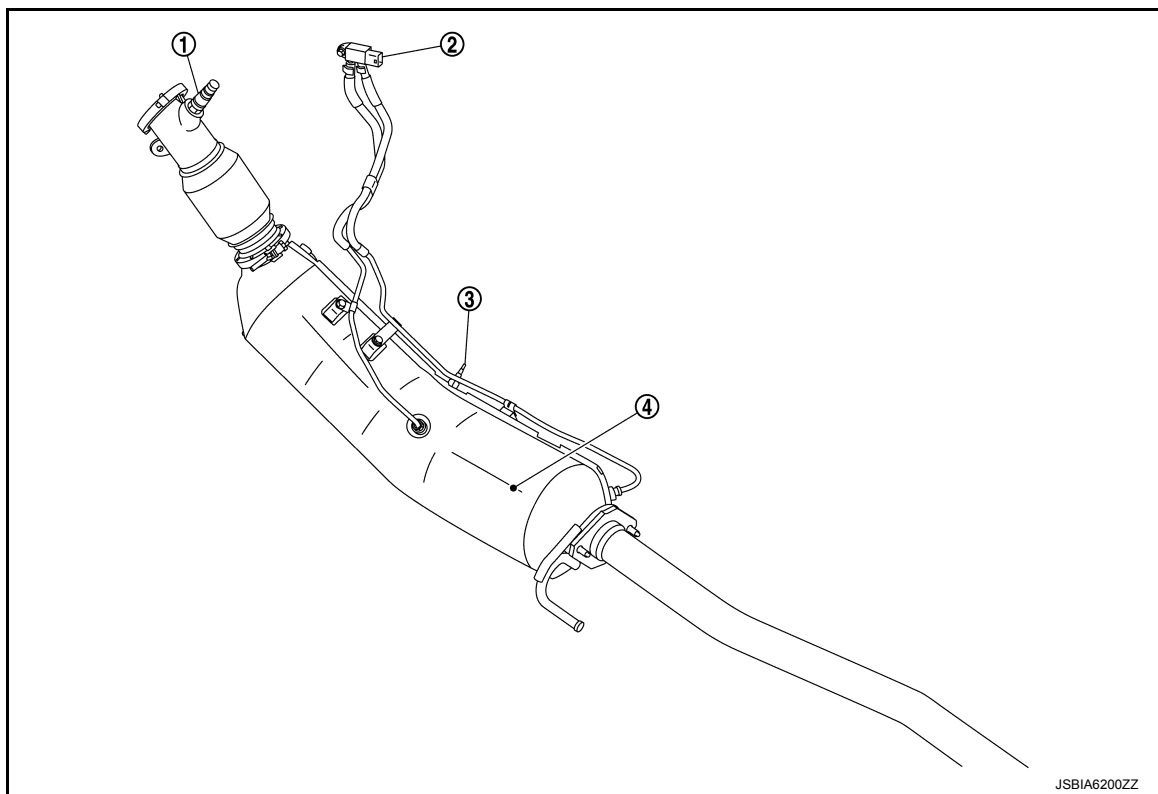
COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

No.	Component parts	Function
⑬	Exhaust gas temperature sensor 1	EC-412, "Exhaust Gas Temperature Sensor 1"
⑭	EGR cooler bypass valve control solenoid valve	EC-410, "EGR Cooler Bypass Valve Control Solenoid Valve"
⑮	EGR cooler bypass valve	EC-410, "EGR Cooler Bypass Valve"
⑯	Crankshaft position sensor	EC-408, "Crankshaft Position Sensor"
⑰	Engine oil pump control valve	EC-412, "Engine Oil Pump Control Valve"
⑱	Thermo management valve control solenoid valve	EC-418, "Thermo Management Valve Control Solenoid Valve"
⑲	Electric throttle control actuator	EC-411, "Electric Throttle Control Actuator"
⑳	Thermo management valve	EC-418, "Thermo Management Valve"
㉑	Intake air temperature sensor 2	EC-416, "Intake Air Temperature Sensor 2"
㉒	Engine coolant temperature sensor	EC-411, "Engine Coolant Temperature Sensor"
㉓	Vacuum pump	EC-419, "Vacuum Pump"
㉔	High pressure fuel pump	EC-415, "High Pressure Fuel Pump"

EXHAUST COMPARTMENT



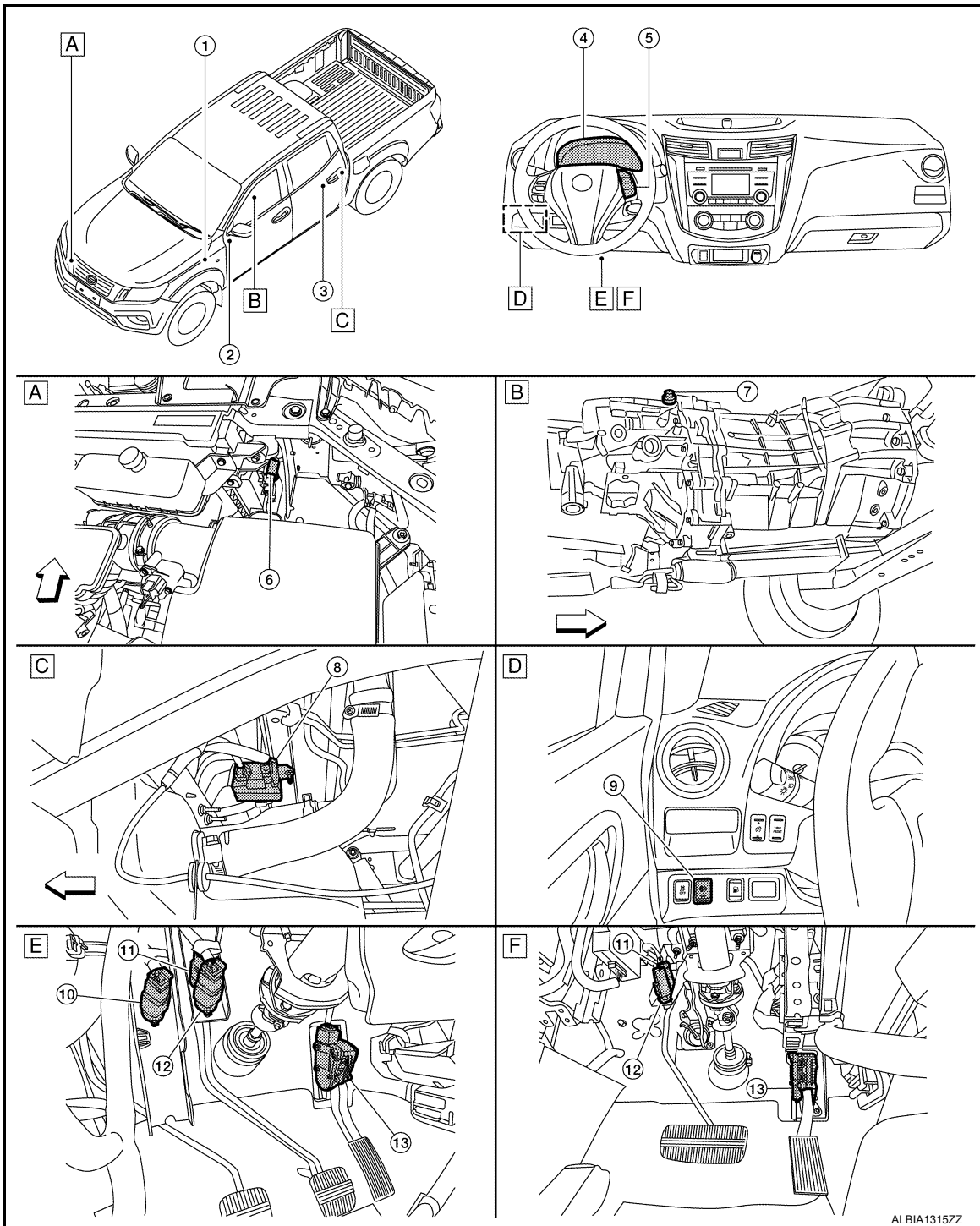
No.	Component parts	Function
①	Air fuel ratio (A/F) sensor	EC-407, "Air Fuel Ratio (A/F) Sensor"
②	DPF (diesel particulate filter) differential pressure sensor	EC-409, "DPF (Diesel Particulate Filter) Differential Pressure Sensor"
③	Exhaust gas temperature sensor 2	EC-413, "Exhaust Gas Temperature Sensor 2"
④	DPF (diesel particulate filter)	EC-408, "DPF (Diesel Particulate Filter)"

BODY COMPARTMENT

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]



A Right front side of engine room

B Transmission (M/T)

C Rear of fuel tank area

D Instrument panel LH

E Pedal periphery (M/T)

F Pedal periphery (A/T)

↶ : Vehicle front

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

No.	Component	Function
①	BCM* ¹	Mainly transmits the following signal to ECM via CAN communication. - A/C ON signal - Blower fan ON signal Refer to BCS-7, "BODY CONTROL SYSTEM : Component Parts Location" (With intelligent key system), BCS-76, "BODY CONTROL SYSTEM : Component Parts Location" (Without intelligent key system) for detailed installation location.
②	TCM* ⁴	Mainly transmits the following signal to ECM via electrical signal. - Park/neutral signal Mainly transmits the following signal to ECM via CAN communication. - Powertrain revolution Refer to TM-107, "A/T CONTROL SYSTEM : Component Parts Location" for detailed installation location.
③	Fuel pump	EC-414, "Fuel Pump"
④	Combination meter	Mainly transmits the following signal to ECM via CAN communication. - Vehicle speed - A/C ON signal*² - Blower fan ON signal*² Refer to MWI-9, "METER SYSTEM : Component Parts Location" (With color display), MWI-144, "METER SYSTEM : Component Parts Location" (With monochrome display) for detailed installation location.
⑤	ASCD steering switch	EC-407, "ASCD Steering Switch"
⑥	Refrigerant pressure sensor	EC-417, "Refrigerant Pressure Sensor"
⑦	Park/neutral position (PNP) switch* ³	EC-417, "Park/Neutral position Switch"
⑧	FPCM (Fuel Pump Control Module)	EC-414, "FPCM (Fuel Pump Control Module)"
⑨	DPF (Diesel Particulate Filter) manual regeneration switch	EC-409, "DPF (Diesel Particulate Filter) Manual Regeneration Switch"
⑩	Clutch pedal position switch* ³	EC-407, "Clutch Pedal Position Switch"
⑪	Stop lamp switch	EC-417, "Stop Lamp Switch & Brake Pedal Position Switch"
⑫	Brake pedal position switch	
⑬	Accelerator pedal position switch	EC-407, "Accelerator Pedal Position Sensor"

*1: With intelligent key system

*2: Without intelligent key system

*3: With M/T models

*4: With A/T models

YS23DDTT

YS23DDTT : Component Parts Location

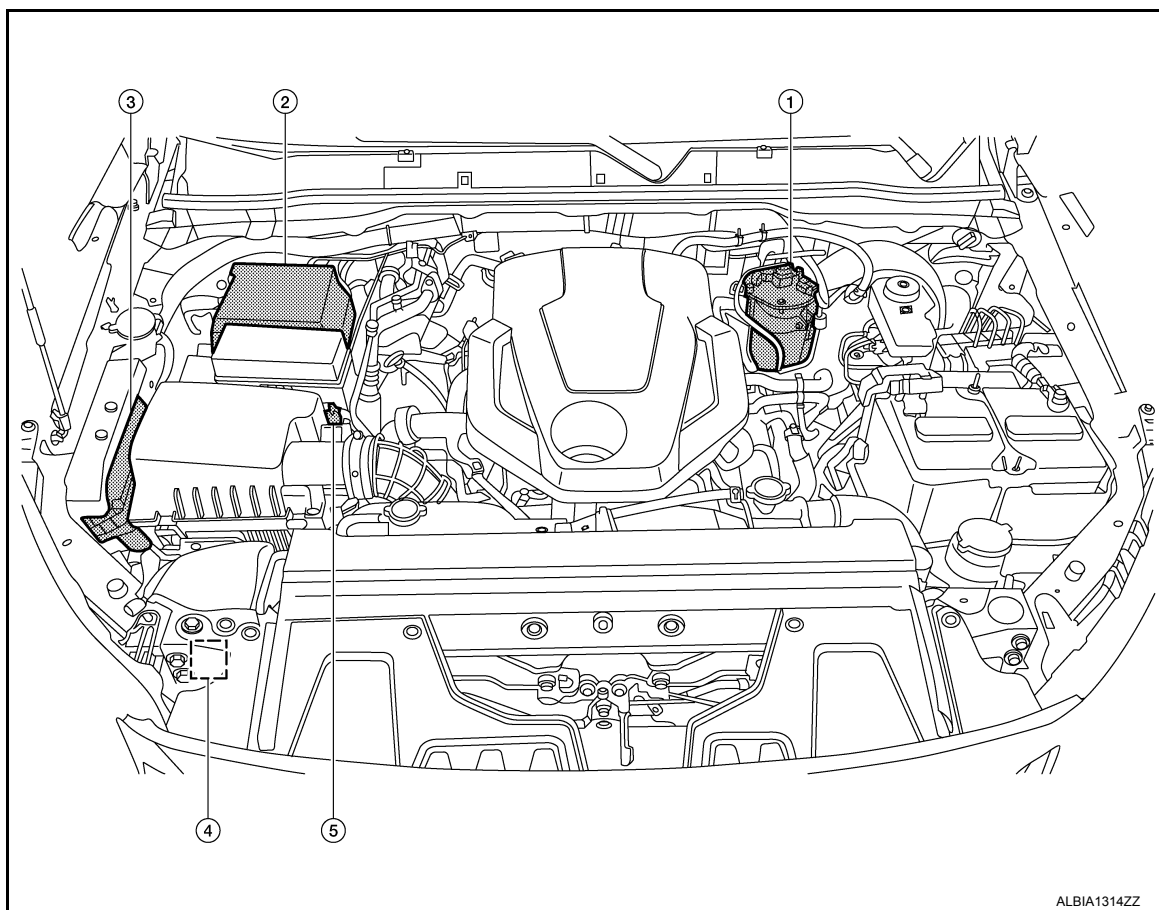
ENGINE ROOM COMPARTMENT

INFOID:0000000014267749

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]



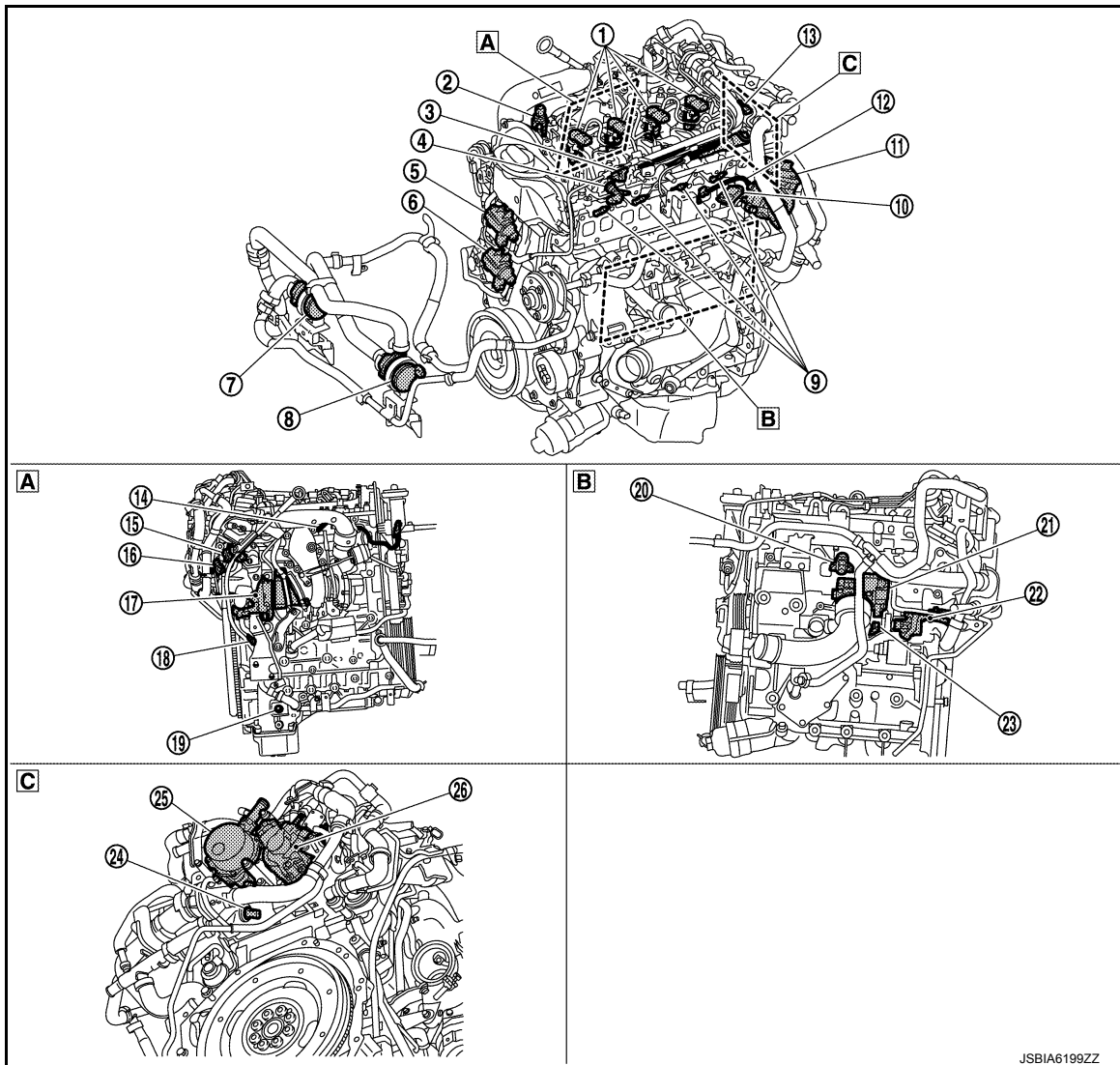
No.	Component parts	Function
①	Fuel filter (Fuel heater and water in fuel sensor)	• EC-413, "Fuel Heater" • EC-419, "Water In Fuel Sensor"
②	IPDM E/R	IPDM E/R activates the internal control circuit to perform the relay ON-OFF control according to the input signals from various sensors and the request signals received from control units via CAN communication. Refer to PCS-7, "Component Parts Location" for detailed installation location.
③	ECM	EC-409, "ECM"
④	Glow control unit	EC-415, "Glow Control Unit"
⑤	Mass air flow (MAF) sensor (with intake air temperature sensor 1)	• EC-417, "Mass Air Flow Sensor" • EC-416, "Intake Air Temperature Sensor 1"

ENGINE COMPARTMENT

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]



A Right side of engine

B Left side of engine

C Backward of engine

No.	Component parts	Function
①	Fuel injector	EC-413. "Fuel Injector"
②	Exhaust gas pressure sensor	EC-412. "Exhaust Gas Pressure Sensor"
③	Fuel rail pressure sensor	EC-414. "Fuel Rail Pressure Sensor"
④	Fuel temperature sensor	EC-414. "Fuel Temperature Sensor"
⑤	High pressure turbine bypass valve control solenoid valve	EC-416. "High Pressure Turbine Bypass Valve Control Solenoid Valve"
⑥	Low pressure wastegate valve control solenoid valve	EC-417. "Low Pressure Wastegate Valve Boost Control Solenoid Valve"
⑦	Electric EGR cooling water pump 1	EC-411. "Electric EGR cooling water pump"
⑧	Electric EGR cooling water pump 2	
⑨	Glow plug	EC-415. "Glow Plug"
⑩	Turbocharger boost sensor	EC-418. "Turbocharger Boost Sensor"
⑪	EGR volume control valve (With EGR volume control valve position sensor)	EC-410. "EGR Volume Control Valve (With EGR Volume Control Valve Position Sensor)"

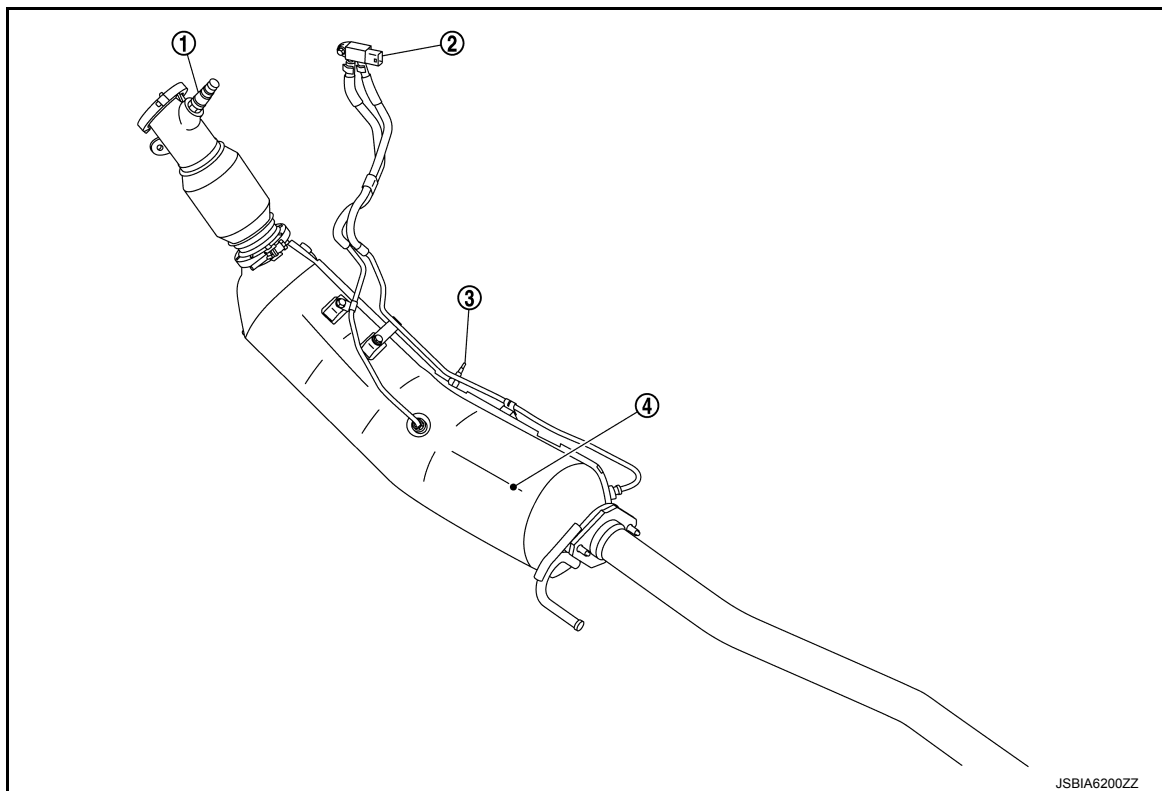
COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

No.	Component parts	Function
⑫	EGR temperature sensor	EC-410, "EGR Temperature Sensor"
⑬	Camshaft position sensor	EC-407, "Camshaft Position Sensor"
⑭	Exhaust gas temperature sensor 1	EC-412, "Exhaust Gas Temperature Sensor 1"
⑮	High pressure compressor bypass valve control solenoid valve	EC-415, "High Pressure Compressor Bypass Valve Control Solenoid Valve"
⑯	EGR cooler bypass valve control solenoid valve	EC-410, "EGR Cooler Bypass Valve Control Solenoid Valve"
⑰	EGR cooler bypass valve	EC-410, "EGR Cooler Bypass Valve"
⑱	Crankshaft position sensor	EC-408, "Crankshaft Position Sensor"
⑲	Engine oil pump control valve	EC-412, "Engine Oil Pump Control Valve"
⑳	Thermo management valve control solenoid valve	EC-418, "Thermo Management Valve Control Solenoid Valve"
㉑	Electric throttle control actuator	EC-411, "Electric Throttle Control Actuator"
㉒	Thermo management valve	EC-418, "Thermo Management Valve"
㉓	Intake air temperature sensor 2	EC-416, "Intake Air Temperature Sensor 2"
㉔	Engine coolant temperature sensor	EC-411, "Engine Coolant Temperature Sensor"
㉕	Vacuum pump	EC-419, "Vacuum Pump"
㉖	High pressure fuel pump	EC-415, "High Pressure Fuel Pump"

EXHAUST COMPARTMENT



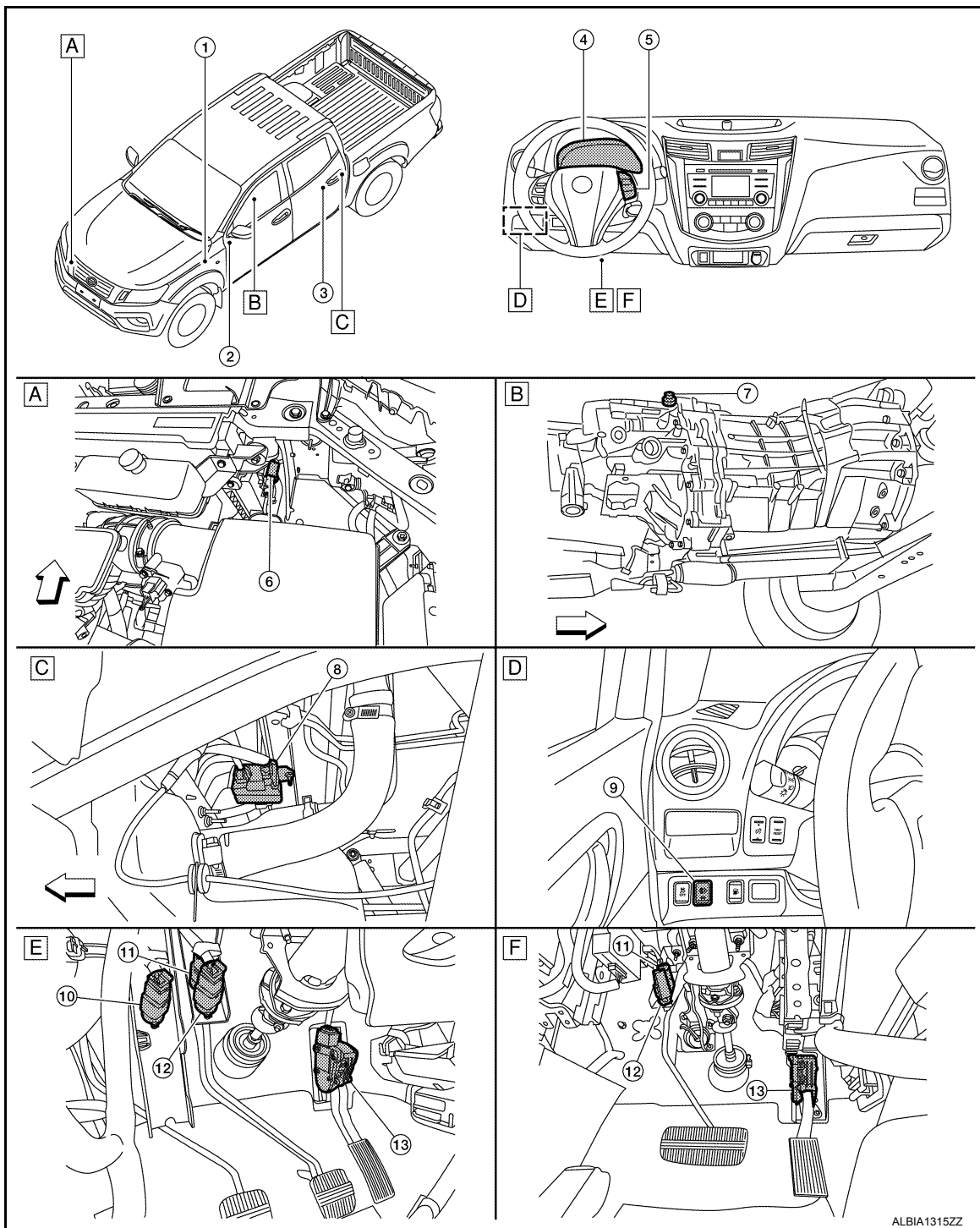
No.	Component parts	Function
①	Air fuel ratio (A/F) sensor	EC-407, "Air Fuel Ratio (A/F) Sensor"
②	DPF (diesel particulate filter) differential pressure sensor	EC-409, "DPF (Diesel Particulate Filter) Differential Pressure Sensor"
③	Exhaust gas temperature sensor 2	EC-413, "Exhaust Gas Temperature Sensor 2"
④	DPF (diesel particulate filter)	EC-408, "DPF (Diesel Particulate Filter)"

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

BODY COMPARTMENT



A Right front side of engine room

B Transmission (M/T)

C Rear of fuel tank area

D Instrument panel LH

E Pedal periphery (M/T)

F Pedal periphery (A/T)

↔ : Vehicle front

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

No.	Component	Function
①	BCM* ¹	Mainly transmits the following signal to ECM via CAN communication. • A/C ON signal • Blower fan ON signal Refer to BCS-7, "BODY CONTROL SYSTEM : Component Parts Location" (With intelligent key system), BCS-76, "BODY CONTROL SYSTEM : Component Parts Location" (Without intelligent key system) for detailed installation location.
②	TCM* ⁴	Mainly transmits the following signal to ECM via electrical signal. • Park/neutral signal Mainly transmits the following signal to ECM via CAN communication. • Powertrain revolution Refer to TM-107, "A/T CONTROL SYSTEM : Component Parts Location" for detailed installation location.
③	Fuel pump	EC-414, "Fuel Pump"
④	Combination meter	Mainly transmits the following signal to ECM via CAN communication. • Vehicle speed • A/C ON signal*² • Blower fan ON signal*² Refer to MWI-9, "METER SYSTEM : Component Parts Location" (With color display), MWI-144, "METER SYSTEM : Component Parts Location" (With monochrome display) for detailed installation location.
⑤	ASCD steering switch	EC-407, "ASCD Steering Switch"
⑥	Refrigerant pressure sensor	EC-417, "Refrigerant Pressure Sensor"
⑦	Park/neutral position (PNP) switch* ³	EC-417, "Park/Neutral position Switch"
⑧	FPCM (Fuel Pump Control Module)	EC-414, "FPCM (Fuel Pump Control Module)"
⑨	DPF (Diesel Particulate Filter) manual regeneration switch	EC-409, "DPF (Diesel Particulate Filter) Manual Regeneration Switch"
⑩	Clutch pedal position switch* ³	EC-407, "Clutch Pedal Position Switch"
⑪	Stop lamp switch	EC-417, "Stop Lamp Switch & Brake Pedal Position Switch"
⑫	Brake pedal position switch	
⑬	Accelerator pedal position switch	EC-407, "Accelerator Pedal Position Sensor"

*1: With intelligent key system

*2: Without intelligent key system

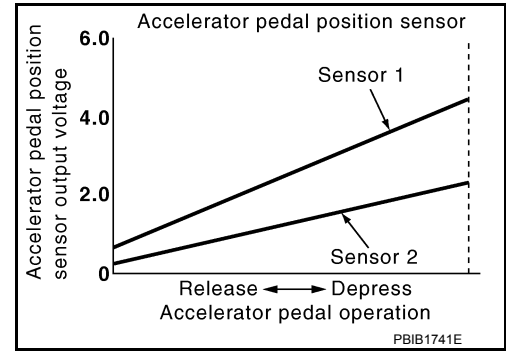
*3: With M/T models

*4: With A/T models

Accelerator Pedal Position Sensor

INFOID:0000000014267750

The accelerator pedal position (APP) sensor is installed on the upper end of the accelerator pedal assembly. The sensors detect the accelerator pedal position and sends a signal to the ECM. The ECM uses the signal to determine the amount of fuel to be injected.

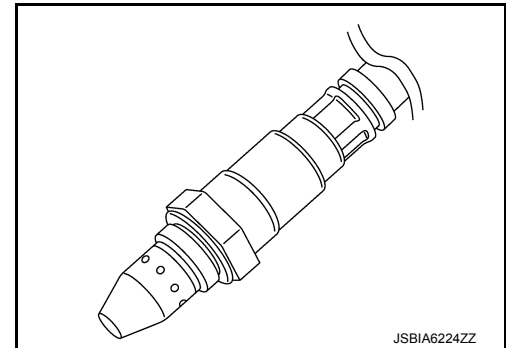


Air Fuel Ratio (A/F) Sensor

INFOID:0000000014267751

Air fuel ratio (A/F) sensor is installed on the upstream of the oxidation catalyst. A/F sensor measures the oxygen level in the exhaust gas and converts it into a voltage signal. A/F sensor sends the signal to ECM. Based on the signal from A/F sensor, ECM calculates the air fuel mixture ratio. ECM uses the calculated ratio for the DPF (Diesel Particulate Filter) regeneration control.

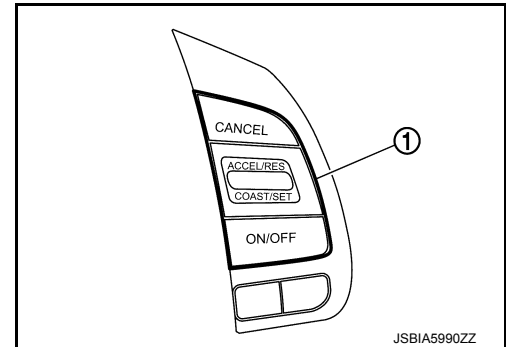
A heater is integrated in A/F sensor to ensure the required operating temperature.



ASCD Steering Switch

INFOID:0000000014267752

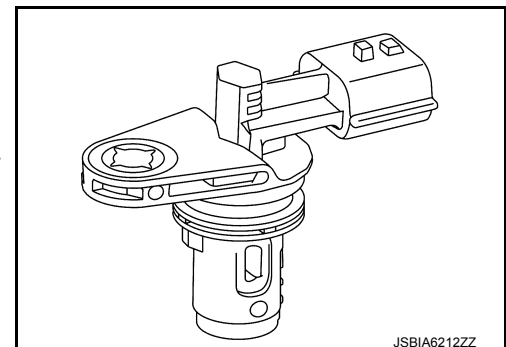
ASCD steering switch ① has variant values of electrical resistance for each button. ECM reads voltage variation of switch, and determines which button is operated.



Camshaft Position Sensor

INFOID:0000000014267753

The camshaft position (CMP) sensor senses the retraction with camshaft to identify a particular cylinder. The camshaft position (CMP) sensor senses the piston position. When the crankshaft position (CKP) sensor system becomes inoperative, the camshaft position (CMP) sensor provides various controls of engine parts instead, utilizing timing of cylinder identification signals. The sensor consists of a permanent magnet and Hall IC.



Clutch Pedal Position Switch

INFOID:0000000014267754

Clutch pedal position switch are installed to clutch pedal bracket. ECM detects the state of the clutch pedal by those two types of input signal (ON/OFF).

COMPONENT PARTS

< SYSTEM DESCRIPTION >

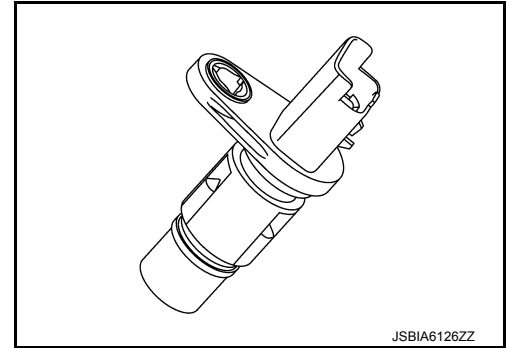
[YS23DDT/YS23DDTT (M9T)]

Clutch pedal	Clutch pedal position switch
Released	ON
Depressed	OFF

Crankshaft Position Sensor

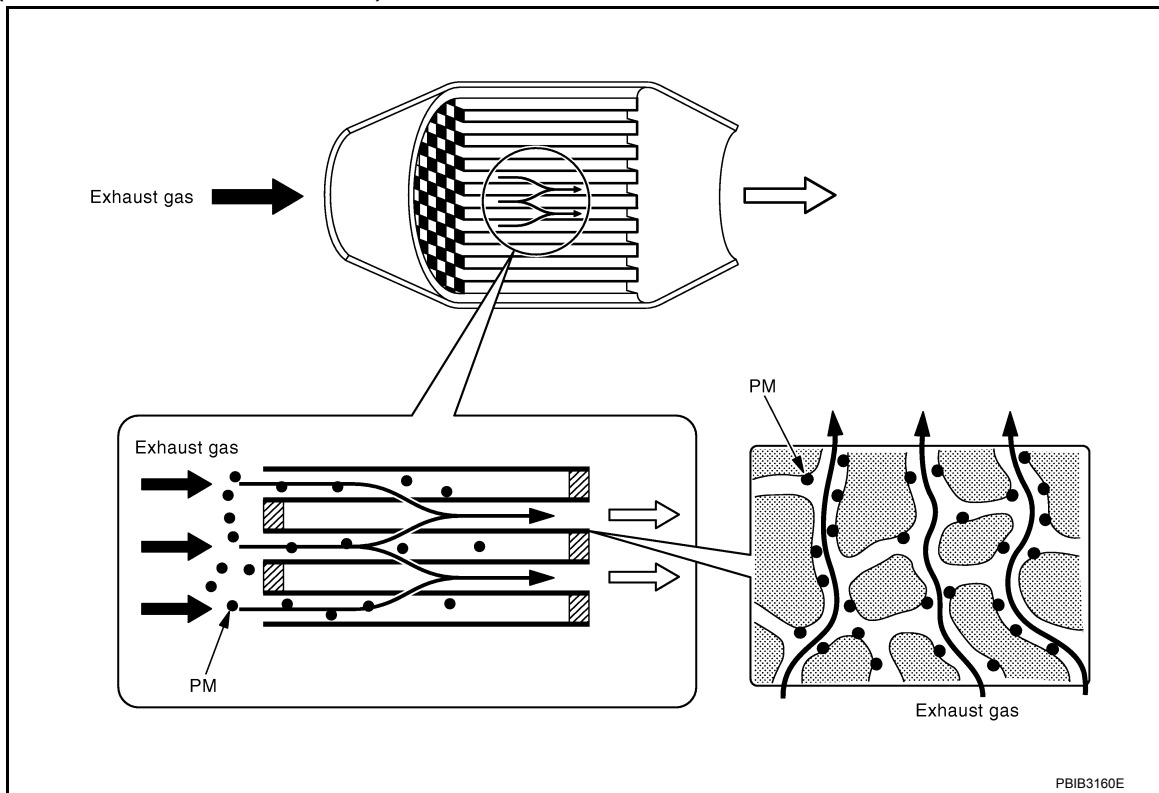
INFOID:0000000014267755

Crankshaft position (CKP) sensor detects engine speed and crankshaft position. The size difference of gear tooth placed on signal plate changes the gap between signal plate and sensor, and magnetic field change around the sensor induces sensor output voltage change. ECM detects engine speed and crankshaft position based on this voltage change.



DPF (Diesel Particulate Filter)

INFOID:0000000014267756



DPF (Diesel Particulate Filter) traps PM (Particulate Matter) in exhaust gas. DPF is formed in a honeycomb form made of ceramic. This structure facilitates to trap particulate matter. When the amount of particulate matter in the DPF reaches the specified level, the particulate matter needs to be reduced through burning to maintain the DPF function. This reducing of particulate matter is called Regeneration and should be performed periodically. DPF can be effective for a long time through the cycle of trapping particulate matter and regeneration.

COMPONENT PARTS

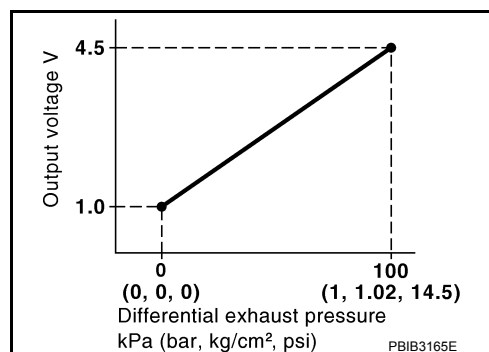
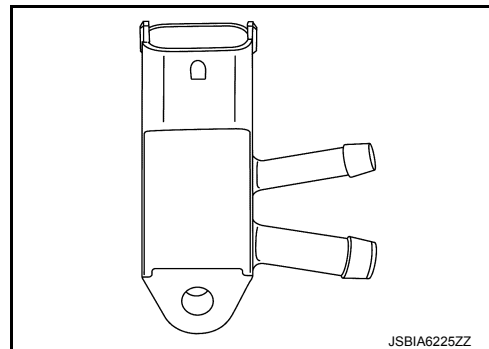
< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DPF (Diesel Particulate Filter) Differential Pressure Sensor

INFOID:0000000014267757

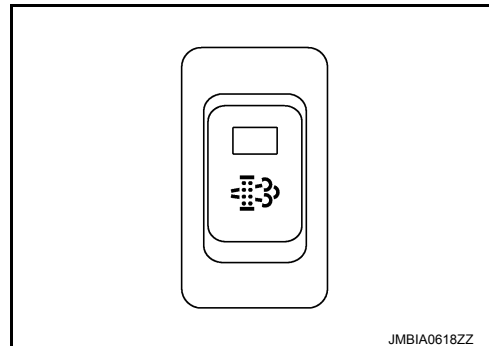
DPF (Diesel Particulate Filter) differential pressure sensor is connected to DPF with tubes (upstream and downstream). DPF pressure sensor measures the difference between the exhaust pressure before and after the DPF. DPF differential pressure sensor converts the difference pressure into a voltage signal. ECM receives the signal and estimates the amount of particulate matter in DPF.



DPF (Diesel Particulate Filter) Manual Regeneration Switch

INFOID:0000000014267758

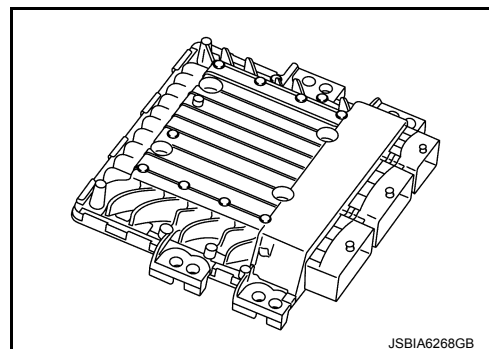
The DPF (Diesel Particulate Filter) manual regeneration switch is installed parallel to the ignition key cylinder. If the operation indicator lamp of the DPF (Diesel Particulate Filter) blinks, the DPF (Diesel Particulate Filter) manual regeneration must be performed. For details of DPF (Diesel Particulate Filter) manual regeneration, refer to [EC-560. "Description"](#).



ECM

INFOID:0000000014267759

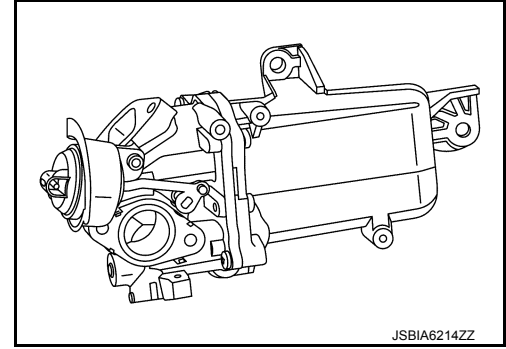
The ECM consists of a microcomputer and connectors for signal input and output and for power supply. The ECM controls the engine.



EGR Cooler Bypass Valve

INFOID:0000000014267760

EGR cooler bypass valve is integral with the EGR cooler. This valve closes the EGR cooler bypass at the engine start and supplies gas not by way of the EGR cooler to raise combustion temperature efficiently. ECM controls EGR cooler bypass valve control solenoid valve. And then, the negative pressure is applied to diaphragm to open the flap through the rod.

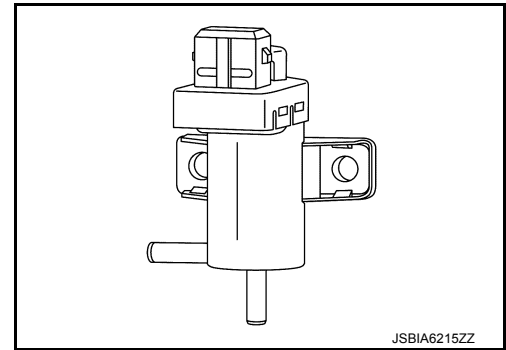


EGR Cooler Bypass Valve Control Solenoid Valve

INFOID:0000000014267761

EGR cooler bypass valve control solenoid valve is controlled by ECM and controls negative pressure exerted on the diaphragm of the EGR cooler bypass valve.

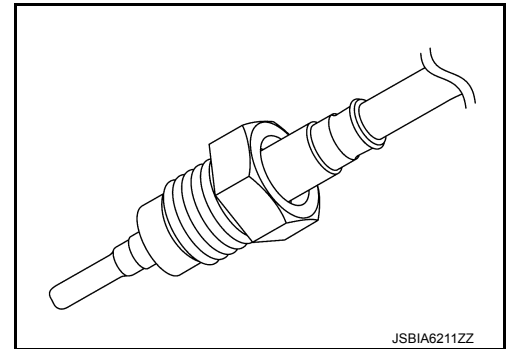
When the EGR cooler bypass valve control solenoid valve is energized, the solenoid valve opens and negative pressure sent from the vacuum pump is exerted on the diaphragm of the EGR cooler bypass valve.



EGR Temperature Sensor

INFOID:0000000014267762

The EGR temperature sensor is located on the EGR cooler. The sensor detects the EGR temperature to the downstream of EGR cooler. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the EGR temperature input.



<Reference data>

EGR temperature °C (°F)	Resistance (Approx.) kΩ
20 (68)	239.301 – 358.168
50 (122)	66.792 – 91.712
100 (212)	11.791 – 14.462
300 (572)	0.975 – 1.025

EGR Volume Control Valve (With EGR Volume Control Valve Position Sensor)

INFOID:0000000014267763

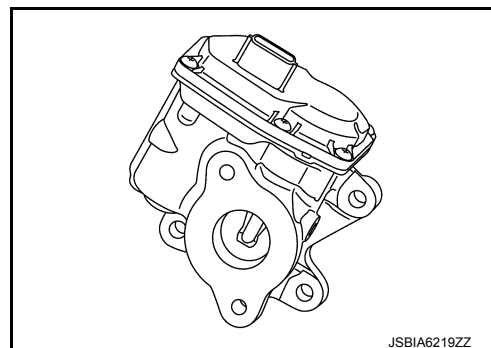
EGR VOLUME CONTROL VALVE

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

The exhaust gases flow from the exhaust manifold (upstream of the turbocharger) is injected in the inlet manifold through the EGR volume control valve. The EGR volume control valve is located in the air circuit between the throttle valve and the intake manifold. The EGR volume control valve runs on a DC current, and is controlled by a high current generating circuit in the ECM.



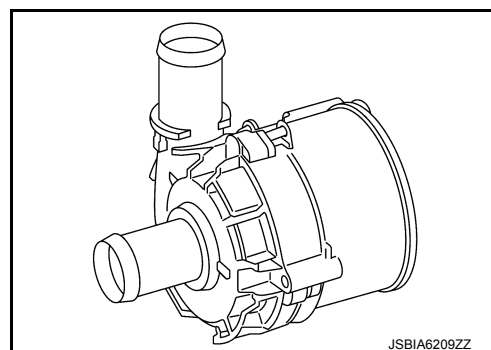
EGR VOLUME CONTROL VALVE POSITION SENSOR

The EGR volume control valve position sensor is installed to the EGR volume control valve. The EGR volume control valve position is read by a position sensor. At reset, the valve is fully closed.

Electric EGR cooling water pump

INFOID:0000000014267764

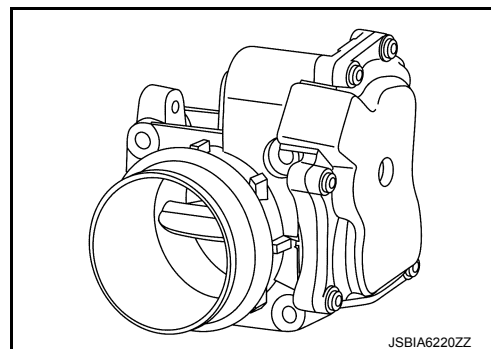
Electric EGR cooling water pump controls the volume of engine coolant flowing from the coolant circuit to the EGR cooler. The mechanical coolant pump does not provide sufficient circulation in all the branches (size and complexity of the circuit). Therefore, an electric coolant pump, which is activated when the engine is running, improves the coolant circulation, particularly in the EGR.



Electric Throttle Control Actuator

INFOID:0000000014267765

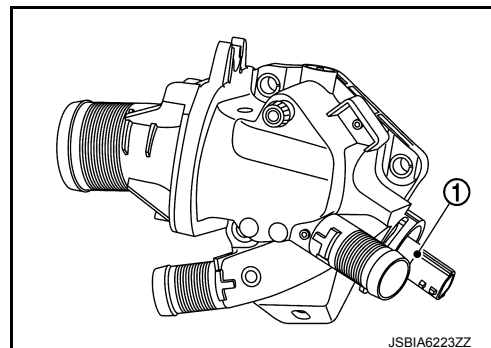
The Electric Throttle Control Actuator consists of position sensor, throttle valve, and DC motor. The throttle valve is a DC valve controlled by a high current generating circuit in the ECM. The flap position is read by a position sensor.



Engine Coolant Temperature Sensor

INFOID:0000000014267766

The engine coolant temperature (ECT) sensor ① is used to detect the engine coolant temperature.



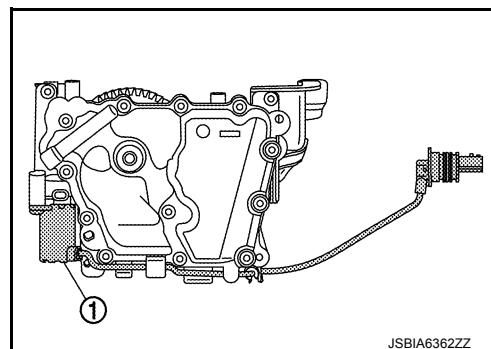
<Reference data>

Engine coolant temperature °C (°F)	Resistance (Approx.) kΩ
-10 (14)	11.33 – 13.59
25 (77)	2.140 – 2.364
80 (176)	0.274 – 0.290
110 (230)	0.112 – 0.117

Engine Oil Pump Control Valve

INFOID:0000000014267767

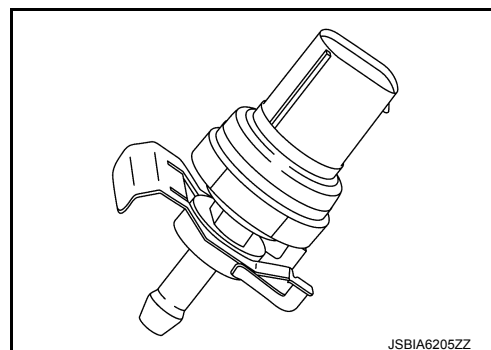
Engine oil pump control valve ① is to adapt the oil pressure to the strict necessary and then to limit the torque absorbed by the oil pump in order to reduce the fuel consumption.



Exhaust Gas Pressure Sensor

INFOID:0000000014267768

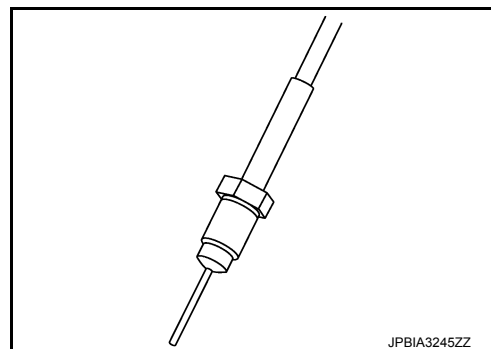
Exhaust gas pressure sensor measures exhaust gas pressure around turbocharger outlet, converts it to voltage signal and transmits it to ECM. ECM controls turbocharger boost pressure according to this signal.



Exhaust Gas Temperature Sensor 1

INFOID:0000000014267769

The exhaust gas temperature (EGT) sensor is located on the exhaust manifold. The sensor detects the exhaust gas temperature before turbocharger. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the exhaust gas temperature input.



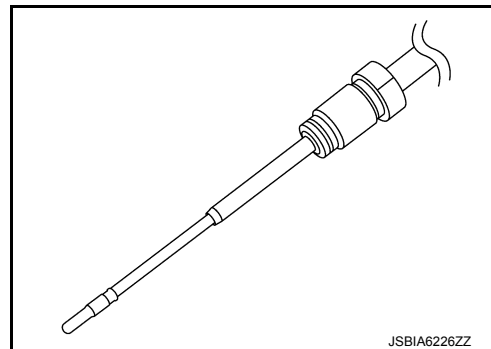
<Reference data>

Exhaust gas temperature °C (°F)	Resistance (Approx.) kΩ
100 (212)	371.245 – 467.392
200 (392)	30.282 – 35.433
400 (752)	1.772 – 1.908
800 (1472)	0.131 – 0.135

Exhaust Gas Temperature Sensor 2

INFOID:0000000014267770

Exhaust gas temperature sensor 2 is installed on the downstream of catalyst. The sensor uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rises.



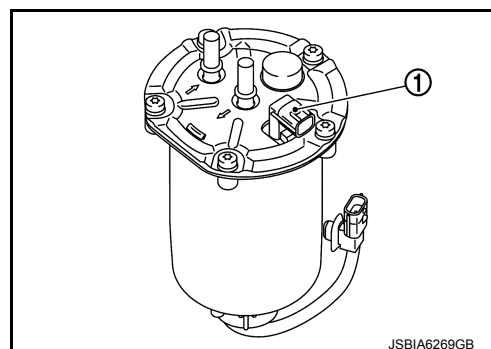
<Reference data>

Exhaust gas temperature °C (°F)	Resistance (Approx.) kΩ
0 (32)	159.8 – 309.4
20 (68)	89.3 – 159.8
100 (212)	15.2 – 22.1
300 (572)	1.307 – 1.562
400 (752)	0.606 – 0.697

Fuel Heater

INFOID:0000000014267771

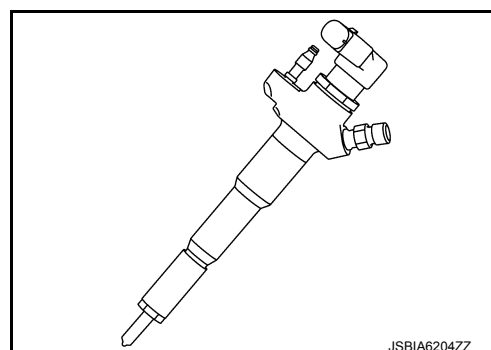
Fuel heater ① is installed on fuel filter and operated when fuel temperature is low in order to inhibit fuel solidification caused by wax content separation in fuel.



Fuel Injector

INFOID:0000000014267772

The injectors are piezo injectors. The injection is triggered by an electrical current pulse applied to the injection nozzle holder based on the previously computed data. The injectors have a code exhibiting unique characteristics, and fuel injection quantity can be controlled with more precision by writing the code into ECM.



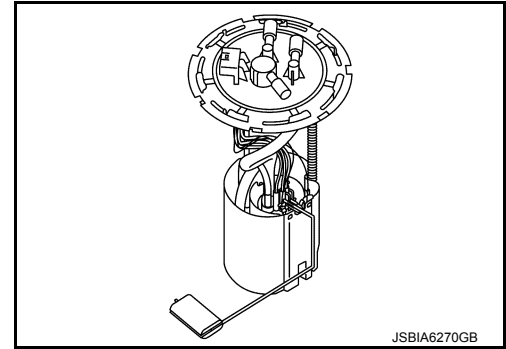
Fuel Pump

INFOID:0000000014267773

The fuel pump is installed in the fuel tank to start the engine faster. Fuel pump is controlled by Fuel pump relay and FPCM (Fuel Pump Control Module).

CAUTION:

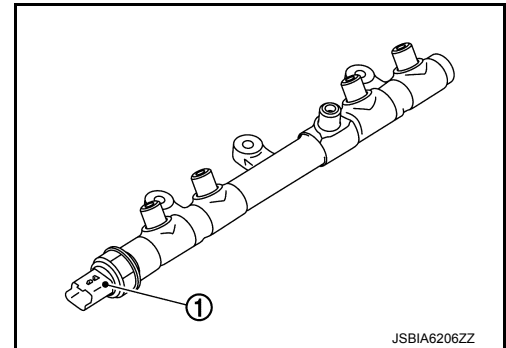
Fuel pump is lubricated by the fuel in the tank. Never operate the pump for a long time without fuel in the tank to prevent serious damages.



Fuel Rail Pressure Sensor

INFOID:0000000014267774

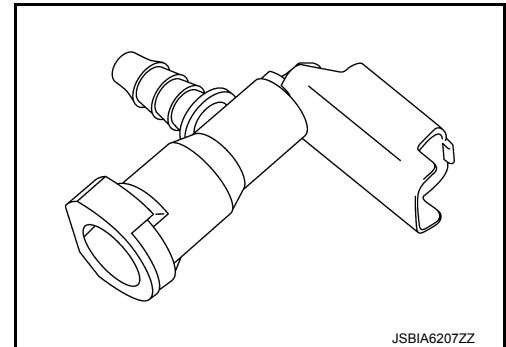
The fuel rail pressure (FRP) sensor ① is placed to the fuel rail. It measures the fuel pressure in the fuel rail. The sensor sends voltage signal to the ECM. As the pressure increases, the voltage rises. ECM operates fuel flow actuator according to feedback signal from fuel rail pressure sensor, and controls fuel pressure inside fuel rail.



Fuel Temperature Sensor

INFOID:0000000014267775

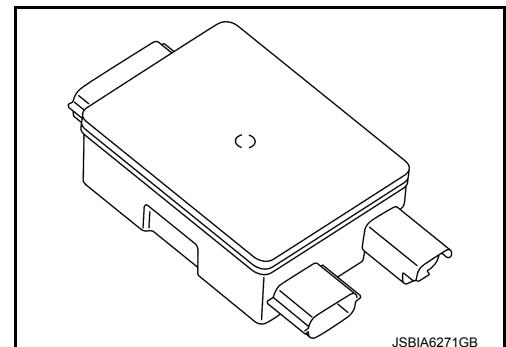
Fuel temperature sensor measures fuel temperature inside fuel tube of engine room. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



FPCM (Fuel Pump Control Module)

INFOID:0000000014267776

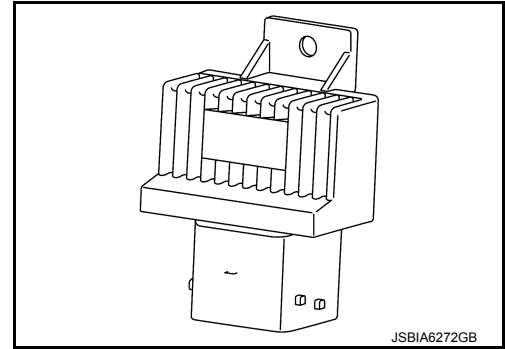
FPCM (Fuel Pump Control Module) controls fuel pump in safety drive mode (max. discharge fix rate).



Glow Control Unit

INFOID:0000000014267777

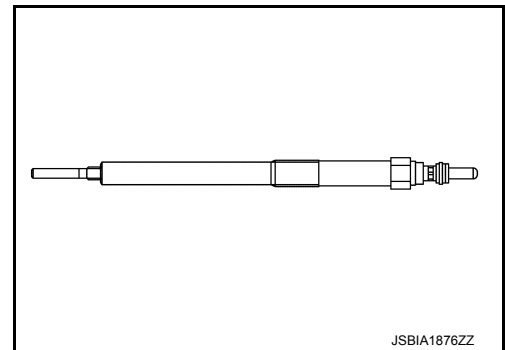
Glow Control Unit performs PWM (Pulse Width Modulation) communication with ECM. It improves engine starting function by performing glow control.



Glow Plug

INFOID:0000000014267778

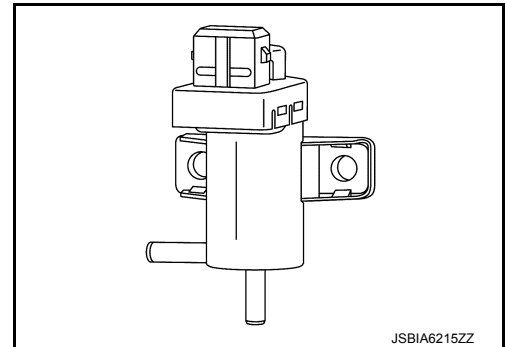
The glow plug is located in the cylinder head, in order to stabilize combustion and keep good cold start performance. The glow plug glows in response to a signal sent from the ECM, allowing current to flow through the glow plug via the glow control unit.



High Pressure Compressor Bypass Valve Control Solenoid Valve

INFOID:0000000014267779

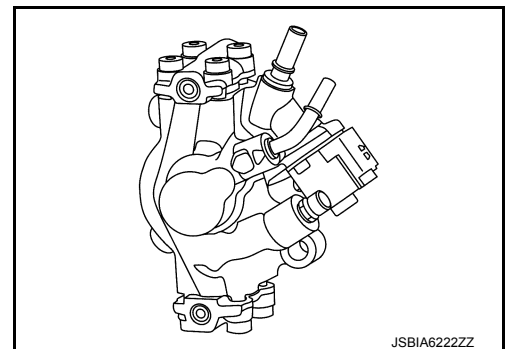
This solenoid valve is placed between the vacuum pump and the HP compressor bypass. The solenoid valve output pressure is between ambient pressure and vacuum pump pressure. The ECM controls the closing rate of the HP compressor bypass valve with an on/off signal. The activation of the HP compressor bypass valve is linked to HP turbocharger activation.



High Pressure Fuel Pump

INFOID:0000000014267780

High Pressure Fuel Pump is operated by high pressure fuel pump drive pinion, installed at camshaft. The high pressure fuel pump inlets fuel transported through fuel filter and performs pressure feed to fuel rail. The pump includes fuel flow actuator which enables adjustment of fuel rail pressure.



COMPONENT PARTS

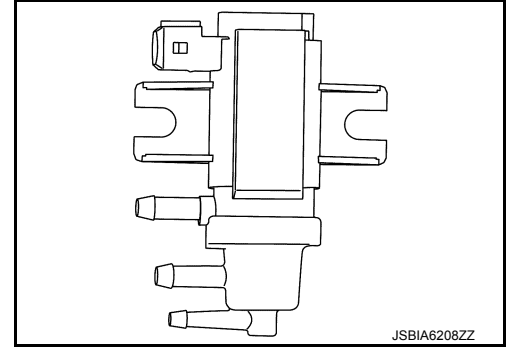
< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

High Pressure Turbine Bypass Valve Control Solenoid Valve

INFOID:0000000014267781

This solenoid valve is placed between the vacuum pump and the HP turbine bypass. The solenoid valve output pressure is between ambient pressure and vacuum pump pressure. The ECM controls the closing rate of the HP turbine bypass valve according to a PWM signal. The boost pressure is increased or decreased by closing/opening the HP turbine bypass valve.



Intake Air Temperature Sensor 1

INFOID:0000000014267782

The intake air temperature (IAT) sensor 1 is built-into the mass air flow sensor. The sensor detects intake air temperature and transmits a signal to the ECM.

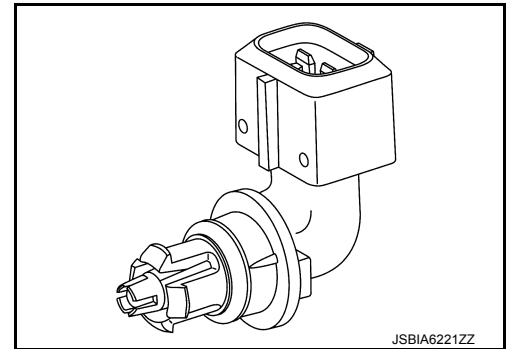
<Reference data>

Intake air temperature °C (°F)	Resistance (Approx.) kΩ
-10 (14)	8.628 – 9.577
10 (50)	3.524 – 3.841
20 (68)	2.342 – 2.531
30 (86)	1.585 – 1.715
50 (122)	0.769 – 0.844

Intake Air Temperature Sensor 2

INFOID:0000000014267783

The Intake Air Temperature (IAT) Sensor 2 is located on the downstream of charge air cooler. The sensor detects intake air temperature and transmits a signal to the ECM.



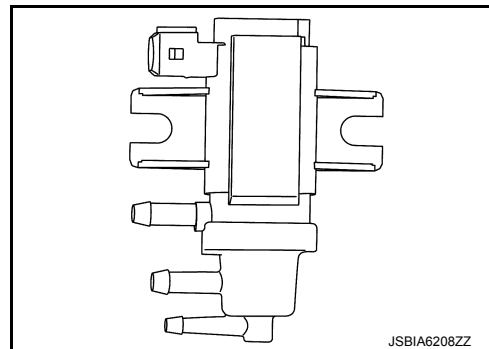
<Reference data>

Intake air temperature °C (°F)	Resistance (Approx.) kΩ
-10 (14)	9.529 – 9.540
10 (50)	3.812 – 3.821
20 (68)	2.502 – 2.510
30 (86)	1.680 – 1.689
50 (122)	0.804 – 0.811

Low Pressure Wastegate Valve Boost Control Solenoid Valve

INFOID:0000000014267784

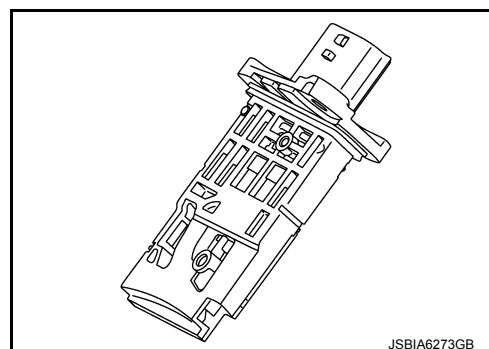
This solenoid valve is placed between the vacuum pump and the LP wastegate. The solenoid valve output pressure is between ambient pressure and vacuum pump pressure. The ECM controls the closing rate of the LP wastegate valve according to a PWM signal. The boost pressure is increased or decreased by closing/opening the LP wastegate valve.



Mass Air Flow Sensor

INFOID:0000000014267785

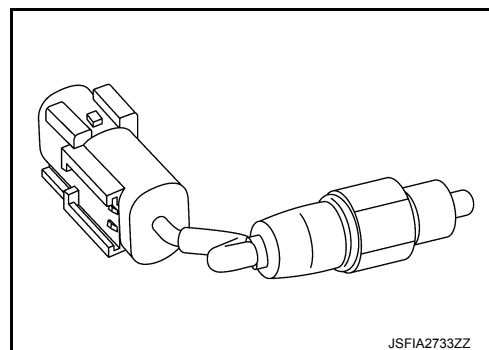
Engine fresh air flow is measured with a MAF sensor (frequency sensor). The intake air temperature (IAT) sensor 1 is built-into the mass air flow sensor.



Park/Neutral position Switch

INFOID:0000000014267786

Park/neutral position switch detects that the transmission is in neutral position and transmits a park/neutral signal to ECM.



Refrigerant Pressure Sensor

INFOID:0000000014267787

The refrigerant pressure sensor is installed at the liquid tank of the air conditioner system. The sensor is used to sense a refrigerant pressure.

Stop Lamp Switch & Brake Pedal Position Switch

INFOID:0000000014267788

STOP LAMP SWITCH

Stop lamp switch signal is sent to ECM via CAN communication line from METER or BCM. This signal is used mainly to decrease the engine speed when the vehicle is driving.

BRAKE PEDAL POSITION SWITCH

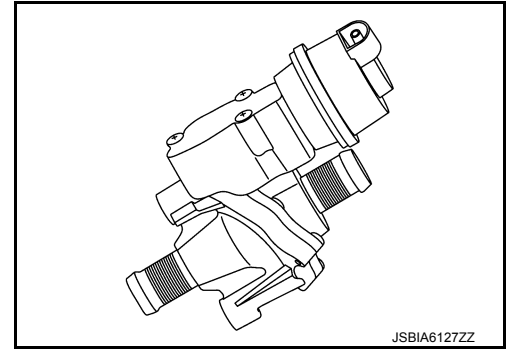
Brake pedal position switch is installed to brake pedal bracket.

ECM detects the state of the brake pedal according to the input signal sent from brake pedal position switch.

Thermo Management Valve

INFOID:0000000014267789

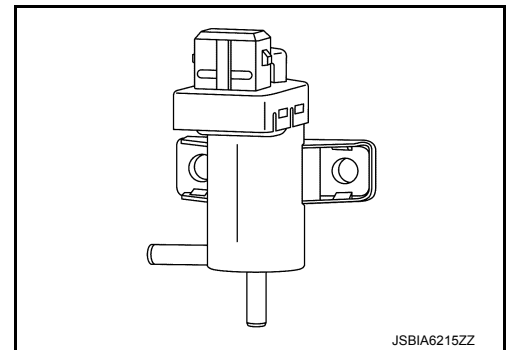
Thermo management valve switches the flow passage of engine coolant. This valve is controlled by thermo management valve control solenoid valve.



Thermo Management Valve Control Solenoid Valve

INFOID:0000000014267790

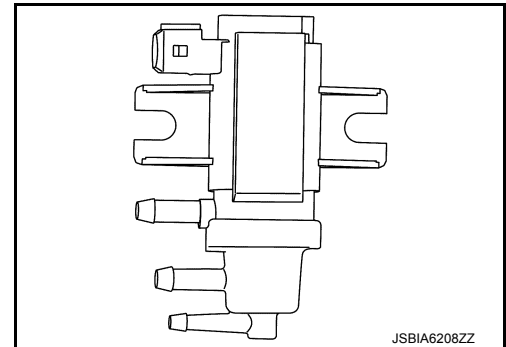
Thermo management valve control solenoid valve is controlled by ECM. The solenoid valve controls negative pressure given to diaphragm of thermo management valve. When thermo management valve control solenoid valve is activated, it opens solenoid valve and gives negative pressure from vacuum pump to diaphragm of thermo management valve.



Turbocharger Boost Control Solenoid Valve

INFOID:0000000014267791

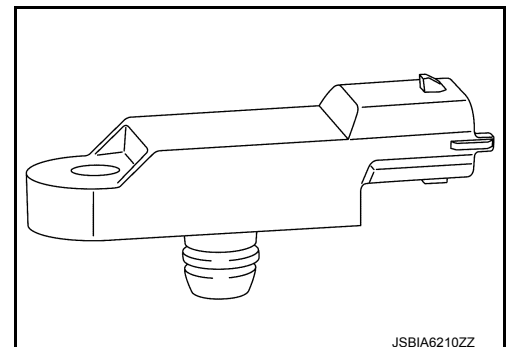
This solenoid valve is placed between the vacuum pump and the wastegate turbocharger. The solenoid valve output pressure is between ambient pressure and vacuum pump pressure. The solenoid valve closes the wastegate valve when PWM signal is in the high frequency area.



Turbocharger Boost Sensor

INFOID:0000000014267792

The turbocharger boost sensor detects pressure in the charge air cooler outlet area. The boost pressure sensor is used to get the boost pressure information in order to adapt the inlet manifold pressure to the setpoint.



COMPONENT PARTS

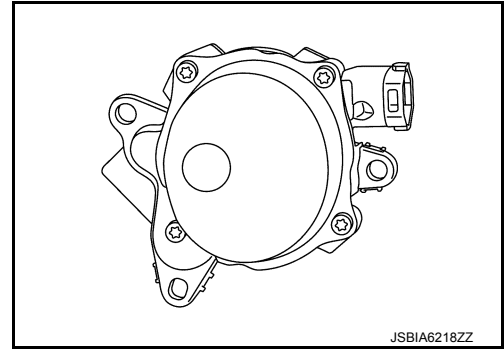
< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Vacuum Pump

INFOID:0000000014267793

Vacuum pump generates the negative pressure. The negative pressure is controlled by each solenoid and operates each actuator.



Water In Fuel Sensor

INFOID:0000000014267794

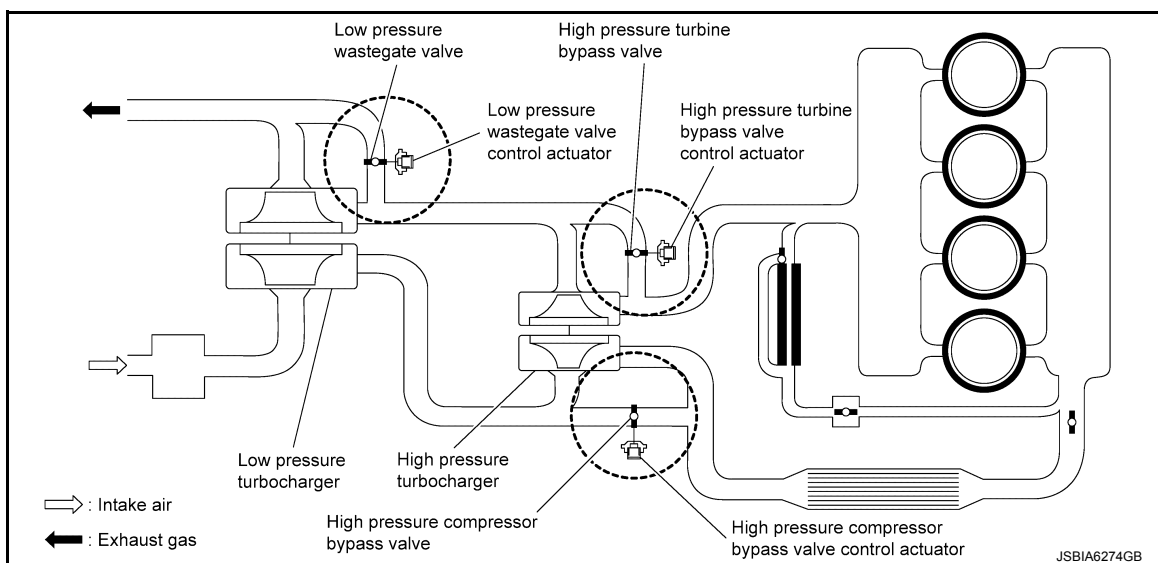
Water in fuel sensor is integrated in the drain plug and detects the water in the fuel filter. Refer to [EC-441](#), "[COMBUSTION CONTROL : System Description](#)".

STRUCTURE AND OPERATION

TURBOCHARGER BOOST CONTROL (YS23DDTT)

TURBOCHARGER BOOST CONTROL (YS23DDTT) : System Diagram

INFOID:0000000014267795



TURBOCHARGER BOOST CONTROL (YS23DDTT) : System Description

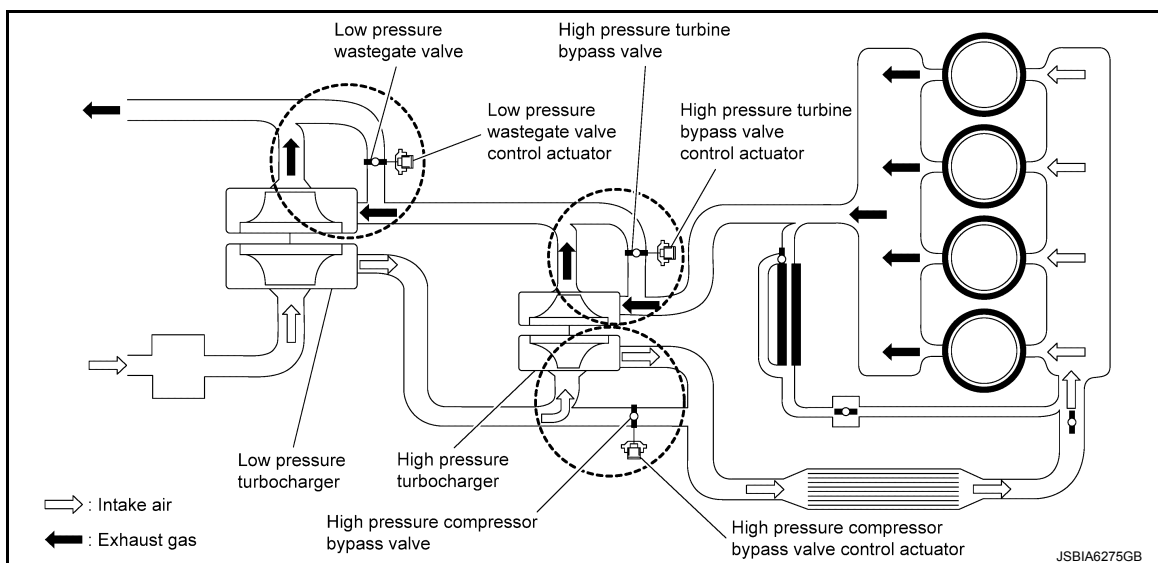
DESCRIPTION

This turbocharger boost control is used by connecting small turbocharger (high pressure turbocharger) and large turbocharger (low pressure turbocharger) in series. The high pressure turbocharger is installed just behind the exhaust manifold and is a small turbine appropriate to the driving range of small exhaust gas flow. The low pressure turbocharger is installed to the downstream of the high pressure turbocharger and has a large turbine appropriate to the driving range of large exhaust gas flow.

The exhaust gas flows in the order of high pressure turbocharger and low pressure turbocharger. These two turbochargers have a bypass path, respectively.

TURBOCHARGER BOOST CONTROL OF EACH CONDITION

Exhaust gas flow rate: Low



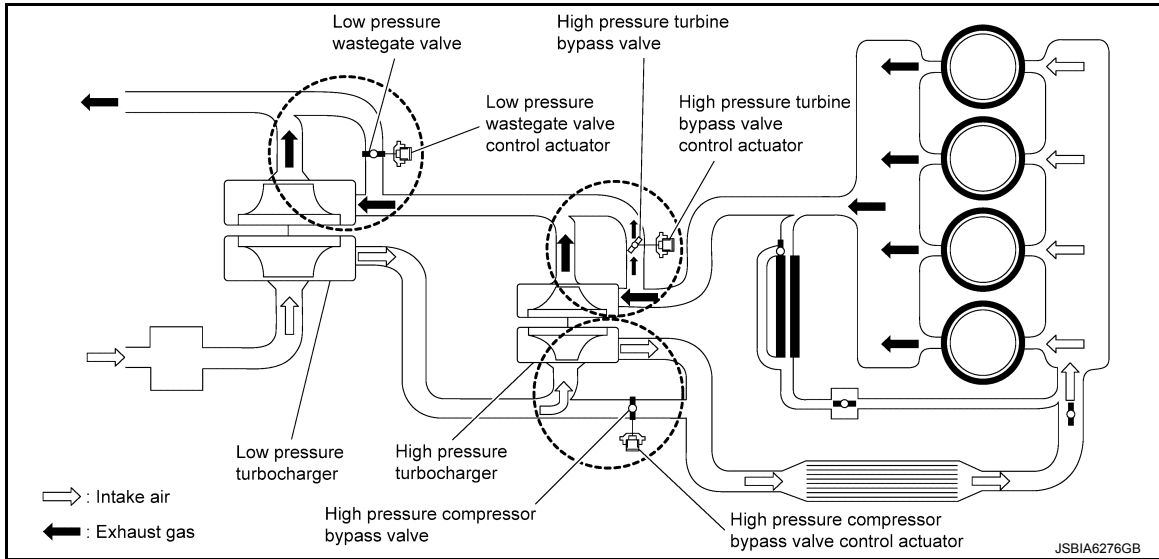
STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

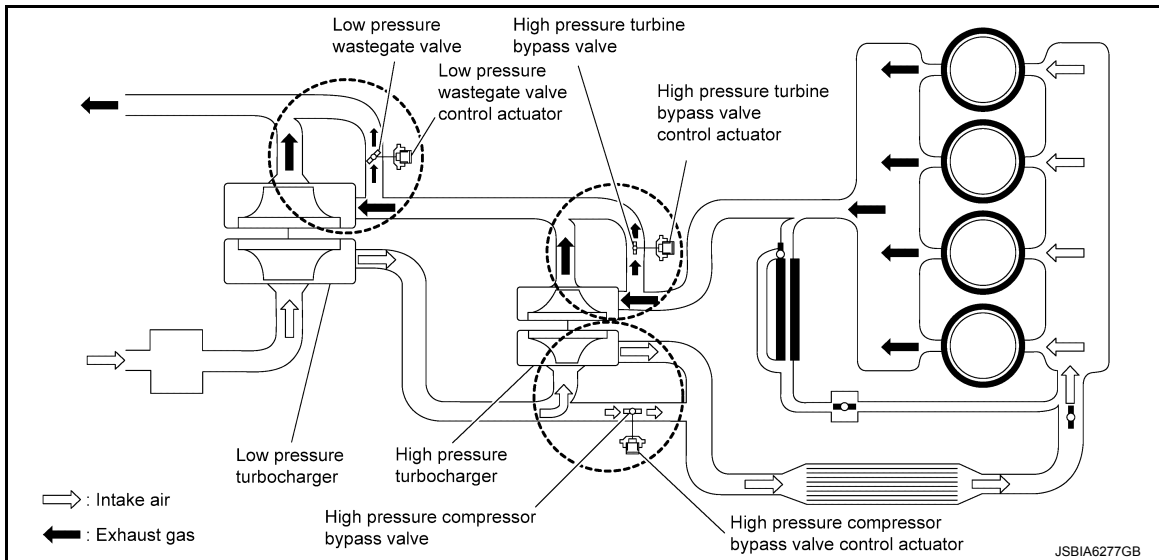
Name	High pressure compressor bypass valve	High pressure turbine bypass valve	Low pressure wastegate valve
Condition	FULL CLOSED	FULL CLOSED	FULL CLOSED

Exhaust gas flow rate: Medium - High



Name	High pressure compressor bypass valve	High pressure turbine bypass valve	Low pressure wastegate valve
Condition	FULL CLOSED	MIDDLE OPEN to FULL OPEN	FULL CLOSED

Exhaust gas flow rate: Maximum



Name	High pressure compressor bypass valve	High pressure turbine bypass valve	Low pressure wastegate valve
Condition	FULL OPEN	FULL OPEN	MIDDLE OPEN (control)

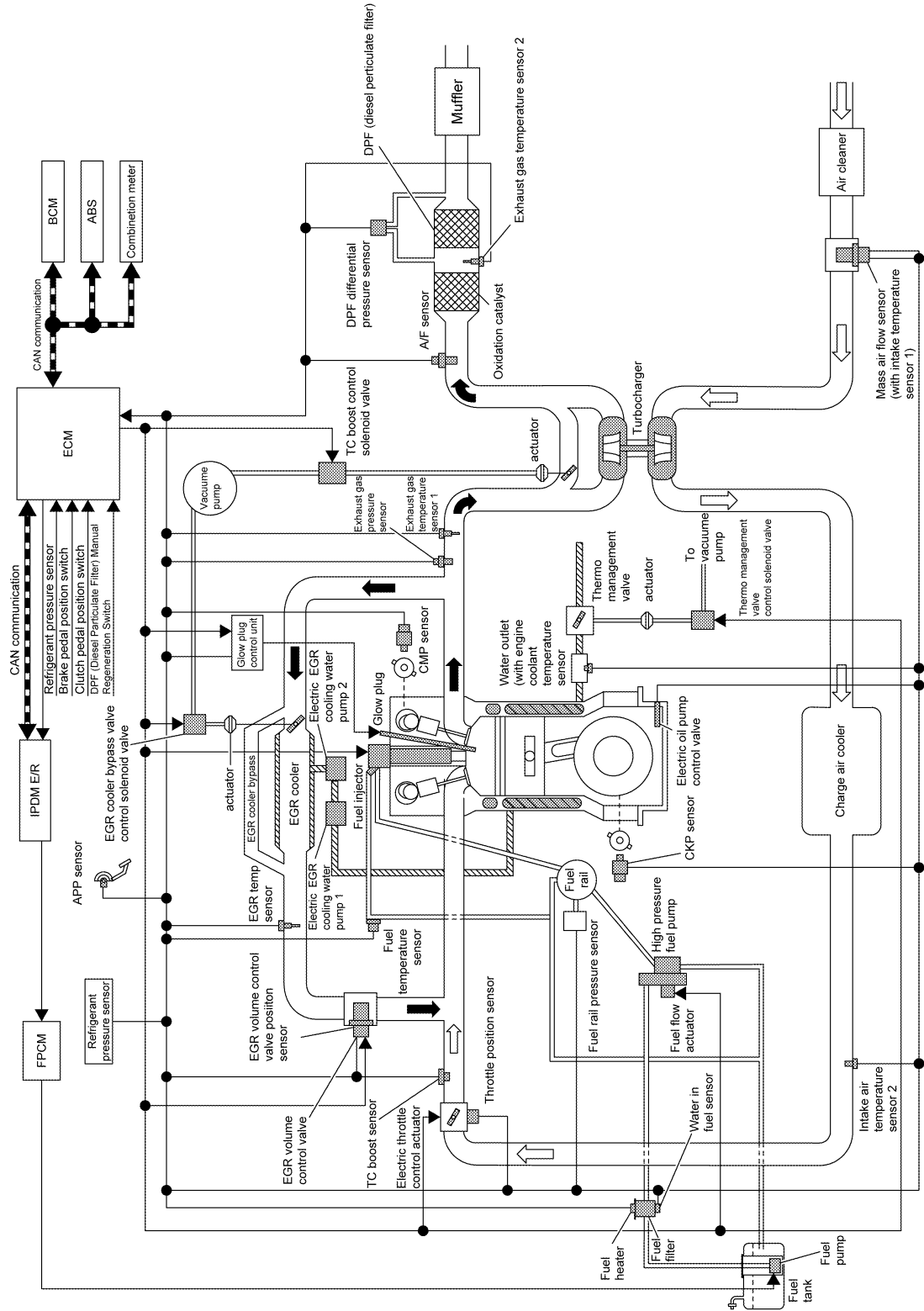
SYSTEM

ENGINE CONTROL SYSTEM (YS23DDT)

ENGINE CONTROL SYSTEM (YS23DDT) : System Description

INFOID:000000014267797

SYSTEM DIAGRAM



JSBIA6300GB

SYSTEM DESCRIPTION

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

ECM controls the engine by various functions.

Function	Reference
Engine speed control	EC-436, "ENGINE SPEED CONTROL : System Description"
Powertrain coordination control	EC-437, "POWERTRAIN COORDINATION CONTROL : System Description"
Turbocharger boost control	EC-437, "TURBOCHARGER BOOST CONTROL (YS23DDT) : System Description"
EGR system	EC-438, "EGR SYSTEM : System Description"
Throttle control	EC-439, "THROTTLE CONTROL : System Description"
Engine torque control	EC-439, "ENGINE TORQUE CONTROL : System Description"
Combustion control	EC-441, "COMBUSTION CONTROL : System Description"
After treatment system	EC-443, "AFTER TREATMENT SYSTEM : System Description"
Thermostat control	EC-444, "THERMOSTAT CONTROL : System Description"
Glow control	EC-445, "GLOW CONTROL : System Description"
ASCD (Automatic Speed Control Device)	EC-445, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description"
Information display (Combination meter)	EC-446, "WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp" EC-447, "WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)" EC-448, "WARNING LAMPS/INDICATOR LAMPS : Glow Indicator Lamp" EC-450, "WARNING LAMPS/INDICATOR LAMPS : DPF (Diesel Particulate Filter) Warning Lamp"
Warning/Indicator/Chime	EC-453, "WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps" EC-453, "WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)"
CAN communication	EC-453, "CAN COMMUNICATION : System Description"

VACUUM HOSE DRAWING

For vacuum hose drawing, refer to [EC-792, "YS23DDT : Vacuum Layout"](#).

ENGINE CONTROL SYSTEM (YS23DDT) : Fail-safe

INFOID:0000000014267798

ENGINE CONTROL SYSTEM

DTC No.	Detected items	Engine operating condition in fail-safe mode
U0121 U0415	CAN communication circuit	VDC deactivation
P0001	Fuel flow actuator circuit	- Pressure limiting valve opening - EGR valve closed - Throttle valve opened - DPF regeneration forbidden - ASCD deactivation - VDC deactivation - Rail pressure limitation - Freeshift inhibited

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0002	Fuel rail pressure	• EGR valve closed • Throttle valve opened • Rail pressure limitation • Freeshift inhibited • ASCD deactivation • DPF regeneration forbidden • VDC deactivation • A/T in limp home • Pressure limiting valve opening • Not limitation of calibrated performance • FMO: Cancellation regulator • FMO: Stop of the adaptation • Strong vehicle speed limitation (30km/h) • Torque limitation • Inhibition of regulation mode of fuel pressure regulator
P0045	Turbo solenoid valve control circuit	• Torque limitation • EGR valve closed • Throttle valve opened • Boost regulation cut off • DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation
P0087	Fuel rail pressure	• DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation
P0089		• DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation • EGR valve closed • Throttle valve opened • VDC deactivation
P0095	Intake air temperature sensor 2	• EGR valve closed • Throttle valve opened • Torque limitation • Oil vapor heater activated when engine is running • Engine speed attachment detection inhibited
P0100 P0101	Mass air flow sensor	• EGR valve closed • Throttle valve opened
P0105 P0106	TC boost sensor	• EGR valve closed • Throttle valve opened • Limited boost pressure regulation • DPF regeneration forbidden • ASCD deactivation • Freeshift Inhibited • Increased idle speed • Wastegate cut off • Torque limitation
P0110	Intake air temperature sensor 1	• EGR valve closed • Throttle valve opened
P0115	Engine coolant temperature sensor circuit	• After sales and factory routines inhibited • Engine speed limitation • EGR valve closed • Throttle valve opened • DPF regeneration forbidden • EGR cooling valve activated • Increased idle speed • Torque limitation • Intake air temperature sensor 2 value frozen • Modelized coolant liquid temperature

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode	
P0120	Throttle position sensor	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Airflow regulation cut off • Compression test routine forbidden • ASCD deactivation • Freeshift inhibited	A EC
P0135 P2244	A/F sensor circuit	Stop closed-loop control	C
P0190	Fuel rail pressure sensor	• EGR valve closed • Throttle valve opened • Rail pressure limitation • DPF regeneration forbidden • After sale routines forbidden • ASCD deactivation • Freeshift inhibited • VDC deactivation	D E
P0200	Injector control circuit	• EGR valve closed • Throttle valve opened • VDC deactivation • ASCD deactivation with dashboard message • DPF regeneration forbidden • Increased idle speed	F G
P0201 P0202 P0203 P0204	Fuel injector circuit	• EGR valve closed • Throttle valve opened • ASCD deactivation • DPF regeneration forbidden • Increased idle speed	H
P0217	Brake/accelerator pedal positions	• Cooling FAN Activated • Controlled shutters opening • Warning overheating lamp activated • Opening of the engine coolant thermostat (request of ineffective opening in that case) • EGR control cut off • A/C compressor cut-off	I J
P0225	Accelerator pedal position sensor 1circuit	• Torque limitation • After sales and factory routines inhibited • Freeshift inhibited • ASCD deactivation	K L
P0226	Brake/accelerator pedal positions	• Torque limitation • Pedal limp home activated • After sales and factory routines inhibited • Freeshift Inhibited • ASCD deactivation	M
P0263 P0266 P0269 P0272	Fuel injector calibration	• Throttle valve opened • EGR valve closed • DPF regeneration forbidden • Freeshift Inhibited • ASCD deactivation • VDC deactivation • A/T in limp home • Increased idle speed	N O
P0335	Crankshaft position sensor	• Throttle valve opened • EGR valve closed • DPF regeneration forbidden • Engine speed limitation • Torque limitation • VDC deactivation	P

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0340	Camshaft position sensor circuit	• Synchronization on the exhaust CAM • Intake variable valve timing control deactivation • Inhibition of the variable valve timing control (setpoint = 0) • Inhibition of the variable valve timing control command (% PWM = 0) • variable valve timing control angular position set to 0 and inhibition of the variable valve timing control
P0402	EGR system	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited
P0403		• EGR valve closed • Throttle valve opened
P0409	EGR volume control valve control position sensor circuit	• EGR valve closed • Stop closed-loop control • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited
P0470	Exhaust gas pressure sensor	• Boost pressure limitation • EGR valve closed • Throttle valve opened • ASCD deactivation • Freeshift inhibited • DPF regeneration forbidden
P0471		• Boost pressure limitation • EGR valve closed • Throttle valve opened • ASCD deactivation • Freeshift inhibited • DPF regeneration forbidden • Torque limitation
P0487	EGR volume command circuit	• EGR valve closed • Throttle valve opened • Stop closed-loop control • Freeshift inhibited • DPF regeneration forbidden • ASCD deactivation
P0488	EGR valve position control	• EGR valve closed • Throttle valve opened • Freeshift inhibited • ASCD deactivation • DPF regeneration forbidden
P0504	Stop lamp switch	• No coherency between wiring and CAN information for brake pedal • ASCD deactivation
P0525	ASCD system	ASCD deactivation
P0530	Refrigerant pressure sensor	A/C deactivation
P0544	Exhaust gas temperature sensor 1 circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited • After sales and factory routines inhibited

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode	
P0560	Battery voltage	• Mechanically activated throttle limp-home • Torque limitation • VDC deactivation • Glow plug circuit deactivated • Inhibition of idle speed control • Factory and after sales routines inhibited • Freeshift Inhibited • ASCD deactivation • Wastegate cut off • A/T in limp home if A/T • Deactivation of the variable valve timing control	A EC C
P0564 P0575	ASCD steering switch	ASCD deactivation	D
P0571	Brake switch	ASCD deactivation	E
P0606	ECM	• Freeshift Inhibited • ASCD deactivation	F
P060A		• Reset ECM • VDC deactivation	
P060B		• Engine speed limitation	G
P062B		• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Increased idle speed • ASCD deactivation • Freeshift inhibited • VDC deactivated and A/T in limp home mode	H
P0638 P2100 P2119	Electric throttle control actuator	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Compression test routine inhibited • Airflow regulation cut off • ASCD deactivation • Freeshift inhibited	I
P0641	Sensor power supply	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Limited boost pressure regulation • Torque limitation • ASCD deactivation • Boost pressure limitation	J
P0651		• A/C deactivation • Torque limitation • ASCD deactivation • Freeshift inhibited • After sales routines forbidden • FAN 2 activation	K
P0697		• EGR valve closed • Throttle valve opened • Rail pressure limitation • DPF regeneration forbidden • After sales routines forbidden • ASCD deactivation • Freeshift inhibited • VDC deactivation	L
P0703	Brake switch	• Engine speed limitation • No coherency between wiring and CAN information for brake pedal	M
P0833	DPF pressure sensor	ASCD not available	N

SYSTEM

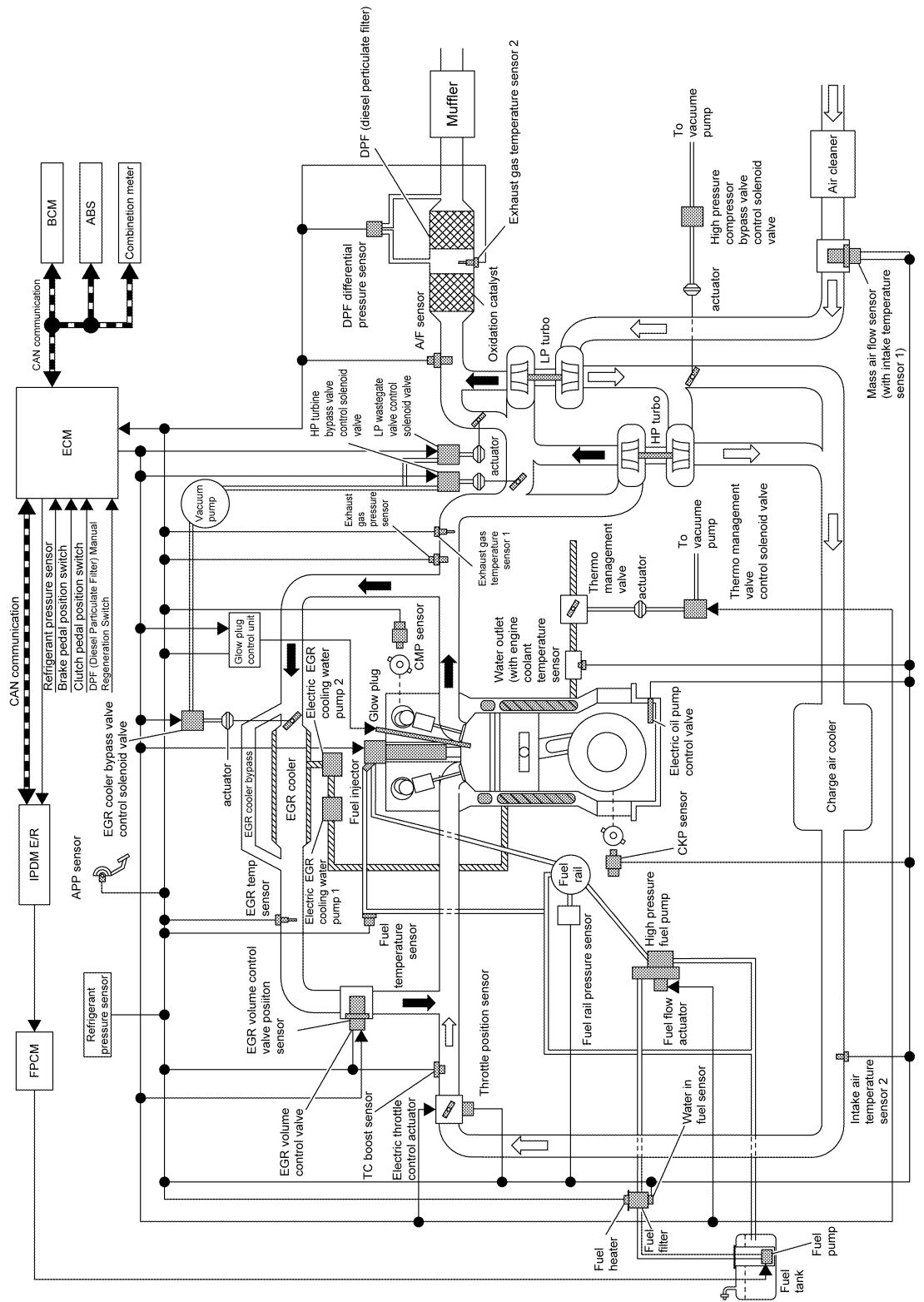
< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode
P1453	DPF pressure sensor	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden
P1525	ASCD system	ASCD deactivation
P1544	Exhaust gas temperature sensor 2 circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited
P1620	ECM	Stop closed-loop control
P1675	Engine coolant temperature	Stop closed-loop control
P2002	Diesel particulate filter	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited
P2120	Accelerator pedal position sensor 2 circuit	• Torque limitation • Freeshift inhibited • ASCD deactivation • After sales and factory routines inhibited
P2226	Atmosphere pressure sensor	• EGR valve is closed position • Throttle valve opened • DPF regeneration forbidden
P2263	Turbocharger boost sensor circuit	• EGR valve closed • Throttle valve opened • Torque limitation • ASCD deactivation • Freeshift is inhibited • Wastegate activation is inhibited • VDC deactivation • DPF regeneration forbidden
P2452	Diesel particulate filter pressure sensor circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden
P245A	EGR cooler bypass control solenoid valve	• EGR regulation cut off • EGR valve closed • Throttle valve opened
P24A7 P24A8	Electric EGR cooling water pump	• Electric EGR cooling water pump at maximum speed • Electric EGR cooling water pump blocked, no flow • Electric EGR cooling water pump cut off • Above 137°C (278.6°F), Electric EGR water pump speed reduction (at 77%)
P253F	Engine oil dilution	• DPF regeneration forbidden • Torque limitation • EGR valve closed • Throttle valve opened
P2681	Engine coolant bypass valve circuit	• Engine cooling fan activation • Throttle valve opened • EGR valve closed

ENGINE CONTROL SYSTEM (YS23DDTT)

SYSTEM DIAGRAM



JSBIA6301GB

SYSTEM DESCRIPTION

ECM controls the engine by various functions.

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Function	Reference
Engine speed control	EC-436, "ENGINE SPEED CONTROL : System Description"
Powertrain coordination control	EC-437, "POWERTRAIN COORDINATION CONTROL : System Description"
Turbocharger boost control	EC-438, "TURBOCHARGER BOOST CONTROL (YS23DDTT) : System Description"
EGR system	EC-438, "EGR SYSTEM : System Description"
Throttle control	EC-439, "THROTTLE CONTROL : System Description"
Engine torque control	EC-439, "ENGINE TORQUE CONTROL : System Description"
Combustion control	EC-441, "COMBUSTION CONTROL : System Description"
After treatment system	EC-443, "AFTER TREATMENT SYSTEM : System Description"
Thermostat control	EC-444, "THERMOSTAT CONTROL : System Description"
Glow control	EC-445, "GLOW CONTROL : System Description"
ASCD (Automatic Speed Control Device)	EC-445, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description"
Information display (Combination meter)	• EC-446, "WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp" • EC-447, "WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)" • EC-448, "WARNING LAMPS/INDICATOR LAMPS : Glow Indicator Lamp" • EC-450, "WARNING LAMPS/INDICATOR LAMPS : DPF (Diesel Particulate Filter) Warning Lamp"
Warning/Indicator/Chime	• EC-453, "WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps" • EC-453, "WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)"
CAN communication	EC-453, "CAN COMMUNICATION : System Description"

VACUUM HOSE DRAWING

For vacuum hose drawing, refer to [EC-795, "YS23DDTT : Vacuum Layout"](#).

ENGINE CONTROL SYSTEM (YS23DDTT) : Fail-safe

INFOID:0000000014267800

ENGINE CONTROL SYSTEM

DTC No.	Detected items	Engine operating condition in fail-safe mode
U0121 U0415	CAN communication circuit	VDC deactivation
P0001	Fuel flow actuator circuit	• Pressure limiting valve opening • EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • VDC deactivation • Rail pressure limitation • Freeshift inhibited

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode	
P0002	Fuel rail pressure	• EGR valve closed • Throttle valve opened • Rail pressure limitation • Freeshift inhibited • ASCD deactivation • DPF regeneration forbidden • VDC deactivation • A/T in limp home • Pressure limiting valve opening • Not limitation of calibrated performance • FMO: Cancellation regulator • FMO: Stop of the adaptation • Strong vehicle speed limitation (30km/h) • Torque limitation • Inhibition of regulation mode of fuel pressure regulator	A EC C D E
P0033	HP compressor bypass valve control solenoid valve	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Boost regulation cut off	F
P0045	Turbo solenoid valve control circuit	• Torque limitation • EGR valve closed • Throttle valve opened • Boost regulation cut off • DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation	G
P004A	HP turbine bypass valve control solenoid valve	HP turbine bypass valve control solenoid valve opened (open loop)	H
P0087	Fuel rail pressure	• DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation	I
P0089		• DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation • EGR valve closed • Throttle valve opened • VDC deactivation	J
P0095	Intake air temperature sensor 2	• EGR valve closed • Throttle valve opened • Torque limitation • Oil vapor heater activated when engine is running • Engine speed attachment detection inhibited	K
P0100 P0101	Mass air flow sensor	• EGR valve closed • Throttle valve opened	L
P0105 P0106	TC boost sensor	• EGR valve closed • Throttle valve opened • Limited boost pressure regulation • DPF regeneration forbidden • ASCD deactivation • Freeshift Inhibited • Increased idle speed • Wastegate cut off • Torque limitation	M
P0110	Intake air temperature sensor 1	• EGR valve closed • Throttle valve opened	N
			O
			P

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0115	Engine coolant temperature sensor circuit	• After sales and factory routines inhibited • Engine speed limitation • EGR valve closed • Throttle valve opened • DPF regeneration forbidden • EGR cooling valve activated • Increased idle speed • Torque limitation • Intake air temperature sensor 2 value frozen • Modelized coolant liquid temperature
P0120	Throttle position sensor	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Airflow regulation cut off • Compression test routine forbidden • ASCD deactivation • Freeshift inhibited
P0135 P2244	A/F sensor circuit	Stop closed-loop control
P0190	Fuel rail pressure sensor	• EGR valve closed • Throttle valve opened • Rail pressure limitation • DPF regeneration forbidden • After sale routines forbidden • ASCD deactivation • Freeshift inhibited • VDC deactivation
P0200	Injector control circuit	• EGR valve closed • Throttle valve opened • VDC deactivation • ASCD deactivation with dashboard message • DPF regeneration forbidden • Increased idle speed
P0201 P0202 P0203 P0204	Fuel injector circuit	• EGR valve closed • Throttle valve opened • ASCD deactivation • DPF regeneration forbidden • Increased idle speed
P0217	Brake/accelerator pedal positions	• Cooling FAN Activated • Controlled shutters opening • Warning overheating lamp activated • Opening of the engine coolant thermostat (request of ineffective opening in that case) • EGR control cut off • A/C compressor cut-off
P0225	Accelerator pedal position sensor 1circuit	• Torque limitation • After sales and factory routines inhibited • Freeshift inhibited • ASCD deactivation
P0226	Brake/accelerator pedal positions	• Torque limitation • Pedal limp home activated • After sales and factory routines inhibited • Freeshift Inhibited • ASCD deactivation

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode	
P0263 P0266 P0269 P0272	Fuel injector calibration	• Throttle valve opened • EGR valve closed • DPF regeneration forbidden • Freeshift Inhibited • ASCD deactivation • VDC deactivation • A/T in limp home • Increased idle speed	A EC
P0335	Crankshaft position sensor	• Throttle valve opened • EGR valve closed • DPF regeneration forbidden • Engine speed limitation • Torque limitation • VDC deactivation	C
P0340	Camshaft position sensor circuit	• Synchronization on the exhaust CAM • Intake variable valve timing control deactivation • Inhibition of the variable valve timing control (setpoint = 0) • Inhibition of the variable valve timing control command (% PWM = 0) • variable valve timing control angular position set to 0 and inhibition of the variable valve timing control	D E
P0402	EGR system	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited	F G
P0403		• EGR valve closed • Throttle valve opened	H
P0409	EGR volume control valve control position sensor circuit	• EGR valve closed • Stop closed-loop control • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited	I J
P0470	Exhaust gas pressure sensor	• Boost pressure limitation • EGR valve closed • Throttle valve opened • ASCD deactivation • Freeshift inhibited • DPF regeneration forbidden	K
P0471		• Boost pressure limitation • EGR valve closed • Throttle valve opened • ASCD deactivation • Freeshift inhibited • DPF regeneration forbidden • Torque limitation	L M
P0487	EGR volume command circuit	• EGR valve closed • Throttle valve opened • Stop closed-loop control • Freeshift inhibited • DPF regeneration forbidden • ASCD deactivation	N O
P0488	EGR valve position control	• EGR valve closed • Throttle valve opened • Freeshift inhibited • ASCD deactivation • DPF regeneration forbidden	P
P0504	Stop lamp switch	• No coherency between wiring and CAN information for brake pedal • ASCD deactivation	
P0525	ASCD system	ASCD deactivation	

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0530	Refrigerant pressure sensor	A/C deactivation
P0544	Exhaust gas temperature sensor 1 circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited • After sales and factory routines inhibited
P0560	Battery voltage	• Mechanically activated throttle limp-home • Torque limitation • VDC deactivation • Glow plug circuit deactivated • Inhibition of idle speed control • Factory and after sales routines inhibited • Freeshift Inhibited • ASCD deactivation • Wastegate cut off • A/T in limp home if A/T • Deactivation of the variable valve timing control
P0564 P0575	ASCD steering switch	ASCD deactivation
P0571	Brake switch	ASCD deactivation
P0606	ECM	• Freeshift Inhibited • ASCD deactivation
P060A		• Reset ECM • VDC deactivation
P060B		• Engine speed limitation
P062B		• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Increased idle speed • ASCD deactivation • Freeshift inhibited • VDC deactivated and A/T in limp home mode
P0638 P2100 P2119	Electric throttle control actuator	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Compression test routine inhibited • Airflow regulation cut off • ASCD deactivation • Freeshift inhibited

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode	
P0641	Sensor power supply	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Limited boost pressure regulation • Torque limitation • ASCD deactivation • Boost pressure limitation	A EC
P0651		• A/C deactivation • Torque limitation • ASCD deactivation • Freeshift inhibited • After sales routines forbidden • FAN 2 activation	C D
P0697		• EGR valve closed • Throttle valve opened • Rail pressure limitation • DPF regeneration forbidden • After sales routines forbidden • ASCD deactivation • Freeshift inhibited • VDC deactivation	E F
P0703	Brake switch	• Engine speed limitation • No coherency between wiring and CAN information for brake pedal	G
P0833	DPF pressure sensor	ASCD not available	H
P1453	DPF pressure sensor	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden	I
P1525	ASCD system	ASCD deactivation	J
P1544	Exhaust gas temperature sensor 2 circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited	K
P1620	ECM	Stop closed-loop control	L
P1675	Engine coolant temperature	Stop closed-loop control	M
P2002	Diesel particulate filter	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited	N
P2120	Accelerator pedal position sensor 2 circuit	• Torque limitation • Freeshift inhibited • ASCD deactivation • After sales and factory routines inhibited	O
P2226	Atmosphere pressure sensor	• EGR valve is closed position • Throttle valve opened • DPF regeneration forbidden	P
P2263	Turbocharger boost sensor circuit	• EGR valve closed • Throttle valve opened • Torque limitation • ASCD deactivation • Freeshift is inhibited • Wastegate activation is inhibited • VDC deactivation • DPF regeneration forbidden	
P2452	Diesel particulate filter pressure sensor circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden	

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode
P245A	EGR cooler bypass control solenoid valve	• EGR regulation cut off • EGR valve closed • Throttle valve opened
P24A7 P24A8	Electric EGR cooling water pump	• Electric EGR cooling water pump at maximum speed • Electric EGR cooling water pump blocked, no flow • Electric EGR cooling water pump cut off • Above 137°C (278.6°F), Electric EGR water pump speed reduction (at 77%)
P253F	Engine oil dilution	• DPF regeneration forbidden • Torque limitation • EGR valve closed • Throttle valve opened
P2681	Engine coolant bypass valve circuit	• Engine cooling fan activation • Throttle valve opened • EGR valve closed

ENGINE SPEED CONTROL

ENGINE SPEED CONTROL : System Description

INFOID:0000000014267801

SYSTEM DESCRIPTION

The engine speed control consists of the following functions:

- Curative anti-jerk
- Idle speed control
- Engine speed limitation
- Engine state

CURATIVE ANTI-JERK

This function aims to smooth the engine speed through torque corrections out of idle engine speed regulation. The torque correction is made by the anti-jerk function to damp the engine speed vibrations caused by the drive-line vibrations.

IDLE SPEED CONTROL

ECM calculates the engine idle speed set point and maintains the engine speed in order to follow the set point. The engine idle speed set-point is computed for the following load and signal:

- Post treatment
 - Diesel particulate filter
- Electric consumers
 - Air heater (air conditioning system)
- Automatic transmission
 - Automatic transmission idle speed set point function (according to coolant temperature)
 - Automatic transmission idle speed increase request
- Mechanical consumers
 - Air conditioning
- Diagnosis and protection
 - Diagnosis
 - Engine protection by oil temperature survey
 - CONSULT function
 - Manifold absolute pressure sensor signal

The final engine idle speed set point is computed from each consumer's engine idle speed set point:

- The final corrective torque of the Idle Speed Regulation is obtained taking into account proportional, integral, and derivative corrections.

ENGINE SPEED LIMITATION

ECM calculates the maximum engine speed set point and controls the maximum engine speed in order to follow the set point.

- Fail-safe mode
- Maximum available engine speed

ENGINE STATE

ECM calculates the engine state from detected engine speed:

< SYSTEM DESCRIPTION >

- Engine running
- Driving state
- Idling state
- Engine stalled
- Initial state
- Stalled state

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POWERTRAIN COORDINATION CONTROL

POWERTRAIN COORDINATION CONTROL : System Description

INFOID:0000000014267802

C

SYSTEM DESCRIPTION

The powertrain coordination can be explained by following:

- Powertrain coordination inputs
- Driver interpretation
- Preventive anti-jerk
- Torque request arbitration

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POWERTRAIN COORDINATION INPUTS

ECM detects following signals necessary to decide the torque set point:

- Gear position
- Torque request from automatic transmission
- Torque request from ABS system
- Brake pedal operation
- Status of Cruise Control System

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DRIVER INTERPRETATION

This strategy computes and arbitrates the torque set point given by the accelerator pedal operation and the cruise control.

The abrupt change of torque is delivered by engine excites a torsional natural frequencies of drive-line. If both acceleration pedal sensors malfunction, the fail-safe mode is activated. This fail-safe mode restores a pedal position so that the vehicle can continue traveling and limits the vehicle speed.

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PREVENTIVE ANTI-JERK

The main objective of the preventive anti-jerk function is to decrease discomforts of driver during depress the accelerator pedal and during release the accelerator pedal.

Abrupt torque changes are carried from the engine to the driveline and produce a vibration. It causes vehicle jerking and acceleration fluctuations. And they are causes of perception and assessment of performance and comfort for driver and the passengers.

The purpose of this function is to limit drive-line torque excitations. In fact, the engine torque set point is filtered according to requirements of driveability.

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TORQUE REQUEST ARBITRATION

This strategy makes the arbitration between the extended driver (pedal, ASCD), the VDC, the automatic transmission torque requests, and the application of engine limitations.

M

TURBOCHARGER BOOST CONTROL (YS23DDT)

TURBOCHARGER BOOST CONTROL (YS23DDT) : System Description

INFOID:0000000014267803

N

DESCRIPTION

Turbocharger is used to increase the air pressure entering the engine. The turbocharger has two separate chambers. The turbocharger consists of the following components:

- A chamber linked to the engine exhaust gas system
- A chamber linked to the engine air inlet system
- A turbine and a compressor, joined together by shaft.

O

The turbine, driven by exhaust gases, drives the compressor which compresses the inlet air.

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CAUTION:

To stop the engine immediately after high-load driving, park the vehicle with the engine at idle before turning OFF the ignition switch.

The boost pressure control increases the manifold pressure with respect to the engine operating point. The system has an electric solenoid valve connected on the circuit of the vacuum pump, which allows via a waste-

gate, to control the flow of exhaust gases through the turbine in order to generate high pressure in the boost circuit.

TURBOCHARGER BOOST CONTROL (YS23DDTT)

TURBOCHARGER BOOST CONTROL (YS23DDTT) : System Description INFOID:0000000014267804

DESCRIPTION

High Pressure Turbocharger Boost Control

Turbocharger is used to increase the air pressure entering the engine. The turbocharger has two separate chambers. The turbocharger consists of the following components:

- A chamber linked to the engine exhaust gas system
- A chamber linked to the engine air inlet system
- A turbine and a compressor, joined together by shaft.

The turbine, driven by exhaust gases, drives the compressor which compresses the inlet air.

CAUTION:

To stop the engine immediately after high-load driving, park the vehicle with the engine at idle before turning OFF the ignition switch.

The boost pressure control increases the manifold pressure with respect to the engine operating point. The compressor can be bypassed in some operating points to allow LP turbocharger to be used alone. The system has two electric solenoid valves connected to the circuit of vacuum pump. Each electric solenoid valve controls exhaust gas flow passing through each turbine via the wastegate valve or the bypass valve to generate a high pressure in the boost circuit.

Low Pressure Turbocharger Boost Control

Turbocharger is used to increase the air pressure entering the engine. The turbocharger has two separate chambers. The turbocharger consists of the following components:

- A chamber linked to the engine exhaust gas system
- A chamber linked to the engine air inlet system
- A turbine and a compressor, joined together by shaft.

The turbine, driven by exhaust gases, drives the compressor which compresses the inlet air.

CAUTION:

To stop the engine immediately after high-load driving, park the vehicle with the engine at idle before turning OFF the ignition switch.

The boost pressure control increases the manifold pressure with respect to the engine operating point. The system has an electric solenoid valve connected to the circuit of the vacuum pump, which allows via a wastegate or a bypass, to control the flow of exhaust gases through the turbine in order to generate high pressure in the boost circuit.

EGR SYSTEM

EGR SYSTEM : System Description INFOID:0000000014267805

DESCRIPTION

The EGR (Exhaust Gas Recirculation) system recirculates exhaust gas to the intake manifold. This system makes a major contribution to the reduction of diesel engine NOx emissions. A gas-coolant liquid exchanger cools the EGR gas flow.

The exhaust gases flow from the exhaust manifold (ahead of the turbocharger) to the EGR cooler via the EGR volume control valve. The EGR volume control valve is located in the air circuit between the air filter and the intake manifold.

CALCULATION OF THE AIR FLOW

In order to control pollutant emission (limitation of smoke by torque limitation: diesel flow), ECM controls the air mass flow.

EGR volume control valve

- EGR volume control valve allows the exhaust gas recirculation between exhaust manifold and inlet one. EGR volume control valve is controlled by a position controller. The demand comes from air flow controller function. When EGR volume control valve is not used, the EGR volume control valve is closed.

Throttle valve

- Throttle valve is controlled by a position controller. The demand comes from ECM. The throttle valve has three main functions:

- In regeneration combustion mode, fresh air flow control uses only throttle valve. EGR volume control valve stays in fully closed position.
- During high pressure EGR control, the electric throttle control actuator reduces the opening angle of the throttle valve and lowers pressure around the EGR feed port so that intake EGR gasses can be efficiently taken in.
- When the engine is stopped, the throttle valve is used to cut the air flow in order to reduce noise, and to have a smoother engine stop.
- When throttle valve is not used, the throttle valve is opened.

EGR BYPASS CIRCUIT

The EGR cooler bypass valve control solenoid valve is controlled by an ON/OFF solenoid valve, connected on one side to the vacuum pump and on the other side to the bypass control diaphragm. Control is determined according to the coolant liquid, air temperatures, and the engine operating point. The gases flow through the cooler during the EGR activation, except when the engine is cold; otherwise, they go through the bypass. There is also a regular bypass activation function to prevent its clogging or jamming. This activation management is based on a periodic distance threshold and the data of previous activation recorded by ECM.

EGR VOLUME CONTROL VALVE CIRCUIT

The EGR volume control valve is controlled by means of a double regulation loop.

The first loop, the quicker of the two, is a position loop. It allows the valve to be adjusted to the desired position by feedback based on the information sent from the sensor position.

The second loop (slower) is a mass air flow loop. The mass air flow set point is set by reference maps depending on engine working point, ambient condition corrections (air and coolant liquid temperatures, atmospheric pressure), gear engaged, and state of EGR cooler bypass. For a given operating point, the air flow is obtained by modulating the quantity of exhaust gases passing through the EGR volume control valve and the fresh air flow passing through the electric throttle control valve. For a constant total flow, the more EGR there is, the less fresh air there is (and vice-versa). The air flow measurement is provided by the mass air flow sensor. Fresh air and EGR gas are supplied by the EGR volume control valve and the inlet throttle position set points. The EGR volume control valve position sensor is used for control and diagnoses of the valve. When the engine is started for the first time, then subsequently at every engine start and every valve closing event, the closed valve position is taught-in (offset). This value is compared with the first or last offset learning positions for diagnosis purpose. It is also used to calibrate valve control. It is therefore important to associate the EGR volume control valve with the ECM controlling it.

THROTTLE CONTROL

THROTTLE CONTROL : System Description

INFOID:0000000014267806

DESCRIPTION

The throttle valve is a DC valve controlled by a high current generating circuit in the ECM. The flap position is read by a position sensor.

The throttle valve has 3 uses in the engines:

- During high pressure EGR control, the electric throttle control actuator reduces the opening angle of the throttle valve and lowers pressure around the EGR feed port so that intake EGR gasses can be efficiently taken in.
- In DPF regeneration mode, it is used to increase exhaust temperature, by reducing inlet fresh air flow.
- When ignition switch is turned off, throttle valve is closed to stop the engine smoothly.

When the engine is turned off, in the power latch phase, the throttle valve carries out several opening / closing cycles in order to teach-in the high and low limits.

ENGINE TORQUE CONTROL

ENGINE TORQUE CONTROL : System Description

INFOID:0000000014267807

SYSTEM DESCRIPTION

The torque function can be explained by the following:

- Accessories torque management
- Engine torque losses
- Minimum available torque
- Maximum available torque
- Fast set-points to complete torque request
- Final torque requests setting

ACCESSORIES TORQUE MANAGEMENT**Air Conditioning Power**

The amount of power absorbed by the air conditioning is useful for the engine control to compute the torque requirement for air conditioning. Therefore, ECM can adapt dynamically the engine speed regulation depending on the load variations.

The power absorbed by the air conditioning depends on the refrigerant pressure and the compressor speed. The air conditioning system power correction for idle speed regulation avoids engine speed undershoots and overshoots at the compressor compressed volume variation.

ENGINE TORQUE LOSSES

The torque losses are the sum of three components: the rubbing, the pumping, and the torque losses caused by accessories consumption.

- The basic friction torque loss uses the coolant liquid temperature sensor and the engine speed for the torque correction.
- the pumping torque is an estimation of the mean indicated torque in the low pressure cycle by using intake air and exhaust gas pressures, the engine capacity displacement, the number of cylinders, and the form factor of the low pressure cycle:
- Accessories' consumption is caused by additional electrical (electric consumers) and mechanical (air conditioning) components.

MINIMUM AVAILABLE TORQUE

The minimum available torque is used for the minimum driver setpoint calculation and the intersystem information.

The minimum torque is designed with a hyperbolic shape depending on the difference between the engine speed and the idle speed set-point:

- When the engine speed is under the idle speed set-point, the minimum torque is equal to the hyperbolic torque which increases to avoid an engine stalling.
- When the engine speed is over an engine speed threshold, the minimum torque reaches the engine torque losses with a ramp.

When the engine starts, a specific torque set-point is calculated to ensure the engine start. This torque is dependent of the engine speed and the coolant temperature.

At first, a calculation of the starting torque value is performed. In case of a difficult start (too long), this torque may be increased thanks to ramp.

The start torque offset is progressively set to zero to ensure a transition with the current torque set-point.

MAXIMUM AVAILABLE TORQUE

The maximum available torque results of a minimum selection including all powertrain constraints:

- Transmission torque limitation
- Maximum engine torque
- Torque reduction for the heating protection
- Torque for the smoke limitation
- Fail-safe

Transmission torque limitation

This limitation is the maximum torque to protect the transmission from a mechanical overload:

- For a manual transmission, the limitation value of the torque is function of the engine speed and the transmission ratio.
- For an automatic transmission, the limitation value is directly supplied by the automatic transmission.

Maximum engine torque

The maximum torque depends on the engine speed and the manifold air pressure. It is corrected by:

- The soot mass value in order to take into account the limitations due to the particulate filter
- The atmospheric pressure
- The upstream inlet throttle temperature.

The maximum engine also depends on the combustion mode (the normal or the regeneration combustion mode). In some conditions (DPF clogging, etc.), this maximum available torque is reduced in order to keep the engine within its safety working limits.

Torque reduction for the heating protection

This torque limitation is dedicated to the protection of the engine from an overheating. This limitation calculation depends on the engine speed, the engine coolant temperature, the intake air temperature and the vehicle speed.

< SYSTEM DESCRIPTION >

Torque for the smoke limitation

This torque limitation is used to reduce the smoke emissions during a high torque driver request. The maximum fuel mass that can be injected is limited according to the maximum richness depending on the gear ratio, the engine speed, and the intake air mass flow. This value is corrected depending on the vehicle speed and the coolant temperature.

Fail-safe

The ECM limits a engine torque in case of malfunction of engine component or ECM.

Depending on the engine components, ECM activates the fail-safe mode of the torque limitation level 1 (low limitation), the level 2 (mean limitation), or the level 3 (strong limitation function of vehicle speed).

FAST SET-POINTS TO COMPLETE TORQUE REQUEST

For each combustion mode (the normal combustion mode, the regeneration combustion mode, and the protection combustion mode), a torque model is designed to calculate the total fuel mass quantity, the estimated mean effective torque, the combustion efficiency and the current fuel consumption for the final torque set-point and the engine current speed.

The total fuel mass quantity is corrected to take into account the main injection advance deviation and the mass air flow deviation.

For each combustion mode, the after and the post injection relative efficiencies are calculated to determine the fuel mass quantity needed to perform the engine inner torque.

The after injection relative efficiency is equal to one in normal combustion mode and to zero in a regeneration combustion mode or in a protection combustion mode.

The post injection relative efficiency is function of the post injection timing and the difference between the current and the basic post injection timing.

FINAL TORQUE REQUESTS SETTING

The final torque requests are computed by the arbitration with the driver request, the intersystem torque request (VDC), the torque limitations and the curative anti-jerk correction.

The engine torque losses and the idle speed torque are added.

The static torque is the maximum available torque. The raw torque is used by the turbocharger and the EGR regulations.

The set-point torque is used for fuel mass calculation. It is filtered by the preventive anti-jerk and corrected by the curative anti-jerk.

COMBUSTION CONTROL

COMBUSTION CONTROL : System Description

INFOID:0000000014267808

SYSTEM DESCRIPTION

The torque set-point is converted into a total fuel quantity injected. This quantity is split in various injections according to a mapped injection pattern. Thus, a fuel quantity and an initial phasing of injection are allocated for each injection. The choice of the number of injection (limited to five maximum) is given with different constraints such as acoustic, performance and emissions.

In the DPF (Diesel Particulate Filter) regeneration phase, post injections do not contribute to the torque elaboration but to the increase of the DPF temperature. Therefore, the fuel consumption increases in the DPF regeneration phase.

FUEL SUPPLY AND PRESSURE CONTROL SYSTEM

Fuel Supply System

The fuel supply system consists of two circuits: the fuel low and high-pressure circuit.

The fuel low-pressure circuit brings fuel from the tank to the pump and includes the following elements:

- Electrical pump submerged in the fuel tank
- Pipes
- Fuel filter with water in fuel sensor

The high-pressure circuit function is to put the fuel under pressure and distribute it to the injectors:

- High-pressure fuel pump
- Fuel flow actuator
- Common rail
- Fuel injectors

The low-pressure fuel (coming from low-pressure circuit) is transferred to the high-pressure pump part via the fuel flow actuator, which regulates the fuel flow quantity. The high-pressure fuel pump consists of a three-piston pump.

The fuel under pressure goes to the common rail, which distributes the fuel equally to each injector. Finally, the commanded injectors deliver the fuel flow entering the cylinder.

Fuel Pressure Control

The pressure in the Common Rail reaches 160 MPa (1,600 bar, 1632 kg/cm², 23,200 psi) and must continuously be regulated. The measuring circuit consists of an active pressure sensor on the rail connected to an analog port on the computer.

The high-pressure pump is fed at a low pressure 500 KPa (5 bar, 5.1 kg/cm², 72.5 psi) by a built-in transfer pump. It feeds the rail, whose fuel flow quantity is controlled by the fuel flow actuator. Thus, pressure drops can be compensated. The fuel flow actuator ensures that the HP pump only delivers the amount of diesel fuel necessary to maintain the pressure in the rail. This technology minimizes heat generation while improving engine performance.

INJECTION CONTROL

The injection control parameters are the quantities to inject and their respective advances. The system performs one to six injections.

The injectors are magnetic injectors. An electrical current (pulse) is sent to each injector holder based on the previously computed data.

An electrical current (impulse or pulse) is sent to each injector holder based on the previously computed data. The piezoelectric injectors ensure injected fuel quantity with an excellent repeatability of the injection process. Piezoelectric actuators work like capacitors. To control the injector, the ECM punctually drives energy resulting in the actuator deformation and injector opening.

During the injection time, piezoelectric actuator stores this energy, the length of electrical pulse is computed with the fuel flow demand and injectors characteristics. At the end of the injection time, ECM recovers energy to send at the start of control. Piezoelectric actuator then discharges and returns to its initial shape. The injector nozzle closes.

At the factory, each injector is calibrated for specific pressure needs on a test bench, and the values are indicated on a label attached to the injector holder body. The injector adjustment values are then written to the ECM's EEPROM, enabling the ECM to control the injectors by taking into account the variance from the factory production dispersion.

A specific strategy controls fuel injection deviations and dispersion during engine life. This function defines individual injector correction to compensate the injector drift to enhance the delivery fuel accuracy.

TEMPERATURE BEFORE TURBINE CONTROL

Upstream turbine temperature control sequentially uses injection parameters:

- Main injection phasing
- Post injection fuel mass
- Total fuel mass quantity
- Maximum torque

In normal combustion mode (without regeneration), the regulation aims to protect the turbine. If the temperature exceeds the recommended limits, the regulation is able to limit total fuel mass quantity and torque demand.

In regeneration mode, to increase the temperature in exhaust line, the regulation controls main injection phasing and post injection.

The purpose is to obtain the highest temperature while respecting the recommended limits. In addition, the regulation protects the turbine when the temperature is too hot.

RICHNESS REGULATION

Fuel Mass Adaptation Strategy

Fuel mass adaptation strategy uses lambda information from A/F (Air Fuel Ratio) sensor to compensate from an intake air system drift. It uses a comparison between target value and measured lambda to adjust the air mass and EGR set points.

A/F Sensor Functionality

It is a wide band lambda sensor. The aim of this type of sensor is to measure precisely the lambda mixture.

As O₂ concentration measure depends on sensor temperature, A/F sensor temperature is regulated with A/F sensor heating power stage at 780°C (1436°F) as set point.

WATER IN FUEL FUNCTION

The water in fuel sensor is an optional sensor integrated in the fuel filter. This function prevents serious damages on the common-rail system caused by water presence.

AFTER TREATMENT SYSTEM

AFTER TREATMENT SYSTEM : System Description

INFOID:000000014267809

DESCRIPTION

This system has two main functions:

- Use the present oxygen in exhaust gases to transform the CO in CO₂, and the HC in CO₂ and H₂O.
- Increase the temperature of exhaust gases (with the exothermal energy of the oxidation reaction) to allow the regeneration in the DPF (Diesel Particulate Filter).

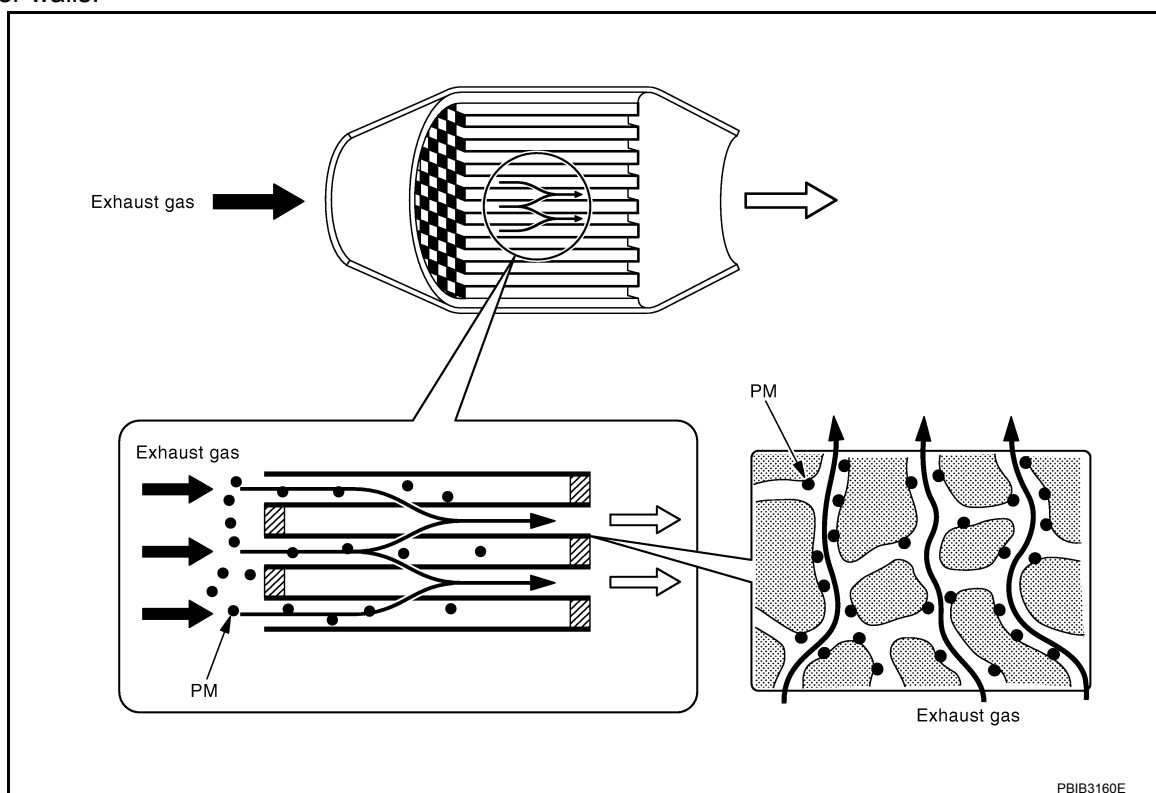
To be effective, the catalytic converter must reach the working temperature of 350 to 400°C (662 to 752°F). It possesses an essential role in the operation of regeneration of the DPF.

DPF (DIESEL PARTICULATE FILTER)

DPF filters soot in the exhaust gas up to 99%. These particulates consist essentially of micro-spherules of carbon on which hydrocarbons from the fuel and lubricant are condensed. These particulates consist essentially of aggregates of variable size. The quantity of particulates and their composition depend on:

- The combustion process (an homogeneous air/fuel mixture minimizes particulate formation)
- The quantity of diesel (increasing the cetane index limits the number of particulates formed)
- The post-processing efficiency (only filtration allows the particulates to be removed efficiently)

The DPF is a porous structure with channels set out in such a way as to force the exhaust gases through the chamber walls.



This post-processing system consists of:

- Post-turbocharger oxidation pre-catalyst, necessary for achieving HC/CO levels in accordance with pollutants emission standards.
- The DPF itself, placed in the underbody, consisting of a silicon carbide substrate, with catalytic impregnation, and equipped with temperature and pressure control sensors.
- System regeneration and self-diagnostic management are provided by the injection ECM.

In normal operation, DPF captures all the particulates emitted by the engine and so fills up progressively. It therefore becomes necessary to eliminate all the accumulated particulates, which is done by combustion (regeneration).

REGENERATION

The purpose of regeneration is to burn the particulates accumulated in the filter. In presence of oxygen, the particulates combustion regeneration occurs naturally when the temperature of exhaust gases exceeds 570°C (1058°F). In urban driving conditions, the engine barely reaches high temperature, and the exhaust gas temperature consequently varies between 150°C (302°F) and 200°C (392°F). Therefore, the DPF regeneration system is necessary to burn and eliminate soot particulates accumulated in DPF. The DPF regeneration is automatically performed while driving, and this does not influence on driving conditions.

A DPF differential pressure sensor detects filter load status (particulate mass) and triggers the regeneration operation. This takes place by means of a controlled combustion that raises the exhaust gas temperature up between 550°C (1022°F) and 650°C (1202°F) at the filter intake.

Regeneration is continuously executed according to the following:

Regarding driving conditions:

- Vehicle speed
- Ambient pressure
- Temperature upstream DPF
- Engine coolant temperature

DPF charging level criteria:

- Soot mass [(computed using DPF charging curves (exhaust gas flow according to differential pressure))]
- Simulated soot mass [computed using mapped soot mass emission speed (g/s)]
- Driven distance since last successful regeneration
- Regeneration error counter

ECM activates many engine management functions to ensure good regeneration efficiency:

- Fuel system: A specific injection pattern using post injections is activated.
- Air system: EGR volume control valve is closed and throttle valve (intake) is used to control engine air flow. In regeneration mode, other boost pressure set points are defined.
- Auxiliary functions: These functions are used to increase engine load.

At the same time, two specific exhaust gas temperature controllers are sequentially activated:

- Upstream turbine temperature control: As soon as a DPF regeneration is requested, the regulation is activated in order to obtain the highest safe upstream turbine temperature for any engine operating point and without turbine damage risk (over temperature).
- Upstream DPF temperature control: This regulation is activated to heat DPF and to control its regeneration.

REGULATION OF TEMPERATURE BEFORE DPF

Regulation of the exhaust gas temperature before DPF is needed to complete a secure regeneration. This strategy uses both exhaust line injectors and late post injections (fuel injectors).

ECM computes the fuel mass flow injected by injectors (post injection) according to several parameters:

- Exhaust line temperature before DPF
- Atmospheric pressure
- Intake air temperature
- Differential pressure of the DPF
- Minimum level of fuel
- Engine speed
- Engine torque

THERMOSTAT CONTROL

THERMOSTAT CONTROL : System Description

INFOID:0000000014267810

THERMOSTAT CONTROL

For system drawing of the thermostat control, Refer to [CO-57, "Engine Cooling System"](#).

The controlled thermostat is to determine an engine cooling setpoint based on the both low [up to 90° (194°F)] and high [up to 110°C (230°F)] temperature requests. The low temperature request is based on the currently engaged gear together with torque load whereas high temperature regulation is requested if the torque is below a threshold during tuned elapsed time or if the torque is around high temperature regulation zone and is out of this zone but does not return back to the low temperature regulation zone. The wax preheating strategy (activated only when the engine coolant temperature is below a tuned threshold or during the once-per-driving cycle) enables to open the thermostat soon after an engine start where the water temperature is low and allows ECM to rev up to accelerate warm-up.

The first open strategy is activated only in 2 cases:

- The engine coolant temperature is above a tuned threshold and there is no request for the low temperature regulation.
- The engine coolant temperature is below a tuned threshold and there is the request for the very first time for low temperature regulation during the driving cycle.

Depending on the type of regulation, fan high speed activation can move from a nominal threshold to a greater threshold.

ENGINE OIL PUMP CONTROL

The aim of the controlled oil pump is to adapt the oil pressure to the strict necessary and then to limit the torque absorbed by the oil pump in order to reduce the fuel consumption. The elaboration of the oil pressure setpoint [200 – 400 kPa (2 – 4 bar, 2.04 – 4.08 kg/cm², 29 – 58 psi)] depends of the engine functioning point and the electric valve control in opened loop.

THERMOMANAGEMENT

The aim of the strategy of null flow is to accelerate the increase of water temperature. This strategy allows to decrease the consumption. The traffic of water is stopped during this period of null flow. This strategy is finished if the temperatures of reliability are reached.

GLOW CONTROL

GLOW CONTROL : System Description

INFOID:0000000014267811

SYSTEM DESCRIPTION

Glow control system operates at engine starting and after engine starting. The system energizes glow plug according to engine coolant temperature to improve engine starting function.

When the ignition switch is turned ON, the glow control system starts Pre-glow and the glow indicator lamp turns ON. When the engine starts, the glow indicator lamp turns OFF and the glow control state changes to After-glow.

Glow time varies according to engine coolant temperature, barometric pressure and battery voltage.

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description

INFOID:0000000014267812

BASIC ASCD SYSTEM

Automatic Speed Control Device (ASCD) allows a driver to keep vehicle at predetermined constant speed without depressing accelerator pedal. Driver can set vehicle speed in advance between approximately 40 km/h (25 MPH) and 170 km/h (105 MPH).

ECM controls fuel injector to regulate engine speed.

Operation status of ASCD is indicated on the information display in the combination meter. If any malfunction occurs in ASCD system, it automatically deactivates control.

NOTE:

Always drive vehicle in a safe manner according to traffic conditions and obey all traffic laws.

SET OPERATION

Press ASCD MAIN switch. (CRUISE indicated on the information display)

When vehicle speed reaches a desired speed between approximately 40 km/h (25 MPH) and 170 km/h (105 MPH), press COAST/SET switch. (SET indicated on the information display)

ACCELERATE OPERATION

If the ACCEL/RES switch is pressed during cruise control driving, increase the vehicle speed until the switch is released or vehicle speed reaches maximum speed controlled by the system.

And then ASCD will keep the new set speed.

CANCEL OPERATION

When any of following conditions exist, cruise operation will be canceled.

- CANCEL switch is pressed
- More than 2 switches at ASCD steering switch are pressed at the same time (Set speed will be cleared)
- Brake pedal is depressed
- Clutch pedal is depressed or gear position is changed to neutral position.
- Vehicle speed decreased under 15% of the set speed from the set speed.
- TCS system is operated.

When the ECM detects any of the following conditions, the ECM will cancel the cruise operation and inform the driver by blinking indicator.

- Engine coolant temperature is slightly higher than the normal operating temperature, CRUISE indicator may blink slowly.
When the engine coolant temperature decreases to the normal operating temperature, CRUISE indicator will stop blinking and the cruise operation will be able to work by pressing COAST/SET switch or ACCEL/RES switch.
- Malfunction for some self-diagnoses regarding ASCD control: SET indicator will blink quickly.

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

If MAIN switch is turned to OFF during ASCD is activated, all of ASCD operations will be canceled and vehicle speed memory will be erased.

COAST OPERATION

When the COAST/SET switch is pressed during cruise control driving, decrease vehicle set speed until the switch is released. And then ASCD will keep the new set speed.

RESUME OPERATION

When the ACCEL/RES switch is pressed after cancel operation other than pressing ASCD MAIN switch is performed, vehicle speed will return to last set speed. To resume vehicle set speed, vehicle condition must meet following conditions.

- Brake pedal is released
- Clutch pedal is released
- Vehicle speed is greater than 40 km/h (25 MPH) and less than 170 km/h (105 MPH)

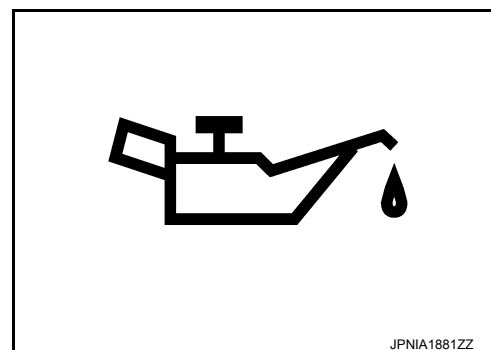
WARNING LAMPS/INDICATOR LAMPS

WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp

INFOID:0000000014267813

DESIGN/PURPOSE

When engine oil pressure is low, the oil pressure warning lamp informs the driver of low oil pressure to prevent damage to the engine.



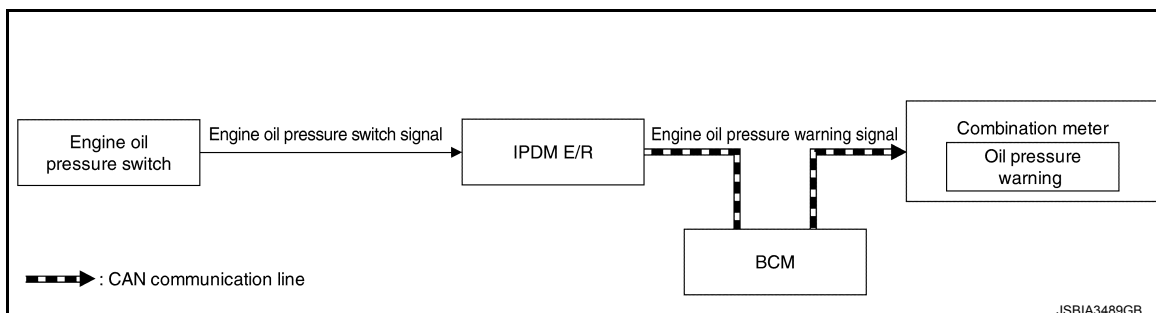
BULB CHECK

Not applicable

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communications blackout or abnormal signal reception, refer to [MWI-38, "Fail-Safe"](#) [with color display (with intelligent key)], [MWI-45, "EXCEPT BCM FUNCTION : Fail-Safe"](#) [with color display (without intelligent key)], [MWI-170, "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with monochrome display).

SYSTEM DIAGRAM



SIGNAL PATH

IPDM E/R received the engine oil pressure switch status from the oil pressure switch. After engine running when the oil pressure switch is OFF and at least 5 seconds, IPDM E/R transmits the engine oil pressure warning signal to combination meter via CAN communication through BCM. Then the engine oil pressure warning displays.

LIGHTING CONDITION

When any of the following conditions is satisfied:

< SYSTEM DESCRIPTION >

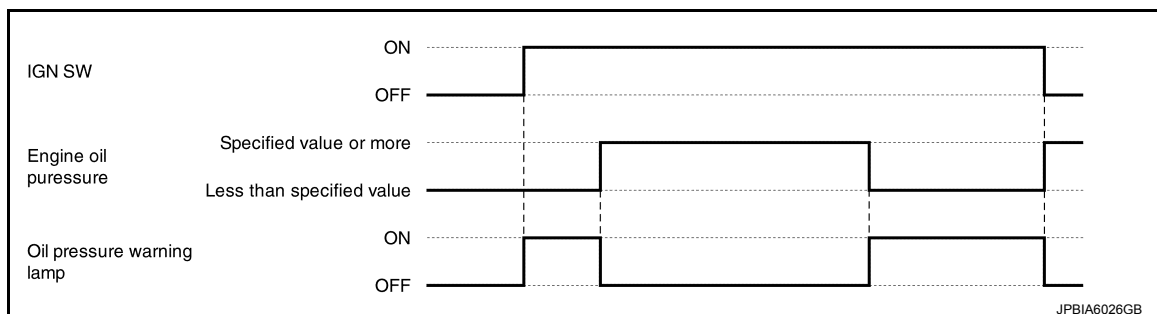
- Ignition switch: OFF
- Engine oil pressure is the specified value or more.

SHUTOFF CONDITION

When any of the following conditions is satisfied:

- Ignition switch: OFF
- Engine oil pressure is the specified value or more.

TIMING CHART



WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)

INFOID:0000000014267814

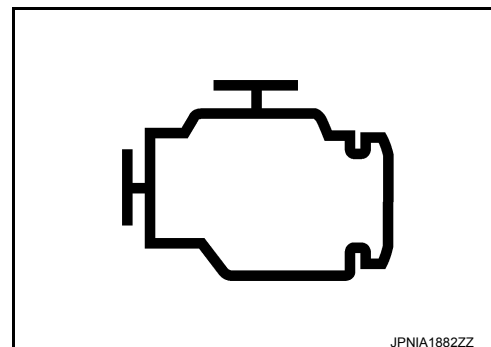
DESIGN/PURPOSE

When a malfunction which increases exhaust gases is detected, ECM turns ON MIL and informs the driver of the necessity of inspection and repair.

When a malfunction which causes damage to the catalyst is detected, ECM immediately blinks MIL to alert the driver.

NOTE:

- ECM turns ON MIL (yellow) when an emission-related malfunction occurs or when a component part specified by European laws and regulations becomes inoperable three trips in a row.
- ECM may turn ON MIL (red) when a malfunction occurs in the engine.



BULB CHECK

The bulb turns ON after turning ON the ignition switch (engine stop) and turns OFF after restarting the engine.

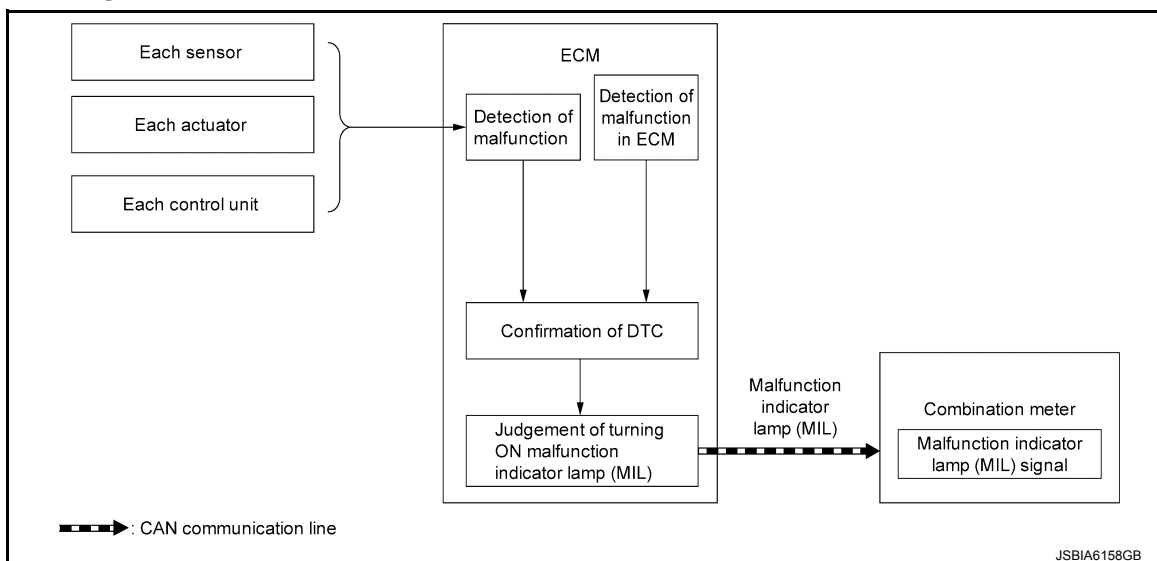
SYNCHRONIZATION WITH MASTER WARNING LAMP

Not applicable

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communication blackout in the combination meter, refer to [MWI-38, "Fail-Safe"](#) [with color display (with intelligent key)], [MWI-45, "EXCEPT BCM FUNCTION : Fail-Safe"](#) [with color display (without intelligent key)], [MWI-170, "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with monochrome display).

SYSTEM DIAGRAM



SIGNAL PATH

- When the lighting conditions of the malfunction indicator lamp (MIL) are satisfied, ECM transmits a malfunction indicator lamp (MIL) signal to the combination meter via CAN communication.
- The combination meter turns ON or blinks the malfunction indicator lamp (MIL), according to a signal received from ECM.

LIGHTING CONDITION

When all of the following conditions are satisfied:

- Ignition switch: ON
- DTC which influences on exhaust gasses is judged.

NOTE:

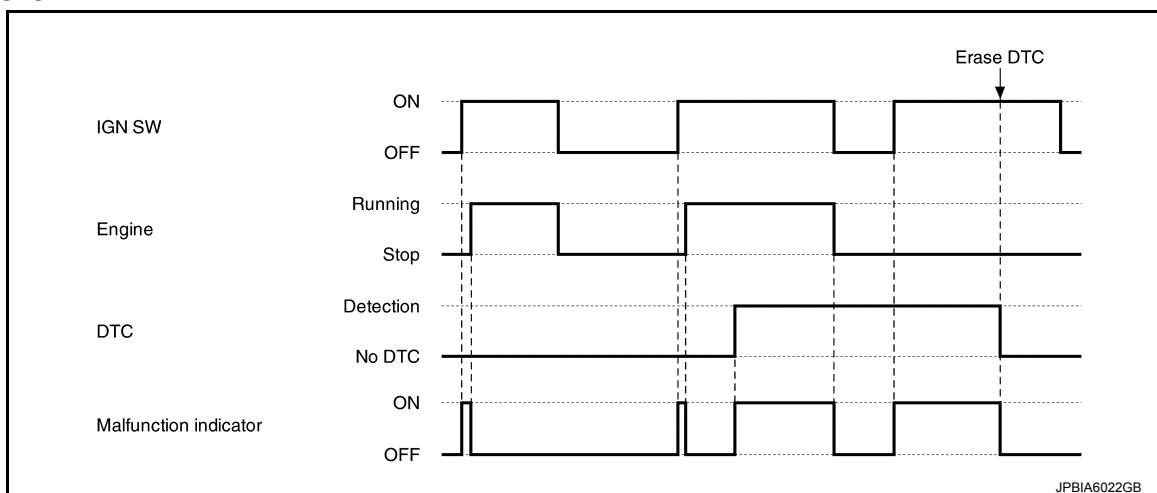
- For DTCs that the malfunction indicator lamp turns ON and the number of DTC diagnosis trips, refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

SHUTOFF CONDITION

When any of the following conditions is satisfied:

- Ignition switch: OFF
- Erase DTC

TIMING CHART



WARNING LAMPS/INDICATOR LAMPS : Glow Indicator Lamp

INFOID:0000000014267815

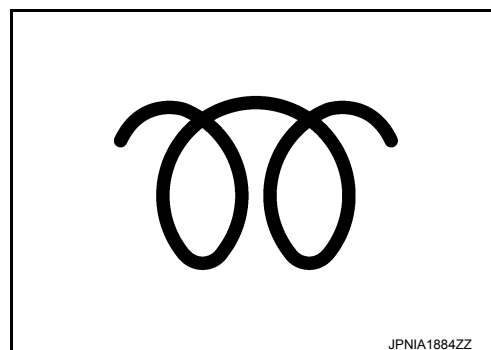
DESIGN/PURPOSE

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

The glow indicator lamp turns ON in quick preheat mode and informs the driver that the glow plug is under preheating condition.



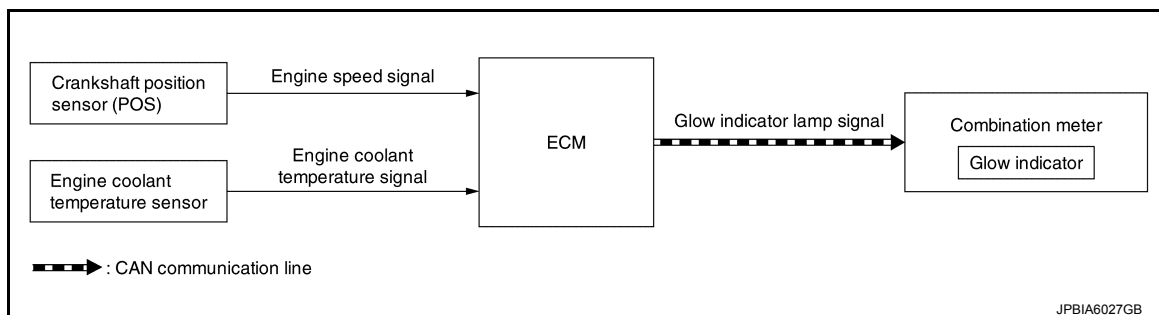
BULB CHECK

Not applicable

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communications blackout or abnormal signal reception, refer to [MWI-38, "Fail-Safe"](#) [with color display (with intelligent key)], [MWI-45, "EXCEPT BCM FUNCTION : Fail-Safe"](#) [with color display (without intelligent key)], [MWI-170, "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with monochrome display).

SYSTEM DIAGRAM



SIGNAL PATH

- ECM performs the glow control, according to an IGN ON signal, water temperature signal, and engine speed signal. ECM transmits a glow indicator lamp signal to the combination meter in quick preheat mode via CAN communication.
- The combination meter turns ON the glow indicator lamp, according to a glow indicator lamp signal received from ECM via CAN communication.

LIGHTING CONDITION

When any of the following conditions is satisfied:

- Ignition switch: ON
- Mode: Quick preheat mode

NOTE:

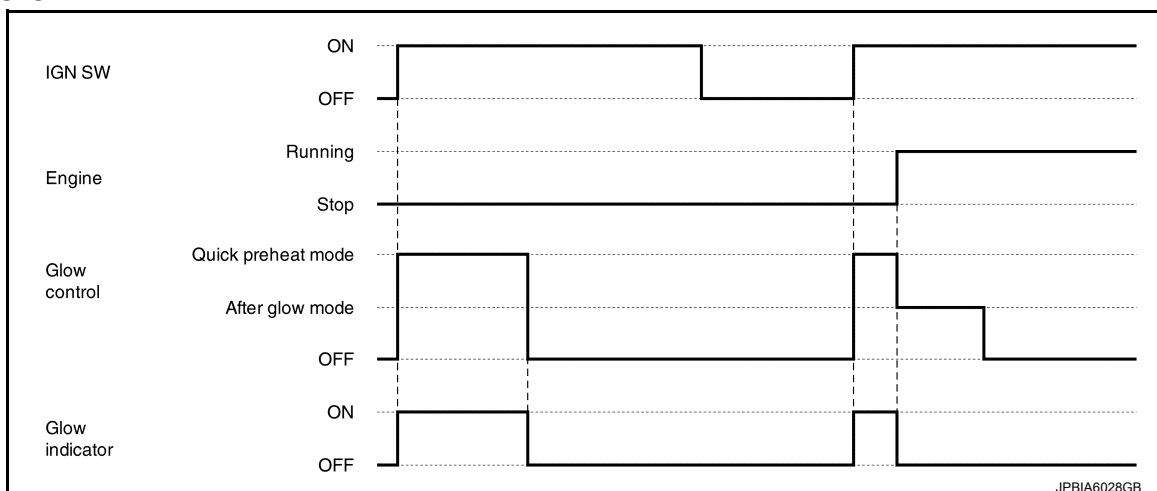
The glow indicator lamp does not turn ON in after glow mode.

SHUTOFF CONDITION

When any of the following conditions is satisfied:

- Ignition switch: OFF
- Quick preheat mode is complete.
- Engine start

TIMING CHART



WARNING LAMPS/INDICATOR LAMPS : DPF (Diesel Particulate Filter) Warning Lamp

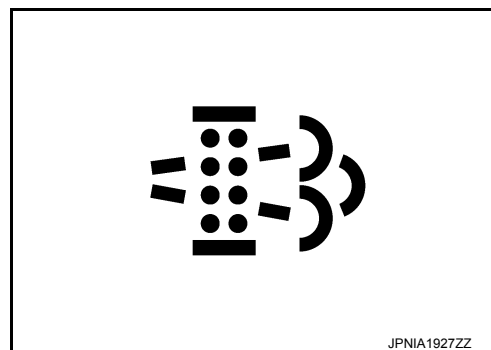
INFOID:000000014267816

DESIGN/PURPOSE

When a certain amount of PM (particulate matter) accumulates in the DPF (Diesel Particulate Filter), the warning lamp/indicator lamp turns ON to inform the driver of the necessity of the DPF (Diesel Particulate Filter) regeneration.

NOTE:

For the outline of DPF (Diesel Particulate Filter) control and regeneration, refer to [EC-443, "AFTER TREATMENT SYSTEM : System Description"](#).



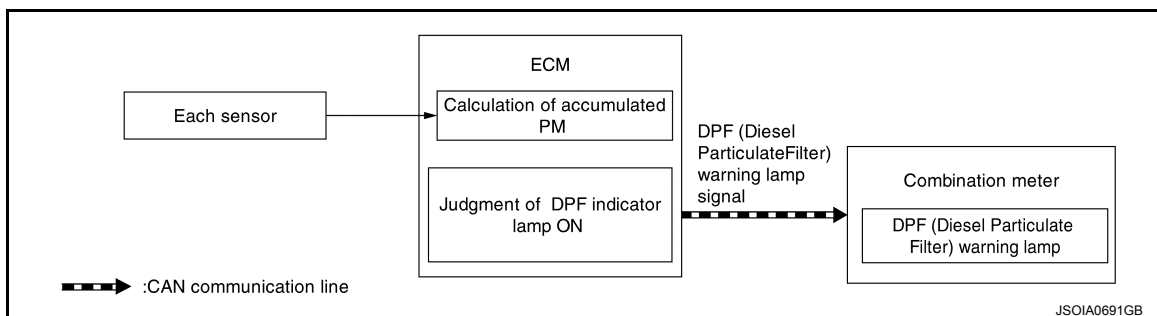
BULB CHECK

The bulb turns ON when the ignition switch is turned ON (engine stop) and turns OFF after the engine is started.

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communications blackout or abnormal signal reception, refer to [MWI-38, "Fail-Safe"](#) [with color display (with intelligent key)], [MWI-45, "EXCEPT BCM FUNCTION : Fail-Safe"](#) [with color display (without intelligent key)], [MWI-170, "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with monochrome display).

SYSTEM DIAGRAM



SIGNAL PATH

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

- When calculating and judging that the amount of PM (particulate matter) accumulated in DPF (Diesel Particulate Filter) reaches the specified amount, ECM transmits a DPF warning lamp signal to the combination meter via CAN communication.
- The combination meter turns ON the DPF (Diesel Particulate Filter) warning lamp, according to a DPF (Diesel Particulate Filter) warning lamp signal received from ECM via CAN communication.

LIGHTING CONDITION

When all of the following conditions are satisfied:

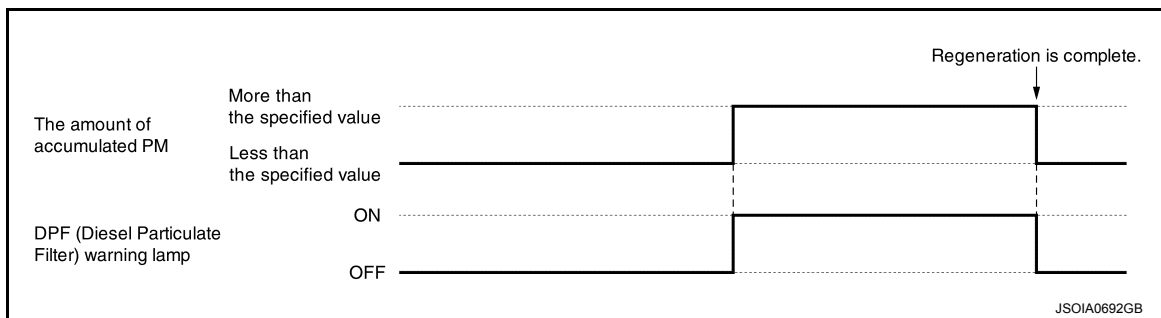
- Ignition switch: ON
- The amount of PM in DPF (Diesel Particulate Filter) is more than the specified amount.

SHUTOFF CONDITION

When any of the following conditions is satisfied:

- Ignition switch: OFF
- The amount of PM in DPF (Diesel Particulate Filter) is less than the specified amount. (Regeneration is complete.)

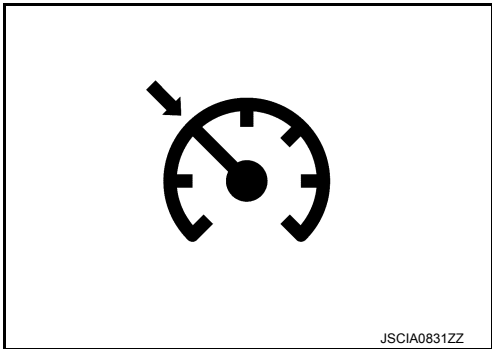
TIMING CHART



INFORMATION DISPLAY (COMBINATION METER)

INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator

INFOID:0000000014267817

Item	Symbol	Function
ASCD indicator	 JSCIA0831ZZ Message: - - Km/h / - - MPH	For detail of ASCD function, refer to EC-445. "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description" .

INFORMATION DISPLAY (COMBINATION METER) : Engine Oil Pressure Warning

INFOID:0000000014267818

DESIGN/PURPOSE

When engine oil pressure is low, the engine oil pressure warning informs the driver of low oil pressure to prevent damage to the engine.

Symbol	Message
 JPNIA1881ZZ	• Low Oil Pressure • Stop Vehicle

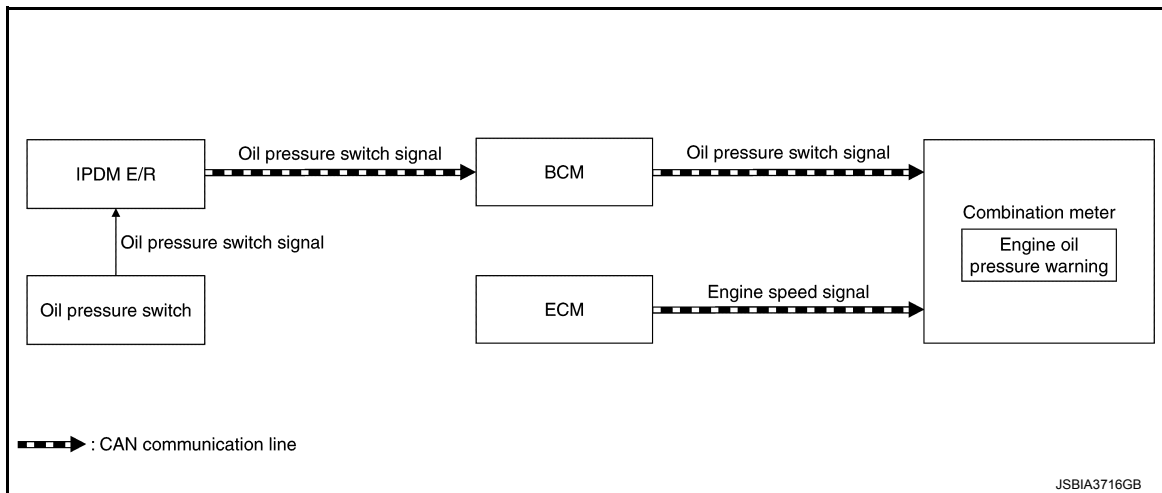
BULB CHECK

Not applicable

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communications blackout or abnormal signal reception, refer to [MWI-38, "Fail-Safe"](#).

SYSTEM DIAGRAM



SIGNAL PATH

- IPDM E/R receives a signal from the engine oil pressure switch and transmits an oil pressure switch signal to BCM via CAN communication.
- BCM transmits the received oil pressure switch signal to the combination meter via CAN communication.
- The information display (on combination meter) is SHOWN/HIDDEN the engine oil pressure warning, according to the oil pressure switch signal received from BCM.

LIGHTING CONDITION

When all of the following conditions for at least 5 seconds are satisfied:

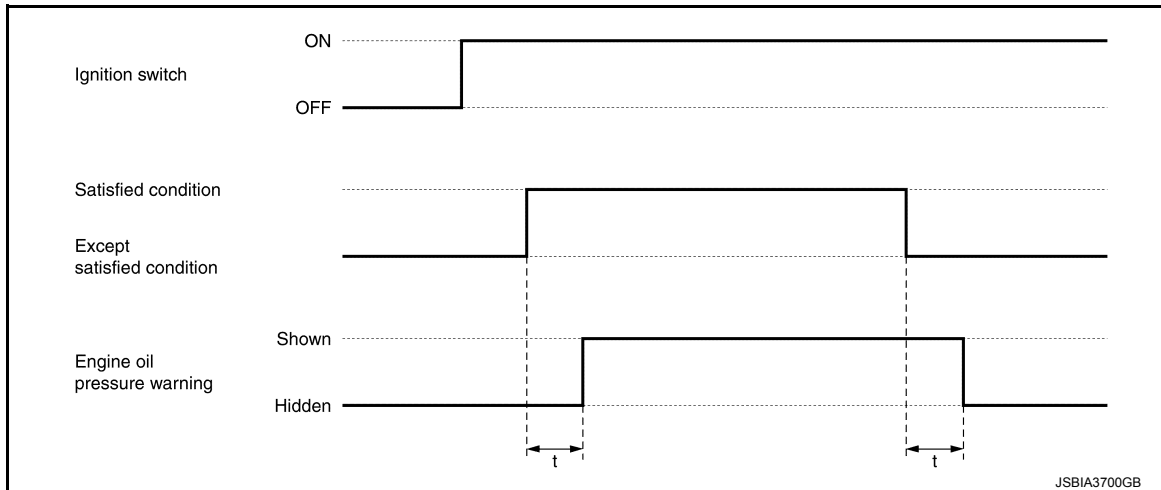
- Ignition switch: ON
- Engine oil pressure is less than specified value. (Oil pressure switch signal: ON)
- Engine speed is more than 500 rpm.

SHUTOFF CONDITION

When any of the following conditions is satisfied:

- Ignition switch: OFF
- Engine oil pressure is the specified value or more. (Oil pressure switch signal: OFF)
- Engine speed is less than 500 rpm.

TIMING CHART



t: 100 ms

WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps

INFOID:0000000014267819

NOTE:

Regarding the arrangement. Refer to [MWI-10, "METER SYSTEM : Design"](#) (with color display) or [MWI-145, "METER SYSTEM : Design"](#) (with monochrome display).

Name	Design	Arrangement/Function
Engine oil pressure warning lamp		Regarding the function. Refer to MWI-19, "OIL PRESSURE WARNING LAMP : System Description" and EC-446, "WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp" .
Malfunction indicator lamp (MIL)		Regarding the function. Refer to EC-447, "WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)" .
Glow indicator lamp		Regarding the function. Refer to EC-448, "WARNING LAMPS/INDICATOR LAMPS : Glow Indicator Lamp" .
DPF (Diesel Particulate Filter) warning lamp		Regarding the function. Refer to EC-450, "WARNING LAMPS/INDICATOR LAMPS : DPF (Diesel Particulate Filter) Warning Lamp" .

WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)

INFOID:0000000014267820

Name	Function
ASCD Indicator	Refer to EC-451, "INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator" .
Engine oil pressure warning	Refer to EC-451, "INFORMATION DISPLAY (COMBINATION METER) : Engine Oil Pressure Warning" .

CAN COMMUNICATION

CAN COMMUNICATION : System Description

INFOID:0000000014267821

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2

SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

communication lines (CAN H-line, CAN L-line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
Refer to [LAN-42. "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart"](#), about CAN communication for detail.

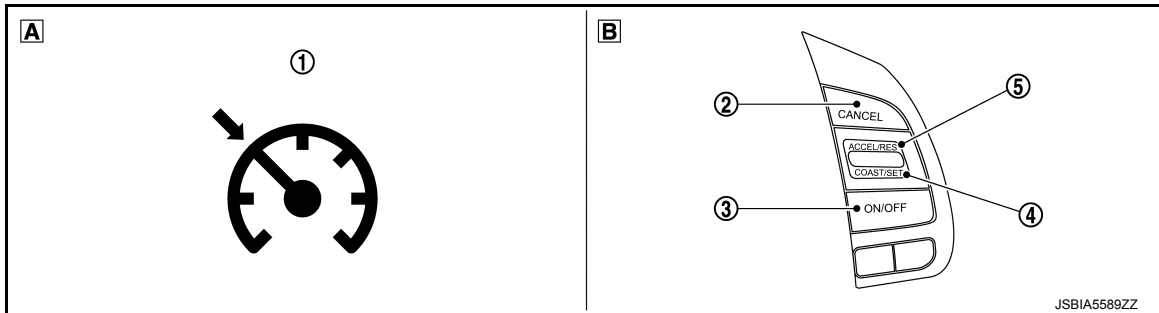
OPERATION

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

AUTOMATIC SPEED CONTROL DEVICE (ASCD) : Switch Name and Function

INFOID:0000000014267822

SWITCHES AND INDICATORS



- A** On the combination meter **B** On the steering wheel
- ① ASCD indicator ② CANCEL switch ③ MAIN switch
- ④ COAST/SET ⑤ ACCEL/RES

SET SPEED RANGE

ASCD system can be set the following vehicle speed.

Minimum speed (Approx.)	Maximum speed (Approx.)
40 km/h (25 MPH)	170 km/h (105 MPH)

SWITCH OPERATION

Item	Function
CANCEL switch	Cancels the cruise control driving.
ACCEL/RES switch	- Resumes the set speed. - Increases speed incrementally during cruise control driving.
COAST/SET switch	- Sets desired cruise speed. - Decreases speed incrementally during cruise control driving.
MAIN switch	Master switch to activate the ASCD system.

Refer to [EC-445. "AUTOMATIC SPEED CONTROL DEVICE \(ASCD\) : System Description"](#) for ASCD operating instructions.

OIL CONTROL SYSTEM

OIL CONTROL SYSTEM : Switch Name and Function

INFOID:0000000014267823

SWITCH OPERATION

Item	Function
Steering switch	Refer to MWI-24. "Switch Name and Function" (with color information display) or MWI-158. "Switch Name and Function" (with monochrome information display).

RESET OPERATION

CAUTION:

When an alert was displayed, change the engine oil, and reset the engine oil data.

- Turn ignition switch ON.
- On information display, select "Settings" >> "Maintenance" >> "Service".
- Press "ENTER" switch until "YES/NO" is appeared.

4. Select "YES".
5. Check that "--" is displayed.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Diagnosis Description

INFOID:0000000014267824

DESCRIPTION

This system uses two malfunction indicator lamps. When detecting a system error, ECM turns ON the malfunction indicator lamp to alert the driver of the presence of malfunction. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

MALFUNCTION INDICATOR LAMP (MIL) (YELLOW)

ECM turns ON MIL (yellow) when an emission-related malfunction occurs or when a component part specified by European laws and regulations becomes inoperable three trips in a row.

MALFUNCTION INDICATOR LAMP (MIL) (RED)

ECM may turn ON MIL (red) when a malfunction occurs in the engine.

A

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P

DIAGNOSIS SYSTEM (ECM)

CONSULT Function

INFOID:000000014267825

FUNCTION

Diagnostic test mode	Function
Self-diagnostic results	Self-diagnostic results such as DTC can be read and erased quickly.*
Data monitor	Input/Output data in the ECM can be read.
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on the CONSULT unit.
Active test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ECMs and also shifts some parameters in a specified range.
ECU identification	ECM part number and homologation number can be read.
Configuration	This function is used to store vehicle specifications to ECM after ECM replacement.

*: The following emission-related diagnostic information is cleared when the ECM memory is erased.

- Diagnostic trouble codes

SELF-DIAGNOSTIC MODE

Self Diagnostic Item

Regarding items detected in “SELF-DIAG RESULTS” mode, refer to — [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YS23DDTT).

Freeze Frame Data and 1st Trip Freeze Frame Data

Item*		Unit
CONSULT screen terms	Full spell	
WATER TEMP	Water temperature	°C or °F
ENGINE SPEED	Engine speed	rpm
VEHICLE SPEED	Vehicle speed	km/h or mph
COMPUTER SUPPLY VOLTAGE	Computer supply voltage	V
RAIL PRES SET	Rail pressure setting	bar
RAIL PRESSURE	Rail pressure	bar
RAIL PRESS SEN VOLT	Rail pressure sensor voltage	V
FUEL FLOW	Fuel flow	mg/cp
BOOST PRESSURE	Boost pressure	mbar
BOOST PRESS REF VALUE	Boost pressure reference value	hpa
MEASURE AIR FLOW	Measured air flow	kg/h
TURBOCHARGING SOLENOID VALVE OCR	Turbocharging solenoid valve OCR	%
MANIFOLD PRESSURE	Manifold pressure	mbar
INLET AIR TEMPERATURE	Inlet air temperature	°C or °F
EST. AIR FLOW	Estimated air flow	mg/cp
INLET AIR FLOW	Inlet air flow	mg/cp
ATMOSPHERIC PRESSURE	Atmospheric pressure	mbar
TBN UPSTR PRS SEN VOLT	Turbine upstream pressure sensor voltage	V
AIR INLET/F REL POS	Air inlet flap relative position	%
FUEL TEMPERATURE	Fuel temperature	°C or °F
IN FLAP ABSO POSI	Air inlet flap absolute position	%
INLET/F SEN SUPPLY VOLT	Inlet flap sensor supply voltage	mV

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Item*		Unit
CONSULT screen terms	Full spell	
DAMPER VALVE SEN VOLT	Damper valve sensor voltage	mV
DMPR VLV SET POS	Damper valve setpoint position	%
IN/FLAP CTRL	Inlet flap control	%
SEN 1 FEED V	Sensors No. 1 feed voltage	mV
ADDITIONAL INFO FD9C	Additional information FD9C	—
ALTERNATOR LOAD	Alternator load	%
ADDITIONAL INFO 2069	Additional information 2069	Nm
SEN 2 FEED V	Sensors No. 2 feed voltage	mV
PL PTNMR T2 V	Pedal potentiometer track 2 voltage	mV
PL PTNMR T1 V	Pedal potentiometer track 1 voltage	mV
HEATER PLUG CONTROL	Heater plug control	%
EGR VALVE OPENING REFERENCE	EGR valve opening reference	%
EGR VALVE CONTROL	EGR valve control	%
LAST EGR VALVE OFFSET	Last EGR valve offset	%
EGR VALVE FIRST OFFSET	EGR valve first offset	%
POTN VAL EGR VALVE CLSD	Potentiometer value EGR valve closed	%
EGR POTENTIOMETER VOLTAGE	EGR potentiometer voltage	mV
EXHAUST SYSTEM FLOW	Exhaust system flow	g/s
TEMP. UPSTREAM OF PF	Temperature upstream of particle filter	°C or °F
PRS UPSTR OF TBN	Pressure upstream of turbine	mbar
RFRG TEMP PRESS SEN VOLT	Refrigerant pressure sensor voltage	V
REFRIGERANT PRESSURE	Refrigerant pressure	bar
TBN UPSTR TEMP SETP	Turbine upstream temperature setpoint	°C or °F
TEMP UPSTREAM TURBINE	Temperature upstream of turbine	°C or °F
RV/LV BUTTON VOLTAGE	RV/LV button voltage	mV
LAST OFF/V CLOSE	Last offset damper valve closed	%
LAST OFF/V OPEN	Last offset damper valve open	%
SEN SUPPLY N-3 VOL	Sensor supply No. 3 voltage	mV
PART.FILTER UPSTREAM TEMP SEN- SOR VOLTAGE	Part.filter upstream temperature sensor voltage	V
ADDITIONAL INFO 2813	Additional information 2813	°Crk
FLOW GAS IN DPF	Flow of gas inside the particle filter	m3/h
P/FLT DIFF. PRS	Particle filter pressure differential	hPa
REGEN MALFNC	Number of regeneration failure	—
FIRST OFF/V CLOSE	First offset damper valve closed	%
FIRST OFF/V OPEN	First offset damper valve open	%
ATMOS PRESS SEN VOLT	Atmospheric pressure sensor voltage	mV
OIL DILUTION INFORMATION	Oil dilution information	%
RAIL FLOW REGULATION VALVE OCR	Rail flow regulation valve OCR	%
CRNKS SYNC LOSS COUN	Crankshaft synchronization loss counter	—
AVERAGE PERIOD OF FLOWMETER SIGNAL	Average period of flow meter signal	μS
ADDITIONAL INFORMATION FD1A	Additional information FD1A	μF
ADDITIONAL INFORMATION FD19	Additional information FD19	μF

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Item*		Unit
CONSULT screen terms	Full spell	
ADDITIONAL INFORMATION FD1B	Additional information FD1B	μF
ADDITIONAL INFORMATION FD1C	Additional information FD1C	μF
CYLINDER 1 ADAPTATION STATUS	Cylinder 1 adaptation status	—
CYLINDER 2 ADAPTATION STATUS	Cylinder 2 adaptation status	—
CYLINDER 3 ADAPTATION STATUS	Cylinder 3 adaptation status	—
CYLINDER 4 ADAPTATION STATUS	Cylinder 4 adaptation status	—
ADDITIONAL INFO 24D0	Additional information 24D0	—
VEHICLE SPEED DISPLAYED	Vehicle speed displayed	km/h or mph
ADDITIONAL INFO 287A	Additional information 287A	—
ADDITIONAL INFORMATION FD42	Additional information FD42	—
ADDITIONAL INFORMATION FD43	Additional information FD43	—
ADDITIONAL INFORMATION FD4D	Additional information FD4D	—
ADDITIONAL INFORMATION FD4E	Additional information FD4E	—
MAIN INJECTION FLOW	Main injection flow	mg/cp
SOOT IN P/FLT	Soot in the particle filter	G
PREHEATING MODE	Preheating mode	%
ADDITIONAL INFO FD2D	Additional information FD2D	%
TURBO REGULATION	Turbo regulation	• MAX • PROTECTED • DIAG MODE • INACTIVE • REG • INTRME
MOTOR	Motor	• Off • RUNNING • STALLED • CRANKING • INACTIVE
LOW FUEL LEVEL INFORMATION	Low fuel level information	• OK • LOW • INACTIVE
GEARBOX RATIO	Gearbox ratio	• REVERSE • DCLTCH • INACTIVE
COMBUSTION MODE SET	Combustion mode setting	• NORMAL • STATUS1 • STAT2 • STAT3 • STAT4 • INACTIVE
ACC. PDL DETECT BLOCK	ACC. pedal detection blocked	• NO • YES
PREHEATING REL CNT	Preheating relay control	• ACTIVE • DEACTIVAT • INACTIVE

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Item*		Unit	
CONSULT screen terms	Full spell		
CRUISE CONTROL/SPEED LIMITER OPERATION	Cruise control/speed limiter operation	• Off • SL ON • SL SUS • SL INHI • CC ON • CC SUS • CC INHI • CC/SL A • INACTIVE	EC
CC OPERATING RELIABLY	Cruise control operating reliably	• STAT0 • STAT3 • STAT2 • STATUS1 • INACTIVE	
CC/SL LMTR BUTTONS	Cruise control/speed limiter buttons	• INACTIVE • INVALID • CO.1 • SUSPD • MINUS • PLUS • RESTART	
BRAKING DETECTED MULTIPLEX SIGNAL	Braking detected multiplex signal	• MISSING • INTRME • PRESENT • INACTIVE	
COMP + AFTER IGNITION	Computer + After ignition	• DEACTIVAT • ACTIVE • INACTIVE	
WATER IN DIESEL DETECTOR	Water in diesel detector	• NOT DETECTED • DETECTED • INACTIVE	
CRANKSHAFT SYNCHRONISATION	Crankshaft synchronization	• INCORRECT • CORRECT • INACTIVE	
CRANK SIGNAL	Crank signal	• NOT DETECTED • DETECTED • INACTIVE	
VEHICLE SPEED UNIT	Vehicle speed unit	• NOT DETECTED • DETECTED • INACTIVE	
CAM TDC SYNC	Camshaft TDC synchronization	• NOT DONE • DONE • INACTIVE	
PREHEATER LIGHT	Preheating warning light	• EXTING • ILLUM • INACTIVE	

*: The items are the same as those of 1st trip freeze frame data.

DATA MONITOR MODE

NOTE:

The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	Unit	Description
A/C COMMAND	NOT DETECTED/DE- TECTED/INACTIVE	Air conditioning request detection
A/C ATHRSTION	NOT DONE/DONE/ INACTIVE	Air conditioning request
FUEL PUMP RELAY	DEACTIVAT/ACTIVE/ INACTIVE	State of the fuel pump relay control
ETAT PRIVE 5	STAT0/STATUS1/In- active	Combustion mode - particulate filter regeneration authorization state
BRAKE PEDAL	NO PRS/RESERVED/ PRESSED/INACTIVE	Brake pedal - close active switch state
REFRIGERANT PRESSURE	bar	Relative air conditioning pressure
FIRST OFF/V OPEN	%	Inlet throttle valve offset - first opened learning
FIRST OFF/V CLOSE	%	Inlet throttle valve offset - first closed learning
LAST OFF/V CLOSE	%	Inlet throttle valve offset - last closed learning
LAST OFF/V OPEN	%	Inlet throttle valve offset - last opened learning
RAIL FLOW REGULATION VALVE OCR	%	Volume flow actuator PWM command
RFRG TEMP PRESS SEN VOLT	V	Freon pressure sensor voltage
TBN UPSTR TEMP SETP	°C or °F	Temperature before turbine setpoint
HEATER PLUG CONTROL	%	Glow plug control PWM command is displayed.
PREHEATING MODE	%	PWM diagnosis signal of the heating glow plugs
MEASURE AIR FLOW	kg/h	Intake air flow rate computed from the mass air flow sensor signal is displayed.
POST INJECTION FLOW 1	mg/strk	Late post injection quantity
FLOW GAS IN DPF	m3/h	Flow of gas inside the DPF is displayed.
AIR INLET/F REL POS	%	Inlet throttle relative position
PARTICLE FILTER DIFF. PRES- SURE CORRECTION	mbr	CSF - Memorized difference pressure to apply on the CSF differential pressure for adaptation
EGR LOW PRESSURE POSITION	%	Low Pressure EMTV - position relative to the closed thrust
IN FLAP ABSO POSI	%	Raw value of the position in percent of the sensor supply voltage
AVERAGE PERIOD OF FLOWME- TER SIGNAL	μS	Basic arithmetic average of the period time
INLET/F SEN SUPPLY VOLT	V	Voltage supplied to the sensor
CRNKS SYNC LOSS COUN	—	Counter of loose of crankshaft synchronization
MAIN INJECTION FLOW	mg/strk	Main injection quantity
CYLINDER 1 ADAPTATION STA- TUS	—	Status flag of the adaptation - cylinder 1
CYLINDER 2 ADAPTATION STA- TUS	—	Status flag of the adaptation - cylinder 2
CL START OF TRAVEL SW	RELS/D/PRESSED/ INACTIVE	State of the begin high of the clutch pedal (0 = pedal released, 1 = pedal pressed)
F/FLOW CORR CYL NO. 1	—	Fuel balancing control - cylinder 1
F/FLOW CORR CYL NO. 4	—	Fuel balancing control - cylinder 4
TEMP UPSTREAM OF PF	°C or °F	Temperature upstream of Particle Filter
SOOT IN P/FLT	g	Soot mass in the DPF is displayed.
EXHAUST SYSTEM FLOW	g/s	Exhaust gas air mass flow for estimation of downstream pressure and temperature models
F/FLOW CORR CYL NO. 2	—	Fuel balancing control - cylinder 2

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	Unit	Description	
F/FLOW CORR CYL NO. 3	—	Fuel balancing control - cylinder 3	A
P/FLT DIFF. PRS	mbr	CSF - Particulate differential pressure	
POTN VAL EGR VALVE CLSD	%	Absolute position in percent of the sensor supply voltage	EC
SEN SUPPLY N-3 VOL	V	Sensors power supply voltage 3 is displayed.	
PRS UPSTR OF TBN	mbar	Pressure before turbine	
TEMP upstream turbine	°C or °F	Exhaust gas temperature computed from exhaust gas temperature sensor 1 is displayed.	C
PART.FILTER UPSTREAM TEMP SENSOR VOLTAGE	mV	Upstream DPF Temperature Sensor signal voltage is displayed.	D
DMPR VLV SET POS	%	Inlet throttle position setpoint	
DAMPER VALVE SEN VOLT	V	Analogic stateline value of the smart inlet throttle	E
TBN UPSTR PRS SEN VOLT	V	Pressure before turbine sensor voltage	
DURATION OF RESUME BUTTON PRESS	s	Duration of resume button press is displayed.	F
DURATION OF + BUTTON PRESS	s	Duration of SET/+ button press is displayed.	
DURATION OF - BUTTON PRESS	s	Duration of SET/- button press is displayed.	G
DURATION OF SUSPEND BUTTON PRESS	s	Duration of suspend button press is displayed.	
TURBOCHARGING SOLENOID VALVE OCR	%	Turbocharger boost control solenoid valve open is displayed.	H
REGEN MALFNC	—	CSF - Indicates the number of regeneration failures since the last success	
NUMBER OF ABNORMAL CC/SL TRANSITIONS	—	Maximum value of blocked button detection counter	I
CYLINDER 3 ADAPTATION STATUS	—	Status flag of the adaptation - cylinder 3	J
CYLINDER 4 ADAPTATION STATUS	—	Status flag of the adaptation - cylinder 4	
AFTER REPLAC DPF	km or mile	CSF - Value of the driven	K
KM SINCE SUCCESS REGEN	km or mile	CSF - Indicates the vehicle mileage just after a successful regeneration	
CRUISE CONTROL INFO MONITORING	STAT0/STAT8/STAT7/ STAT6/STAT5/STAT4/ STAT3/STAT2/ STATUS1//INACTIVE	CCSL - State of the reversible failures not due to CC which cause CC failure	L
CC/SL SPEED SIGNAL MONITORING	STAT0/STAT1/STAT2/ STAT3/STAT4/STAT5/ STAT6//Inactive	State of the reversible failures not due to ASCD/speed limiter which cause ASCD/speed limiter failure • STATUS1: Real vehicle speed unavailable is detected. • STAT2: Displayed vehicle speed unavailable is detected. • STAT3: Real vehicle speed absence is detected. • STAT4: Display vehicle speed absence is detected. • STAT5: Change of the displayed speed unit is detected. • STAT6: Speed limiter inhibition is detected.	M
COMP + AFTER IGNITION	PRESENT/MISSING/ Inactive	Key state	N
MOTOR	Running/OFF/ STALLED/CRANKING/ Inactive	Engine status is displayed.	O
CC/SL LMTR	LIMIT/REG/Incoherence/ Inactive	Cruise control On/Off button state	P
CRUISE CONTROL	CORRECT/Incoherence/ Inactive	Speed/set point ratio too small.	

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	Unit	Description
CRANKSHAFT SYNCHRONISATION	INCORRECT/CORRECT/INACTIVE	Crankshaft synchronization state
PREHEATER LIGHT	EXTING/ILLUM/INACTIVE	Preheating lamp state
PREHEATING REL CNT	ACTIVE/Deactivat/INACTIVE	State of glow plug control actuator relay
COMBUSTION MODE SET	NORMAL/STATUS1/STAT2/STAT3/STAT4/STAT5/STAT6/STAT7/Inactive	Requirement value of combustion mode
EGR FUN PROG	NOT DONE/DONE/Inactive	High pressure EGR volume control valve offset - first learning running
CLUTCH PEDAL SWITCH	INACTIVE/ACTIVE/BLOCKED	Clutch pedal position switch status is displayed.
CRUISE CONTROL/SPEED LIMITER OPERATION	off/SL ON/SL SUS/SL INHI/CC ON/CC SUS/CC INHI/ CC SLA/Inactive	Cruse control/speed limiter operation
LOW FUEL LEVEL INFORMATION	OK/Low/Inactive	LOW FUEL LEVEL INFORMATION is displayed.
CC/SL DEACT BY DR ACTIN	STATUS1/STAT2/STAT3/STAT4/STAT5/NONE/INACTIVE	CCSL - State of the causes for normal CCSL deactivation
WATER IN DIESEL DETECTOR	NOT DETECTED/DETECTED/INACTIVE	Flag that indicates the activation of the fuel water sensor
ACC. PDL DETECT BLOCK	NO/YES	Counter of inconsistencies between accelerator pedal and brake
COMBUSTION MODE	NORMAL/STATUS1/STAT2/STAT3/STAT4/STAT5/STAT6/STAT7/RESERVED/Inactive	REQUIREMENT VALUE OF COMBUSTION MODE is displayed.
STARTER BUTTON	PRESSED/RELS/Inactive	Ignition switch status is displayed.
CC/SL LMTR BUTTONS	INACTIVE/INVALID/CO.1/SUSPD/DECREASE/INCREASE/RESTART/INACTIVE	CCSL - Steering wheel push buttons state
ENGAGE REVERSE GEAR	No/Yes/Inactive	Selector lever "R" position status is displayed.
AUTOMATIC GEARBOX IN DEFECT MODE	Not detected/DETECTED/Inactive	Transmission in limp home mode is detected.
BRAKING DETECTED MULTIPLEX SIGNAL	NO PRS/PRESSED/STATUS1/Inactive	Brake pedal - switches consolidation state
FIRST START	NOT DONE/DONE/Inactive	First start status is displayed.
CC OPERATING RELIABLY	STAT0/STAT1/STAT2/STAT3/Inactive	State of the failures which cause irreversible ASCD safety failure is displayed. • STATUS1: Presence of ASCD force request despite the ASCD deactivation • STAT2: Activation of the open brake switch without ASCD deactivation • STAT3: Activation of the minimum travel clutch switch without ASCD deactivation
VEHICLE SPEED UNIT	km/h/mph/Inactive	Vehicle speed is displayed.
TURBO REGULATION	Inactive/REGUL/INTRME/DIAG MODE/PRTECTED/MAX	Boost regulation state is displayed.

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	Unit	Description	
CAM TDC SYNC	NOT DONE/DONE/Inactive	Camshaft/crankshaft synchronization status is displayed.	A
CLUTCH INFO UNAVAILABLE	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CC which cause CC failure	EC
CLUTCH INFO ABSENT	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CC which cause CC failure	
BRAKE INFO UNAVAILABLE	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CC which cause CC failure	C
BRAKE INFO ABSENT	Not detected/DETECTED/Inactive	Brake information absent is detected.	D
DECEL W/O BRK DEPR	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CC which cause CC failure	
S/DECEL W/O BRK DEPR	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CC which cause CC failure	E
CC INHIBITED BY INJECTION	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CC which cause CC failure	F
SL INHIBITED BY INJECTION	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CCSL which cause CCSL failure	
ACTL VHCL SPD INFO UNAVL	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CCSL which cause CCSL failure	G
DISP VHCL SPD UNAVL	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CCSL which cause CCSL failure	H
ACTL VHCL SPD INFO ABSNT	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CCSL which cause CCSL failure	
DISP VHCL SPD INFO ABSNT	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CCSL which cause CCSL failure	I
CHANGE OF VHCL SPD UNIT	NOT DETECTED/DETECTED/INACTIVE	CCSL - State of the reversible failures not due to CCSL which cause CCSL failure	J
WIRED BRAKE CONTACT	NO PRS/INTRME/PRESSED/INACTIVE	Brake pedal - open active switch state	
TRC/ANTI-YAW CNT	No/Yes/Inactive	Anti skid regulation or anti yaw control in regulation.	K
PARKING BRAKE	RELSA/APPLIED/Inactive	Parking brake status is displayed.	
1ST IN VAL OPEN PR	NOT DONE/DONE/INACTIVE/	Inlet throttle valve offset - first opened learning running	L
1ST IN VAL CLOS PR	NOT DONE/DONE/INACTIVE/	Inlet throttle valve offset - first closed learning running	M
CC CONT INHI INJ	No/Yes/Inactive	ASCD system engine control inhibition	
SL INHI SYS INJ	NO/YES/INACTIVE	CCSL - State of the system causes for normal CCSL deactivation	N
NUMBER OF STARTING 1	—	Number of engine first starts (or number of trips done by the vehicle), nonresettable	
NUMBER OF STARTING 2	—	Cumulative number of engine starts, nonresettable	O
NUMBER OF STARTING 3	—	Number of engine first starts (or number of trips done by the vehicle)	
NUMBER OF STARTING 4	—	Cumulative number of engine starts	P
MAXIMUM VEHICLE SPEED	km/h or mph	Maximum vehicle speed to authorize commercial vehicle accessories accelerated idle speed	
FAST IDLE SPD FUNCTION	INACTIVE/ACTIVE	Configuration - Accessories idle engine speed strategy	
VEHICLE SPEED DISPLAYED	ACTIVE/Deactivat/Inactive	The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed.	
VEHICLE SPEED MULTIPLEXED INFORMATION	ACTIVE/Deactivat/Inactive	Vehicle speed received on the CAN network not available after a filtering time	

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	Unit	Description
CLUTCH CONTACT MULTIPLEX SIGNAL	ACTIVE/Deactivat/Inactive	Filtered unavailable clutch pedal status information
VEHICLE SPEED DISPLAYED	ACTIVE/Deactivat/Inactive	Displayed vehicle speed received on the CAN network not available after a filtering time
MANIFOLD PRESSURE	mbar	Intake manifold pressure computed from the TC boost sensor is displayed.
OIL DILUTION INFORMATION	%	Oil dilution rate
MAX PERMISSIBLE SPEED	km/h or mph	Requested speed setpoint for FSL function
GEARBOX RATIO	DCLTCH/1/2/3/4/5/6/REVERSE/Inactive	Current gear engaged • DCLTCH: Declutched at rest • 1: 1st gear • 2: 2nd gear • 3: 3rd gear • 4: 4th gear • 5: 5th gear • 6: 6th gear • REVERSE: Reverse
SOOT AFTER REGEN	G	CSF - Memorized soot mass left in CSF after a regeneration
CARBON MATERIAL RATE	%	OWE - Oil soot rate
CRANK SIGNAL	NOT DETECTED/DETECTED/INACTIVE	Crankshaft signal
ENGINE OIL DILUTION RATIO	%	Current raw oil dilution rate
EGR VALVE OPENING REFERENCE	%	EGR valve position setpoint
RAIL PRES SET	bar	Target fuel rail pressure is displayed.
BOOST PRESS REF VALUE	hPa	Boost pressure setpoint
ENGINE TORQUE	Nm	Estimated effective engine torque
FUEL FLOW	mg/strk	Total fuel flow is displayed.
EST. AIR FLOW	mg/strk	Estimated air flow is displayed
MILEAGE	km or mile	Total vehicle distance
ACCELERATOR PEDAL POSITION	—	Accelerator pedal position
ATMOSPHERIC PRESSURE	mbr	Atmospheric pressure sensor voltage
RAIL PRESSURE	bar	Fuel rail pressure is displayed.
BOOST PRESSUR	mbar	The boost pressure (determined by the signal voltage of the turbocharger boost sensor) is displayed.
ENGINE SPEED	rpm	Engine speed computed from crankshaft position sensors displayed.
INLET AIR TEMPERATURE	°C or °F	Intake air temperature is displayed.
FUEL TEMPERATURE	°C or °F	Fuel temperature
WATER TEMP	°C or °F	Engine coolant temperature is displayed.
COMPUTER SUPPLY VOLTAGE	V	Battery voltage
ATMOS PRESS SEN VOLT	V	Atmospheric pressure sensor voltage
RAIL PRESS SEN VOLT	V	Rail pressure sensor voltage
NUMBER OF ROT ENG	—	OWE - Number of engine revolutions since the last oil drain
VEHICLE SPEED	km/h or mph	The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed.
EGR VALVE FIRST OFFSET	%	High pressure EGR valve offset - first learning
LAST EGR VALVE OFFSET	%	High pressure EGR valve offset - last learning
Cruise control setting	km or mile	The preset ASCD vehicle speed is displayed.
RV/LV BUTTON VOLTAGE	V	ASCD/Speed limiter steering switch voltage

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	Unit	Description
EGR POSITION	%	High pressure EGR position is displayed.
INLET AIR FLOW	mg/strk	Mass air flow
PL PTNMR T1 V	V	Accelerator pedal position sensor 1 signal voltage is displayed.
PL PTNMR T2 V	V	Accelerator pedal position sensor 2 signal voltage is displayed.
EGR POTENTIOMETER VOLTAGE	V	EGR valve position sensor voltage
SEN 1 FEED V	V	Sensors power supply voltage 1 is displayed.
SEN 2 FEED V	V	Sensors power supply voltage 2 is displayed.
EGR VALVE CONTROL	%	EGR valve PWM command
IN/FLAP CTRL	%	Inlet throttle PWM command is displayed.
MANIFOLD PRESSURE	hPa	Intake manifold pressure computed from the TC boost sensor is displayed.

NOTE:

Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

WORK SUPPORT MODE

Work Item

Work item	Description	Usage
WRITE V.I.N.	In this mode, VIN is registered in ECM.	When registering VIN in ECM.
NUMBER OF STARTING 1	In this mode, number of engine first starts (or number of trips done by the vehicle), nonresettable.	Driving cycle severity for Oil Change System.
NUMBER OF STARTING 2	In this mode, cumulative number of engine starts, non resettable.	Driving cycle severity for Oil Change System.
NUMBER OF STARTING 3	In this mode, number of engine first starts (or number of trips done by the vehicle).	Driving cycle severity for Oil Change System.
NUMBER OF STARTING 4	In this mode, cumulative number of engine starts.	Driving cycle severity for Oil Change System.
AIR DAMPER VALVE PROGRAMMING	In this mode, intake throttle valve learnings are cleared.	When intake throttle valve is replaced.
EGR VALVE PROGRAMMING	In this mode, EGR valve learnings are cleared.	When EGR valve is replaced.
INJECTION PUMP ADAPTATIVES	In this mode, high pressure fuel pump learnings are cleared.	When high pressure fuel pump is replaced.
ENGINE ADAPTIVES	In this mode, long engine start request.	- When fuel injector(s) is replaced. - When fuel rail pressure sensor is replaced. - When HP fuel pump is replaced. - When compression test is activated.
FUEL PUMP PROGRAMMING	In this mode, first priming is requested.	When fuel pump is replaced.
TURBOCHARGER PROGRAMMING	In this mode, turbocharger learnings are cleared.	When turbocharger is replaced.
CC/SL PRGRM	In this mode, authorization to connect cruise control and speed limiter option.	When Cruise control option must be detected.
PRPR RICH SEN PROG	In this mode, reset to calibrated values the learned map and the learning counter.	When fuel injector(s) is replaced.
P/FLT DIFF PRS SEN	In this mode, DPF differential pressure sensor learnings are cleared.	When DPF differential pressure sensor is replaced.
HP TURBINE BYPASS SOL VLV PROGRAMMING	In this mode, high pressure turbocharger bypass programming.	When HP turbine bypass valve is replaced.

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Work item	Description	Usage
SERVICE REGENERATION	In this mode, service regeneration is performed.	- When ECM is replaced.* - ECM enter fail-safe mode because the amount of particulate matter in DPF reaches the specified level. - Component inspection for DPF is performed.
ENTER INJECTOR CODES	In this mode, fuel injector adjustment value is registered.	- When ECM is replaced.* - When fuel injector(s) is replaced.
WRITE SAVED DATA	In this mode, write data stored by "SAVE COMPUTER DATA" in work support mode to ECM.	When ECM is replaced.*
SAVE COMPUTER DATA	In this mode, save data that is in ECM.	When ECM is replaced.*
ADAPTIVES AFTER REPLACING CABIN FILTER	In this mode, DPF learnings are cleared.	When DPF is replaced.
INTERVAL OF OIL CHANGE (OCS) OXIDATION	In this mode, capable to advise customer about the cause of oil change interval is shortened by oil control system.	—
OIL CHANGE INTERVAL (OCS): DILUTION	In this mode, capable to advise customer about the cause of oil change interval is shortened by oil control system.	—

*: The necessary operation is different depending on the operation result of ECM data save or write. Always perform the operation according to procedures. Refer to [EC-553. "Description"](#).

ACTIVE TEST MODE

Test item	Condition	Judgment	Check item (Remedy)
FUEL PUMP	- Ignition switch: ON - Turn fuel flow actuator ON and OFF with the CONSULT and listen to operation sound.	Fuel flow actuator makes an operating sound.	- Harness and connector - Fuel pump
TURBOCHARGING SOLENOID VALVE	- Ignition switch: ON - Turn turbocharger boost control solenoid valve ON and OFF with the CONSULT and listen to operation sound.	Turbocharger boost control solenoid valve makes an operating sound.	- Harness and connector - Turbocharger boost control solenoid valve
AIR INLET FLAP	- Ignition switch: ON - Turn throttle control motor ON and OFF with the CONSULT and confirm the operation.	Throttle valve is operated.	- Harness and connector - Electric throttle control actuator
PREHEATER RELAY	- Ignition switch: ON - Glow plug control unit ON and OFF with the CONSULT and confirm the operation.	Glow plug control unit is operated.	- Harness and connector - Glow plug control unit
COOLANT CIRC SWITCHING S/V	- Ignition switch: ON - Turn thermo management valve control solenoid valve ON and OFF with the CONSULT and confirm the operation.	Thermo management valve control solenoid valve is operated.	- Harness and connector - Thermo management valve control solenoid valve
EGR VALVE	- Ignition switch: ON - Turn high pressure EGR volume control valve ON and OFF with the CONSULT and confirm the operation.	High pressure EGR volume control valve is operated.	- Harness and connector - High pressure EGR volume control valve

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YS23DDT/YS23DDTT (M9T)]

Test item	Condition	Judgment	Check item (Remedy)
HIGH PRESSURE CIRCUIT LEAK TEST	- Engine running - Engine coolant temperature: 60°C (140°F) - A/F sensor heater ON and OFF with the CONSULT and confirm the operation.	A/F sensor heater is operated.	- Harness and connector - A/F sensor heater
HIGH PRESSURE TURBINE	- Ignition switch: ON - HP turbine bypass valve control solenoid valve ON and OFF with the CONSULT and confirm the operation.	HP turbine bypass valve control solenoid valve is operated.	- Harness and connector - HP turbine bypass valve control solenoid valve
EGR BYPASS	- Ignition switch: ON - EGR cooler bypass valve control solenoid valve ON and OFF with the CONSULT and confirm the operation.	EGR cooler bypass valve control solenoid valve is operated.	- Harness and connector - EGR cooler bypass valve control solenoid valve
SECOND EGR COOLING PUMP	- Ignition switch: ON - EGR cooling water pump 2 ON and OFF with the CONSULT and confirm the operation.	EGR cooling water pump 2 is operated.	- Harness and connector - EGR cooling water pump 2
FIRST EGR COOL- ING PUMP	- Ignition switch: ON - EGR cooling water pump 1 ON and OFF with the CONSULT and confirm the operation.	EGR cooling water pump 1 is operated.	- Harness and connector - EGR cooling water pump 1
HIGH PRESSURE COMPRESSOR	- Ignition switch: ON - HP compressor bypass valve control solenoid valve ON and OFF with the CONSULT and confirm the operation.	HP compressor bypass valve control solenoid valve is operated.	- Harness and connector - HP compressor bypass valve control solenoid valve

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ECU DIAGNOSIS INFORMATION

ECM

YS23DDT

YS23DDT : Reference Value

INFOID:0000000014267826

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- Numerical values in the following table are reference values.
- These values are input/output values that ECM receives/transmits and may differ from actual operations.
- For outlines of following items, refer to [EC-458, "CONSULT Function"](#).

Monitor item	condition		Values/Status
A/C COMMAND	Ignition switch: ON		NOT DETECTED
A/C ATHRSTION	Ignition switch: ON	A/C switch: ON	DONE
		A/C switch: OFF	NOT DONE
FUEL PUMP RELAY	Ignition switch: ON		ACTIVE
ETAT PRIVE 5	Ignition switch: ON		STAT0
BRAKE PEDAL	Ignition switch: ON	Brake pedal: Fully released	NO PRS
		Brake pedal: Fully depressed	PRESSED
		Other than above condition	RESERVED/INACTIVE
REFRIGERANT PRES-SURE	Ignition switch: ON		Approx. 4 bar Indicates refrigerant pressure
FIRST OFF/V OPEN	Ignition switch: ON		Approx. 90.04%
FIRST OFF/V CLOSE	Ignition switch: ON		Approx. 14.64 %
LAST OFF/V CLOSE	Ignition switch: ON		Approx. 14.64 %
LAST OFF/V OPEN	Ignition switch: ON		Approx. 90.04 %
RAIL FLOW REGULA-TION VALVE OCR	Ignition switch: ON		0.0%
RFRG TEMP PRESS SEN VOLT	Ignition switch: ON		Approx. 0.7 V
TBN UPSTR TEMP SETP	Engine running at idle		770 °C
HEATER PLUG CON-TROL	Ignition switch: ON		0.00%
PREHEATING MODE	Ignition switch: ON		0.0%
MEASURE AIR FLOW	• Engine: After warming up • Shift lever: P • No load	Idle speed	Approx. 54.5 kg/h
		Engine speed: 2,000 rpm	Approx. 164.8 kg/h
POST INJECTION FLOW 1	Ignition switch: ON		Approx. 0.00 mg/strk
FLOW GAS IN DPF	• Engine: After warming up • Shift lever: P • No load	Idle speed	Approx. 65.6 m3/h
		Engine speed: 2,000 rpm	Approx. 16 m3/h
AIR INLET/F REL POS	Ignition switch: ON		Approx. 75.60%
PARTICLE FILTER DIFF. PRESSURE CORREC-TION	Ignition switch: ON		-3.0 mbar
EGR LOW PRESSURE POSITION	Ignition switch: ON		0.0 %

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition		Values/Status
IN FLAP ABSO POSI	Ignition switch: ON		90.13 %
AVERAGE PERIOD OF FLOWMETER SIGNAL	- Engine: After warming up - Shift lever: P - No load	Idle speed	901 μs
		Engine speed: 2,000 rpm	612 μs
INLET/F SEN SUPPLY VOLT	Ignition switch: ON		6.0 V
CRNKS SYNC LOSS COUN	Ignition switch: ON		0
MAIN INJECTION FLOW	- Engine: After warming up - Shift lever: P - No load	Idle speed	4.07 mg/strk
		Engine speed: 2,000 rpm	7.47 mg/strk
CYLINDER 1 ADAPTA-TION STATUS	Ignition switch: ON		0.00
CYLINDER 2 ADAPTA-TION STATUS	Ignition switch: ON		0.00
CL START OF TRAVEL SW	Ignition switch: ON	Clutch pedal: Fully released	RELS
		Clutch pedal: Fully depressed	PRESSED
		Other than above condition	INACTIVE
F/FLOW CORR CYL NO. 1	Engine running at idle	Fuel balancing control - cylinder 1	1.04
F/FLOW CORR CYL NO. 4	Engine running at idle	Fuel balancing control - cylinder 4	0.91
TEMP. UPSTREAM OF PF	- Engine: After warming up - Shift lever: P - No load	Idle speed	94.3 °C
		Engine speed: 2,000 rpm	110.7 °C
SOOT IN P/FLT	Ignition switch: ON		6.36 g Indicates soot mas in the DPF
EXHAUST SYSTEM FLOW	- Engine: After warming up - Shift lever: P - No load	Idle speed	16.16 g/s
		Engine speed: 2,000 rpm	54.89 g/s
F/FLOW CORR CYL NO. 2	Engine running at idle	Fuel balancing control - cylinder 2	0.97
F/FLOW CORR CYL NO. 3	Engine running at idle	Fuel balancing control - cylinder 3	1.08
P/FLT DIFF. PRS	- Engine: After warming up - Shift lever: P - No load	Idle speed	1127 mbar
		Engine speed: 2,000 rpm	1568 mbar
POTN VAL EGR VALVE CLSD	Ignition switch: ON		20.4 %
SEN SUPPLY N-3 VOL	Ignition switch: ON		Approx. 4.98 V
PRS UPSTR OF TBN	- Engine: After warming up - Shift lever: P - No load	Idle speed	8 mbar
		Engine speed: 2,000 rpm	30 mbar
TEMP upstream turbine	Ignition switch: ON		Indicates temperature up-stream of turbine
PART.FILTER UP-STREAM TEMP SENSOR VOLTAGE	Ignition switch: ON		4.95 V
DMPR VLV SET POS	Ignition switch: ON		0.0 %
DAMPER VALVE SEN VOLT	Ignition switch: ON		4.51 V

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition		Values/Status
TBN UPSTR PRS SEN VOLT	- Engine: After warming up - Shift lever: P - No load	Idle speed	0.96 V
		Engine speed: 2,000 rpm	1.49 V
DURATION OF RESUME BUTTON PRESS	Ignition switch: ON		0 s
DURATION OF + BUTTON PRESS	Ignition switch: ON		0 s
DURATION OF - BUTTON PRESS	Ignition switch: ON		0 s
DURATION OF SUSPEND BUTTON PRESS	Ignition switch: ON		0 s
TURBOCHARGING SOLENOID VALVE OCR	Ignition switch: ON		5.0 %
	Engine running at idle		92.6 %
REGEN MALFNC	Ignition switch: ON		0
NUMBER OF ABNORMAL CC/SL TRANSITIONS	Ignition switch: ON		0
CYLINDER 3 ADAPTATION STATUS	Ignition switch: ON		0.00
CYLINDER 4 ADAPTATION STATUS	Ignition switch: ON		0.00
AFTER REPLAC DPF	Ignition switch: ON		0 km Value of the driven distance when the last DPF change occurs
KM SINCE SUCCESS REGEN	Ignition switch: ON		0 km Indicates of the vehicle mileage just after a successful regeneration
CRUISE CONTROL INFO MONITORING	Ignition switch: ON		STAT 0
CC/SL SPEED SIGNAL MONITORING	Ignition switch: ON		State of the reversible failures not due to ASCD/speed limiter which cause ASCD/speed limiter failure • STAT1: Real vehicle speed unavailable is detected. • STAT2: Displayed vehicle speed unavailable is detected. • STAT3: Real vehicle speed absence is detected. • STAT4: Display vehicle speed absence is detected. • STAT5: Change of the displayed speed unit is detected. • STAT6: Speed limiter inhibition is detected.
COMP + AFTER IGNITION	Ignition switch: ON		PRESENT
MOTOR	Ignition switch: ON		Off
	Engine running at idle		Running
CC/SL LMTR	Ignition switch: ON		inactive
CRUISE CONTROL	Ignition switch: ON		CORRECT

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition		Values/Status
CRANKSHAFT SYN-CHRONISATION	Engine running at idle		CORRECT
PREHEATER LIGHT	Ignition switch: ON		EXTING
PREHEATING REL CNT	Ignition switch: ON		Deactivat
COMBUSTION MODE SET	Ignition switch: ON		NORMAL
EGR FUN PROG	Ignition switch: ON		DONE
CLUTCH PEDAL SWITCH	Ignition switch: ON		Clutch pedal position switch status is displayed.
CRUISE CONTROL/ SPEED LIMITER OPERATION	Ignition switch: ON		Off
LOW FUEL LEVEL INFORMATION	Ignition switch: ON		Low
CC/SL DEACT BY DR ACTIN	Ignition switch: ON		NONE
WATER IN DIESEL DETECTOR	Ignition switch: ON		DETECTED
ACC. PDL DETECT BLOCK	Ignition switch: ON		NO
COMBUSTION MODE	Ignition switch: ON		NORMAL
STARTER BUTTON	Ignition switch: ON		RELS
CC/SL LMTR BUTTONS	Ignition switch: ON		Inactive
ENGAGE REVERSE GEAR	Ignition switch: ON		NO
AUTOMATIC GEARBOX IN DEFECT MODE	Ignition switch: ON		Not detected
BRAKING DETECTED MULTIPLEX SIGNAL	Ignition switch: ON	Brake pedal: Fully released	NO PRS
		Brake pedal: Fully depressed	PRESSED
MANIFOLD AIR TEMP	Ignition switch: ON		Indicates Manifold air temperature.
FIRST START	Ignition switch: ON		DONE
CC OPERATING RELIABLY	Ignition switch: ON		State of the failures which cause irreversible ASCD safety failure is displayed. • STAT1: Presence of ASCD force request despite the ASCD deactivation • STAT2: Activation of the open brake switch without ASCD deactivation • STAT3: Activation of the minimum travel clutch switch without ASCD deactivation
VEHICLE SPEED UNIT	Ignition switch: ON		km/h or mph Indicates vehicle speed
TURBO REGULATION	Ignition switch: ON		Indicates boost regulation state
CAM TDC SYNC	Ignition switch: ON		DONE
CLUTCH INFO UNAVAILABLE	Ignition switch: ON		Not detected
CLUTCH INFO ABSENT	Ignition switch: ON		Not detected

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition		Values/Status
BRAKE INFO UNAVAILABLE	Ignition switch: ON		Not detected
BRAKE INFO ABSENT	Ignition switch: ON		Not detected
DECEL W/O BRK DEPR	Ignition switch: ON		Not detected
S/DECEL W/O BRK DEPR	Ignition switch: ON		Not detected
CC INHIBITED BY INJECTION	Ignition switch: ON		Not detected
SL INHIBITED BY INJECTION	Ignition switch: ON		Not detected
ACTL VHCL SPD INFO UNAVL	Ignition switch: ON		Not detected
DISP VHCL SPD UNAVL	Ignition switch: ON		Not detected
ACTL VHCL SPD INFO ABSNT	Ignition switch: ON		Not detected
DISP VHCL SPD INFO ABSNT	Ignition switch: ON		Not detected
CHANGE OF VHCL SPD UNIT	Ignition switch: ON		Not detected
WIRED BRAKE CONTACT	Ignition switch: ON	Brake pedal: Fully released	NO PRS
		Brake pedal: Fully depressed	PRESSED
TRC/ANTI-YAW CNT	Ignition switch: ON		NO
PARKING BRAKE	Ignition switch: ON		RELS
1ST IN VAL OPEN PR	Ignition switch: ON		DONE
1ST IN VAL CLOS PR	Ignition switch: ON		DONE
CC/SL CONN AUTHR	Ignition switch: ON		inactive
CC CONT INHI INJ	Ignition switch: ON		NO
SL INHI SYS INJ	Ignition switch: ON		NO
NUMBER OF STARTING 1	Ignition switch: ON		0
NUMBER OF STARTING 2	Ignition switch: ON		0
NUMBER OF STARTING 3	Ignition switch: ON		0
NUMBER OF STARTING 4	Ignition switch: ON		0
MAXIMUM VEHICLE SPEED	Ignition switch: ON		Maximum vehicle speed to authorize commercial vehicle accessories accelerated idle speed
FAST IDLE SPD FUNCTION	Ignition switch: ON		inactive
ENGINE TORQUE REFERENCE VALUE	- Engine: After warming up - Shift lever: P - No load	Idle speed	46.6 Nm
		Engine speed: 2,000 rpm	75.9 Nm
VEHICLE SPEED DISPLAYED	Ignition switch: ON		Deactivat
CLUTCH CONTACT MULTIPLEX SIGNAL	Ignition switch: ON		Deactivat
VEHICLE SPEED MULTIPLEXED INFORMATION	Ignition switch: ON		Deactivat

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition		Values/Status
VEHICLE SPEED DISPLAYED	Turn drive wheels and compare CONSULT value with the speedometer indication.		Almost the same speed as the speedometer indication.
MANIFOLD PRESSURE	Engine running at idle		1012 mbar
OIL DILUTION INFORMATION	Ignition switch: ON		Indicates oil dilution rate.
MAX PERMISSIBLE SPEED	Ignition switch: ON		65535.0 km/h
GEARBOX RATIO	Turn drive wheels and compare CONSULT value with the speedometer indication.		Speed meter indication current gear engaged: DECLTC/1/2/3/4/5/6/RVRS
SOOT AFTER REGEN	Ignition switch: ON		Memorized soot mass left in CSF after a regeneration is display.
CARBON MATERIAL RATE	Ignition switch: ON		0.0 %
CRANK SIGNAL	Engine running at idle		DETECTED
ENGINE OIL DILUTION RATIO	Ignition switch: ON		0.0 %
EGR VALVE OPENING REFERENCE	Ignition switch: ON		0.0 %
RAIL PRES SET	Engine running at idle		Indicates target fuel rail pressure
BOOST PRESS REF VALUE	- Engine: After warming up - Shift lever: P - No load	Idle speed	1056 hPa
		Engine speed: 2,000 rpm	1175 hPa
ENGINE TORQUE	- Engine: After warming up - Shift lever: P - No load	Idle speed	10.06 Nm
		Engine speed: 2,000 rpm	26.94 Nm
FUEL FLOW	- Engine: After warming up - Shift lever: P - No load	Idle speed	6.91 mg/strk
		Engine speed: 2,000 rpm	7.04 mg/strk
EST. AIR FLOW	- Engine: After warming up - Shift lever: P - No load	Idle speed	697.80 mg/strk
		Engine speed: 2,000 rpm	728.80 mg/strk
MILEAGE	Ignition switch: ON		Total vehicle distance
ACCELERATOR PEDAL POSITION	Ignition switch: ON	Accelerator pedal: Fully released	0.0
		Accelerator pedal: Fully depressed	1.05
ATMOSPHERIC PRESSURE	Ignition switch: ON		Output voltage varies with atmospheric pressure sensor
RAIL PRESSURE	- Engine: After warming up - Shift lever: P - No load	Idle speed	Approx. 337 bar
		Engine speed: 2,000 rpm	Approx. 382 bar
BOOST PRESSURE	- Engine: After warming up - Shift lever: P - No load	Idle speed	Approx. 1012 mbar
		Engine speed: 2,000 rpm	Approx. 1132 mbar
ENGINE SPEED	Engine running at idle		Indicates engine speed
INLET AIR TEMPERATURE	Ignition switch: ON		Indicates inlet air temperature
FUEL TEMPERATURE	Ignition switch: ON		Indicates fuel temperature
WATER TEMP	Ignition switch: ON		Indicates engine coolant temperature
COMPUTER SUPPLY VOLTAGE	Ignition switch: ON		14.12 V

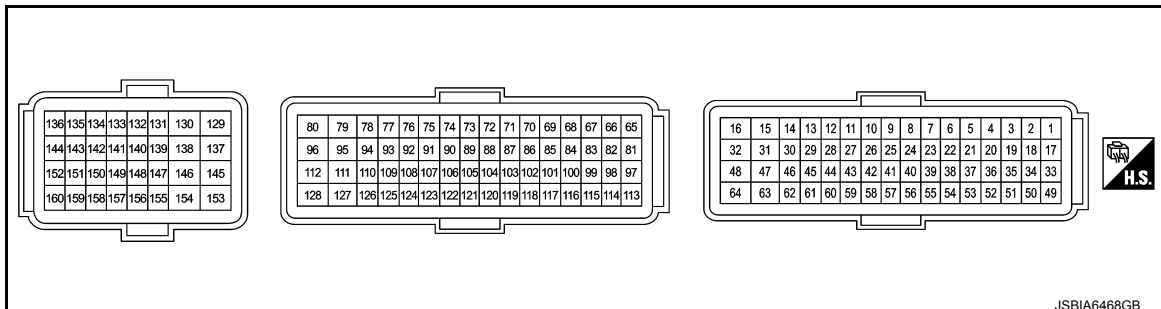
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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition		Values/Status
ATMOS PRESS SEN VOLT	Ignition switch: ON		Output voltage varies with atmospheric pressure sensor
RAIL PRESS SEN VOLT	Engine running at idle		Output voltage varies with rail pressure
NUMBER OF ROT ENG	Ignition switch: ON		Indicates number of engine revolutions since the last oil drain
VEHICLE SPEED	Turn drive wheels and compare CONSULT value with the speed meter indication.		Almost the same speed as the speedometer indication.
EGR VALVE FIRST OFF-SET	Ignition switch: ON		21.4 %
LAST EGR VALVE OFF-SET	Ignition switch: ON		21.2 %
Cruise control setting	Ignition switch: ON		The preset ASCD vehicle speed is displayed.
RV/LV BUTTON VOLT-AGE	Ignition switch: ON	ASCD MAIN switch: Pressed	Approx. 0 V
		CANCEL switch: Pressed	Approx. 0.99 V
		ACCEL/RES switch: Pressed	Approx. 2.99 V
		COAST/SET switch: Pressed	Approx. 1.99 V
		ASCD switches: Released	Approx. 3.99 V
EGR POSITION	Engine running at idle		High pressure EGR position is displayed.
INLET AIR FLOW	- Engine: After warming up - Shift lever: P - No load	Idle speed	597.0 mg/strk
		Engine speed: 2,000 rpm	613.3 mg/strk
PL PTNMR T1 V	Ignition switch: ON	Accelerator pedal: Fully released	Approx. 0.74 V
		Accelerator pedal: Fully depressed	Approx. 4.54 V
PL PTNMR T2 V	Ignition switch: ON	Accelerator pedal: Fully released	Approx. 0.37 V
		Accelerator pedal: Fully depressed	Approx. 2.25 V
EGR POTENTIOMETER VOLTAGE	Engine running at idle		EGR valve position sensor voltage
SEN 1 FEED V	Ignition switch: ON		Approx. 5.00 V
SEN 2 FEED V	Ignition switch: ON		Approx. 5.00 V
EGR VALVE CONTROL	Engine running at idle		Indicates EGR valve PWM command
IN/FLAP CTRL	Engine running at idle		Inlet throttle PWM command is displayed.
MANIFOLD PRESSURE	- Engine: After warming up - Shift lever: P - No load	Idle speed	1012.0 hPa
		Engine speed: 2,000 rpm	1236.0 hPa

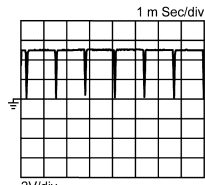
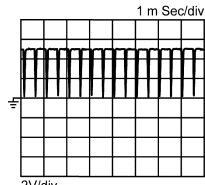
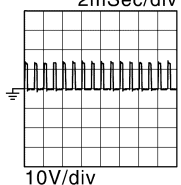
TERMINAL LAYOUT

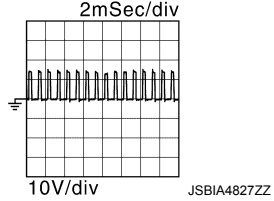
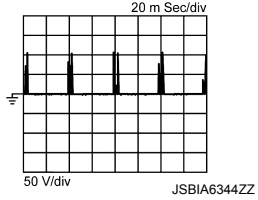
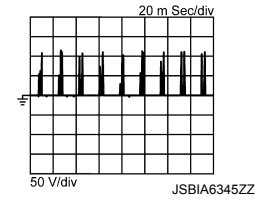
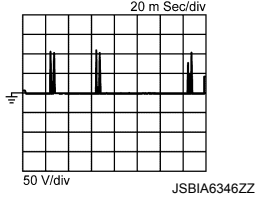
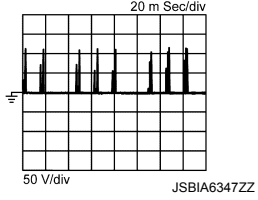


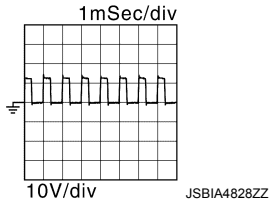
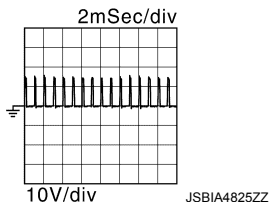
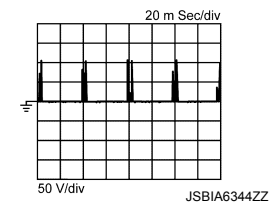
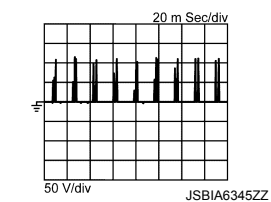
PHYSICAL VALUES

NOTE:

- ECM is located near the battery in the engine room.
- Specification data are reference values and are measured between each terminal and ground.
- Pulse signal is measured by CONSULT.

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
1 (V)	34 (G)	Turbocharger boost sensor	Input	[Engine is running] • Warm-up condition • Idle speed	1.07 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.45 V
2 (BG)	28 (P)	Intake air temperature sensor 2	Input	[Engine is running] • Warm-up condition • Idle speed	3.19 V Output voltage varies with intake air temperature.
3 (BR)	23 (Y)	Exhaust gas temperature sensor 2	Input	[Engine is running] • Warm-up condition • Idle speed	4.6 V Output voltage varies with exhaust gas temperature.
6 (SB)	39 (W)	Engine coolant temperature sensor	Input	Engine coolant temperature: 25°C (77°F)	2.89 V
				Engine coolant temperature: 80°C (176°F)	0.84 V
8 (Y)	135 (B)	A/F sensor	Input	[Engine is running] • Warm-up condition	2.5 V
9 (W)	44 (B)	G sensor*3	Input	[Ignition switch: ON]	2.5 V
10 (R)	26 (B)	Crankshaft position sensor	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	
				[Engine is running] • Engine speed: 2,000 rpm	
11 (L)	135 (B)	Electric throttle control motor (-)	Output	[Ignition switch: OFF] For 20 seconds after turning ignition switch OFF NOTE: Repeat several times opening and shutting after turning ignition switch OFF.	
				[Ignition switch: OFF] More than 20 seconds after turning ignition switch OFF	0 V

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
13 (BG)	135 (B)	EGR volume control valve motor (-)	Input	[Engine is running] - Engine coolant temperature: less than 30°C (86°F) - Idle speed NOTE: The duty cycle changes depending on EGR volume control valve operation.	
15 (R)	135 (B)	Fuel injector No.1 (HI)	Output	[Engine is running] - Warm-up condition - Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] - Warm-up condition - Engine speed: 2,000 rpm	
16 (G)	135 (B)	Fuel injector No.1 (LO)	Input	[Engine is running] - Warm-up condition - Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] - Warm-up condition - Engine speed: 2,000 rpm	
17 (W)	56 (BR)	Refrigerant pressure sensor	Input	[Engine is running] - Warm-up condition - Both A/C switch and blower fan switch: ON (Compressor operates)	1.2 - 1.3 V
18 (L)	33 (B)	Fuel temperature sensor	Input	[Engine is running] - Warm-up condition - Idle speed	1.9 V Output voltage varies with fuel temperature.
21 (LG)	37 (P)	Exhaust gas temperature sensor 1	Input	[Engine is running] - Warm-up condition - Idle speed	4.85 V Output voltage varies with exhaust gas temperature.
22 (GR)	38 (LG)	EGR temperature sensor	Input	[Engine is running]	0.1 - 4.8 V Output voltage varies with EGR temperature.

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
23 (Y)	—	Sensor ground (Exhaust gas temperature sensor 2)	—	—	—
26 (B)	—	Sensor ground (Crankshaft position sensor)	—	—	—
27 (GR)	135 (B)	Electric throttle control mo- tor (+)	Output	[Ignition switch: OFF] For 20 seconds after turning igni- tion switch OFF NOTE: Repeat several times opening and shutting after turning ignition switch OFF.	
				[Ignition switch: OFF] More than 20 seconds after turning ignition switch OFF	0 V
28 (P)	—	Sensor ground (Intake Air Temperature Sensor 2)	—	—	—
29 (V)	135 (B)	EGR volume control valve motor (+)	Input	[Engine is running] • Engine coolant temperature: less than 30°C (86°F) • Idle speed NOTE: The duty cycle changes depend- ing on EGR volume control valve operation.	
31 (L)	135 (B)	Fuel injector No.3 (HI)	Output	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes de- pending on rpm at idle.	
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	

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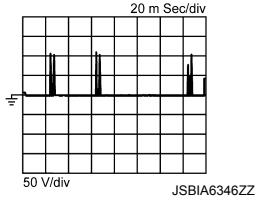
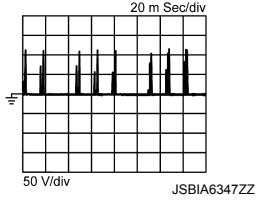
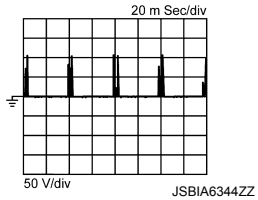
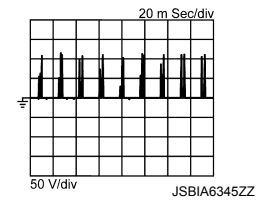
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Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
32 (Y)	135 (B)	Fuel injector No.3 (LO)	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	
33 (B)	—	Sensor ground (Fuel temperature sensor)	—	—	—
34 (G)	—	Sensor ground (Turbocharger boost sensor)	—	—	—
37 (P)	—	Sensor ground (Exhaust gas temperature sensor 1)	—	—	—
38 (LG)	—	Sensor ground (EGR temperature sensor)	—	—	—
39 (W)	—	Sensor ground (Engine coolant temperature sensor)	—	—	—
41 (G)	135 (B)	A/F sensor	Input	[Engine is running] • Warm-up condition	3.09 V
43 (Y)	26 (B)	Sensor power supply (Crankshaft position sensor)	—	[Ignition switch: ON]	5.0 V
44 (B)	—	Sensor ground*3 (G sensor)	—	—	—
47 (SB)	135 (B)	Fuel injector No.4 (HI)	Output	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
48 (V)	135 (B)	Fuel injector No.4 (LO)	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	
49 (B)	56 (BR)	Sensor power supply (Refrigerant pressure sensor)	—	[Ignition switch: ON]	5.0 V
50 (R)	135 (B)	Sensor power supply (Turbocharger boost sensor)	—	[Ignition switch: ON]	5.0 V
52 (Y)	135 (B)	Glow plug control unit (diagnosis)	Input	[Engine is running] • Idle speed • No malfunction in glow control system.	13 V
53 (R)	135 (B)	Diesel particulate filter manual regeneration switch	Input	[Engine is running] • Diesel particulate filter manual regeneration switch: OFF	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Diesel particulate filter manual regeneration switch: ON	0 V
56 (BR)	—	Sensor ground (Refrigerant pressure sensor)	—	—	—
59 (BR)	44 (B)	Sensor power supply*3 (G sensor)	Input	[Ignition switch: ON]	5.0 V
63 (W)	135 (B)	Fuel injector No.2 (HI)	Output	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	

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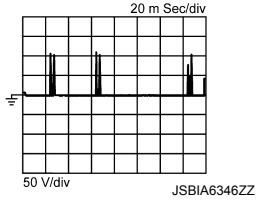
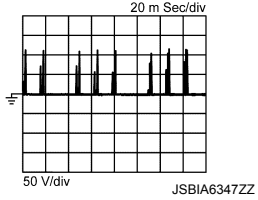
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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

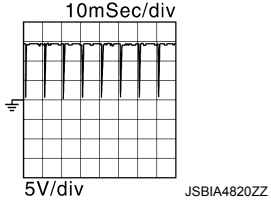
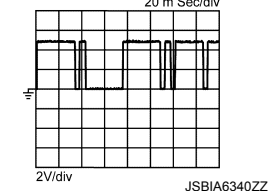
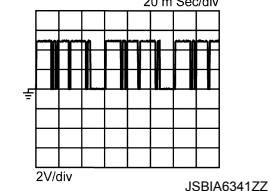
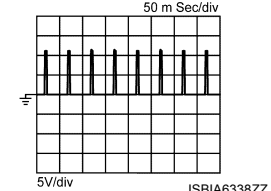
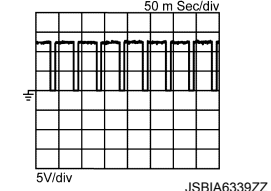
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
64 (B)	135 (B)	Fuel injector No.2 (LO)	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	
65 (BR)	135 (B)	ECM relay (Self shut-off)	Output	[Engine is running] [Ignition switch: OFF] • A few seconds after turning ignition switch OFF	0.78 V
				[Ignition switch: OFF] • More than a few seconds after turning ignition switch OFF	12.42 V
68 (Y)	135 (B)	Thermo management valve control solenoid valve	Output	[Ignition switch: ON]	12 V
				Perform "COOLANT CIRC SWITCHING S/V" in "ACTIVE TEST" mode.*2 Touch "START": Command in progress	0 V
70 (W)	135 (B)	Glow plug control (com- mand)	Output	[Engine is running] • Engine coolant temperature: less than 20°C (68°F) • Idle speed	12.91 V
				[Engine is running] • Engine coolant temperature: more than 80°C (176°F) • Idle speed	12.8 V
71 (B)	135 (B)	Engine oil pump control valve	Input	[Ignition switch: ON]	12 V
				Engine is running (at idle)	0 V
72 (BG)	135 (B)	Turbocharger boost control solenoid valve	Output	Engine is running (at idle)	1.1 V
				Perform "TIRBOCHARGING SOLENOID VALVE" in "ACTIVE TEST" mode.*2 Touch "START": Command in progress	1.5 V
73 (B)	—	Sensor ground (Fuel rail pressure sensor)	—	—	—

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

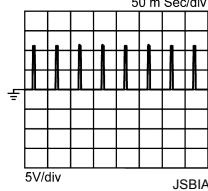
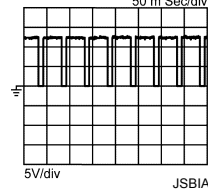
Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
74 (BR)	73 (B)	Fuel rail pressure sensor	Input	[Engine is running] • Warm-up condition • Idle speed	1.13 V
				[Engine is running] • Warm-up condition • Revving engine from idle to 2,000 rpm quickly	1.77 V
76 (BR)	103 (B)	DPF differential pressure sensor	Input	[Engine is running] • Warm-up condition • Idle speed	0.52 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	0.55 V
79 (L)	135 (B)	Fuel flow actuator	Output	[Engine is running] • Warm-up condition • Idle speed	9.6 - 12 V
80 (SB)	135 (B)	Diesel particulate filter manual regeneration switch indicator	Output	[Engine is running] • Diesel particulate filter manual regeneration switch indicator: OFF	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Diesel particulate filter manual regeneration switch indicator: ON	0 V
86 (P)	135 (B)	Fuel heater relay control	Output	[Ignition switch: ON] • Fuel temperature: less than 45°C (113°F)	0.05 V
				[Engine is running] • Warm-up condition • Fuel temperature: 65°C (149°F) or more	14.43 V
89 (G)	—	Sensor ground (Throttle position sensor)	—	—	—
90 (P)	89 (G)	Throttle position sensor	Input	[Ignition switch: OFF] For 20 seconds after turning ignition switch OFF NOTE: Repeat several times opening and shutting after turning ignition switch OFF.	0.2 – 4.7 V Output voltage fluctuates between 0 V and 5.0 V.
91 (SB)	106 (R)	EGR volume control valve control position sensor	Input	[Engine is running] • Warm-up condition • Idle speed	2.16 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1 V
93 (GR)	108 (BG)	Exhaust gas pressure sensor	Input	[Engine is running] • Warm-up condition • Idle speed	0.88 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.6 V
94 (SB)	110 (W)	Intake air temperature sensor 1	Input	[Engine is running] • Warm-up condition	2.38 V Output voltage varies with intake air temperature.

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
95 (W)	135 (B)	A/F sensor heater	Input	[Engine is running] After the vehicles is driven for 6 minutes under the following conditions • Warm-up condition • Vehicle speed: 80 km/h (50 MPH) or more • Shift lever: Suitable gear position	
99 (L)	101 (B)	Camshaft position sensor	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	
				[Engine is running] • Engine speed is 2,000 rpm	
100 (G)	110 (W)	Mass air flow sensor	Input	[Engine is running] • Warm-up condition • Idle speed	4.49 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	4.58 V
101 (B)	—	Sensor ground (Camshaft position sensor)	—	—	—
103 (B)	—	Sensor ground (DPF differential pressure sensor)	—	—	—
106 (R)	—	Sensor ground (EGR volume control valve control position sensor)	—	—	—
107 (V)	135 (B)	Electric EGR cooling water pump 2	Output	Ignition switch: ON	0 V 
				Engine is running (at idle)	

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
108 (BG)	—	Sensor ground (Exhaust gas pressure sensor)	—	—	—
110 (W)	—	Sensor ground (Mass air flow sensor, Intake air temperature sensor 1)	—	—	—
112 (R)	135 (B)	Power supply for ECM	Input	[Ignition switch: OFF]	0 V
				[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
114 (G)	135 (B)	Electric EGR cooling water pump 1	Output	Ignition switch: ON	0 V 
				Engine is running (at idle)	
115 (LG)	101 (B)	Sensor power supply (Camshaft position sensor)	—	[Ignition switch: ON]	5.0 V
116 (W)	73 (B)	Sensor power supply (Fuel rail pressure sensor)	—	[Ignition switch: ON]	2.468 V
118 (G)	103 (B)	Sensor power supply (DPF differential pressure sensor)	—	[Ignition switch: ON]	5.0 V
120 (V)	135 (B)	Sensor power supply (Throttle position sensor)	—	[Ignition switch: ON]	5.0 V
122 (L)	106 (R)	Sensor power supply (EGR volume control valve control position sensor)	—	[Ignition switch: ON]	5.0 V
123 (R)	135 (B)	Sensor power supply (Mass air flow sensor)	—	[Ignition switch: ON]	5.0 V
124 (LG)	135 (B)	Sensor power supply (Exhaust gas pressure sensor)	—	[Ignition switch: ON]	5.0 V
126 (Y)	135 (B)	EGR cooler bypass valve control solenoid valve	Output	[Engine is running] • Not warm-up condition • Idle speed	0.1 V
				Perform "EGR BYPASS" in "ACTIVE TEST" mode.*2 Touch "START": Command in progress	12 V

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
127 (P)	135 (B)	Fuel pump relay control	Output	[Ignition switch: ON] • Fuel Pump relay always is on	0 – 5.17 V
				Perform "FUEL PUMP" in "ACTIVE TEST" mode.*2 Touch "START": Command in progress	12 V
128 (LG)	135 (B)	Power supply for ECM	Input	[Ignition switch: OFF]	0 V
				[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
129 (L)	—	CAN-H	Input/ Output	—	—
131 (G)	135 (B)	Clutch pedal position switch*1	Input	[Ignition switch: ON] • Clutch pedal: Fully released	0 V
				[Ignition switch: ON] • Clutch pedal: Fully depressed	11.25 V
133 (LG)	135 (B)	Brake pedal position switch	Input	[Ignition switch: ON] • Brake pedal: Fully released	12.12 V
				[Ignition switch: ON] • Brake pedal: Slightly depressed	0 V
134 (GR)	—	Sensor ground (Accelerator pedal position sensor 2)	—	—	—
135 (B)	—	ECM ground	—	—	—
136 (B)	—	ECM ground	—	—	—
137 (P)	—	CAN-L	Input/ Output	—	—
140 (B)	—	Sensor ground (ASCD steering switch)	—	—	—
142 (R)	134 (GR)	Accelerator pedal position sensor 2	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released	0.38 V
				[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	2.25 V
143 (B)	—	ECM ground	—	—	—
144 (B)	—	Sensor ground (Accelerator pedal position sensor 1)	—	—	—

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
148 (SB)	140 (B)	ASCDC steering switch	Input	[Ignition switch: ON] • ASCDC steering switch: OFF	4 V
				[Ignition switch: ON] • CANCEL switch: Pressed	1 V
				[Ignition switch: ON] • ACCEL/RES switch: Pressed	3 V
				[Ignition switch: ON] • COAST/SET switch: Pressed	2 V
				[Ignition switch: ON] • ASCDC main switch: Pressed	0 V
150 (W)	134 (GR)	Sensor power supply (Accelerator pedal position sensor 2)	—	[Ignition switch: ON]	5 V
151 (L)	144 (B)	Sensor power supply (Accelerator pedal position sensor 1)	—	[Ignition switch: ON]	5 V
152 (P)	144 (B)	Accelerator pedal position sensor 1	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully re- leased	0.74 V
				[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully de- pressed	4.54 V
156 (BG)	135 (B)	Ignition switch	Input	[Ignition switch: ON]	11.87 V
158 (BG)	135 (B)	Water in fuel sensor	Input	[Ignition switch: ON]	11.69 V
				[Engine is running] • Warm-up condition • Idle speed	0.976 V
159 (Y)	135 (B)	Sensor power supply (Water in fuel sensor)	—	[Ignition switch: ON]	12.23V
160 (B)	—	ECM ground	—	—	—

*1: M/T models

*2: It can be confirmed using CONSULT.

*3: A/T models

YS23DDT : Fail-safe

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ENGINE CONTROL SYSTEM

DTC No.	Detected items	Engine operating condition in fail-safe mode
U0121 U0415	CAN communication circuit	VDC deactivation
P0001	Fuel flow actuator circuit	• Pressure limiting valve opening • EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCDC deactivation • VDC deactivation • Rail pressure limitation • Freeshift inhibited

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0002	Fuel rail pressure	• EGR valve closed • Throttle valve opened • Rail pressure limitation • Freeshift inhibited • ASCD deactivation • DPF regeneration forbidden • VDC deactivation • A/T in limp home • Pressure limiting valve opening • Not limitation of calibrated performance • FMO: Cancellation regulator • FMO: Stop of the adaptation • Strong vehicle speed limitation (30km/h) • Torque limitation • Inhibition of regulation mode of fuel pressure regulator
P0045	Turbo solenoid valve control circuit	• Torque limitation • EGR valve closed • Throttle valve opened • Boost regulation cut off • DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation
P0087	Fuel rail pressure	• DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation
P0089		• DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation • EGR valve closed • Throttle valve opened • VDC deactivation
P0095	Intake air temperature sensor 2	• EGR valve closed • Throttle valve opened • Torque limitation • Oil vapor heater activated when engine is running • Engine speed attachment detection inhibited
P0100 P0101	Mass air flow sensor	• EGR valve closed • Throttle valve opened
P0105 P0106	TC boost sensor	• EGR valve closed • Throttle valve opened • Limited boost pressure regulation • DPF regeneration forbidden • ASCD deactivation • Freeshift Inhibited • Increased idle speed • Wastegate cut off • Torque limitation
P0110	Intake air temperature sensor 1	• EGR valve closed • Throttle valve opened
P0115	Engine coolant temperature sensor circuit	• After sales and factory routines inhibited • Engine speed limitation • EGR valve closed • Throttle valve opened • DPF regeneration forbidden • EGR cooling valve activated • Increased idle speed • Torque limitation • Intake air temperature sensor 2 value frozen • Modelized coolant liquid temperature

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0120	Throttle position sensor	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Airflow regulation cut off • Compression test routine forbidden • ASCD deactivation • Freeshift inhibited
P0135 P2244	A/F sensor circuit	Stop closed-loop control
P0190	Fuel rail pressure sensor	• EGR valve closed • Throttle valve opened • Rail pressure limitation • DPF regeneration forbidden • After sale routines forbidden • ASCD deactivation • Freeshift inhibited • VDC deactivation
P0200	Injector control circuit	• EGR valve closed • Throttle valve opened • VDC deactivation • ASCD deactivation with dashboard message • DPF regeneration forbidden • Increased idle speed
P0201 P0202 P0203 P0204	Fuel injector circuit	• EGR valve closed • Throttle valve opened • ASCD deactivation • DPF regeneration forbidden • Increased idle speed
P0217	Brake/accelerator pedal positions	• Cooling FAN Activated • Controlled shutters opening • Warning overheating lamp activated • Opening of the engine coolant thermostat (request of ineffective opening in that case) • EGR control cut off • A/C compressor cut-off
P0225	Accelerator pedal position sensor 1circuit	• Torque limitation • After sales and factory routines inhibited • Freeshift inhibited • ASCD deactivation
P0226	Brake/accelerator pedal positions	• Torque limitation • Pedal limp home activated • After sales and factory routines inhibited • Freeshift Inhibited • ASCD deactivation
P0263 P0266 P0269 P0272	Fuel injector calibration	• Throttle valve opened • EGR valve closed • DPF regeneration forbidden • Freeshift Inhibited • ASCD deactivation • VDC deactivation • A/T in limp home • Increased idle speed
P0335	Crankshaft position sensor	• Throttle valve opened • EGR valve closed • DPF regeneration forbidden • Engine speed limitation • Torque limitation • VDC deactivation

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DTC No.	Detected items	Engine operating condition in fail-safe mode
P0340	Camshaft position sensor circuit	• Synchronization on the exhaust CAM • Intake variable valve timing control deactivation • Inhibition of the variable valve timing control (setpoint = 0) • Inhibition of the variable valve timing control command (% PWM = 0) • variable valve timing control angular position set to 0 and inhibition of the variable valve timing control
P0402	EGR system	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited
P0403		• EGR valve closed • Throttle valve opened
P0409	EGR volume control valve control position sensor circuit	• EGR valve closed • Stop closed-loop control • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited
P0470	Exhaust gas pressure sensor	• Boost pressure limitation • EGR valve closed • Throttle valve opened • ASCD deactivation • Freeshift inhibited • DPF regeneration forbidden
P0471		• Boost pressure limitation • EGR valve closed • Throttle valve opened • ASCD deactivation • Freeshift inhibited • DPF regeneration forbidden • Torque limitation
P0487	EGR volume command circuit	• EGR valve closed • Throttle valve opened • Stop closed-loop control • Freeshift inhibited • DPF regeneration forbidden • ASCD deactivation
P0488	EGR valve position control	• EGR valve closed • Throttle valve opened • Freeshift inhibited • ASCD deactivation • DPF regeneration forbidden
P0504	Stop lamp switch	• No coherency between wiring and CAN information for brake pedal • ASCD deactivation
P0525	ASCD system	ASCD deactivation
P0530	Refrigerant pressure sensor	A/C deactivation
P0544	Exhaust gas temperature sensor 1 circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited • After sales and factory routines inhibited

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0560	Battery voltage	• Mechanically activated throttle limp-home • Torque limitation • VDC deactivation • Glow plug circuit deactivated • Inhibition of idle speed control • Factory and after sales routines inhibited • Freeshift Inhibited • ASCD deactivation • Wastegate cut off • A/T in limp home if A/T • Deactivation of the variable valve timing control
P0564 P0575	ASCD steering switch	ASCD deactivation
P0571	Brake switch	ASCD deactivation
P0606	ECM	• Freeshift Inhibited • ASCD deactivation
P060A		• Reset ECM • VDC deactivation
P060B		• Engine speed limitation
P062B		• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Increased idle speed • ASCD deactivation • Freeshift inhibited • VDC deactivated and A/T in limp home mode
P0638 P2100 P2119	Electric throttle control actuator	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Compression test routine inhibited • Airflow regulation cut off • ASCD deactivation • Freeshift inhibited
P0641	Sensor power supply	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Limited boost pressure regulation • Torque limitation • ASCD deactivation • Boost pressure limitation
P0651		• A/C deactivation • Torque limitation • ASCD deactivation • Freeshift inhibited • After sales routines forbidden • FAN 2 activation
P0697		• EGR valve closed • Throttle valve opened • Rail pressure limitation • DPF regeneration forbidden • After sales routines forbidden • ASCD deactivation • Freeshift inhibited • VDC deactivation
P0703	Brake switch	• Engine speed limitation • No coherency between wiring and CAN information for brake pedal
P0833	DPF pressure sensor	ASCD not available

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DTC No.	Detected items	Engine operating condition in fail-safe mode
P1453	DPF pressure sensor	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden
P1525	ASCD system	ASCD deactivation
P1544	Exhaust gas temperature sensor 2 circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited
P1620	ECM	Stop closed-loop control
P1675	Engine coolant temperature	Stop closed-loop control
P2002	Diesel particulate filter	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited
P2120	Accelerator pedal position sensor 2 circuit	• Torque limitation • Freeshift inhibited • ASCD deactivation • After sales and factory routines inhibited
P2226	Atmosphere pressure sensor	• EGR valve is closed position • Throttle valve opened • DPF regeneration forbidden
P2263	Turbocharger boost sensor circuit	• EGR valve closed • Throttle valve opened • Torque limitation • ASCD deactivation • Freeshift is inhibited • Wastegate activation is inhibited • VDC deactivation • DPF regeneration forbidden
P2452	Diesel particulate filter pressure sensor circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden
P245A	EGR cooler bypass control solenoid valve	• EGR regulation cut off • EGR valve closed • Throttle valve opened
P24A7 P24A8	Electric EGR cooling water pump	• Electric EGR cooling water pump at maximum speed • Electric EGR cooling water pump blocked, no flow • Electric EGR cooling water pump cut off • Above 137°C (278.6°F), Electric EGR water pump speed reduction (at 77%)
P253F	Engine oil dilution	• DPF regeneration forbidden • Torque limitation • EGR valve closed • Throttle valve opened
P2681	Engine coolant bypass valve circuit	• Engine cooling fan activation • Throttle valve opened • EGR valve closed

YS23DDT : DTC Inspection Priority Chart

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If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

Priority	DTC	Detected items	
1	U0101, U0121, U0415, P1656	CAN communication line	A
	P0016	Crankshaft position - camshaft position correlation	EC
	P0095	Intake air temperature sensor 2	
	P0100, P0101	Mass air flow sensor	
	P0105, P0106	Turbocharger boost sensor	C
	P0110	Intake air temperature sensor 1	
	P0115	Engine coolant temperature sensor	
	P0120	Throttle position sensor	D
	P0135, P1130, P1131, P2244, P2626, P2A06	Air fuel ratio (A/F) sensor	
	P0180	Fuel temperature sensor	E
	P0190	Fuel rail pressure sensor	
	P0225, P0226, P2120	Accelerator pedal sensor	
	P0335	Crankshaft position sensor	F
	P0340	Camshaft position sensor	
	P0409	High pressure EGR volume control valve control position sensor	G
	P0470, P0471	Exhaust gas pressure sensor 1	
	P040A	EGR temperature sensor	H
	P0530	Refrigerant pressure sensor	
	P0544, P2080	Exhaust gas temperature sensor 1	
	P0606, P060A, P060B, P061A, P062B, P160C, P1620	ECM	I
	P0641, P0651, P0697	Sensor power supply	
	P1453, P2452	DPF pressure sensor	J
	P1544	Exhaust gas temperature sensor 2	
	P1610, P1612, P1615, P1616	NATS	
	P2226	Atmosphere pressure sensor	K
2	P0001, P0002	High pressure supply pump (volumetric control valve)	
	P0045	Turbocharger boost control solenoid valve	L
	P0200, P0201, P0202, P0203, P0204	Fuel injector	
	P025A	Fuel pump relay	
	P0403	High pressure EGR volume control valve	M
	P0560	Battery voltage	
	P0504, P0571, P0703	Brake switch	
	P0638, P2100, P2119	Electric throttle control actuator	N
	P0657	ECM relay	
	P0833	Clutch pedal position switch	O
	P1560	Engine oil pump control valve	
	P245A	EGR cooler bypass valve control solenoid valve	
	P24A7, P24A8	Electric EGR cooling water pump	P
	P2681	Engine coolant bypass valve	
	P2688	Fuel heater	

Priority	DTC	Detected items
3	P0087, P0089	Fuel system
	P0217, P1675	Engine over temperature (Overheat)
	P0219	Engine over speed
	P0263, P0266, P0269, P0272	Combustion disorder
	P0380	Glow control system
	P0402, P0487, P0488	EGR system
	P0500	Vehicle speed signal
	P0525, P1525	ASCD system
	P0564, P0575	ASCD steering switch
	P1546, P2002	Diesel particulate filter
	P2263	Turbocharger system
	P2264	Water diesel detector
	P253F	Engine oil dilution

YS23DDT : DTC Index

INFOID:0000000014267829

DTC*1	Items (CONSULT screen terms)	Trip	MIL lighting up		Reference
			Yellow	Red	
U0101	AUTOMATIC TRANSMISSION	10	—	—	EC-572
U0121	MLTIPLXD TRACTION CNTRL CONN	10	—	—	EC-573
U0415	MLTIPLXD TRACTION CNTRL CONN	10	—	—	EC-574
P0001	FUEL FLOW REGULATOR CIRCUIT	10	—	×	EC-575
P0002	FLOW CONTROL ADAPTIVE	10	—	×	EC-577
P0016	COHER BTWN CSFT SEN/ENG SPD	10	—	—	EC-580
P0045	TC SOLENOID VALVE CNTRL CIRC	3	×	—	EC-584
P0087	RAIL PRESSURE	10	—	—	EC-590
P0089	RAIL PRESSURE REGULATION FUNCTION	3	—	—	EC-593
P0095	AIR TEMP SEN/CIRC	3	×	—	EC-597
P0100	AIR FLOW SENSOR CIRCUIT	3	×	—	EC-599
P0101	INLET AIR CIRCUIT	1	×	—	EC-601
P0105	INLET MANIF PRS SEN CIRC	3	×	—	EC-603
P0106	INLET PRESSURE CONSISTENCY	3	×	—	EC-605
P0110	AIR TEMP SEN/CIRC	3	×	—	EC-608
P0115	WATER TEMPERATURE SENSOR CIRC	3	×	—	EC-610
P0120	INLET AIR FLAP POSITION SEN	3	×	—	EC-612
P0135	PROPOR RICH SEN HEAT CIRC	3	—	—	EC-614
P0180	FUEL TEMPERATURE SENSOR CIRCUIT	3	—	—	EC-616
P0190	RAIL PRESSURE SENSOR CIRCUIT	10	—	×	EC-618
P0200	INJECTOR CONTROL CIRCUIT	10	—	×	EC-620
P0201	CYLINDER 1 INJECTOR CIRC	3	×	×	EC-622
P0202	CYLINDER 2 INJECTOR CIRC	3	×	×	EC-622
P0203	CYLINDER 3 INJECTOR CIRC	3	×	×	EC-622
P0204	CYLINDER 4 INJECTOR CIRC	3	×	×	EC-622
P0217	ENGINE OVERHEATING	10	—	×	EC-625
P0219	ENGINE OVERSPEED	10	—	×	EC-628

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

DTC*1	Items (CONSULT screen terms)	Trip	MIL lighting up		Reference
			Yellow	Red	
P0225	PEDAL POTENTIOMETER CIRCUIT TRACK 1	3	×	—	EC-629
P0226	BRAKE/ACCELERATOR PEDAL POSITIONS	3	×	×	EC-632
P025A	FUEL PUMP MODULE A	10	—	—	EC-634
P0263	FUEL INJECTION CALIBRATION FOR CYLINDER NO. 1	10	—	—	EC-636
P0266	FUEL INJECTION CALIBRATION FOR CYLINDER NO. 2	10	—	—	EC-636
P0269	FUEL INJECTION CALIBRATION FOR CYLINDER NO. 3	10	—	—	EC-636
P0272	FUEL INJECTION CALIBRATION FOR CYLINDER NO. 4	10	—	—	EC-636
P0335	ENGINE SPEED SENSOR SIGNAL	3	×	—	EC-639
P0340	CAMSHAFT SENSOR CIRCUIT	10	—	—	EC-641
P0380	PREHEATING UNIT DIAG CONN	3	—	—	EC-643
P0402	EGR VALVE JAMMED OPEN	3	×	—	EC-646
P0403	EGR VLV CMD CIRC	3	×	—	EC-648
P0409	EGR VALVE POSITION SEN CIRC	3	×	—	EC-651
P040A	HIGH PRESS EGR TEMP SEN	3	×	—	EC-653
P0470	TBN UPSTR PRS SEN CIRC	3	×	—	EC-656
P0471	PRS UPSTR OF TBN	3	×	—	EC-659
P0487	EGR VLV CMD CIRC	1	×	—	EC-662
P0488	EGR VALVE POSITION CNTRL	3	×	—	EC-664
P0500	VEHICLE SPEED INFORMATION	10	—	—	EC-666
P0504	BRAKE SWITCH SIGNAL CONSISTENCY	1	—	—	EC-667
P0525	CRUISE CONTROL DATA MONITORING	10	—	—	EC-669
P0530	RFRG TEMP PRESS SEN VOLT	1	—	—	EC-670
P0544	TBN UPSTR TEMP SEN CIRC	3	×	—	EC-672
P0560	COMPUTER SUPPLY VOLTAGE	10	—	—	EC-674
P0564	SL LMTR/CC FNC	10	—	—	EC-676
P0571	BRAKE SWITCH CIRCUIT	1	—	—	EC-678
P0575	CC/SL LMTR BUTTONS	10	—	—	EC-680
P0606	COMPUTER	3	×	—	EC-682
P060A	COMPUTER	3	×	×	EC-683
P060B	COMPUTER	3	×	—	EC-684
P061A	COMP	3	×	×	EC-685
P062B	COMPUTER	10	—	×	EC-686
P0638	INLET AIR FLAP POSITION CTRL	3	×	—	EC-688
P0641	SEN SUPPLY N-1 VOL	10	—	×	EC-690
P0651	SEN SUPPLY N-2 VOL	10	—	×	EC-693
P0657	MAIN RELAY CONTROL CIRCUIT	10	—	—	EC-695
P0697	SEN SUPPLY N-3 VOL	10	—	×	EC-697
P0703	BRAKE PEDAL CONTACT CIRCUIT	1	—	—	EC-699
P0833*2	CLUTCH SWITCH SIGNAL CONSISTENCY	1	—	—	EC-702
P1130	PROPOR RICH SEN CIRC	3	—	—	EC-705
P1131	PROPOR RICH SEN HEAT CIRC	3	—	—	EC-707
P1453	DIFF. PRESSURE SENSOR CIRCUIT, PARTICLE FILTER	3	×	—	EC-709

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

DTC*1	Items (CONSULT screen terms)	Trip	MIL lighting up		Reference
			Yellow	Red	
P1525	CONSISTENT MULTIPLEX SIGNALS FOR CC/SL	10	—	—	EC-711
P1544	TEMP SEN UPSTREAM OF PF	10	×	×	EC-712
P1546	TEMP. UPSTREAM OF PF	10	—	×	EC-715
P1560	ENGINE OIL PRESSURE	10	—	—	EC-716
P160C	COMPUTER	10	—	—	EC-718
P1610	LOCK MODE	10	—	—	SEC-74 (With intelligent key), SEC-242 (Without intelligent key)
P1612	CHAIN OF ECM-IMMU	10	—	—	SEC-78 (With intelligent key), SEC-246 (Without intelligent key)
P1615	DIFFERENCE OF KEY	10	—	—	SEC-82 (With intelligent key), SEC-251 (Without intelligent key)
P1616	ECM	10	—	—	SEC-83 (With intelligent key), SEC-252 (Without intelligent key)
P1620	PROPOR RICH SEN FNC	3	—	—	EC-720
P1656	MULTIPLEXED E.T.C. CONNECTION	10	—	—	EC-722
P1675	ENGINE COOLANT TEMPERATURE	1	—	—	EC-723
P2002	PARTICLE FILTER	3	×	×	EC-726
P2080	TBN DOWNS TEMP REG	3	×	—	EC-728
P2100	INLET AIR FLAP CIRCUIT	3	×	—	EC-730
P2119	AIR INLET FLAP	1	×	—	EC-732
P2120	PEDAL POTENTIOMETER CIRCUIT TRACK 2	3	×	—	EC-734
P2226	ATMOS PRESS SEN	3	×	—	EC-737
P2244	PROPOR RICH SEN CIRC	3	—	—	EC-738
P2263	BOOST PRESSURE CIRCUIT	10	—	—	EC-740
P2264	WATER IN DIESEL DETECTOR	10	—	—	EC-742
P2452	P/FLT DIFF PRS SEN	3	×	—	EC-744
P245A	EGR BYPASS CIRCUIT	3	×	—	EC-747
P24A7	1ST EGR WATER PUMP CNT CIRC	3	×	—	EC-750
P24A8	EGR CLNT PUMP 2 CNT CIRC	3	×	—	EC-754
P253F	ENG OIL DILUTION	3	—	—	EC-758
P2626	PROPOR RICH SEN CIRC	3	—	—	EC-760
P2681	COOLANT CIRC SWITCHING S/V	10	—	×	EC-762
P2688	FUEL SUPPLY HEATER CONTROL	10	—	—	EC-765
P2A06	PROPOR RICH SEN CIRC	3	—	—	EC-768

*1: This number is prescribed by SAE J2012/ISO 15031-6.

*2: With M/T models

YS23DDTT

YS23DDTT : Reference Value

INFOID:000000014267830

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- Numerical values in the following table are reference values.
- These values are input/output values that ECM receives/transmits and may differ from actual operations.
- For outlines of following items, refer to [EC-458, "CONSULT Function"](#).

Monitor item	condition		Values/Status
A/C COMMAND	Ignition switch: ON		NOT DETECTED
A/C ATRSTION	Ignition switch: ON	A/C switch: ON	DONE
		A/C switch: OFF	NOT DONE
FUEL PUMP RELAY	Ignition switch: ON		ACTIVE
ETAT PRIVE 5	Ignition switch: ON		STAT0
BRAKE PEDAL	Ignition switch: ON	Brake pedal: Fully released	NO PRS
		Brake pedal: Fully depressed	PRESSED
		Other than above condition	RESERVED/INACTIVE
REFRIGERANT PRESSURE	Ignition switch: ON		Approx. 4 bar Indicates refrigerant pressure
FIRST OFF/V OPEN	Ignition switch: ON		Approx. 90.04%
FIRST OFF/V CLOSE	Ignition switch: ON		Approx. 14.64 %
LAST OFF/V CLOSE	Ignition switch: ON		Approx. 14.64 %
LAST OFF/V OPEN	Ignition switch: ON		Approx. 90.04 %
RAIL FLOW REGULATION VALVE OCR	Ignition switch: ON		0.0%
RFRG TEMP PRESS SEN VOLT	Ignition switch: ON		Approx. 0.7 V
TBN UPSTR TEMP SETP	Engine running at idle		770 °C
HEATER PLUG CONTROL	Ignition switch: ON		0.00%
PREHEATING MODE	Ignition switch: ON		0.0%
MEASURE AIR FLOW	• Engine: After warming up • Shift lever: P • No load	Idle speed	Approx. 54.5 kg/h
		Engine speed: 2,000 rpm	Approx. 164.8 kg/h
POST INJECTION FLOW 1	Ignition switch: ON		Approx. 0.00 mg/strk
FLOW GAS IN DPF	• Engine: After warming up • Shift lever: P • No load	Idle speed	Approx. 65.6 m3/h
		Engine speed: 2,000 rpm	Approx. 16 m3/h
AIR INLET/F REL POS	Ignition switch: ON		Approx. 75.60%
PARTICLE FILTER DIFF. PRESSURE CORRECTION	Ignition switch: ON		-3.0 mbar
EGR LOW PRESSURE POSITION	Ignition switch: ON		0.0 %
IN FLAP ABSO POSI	Ignition switch: ON		90.13 %
AVERAGE PERIOD OF FLOWMETER SIGNAL	• Engine: After warming up • Shift lever: P • No load	Idle speed	901 μs
		Engine speed: 2,000 rpm	612 μs

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition		Values/Status
INLET/F SEN SUPPLY VOLT	Ignition switch: ON		6.0 V
CRNKS SYNC LOSS COUN	Ignition switch: ON		0
MAIN INJECTION FLOW	- Engine: After warming up - Shift lever: P - No load	Idle speed	4.07 mg/strk
		Engine speed: 2,000 rpm	7.47 mg/strk
CYLINDER 1 ADAPTA-TION STATUS	Ignition switch: ON		0.00
CYLINDER 2 ADAPTA-TION STATUS	Ignition switch: ON		0.00
CL START OF TRAVEL SW	Ignition switch: ON	Clutch pedal: Fully released	RELS
		Clutch pedal: Fully depressed	PRESSED
		Other than above condition	INACTIVE
F/FLOW CORR CYL NO. 1	Engine running at idle	Fuel balancing control - cylinder 1	1.04
F/FLOW CORR CYL NO. 4	Engine running at idle	Fuel balancing control - cylinder 4	0.91
TEMP. UPSTREAM OF PF	- Engine: After warming up - Shift lever: P - No load	Idle speed	94.3 °C
		Engine speed: 2,000 rpm	110.7 °C
SOOT IN P/FLT	Ignition switch: ON		6.36 g Indicates soot mas in the DPF
EXHAUST SYSTEM FLOW	- Engine: After warming up - Shift lever: P - No load	Idle speed	16.16 g/s
		Engine speed: 2,000 rpm	54.89 g/s
F/FLOW CORR CYL NO. 2	Engine running at idle	Fuel balancing control - cylinder 2	0.97
F/FLOW CORR CYL NO. 3	Engine running at idle	Fuel balancing control - cylinder 3	1.08
P/FLT DIFF. PRS	- Engine: After warming up - Shift lever: P - No load	Idle speed	1127 mbar
		Engine speed: 2,000 rpm	1568 mbar
POTN VAL EGR VALVE CLSD	Ignition switch: ON		20.4 %
SEN SUPPLY N-3 VOL	Ignition switch: ON		Approx. 4.98 V
PRS UPSTR OF TBN	- Engine: After warming up - Shift lever: P - No load	Idle speed	8 mbar
		Engine speed: 2,000 rpm	30 mbar
TEMP upstream turbine	Ignition switch: ON		Indicates temperature up-stream of turbine
PART.FILTER UP-STREAM TEMP SENSOR VOLTAGE	Ignition switch: ON		4.95 V
DMPR VLV SET POS	Ignition switch: ON		0.0 %
DAMPER VALVE SEN VOLT	Ignition switch: ON		4.51 V
TBN UPSTR PRS SEN VOLT	- Engine: After warming up - Shift lever: P - No load	Idle speed	0.96 V
		Engine speed: 2,000 rpm	1.49 V
DURATION OF RESUME BUTTON PRESS	Ignition switch: ON		0 s

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition	Values/Status
DURATION OF + BUT-TON PRESS	Ignition switch: ON	0 s
DURATION OF - BUT-TON PRESS	Ignition switch: ON	0 s
DURATION OF SUS-PEND BUTTON PRESS	Ignition switch: ON	0 s
TURBOCHARGING SO-LENOID VALVE OCR	Ignition switch: ON	5.0 %
	Engine running at idle	92.6 %
REGEN MALFNC	Ignition switch: ON	0
NUMBER OF ABNOR-MAL CC/SL TRANSI-TIONS	Ignition switch: ON	0
CYLINDER 3 ADAPTA-TION STATUS	Ignition switch: ON	0.00
CYLINDER 4 ADAPTA-TION STATUS	Ignition switch: ON	0.00
AFTER REPLAC DPF	Ignition switch: ON	0 km
		Value of the driven distance when the last DPF change occurs
KM SINCE SUCCESS REGEN	Ignition switch: ON	0 km
		Indicates of the vehicle mileage just after a successful re-generation
CRUISE CONTROL INFO MONITORING	Ignition switch: ON	STAT 0
CC/SL SPEED SIGNAL MONITORING	Ignition switch: ON	State of the reversible failures not due to ASCD/speed limiter which cause ASCD/speed limiter failure
		• STAT1: Real vehicle speed unavailable is detected.
		• STAT2: Displayed vehicle speed unavailable is detected.
		• STAT3: Real vehicle speed absence is detected.
		• STAT4: Display vehicle speed absence is detected.
		• STAT5: Change of the displayed speed unit is detected.
COMP + AFTER IGNI-TION	Ignition switch: ON	PRESENT
		Off
MOTOR	Ignition switch: ON	Running
	Engine running at idle	Running
CC/SL LMTR	Ignition switch: ON	inactive
CRUISE CONTROL	Ignition switch: ON	CORRECT
CRANKSHAFT SYN-CHRONISATION	Engine running at idle	CORRECT
PREHEATER LIGHT	Ignition switch: ON	EXTING
PREHEATING REL CNT	Ignition switch: ON	Deactivat

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition		Values/Status
COMBUSTION MODE SET	Ignition switch: ON		NORMAL
EGR FUN PROG	Ignition switch: ON		DONE
CLUTCH PEDAL SWITCH	Ignition switch: ON		Clutch pedal position switch status is displayed.
CRUISE CONTROL/ SPEED LIMITER OPERATION	Ignition switch: ON		Off
LOW FUEL LEVEL INFORMATION	Ignition switch: ON		Low
CC/SL DEACT BY DR ACTIN	Ignition switch: ON		NONE
WATER IN DIESEL DETECTOR	Ignition switch: ON		DETECTED
ACC. PDL DETECT BLOCK	Ignition switch: ON		NO
COMBUSTION MODE	Ignition switch: ON		NORMAL
STARTER BUTTON	Ignition switch: ON		RELS
CC/SL LMTR BUTTONS	Ignition switch: ON		Inactive
ENGAGE REVERSE GEAR	Ignition switch: ON		NO
AUTOMATIC GEARBOX IN DEFECT MODE	Ignition switch: ON		Not detected
BRAKING DETECTED MULTIPLEX SIGNAL	Ignition switch: ON	Brake pedal: Fully released	NO PRS
		Brake pedal: Fully depressed	PRESSED
MANIFOLD AIR TEMP	Ignition switch: ON		Indicates Manifold air temperature.
FIRST START	Ignition switch: ON		DONE
CC OPERATING RELIABLY	Ignition switch: ON		State of the failures which cause irreversible ASCD safety failure is displayed. • STAT1: Presence of ASCD force request despite the ASCD deactivation • STAT2: Activation of the open brake switch without ASCD deactivation • STAT3: Activation of the minimum travel clutch switch without ASCD deactivation
VEHICLE SPEED UNIT	Ignition switch: ON		km/h or mph Indicates vehicle speed
TURBO REGULATION	Ignition switch: ON		Indicates boost regulation state
CAM TDC SYNC	Ignition switch: ON		DONE
CLUTCH INFO UNAVAILABLE	Ignition switch: ON		Not detected
CLUTCH INFO ABSENT	Ignition switch: ON		Not detected
BRAKE INFO UNAVAILABLE	Ignition switch: ON		Not detected
BRAKE INFO ABSENT	Ignition switch: ON		Not detected
DECEL W/O BRK DEPR	Ignition switch: ON		Not detected

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition		Values/Status
S/DECEL W/O BRK DEPR	Ignition switch: ON		Not detected
CC INHIBITED BY INJECTION	Ignition switch: ON		Not detected
SL INHIBITED BY INJECTION	Ignition switch: ON		Not detected
ACTL VHCL SPD INFO UNAVL	Ignition switch: ON		Not detected
DISP VHCL SPD UNAVL	Ignition switch: ON		Not detected
ACTL VHCL SPD INFO ABSNT	Ignition switch: ON		Not detected
DISP VHCL SPD INFO ABSNT	Ignition switch: ON		Not detected
CHANGE OF VHCL SPD UNIT	Ignition switch: ON		Not detected
WIRED BRAKE CONTACT	Ignition switch: ON	Brake pedal: Fully released	NO PRS
		Brake pedal: Fully depressed	PRESSED
TRC/ANTI-YAW CNT	Ignition switch: ON		NO
PARKING BRAKE	Ignition switch: ON		RELS
1ST IN VAL OPEN PR	Ignition switch: ON		DONE
1ST IN VAL CLOS PR	Ignition switch: ON		DONE
CC/SL CONN AUTHR	Ignition switch: ON		inactive
CC CONT INHI INJ	Ignition switch: ON		NO
SL INHI SYS INJ	Ignition switch: ON		NO
NUMBER OF STARTING 1	Ignition switch: ON		0
NUMBER OF STARTING 2	Ignition switch: ON		0
NUMBER OF STARTING 3	Ignition switch: ON		0
NUMBER OF STARTING 4	Ignition switch: ON		0
MAXIMUM VEHICLE SPEED	Ignition switch: ON		Maximum vehicle speed to authorize commercial vehicle accessories accelerated idle speed
FAST IDLE SPD FUNCTION	Ignition switch: ON		inactive
ENGINE TORQUE REFERENCE VALUE	- Engine: After warming up - Shift lever: P - No load	Idle speed	46.6 Nm
		Engine speed: 2,000 rpm	75.9 Nm
VEHICLE SPEED DISPLAYED	Ignition switch: ON		Deactivat
CLUTCH CONTACT MULTIPLEX SIGNAL	Ignition switch: ON		Deactivat
VEHICLE SPEED MULTIPLEXED INFORMATION	Ignition switch: ON		Deactivat
VEHICLE SPEED DISPLAYED	Turn drive wheels and compare CONSULT value with the speedometer indication.		Almost the same speed as the speedometer indication.
MANIFOLD PRESSURE	Engine running at idle		1012 mbar

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition		Values/Status
OIL DILUTION INFORMATION	Ignition switch: ON		Indicates oil dilution rate.
MAX PERMISSIBLE SPEED	Ignition switch: ON		65535.0 km/h
GEARBOX RATIO	Turn drive wheels and compare CONSULT value with the speedometer indication.		Speed meter indication current gear engaged: DECLTC/1/2/3/4/5/6/RVRS
SOOT AFTER REGEN	Ignition switch: ON		Memorized soot mass left in CSF after a regeneration is display.
CARBON MATERIAL RATE	Ignition switch: ON		0.0 %
CRANK SIGNAL	Engine running at idle		DETECTED
ENGINE OIL DILUTION RATIO	Ignition switch: ON		0.0 %
EGR VALVE OPENING REFERENCE	Ignition switch: ON		0.0 %
RAIL PRES SET	Engine running at idle		Indicates target fuel rail pressure
BOOST PRESS REF VALUE	- Engine: After warming up - Shift lever: P - No load	Idle speed	1056 hPa
		Engine speed: 2,000 rpm	1175 hPa
ENGINE TORQUE	- Engine: After warming up - Shift lever: P - No load	Idle speed	10.06 Nm
		Engine speed: 2,000 rpm	26.94 Nm
FUEL FLOW	- Engine: After warming up - Shift lever: P - No load	Idle speed	6.91 mg/strk
		Engine speed: 2,000 rpm	7.04 mg/strk
EST. AIR FLOW	- Engine: After warming up - Shift lever: P - No load	Idle speed	697.80 mg/strk
		Engine speed: 2,000 rpm	728.80 mg/strk
MILEAGE	Ignition switch: ON		Total vehicle distance
ACCELERATOR PEDAL POSITION	Ignition switch: ON	Accelerator pedal: Fully released	0.0
		Accelerator pedal: Fully depressed	1.05
ATMOSPHERIC PRESSURE	Ignition switch: ON		Output voltage varies with atmospheric pressure sensor
RAIL PRESSURE	- Engine: After warming up - Shift lever: P - No load	Idle speed	Approx. 337 bar
		Engine speed: 2,000 rpm	Approx. 382 bar
BOOST PRESSURE	- Engine: After warming up - Shift lever: P - No load	Idle speed	Approx. 1012 mbar
		Engine speed: 2,000 rpm	Approx. 1132 mbar
ENGINE SPEED	Engine running at idle		Indicates engine speed
INLET AIR TEMPERATURE	Ignition switch: ON		Indicates inlet air temperature
FUEL TEMPERATURE	Ignition switch: ON		Indicates fuel temperature
WATER TEMP	Ignition switch: ON		Indicates engine coolant temperature
COMPUTER SUPPLY VOLTAGE	Ignition switch: ON		14.12 V
ATMOS PRESS SEN VOLT	Ignition switch: ON		Output voltage varies with atmospheric pressure sensor

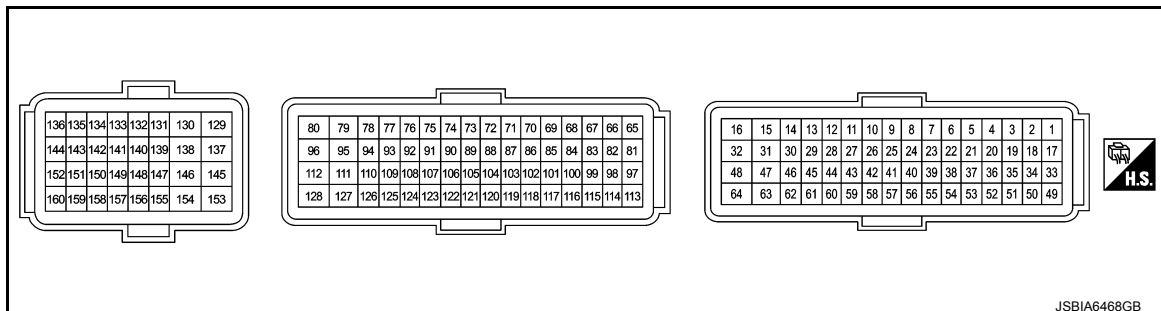
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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Monitor item	condition		Values/Status
RAIL PRESS SEN VOLT	Engine running at idle		Output voltage varies with rail pressure
NUMBER OF ROT ENG	Ignition switch: ON		Indicates number of engine revolutions since the last oil drain
VEHICLE SPEED	Turn drive wheels and compare CONSULT value with the speed meter indication.		Almost the same speed as the speedometer indication.
EGR VALVE FIRST OFF-SET	Ignition switch: ON		21.4 %
LAST EGR VALVE OFF-SET	Ignition switch: ON		21.2 %
Cruise control setting	Ignition switch: ON		The preset ASCD vehicle speed is displayed.
RV/LV BUTTON VOLT-AGE	Ignition switch: ON	ASCD MAIN switch: Pressed	Approx. 0 V
		CANCEL switch: Pressed	Approx. 0.99 V
		ACCEL/RES switch: Pressed	Approx. 2.99 V
		COAST/SET switch: Pressed	Approx. 1.99 V
		ASCD switches: Released	Approx. 3.99 V
EGR POSITION	Engine running at idle		High pressure EGR position is displayed.
INLET AIR FLOW	- Engine: After warming up - Shift lever: P - No load	Idle speed	597.0 mg/strk
		Engine speed: 2,000 rpm	613.3 mg/strk
PL PTNMR T1 V	Ignition switch: ON	Accelerator pedal: Fully released	Approx. 0.74 V
		Accelerator pedal: Fully depressed	Approx. 4.54 V
PL PTNMR T2 V	Ignition switch: ON	Accelerator pedal: Fully released	Approx. 0.37 V
		Accelerator pedal: Fully depressed	Approx. 2.25 V
EGR POTENTIOMETER VOLTAGE	Engine running at idle		EGR valve position sensor voltage
SEN 1 FEED V	Ignition switch: ON		Approx. 5.00 V
SEN 2 FEED V	Ignition switch: ON		Approx. 5.00 V
EGR VALVE CONTROL	Engine running at idle		Indicates EGR valve PWM command
IN/FLAP CTRL	Engine running at idle		Inlet throttle PWM command is displayed.
MANIFOLD PRESSURE	- Engine: After warming up - Shift lever: P - No load	Idle speed	1012.0 hPa
		Engine speed: 2,000 rpm	1236.0 hPa

TERMINAL LAYOUT

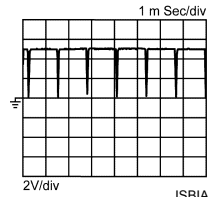
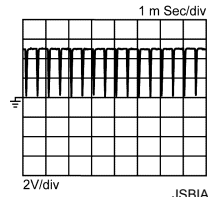
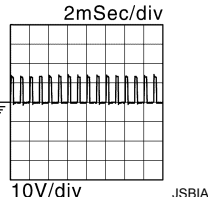


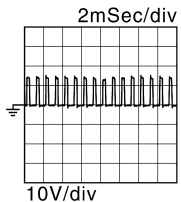
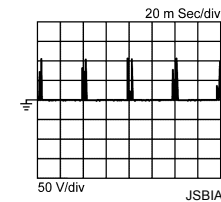
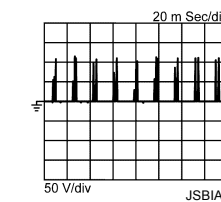
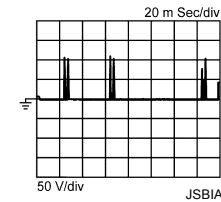
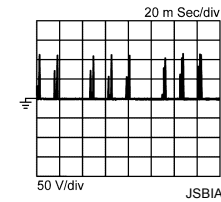
PHYSICAL VALUES

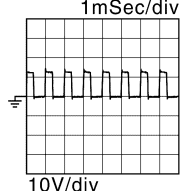
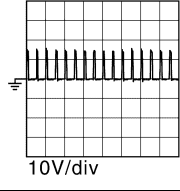
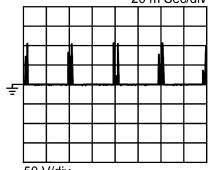
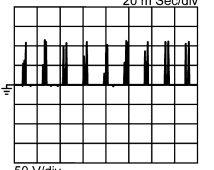
NOTE:

- ECM is located near the battery in the engine room.

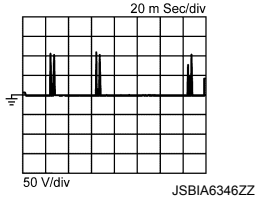
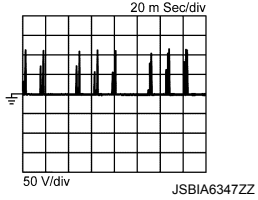
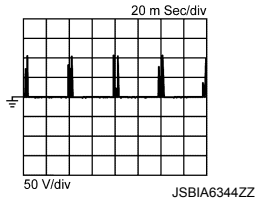
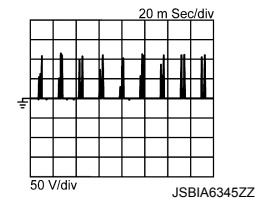
- Specification data are reference values and are measured between each terminal and ground.
- Pulse signal is measured by CONSULT.

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
1 (V)	34 (G)	Turbocharger boost sensor	Input	[Engine is running] • Warm-up condition • Idle speed	1.07 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.45 V
2 (BG)	28 (P)	Intake air temperature sensor 2	Input	[Engine is running] • Warm-up condition • Idle speed	3.19 V Output voltage varies with intake air temperature.
3 (BR)	23 (Y)	Exhaust gas temperature sensor 2	Input	[Engine is running] • Warm-up condition • Idle speed	4.6 V Output voltage varies with exhaust gas temperature.
6 (SB)	39 (W)	Engine coolant temperature sensor	Input	Engine coolant temperature: 25°C (77°F)	2.89 V
				Engine coolant temperature: 80°C (176°F)	0.84 V
8 (Y)	135 (B)	A/F sensor	Input	[Engine is running] • Warm-up condition	2.5 V
9 (W)	44 (B)	G sensor*3	Input	[Ignition switch: ON]	2.5 V
10 (R)	26 (B)	Crankshaft position sensor	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle	
				[Engine is running] • Engine speed: 2,000 rpm	
11 (L)	135 (B)	Electric throttle control motor (-)	Output	[Ignition switch: OFF] For 20 seconds after turning ignition switch OFF NOTE: Repeat several times opening and shutting after turning ignition switch OFF.	
				[Ignition switch: OFF] More than 20 seconds after turning ignition switch OFF	0 V

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
13 (BG)	135 (B)	EGR volume control valve motor (-)	Input	[Engine is running] - Engine coolant temperature: less than 30°C (86°F) - Idle speed NOTE: The duty cycle changes depending on EGR volume control valve operation.	 JSBIA4827ZZ
15 (R)	135 (B)	Fuel injector No.1 (HI)	Output	[Engine is running] - Warm-up condition - Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	 JSBIA6344ZZ
				[Engine is running] - Warm-up condition - Engine speed: 2,000 rpm	 JSBIA6345ZZ
16 (G)	135 (B)	Fuel injector No.1 (LO)	Input	[Engine is running] - Warm-up condition - Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	 JSBIA6346ZZ
				[Engine is running] - Warm-up condition - Engine speed: 2,000 rpm	 JSBIA6347ZZ
17 (W)	56 (BR)	Refrigerant pressure sensor	Input	[Engine is running] - Warm-up condition - Both A/C switch and blower fan switch: ON (Compressor operates)	1.2 - 1.3 V
18 (L)	33 (B)	Fuel temperature sensor	Input	[Engine is running] - Warm-up condition - Idle speed	1.9 V Output voltage varies with fuel temperature.
21 (LG)	37 (P)	Exhaust gas temperature sensor 1	Input	[Engine is running] - Warm-up condition - Idle speed	4.85 V Output voltage varies with exhaust gas temperature.
22 (GR)	38 (LG)	EGR temperature sensor	Input	[Engine is running]	0.1 - 4.8 V Output voltage varies with EGR temperature.

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
23 (Y)	—	Sensor ground (Exhaust gas temperature sensor 2)	—	—	—
26 (B)	—	Sensor ground (Crankshaft position sensor)	—	—	—
27 (GR)	135 (B)	Electric throttle control mo- tor (+)	Output	[Ignition switch: OFF] For 20 seconds after turning igni- tion switch OFF NOTE: Repeat several times opening and shutting after turning ignition switch OFF.	 1mSec/div 10V/div JSBIA4828ZZ
				[Ignition switch: OFF] More than 20 seconds after turning ignition switch OFF	0 V
28 (P)	—	Sensor ground (Intake Air Temperature Sensor 2)	—	—	—
29 (V)	135 (B)	EGR volume control valve motor (+)	Input	[Engine is running] • Engine coolant temperature: less than 30°C (86°F) • Idle speed NOTE: The duty cycle changes depend- ing on EGR volume control valve operation.	 2mSec/div 10V/div JSBIA4825ZZ
31 (L)	135 (B)	Fuel injector No.3 (HI)	Output	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes de- pending on rpm at idle.	 20 m Sec/div 50 V/div JSBIA6344ZZ
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	 20 m Sec/div 50 V/div JSBIA6345ZZ

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
32 (Y)	135 (B)	Fuel injector No.3 (LO)	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	
33 (B)	—	Sensor ground (Fuel temperature sensor)	—	—	—
34 (G)	—	Sensor ground (Turbocharger boost sensor)	—	—	—
37 (P)	—	Sensor ground (Exhaust gas temperature sensor 1)	—	—	—
38 (LG)	—	Sensor ground (EGR temperature sensor)	—	—	—
39 (W)	—	Sensor ground (Engine coolant temperature sensor)	—	—	—
41 (G)	135 (B)	A/F sensor	Input	[Engine is running] • Warm-up condition	3.09 V
43 (Y)	26 (B)	Sensor power supply (Crankshaft position sensor)	—	[Ignition switch: ON]	5.0 V
44 (B)	—	Sensor ground*3 (G sensor)	—	—	—
47 (SB)	135 (B)	Fuel injector No.4 (HI)	Output	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
48 (V)	135 (B)	Fuel injector No.4 (LO)	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	
49 (B)	56 (BR)	Sensor power supply (Refrigerant pressure sensor)	—	[Ignition switch: ON]	5.0 V
50 (R)	135 (B)	Sensor power supply (Turbocharger boost sensor)	—	[Ignition switch: ON]	5.0 V
52 (Y)	135 (B)	Glow plug control unit (diagnosis)	Input	[Engine is running] • Idle speed • No malfunction in glow control system.	13 V
53 (R)	135 (B)	Diesel particulate filter manual regeneration switch	Input	[Engine is running] • Diesel particulate filter manual regeneration switch: OFF	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Diesel particulate filter manual regeneration switch: ON	0 V
56 (BR)	—	Sensor ground (Refrigerant pressure sensor)	—	—	—
59 (BR)	44 (B)	Sensor power supply*3 (G sensor)	Input	[Ignition switch: ON]	5.0 V
63 (W)	135 (B)	Fuel injector No.2 (HI)	Output	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
64 (B)	135 (B)	Fuel injector No.2 (LO)	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes depending on rpm at idle.	
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	
65 (BR)	135 (B)	ECM relay (Self shut-off)	Output	[Engine is running] [Ignition switch: OFF] • A few seconds after turning ignition switch OFF	0.78 V
				[Ignition switch: OFF] • More than a few seconds after turning ignition switch OFF	12.42 V
68 (Y)	135 (B)	Thermo management valve control solenoid valve	Output	[Ignition switch: ON]	12 V
				Perform "COOLANT CIRC SWITCHING S/V" in "ACTIVE TEST" mode.*2 Touch "START": Command in progress	0 V
69 (L)	135 (B)	HP turbine bypass valve control solenoid valve	Output	[Engine is running] • Warm-up condition • Idle speed	3 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	7 V
				Perform "HIGH PRESSURE TURBINE" in "ACTIVE TEST" mode.*2 Touch "START": Command in progress	1.6 V
70 (W)	135 (B)	Glow plug control (command)	Output	[Engine is running] • Engine coolant temperature: less than 20°C (68°F) • Idle speed	12.91 V
				[Engine is running] • Engine coolant temperature: more than 80°C (176°F) • Idle speed	12.8 V
71 (B)	135 (B)	Engine oil pump control valve	Input	[Ignition switch: ON]	12 V
				Engine is running (at idle)	0 V

ECM

< ECU DIAGNOSIS INFORMATION >

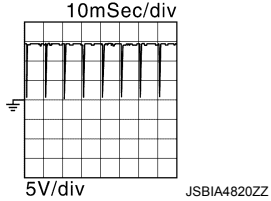
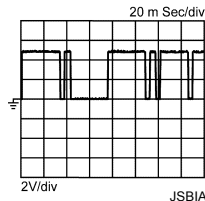
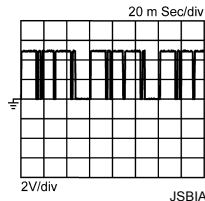
[YS23DDT/YS23DDTT (M9T)]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
72 (BG)	135 (B)	LP waste gate valve control solenoid valve	Output	Engine is running (at idle)	1.1 V
				Perform "TIRBOCHARGING SOLENOID VALVE" in "ACTIVE TEST" mode.*2 Touch "START": Command in progress	1.5 V
73 (B)	—	Sensor ground (Fuel rail pressure sensor)	—	—	—
74 (BR)	73 (B)	Fuel rail pressure sensor	Input	[Engine is running] • Warm-up condition • Idle speed	1.13 V
				[Engine is running] • Warm-up condition • Revving engine from idle to 2,000 rpm quickly	1.77 V
76 (BR)	103 (B)	DPF differential pressure sensor	Input	[Engine is running] • Warm-up condition • Idle speed	0.52 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	0.55 V
79 (L)	135 (B)	Fuel flow actuator	Output	[Engine is running] • Warm-up condition • Idle speed	9.6 - 12 V
80 (SB)	135 (B)	Diesel particulate filter manual regeneration switch indicator	Output	[Engine is running] • Diesel particulate filter manual regeneration switch indicator: OFF	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Diesel particulate filter manual regeneration switch indicator: ON	0 V
85 (BR)	135 (B)	HP compressor bypass valve control solenoid valve	Output	Engine is running (at idle)	12 V
				Perform "HIGH PRESSURE COMPRESSOR" in "ACTIVE TEST" mode.*2 Touch "START": Command in progress	0 V
86 (P)	135 (B)	Fuel heater relay control	Output	[Ignition switch: ON] • Fuel temperature: less than 45°C (113°F)	0.05 V
				[Engine is running] • Warm-up condition • Fuel temperature: 65°C (149°F) or more	14.43 V
89 (G)	—	Sensor ground (Throttle position sensor)	—	—	—
90 (P)	89 (G)	Throttle position sensor	Input	[Ignition switch: OFF] For 20 seconds after turning ignition switch OFF NOTE: Repeat several times opening and shutting after turning ignition switch OFF.	0.2 – 4.7 V Output voltage fluctuates between 0 V and 5.0 V.

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
91 (SB)	106 (R)	EGR volume control valve control position sensor	Input	[Engine is running] • Warm-up condition • Idle speed	2.16 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1 V
93 (GR)	108 (BG)	Exhaust gas pressure sen- sor	Input	[Engine is running] • Warm-up condition • Idle speed	0.88 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.6 V
94 (SB)	110 (W)	Intake air temperature sen- sor 1	Input	[Engine is running] • Warm-up condition	2.38 V Output voltage varies with intake air temperature.
95 (W)	135 (B)	A/F sensor heater	Input	[Engine is running] After the vehicles is driven for 6 minutes under the following con- ditions • Warm-up condition • Vehicle speed: 80 km/h (50 MPH) or more • Shift lever: Suitable gear posi- tion	
99 (L)	101 (B)	Camshaft position sensor	Input	[Engine is running] • Warm-up condition • Idle speed NOTE: The pulse cycle changes de- pending on rpm at idle	
				[Engine is running] • Engine speed is 2,000 rpm	
100 (G)	110 (W)	Mass air flow sensor	Input	[Engine is running] • Warm-up condition • Idle speed	4.49 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	4.58 V
101 (B)	—	Sensor ground (Camshaft position sensor)	—	—	—
103 (B)	—	Sensor ground (DPF differential pressure sensor)	—	—	—
106 (R)	—	Sensor ground (EGR volume control valve control position sensor)	—	—	—

A

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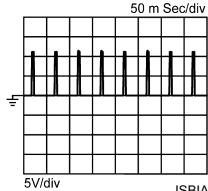
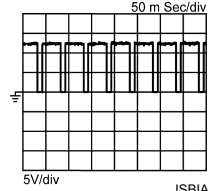
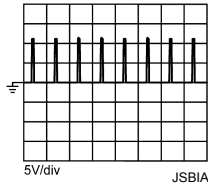
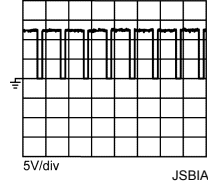
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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
107 (V)	135 (B)	Electric EGR cooling water pump 2	Output	Ignition switch: ON	0 V 
				Engine is running (at idle)	
108 (BG)	—	Sensor ground (Exhaust gas pressure sen- sor)	—	—	—
110 (W)	—	Sensor ground (Mass air flow sensor, Intake air temperature sensor 1)	—	—	—
112 (R)	135 (B)	Power supply for ECM	Input	[Ignition switch: OFF]	0 V
				[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
114 (G)	135 (B)	Electric EGR cooling water pump 1	Output	Ignition switch: ON	0 V 
				Engine is running (at idle)	
115 (LG)	101 (B)	Sensor power supply (Camshaft position sensor)	—	[Ignition switch: ON]	5.0 V
116 (W)	73 (B)	Sensor power supply (Fuel rail pressure sensor)	—	[Ignition switch: ON]	2.468 V
118 (G)	103 (B)	Sensor power supply (DPF differential pressure sensor)	—	[Ignition switch: ON]	5.0 V
120 (V)	135 (B)	Sensor power supply (Throttle position sensor)	—	[Ignition switch: ON]	5.0 V
122 (L)	106 (R)	Sensor power supply (EGR volume control valve control position sensor)	—	[Ignition switch: ON]	5.0 V

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)	
+	—	Signal name	Input/ Output			
123 (R)	135 (B)	Sensor power supply (Mass air flow sensor)	—	[Ignition switch: ON]	5.0 V	EC
124 (LG)	135 (B)	Sensor power supply (Exhaust gas pressure sensor)	—	[Ignition switch: ON]	5.0 V	C
126 (Y)	135 (B)	EGR cooler bypass valve control solenoid valve	Output	[Engine is running] • Not warm-up condition • Idle speed	0.1 V	D
				Perform "EGR BYPASS" in "ACTIVE TEST" mode.*2 Touch "START": Command in progress	12 V	E
127 (P)	135 (B)	Fuel pump relay control	Output	[Ignition switch: ON] • Fuel Pump relay always is on	0 – 5.17 V	F
				Perform "FUEL PUMP" in "ACTIVE TEST" mode.*2 Touch "START": Command in progress	12 V	G
128 (LG)	135 (B)	Power supply for ECM	Input	[Ignition switch: OFF]	0 V	H
				[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)	
129 (L)	—	CAN-H	Input/ Output	—	—	I
131 (G)	135 (B)	Clutch pedal position switch*1	Input	[Ignition switch: ON] • Clutch pedal: Fully released	0 V	J
				[Ignition switch: ON] • Clutch pedal: Fully depressed	11.25 V	
133 (LG)	135 (B)	Brake pedal position switch	Input	[Ignition switch: ON] • Brake pedal: Fully released	12.12 V	K
				[Ignition switch: ON] • Brake pedal: Slightly depressed	0 V	
134 (GR)	—	Sensor ground (Accelerator pedal position sensor 2)	—	—	—	L
135 (B)	—	ECM ground	—	—	—	M
136 (B)	—	ECM ground	—	—	—	N
137 (P)	—	CAN-L	Input/ Output	—	—	O
140 (B)	—	Sensor ground (ASCD steering switch)	—	—	—	
142 (R)	134 (GR)	Accelerator pedal position sensor 2	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully released	0.38 V	P
				[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully depressed	2.25 V	

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
143 (B)	—	ECM ground	—	—	—
144 (B)	—	Sensor ground (Accelerator pedal position sensor 1)	—	—	—
148 (SB)	140 (B)	ASCD steering switch	Input	[Ignition switch: ON] • ASCD steering switch: OFF	4 V
				[Ignition switch: ON] • CANCEL switch: Pressed	1 V
				[Ignition switch: ON] • ACCEL/RES switch: Pressed	3 V
				[Ignition switch: ON] • COAST/SET switch: Pressed	2 V
				[Ignition switch: ON] • ASCD main switch: Pressed	0 V
150 (W)	134 (GR)	Sensor power supply (Accelerator pedal position sensor 2)	—	[Ignition switch: ON]	5 V
151 (L)	144 (B)	Sensor power supply (Accelerator pedal position sensor 1)	—	[Ignition switch: ON]	5 V
152 (P)	144 (B)	Accelerator pedal position sensor 1	Input	[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully re- leased	0.74 V
				[Ignition switch: ON] • Engine stopped • Accelerator pedal: Fully de- pressed	4.54 V
156 (BG)	135 (B)	Ignition switch	Input	[Ignition switch: ON]	11.87 V
158 (BG)	135 (B)	Water in fuel sensor	Input	[Ignition switch: ON]	11.69 V
				[Engine is running] • Warm-up condition • Idle speed	0.976 V
159 (Y)	135 (B)	Sensor power supply (Water in fuel sensor)	—	[Ignition switch: ON]	12.23V
160 (B)	—	ECM ground	—	—	—

*1: M/T models

*2: It can be confirmed using CONSULT.

*3: A/T models

YS23DDTT : Fail-safe

INFOID:0000000014267831

ENGINE CONTROL SYSTEM

DTC No.	Detected items	Engine operating condition in fail-safe mode	
U0121 U0415	CAN communication circuit	VDC deactivation	A
P0001	Fuel flow actuator circuit	• Pressure limiting valve opening • EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • VDC deactivation • Rail pressure limitation • Freeshift inhibited	EC
P0002	Fuel rail pressure	• EGR valve closed • Throttle valve opened • Rail pressure limitation • Freeshift inhibited • ASCD deactivation • DPF regeneration forbidden • VDC deactivation • A/T in limp home • Pressure limiting valve opening • Not limitation of calibrated performance • FMO: Cancellation regulator • FMO: Stop of the adaptation • Strong vehicle speed limitation (30km/h) • Torque limitation • Inhibition of regulation mode of fuel pressure regulator	C D E F G H
P0033	HP compressor bypass valve control solenoid valve	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Boost regulation cut off	I
P0045	Turbo solenoid valve control circuit	• Torque limitation • EGR valve closed • Throttle valve opened • Boost regulation cut off • DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation	J K
P004A	HP turbine bypass valve control solenoid valve	HP turbine bypass valve control solenoid valve opened (open loop)	L
P0087	Fuel rail pressure	• DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation	M
P0089		• DPF regeneration forbidden • Freeshift inhibited • ASCD deactivation • EGR valve closed • Throttle valve opened • VDC deactivation	N
P0095	Intake air temperature sensor 2	• EGR valve closed • Throttle valve opened • Torque limitation • Oil vapor heater activated when engine is running • Engine speed attachment detection inhibited	O
P0100 P0101	Mass air flow sensor	• EGR valve closed • Throttle valve opened	P

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0105 P0106	TC boost sensor	• EGR valve closed • Throttle valve opened • Limited boost pressure regulation • DPF regeneration forbidden • ASCD deactivation • Freeshift Inhibited • Increased idle speed • Wastegate cut off • Torque limitation
P0110	Intake air temperature sensor 1	• EGR valve closed • Throttle valve opened
P0115	Engine coolant temperature sensor circuit	• After sales and factory routines inhibited • Engine speed limitation • EGR valve closed • Throttle valve opened • DPF regeneration forbidden • EGR cooling valve activated • Increased idle speed • Torque limitation • Intake air temperature sensor 2 value frozen • Modelized coolant liquid temperature
P0120	Throttle position sensor	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Airflow regulation cut off • Compression test routine forbidden • ASCD deactivation • Freeshift inhibited
P0135 P2244	A/F sensor circuit	Stop closed-loop control
P0190	Fuel rail pressure sensor	• EGR valve closed • Throttle valve opened • Rail pressure limitation • DPF regeneration forbidden • After sale routines forbidden • ASCD deactivation • Freeshift inhibited • VDC deactivation
P0200	Injector control circuit	• EGR valve closed • Throttle valve opened • VDC deactivation • ASCD deactivation with dashboard message • DPF regeneration forbidden • Increased idle speed
P0201 P0202 P0203 P0204	Fuel injector circuit	• EGR valve closed • Throttle valve opened • ASCD deactivation • DPF regeneration forbidden • Increased idle speed
P0217	Brake/accelerator pedal positions	• Cooling FAN Activated • Controlled shutters opening • Warning overheating lamp activated • Opening of the engine coolant thermostat (request of ineffective opening in that case) • EGR control cut off • A/C compressor cut-off
P0225	Accelerator pedal position sensor 1circuit	• Torque limitation • After sales and factory routines inhibited • Freeshift inhibited • ASCD deactivation

DTC No.	Detected items	Engine operating condition in fail-safe mode	
P0226	Brake/accelerator pedal positions	• Torque limitation • Pedal limp home activated • After sales and factory routines inhibited • Freeshift Inhibited • ASCD deactivation	A EC
P0263 P0266 P0269 P0272	Fuel injector calibration	• Throttle valve opened • EGR valve closed • DPF regeneration forbidden • Freeshift Inhibited • ASCD deactivation • VDC deactivation • A/T in limp home • Increased idle speed	C D
P0335	Crankshaft position sensor	• Throttle valve opened • EGR valve closed • DPF regeneration forbidden • Engine speed limitation • Torque limitation • VDC deactivation	E F
P0340	Camshaft position sensor circuit	• Synchronization on the exhaust CAM • Intake variable valve timing control deactivation • Inhibition of the variable valve timing control (setpoint = 0) • Inhibition of the variable valve timing control command (% PWM = 0) • variable valve timing control angular position set to 0 and inhibition of the variable valve timing control	G H
P0402	EGR system	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited	I
P0403		• EGR valve closed • Throttle valve opened	J
P0409	EGR volume control valve control position sensor circuit	• EGR valve closed • Stop closed-loop control • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited	K
P0470	Exhaust gas pressure sensor	• Boost pressure limitation • EGR valve closed • Throttle valve opened • ASCD deactivation • Freeshift inhibited • DPF regeneration forbidden	L M
P0471		• Boost pressure limitation • EGR valve closed • Throttle valve opened • ASCD deactivation • Freeshift inhibited • DPF regeneration forbidden • Torque limitation	N O
P0487	EGR volume command circuit	• EGR valve closed • Throttle valve opened • Stop closed-loop control • Freeshift inhibited • DPF regeneration forbidden • ASCD deactivation	P

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0488	EGR valve position control	• EGR valve closed • Throttle valve opened • Freeshift inhibited • ASCD deactivation • DPF regeneration forbidden
P0504	Stop lamp switch	• No coherency between wiring and CAN information for brake pedal • ASCD deactivation
P0525	ASCD system	ASCD deactivation
P0530	Refrigerant pressure sensor	A/C deactivation
P0544	Exhaust gas temperature sensor 1 circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited • After sales and factory routines inhibited
P0560	Battery voltage	• Mechanically activated throttle limp-home • Torque limitation • VDC deactivation • Glow plug circuit deactivated • Inhibition of idle speed control • Factory and after sales routines inhibited • Freeshift Inhibited • ASCD deactivation • Wastegate cut off • A/T in limp home if A/T • Deactivation of the variable valve timing control
P0564 P0575	ASCD steering switch	ASCD deactivation
P0571	Brake switch	ASCD deactivation
P0606	ECM	• Freeshift Inhibited • ASCD deactivation
P060A		• Reset ECM • VDC deactivation
P060B		• Engine speed limitation
P062B		• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Increased idle speed • ASCD deactivation • Freeshift inhibited • VDC deactivated and A/T in limp home mode
P0638 P2100 P2119	Electric throttle control actuator	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Compression test routine inhibited • Airflow regulation cut off • ASCD deactivation • Freeshift inhibited

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0641	Sensor power supply	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • Limited boost pressure regulation • Torque limitation • ASCD deactivation • Boost pressure limitation
P0651		• A/C deactivation • Torque limitation • ASCD deactivation • Freeshift inhibited • After sales routines forbidden • FAN 2 activation
P0697		• EGR valve closed • Throttle valve opened • Rail pressure limitation • DPF regeneration forbidden • After sales routines forbidden • ASCD deactivation • Freeshift inhibited • VDC deactivation
P0703	Brake switch	• Engine speed limitation • No coherency between wiring and CAN information for brake pedal
P0833	DPF pressure sensor	ASCD not available
P1453	DPF pressure sensor	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden
P1525	ASCD system	ASCD deactivation
P1544	Exhaust gas temperature sensor 2 circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited
P1620	ECM	Stop closed-loop control
P1675	Engine coolant temperature	Stop closed-loop control
P2002	Diesel particulate filter	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden • ASCD deactivation • Freeshift inhibited
P2120	Accelerator pedal position sensor 2 circuit	• Torque limitation • Freeshift inhibited • ASCD deactivation • After sales and factory routines inhibited
P2226	Atmosphere pressure sensor	• EGR valve is closed position • Throttle valve opened • DPF regeneration forbidden
P2263	Turbocharger boost sensor circuit	• EGR valve closed • Throttle valve opened • Torque limitation • ASCD deactivation • Freeshift is inhibited • Wastegate activation is inhibited • VDC deactivation • DPF regeneration forbidden
P2452	Diesel particulate filter pressure sensor circuit	• EGR valve closed • Throttle valve opened • DPF regeneration forbidden

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DTC No.	Detected items	Engine operating condition in fail-safe mode
P245A	EGR cooler bypass control solenoid valve	• EGR regulation cut off • EGR valve closed • Throttle valve opened
P24A7 P24A8	Electric EGR cooling water pump	• Electric EGR cooling water pump at maximum speed • Electric EGR cooling water pump blocked, no flow • Electric EGR cooling water pump cut off • Above 137°C (278.6°F), Electric EGR water pump speed reduction (at 77%)
P253F	Engine oil dilution	• DPF regeneration forbidden • Torque limitation • EGR valve closed • Throttle valve opened
P2681	Engine coolant bypass valve circuit	• Engine cooling fan activation • Throttle valve opened • EGR valve closed

YS23DDTT : DTC Inspection Priority Chart

INFOID:0000000014267832

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

Priority	DTC	Detected items
1	U0101, U0121, U0415, P1656	CAN communication line
	P0016	Crankshaft position - camshaft position correlation
	P0095	Intake air temperature sensor 2
	P0100, P0101	Mass air flow sensor
	P0105, P0106	Turbocharger boost sensor
	P0110	Intake air temperature sensor 1
	P0115	Engine coolant temperature sensor
	P0120	Throttle position sensor
	P0135, P1130, P1131, P2244, P2626, P2A06	Air fuel ratio (A/F) sensor
	P0180	Fuel temperature sensor
	P0190	Fuel rail pressure sensor
	P0225, P0226, P2120	Accelerator pedal sensor
	P0335	Crankshaft position sensor
	P0340	Camshaft position sensor
	P0409	High pressure EGR volume control valve control position sensor
	P0470, P0471	Exhaust gas pressure sensor 1
	P040A	EGR temperature sensor
	P0530	Refrigerant pressure sensor
	P0544, P2080	Exhaust gas temperature sensor 1
	P0606, P060A, P060B, P061A, P062B, P160C, P1620	ECM
	P0641, P0651, P0697	Sensor power supply
	P1453, P2452	DPF pressure sensor
	P1544	Exhaust gas temperature sensor 2
	P1610, P1612, P1615, P1616	NATS
	P2226	Atmosphere pressure sensor

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

Priority	DTC	Detected items
2	P0001, P0002	High pressure supply pump (volumetric control valve)
	P0033	High pressure compressor bypass valve control solenoid valve
	P0045	Turbocharger boost control solenoid valve
	P004A	High pressure turbine bypass valve control solenoid valve
	P0200, P0201, P0202, P0203, P0204	Fuel injector
	P025A	Fuel pump relay
	P0403	High pressure EGR volume control valve
	P0560	Battery voltage
	P0504, P0571, P0703	Brake switch
	P0638, P2100, P2119	Electric throttle control actuator
	P0657	ECM relay
	P0833	Clutch pedal position switch
	P1560	Engine oil pump control valve
	P245A	EGR cooler bypass valve control solenoid valve
	P24A7, P24A8	Electric EGR cooling water pump
	P2681	Engine coolant bypass valve
	P2688	Fuel heater
3	P0087, P0089	Fuel system
	P0217, P1675	Engine over temperature (Overheat)
	P0219	Engine over speed
	P0263, P0266, P0269, P0272	Combustion disorder
	P0380	Glow control system
	P0402, P0487, P0488	EGR system
	P0500	Vehicle speed signal
	P0525, P1525	ASCD system
	P0564, P0575	ASCD steering switch
	P1546, P2002	Diesel particulate filter
	P2263	Turbocharger system
	P2264	Water diesel detector
	P253F	Engine oil dilution

YS23DDTT : DTC Index

INFOID:0000000014267833

DTC*1	Items (CONSULT screen terms)	Trip	MIL lighting up		Reference
			Yellow	Red	
U0101	AUTOMATIC TRANSMISSION	10	—	—	EC-572
U0121	MLTIPLXD TRACTION CNTRL CONN	10	—	—	EC-573
U0415	MLTIPLXD TRACTION CNTRL CONN	10	—	—	EC-574
P0001	FUEL FLOW REGULATOR CIRCUIT	10	—	×	EC-575
P0002	FLOW CONTROL ADAPTIVE	10	—	×	EC-577
P0016	COHER BTWN CSFT SEN/ENG SPD	10	—	—	EC-580
P0033	BYPASS SOL VLV CONTROL VALVE	3	×	—	EC-582
P0045	TC SOLENOID VALVE CNTRL CIRC	3	×	—	EC-585
P004A	HIGH PRESS COMP BYPASS SOL VLV	10	—	—	EC-588

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< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

DTC*1	Items (CONSULT screen terms)	Trip	MIL lighting up		Reference
			Yellow	Red	
P0087	RAIL PRESSURE	10	—	—	EC-590
P0089	RAIL PRESSURE REGULATION FUNCTION	3	—	—	EC-593
P0095	AIR TEMP SEN/CIRC	3	×	—	EC-597
P0100	AIR FLOW SENSOR CIRCUIT	3	×	—	EC-599
P0101	INLET AIR CIRCUIT	1	×	—	EC-601
P0105	INLET MANIF PRS SEN CIRC	3	×	—	EC-603
P0106	INLET PRESSURE CONSISTENCY	3	×	—	EC-605
P0110	AIR TEMP SEN/CIRC	3	×	—	EC-608
P0115	WATER TEMPERATURE SENSOR CIRC	3	×	—	EC-610
P0120	INLET AIR FLAP POSITION SEN	3	×	—	EC-612
P0135	PROPOR RICH SEN HEAT CIRC	3	—	—	EC-614
P0180	FUEL TEMPERATURE SENSOR CIRCUIT	3	—	—	EC-616
P0190	RAIL PRESSURE SENSOR CIRCUIT	10	—	×	EC-618
P0200	INJECTOR CONTROL CIRCUIT	10	—	×	EC-620
P0201	CYLINDER 1 INJECTOR CIRC	3	×	×	EC-622
P0202	CYLINDER 2 INJECTOR CIRC	3	×	×	EC-622
P0203	CYLINDER 3 INJECTOR CIRC	3	×	×	EC-622
P0204	CYLINDER 4 INJECTOR CIRC	3	×	×	EC-622
P0217	ENGINE OVERHEATING	10	—	×	EC-625
P0219	ENGINE OVERSPEED	10	—	×	EC-628
P0225	PEDAL POTENTIOMETER CIRCUIT TRACK 1	3	×	—	EC-629
P0226	BRAKE/ACCELERATOR PEDAL POSITIONS	3	×	×	EC-632
P025A	FUEL PUMP MODULE A	10	—	—	EC-634
P0263	FUEL INJECTION CALIBRATION FOR CYLINDER NO. 1	10	—	—	EC-636
P0266	FUEL INJECTION CALIBRATION FOR CYLINDER NO. 2	10	—	—	EC-636
P0269	FUEL INJECTION CALIBRATION FOR CYLINDER NO. 3	10	—	—	EC-636
P0272	FUEL INJECTION CALIBRATION FOR CYLINDER NO. 4	10	—	—	EC-636
P0335	ENGINE SPEED SENSOR SIGNAL	3	×	—	EC-639
P0340	CAMSHAFT SENSOR CIRCUIT	10	—	—	EC-641
P0380	PREHEATING UNIT DIAG CONN	3	—	—	EC-643
P0402	EGR VALVE JAMMED OPEN	3	×	—	EC-646
P0403	EGR VLV CMD CIRC	3	×	—	EC-648
P0409	EGR VALVE POSITION SEN CIRC	3	×	—	EC-651
P040A	HIGH PRESS EGR TEMP SEN	3	×	—	EC-653
P0470	TBN UPSTR PRS SEN CIRC	3	×	—	EC-656
P0471	PRS UPSTR OF TBN	3	×	—	EC-659
P0487	EGR VLV CMD CIRC	1	×	—	EC-662
P0488	EGR VALVE POSITION CNTRL	3	×	—	EC-664
P0500	VEHICLE SPEED INFORMATION	10	—	—	EC-666
P0504	BRAKE SWITCH SIGNAL CONSISTENCY	1	—	—	EC-667
P0525	CRUISE CONTROL DATA MONITORING	10	—	—	EC-669
P0530	RFRG TEMP PRESS SEN VOLT	1	—	—	EC-670
P0544	TBN UPSTR TEMP SEN CIRC	3	×	—	EC-672

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

DTC*1	Items (CONSULT screen terms)	Trip	MIL lighting up		Reference
			Yellow	Red	
P0560	COMPUTER SUPPLY VOLTAGE	10	—	—	EC-674
P0564	SL LMTR/CC FNC	10	—	—	EC-676
P0571	BRAKE SWITCH CIRCUIT	1	—	—	EC-678
P0575	CC/SL LMTR BUTTONS	10	—	—	EC-680
P0606	COMPUTER	3	×	—	EC-682
P060A	COMPUTER	3	×	×	EC-683
P060B	COMPUTER	3	×	—	EC-684
P061A	COMP	3	×	×	EC-685
P062B	COMPUTER	10	—	×	EC-686
P0638	INLET AIR FLAP POSITION CTRL	3	×	—	EC-688
P0641	SEN SUPPLY N-1 VOL	10	—	×	EC-690
P0651	SEN SUPPLY N-2 VOL	10	—	×	EC-693
P0657	MAIN RELAY CONTROL CIRCUIT	10	—	—	EC-695
P0697	SEN SUPPLY N-3 VOL	10	—	×	EC-697
P0703	BRAKE PEDAL CONTACT CIRCUIT	1	—	—	EC-699
P0833*2	CLUTCH SWITCH SIGNAL CONSISTENCY	1	—	—	EC-702
P1130	PROPOR RICH SEN CIRC	3	—	—	EC-705
P1131	PROPOR RICH SEN HEAT CIRC	3	—	—	EC-707
P1453	DIFF. PRESSURE SENSOR CIRCUIT, PARTICLE FILTER	3	×	—	EC-709
P1525	CONSISTENT MULTIPLEX SIGNALS FOR CC/SL	10	—	—	EC-711
P1544	TEMP SEN UPSTREAM OF PF	10	×	×	EC-712
P1546	TEMP. UPSTREAM OF PF	10	—	×	EC-715
P1560	ENGINE OIL PRESSURE	10	—	—	EC-716
P160C	COMPUTER	10	—	—	EC-718
P1610	LOCK MODE	10	—	—	SEC-74 (With intelligent key), SEC-242 (Without intelligent key)
P1612	CHAIN OF ECM-IMMU	10	—	—	SEC-78 (With intelligent key), SEC-246 (Without intelligent key)
P1615	DIFFERENCE OF KEY	10	—	—	SEC-82 (With intelligent key), SEC-246 (Without intelligent key)
P1616	ECM	10	—	—	SEC-83 (With intelligent key), SEC-251 (Without intelligent key)
P1620	PROPOR RICH SEN FNC	3	—	—	EC-720
P1656	MULTIPLEXED E.T.C. CONNECTION	10	—	—	EC-722
P1675	ENGINE COOLANT TEMPERATURE	1	—	—	EC-723
P2002	PARTICLE FILTER	3	×	×	EC-726

ECM

< ECU DIAGNOSIS INFORMATION >

[YS23DDT/YS23DDTT (M9T)]

DTC*1	Items (CONSULT screen terms)	Trip	MIL lighting up		Reference
			Yellow	Red	
P2080	TBN DOWNS TEMP REG	3	×	—	EC-728
P2100	INLET AIR FLAP CIRCUIT	3	×	—	EC-730
P2119	AIR INLET FLAP	1	×	—	EC-732
P2120	PEDAL POTENTIOMETER CIRCUIT TRACK 2	3	×	—	EC-734
P2226	ATMOS PRESS SEN	3	×	—	EC-737
P2244	PROPOR RICH SEN CIRC	3	—	—	EC-738
P2263	BOOST PRESSURE CIRCUIT	10	—	—	EC-740
P2264	WATER IN DIESEL DETECTOR	10	—	—	EC-742
P2452	P/FLT DIFF PRS SEN	3	×	—	EC-744
P245A	EGR BYPASS CIRCUIT	3	×	—	EC-747
P24A7	1ST EGR WATER PUMP CNT CIRC	3	×	—	EC-750
P24A8	EGR CLNT PUMP 2 CNT CIRC	3	×	—	EC-754
P253F	ENG OIL DILUTION	3	—	—	EC-758
P2626	PROPOR RICH SEN CIRC	3	—	—	EC-760
P2681	COOLANT CIRC SWITCHING S/V	10	—	×	EC-762
P2688	FUEL SUPPLY HEATER CONTROL	10	—	—	EC-765
P2A06	PROPOR RICH SEN CIRC	3	—	—	EC-768

*1: This number is prescribed by SAE J2012/ISO 15031-6.

*2: With M/T models

WIRING DIAGRAM

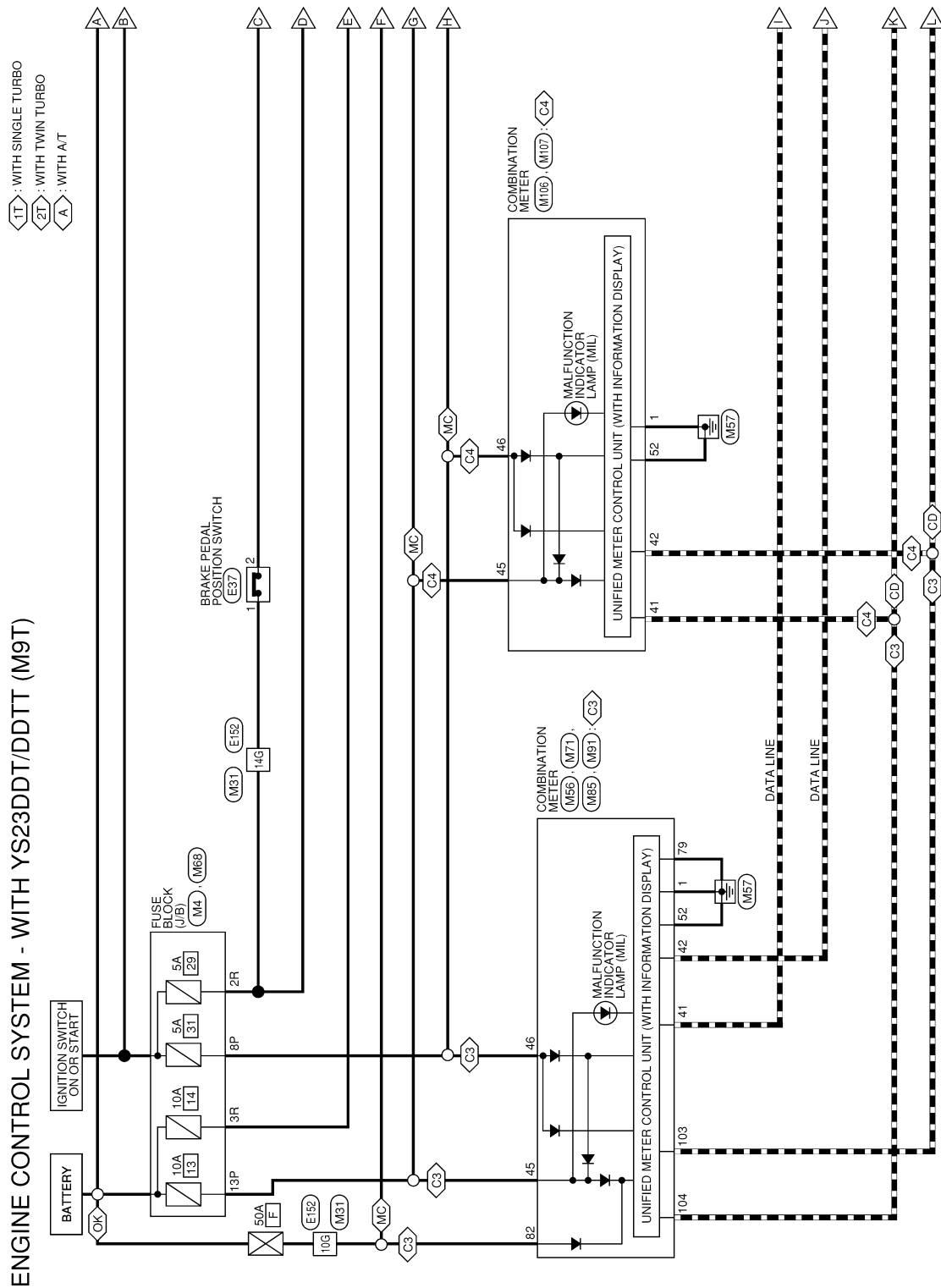
ENGINE CONTROL SYSTEM

Wiring Diagram

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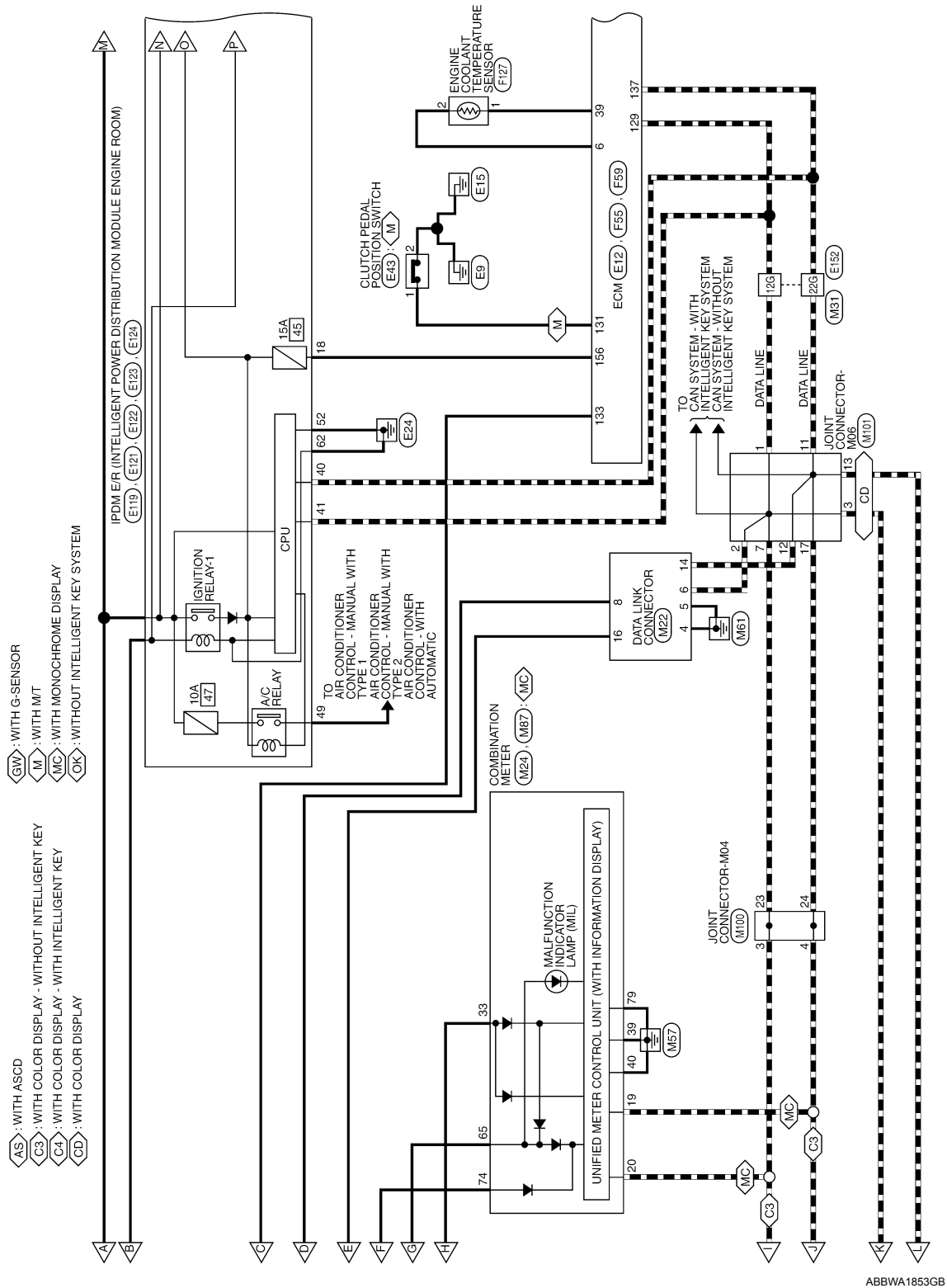
* : THIS CONNECTOR IS NOT SHOWN IN " HARNESS LAYOUT " OF PG SECTION.

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ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

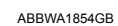
[YS23DDT/YS23DDTT (M9T)]



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[YS23DDT/YS23DDTT (M9T)]

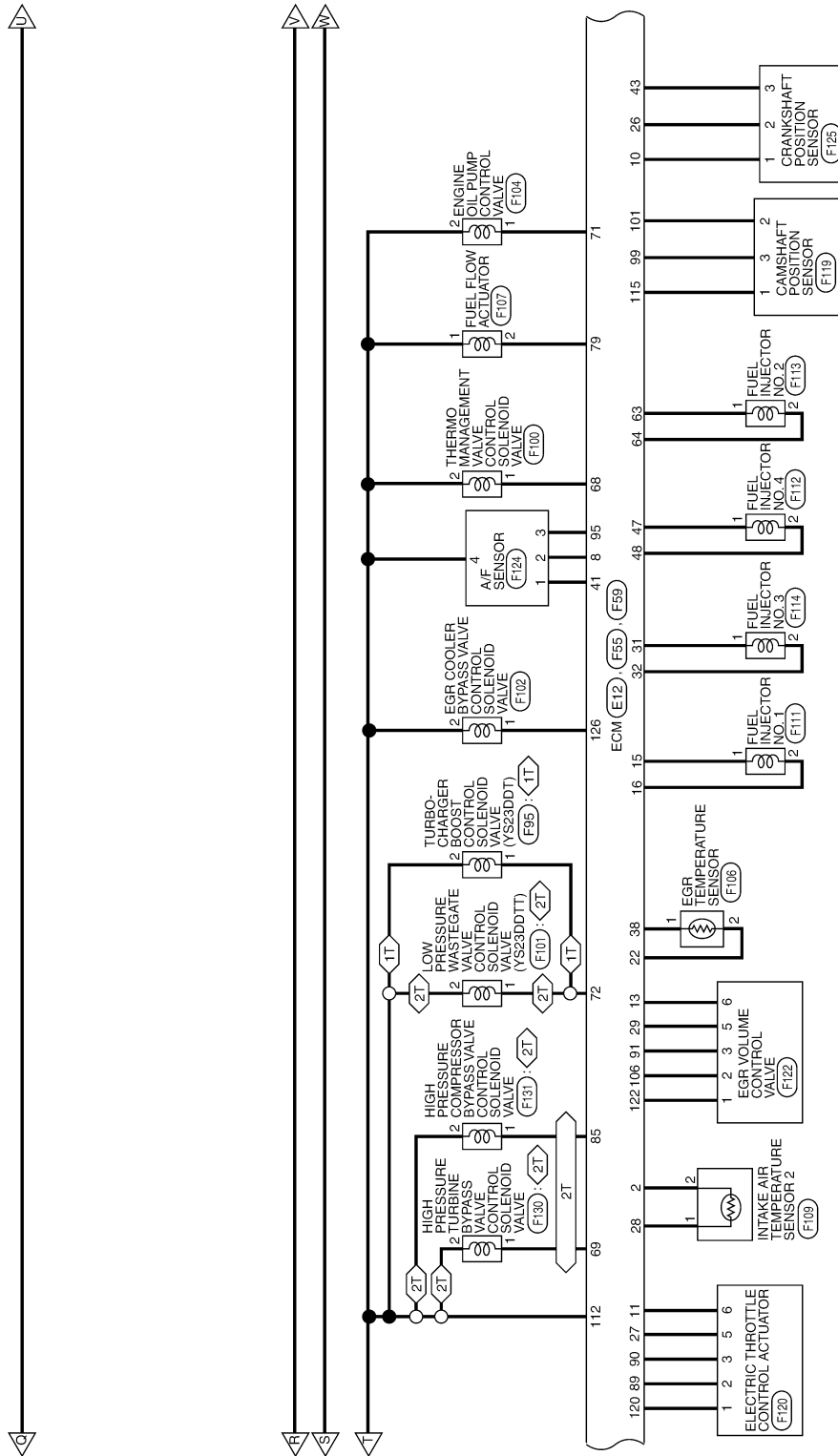
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ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YS23DDT/YS23DDTT (M9T)]



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[YS23DDT/YS23DDTT (M9T)]

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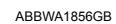
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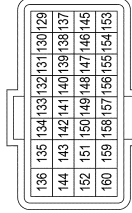
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ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

Connector No.	E12
Connector Name	ECM (WITH M9T)
Connector Type	RH24FB-RZ8-R-LH
Connector Color	BLACK



H.S.

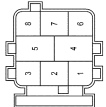
Connector No.	E13
Connector Name	EXHAUST GAS TEMPERATURE SENSOR 2
Connector Type	RH02FLGY
Connector Color	GRAY



H.S.

11	P	TO ENGINE CONTROL HARNESS - (WITH M9T)
12	Y	TO ENGINE CONTROL HARNESS
13	O	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
13	BR	TO ENGINE CONTROL HARNESS - (WITH M9T)
14	G/R	TO ENGINE CONTROL HARNESS
15	Y/R	TO ENGINE CONTROL HARNESS
16	W	TO ENGINE CONTROL HARNESS

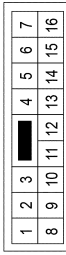
Connector No.	E28
Connector Name	GLOW CONTROL UNIT
Connector Type	FHX06FB-ANZ2
Connector Color	BLACK



H.S.

Terminal No.	Color of Wire	Signal Name
1	Y	SENSOR GROUND
2	BR	EXHAUST GAS TEMPERATURE SENSOR 2

Connector No.	E23
Connector Name	WIRE TO WIRE
Connector Type	NS16MW-CS
Connector Color	WHITE



H.S.

Terminal No.	Color of Wire	Signal Name
1	BG	GLOW 3
2	Y	GLOW 1
3	Y	DIAG (PWM)
4	R	VBD
5	B	GND
6	P	GLOW 4
7	GR	GLOW 2
8	W	COM (PWM)

Terminal No.	Color of Wire	Signal Name
1	P	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
1	V	TO ENGINE CONTROL HARNESS - (WITH M9T)
2	L	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
2	G	TO ENGINE CONTROL HARNESS - (WITH M9T)
3	B	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
3	G	TO ENGINE CONTROL HARNESS - (WITH M9T)
4	R	TO ENGINE CONTROL HARNESS
5	GY	TO ENGINE CONTROL HARNESS
6	SHIELD	TO ENGINE CONTROL HARNESS
7	O	TO ENGINE CONTROL HARNESS
8	-	TO ENGINE CONTROL HARNESS
9	B	TO ENGINE CONTROL HARNESS
10	Lg/R	TO ENGINE CONTROL HARNESS
11	W/R	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)

Terminal No.	Color of Wire	Signal Name
129	L	CAN-H
130	-	-
131	G	CLUTCH PEDAL POSITION SWITCH
132	-	-
133	LG	BRAKE PEDAL POSITION SWITCH
134	GR	SENSOR GROUND
135	B	ECM GROUND
136	B	ECM GROUND
137	P	CAN-L
138	-	-
139	-	-
140	B	SENSOR GROUND
141	-	-
142	R	ACCELERATOR PEDAL POSITION SENSOR 2
143	B	ECM GROUND
144	B	SENSOR GROUND
145	-	-
146	-	-
147	-	-
148	SB	ASCD STEERING SWITCH
149	-	-
150	W	SENSOR POWER SUPPLY
151	L	SENSOR POWER SUPPLY
152	P	ACCELERATOR PEDAL POSITION SENSOR 1
153	-	-
154	-	-
155	-	-
156	BG	IGNITION SWITCH
157	-	-
158	BG	WATER IN FUEL SENSOR
159	Y	SENSOR POWER SUPPLY
160	B	ECM GROUND

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ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YS23DDT/YS23DDTT (M9T)]

ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

Connector No.	E32
Connector Name	WIRE TO WIRE
Connector Type	TH40MW-NH
Connector Color	WHITE



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

Terminal No.	Color of Wire	Signal Name
1	BR/W	TO ENGINE CONTROL HARNESS
2	W/G	TO ENGINE CONTROL HARNESS
3	B	TO ENGINE CONTROL HARNESS
4	B	TO ENGINE CONTROL HARNESS
5	SHIELD	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
5	BR	TO ENGINE CONTROL HARNESS - (WITH M9T)
6	LG	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
6	G	TO ENGINE CONTROL HARNESS - (WITH M9T)
7	V	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
7	BR/R	TO ENGINE CONTROL HARNESS - (WITH M9T)
8	L	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
8	W	TO ENGINE CONTROL HARNESS - (WITH M9T)
9	V	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
9	Y	TO ENGINE CONTROL HARNESS - (WITH M9T)
10	BR/Y	TO ENGINE CONTROL HARNESS
11	LG/B	TO ENGINE CONTROL HARNESS - (WITH A/T)
11	V/W	TO ENGINE CONTROL HARNESS - (WITH M/T)
12	SB/R	TO ENGINE CONTROL HARNESS
13	P	TO ENGINE CONTROL HARNESS
14	L	TO ENGINE CONTROL HARNESS
15	R/W	TO ENGINE CONTROL HARNESS
16	R	TO ENGINE CONTROL HARNESS
17	G/B	TO ENGINE CONTROL HARNESS
18	R/B	TO ENGINE CONTROL HARNESS
19	GR	TO ENGINE CONTROL HARNESS - (WITH M/T)
19	SB/Y	TO ENGINE CONTROL HARNESS - (WITH A/T)
20	BR	TO ENGINE CONTROL HARNESS - (WITH A/T)
20	G/Y	TO ENGINE CONTROL HARNESS - (WITH M/T)

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21	GR	TO ENGINE CONTROL HARNESS
22	W	TO ENGINE CONTROL HARNESS - (WITH M9T)
22	B	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
23	B	TO ENGINE CONTROL HARNESS
24	W	TO ENGINE CONTROL HARNESS
25	P	TO ENGINE CONTROL HARNESS
25	SB/O	TO ENGINE CONTROL HARNESS
27	GR/R	TO ENGINE CONTROL HARNESS
28	B	TO ENGINE CONTROL HARNESS
29	BR/LG	TO ENGINE CONTROL HARNESS
30	B	TO ENGINE CONTROL HARNESS
30	R/Y	TO ENGINE CONTROL HARNESS - (WITH M9T)
31	LG/O	TO ENGINE CONTROL HARNESS - (WITH A/T)
31	LG/W	TO ENGINE CONTROL HARNESS - (WITH M/T AND INTELLIGENT KEY)
32	SB/W	TO ENGINE CONTROL HARNESS
33	L	TO ENGINE CONTROL HARNESS - (WITH A/B5)
33	SHIELD	TO ENGINE CONTROL HARNESS - (WITHOUT A/B5)
34	BR/Y	TO ENGINE CONTROL HARNESS
35	W/B	TO ENGINE CONTROL HARNESS
36	LG/Y	TO ENGINE CONTROL HARNESS
37	BR/SB	TO ENGINE CONTROL HARNESS
38	W/L	TO ENGINE CONTROL HARNESS
39	W	TO ENGINE CONTROL HARNESS - (WITH M9T)
39	B	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
40	BR	TO ENGINE CONTROL HARNESS - (WITH M9T)
40	R	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)

Connector No.	E37
Connector Name	BRAKE PEDAL POSITION SWITCH
Connector Type	M02BR-LC
Connector Color	BROWN



2
1

Terminal No.	Color of Wire	Signal Name
1	R	CLUTCH PEDAL POSITION SWITCH OUTPUT (WITH GR25DE)
1	G	IGNITION (EXCEPT QR25DE)

2	LG	BRAKE PEDAL POSITION SWITCH (WITH M9T)
2	LG	BRAKE/CLUTCH PEDAL POSITION SWITCH (WITH QR25DE)
2	R	BRAKE/CLUTCH PEDAL POSITION SWITCH (FOR YD25DDT WITH M/T)
2	LG/O	BRAKE/CLUTCH PEDAL POSITION SWITCH (FOR YD25DDT WITH A/T)

Connector No.	E41
Connector Name	WIRE TO WIRE
Connector Type	SAA36MB-RS10-SJ22
Connector Color	BLACK



15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Terminal No.	Color of Wire	Signal Name
1B	B	TO CHASSIS HARNESS
2B	Y	TO CHASSIS HARNESS
3B	SB/R	TO CHASSIS HARNESS
4B	L	TO CHASSIS HARNESS
5B	B	TO CHASSIS HARNESS
6B	W	TO CHASSIS HARNESS
7B	R	TO CHASSIS HARNESS
8B	O	TO CHASSIS HARNESS
9B	SB	TO CHASSIS HARNESS
10B	SHIELD	TO CHASSIS HARNESS
11B	W	TO CHASSIS HARNESS
12B	B	TO CHASSIS HARNESS
13B	R	TO CHASSIS HARNESS
14B	L	TO CHASSIS HARNESS
15B	GR	TO CHASSIS HARNESS
16B	P	TO CHASSIS HARNESS
17B	B	TO CHASSIS HARNESS
18B	Y/L	TO CHASSIS HARNESS
19B	-	TO CHASSIS HARNESS
20B	B	TO CHASSIS HARNESS
21B	L	TO CHASSIS HARNESS
22B	B	TO CHASSIS HARNESS
23B	Y	TO CHASSIS HARNESS
24B	B	TO CHASSIS HARNESS
25B	-	TO CHASSIS HARNESS
26B	B	TO CHASSIS HARNESS
27B	L	TO CHASSIS HARNESS
28B	-	TO CHASSIS HARNESS

29B	B	TO CHASSIS HARNESS
30B	B	TO CHASSIS HARNESS
31B	W	TO CHASSIS HARNESS
32B	Y	TO CHASSIS HARNESS
33B	GR	TO CHASSIS HARNESS
34B	R	TO CHASSIS HARNESS
35B	-	TO CHASSIS HARNESS
36B	-	TO CHASSIS HARNESS
37B	-	TO CHASSIS HARNESS
38B	-	TO CHASSIS HARNESS
39B	-	TO CHASSIS HARNESS
40B	P	TO CHASSIS HARNESS
41B	LG	TO CHASSIS HARNESS
42B	BR	TO CHASSIS HARNESS
43B	G	TO CHASSIS HARNESS
44B	B	TO CHASSIS HARNESS
45B	V	TO CHASSIS HARNESS
46B	L/W	TO CHASSIS HARNESS
47B	Y	TO CHASSIS HARNESS
48B	-	TO CHASSIS HARNESS

Connector No.	E43
Connector Name	CLUTCH PEDAL POSITION SWITCH
Connector Type	S02FL
Connector Color	BLUE



2
1

Terminal No.	Color of Wire	Signal Name
1	R	CLUTCH PEDAL POSITION SWITCH OUTPUT
2	LG/W	ASCD BRAKE SWITCH AND ASCD CLUTCH SWITCH

ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

6	-	TO ENGINE CONTROL HARNESS
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Connector No.	E49
Connector Name	REFRIGERANT PRESSURE SENSOR
Connector Type	RK03FB
Connector Color	BLACK



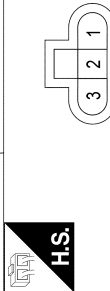
Terminal No.	Color of Wire	Signal Name
1	BR	SENSOR GROUND (WITH QR25DE)
1	BRW	SENSOR GROUND (WITHOUT QR25DE)
2	W/G	REFRIGERANT PRESSURE SENSOR (WITHOUT QR25DE)
2	W	REFRIGERANT PRESSURE SENSOR (WITH QR25DE)
3	B	SENSOR POWER SUPPLY

Connector No.	E72
Connector Name	WIRE TO WIRE
Connector Type	M06MW-LC
Connector Color	WHITE



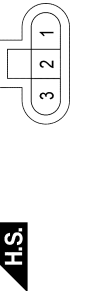
Terminal No.	Color of Wire	Signal Name
1	G	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
1	GR	TO ENGINE CONTROL HARNESS - (WITH M9T)
2	V	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
2	Y	TO ENGINE CONTROL HARNESS - (WITH M9T)
3	Y	TO ENGINE CONTROL HARNESS
4	Y	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
4	P	TO ENGINE CONTROL HARNESS - (WITH M9T)
5	SB	TO ENGINE CONTROL HARNESS - (WITH YD25DDT)
5	BG	TO ENGINE CONTROL HARNESS - (WITH M9T)

Connector No.	E100
Connector Name	DPF DIFFERENTIAL PRESSURE SENSOR
Connector Type	1928-04073
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	G	SENSOR POWER SUPPLY
2	B	SENSOR GROUND
3	BR	DPF DIFFERENTIAL PRESSURE SENSOR

Connector No.	E103
Connector Name	ENGINE COOLER WATER PUMP 1
Connector Type	243406474R
Connector Color	GRAY



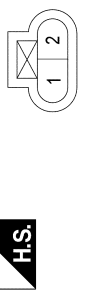
Terminal No.	Color of Wire	Signal Name
1	W	SENSOR POWER SUPPLY
2	G	ELECTRIC EGR COOLING WATER PUMP 1
3	B	GROUND

Connector No.	E104
Connector Name	ENGINE COOLER WATER PUMP 2
Connector Type	243406474R
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	R	SENSOR POWER SUPPLY
2	V	ELECTRIC EGR COOLING WATER PUMP 2
3	B	GROUND

Connector No.	E106
Connector Name	FUEL HEATER
Connector Type	E02FG-RS
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
1	R	SENSOR POWER SUPPLY
2	V	ELECTRIC EGR COOLING WATER PUMP 2
3	B	GROUND

Connector No.	E108
Connector Name	WATER IN FUEL SENSOR (WITH M9T)
Connector Type	RH03FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	BR	FUEL HEATER RELAY OUTPUT
2	B	GROUND

Terminal No.	Color of Wire	Signal Name
1	B	WATER IN FUEL SENSOR
2	P	FUEL HEATER RELAY CONTROL
3	R	BATTERY
5	BR	RELAY OUTPUT

Connector No.	E109
Connector Name	FUEL HEATER RELAY
Connector Type	MS02FL-M2-LC
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	B	WATER IN FUEL SENSOR
2	Y	SENSOR POWER SUPPLY
3		GROUND

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ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS16FW-CS
Connector Color	WHITE



H.S.

9	8	7	6	5	4	3		
18	17	16	15	14	13	12	11	10

25	G	ECM VB
26	R	O2 SENS
27	R/W	CLEARANCE/L RH
28	-	-
29	L	FR WIPER HI
30	-	-
31	BR/R	ECM RLY CONT (WITH M9T)
32	Y	ECM BAT (EXCEPT M9T)
32	V	ECM BAT (WITH M9T)
33	R	CLEARANCE/L LH
34	O	TAIL 2
35	GR	FR WIPER LO
36	O	ESCL

Connector No.	E123
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS08FBR-CS
Connector Color	BROWN



51		50	49	
56	55	54	53	52

Terminal No.	Color of Wire	Signal Name
3	-	-
4	BR	NP SW (WITH A/T)
4	G	NP SW (WITH M/T)
5	Y	H/LAMP HI RH
6	R/Y	H/LAMP HI LH
7	L	H/LAMP LO LH
8	L/W	H/LAMP LO RH
9	W	FR FOG/L LH
10	L	FUEL PUMP
11	W	ETC VB
12	V	FR FOG/L RH
13	R/W	A/T ECU (WITH A/T)
13	GR	A/T ECU (WITH M/T)
14	V/W	REVERSE LAMP
15	BR	ABS ECU
16	V/R	ETC RLY CONT
17	R	IGN COIL
18	LG	INJECTOR (EXCEPT M9T)
18	BG	INJECTOR (WITH M9T)

Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH12FW-NH
Connector Color	WHITE



42	41	40	39	38	37
48	47	46	45	44	43

Terminal No.	Color of Wire	Signal Name
37	-	-
38	GR/R	OIL PRESSURE SW
39	G	WIPER AUTO STOP
40	P	CAN-L
41	L	CAN-H
42	G/B	DRL RLY
43	-	-
44	SB/R	START CONT
45	R/Y	FUEL RLY CONT
46	-	-
47	O	ALT C
48	BR	HORN RLY CONT

Connector No.	E121
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FBR-CS
Connector Color	BROWN



H.S.

29	28	27	26	25		
36	35	34	33	32	31	30

Terminal No.	Color of Wire	Signal Name
57	Y	RF DEF
58	-	-
59	-	-
60	-	-
61	-	-
62	B/W	P-GND

Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	M06FB-LC
Connector Color	BLACK



59	58	57
62	61	60

Terminal No.	Color of Wire	Signal Name
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ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

Connector No.	F30
Connector Name	WIRE TO WIRE
Connector Type	NS16FW-CS
Connector Color	WHITE

7	6	5	4		3	2	1	
16	15	14	13		12	11	10	9

Terminal No.	Color of Wire	Signal Name
1	P	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
1	V	TO ENGINE ROOM HARNESS - (WITH M9T)
2	L	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
2	G	TO ENGINE ROOM HARNESS - (WITH M9T)
3	GR	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
3	LG	TO ENGINE ROOM HARNESS - (WITH M9T)
4	R	TO ENGINE ROOM HARNESS
5	G/Y	TO ENGINE ROOM HARNESS
6	B	TO ENGINE ROOM HARNESS
7	GR	TO ENGINE ROOM HARNESS
8	L	TO ENGINE ROOM HARNESS
9	B	TO ENGINE ROOM HARNESS
10	GR	TO ENGINE ROOM HARNESS
11	W	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
11	P	TO ENGINE ROOM HARNESS - (WITH M9T)
12	Y	TO ENGINE ROOM HARNESS
13	BG	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
13	BR	TO ENGINE ROOM HARNESS - (WITH M9T)
14	G/R	TO ENGINE ROOM HARNESS
15	Y	TO ENGINE ROOM HARNESS
16	SB	TO ENGINE ROOM HARNESS - (WITHOUT M9T)
16	W	TO ENGINE ROOM HARNESS -

800	-	TO MAIN HARNESS
810	-	TO MAIN HARNESS
820	Y	TO MAIN HARNESS
830	W	TO MAIN HARNESS
840	GR	TO MAIN HARNESS
850	R	TO MAIN HARNESS
860	B	TO MAIN HARNESS
870	BR	TO MAIN HARNESS
880	L/W	TO MAIN HARNESS
890	BR	TO MAIN HARNESS
900	-	TO MAIN HARNESS
910	-	TO MAIN HARNESS
920	-	TO MAIN HARNESS
930	P	TO MAIN HARNESS
940	-	TO MAIN HARNESS
950	-	TO MAIN HARNESS
960	G	TO MAIN HARNESS
970	-	TO MAIN HARNESS
980	R/W	TO MAIN HARNESS
990	-	TO MAIN HARNESS
1000	R	TO MAIN HARNESS

Connector No.	F22
Connector Name	WIRE TO WIRE
Connector Type	M06FW-LC
Connector Color	WHITE

	1	4
	2	5
	3	6

Terminal No.	Color of Wire	Signal Name
1	G	TO ENGINE ROOM HARNESS - (WITH Y23D371)
1	GR	TO ENGINE ROOM HARNESS - (WITH M97)
2	V	TO ENGINE ROOM HARNESS - (WITH Y23D371)
2	Y	TO ENGINE ROOM HARNESS - (WITH M97)
3	R	TO ENGINE ROOM HARNESS - (WITH Y23D371)
4	Y	TO ENGINE ROOM HARNESS - (WITH Y23D371)
4	P	TO ENGINE ROOM HARNESS - (WITH M97)
5	SB	TO ENGINE ROOM HARNESS - (WITH Y23D371)
5	BQ	TO ENGINE ROOM HARNESS - (WITH M97)
6	G	TO ENGINE ROOM HARNESS - (WITH M97)

270	BRY	TO MAIN HARNESS
280	B	TO MAIN HARNESS
290	P	TO MAIN HARNESS
300	-	TO MAIN HARNESS
310	LGO	TO MAIN HARNESS
320	-	TO MAIN HARNESS
330	Y	TO MAIN HARNESS
340	-	TO MAIN HARNESS
350	P/B	TO MAIN HARNESS
360	BR	TO MAIN HARNESS
370	-	TO MAIN HARNESS
380	BR	TO MAIN HARNESS
390	-	TO MAIN HARNESS
400	-	TO MAIN HARNESS
410	-	TO MAIN HARNESS
420	G	TO MAIN HARNESS
430	-	TO MAIN HARNESS
440	-	TO MAIN HARNESS
450	G/B	TO MAIN HARNESS
460	P/W	TO MAIN HARNESS
470	L/G	TO MAIN HARNESS
480	-	TO MAIN HARNESS
490	-	TO MAIN HARNESS
500	-	TO MAIN HARNESS
510	L/R	TO MAIN HARNESS
520	L/G	TO MAIN HARNESS
530	V	TO MAIN HARNESS
540	S/B/R	TO MAIN HARNESS
550	S/B/Y	TO MAIN HARNESS
560	L/G	TO MAIN HARNESS
570	S/B	TO MAIN HARNESS
580	L	TO MAIN HARNESS
590	W	TO MAIN HARNESS
600	G/R	TO MAIN HARNESS
610	R	TO MAIN HARNESS
620	L	TO MAIN HARNESS
630	GR	TO MAIN HARNESS
640	P	TO MAIN HARNESS
650	G	TO MAIN HARNESS
660	BR	TO MAIN HARNESS
670	O	TO MAIN HARNESS
680	O	TO MAIN HARNESS
690	P/B	TO MAIN HARNESS
700	R	TO MAIN HARNESS
710	-	TO MAIN HARNESS
720	L/G	TO MAIN HARNESS
730	P	TO MAIN HARNESS
740	BR	TO MAIN HARNESS
750	G	TO MAIN HARNESS
760	W	TO MAIN HARNESS
770	V	TO MAIN HARNESS
780	Y	TO MAIN HARNESS
790	W	TO MAIN HARNESS

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4
Connector Color	WHITE

[illegible]

Terminal No.	Color of Wire	Signal Name
1G	V	TO MAIN HARNESS
2G	SHIELD	TO MAIN HARNESS
3G	R	TO MAIN HARNESS
4G	BR	TO MAIN HARNESS
5G	R	TO MAIN HARNESS
6G	Y	TO MAIN HARNESS
7G		TO MAIN HARNESS
8G	-	TO MAIN HARNESS
9G	-	TO MAIN HARNESS
10G	P	TO MAIN HARNESS
11G	R/Y	TO MAIN HARNESS
12G	L	TO MAIN HARNESS
13G	Y/R	TO MAIN HARNESS
14G	G	TO MAIN HARNESS
15G	B	TO MAIN HARNESS
16G	L	TO MAIN HARNESS
17G	SB/R	TO MAIN HARNESS
18G	Y/L	TO MAIN HARNESS
19G	SB/O	TO MAIN HARNESS
20G	R	TO MAIN HARNESS
21G	BR	TO MAIN HARNESS
22G	P	TO MAIN HARNESS
23G	W	TO MAIN HARNESS
24G	GR	TO MAIN HARNESS
25G	SB/W	TO MAIN HARNESS
26G		TO MAIN HARNESS

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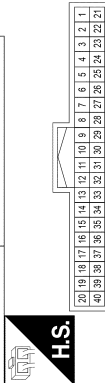
ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YS23DDT/YS23DDTT (M9T)]

ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

Connector No.	F33
Connector Name	WIRE TO WIRE
Connector Type	TH40FW-NH
Connector Color	WHITE



19	W	TO ENGINE ROOM HARNESS - (EXCEPT M9T WITH A/T)
19	SB	TO ENGINE ROOM HARNESS - (M9T WITH A/T)
20	BR	TO ENGINE ROOM HARNESS - (M9T WITH A/T)
20	V	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
20	L	TO ENGINE ROOM HARNESS - (M9T WITH M/T)
21	G	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
21	BR	TO ENGINE ROOM HARNESS - (WITH M9T)
22	B	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
22	W	TO ENGINE ROOM HARNESS - (WITH M9T)
23	B	TO ENGINE ROOM HARNESS
24	W	TO ENGINE ROOM HARNESS
25	P	TO ENGINE ROOM HARNESS
26	BG	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
26	LG	TO ENGINE ROOM HARNESS - (WITH M9T)
27	GR	TO ENGINE ROOM HARNESS
28	B	TO ENGINE ROOM HARNESS
29	Y	TO ENGINE ROOM HARNESS
30	B	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
30	P	TO ENGINE ROOM HARNESS - (WITH M9T)
31	LG	TO ENGINE ROOM HARNESS
32	SB	TO ENGINE ROOM HARNESS
33	BR	TO ENGINE ROOM HARNESS - (WITHOUT ABS)
33	Y	TO ENGINE ROOM HARNESS - (WITH ABS)
34	BG	TO ENGINE ROOM HARNESS
35	V	TO ENGINE ROOM HARNESS
36	LG	TO ENGINE ROOM HARNESS
37	Y	TO ENGINE ROOM HARNESS
38	GR	TO ENGINE ROOM HARNESS
39	R	TO ENGINE ROOM HARNESS - (WITH M9T)
39	P	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
40	SB	TO ENGINE ROOM HARNESS - (WITH M9T)
40	R	TO ENGINE ROOM HARNESS - (WITH YD25DDT)

Terminal No.	Color of Wire	Signal Name
1	BR	TO ENGINE ROOM HARNESS
2	W	TO ENGINE ROOM HARNESS
3	B	TO ENGINE ROOM HARNESS
4	B	TO ENGINE ROOM HARNESS - (WITH M9T)
5	GR	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
5	BR	TO ENGINE ROOM HARNESS - (WITH M9T)
6	B	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
6	G	TO ENGINE ROOM HARNESS - (WITH M9T)
7	W	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
7	BR	TO ENGINE ROOM HARNESS - (WITH M9T)
8	L	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
8	W	TO ENGINE ROOM HARNESS - (WITH M9T)
9	V	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
9	Y	TO ENGINE ROOM HARNESS - (WITH M9T)
10	BR	TO ENGINE ROOM HARNESS - (WITH OR25DE)
10	Y	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
10	GR	TO ENGINE ROOM HARNESS - (WITH M9T)
11	LG	TO ENGINE ROOM HARNESS - (WITH A/T)
11	P	TO ENGINE ROOM HARNESS - (WITH M/T)
12	SB	TO ENGINE ROOM HARNESS
13	P	TO ENGINE ROOM HARNESS
14	L	TO ENGINE ROOM HARNESS
15	R	TO ENGINE ROOM HARNESS
16	G	TO ENGINE ROOM HARNESS - (WITH YD25DDT)
16	V	TO ENGINE ROOM HARNESS - (WITH M9T)
17	BG	TO ENGINE ROOM HARNESS
18	R	TO ENGINE ROOM HARNESS

ABBIA3690GB

Connector No.	F55
Connector Name	ECM (WITH M9T)
Connector Type	RH56FGY-RZ8-R-RH
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	V	TURBOCHARGER BOOST SENSOR
2	BG	INTAKE AIR TEMPERATURE SENSOR 2
3	BR	EXHAUST GAS TEMPERATURE SENSOR 2
4	-	-
5	-	-
6	SB	ENGINE COOLANT TEMPERATURE SENSOR
7	-	-
8	Y	A/F SENSOR
9	W	G SENSOR
10	R	CRANKSHAFT POSITION SENSOR
11	L	ELECTRIC THROTTLE CONTROL MOTOR (-)
12	-	-
13	BG	EGR VOLUME CONTROL VALVE MOTOR (-)
14	-	-
15	R	FUEL INJECTOR NO.1 (H)
16	G	FUEL INJECTOR NO.1 (LO)
17	W	REFRIGERANT PRESSURE SENSOR
18	L	FUEL TEMPERATURE SENSOR
19	-	-
20	-	-
21	LG	EXHAUST GAS TEMPERATURE SENSOR 1
22	GR	EGR TEMPERATURE SENSOR
23	Y	SENSOR GROUND
24	-	-
25	-	-
26	B	SENSOR GROUND
27	GR	ELECTRIC THROTTLE CONTROL MOTOR (+)
28	P	SENSOR GROUND
29	V	EGR VOLUME CONTROL VALVE MOTOR (+)
30	-	-
31	L	FUEL INJECTOR NO.3 (H)

32	Y	FUEL INJECTOR NO.3 (LO)
33	B	SENSOR GROUND
34	G	SENSOR GROUND
35	-	-
36	-	-
37	P	SENSOR GROUND
38	LG	SENSOR GROUND
39	W	SENSOR GROUND
40	-	-
41	G	A/F SENSOR
42	-	-
43	Y	SENSOR POWER SUPPLY
44	B	SENSOR GROUND
45	-	-
46	-	-
47	SB	FUEL INJECTOR NO.4 (H)
48	V	FUEL INJECTOR NO.4 (LO)
49	B	SENSOR POWER SUPPLY
50	R	SENSOR POWER SUPPLY
51	-	-
52	Y	GLOW PLUG CONTROL UNIT (DIAGNOSIS)
53	R	DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH
54	-	-
55	-	-
56	BR	SENSOR GROUND
57	-	-
58	-	-
59	BR	SENSOR POWER SUPPLY
60	-	-
61	-	-
62	-	-
63	W	FUEL INJECTOR NO.2 (H)
64	B	FUEL INJECTOR NO.2 (LO)

ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YS23DDT/YS23DDTT (M9T)]

ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

Connector No.	F59
Connector Name	ECM (WITH M9T)
Connector Type	RH56FB-RZ8-R-RH
Connector Color	BLACK

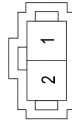


Terminal No.	Color of Wire	Signal Name
65	BR	ECM RELAY
66	-	-
67	-	-
68	Y	THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE
69	L	HP TURBINE BYPASS VALVE CONTROL SOLENOID VALVE (YS23DDTT)
70	W	GLOW PLUG CONTROL (COMMAND)
71	B	ENGINE OIL PUMP CONTROL VALVE
72	BG	TURBOCHARGER BOOST CONTROL SOLENOID VALVE (YS23DDT)
73	B	SENSOR GROUND
74	BR	FUEL RAIL PRESSURE SENSOR
75	-	-
76	BR	DPF DIFFERENTIAL PRESSURE SENSOR
77	-	-
78	-	-
79	L	FUEL FLOW ACTUATOR
80	SB	DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH INDICATOR
81	-	-
82	-	-
83	-	-
84	-	-
85	BR	HP COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE (YS23DDTT)
86	P	FUEL HEATER RELAY CONTROL
87	-	-
88	-	-
89	G	SENSOR GROUND
90	P	THROTTLE POSITION SENSOR
91	SB	EGR VOLUME CONTROL VALVE CONTROL POSITION SENSOR
92	-	-

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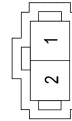
93	GR	EXHAUST GAS PRESSURE SENSOR
94	SB	INTAKE AIR TEMPERATURE SENSOR 1
95	W	A/F SENSOR HEATER
96	-	-
97	-	-
98	-	-
99	L	CAMSHAFT POSITION SENSOR
100	G	MASS AIR FLOW SENSOR
101	B	SENSOR GROUND
102	-	-
103	B	SENSOR GROUND
104	-	-
105	-	-
106	R	SENSOR GROUND
107	V	ELECTRIC EGR COOLING WATER PUMP 2
108	BG	SENSOR GROUND
109	-	-
110	W	SENSOR GROUND
111	-	-
112	R	POWER SUPPLY FOR ECM
113	-	-
114	G	ELECTRIC EGR COOLING WATER PUMP 1
115	LG	SENSOR POWER SUPPLY
116	W	SENSOR POWER SUPPLY
117	-	-
118	G	SENSOR POWER SUPPLY
119	-	-
120	V	SENSOR POWER SUPPLY
121	-	-
122	L	SENSOR POWER SUPPLY
123	R	SENSOR POWER SUPPLY
124	LG	SENSOR POWER SUPPLY
125	-	-
126	Y	EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE
127	P	FUEL PUMP RELAY CONTROL
128	LG	POWER SUPPLY FOR ECM

Connector No.	F95
Connector Name	TURBOCHARGER BOOST CONTROL SOLENOID VALVE (YS23DDT)
Connector Type	BS02FB-AHY
Connector Color	BLACK



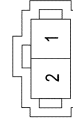
Terminal No.	Color of Wire	Signal Name
1	BG	TURBOCHARGER BOOST CONTROL SOLENOID VALVE (YS23DDT)
2	R	OS SENS

Connector No.	F100
Connector Name	THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE
Connector Type	BS02FB-AHY
Connector Color	BLACK



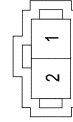
Terminal No.	Color of Wire	Signal Name
1	Y	THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE
2	R	OS SENS

Connector No.	F101
Connector Name	LOW PRESSURE WASTEGATE VALVE (YS23DDT)
Connector Type	BS02FB-AHY
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	BG	TURBOCHARGER BOOST CONTROL SOLENOID VALVE (YS23DDT)
2	R	OS SENS

Connector No.	F102
Connector Name	EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE
Connector Type	BS02FB-AHY
Connector Color	BLACK

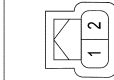


Terminal No.	Color of Wire	Signal Name
1	Y	EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE
2	R	OS SENS

A
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O
P

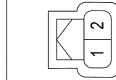
ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

Connector No.	F103
Connector Name	EXHAUST GAS TEMPERATURE SENSOR 1
Connector Type	RH02FBR
Connector Color	BROWN



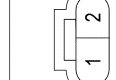
Terminal No.	Color of Wire	Signal Name
1	P	SENSOR GROUND
2	LG	EXHAUST GAS TEMPERATURE SENSOR 1

Connector No.	F104
Connector Name	ENGINE OIL PUMP CONTROL VALVE
Connector Type	RH02FLGY
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	B	ENGINE OIL PUMP CONTROL VALVE
2	R	OS SENS

Connector No.	F105
Connector Name	FUEL TEMPERATURE SENSOR
Connector Type	FEA02FGY-LC
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	W	FUEL INJECTOR NO.2 (HI)
2	B	FUEL INJECTOR NO.2 (LO)

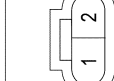
Terminal No.	Color of Wire	Signal Name
1	L	FUEL TEMPERATURE SENSOR
2	B	SENSOR GROUND

Connector No.	F106
Connector Name	EGR TEMPERATURE SENSOR
Connector Type	RH02FB
Connector Color	BLACK



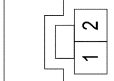
Terminal No.	Color of Wire	Signal Name
1	LG	SENSOR GROUND
2	GR	EGR TEMPERATURE SENSOR

Connector No.	F107
Connector Name	FUEL FLOW ACTUATOR
Connector Type	FEA02FB-LC
Connector Color	BLACK



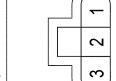
Terminal No.	Color of Wire	Signal Name
1	R	OS SENS
2	L	FUEL FLOW ACTUATOR

Connector No.	F109
Connector Name	INTAKE AIR TEMPERATURE SENSOR 2
Connector Type	0-1544567-1
Connector Color	GRAY



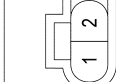
Terminal No.	Color of Wire	Signal Name
1	P	SENSOR GROUND
2	BG	INTAKE AIR TEMPERATURE SENSOR 2

Connector No.	F110
Connector Name	TURBOCHARGER BOOST SENSOR
Connector Type	1928404073
Connector Color	BLACK



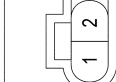
Terminal No.	Color of Wire	Signal Name
1	R	SENSOR POWER SUPPLY
2	G	SENSOR GROUND
3	V	TURBOCHARGER BOOST SENSOR

Connector No.	F111
Connector Name	FUEL INJECTOR NO. 1
Connector Type	AHYS02FB
Connector Color	BLACK



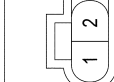
Terminal No.	Color of Wire	Signal Name
1	R	FUEL INJECTOR NO.1 (HI)
2	G	FUEL INJECTOR NO.1 (LO)

Connector No.	F112
Connector Name	FUEL INJECTOR NO. 4
Connector Type	AHYS02FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	SB	FUEL INJECTOR NO.4 (HI)
2	V	FUEL INJECTOR NO.4 (LO)

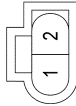
Connector No.	F113
Connector Name	FUEL INJECTOR NO. 2
Connector Type	AHYS02FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	W	FUEL INJECTOR NO.2 (HI)
2	B	FUEL INJECTOR NO.2 (LO)

ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

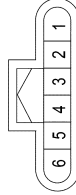
Connector No.	F114
Connector Name	FUEL INJECTOR NO. 3
Connector Type	AHYS02FB
Connector Color	BLACK



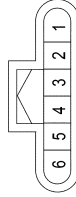
Connector No.	F117
Connector Name	GLOW PLUG NO. 1
Connector Type	AZZ01FB-1V
Connector Color	BLACK



Connector No.	F120
Connector Name	ELECTRIC THROTTLE CONTROL ACTUATOR
Connector Type	RH06FB
Connector Color	BLACK



Connector No.	F122
Connector Name	EGR VOLUME CONTROL VALVE
Connector Type	RH06FB
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	FUEL INJECTOR NO.3 (HI)
2	Y	FUEL INJECTOR NO.3 (LO)

Terminal No.	Color of Wire	Signal Name
1	Y	GLOW 1

Terminal No.	Color of Wire	Signal Name
1	V	SENSOR POWER SUPPLY
2	G	SENSOR GROUND
3	P	THROTTLE POSITION SENSOR
4	-	-
5	GR	ELECTRIC THROTTLE CONTROL MOTOR (+)
6	L	ELECTRIC THROTTLE CONTROL MOTOR (-)

Terminal No.	Color of Wire	Signal Name
1	L	SENSOR POWER SUPPLY
2	R	SENSOR GROUND
3	SB	EGR VOLUME CONTROL VALVE CONTROL POSITION SENSOR
4	-	-
5	V	EGR VOLUME CONTROL VALVE MOTOR (+)
6	BG	EGR VOLUME CONTROL VALVE MOTOR (-)

Connector No.	F115
Connector Name	GLOW PLUG NO. 3
Connector Type	AZZ01FB-1V
Connector Color	BLACK



Connector No.	F118
Connector Name	GLOW PLUG NO. 4
Connector Type	AZZ01FB-1V
Connector Color	BLACK



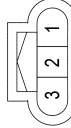
Terminal No.	Color of Wire	Signal Name
1	BG	GLOW 3

Terminal No.	Color of Wire	Signal Name
1	P	GLOW 4

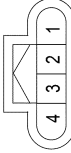
Connector No.	F116
Connector Name	GLOW PLUG NO. 2
Connector Type	AZZ01FB-1V
Connector Color	BLACK



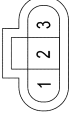
Connector No.	F119
Connector Name	CAMSHAFT POSITION SENSOR (WITH M9T)
Connector Type	RH03FB
Connector Color	BLACK



Connector No.	F121
Connector Name	MASS AIR FLOW SENSOR (WITH M9T)
Connector Type	RH04FB
Connector Color	BLACK



Connector No.	F123
Connector Name	FUEL RAIL PRESSURE SENSOR (WITH M9T)
Connector Type	FEA03FB-LC
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	GR	GLOW 2

Terminal No.	Color of Wire	Signal Name
1	LG	SENSOR POWER SUPPLY
2	B	SENSOR GROUND
3	L	CAMSHAFT POSITION SENSOR

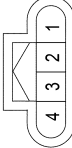
Terminal No.	Color of Wire	Signal Name
1	G	MASS AIR FLOW SENSOR
2	W	SENSOR GROUND
3	R	SENSOR POWER SUPPLY
4	SB	INTAKE AIR TEMPERATURE SENSOR 1

Terminal No.	Color of Wire	Signal Name
1	BR	FUEL RAIL PRESSURE SENSOR
2	B	SENSOR GROUND
3	W	SENSOR POWER SUPPLY

ABBIA3693GB

ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

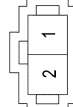
Connector No.	F124
Connector Name	A/F SENSOR
Connector Type	RH04FDGY-P
Connector Color	GRAY

Connector No.	F126
Connector Name	EXHAUST GAS PRESSURE SENSOR
Connector Type	AAZ03FB1-S
Connector Color	BLACK




Connector No.	F130
Connector Name	HIGH PRESSURE TURBINE BYPASS VALVE CONTROL SOLENOID VALVE
Connector Type	BS02FB-AHY
Connector Color	BLACK

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS
Connector Color	WHITE



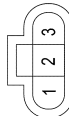

Terminal No.	Color of Wire	Signal Name
1	G	A/F SENSOR
2	Y	A/F SENSOR
3	W	A/F SENSOR HEATER
4	L	O2 SENS

Terminal No.	Color of Wire	Signal Name
1	BG	SENSOR GROUND
2	GR	EXHAUST GAS PRESSURE SENSOR
3	LG	SENSOR POWER SUPPLY

Terminal No.	Color of Wire	Signal Name
1	L	HP TURBINE BYPASS VALVE CONTROL SOLENOID VALVE (YS23DDTT)
2	R	O2 SENS

Terminal No.	Color of Wire	Signal Name
1P	R	IGNITION
2P	G	IGNITION
3P	W	IGNITION (WITHOUT INTELLIGENT KEY SYSTEM)
3P	R	IGNITION (WITH INTELLIGENT KEY SYSTEM)
4P	-	-
5P	-	-
6P	G	RELAY CONTROL
7P	-	-
8P	BG	IGNITION
9P	BG	BATTERY
10P	SB	IGNITION
11P	-	-
12P	-	-
13P	R	BATTERY
14P	-	-
15P	-	-
16P	GR	RELAY CONTROL (WITHOUT INTELLIGENT KEY SYSTEM)
16P	Y	RELAY CONTROL (WITH INTELLIGENT KEY SYSTEM)

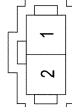
Connector No.	F125
Connector Name	CRANKSHAFT POSITION SENSOR (WITH M9T)
Connector Type	FEA03FB-LC
Connector Color	BLACK

Connector No.	F127
Connector Name	ENGINE COOLANT TEMPERATURE SENSOR (WITH M9T)
Connector Type	RH02FB
Connector Color	BLACK




Connector No.	F131
Connector Name	HIGH PRESSURE COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE
Connector Type	BS02FB-AHY
Connector Color	BLACK

Terminal No.	Color of Wire	Signal Name
1	R	CRANKSHAFT POSITION SENSOR
2	B	SENSOR GROUND
3	Y	SENSOR POWER SUPPLY

Terminal No.	Color of Wire	Signal Name
1	W	SENSOR GROUND
2	SB	ENGINE COOLANT TEMPERATURE SENSOR

Terminal No.	Color of Wire	Signal Name
1	BR	HP COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE (YS23DDTT)
2	R	O2 SENS

ABBIA3694GB

ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

Connector No.	M22
Connector Name	DATA LINK CONNECTOR
Connector Type	BD16FW
Connector Color	WHITE



9	10	11	12	13	14	15	16
1	2	3	4	5	6	7	8

Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	-	-
4	B	GROUND
5	B	GROUND
6	L	CAN-H
7	LG	K-LINE
8	G	IGNITION
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	P	CAN-L
15	-	-
16	GR	BATTERY

Connector No.	M24
Connector Name	COMBINATION METER (WITH MONOCHROME DISPLAY)
Connector Type	TH40FW-NH
Connector Color	WHITE



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	-	-
4	V	WASHER LEVEL SW
5	R	FILTER

ABBIA3695GB

6	R	ACC
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12	W	DR BELT SW
13	-	-
14	B	AIR BAG (WITH OUT AIR BAGS)
14	BR	AIR BAG (WITH AIR BAGS)
15	Y	FUEL SENSOR
16	G	SPEED SENS +
17	SB	8P/R OUTPUT
18	-	-
19	P	CAN-L
20	L	CAN-H
21	-	-
22	-	-
23	SB	OIL LEVEL GND
24	L	OIL LEVEL
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	W	BRAKE OIL SW
32	G	PKE SW
33	BG	IGN
34	Y	BRAKE SW
35	R	SPEED SENS -
36	BR	CHG
37	B	FUEL SENSOR GND
38	-	-
39	B	GND (POWER)
40	B	GND (SENS)

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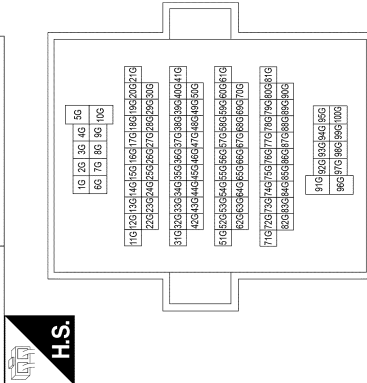
ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YS23DDT/YS23DDTT (M9T)]

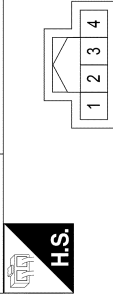
ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE



80G	BR	TO ENGINE ROOM HARNESS
81G	-	TO ENGINE ROOM HARNESS
82G	Y	TO ENGINE ROOM HARNESS
83G	W	TO ENGINE ROOM HARNESS
84G	GR	TO ENGINE ROOM HARNESS
85G	R	TO ENGINE ROOM HARNESS
86G	B	TO ENGINE ROOM HARNESS
87G	BR	TO ENGINE ROOM HARNESS
88G	L	TO ENGINE ROOM HARNESS
89G	BR	TO ENGINE ROOM HARNESS
90G	-	TO ENGINE ROOM HARNESS
91G	-	TO ENGINE ROOM HARNESS
92G	-	TO ENGINE ROOM HARNESS
93G	P	TO ENGINE ROOM HARNESS
94G	-	TO ENGINE ROOM HARNESS
95G	-	TO ENGINE ROOM HARNESS
96G	G	TO ENGINE ROOM HARNESS
97G	-	TO ENGINE ROOM HARNESS
98G	L	TO ENGINE ROOM HARNESS
99G	-	TO ENGINE ROOM HARNESS
100G	R	TO ENGINE ROOM HARNESS

Connector No.	M48
Connector Name	WIRE TO WIRE
Connector Type	TH04FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	GR	TO MAIN HARNESS
2	SB	TO MAIN HARNESS
3	B	TO MAIN HARNESS
4	BR	TO MAIN HARNESS
5	-	TO MAIN HARNESS
6	-	TO MAIN HARNESS
7	B	TO MAIN HARNESS
8	V	TO MAIN HARNESS

27G	BR	TO ENGINE ROOM HARNESS
28G	L	TO ENGINE ROOM HARNESS
29G	B	TO ENGINE ROOM HARNESS
30G	-	TO ENGINE ROOM HARNESS
31G	-	TO ENGINE ROOM HARNESS
32G	-	TO ENGINE ROOM HARNESS
33G	Y	TO ENGINE ROOM HARNESS
34G	-	TO ENGINE ROOM HARNESS
35G	R	TO ENGINE ROOM HARNESS
36G	GR	TO ENGINE ROOM HARNESS
37G	-	TO ENGINE ROOM HARNESS
38G	GR	TO ENGINE ROOM HARNESS
39G	-	TO ENGINE ROOM HARNESS
40G	-	TO ENGINE ROOM HARNESS
41G	-	TO ENGINE ROOM HARNESS
42G	G	TO ENGINE ROOM HARNESS
43G	-	TO ENGINE ROOM HARNESS
44G	-	TO ENGINE ROOM HARNESS
45G	G	TO ENGINE ROOM HARNESS
46G	SB	TO ENGINE ROOM HARNESS
47G	V	TO ENGINE ROOM HARNESS
48G	-	TO ENGINE ROOM HARNESS
49G	-	TO ENGINE ROOM HARNESS
50G	R	TO ENGINE ROOM HARNESS
51G	-	TO ENGINE ROOM HARNESS
52G	LG	TO ENGINE ROOM HARNESS
53G	SB	TO ENGINE ROOM HARNESS
54G	V	TO ENGINE ROOM HARNESS
55G	LG	TO ENGINE ROOM HARNESS
56G	P	TO ENGINE ROOM HARNESS
57G	R	TO ENGINE ROOM HARNESS
58G	W	TO ENGINE ROOM HARNESS
59G	V	TO ENGINE ROOM HARNESS
60G	R	TO ENGINE ROOM HARNESS
61G	BR	TO ENGINE ROOM HARNESS
62G	BG	TO ENGINE ROOM HARNESS
63G	GR	TO ENGINE ROOM HARNESS
64G	P	TO ENGINE ROOM HARNESS
65G	G	TO ENGINE ROOM HARNESS
66G	BG	TO ENGINE ROOM HARNESS
67G	V	TO ENGINE ROOM HARNESS
68G	BR	TO ENGINE ROOM HARNESS
69G	P	TO ENGINE ROOM HARNESS
70G	W	TO ENGINE ROOM HARNESS
71G	-	TO ENGINE ROOM HARNESS
72G	LG	TO ENGINE ROOM HARNESS
73G	P	TO ENGINE ROOM HARNESS
74G	BR	TO ENGINE ROOM HARNESS
75G	G	TO ENGINE ROOM HARNESS
76G	W	TO ENGINE ROOM HARNESS
77G	V	TO ENGINE ROOM HARNESS
78G	Y	TO ENGINE ROOM HARNESS
79G	W	TO ENGINE ROOM HARNESS

Terminal No.	Color of Wire	Signal Name
1G	V	TO ENGINE ROOM HARNESS
2G	SHIELD	TO ENGINE ROOM HARNESS
3G	R	TO ENGINE ROOM HARNESS
4G	BR	TO ENGINE ROOM HARNESS
5G	SB	TO ENGINE ROOM HARNESS
6G	Y	TO ENGINE ROOM HARNESS
7G	-	TO ENGINE ROOM HARNESS
8G	-	TO ENGINE ROOM HARNESS
9G	-	TO ENGINE ROOM HARNESS
10G	Y	TO ENGINE ROOM HARNESS
11G	W	TO ENGINE ROOM HARNESS
12G	L	TO ENGINE ROOM HARNESS
13G	R	TO ENGINE ROOM HARNESS
14G	G	TO ENGINE ROOM HARNESS
15G	B	TO ENGINE ROOM HARNESS
16G	V	TO ENGINE ROOM HARNESS
17G	W	TO ENGINE ROOM HARNESS
18G	Y	TO ENGINE ROOM HARNESS
19G	SB	TO ENGINE ROOM HARNESS
20G	R	TO ENGINE ROOM HARNESS
21G	BR	TO ENGINE ROOM HARNESS
22G	P	TO ENGINE ROOM HARNESS
23G	W	TO ENGINE ROOM HARNESS
24G	GR	TO ENGINE ROOM HARNESS
25G	SB	TO ENGINE ROOM HARNESS
26G	-	TO ENGINE ROOM HARNESS

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Connector No.	M56
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITHOUT INTELLIGENT KEY)
Connector Type	FEA09FW-FHA6-SA
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
68	P	FLASHER OUTPUT (LEFT)
69	GR	FLASHER OUTPUT (RIGHT)
70	BG	BATTERY (FUSE)
71	BR	ROOM LAMP OUTPUT
72	-	-
73	-	-
74	-	-
75	-	-
76	-	-
77	SB	DOOR UNLOCK OUTPUT (ALL)
78	BG	DOOR LOCK OUTPUT (ALL)
79	B	GND
80	L	POWER WINDOW POWER SUPPLY OUTPUT (LINKED TO IGN)
81	P	POWER WINDOW POWER SUPPLY OUTPUT (BAT)
82	Y	BATTERY (F/L)

ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YS23DDT/YS23DDTT (M9T)]

ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

Connector No.	M68
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FBR-CS
Connector Color	BROWN

7R 6R 5R 4R 3R 2R 1R
 16R 15R 14R 13R 12R 11R 10R 9R 8R

Terminal No.	Color of Wire	Signal Name
1R	-	-
2R	G	IGNITION
3R	GR	BATTERY
4R	-	-
5R	Y	BATTERY
6R	R	ACCESSORY
7R	-	-
8R	-	-
9R	-	-
10R	-	-
11R	-	-
12R	P	BATTERY
13R	B	IGNITION
14R	-	-
15R	BR	BATTERY
16R	R	ACCESSORY

Connector No.	M71
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITHOUT INTELLIGENT KEY)
Connector Type	TH40FW-NH
Connector Color	WHITE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Terminal No.	Color of Wire	Signal Name
1	B	GND (STRG/SAATELITE SW GND)
2	-	-
3	-	-
4	-	-

ABBIA3697GB

5	-	-
6	-	-
7	R	SECURITY
8	-	-
9	-	-
10	-	-
11	BR	CHG
12	-	-
13	-	-
14	R	ACC
15	-	-
16	BR	AIR BAG
17	-	-
18	P	TRIP RESET SW
19	-	-
20	-	-
21	R	FILTER
22	V	STRG SW A
23	BG	STRG SW B
24	V	WASHER SW
25	W	BRAKE OIL SW
26	G	PKG SW
27	-	-
28	W	DR BELT SW
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	R	ILL UP SW
37	G	ILL DOWN SW
38	SB	8PR OUTPUT
39	-	-
40	-	-

Connector No.	M73
Connector Name	COMBINATION SWITCH (SPIRAL CABLE)
Connector Type	TK08FGY-1V
Connector Color	GRAY

10 9 8 7
 14 13 12 11

Terminal No.	Color of Wire	Signal Name
-	-	-

7	B	ASCD STEERING SWITCH GROUND
8	BG	STRG SW B
9	V	STRG SW A
10	SB	ASCD STEERING SWITCH
11	B	GND (STRG/SAATELITE SW GND)
12	-	-
13	-	-
14	-	-

Connector No.	M85
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITHOUT INTELLIGENT KEY)
Connector Type	TH12FW-NH
Connector Color	WHITE

41 42 43 44 45 46
 47 48 49 50 51 52

Terminal No.	Color of Wire	Signal Name
41	L	CAN-H
42	P	CAN-L
43	-	-
44	B	FUEL SENSOR GND
45	R	BAT
46	BG	IGN
47	SB	M-CAN H
48	LG	M-CAN L
49	L	OIL LEVEL
50	SB	OIL LEVEL GND
51	Y	FUEL SENSOR
52	B	G1

Connector No.	M87
Connector Name	COMBINATION METER (WITH MONOCHROME DISPLAY)
Connector Type	FEA09FW-FH46-SA
Connector Color	WHITE

66 66 67 68 69 70 71 72 73
 74 75 76 77 78 79

Terminal No.	Color of Wire	Signal Name
65	R	BATTERY (FUSE)
66	-	-
67	-	-
68	-	-
69	L	AIRCON SW
70	R	BLOWER FAN SW
71	-	-
72	-	-
73	BR	ROOM LAMP OUTPUT (GND)
74	Y	BAT(F/L)
75	-	-
76	-	-
77	P	FLASHER OUTPUT (LEFT)
78	GR	FLASHER OUTPUT (RIGHT)
79	B	GND

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ENGINE CONTROL SYSTEM CONNECTORS - WITH YS23DDT/DDTT (M9T)

Connector No.	M91
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITHOUT INTELLIGENT KEY)
Connector Type	TH40FB-NH
Connector Color	BLACK

100	101	100	99	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83
122	121	120	119	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103

116	R	COMBINATION SW INPUT 2
117	V	COMBINATION SW INPUT 3
118	Y	COMBINATION SW INPUT 4
119	LG	COMBINATION SW INPUT 5
120	W	COMBINATION SW OUTPUT 1
121	G	COMBINATION SW OUTPUT 2
122	SB	COMBINATION SW OUTPUT 3

Connector No.	M95
Connector Name	G SENSOR
Connector Type	HS03FB-2V
Connector Color	BLACK

3	2	1
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Terminal No.	Color of Wire	Signal Name
83	V	KEYLESS & AUTO LIGHT SENSOR GND
84	-	-
85	BG	AUTO LIGHT SENSOR INPUT 1
86	Y	AUTO LIGHT SENSOR POWER SUPPLY OUTPUT
87	R	SECURITY INDICATOR OUTPUT
88	G	KEY SW
89	-	-
90	-	-
91	LG	KEYLESS TUNNER SIGNAL
92	BG	KEYLESS TUNNER POWER SUPPLY
93	BG	IGN SW
94	-	-
95	-	-
96	Y	BRAKE SW
97	-	-
98	V	HAZARD SW
99	Y	AIR CON SW
100	LG	BLOWER FAN SW
101	L	COMBINATION SW OUTPUT 5
102	GR	COMBINATION SW OUTPUT 4
103	P	CAN-L
104	L	CAN-H
105	R	ACC SW
106	-	-
107	-	-
108	G	IMMOBILIZER ONE WAY COMMUNICATION (CLOCK)
109	W	IMMOBILIZER TWO WAY COMMUNICATION
110	R	DOOR LOCK STATUS SW (DR)
111	BR	REAR DEFROGGER SW
112	G	CENTRAL DOOR UNLOCK SW
113	Y	CENTRAL DOOR LOCK SW
114	-	-
115	SB	COMBINATION SW INPUT 1

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10	BR	W/L
11	-	-
12	-	-
13	B	GROUND
14	-	-
15	L	CAN-H
16	P	CAN-L
17	B	GND
18	-	-
19	L	CAN-H
20	P	CAN-L
21	B	GROUND
22	-	-
23	L	CAN-H
24	P	CAN-L

Connector No.	M101
Connector Name	JOINT CONNECTOR-M06
Connector Type	NH20FL-DC
Connector Color	BLUE

									
9 8 7 6 5 4 3 2 1 20 19 18 17 16 15 14 13 12 11 10									

Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
2	L	CAN-H
3	L	CAN-H
4	L	CAN-H
5	L	CAN-H
6	-	-
7	L	CAN-H
8	-	-
9	-	-
10	-	-
11	P	CAN-L
12	P	CAN-L
13	P	CAN-L
14	P	CAN-L
15	P	CAN-L
16	-	-
17	P	CAN-L
18	LG	BATTERY SAVER OUTPUT
19	LG	BATTERY SAVER OUTPUT
20	LG	BATTERY SAVER OUTPUT

Connector No.	M100
Connector Name	JOINT CONNECTOR-M04
Connector Type	NH24FGY-J
Connector Color	GRAY

4	3	2	1
8	7	6	5
12	11	10	9
16	15	14	13
20	19	18	17
24	23	22	21

Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	L	CAN-H
4	P	CAN-L
5	V	IGN
6	BR	AIR BAG
7	L	CAN-H
8	P	CAN-L
9	R	IGNITION

BASIC INSPECTION

BASIC INSPECTION

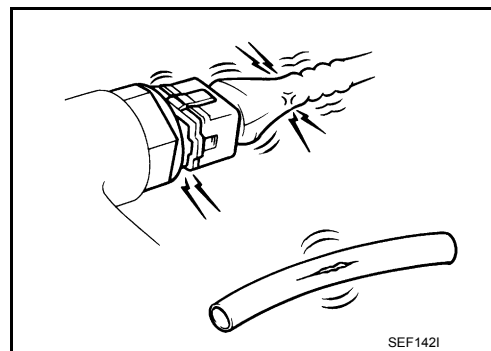
Work Procedure

INFOID:0000000014267835

1.INSPECTION START

1. Check service records for any recent repairs that may indicate a related incident.
2. Check the current need for scheduled maintenance, especially for fuel filter and air cleaner filter. Refer to [MA-14, "EXCEPT MEXICO AND BRAZIL : Periodic Maintenance"](#).
3. Open engine hood and check the following:
 - Harness connectors for improper connections
 - Vacuum hoses for splits, kinks, or improper connections
 - Wiring for improper connections, pinches, or cuts
4. Start engine and warm it up to the normal operating temperature.

>> GO TO 2.



2.CHECK IDLE SPEED

Check idle speed.

For procedure, refer to [EC-791, "Inspection"](#).For specification, refer to [EC-802, "Idle Speed"](#).Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3.CHECK FOR INTAKE AIR LEAK

1. Stop engine.
2. Listen for an intake air leak after the mass air flow sensor.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace. Refer to [EM-307, "Exploded View"](#).

4.CHECK IDLE SPEED AGAIN

Check idle speed.

For procedure, refer to [EC-791, "Inspection"](#).For specification, refer to [EC-802, "Idle Speed"](#).Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5.DRAIN WATER FROM FUEL FILTER

1. Stop engine.
2. Drain water from fuel filter. Refer to [FL-46, "Draining Water from Fuel Filter"](#).

>> GO TO 6.

6.CHECK IDLE SPEED AGAIN

Check idle speed.

For procedure, refer to [EC-791, "Inspection"](#).For specification, refer to [EC-802, "Idle Speed"](#).

BASIC INSPECTION

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 7.

7.CHECK AIR CLEANER FILTER

1. Stop engine.
2. Check air cleaner filter for clogging or breaks.

Is the inspection result normal?

YES >> GO TO 8.
NO >> Replace air cleaner filter. Refer to [EM-307, "Removal and Installation"](#).

8.CHECK BATTERY VOLTAGE

Check battery voltage.

Voltage: More than 12.13V

Is the inspection result normal?

YES >> GO TO 10.
NO >> GO TO 9.

9.CHECK BATTERY

Refer to [PG-140, "How to Handle Battery"](#).

Is the inspection result normal?

YES >> Check charging system. Refer to [CHG-35, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#).
NO >> Repair or replace. Refer to [PG-150, "Removal and Installation"](#).

10.CHECK COMPRESSION PRESSURE

Check compression pressure.

Is the inspection result normal?

YES >> GO TO 11.
NO >> Repair or replace error-detected parts.

11.CHECK IDLE SPEED AGAIN

Check idle speed.

For procedure, refer to [EC-791, "Inspection"](#).
For specification, refer to [EC-802, "Idle Speed"](#).

Is the inspection result normal?

YES >> INSPECTION END
NO >> 1. Replace fuel injector. Refer to [EM-338, "Removal and Installation"](#).
2. Perform [EC-556, "Work Procedure"](#).
3. GO TO 2.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

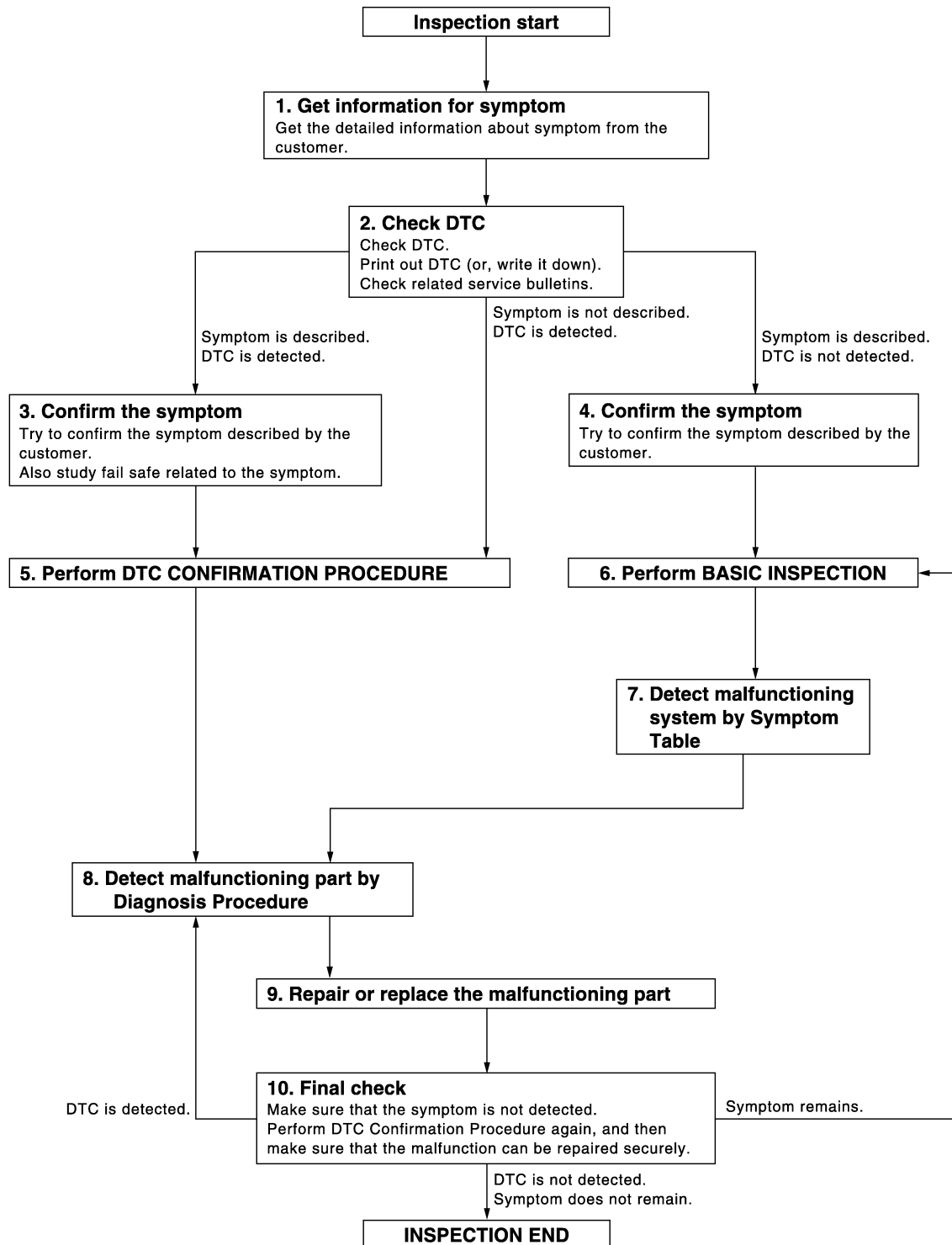
[YS23DDT/YS23DDTT (M9T)]

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000014267836

OVERALL SEQUENCE



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DETAILED FLOW

1.GET INFORMATION FOR SYMPTOM

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the "Diagnostic Work Sheet". (Refer to [EC-550, "Diagnostic Work Sheet"](#).)

>> GO TO 2.

2.CHECK DTC

1. Check DTC.
2. Perform the following procedure if DTC is displayed.
 - Record DTC. (Print them out with CONSULT or GST.)
 - Erase DTC.
 - Study the relationship between the cause detected by DTC and the symptom described by the customer. [Symptom Table or diagnosis procedure is useful. Refer to [EC-785, "YS23DDT : Symptom Table"](#) (YS23DDT), [EC-787, "YS23DDTT : Symptom Table"](#) (YS23DDTT)].
3. Check related service bulletins for information.

Is any symptom described and is any DTC detected?

Symptom is described, DTC is detected>>GO TO 3.

Symptom is described, DTC is not detected>>GO TO 4.

Symptom is not described, DTC is detected>>GO TO 5.

3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer (except MIL ON).

Also study the fail safe related to the symptom. Refer to [EC-487, "YS23DDT : Fail-safe"](#) (YS23DDT), [EC-514, "YS23DDTT : Fail-safe"](#) (YS23DDTT).

Diagnosis Work Sheet is useful to verify the incident.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

4.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

Diagnosis Work Sheet is useful to verify the incident.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

5.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the displayed DTC.

If two or more DTCs are detected, refer to [EC-492, "YS23DDT : DTC Inspection Priority Chart"](#) (YS23DDT), [EC-520, "YS23DDTT : DTC Inspection Priority Chart"](#) (YS23DDTT) and determine trouble diagnosis order.

NOTE:

Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.

If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIRMATION PROCEDURE.

Is DTC detected?

YES >> GO TO 8.

NO >> Check according to [GI-45, "Intermittent Incident"](#).

6.PERFORM BASIC INSPECTION

Perform [EC-546, "Work Procedure"](#).

>> GO TO 7.

7.DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

Detect malfunctioning system according to [EC-785, "YS23DDT : Symptom Table"](#) (YS23DDT), [EC-787, "YS23DDTT : Symptom Table"](#) (YS23DDTT) based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

>> GO TO 8.

8. DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

NOTE:

The Diagnosis Procedure in EC section described based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnosis Procedure. For details, refer to [GI-47, "Circuit Inspection"](#).

Is malfunctioning part detected?

YES >> GO TO 9.

NO >> Monitor input data from related sensors or check voltage of related ECM terminals using CONSULT. Refer to [EC-470, "YS23DDT : Reference Value"](#) (YS23DDT), [EC-497, "YS23DDTT : Reference Value"](#) (YS23DDTT).

9. REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement.
3. Check DTC. If DTC is displayed, erase it. Refer to [EC-457, "Diagnosis Description"](#).

>> GO TO 10.

10. FINAL CHECK

When DTC was detected in step 2, perform DTC CONFIRMATION PROCEDURE or Component Function Check again, and then make sure that the malfunction have been repaired securely.

When symptom was described from the customer, refer to confirmed symptom in step 3 or 4, and make sure that the symptom is not detected.

Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 8.

YES-2 >> Symptom remains: GO TO 6.

NO >> Before returning the vehicle to the customer, make sure to erase unnecessary DTC in ECM.

Diagnostic Work Sheet

INFOID:000000014267837

DESCRIPTION

There are many operating conditions that lead to the malfunction of engine components. A good grasp of such conditions can make troubleshooting faster and more accurate.

In general, each customer feels differently about a incident. It is important to fully understand the symptoms or conditions for a customer complaint.

Utilize a diagnostic worksheet like the one on the next page in order to organize all the information for troubleshooting.

Some conditions may cause the MIL to come on steady and DTC to be detected. Examples:

- Vehicle ran out of fuel, which caused the engine to misfire.
- Fuel filler cap was left off or incorrectly screwed on, allowing fuel to evaporate into the atmosphere.

KEY POINTS

WHAT		Vehicle & engine model
WHEN		Date, Frequencies
WHERE		Road conditions
HOW		Operating conditions, Weather conditions, Symptoms

SEF907L

SERVICE AFTER REPLACING OR REMOVING ENGINE PARTS

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

SERVICE AFTER REPLACING OR REMOVING ENGINE PARTS

Description

INFOID:0000000014267838

×:Applicable

Part name	Service performed		Required service	Reference
	Replace- ment	Removal*		
ECM	×	—	Additional service when replacing ECM	EC-553
Fuel injector	×	—	Injector adjustment value registration	EC-556
Electric throttle control actuator	×	×	Throttle valve position learning	EC-558
EGR volume control valve	×	×	High pressure EGR volume control valve position learning	EC-559
DPF (Diesel Particulate Filter)	×	—	DPF (Diesel Particulate Filter) data clear	EC-564
Fuel pump	×	—	Additional service when replacing fuel pump	EC-567
Engine oil	×	—	Oil change remaining distance reset	EC-565

*:Harness connector disconnection included.

ADDITIONAL SERVICE WHEN REPLACING ECM

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

ADDITIONAL SERVICE WHEN REPLACING ECM

Description

INFOID:0000000014267839

When replacing ECM, this procedure must be performed.

NOTE:

The necessary operation is different depending on the operation result of ECM data save or write. Always perform the operation according to procedures. (For details, refer to [EC-553. "Work Procedure"](#).)

Work Procedure

INFOID:0000000014267840

1. SAVE ECM DATA

1. Turn ignition switch OFF and wait at least 1 minute.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Select "SAVE COMPUTER DATA" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
5. Follow the instruction of CONSULT display.

NOTE:

Necessary data in ECM is copied and saved to CONSULT.

Is operation completed successfully?

YES >> GO TO 2.

NO >> GO TO 7.

2. REPLACE THE ECM

1. Turn ignition switch OFF and wait at least 1 minute.
2. Replace the ECM. Refer to [EC-798. "Removal and Installation"](#).

>> GO TO 3.

3. PERFORM PROGRAMMING

Refer to "CONSULT Operation Manual".

>> GO TO 4.

4. PERFORM ECM KEY ID REGISTRATION

Refer to "CONSULT Operation Manual NATS-IVIS/NVIS".

>> GO TO 5.

5. PERFORM CONFIGURATION REGISTRATION

1. Turn ignition switch OFF and wait at least 1 minute.
2. Turn ignition switch ON.
3. Check that the battery voltage is between 11 V and 14 V.
4. Wait at least 10 seconds.

CAUTION:

During this step, never perform any vehicle operation.

5. If necessary, perform configuration registration using CONSULT function.

>> GO TO 6.

6. WRITE ECM DATA

1. Select "WRITE SAVED DATA" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
2. Follow the instruction of CONSULT display.

NOTE:

The data saved by "WRITE SAVED DATA" is written to ECM.

Is operation completed successfully?

YES >> GO TO 12.

NO >> GO TO 10.

ADDITIONAL SERVICE WHEN REPLACING ECM

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

7. REPLACE THE ECM

1. Turn ignition switch OFF and wait at least 1 minute.
2. Replace the ECM. Refer to [EC-798, "Removal and Installation"](#).

>> GO TO 8.

8. PERFORM PROGRAMMING

Refer to "CONSULT Operation Manual".

>> GO TO 9.

9. PERFORM ECM KEY ID REGISTRATION

Refer to "CONSULT Operation Manual NATS-IVIS/NVIS".

>> GO TO 10.

10. PERFORM CONFIGURATION REGISTRATION

1. Turn ignition switch OFF and wait at least 1 minute.
 2. Turn ignition switch ON.
 3. Check that the battery voltage is between 11 V and 14 V.
 4. Wait at least 10 seconds.
- CAUTION:**
During this step, never perform any vehicle operation.
5. If necessary, perform configuration registration using CONSULT function.

>> GO TO 11.

11. PERFORM INJECTOR ADJUSTMENT VALUE REGISTRATION

Perform [EC-556, "Description"](#).

>> GO TO 12.

12. PERFORM THROTTLE VALVE POSITION LEARNING

Perform [EC-558, "Description"](#).

>> GO TO 13.

13. PERFORM EGR VOLUME CONTROL VALVE POSITION LEARNING

Perform [EC-559, "Description"](#).

>> GO TO 14.

14. PERFORM G SENSOR CALIBRATION

Perform [TM-198, "Description"](#).

>> GO TO 15.

15. PERFORM VIN REGISTRATION

Perform [EC-566, "Description"](#).

>> GO TO 16.

16. PERFORM FUEL PUMP FIRST PRIMING PROCEDURE

Perform [EC-567, "Description"](#).

ADDITIONAL SERVICE WHEN REPLACING ECM

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

>> GO TO 17.

17.PERFORM SERVICE REGENERATION

Perform [EC-561, "Description"](#).

>> GO TO 18.

18.CHANGE ENGINE OIL

Refer to [LU-44, "Draining"](#) or [LU-44, "Refilling"](#).

>> GO TO 19.

19.PERFORM ENGINE OIL DATA RESET

Perform [EC-565, "Description"](#).

>> GO TO 20.

20.CHECK DTC

1. Turn ignition switch OFF and wait at least 1 minute.
2. Turn ignition switch ON.
3. Check DTC. If DTC is displayed, erase it.

>> END

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INJECTOR ADJUSTMENT VALUE REGISTRATION

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

INJECTOR ADJUSTMENT VALUE REGISTRATION

Description

INFOID:0000000014267841

Injector adjustment value ① indicates manufacturing tolerance and the value is printed on the top of fuel injector.

The injector adjustment value which is correctly stored in ECM is needed for precise fuel injection control.

A performance of emission control and a driveability may effect when there is a mismatch between the following two values.

- The injector adjustment value stored in ECM
- The injector adjustment value of the injector which is installed on the vehicle

Injector Adjustment Value Registration must be performed after the following cases.

- Injector(s) are replaced.
- Injector Adjustment Value Registration for the replaced fuel injector must be performed.
- ECM is replaced.
- Injector Adjustment Value Registration for all the fuel injectors must be performed.

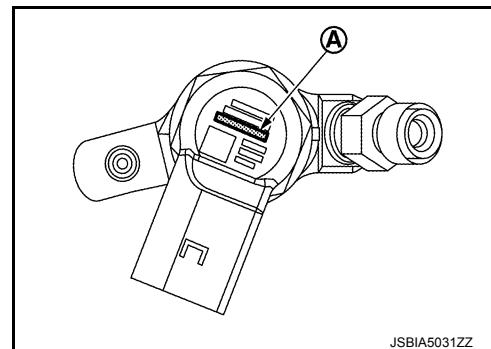
NOTE:

The necessary operation is different depending on the operation result of ECM data save or write. Always perform the operation according to procedures. Refer to [EC-553. "Description"](#).

For injector adjustment value, refer to the following table.

NOTE:

"I", "O", "Q" and "V" are not applied.



JSBIA5031ZZ

Input character	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Stamping on injector	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Input character	1	2	3	4	5	6	7	8	9	0																
Stamping on injector	1	2	3	4	5	6	7	8	9	0																

JMBIA2928GB

(For details, refer to [EC-556. "Work Procedure"](#).)

Work Procedure

INFOID:0000000014267842

1.START

NOTE:

- Before performing this procedure, record injector adjustment value printed on a fuel injector.

1. Turn ignition switch ON (engine stopped).
2. Select "ENTER INJECTOR CODES" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
3. Touch "START".

NOTE:

When touching "START", CONSULT reads injector adjustment values stored in ECM.

4. Select the number of the cylinder which needs Injector Adjustment Value Registration.
5. Input injector adjustment value.

NOTE:

- For injector adjustment value, refer to the following table.

INJECTOR ADJUSTMENT VALUE REGISTRATION

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

- “I”, “O”, “Q” and “V” are not applied.

Input character	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Stamping on injector	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Input character	1	2	3	4	5	6	7	8	9	0																
Stamping on injector	1	2	3	4	5	6	7	8	9	0																

JMBIA2928GB

- Repeat step 4 - 5 till there is no cylinder which needs Injector Adjustment Value Registration, and touch “START”.

NOTE:

When touching “START”, injector adjustment values stored in CONSULT are written onto ECM memory.

- Check that the following values are same for each cylinder.
 - Injector adjustment value which is printed on a fuel injector.
 - Injector adjustment value which is displayed on CONSULT screen.

NOTE:

- In this step, CONSULT reads injector adjustment values stored in ECM and displays the values on the CONSULT screen. This is for checking if injector adjustment values are written onto ECM memory correctly.
 - If DTC is detected, perform DTC Confirmation Procedure for the DTC, and check if the same DTC is detected again.
- Turn ignition switch OFF and wait at least 1 minute.

>> END

THROTTLE VALVE POSITION LEARNING

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

THROTTLE VALVE POSITION LEARNING

Description

INFOID:0000000014267843

Throttle Valve Position Learning is an operation to learn the fully closed position of the throttle valve by monitoring the throttle position sensor output signal. It must be performed each time harness connector of electric throttle control actuator or ECM is disconnected.

Throttle Valve Position Learning Value Clear is an operation to clear the fully closed position of the throttle valve learnt in ECM. It must be performed when replacing electric controlled throttle actuator. (For details, refer to [EC-558, "Work Procedure"](#).)

Work Procedure

INFOID:0000000014267844

1.START

Is the work performing after replacing throttle actuator?

- YES >> GO TO 2.
- NO >> GO TO 3.

2.PERFORM THROTTLE VALVE POSITION LEARNING VALUE CLEAR

With CONSULT

Perform "AIR DAMPER VALVE PROGRAMMING" of "WORK SUPPORT" in "ENGINE" using CONSULT.

>> GO TO 3.

3.PERFORM THROTTLE VALVE POSITION LEARNING

1. Turn ignition switch OFF and wait at least 1 minute.
2. Check that accelerator pedal is fully released.
3. Turn ignition switch ON and wait at least 1 minute.
4. Turn ignition switch OFF and wait at least 1 minute.

NOTE:

Check that throttle valve moves by confirming the operating sound.

>> END

EGR VOLUME CONTROL VALVE POSITION LEARNING

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

EGR VOLUME CONTROL VALVE POSITION LEARNING

Description

INFOID:0000000014267845

EGR Volume Control Valve Position Learning is an operation to learn the fully closed position of the EGR volume control valve by monitoring the EGR volume control valve position sensor output signal. It must be performed under any of the following conditions:

- EGR volume control valve is removed.
- EGR volume control valve is replaced.
- ECM is replaced.

EGR Volume Control Valve Position Learning Value Clear is an operation to clear the fully closed position of the EGR volume control valve learnt in ECM. It must be performed when replacing EGR volume control valve. (For details, refer to [EC-559, "Work Procedure"](#).)

Work Procedure

INFOID:0000000014267846

1.START

Is the work performing after replacing EGR volume control valve?

YES >> GO TO 2.

NO >> GO TO 3.

2.PERFORM EGR VOLUME CONTROL VALVE POSITION LEARNING VALUE CLEAR

With CONSULT

1. Turn ignition switch OFF and wait at least 1 minute.
2. Turn ignition switch ON.
3. Perform "EGR VALVE PROGRAMMING" of "WORK SUPPORT" in "ENGINE" using CONSULT.

>> GO TO 3.

3.PERFORM EGR VOLUME CONTROL VALVE POSITION LEARNING

1. Turn ignition switch OFF and wait at least 1 minute.
2. Turn ignition switch ON and wait at least 1 minute.
3. Turn ignition switch OFF and wait at least 1 minute.

NOTE:

Check that EGR volume control valve moves by confirming the operating sound.

>> END

DIESEL PARTICULATE FILTER MANUAL REGENERATION

Description

INFOID:0000000014267847

DIESEL PARTICULATE FILTER MANUAL REGENERATION is a function where driver intentionally performs regeneration so that PM is not deposited excessively in diesel particulate filter. If excessively short distance or light load driving is continued, automatic regeneration cannot be performed when PM is deposited. Therefore, when PM is reached to the specified level, diesel particulate filter warning light of combination meter turns ON. (For details, refer to [EC-560](#), "Work Procedure".)

NOTE:

If DTC P2002 is detected, diesel particulate filter manual regeneration cannot be performed when pressing diesel particulate filter manual regeneration switch.

Work Procedure

INFOID:0000000014267848

1. PREPARATION

Check that all of the following conditions are satisfied.

Regeneration is interrupted if any of the following items changes to another condition.

- Diesel particulate filter warning light: ON
- Vehicle speed: 0 km/h (0 MPH)
- Transmission gear position: Neutral (M/T models), P (A/T models)
- Accelerator pedal: Released state
- Clutch pedal: Released state (M/T models)
- Brake pedal: Released state

>> GO TO 2.

2. PERFORM DIESEL PARTICULATE FILTER MANUAL REGENERATION

1. Start engine and warm it up to the normal operating temperature.
2. Press diesel particulate filter manual regeneration switch and wait for approximately 20 minutes until diesel particulate filter warning light turns OFF.

NOTE:

Engine speed increases during diesel particulate filter manual regeneration.

3. Check that diesel particulate filter warning light turns OFF.

Does diesel particulate filter warning light turn OFF?

YES >> END

NO >> Perform DIESEL PARTICULATE FILTER SERVICE REGENERATION. Refer to [EC-561](#), "Description".

SERVICE REGENERATION

Description

INFOID:0000000014267849

Certain types of driving conditions (e.g. urban driving) may load to heavy loads in DPF (Diesel Particulate Filter). This soot mass may adversely affect the driving. This function can perform DPF regeneration under vehicle stop condition.

Service regeneration is performed with CONSULT to reduce particulate matter in DPF (Diesel Particulate Filter). Service regeneration should be performed in the following cases.

- ECM enters fail-safe mode because the amount of particulate matter in DPF reaches the specified level.

NOTE:

When ECM enters fail-safe mode because the amount of particulate matter in DPF reaches the specified level, check whether or not DTC P2002 is stored in ECM. In the case of DTC stored, perform the Diagnostic Procedure for the DTC.

- ECM is replaced.

NOTE:

- Based on the signal from sensors ECM measures the amount of particulate matter in DPF and stores the value in EEPROM (Electrically Erasable Programmable Read Only Memory). When ECM is replaced as new one, there is a difference between the actual amount of particulate matter and the value stored in new ECM, because the value stored in new ECM is initialized one. In the case above, ECM can not perform regeneration control correctly. So, perform service regeneration to make the amount of particulate matter in DPF zero.
- The necessary operation is different depending on the operation result of ECM data save or write. Always perform the operation according to procedures. Refer to [EC-553, "Work Procedure"](#).
- Component inspection for DPF is performed.

CAUTION:

Oil change is required, depending on service regeneration procedure. Because fuel mixes with engine oil during service regeneration. The mixture does not occur during the regeneration which is automatically performed under normal operation.

(For details, refer to [EC-561, "Work Procedure"](#).)

Work Procedure

INFOID:0000000014267850

1. CHECK DTC

1. Turn ignition switch OFF and wait at least 1 minute.
2. Turn ignition switch ON.
3. Check DTC.

Is any DTC detected?

YES >> Perform trouble diagnosis for detected DTC. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2. CHECK QUANTITY OF SOOT MASS

1. On CONSULT screen, select "ENGINE" >> "DATA MONITOR" >> "SOOT IN P/FLT".
2. Check that the value is 46.2g or less.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the DPF. Refer to [EX-18, "Exploded View"](#).

3. CHECK ENGINE OIL LEVEL

Refer to [LU-43, "Inspection"](#).

CAUTION:

When the oil level reaches maximum, drain engine oil as to be in MIN and HALF.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Drain or refill engine oil. And then GO TO 4.

4. PERFORM SERVICE REGENERATION

1. Close the engine hood.

SERVICE REGENERATION

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

2. Start engine and warm it up to normal operating temperature.

NOTE:

For best results, warm up the engine until "WATER TEMP" on "DATA MONITOR" mode of "ENGINE" using CONSULT reaches at least 80°C (176°F).

3. Select "SERVICE REGENERATION" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
4. Touch "START" and wait for approximately 40 minutes.

NOTE:

- A message indicating the normal completion of service regeneration is displayed approximately after 40 minutes.
- Never perform any vehicle operation during service regeneration.

Is service regeneration completed normally?

- YES >> GO TO 7.
NG >> GO TO 5.

5.CHECK DPF TEMPERATURE

Check "TEMP UPSTREAM OF PF" in "DATA MONITOR" mode of "ENGINE" using CONSULT.

Is the indication value more than 400°C (752°F)?

- YES >> GO TO 6.
NO >> Check exhaust system.

6.PERFORM SERVICE REGENERATION AGAIN

1. Turn ignition switch OFF.
2. Open the engine hood.
3. Cool the engine at least 2 hours.
4. Check engine oil level. Refer to [LU-43. "Inspection"](#).
5. Close the engine hood.
6. Turn ignition switch ON.
7. Perform "SERVICE REGENERATION" again.

Which is displayed on CONSULT screen?

- COMPLETE>>GO TO 7.
INCOMPLETE>>GO TO 8.

7.PERFORM RESET AFTER SERVICE REGENERATION

1. Select "AFTER DPF REGENERATION" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
2. Touch "START".
3. Check that "COMPLETE" is displayed on CONSULT screen.
4. Touch "END".

>> GO TO 9.

8.REPLACE DPF

1. Turn ignition switch OFF.
2. Replace the DPF. Refer to [EX-18. "Removal and Installation"](#).
3. Turn ignition switch ON.
4. Perform "ADAPTIVES AFTER REPLACING CABIN FILTER" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.

>> GO TO 9.

9.CHECK DTC

1. Turn ignition switch OFF and wait at least 1 minute.
2. Turn ignition switch ON.
3. Check DTC.

Is DTC "P253F" detected?

- YES >> GO TO 10.
NO >> END

10.CHANGE ENGINE OIL

SERVICE REGENERATION

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

1. Change engine oil. Refer to [LU-44, "Draining"](#) or [LU-44, "Refilling"](#).
2. Perform "ENGINE OIL DATA RESET". Refer to [EC-565, "Description"](#).
3. Erase DTC.

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>> END

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DIESEL PARTICULATE FILTER DATA CLEAR

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

DIESEL PARTICULATE FILTER DATA CLEAR

Description

INFOID:0000000014267851

Perform "ADAPTIVE AFTER REPLACING CABIN FILTER" in "WORK SUPPORT" mode with CONSULT when oxidation catalyst with diesel particulate filter is replaced with a new one. Based on the signal from sensors, ECM estimates the amount of particulate matter in diesel particulate filter and stores the value in EEPROM as diesel particulate filter data. When oxidation catalyst with diesel particulate filter is replaced with a new one, there is a difference between diesel particulate filter data stored in ECM and the actual amount of particulate matter in diesel particulate filter, because no particulate matter is trapped in new diesel particulate filter. In this case, ECM cannot perform regeneration control correctly. So perform "AFTER DPF REPLACEMENT" in "WORK SUPPORT" mode of "ENGINE" using CONSULT to clear diesel particulate filter data stored in ECM.

(For details, refer to [EC-564, "Work Procedure"](#).)

CAUTION:

Never perform "ADAPTIVE AFTER REPLACING CABIN FILTER" in "WORK SUPPORT" mode of "ENGINE" using CONSULT when oxidation catalyst with diesel particulate filter is not replaced with a new one. Diesel particulate filter may be damaged because regeneration is not performed at appropriate timing.

Work Procedure

INFOID:0000000014267852

1.START

1. Turn ignition switch ON.
2. Select "ADAPTIVE AFTER REPLACING CABIN FILTER" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
3. Touch "CLEAR" and wait a few seconds.
4. Make sure that "CMPLT" is displayed on CONSULT screen.

>> END

ENGINE OIL DATA RESET

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

ENGINE OIL DATA RESET

Description

INFOID:0000000014267853

The oil change alert function allows calculating the remaining distance to drive before oil change request. The engine oil data reset must be performed after engine oil is changed or ECM is replaced.
(For details, refer to [EC-565, "Work Procedure"](#).)

EC

Work Procedure

INFOID:0000000014267854

1. ENGINE OIL DATA RESET

Refer to [EC-455, "OIL CONTROL SYSTEM : Switch Name and Function"](#).

NOTE:

Reset the data with the vehicle stopped and the engine running.

>> END

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VIN REGISTRATION

Description

INFOID:0000000014267855

VIN Registration is an operation to registering VIN in ECM. It must be performed each time ECM is replaced. (For details, refer to [EC-566. "Work Procedure"](#).)

Work Procedure

INFOID:0000000014267856

1. CHECK VIN

Check the VIN of the vehicle and note it. Refer to [GI-36. "Identification Number"](#).

>> GO TO 2.

2. PERFORM VIN REGISTRATION **With CONSULT**

1. Turn ignition switch ON and engine stopped.
2. Select "WRITE V.I.N." in "WORK SUPPORT" mode of "ENGINE".
3. Follow the instruction of CONSULT display.

>> END

FUEL PUMP FIRST PRIMING PROCEDURE

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

FUEL PUMP FIRST PRIMING PROCEDURE

Description

INFOID:0000000014267857

Fuel pump programming should be performed when fuel pump is replaced or ECM is replaced. (For details, refer to [EC-567, "Work Procedure"](#).)

EC

Work Procedure

INFOID:0000000014267858

1. PERFORM FUEL PUMP PROGRAMMING

With CONSULT

1. Turn ignition switch ON and engine stopped.
2. Select "FUEL PUMP PROGRAMMING" in "WORK SUPPORT" mode of "ENGINE".
3. Follow the instruction of CONSULT display.

>> END

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INJECTOR CHECK

Work Procedure (Fuel Injectors Leak Check)

INFOID:000000014267859

NOTE:**• CONDITIONS PRIOR TO TEST**

- The entire low pressure system must be in good condition.
- Check the sealing of the high pressure pipes and unions.
- Test 3 High pressure fuel pump (pressure control valve) check is OK
- Test 4 High pressure fuel pump (volumetric control valve) check is OK
- Test 5 Rail high pressure regulation circuit check is OK.

• CAUSE

- Not enough or no rail pressure during starting.
- The engine does not start.

1. CHECK FUEL INJECTOR-I

Refer to [EC-624. "Component Inspection \(Fuel Injector\)".](#)

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning fuel injector. Refer to [EM-338. "Removal and Installation".](#)

2. CHECK INTERNAL FUEL TRANSFER PUMP

1. Turn ignition switch OFF.
2. Disconnect the return system connections at the fuel injectors and close off the return pipes so they are leak-tight.
3. To authorise a 15 second cranking engine and carry out this test it is essential to carry out the following procedure:
 - Disconnect high pressure fuel pump (volumetric control valve) harness connector
 - Turn ignition switch ON.
 - Perform "SAVE COMPUTER DATA" in WORK SUPPORT mode with CONSULT.
 - Cranking engine for at least 15 seconds (starting speed 250 rpm)
 - Perform "WRITE SAVED DATA" in WORK SUPPORT mode with CONSULT.

Is the return volume at the fuel injectors more than 20 ml per fuel injector for the starting phase?

NOTE:

- Do not repeat this procedure more than 3 times and wait 30 seconds between each 15 second cranking engine.
- Then wait 30 minutes before cranking the engine for 315 second cycles.
- Follow this instruction so that the starter does not get damaged.

Does the flow measure more than 20 ml?

Yes >> Replace malfunctioning fuel injector. Refer to [EM-338. "Removal and Installation".](#)

No >> GO TO 3.

3. CHECK FUEL INJECTOR-II

1. Turn ignition switch OFF.
2. Reconnect return pipes.
3. Start Engine.
4. Select "DATA MONITOR" mode with CONSULT.
5. Check "RAIL PRESSURE" and "RAIL PRES SET" indication.
6. Does "RAIL PRESSURE" follow "RAIL PRES SET" during the 3 second cranking engine?

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4. CHECK GLOW PLUG

1. Turn ignition switch OFF.
2. Remove the glow plugs and check for moisture.
3. If the glow plugs are wet with fuel, it is possible that the fuel injector is leaking.

Are the glow plugs wet with fuel?

Yes >> Replace malfunction fuel injector. Refer to [EM-338. "Removal and Installation".](#)

INJECTOR CHECK

< BASIC INSPECTION >

[YS23DDT/YS23DDTT (M9T)]

No >> Replace high pressure fuel pump. Refer to [EM-341, "Removal and Installation"](#).

5.INSPECTION END

Fuel injector system OK.

>> INSPECTION END

Work Procedure (Fuel Injection Quantity Check)

INFOID:0000000014267860

NOTE:

• CONDITIONS PRIOR TO TEST

- The entire low pressure system must be in good condition.
- Check the sealing of the high pressure pipes and unions.
- Test 3 High pressure fuel pump (pressure control valve) check is OK
- Test 4 High pressure fuel pump (volumetric control valve) check is OK
- Test 5 Rail high pressure regulation circuit check is OK.
- All the electrical loads are switched off.
- Air conditioning is switched off.

• CAUSE

- The engine runs poorly at idle speed, possibly emits white smoke.

1.CHECK FUEL INJECTOR 1

Refer to [EC-624, "Component Inspection \(Fuel Injector\)"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace malfunctioning fuel injector. Refer to [EM-338, "Removal and Installation"](#).

2.CHECK FUEL INJECTOR 2

1. Start engine let it idle speed.
2. Check the signal of the fuel injector. Refer to [EC-470, "YS23DDT : Reference Value"](#)(YS23DDT) or [EC-497, "YS23DDTT : Reference Value"](#)(YS23DDTT).

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK INTERNAL FUEL TRANSFER PUMP

1. Turn ignition switch OFF.
2. Disconnect the return system connections at the fuel injectors and close off the return pipes so they are leak-tight. While the engine is idling, check the return flow rate at the fuel injector. After 5 minutes the return volume must be between 16 - 24 ml per fuel injector.

Is there more than 24 ml or less than 16 ml of return for each fuel injector?

Yes >> Replace malfunctioning fuel injector. Refer to [EM-338, "Removal and Installation"](#).

No >> INSPECTION END

4.CHECK COMPRESSION PRESSURE

Check compression pressure.

>> INSPECTION END

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

DTC/CIRCUIT DIAGNOSIS

POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000014267861

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check that the following fuse is not blowing.

Location	Fuse No.	Capacity
IPDM E/R	#45	15 A
	#49	20 A

Is the fuse blown (open)?

- YES >> Replace the fuse after repairing the applicable circuit.
NO >> GO TO 2.

2.CHECK GROUND CONNECTION

Check ground connection E15 and E24. Refer to Ground Inspection in [GI-47. "Circuit Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace ground connection.

3.CHECK ECM POWER SUPPLY (ECM RELAY)

1. Reinsert the fuse which pulled out.
2. Turn ignition switch ON.
3. Check the voltage between IPDM E/R terminal and ground.

+		-	Voltage
IPDM E/R			
Connector	Terminal	Ground	Battery voltage
E121	25		
	26		

Is the inspection result normal?

- YES >> GO TO 5.
NO >> GO TO 4.

4.CHECK ECM RELAY CONTROL SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between ECM harness connector and IPDM E/R harness connector.

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F59	65	E121	31	Existed

5. Also check harness for short to ground and to power.

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

5.CHECK ECM POWER SUPPLY (IGNITION POWER SUPPLY)

Check the voltage between IPDM E/R and ground.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

+		-	Voltage
IPDM E/R			
Connector	Terminal		
E119	18	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 7.

NO >> GO TO 6.

6.CHECK IPDM E/R POWER SUPPLY AND GROUND

Check IPDM E/R power supply and ground. Refer to [PCS-39. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-40. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

7.CHECK ECM GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between ECM harness connector and ground.

ECM		—	Continuity
Connector	Terminal		
E12	160	Ground	Existed
	136		
	143		
	135		

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8.CHECK ECM POWER SUPPLY CIRCUIT

1. Disconnect IPDM E/R harness connector.
2. Check the continuity between ECM harness connector and IPDM E/R harness connector.

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E12	156	E119	18	Existed
F59	65	E121	31	
	128		25	
	112		26	

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

U0101 CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

U0101 CAN COMMUNICATION

DTC Description

INFOID:0000000014267862

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
U0101	AUTOMATIC TRANSMISSION (Lost communication with TCM) • 1.DEF • 2.DEF • 3.DEF	When ECM is not transmitting or receiving CAN communication signal of OBD (emission related diagnosis) with TCM for 2 seconds or more.

POSSIBLE CAUSE

- CAN communication line between TCM and ECM
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and let it idle for at least 3 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-572, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267863

Perform trouble diagnosis for CAN communication system. Refer to [LAN-39, "CAN COMMUNICATION SYSTEM: CAN System Specification Chart"](#).

U0121 CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

U0121 CAN COMMUNICATION

DTC Description

INFOID:0000000014267864

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
U0121	MLTIPLXD TRACTION CNTRL CONN [Lost communication with anti-lock brake system (ABS) control Module] • 1.DEF • 2.DEF • 3.DEF	When ECM is not transmitting or receiving CAN communication signal between ABS actuator and electric unit (control unit).

POSSIBLE CAUSE

- CAN communication line between ABS actuator and electric unit (control unit) and ECM
- ABS actuator and electric unit (control unit)
- ECM

FAIL-SAFE

VDC deactivation

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 3 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-573. "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267865

1.CHECK DTC WITH ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Check DTC with ABS actuator and electric unit (control unit). Refer to [BRC-25. "CONSULT Function"](#) (Without VDC), [BRC-153. "CONSULT Function"](#) (With VDC).

Is DTC detected?

- YES >> INSPECTION END
- NO >> Perform trouble shooting relevant to DTC indicated.

U0415 CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

U0415 CAN COMMUNICATION

DTC Description

INFOID:0000000014267866

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
U0415	MLTIPLXD TRACTION CNTRL CONN [Invalid data received from anti-lock brake system (ABS) control module] • 1.DEF • 2.DEF	ECM receives invalid data sent from ABS actuator and electric unit (control unit).

POSSIBLE CAUSE

- ABS actuator and electric unit (control unit)
- CAN communication line between ABS actuator and electric unit (control unit) and ECM
- ECM

FAIL-SAFE

VDC deactivation

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC U0415 can not duplicate.

>> Proceed to [EC-574. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267867

1.CHECK DTC WITH ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Check DTC with ABS actuator and electric unit (control unit). Refer to [BRC-25. "CONSULT Function"](#) (Without VDC), [BRC-153. "CONSULT Function"](#) (With VDC).

Is DTC detected?

- YES >> Check intermittent incident. Refer to [GI-45. "Intermittent Incident"](#).
- NO >> Perform trouble shooting relevant to DTC indicated.

P0001 FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0001 FUEL PUMP

DTC Description

INFOID:0000000014267868

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0001	FUEL FLOW REGULATOR CIRCUIT (Fuel volume regulator control circuit/open) • 1.DEF • 2.DEF • 3.DEF	• ECM detects a short circuit to ground. • ECM detects a short circuit to battery. • ECM detects a open circuit.

POSSIBLE CAUSE

- Harness or connectors (Fuel flow actuator circuit is open or shorted.)
- Fuel flow actuator
- High pressure fuel pump
- ECM

FAIL-SAFE

- Pressure limiting valve opening
- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden
- ASCD deactivation with dashboard message
- VDC deactivation
- Rail pressure limitation
- Freeshift inhibited

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minutes before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 2 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-575. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267869

1.CHECK FUEL FLOW ACTUATOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect fuel flow actuator harness connector.
3. Turn ignition switch ON.
4. Check the voltage between fuel flow actuator harness connector and ground.

+		-	Voltage
Fuel flow actuator			
Connector	Terminal		
F107	1	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 3.

P0001 FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> GO TO 2.

2. FUEL FLOW ACTUATOR POWER SUPPLY CIRCUIT

Refer to [EC-570, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

3. CHECK FUEL FLOW ACTUATOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between fuel flow actuator harness connector and ECM harness connector.

Fuel flow actuator		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F107	2	F59	79	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

P0002 FUEL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0002 FUEL PRESSURE

DTC Description

INFOID:0000000014267870

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0002	FLOW CONTROL ADAPTIVE (Fuel volume regulator control circuit range/ performance)	• 1.DEF • 2.DEF • 3.DEF • 4.DEF • 5.DEF • 6.DEF • 7.DEF • Fuel rail pressure is excessively high. • Fuel rail pressure is excessively low. • Fuel rail pressure of high pressure fuel circuit is excessively high. • Fuel flow actuator adaptation value is not allowed range.

POSSIBLE CAUSE

- Fuel flow actuator
- Fuel rail pressure sensor
- Fuel temperature sensor
- Low pressure fuel pump
- High pressure fuel pump
- Low pressure fuel circuit
- High pressure fuel circuit
- Fuel filter
- Injectors

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- Rail pressure limitation
- Freeshift inhibited
- ASCD deactivation
- DPF regeneration forbidden
- VDC deactivation
- A/T in limp home
- Pressure limiting valve opening
- Not limitation of calibrated performance
- FMO: Cancellation regulator
- FMO: Stop of the adaptation
- Strong vehicle speed limitation [30km/h (18.6 MPH)]
- Torque limitation
- Inhibition of regulation mode of fuel pressure regulator

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0002 is displayed with DTC P0001, P0087, P0089, P0115, P0180, P0190, P0200, P0201, P0202, P0203 or P0204, first perform the trouble diagnosis for DTC P0001, P0087, P0089, P0115, P0180, P0190, P0200, P0201, P0202, P0203 or P0204.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0002 can not duplicate.

>> Proceed to [EC-578, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000014267871

1.CHECK DTC PRIORITY

If DTC P0002 is displayed with DTC P0001, P0087, P0089, P0115, P0180, P0190, P0200, P0201, P0202, P0203 or P0204, first perform the trouble diagnosis for DTC P0001, P0087, P0089, P0115, P0180, P0190, P0200, P0201, P0202, P0203 or P0204.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK FUEL LEVEL

Check that the fuel level is enough.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Refuel.

3.CHECK FUEL FILTER

Check the correctness of the fuel filter. Refer to [FL-47. "Removal and Installation"](#) (Removal and Installation), [FL-48. "Inspection"](#) (Inspection).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace error-detected parts.

4.CHECK FOR FUEL LEAK

Check for fuel leakage at fuel circuit.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning parts.

5.CHECK FUEL TEMPERATURE SENSOR

Check fuel temperature sensor. Refer to [EC-579. "Component Inspection \(Fuel Temperature Sensor\)"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace error-detected parts.

6.CHECK FUEL FLOW ACTUATOR

Check fuel flow actuator. Refer to [EC-579. "Component Inspection \(Fuel Flow Actuator\)"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace error-detected parts.

7.CHECK FUEL INJECTOR

Check fuel injector. Refer to [EC-579. "Component Inspection \(Fuel Injector\)"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace error-detected parts.

8.CHECK FUEL RAIL PRESSURE SENSOR CIRCUIT

Check fuel rail pressure sensor circuit. Refer to [EC-618. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace error-detected parts.

9.CHECK FUEL PUMP

Check low pressure fuel pump system. Refer to [EC-770. "Component Function Check"](#).

P0002 FUEL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace error-detected parts.

Component Inspection (Fuel Flow Actuator)

INFOID:0000000014267872

1.CHECK FUEL FLOW ACTUATOR

1. Disconnect fuel flow actuator harness connector.
2. Check the resistance between fuel flow actuator terminals as follows.

Fuel flow actuator		Condition		Resistance (Approx.)
Terminal				
1	2	Temperature	20 °C (68°F)	2.48 Ω

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace high pressure fuel pump (with fuel flow actuator). Refer to [EM-341, "Removal and Installation"](#).

Component Inspection (Fuel Injector)

INFOID:0000000014267873

1.CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Disconnect fuel injector harness connector.
3. Check the resistance between fuel injector terminals.

Fuel injector		Condition		Resistance
Terminal				
1	2	Temperature	0 - 40 °C (32 - 104 °F)	150 - 250 kΩ

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace fuel injector. Refer to [EM-338, "Removal and Installation"](#).

Component Inspection (Fuel Temperature Sensor)

INFOID:0000000014267874

1.CHECK FUEL TEMPERATURE SENSOR

1. Turn ignition switch OFF.
2. Disconnect fuel temperature sensor.
3. Check the resistance between fuel temperature sensor terminals.

Fuel temperature sensor		Resistance
Terminal		
1	2	77 Ω - 49 kΩ

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace fuel temperature sensor. Refer to [EC-397, "YS23DDT : Component Parts Location"](#).

P0016 CKP - CMP CORRELATION

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0016 CKP - CMP CORRELATION

DTC Description

INFOID:0000000014267875

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0016	COHER BTWN CSFT SEN/ENG SPD (Crankshaft position - camshaft position correlation bank 1 sensor A)	1.DEF The correlation between crankshaft position sensor signal and camshaft position sensor signal is out of the normal range.

POSSIBLE CAUSE

- Harness or connectors
- Crankshaft position sensor
- Camshaft position sensor
- Crankshaft position sensor target

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0016 is displayed with DTC P0335, P0560, P0657 or P0641, first perform the trouble diagnosis for DTC P0335, P0560, P0657 or P0641.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).
- NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minutes before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and let it idle for at least 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-580, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267876

1.CHECK DTC PRIORITY

If DTC P0016 is displayed with DTC P0335, P0560, P0657 or P0641, first perform the trouble diagnosis for DTC P0335, P0560, P0657 or P0641.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).
- NO >> GO TO 2.

2.CHECK CKP SENSOR

Check CKP sensor. Refer to [EC-581, "Component Inspection \(Crankshaft Position Sensor\)"](#).

Is the inspection result normal?

P0016 CKP - CMP CORRELATION

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

- YES >> GO TO 3.
NO >> Replace error-detected parts.

3.CHECK CMP SENSOR

Check CMP sensor. Refer to [EC-581. "Component Inspection \(Camshaft Position Sensor\)".](#)

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Replace error-detected parts.

4.CHECK SIGNAL PLATE OF CAMSHAFT REAR END

Visually check for chipping signal plate of camshaft rear end (intake side).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace camshaft. Refer to [EM-358. "Removal and Installation".](#)

5.CHECK CKP SENSOR TARGET

Visually check for chipping CKP sensor target.

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Replace CKP sensor target. Refer to [EM-387. "Exploded View".](#)

6.CHECK TIMING CHAIN

Check timing chain. Refer to [EM-352. "Inspection".](#)

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace timing chain. Refer to [EM-347. "Removal and Installation".](#)

Component Inspection (Crankshaft Position Sensor)

INFOID:0000000014267877

1.CHECK CRANKSHAFT POSITION SENSOR

1. Turn ignition switch OFF.
2. Disconnect crankshaft position (CKP) sensor harness connector.
3. Check the resistance between CKP sensor terminals.

CKP sensor		Resistance
Terminal		
1	2	1.0 - 1.2 kΩ

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace CKP sensor. Refer to [EM-387. "Exploded View".](#)

Component Inspection (Camshaft Position Sensor)

INFOID:0000000014267878

1.CHECK CAMSHAFT POSITION SENSOR

1. Turn ignition switch OFF.
2. Disconnect camshaft position (CMP) sensor harness connector.
3. Check the resistance between CMP sensor terminals.

CMP sensor		Resistance
Terminal		
3	2	More than 100 kΩ

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace CMP sensor. Refer to [EM-358. "Exploded View".](#)

P0033 HP COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0033 HP COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE

DTC Description

INFOID:0000000014267879

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0033	BYPASS SOL VLV CONTROL VALVE (Turbocharger/supercharger bypass valve A control circuit) • 1.DEF • 2.DEF	ECM detects a voltage of power source for HP compressor bypass valve control solenoid valve is excessively low or high.

POSSIBLE CAUSE

- Harness or connectors
- HP compressor bypass valve control solenoid valve
- ECM

FAIL-SAFE

- Boost regulation cutoff
- Throttle valve opened
- DPF regeneration forbidden
- EGR valve closed

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0033 is displayed with DTC P0560 or P0657, first perform the trouble diagnosis for DTC P0560 or P0657.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-521, "YS23DDTT : DTC Index"](#).
NO >> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-582, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267880

1.CHECK DTC PRIORITY

If DTC P0033 is displayed with DTC P0560 or P0657, perform the trouble diagnosis for DTC P0560 or P0657.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-521, "YS23DDTT : DTC Index"](#).
NO >> GO TO 2.

2.CHECK HP COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE VISUALLY

Check if foreign matter is caught between the HP compressor bypass valve control solenoid valve.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Remove the foreign matter and clean the HP compressor bypass valve control solenoid valve inside.

3.CHECK HP COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect HP compressor bypass valve control solenoid valve.
3. Turn ignition switch ON.

P0033 HP COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

4. Check the voltage between HP compressor bypass valve control solenoid valve harness connector and ground.

+		-	Voltage (Approx.)
HP compressor bypass valve control solenoid valve			
Connector	Terminal		
F131	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Perform the trouble diagnosis for power supply circuit.

4.CHECK HP COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE CONTROL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between ECM harness connector and HP compressor bypass valve control solenoid valve harness connector.

ECM		HP compressor bypass valve control solenoid valve		Continuity
Connector	Terminal	Connector	Terminal	
F59	85	F131	1	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK HP COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE

Check the HP compressor bypass valve control solenoid valve. Refer to [EC-583. "Component Inspection \(HP Compressor Bypass Valve Control Solenoid Valve\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (HP Compressor Bypass Valve Control Solenoid Valve)

INFOID:0000000014267881

1.CHECK HP COMPRESSOR BYPASS VALVE CONTROL SOLENOID VALVE

1. Turn ignition switch OFF.
2. Disconnect HP compressor bypass valve control solenoid valve harness connector.
3. Check resistance between HP compressor bypass valve control solenoid valve terminals as follows.

HP compressor bypass valve control solenoid valve		Resistance (Approx.)
Terminals		
2	1	35 - 60 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace HP compressor bypass valve control solenoid valve. Refer to [EM-326. "Removal and Installation"](#).

P0045 TC BOOST CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0045 TC BOOST CONTROL SOLENOID VALVE

YS23DDT

YS23DDT : DTC Description

INFOID:0000000014267882

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0045	TC SOLENOID VALVE CNTRL CIRC (Turbocharger/supercharger boost control "A" circuit/open)	• 1.DEF • 2.DEF	• ECM detects turbocharger boost control solenoid valve circuit is open. • ECM detects turbocharger boost control solenoid valve circuit is short to ground. • ECM detects turbocharger boost control solenoid valve circuit is short to power.

POSSIBLE CAUSE

- Harness or connectors (Turbocharger boost control solenoid valve circuit is open or shorted.)
- Turbocharger boost control solenoid valve
- ECM

FAIL-SAFE

- Torque limitation
- EGR valve closed
- Throttle valve opened
- Boost regulation cutoff
- DPF regeneration forbidden
- Freeshift inhibited
- ASCD deactivation

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minutes before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 3 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-584, "YS23DDT : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

YS23DDT : Diagnosis Procedure

INFOID:0000000014267883

1.CHECK ECM HARNESS CONNECTOR CONNECTION

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace ECM harness connector connection. Refer to [PG-9, "Harness Connector"](#) (LEVER LOCKING TYPE).

2.CHECK TURBOCHARGER BOOST CONTROL SOLENOID VALVE HARNESS CONNECTOR CONNECTION

Check turbocharger boost control solenoid valve harness connector connection.

P0045 TC BOOST CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace turbocharger boost control solenoid valve harness connector connection.

3. CHECK TURBOCHARGER BOOST CONTROL SOLENOID VALVE POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect turbocharger boost control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check the voltage between turbocharger boost control solenoid valve harness connector and ground.

+		-	Voltage
Turbocharger boost control solenoid valve			
Connector	Terminal		
F95	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Perform trouble diagnosis for power supply circuit.

4. CHECK TURBOCHARGER BOOST CONTROL SOLENOID VALVE GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between turbocharger boost control solenoid valve harness connector and ECM harness connector.

Turbocharger boost control solenoid valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F95	1	F59	72	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> Replace turbocharger boost control solenoid valve. Refer to [EC-792, "YS23DDT : Vacuum Layout"](#).

NO >> Repair or replace error-detected parts.

YS23DDTT

YS23DDTT : DTC Description

INFOID:0000000014267884

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0045	TC SOLENOID VALVE CNTRL CIRC (Turbocharger/supercharger boost control "A" circuit/open)	• 1.DEF • 2.DEF	• ECM detects LP wastegate valve control solenoid valve circuit is open. • ECM detects LP wastegate valve control solenoid valve circuit is short to ground. • ECM detects LP wastegate valve control solenoid valve circuit is short to power.

POSSIBLE CAUSE

- Harness or connectors (LP wastegate valve control solenoid valve circuit is open or shorted.)
- LP wastegate valve control solenoid valve
- ECM

FAIL-SAFE

- Torque limitation
- EGR valve is closed

P0045 TC BOOST CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

- Throttle valve opened
- Boost regulation cutoff
- DPF regeneration forbidden
- Freeshift inhibited
- ASCD deactivation

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 3 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-586, "YS23DDTT : Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

YS23DDTT : Diagnosis Procedure

INFOID:0000000014267885

1.CHECK ECM HARNESS CONNECTOR CONNECTION

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace ECM harness connector connection.

2.CHECK LP WASTEGATE VALVE CONTROL SOLENOID VALVE HARNESS CONNECTOR CONNECTION

Check LP wastegate valve control solenoid valve harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace LP wastegate valve control solenoid valve harness connector connection.

3.CHECK LP WASTEGATE VALVE CONTROL SOLENOID VALVE POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect LP wastegate valve control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check the voltage between LP wastegate valve control solenoid valve harness connector and ground.

+		-	Voltage
LP wastegate valve control solenoid valve			
Connector	Terminal		
F101	2	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Perform trouble diagnosis for power supply circuit.

4.CHECK LP WASTEGATE VALVE CONTROL SOLENOID VALVE GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between LP wastegate valve control solenoid valve harness connector and ECM harness connector.

P0045 TC BOOST CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

LP wastegate valve control solenoid valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F101	1	F59	72	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK LP WASTEGATE VALVE CONTROL SOLENOID VALVE

Check the LP wastegate valve control solenoid valve. Refer to [EC-587, "YS23DDTT : Component Inspection \(LP Wastegate Valve Control Solenoid Valve\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

YS23DDTT : Component Inspection (LP Wastegate Valve Control Solenoid Valve)

INFOID:0000000014267886

1.CHECK LP WASTEGATE VALVE CONTROL SOLENOID VALVE

1. Turn ignition switch OFF.
2. Disconnect LP wastegate valve control solenoid valve harness connector.
3. Check resistance between LP wastegate valve control solenoid valve terminals as follows.

LP wastegate valve control solenoid valve		Resistance (Approx.)
Terminals		
2	1	13 - 15 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace LP wastegate valve control solenoid valve. Refer to [EC-795, "YS23DDTT : Vacuum Layout"](#).

P004A HP TURBINE BYPASS VALVE CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P004A HP TURBINE BYPASS VALVE CONTROL SOLENOID VALVE

DTC Description

INFOID:0000000014267887

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P004A	HIGH PRESS BYPASS SOL VLV (Turbocharger/supercharger boost control "B" circuit/open) • 1.DEF • 2.DEF	• ECM detects HP turbine bypass valve control solenoid valve circuit is open. • ECM detects HP turbine bypass valve control solenoid valve circuit is short to ground. • ECM detects HP turbine bypass valve control solenoid valve circuit is short to power.

POSSIBLE CAUSE

- Harness or connectors (HP turbine bypass valve control solenoid valve circuit is open or shorted.)
- HP turbine bypass valve control solenoid valve
- ECM

FAIL-SAFE

- HP turbine bypass valve control solenoid valve opened (open loop)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-588, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267888

1.CHECK ECM HARNESS CONNECTOR CONNECTION

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace ECM harness connector connection.

2.CHECK HP TURBINE BYPASS VALVE CONTROL SOLENOID VALVE HARNESS CONNECTOR CONNECTION

Check HP turbine bypass valve control solenoid valve harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace HP turbine bypass valve control solenoid valve harness connector connection.

3.CHECK HP TURBINE BYPASS VALVE CONTROL SOLENOID VALVE POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect HP turbine bypass valve control solenoid valve harness connector.
3. Turn ignition switch ON.

P004A HP TURBINE BYPASS VALVE CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

4. Check the voltage between HP turbine bypass valve control solenoid valve harness connector and ground.

+		-	Voltage
HP turbine bypass valve control solenoid valve			
Connector	Terminal		
F130	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Perform trouble diagnosis for power supply circuit.

4.CHECK HP TURBINE BYPASS VALVE CONTROL SOLENOID VALVE GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between HP turbine bypass valve control solenoid valve harness connector and ECM harness connector.

HP turbine bypass valve control solenoid valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F130	1	F59	69	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK HP TURBINE BYPASS VALVE CONTROL SOLENOID VALVE

Check the HP turbine bypass valve control solenoid valve. Refer to [EC-589, "Component Inspection \(HP Turbine Bypass Valve Control Solenoid Valve\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (HP Turbine Bypass Valve Control Solenoid Valve) INFOID:0000000014267889

1.CHECK HP TURBINE BYPASS VALVE CONTROL SOLENOID VALVE

1. Turn ignition switch OFF.
2. Disconnect HP turbine bypass valve control solenoid valve harness connector.
3. Check resistance between HP turbine bypass valve control solenoid valve terminals as follows.

HP turbine bypass valve control solenoid valve		Resistance (Approx.)
Terminals		
2	1	13 - 18 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace HP turbine bypass valve control solenoid valve. Refer to [EM-346, "Exploded View"](#).

P0087 FUEL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0087 FUEL SYSTEM

DTC Description

INFOID:0000000014267890

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0087	RAIL PRESSURE (Fuel rail/system pressure - too low)	1.DEF	An excessively low voltage from the fuel rail pressor sensor is sent to ECM.

POSSIBLE CAUSE

- High pressure fuel pump (fuel circuit)
- Fuel pump (low pressure fuel circuit) (electrical fuel pump)
- Fuel injector
- Fuel rail pressure sensor
- Fuel temperature sensor
- Fuel filter
- Fuel tank degassing chamber
- Common rail

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0087 is displayed with DTC P0001, P0089, P0115, P0180, P0190, P0201, P0202, P0203 or P0204, perform the trouble diagnosis for DTC P0001, P0089, P0115, P0180, P0190, P0201, P0202, P0203 or P0204.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YD23DDTT).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-590. "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267891

1.CHECK DTC PRIORITY

If DTC P0087 is displayed with DTC P0001, P0089, P0115, P0180, P0190, P0201, P0202, P0203 or P0204, perform the trouble diagnosis for DTC P0001, P0089, P0115, P0180, P0190, P0201, P0202, P0203 or P0204.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK FUEL RAIL PRESSURE SENSOR

Check fuel rail pressure sensor. Refer to [EC-618. "Diagnosis Procedure"](#).

P0087 FUEL SYSTEM

[YS23DDT/YS23DDTT (M9T)]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3.CHECK FUEL INJECTOR

Check fuel injector. Refer to [EC-620, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> GO TO 4.

4.REPLACE FUEL INJECTOR

Replace fuel injector of malfunctioning cylinder.

>> INSPECTION END

5.CHECK FUEL PUMP

Check fuel pump. Refer to [EC-592, "Component Inspection \(Fuel Pump\)"](#).

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

6.CHECK FUEL FLOW ACTUATOR

Check fuel flow actuator. Refer to [EC-595, "Component Inspection \(Fuel flow actuator\)"](#).

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Repair or replace error-detected parts.

7.CHECK FUEL FILTER

Check fuel filter. Refer to [FL-46, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 8.
NO >> Repair or replace error-detected parts.

8.CHECK FUEL LINE

Check fuel line. Refer to [FL-42, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 9.
NO >> Repair or replace error-detected parts.

9.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Check engine coolant temperature sensor. Refer to [CO-73, "Exploded View"](#).

Is the inspection result normal?

- YES >> GO TO 10.
NO >> Repair or replace error-detected parts.

10.CHECK FUEL TEMPERATURE SENSOR

Check fuel temperature sensor. Refer to [EC-397, "YS23DDT : Component Parts Location"](#).

Is the inspection result normal?

- YES >> GO TO 11.
NO >> Repair or replace error-detected parts.

11.PERFORM HIGH PRESSURE SYSTEM CHECK

Perform high pressure system check. Refer to [EC-578, "Diagnosis Procedure"](#).

>> INSPECTION END

P0087 FUEL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Component Inspection (Fuel Pump)

INFOID:0000000014267892

1.CHECK FUEL PRESSURE REGULATOR

1. Turn ignition switch OFF.
2. Check low fuel pressure. Refer to [FL-42, "Inspection"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 2.

2.CHECK FUEL PUMP

1. Turn ignition switch OFF.
2. Disconnect fuel level sensor (fuel pump).
3. Check continuity between fuel level sensor (fuel pump) terminals as follows.

Fuel level sensor (fuel pump)		Continuity
Terminals		
3	4	Existed
	5	

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace fuel level sensor (fuel pump). Refer to [FL-47, "Removal and Installation"](#).

P0089 FUEL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0089 FUEL PRESSURE

DTC Description

INFOID:0000000014267893

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0089	RAIL PRESS REGULTIN (Fuel pressure regulator 1 performance)	• 1.DEF • 2.DEF • 3.DEF • 4.DEF • 5.DEF • 6.DEF • 7.DEF • 8.DEF • 9.DEF Fuel rail pressure is out of the target range

POSSIBLE CAUSE

- Harness or connectors
- High pressure fuel pump
- Fuel leakage
- Fuel filter clogged
- Fuel tank degassing chamber
- Fuel injector

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0089 is displayed with DTC P0001, P0087, P0089, P0115, P0180, P0190, P0200, P0201, P0202, P0203 or P0204, perform the trouble diagnosis for DTC P0001, P0087, P0089, P0115, P0180, P0190, P0200, P0201, P0202, P0203 or P0204.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and let it idle
2. Turn ignition switch OFF.
3. Turn ignition switch ON.
4. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-593, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267894

1.CHECK DTC PRIORITY

If DTC P0089 is displayed with DTC P0001, P0087, P0089, P0115, P0180, P0190, P0200, P0201, P0202, P0203 or P0204, perform the trouble diagnosis for DTC P0001, P0087, P0089, P0115, P0180, P0190, P0200, P0201, P0202, P0203 or P0204.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

P0089 FUEL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

2.CHECK FUEL LEVEL

Check that the fuel level is enough.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Refuel.

3.PERFORM FUEL FILTER AIR BLEEDING

NOTE:

If the DTC is detected because of air mixed with fuel (i.e.: caused by lack of fuel), it may become normal by performing following procedure.

1. Turn ignition switch ON.
2. Perform fuel filter air bleeding. Refer to [FL-43, "Air Bleeding"](#).
3. Erase DTC.
4. Perform DTC confirmation procedure again. Refer to [EC-593, "DTC Description"](#).

Is the DTC P0089 detected again?

YES >> GO TO 4.

NO >> INSPECTION END

4.CHECK FUEL FILTER

Check the correctness of the fuel filter.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace fuel filter.

5.CHECK FUEL RAIL PRESSURE SENSOR CONNECTION

1. Turn ignition switch OFF.
2. Check fuel rail pressure sensor harness connector connection.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair error-detected parts.

6.CHECK FUEL FLOW ACTUATOR HARNESS CONNECTOR CONNECTION

Check fuel flow actuator harness connector connection.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair error-detected parts.

7.CHECK ECM HARNESS CONNECTOR CONNECTION

Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair error-detected parts.

8.CHECK FUEL FLOW ACTUATOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and fuel flow actuator harness connector.
3. Check fuel flow actuator circuit for open and short.

ECM		Fuel flow actuator		Continuity
Connector	Terminal	Connector	Terminal	
F59	79	F107	2	Existed

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9.CHECK FUEL FLOW ACTUATOR

Check fuel flow actuator. Refer to [EC-595, "Component Inspection \(Fuel flow actuator\)"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Replace error-detected parts.

10.CHECK FUEL RAIL PRESSURE SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and fuel rail pressure sensor harness connector.
3. Check fuel rail pressure sensor circuit for open and short.

ECM		Fuel rail pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	116	F123	3	Existed
	73		2	
	74		1	

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts.

11.CHECK FOR FUEL LEAK

Check for fuel leakage at fuel circuit.

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace malfunctioning parts.

12.CHECK FUEL INJECTOR

Check fuel injector. Refer to [EC-636, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace error-detected parts.

13.CHECK FUEL FLOW ACTUATOR

Check fuel flow actuator. Refer to [EC-575, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 14.

NO >> Replace error-detected parts.

14.CHECK FUEL TEMPERATURE SENSOR

Check fuel temperature sensor. Refer to [EC-616, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 15.

NO >> Replace error-detected parts.

15.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Check engine coolant temperature sensor. Refer to [EC-723, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace error-detected parts.

Component Inspection (Fuel flow actuator)

INFOID:0000000014267895

1.CHECK FUEL FLOW ACTUATOR

1. Turn ignition switch OFF.

P0089 FUEL PRESSURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

2. Disconnect fuel flow actuator harness connector.
3. Check the resistance between fuel flow actuator terminals as follows.

Fuel flow actuator		Condition		Resistance (Approx.)
Terminal				
1	2	Temperature	20 °C (68°F)	2.48 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace high pressure fuel pump (with fuel flow actuator). Refer to [EM-341, "Removal and Installation"](#).

Component Inspection (Fuel Injector)

INFOID:0000000014267896

1.CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Disconnect fuel injector harness connector.
3. Check the resistance between fuel injector terminals.

Fuel injector		Condition		Resistance
Terminal				
1	2	Temperature	0 - 40 °C (32 - 104 °F)	150 - 250 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel injector. Refer to [EM-338, "Removal and Installation"](#).

P0095 IAT SENSOR 2

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0095 IAT SENSOR 2

DTC Description

INFOID:0000000014267897

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0095	AIR TEMP SEN/CIRC (Intake air temperature sensor 2 circuit bank 1)	• 1.DEF • 2.DEF • 3.DEF • 4.DEF • 5.DEF • 6.DEF • Signal voltage from the intake air temperature sensor 2 remains 4.9 V or more for 1 second or more. • An excessively low voltage from the intake air temperature sensor 2 is sent to ECM. • ECM receives an abnormal signal.

POSSIBLE CAUSE

- Harness or connectors (Intake air temperature sensor 2 circuit is open or shorted.)
- Intake air temperature sensor 2

FAIL-SAFE

- EGR cooler bypass valve closed
- Over torque inhibited
- Oil vapor heater activated when engine is running
- Engine speed attachment detection inhibited

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0095 can not duplicate.

>> Proceed to [EC-597, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267898

1.CHECK ECM HARNESS CONNECTOR CONNECTION

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair error-detected parts.

2.CHECK INTAKE AIR TEMPERATURE SENSOR 2 HARNESS CONNECTOR CONNECTION

1. Turn ignition switch OFF.
2. Check turbocharger boost sensor (with intake air temperature sensor 2) harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair error-detected parts.

3.CHECK INTAKE AIR TEMPERATURE SENSOR 2

Refer to [EC-598, "Component Inspection \(Intake Air Temperature Sensor 2\)"](#).

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Replace error-detected parts.

4.CHECK INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and intake air temperature sensor 2 harness connector.
3. Check intake air temperature sensor 2 circuit for open and short.

P0095 IAT SENSOR 2

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

ECM		Intake air temperature sensor 2		Continuity
Connector	Terminal	Connector	Terminal	
F55	2	F109	2	Existed
	28		1	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK EGR TEMPERATURE SENSOR

Refer to [EC-655, "Component Inspection \(EGR Temperature Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace error-detected parts.

Component Inspection (Intake Air Temperature Sensor 2)

INFOID:0000000014267899

1.CHECK INTAKE AIR TEMPERATURE SENSOR 2

1. Disconnect intake air temperature sensor 2 harness connector.
2. Check resistance between intake air temperature sensor 2 harness connector terminals under the following conditions.

Intake air temperature sensor 2		Condition		Resistance
Terminals				
1	2	Temperature	20 ° C (68 °F)	2502.8 – 2510.9 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace intake air temperature sensor 2. Refer to [EM-309, "Exploded View"](#).

P0100 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0100 MAF SENSOR

DTC Description

INFOID:0000000014267900

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0100	AIR FLOW SENSOR CIRCUIT (Mass or volume air flow sensor "A" circuit)	• 1.DEF • 2.DEF • 3.DEF	• Too many signal microcuts for 0.2 seconds or more • ECM receives an abnormal sensor signal for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connectors (Mass air flow sensor circuit is open or shorted.)
- Mass air flow sensor

FAIL-SAFE

- EGR valve closed
- Throttle valve opened

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0100 can not duplicate.

>> Proceed to [EC-599. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267901

1.CHECK MASS AIR FLOW SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect mass air flow sensor harness connector.
3. Turn ignition switch ON.
4. Check the power supply of the mass air flow sensor.

+		-	Voltage
Mass air flow sensor			
Connector	Terminal		
F121	3	Ground	5.0 V

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform trouble diagnosis for power supply circuit.

2.CHECK MASS AIR FLOW SENSOR CIRCUIT FOR OPEN AND SHORT 2

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check mass air flow sensor circuit for open and short.

ECM		Mass air flow sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	100	F121	1	Existed
	123		3	
	110		2	

Is the inspection result normal?

YES >> GO TO 3.

P0100 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Repair or replace error-detected parts.

3.CHECK TC BOOST SENSOR

Refer to [EC-603, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace error-detected parts.

4.CHECK AIR CLEANER

Refer to [EM-304, "Inspection \(Dry Paper Type\)"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace error-detected parts.

5.CHECK FOR CHARGE AIR LEAK

1. Start the engine and let it idle.

2. Listen for an charge air leak.

Is intake air leak detected?

YES >> Replace error-detected parts.

NO >> INSPECTION END

P0101 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0101 MAF SENSOR

DTC Description

INFOID:0000000014267902

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0101	INLET AIR CIRCUIT (Mass or volume air flow sensor "A" circuit range/performance) • 1.DEF • 2.DEF	ECM receives too high ratio signal voltage sent from MAF sensor for more than 5 seconds during driving condition.

POSSIBLE CAUSE

- Harness or connectors
- High pressure tube
- Intake air leaks
- Turbocharger
- Mass air flow sensor
- Turbocharger boost sensor
- Intake air temperature sensor 2
- Charge air cooler
- Electric throttle
- EGR valve
- EGR cooler
- EGR cooler bypass
- HP compressor bypass
- ECM

FAIL-SAFE

- EGR valve closed
- Throttle valve opened

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0101 can not duplicate.

>> Proceed to [EC-601. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267903

1.CHECK FOR CHARGE AIR LEAK

1. Start the engine and let it idle.
2. Listen for an charge air leak.

Is intake air leak detected?

- YES >> Repair or replace malfunctioning part.
NO >> GO TO 2.

2.CHECK INTAKE AIR TEMPERATURE SENSOR 2

Refer to [EC-597. "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace malfunctioning part.

3.CHECK MAS AIR FLOW SENSOR

Refer to [EC-599. "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 4.

P0101 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Repair or replace malfunctioning part.

4.CHECK TC BOOST SENSOR

Refer to [EC-603, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace malfunctioning part.

P0105 TC BOOST SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0105 TC BOOST SENSOR

DTC Description

INFOID:0000000014267904

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0105	INLET MANIF PRS SEN CIRC (Manifold absolute pressure/barometric pressure sensor circuit)	1.DEF 2.DEF	- An excessively low voltage from Turbocharger Boost sensor is sent to ECM for 1 second or more. - An excessively high voltage from Turbocharger Boost sensor is sent to ECM for 1 second or more.

POSSIBLE CAUSE

- Harness or connectors (TC boost sensor circuit is open or shorted.)
- TC boost sensor
- ECM

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- Limited boost pressure regulation
- DPF regeneration forbidden
- ASCD deactivation
- Freeshift Inhibited
- Increased idle speed
- Wastegate cutoff
- Torque limitation

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and let it idle for at least 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-603. "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267905

1.CHECK TURBOCHARGER BOOST SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect turbocharger boost sensor harness connector.
3. Turn ignition switch ON.
4. Check the power supply of the turbocharger boost sensor.

+		-	Voltage (Approx.)
Turbocharger boost sensor			
Connector	Terminal		
F110	1	Ground	5.0 V

Is the inspection result normal?

P0105 TC BOOST SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> GO TO 2.

NO >> Perform trouble diagnosis for power supply circuit.

2. CHECK TURBOCHARGER BOOST SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check turbocharger boost sensor circuit for open and short.

ECM		Turbocharger boost sensor		Continuity
Connector	Terminal	Connector	Terminal	
F55	1	F110	3	Existed
	50		1	
	34		2	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3. REPLACE TURBOCHARGER BOOST SENSOR

1. Replace turbocharger boost sensor. Refer to [EM-314, "Exploded View"](#).
2. Erase DTC.
3. Perform DTC confirmation procedure again. Refer to [EC-603, "DTC Description"](#).

Is the DTC detected again?

YES >> Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

NO >> INSPECTION END

P0106 TC BOOST SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0106 TC BOOST SENSOR

DTC Description

INFOID:0000000014267906

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0106	INLET PRESSURE CONSISTENCY (Manifold absolute pressure/barometric pressure circuit range/performance)	• 1.DEF • 2.DEF • 3.DEF	Difference between intake manifold air pressure and barometric pressure for 5 seconds while engine stopped.

POSSIBLE CAUSE

- Harness or connectors
- TC boost sensor

FAIL-SAFE

- Limited boost pressure regulation
- Freeshift Inhibited
- ASCD deactivation
- Torque limitation
- Wastegate cutoff
- EGR valve closed
- Throttle valve opened
- Increased idle speed
- DPF regeneration forbidden

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 5 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-605, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267907

1.CHECK TURBOCHARGER BOOST SENSOR FITTING CONDITION

Check turbocharger boost sensor fitting condition.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Adjust parts fitting condition.

2.CHECK FOR CHARGE AIR LEAK

1. Start the engine and let it idle.
2. Listen for an charge air leak.

Is intake air leak detected?

- YES >> Repair or replace error-detected parts.
NO >> GO TO 3.

3.CHECK TURBOCHARGER

P0106 TC BOOST SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Check if foreign matter is caught between the turbocharger. Refer to [EM-327, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Remove the foreign matter and clean the turbocharger.

4.CHECK TURBOCHARGER BOOST SENSOR HARNESS CONNECTOR CONNECTION

Check turbocharger boost sensor harness connector connection.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK TURBOCHARGER BOOST SENSOR

Check turbocharger boost sensor. Refer to [EC-606, "Component Inspection \(Turbocharger Boost Sensor\)"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace error-detected parts.

6.CHECK TURBOCHARGER BOOST SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect turbocharger boost sensor harness connector.
3. Turn ignition switch ON.
4. Check the power supply of the turbocharger boost sensor.

+		-	Voltage (Approx.)
Turbocharger boost sensor			
Connector	Terminal		
F110	1	Ground	5.0 V

Is the inspection result normal?

YES >> GO TO 7.

NO >> Perform trouble diagnosis for power supply circuit.

7.CHECK TURBOCHARGER BOOST SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check turbocharger boost sensor circuit for open and short.

ECM		Turbocharger boost sensor		Continuity
Connector	Terminal	Connector	Terminal	
F55	1	F110	3	Existed
	50		1	
	34		2	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (Turbocharger Boost Sensor)

INFOID:0000000014267908

1.CHECK TURBOCHARGER BOOST SENSOR

1. Turn ignition switch OFF.
2. Disconnect turbocharger boost sensor harness connector.
3. Check resistance between turbocharger boost sensor terminals under the following conditions.

P0106 TC BOOST SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Turbocharger boost sensor		Resistance
Terminal		
3	2	More than 50 kΩ

Is the inspection result normal?

YES >> **INSPECTION END**

NO >> Replace turbocharger boost sensor. Refer to [EM-314, "Exploded View"](#).

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P0110 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0110 IAT SENSOR

DTC Description

INFOID:0000000014267909

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0110	AIR TEMP SEN/CIRC (Intake air temperature sensor 1 circuit bank 1)	• 1.DEF • 2.DEF • 3.DEF • 4.DEF • 5.DEF • An excessively low voltage from Intake air temperature sensor 1 is sent to ECM for 1 second. • An excessively high voltage from Intake air temperature sensor 1 is sent to ECM for 1 second.

POSSIBLE CAUSE

- Harness or connectors (Intake air temperature sensor 1 circuit is open or shorted.)
- Intake air temperature sensor 1
- ECM

FAIL-SAFE

- EGR valve closed
- Throttle valve opened

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0110 can not duplicate.

>> Proceed to [EC-608. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267910

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair error-detected parts.

2.CHECK MASS AIR FLOW SENSOR HARNESS CONNECTOR CONNECTIONS

Check mass air flow sensor (with intake air temperature sensor 1) harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair error-detected parts.

3.CHECK INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector and intake air temperature sensor 1 harness connector.
2. Check intake air temperature sensor 1 circuit for open and short.

ECM		Mass air flow sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	94	F121	4	Existed
	110		2	

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

P0110 IAT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

4.CHECK INTAKE AIR TEMPERATURE SENSOR 1

Refer to [EC-609, "Component Inspection \(Intake Air Temperature Sensor 1\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace error-detected parts.

Component Inspection (Intake Air Temperature Sensor 1)

INFOID:0000000014267911

1.CHECK INTAKE AIR TEMPERATURE SENSOR 1

1. Disconnect mass air flow sensor harness connector.
2. Check resistance between mass air flow sensor (intake air temperature sensor 1) terminals under the following conditions.

Mass air flow sensor (intake air temperature sensor 1)		Condition		Resistance
Terminal				
4	2	Temperature	20° C (68°F)	2342 – 2531 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (intake air temperature sensor 1). Refer to [EM-307, "Removal and Installation"](#).

P0115 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0115 ECT SENSOR

DTC Description

INFOID:0000000014267912

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0115	WATER TEMPERATURE SENSOR CIRC (Engine coolant temperature sensor 1 circuit) • 2.DEF • 4.DEF • 5.DEF	• An excessively low voltage from Engine Coolant Temperature Sensor is sent to ECM for 1 second. • An excessively high voltage from Engine Coolant Temperature Sensor is sent to ECM for 1 second. • ECM receives an abnormal sensor signal for 41 seconds.

POSSIBLE CAUSE

- Harness or connectors (Engine coolant temperature sensor circuit is open or shorted.)
- Engine coolant temperature sensor

FAIL-SAFE

- After sales and factory routines inhibited
- Increased idle speed
- Torque limitation
- Engine speed limitation
- Intake air temperature sensor 2 value frozen
- Modelized coolant liquid temperature
- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden
- EGR cooling valve activated

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 10 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-610, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267913

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair error-detected parts.

2.CHECK ENGINE COOLANT TEMPERATURE SENSOR HARNESS CONNECTOR CONNECTIONS

Check engine coolant temperature sensor harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.

P0115 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Repair error-detected parts.

3.CHECK ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector and engine coolant temperature sensor harness connector.
2. Check engine coolant temperature sensor circuit for open and short.

ECM		Engine coolant temperature sensor		Continuity
Connector	Terminal	Connector	Terminal	
F55	6	F127	2	Existed
	39		1	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to [EC-611, "Component Inspection \(Engine Coolant Temperature Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace error-detected parts.

Component Inspection (Engine Coolant Temperature Sensor)

INFOID:0000000014267914

1.CHECK ENGINE COOLANT TEMPERATURE SENSOR

1. Disconnect engine coolant temperature sensor harness connector.
2. Check resistance between engine coolant temperature sensor terminals under the following conditions.

Engine coolant temperature sensor		Condition		Resistance
Terminal				
2	1	Temperature	25°C (77°F)	2139.84 – 2364.16 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor. Refer to [CO-73, "Exploded View"](#).

P0120 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0120 TP SENSOR

DTC Description

INFOID:0000000014267915

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0120	INLET AIR FLAP POSITION SEN (Throttle/pedal position sensor/switch "A" circuit)	1.DEF	- Throttle position sensor voltage sent to ECM is 4.8 V or more for 0.5 seconds or more. - Throttle position sensor voltage sent to ECM is 0.2 V or less for 0.5 seconds or more.

POSSIBLE CAUSE

- Harness or connectors (Throttle position sensor circuit is open or shorted.)
- Throttle position sensor
- Electric throttle control actuator

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden
- Air flow regulation cutoff
- Compression test routine forbidden
- ASCD deactivation
- Freeshift inhibited

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 1 second.
- Check DTC.

Is DTC detected?

YES >> Proceed to [EC-612, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267916

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

- Turn ignition switch OFF.
- Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair error-detected parts.

2.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR HARNESS CONNECTOR CONNECTIONS

Check electric throttle control actuator harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR FITTING CONDITION

P0120 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Check electric throttle control actuator fitting condition.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Adjust parts fitting condition.

4.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector and electric throttle control actuator harness connector.
2. Check electric throttle control actuator circuit for open and short.

ECM		Electric throttle control actuator		Continuity
Connector	Terminal	Connector	Terminal	
F59	89	F120	2	Existed
	90		3	
	120		1	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK THROTTLE POSITION SENSOR

Refer to [EC-613. "Component Inspection \(Throttle Position Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace error-detected parts.

Component Inspection (Throttle Position Sensor)

INFOID:0000000014267917

1.CHECK THROTTLE POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Perform [EC-558. "Description"](#).
4. Turn ignition switch ON.
5. Set selector lever to D position.
6. Check the voltage between ECM harness connector terminals under the following conditions.

ECM			Condition	Voltage (Approx.)
Connector	+	−		
	Terminal			
F59	90	89	Accelerator pedal: Fully released	More than 200 mV
			Accelerator pedal: Fully depressed	Less than 4,700 mV

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning electric throttle control actuator. Refer to [EM-314. "Exploded View"](#).

P0135 A/F SENSOR HEATER

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0135 A/F SENSOR HEATER

DTC Description

INFOID:0000000014267918

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0135	PROPOR RICH SEN HEAT CIRC (O2 sensor heater circuit bank 1 sensor 1)	• CC.0 • CC.1 • CO	• ECM detects Air Fuel Ratio Sensor Heater circuit is open for 5 seconds. • ECM detects Air Fuel Ratio Sensor Heater circuit is short to ground for 5 seconds. • ECM detects Air Fuel Ratio Sensor Heater circuit is short to power for 5 seconds.

POSSIBLE CAUSE

- Harness or connectors (The air fuel ratio sensor heater circuit is open or shorted.)
- Air fuel ratio sensor heater
- ECM

FAIL-SAFE

Stop closed-loop control

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-614, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267919

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair error-detected parts.

2.CHECK AIR FUEL RATIO (A/F) SENSOR HARNESS CONNECTOR CONNECTIONS

Check A/F sensor harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK A/F SENSOR HEATER CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector and A/F sensor harness connector.
2. Check A/F sensor circuit for open and short.

P0135 A/F SENSOR HEATER

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

ECM		A/F sensor		Continuity
Connector	Terminal	Connector	Terminal	
F159	95	F124	3	Existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK A/F SENSOR HEATER

Check A/F sensor heater. Refer to [EC-615. "Component Inspection \(A/F Sensor Heater\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5.REPLACE A/F SENSOR

Replace A/F sensor. Refer to [EM-319. "Removal and installation"](#).

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner tool and approved anti-seize lubricant.

>> INSPECTION END

Component Inspection (A/F Sensor Heater)

INFOID:0000000014267920

CAUTION:

- Discard any air fuel ratio (A/F) sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new air fuel ratio (A/F) sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner tool and approved anti-seize lubricant.

1.CHECK AIR FUEL RATIO (A/F) SENSOR

1. Turn ignition switch OFF.
2. Disconnect A/F sensor harness connector.
3. Check the resistance between A/F sensor terminals.

A/ F sensor		Condition		Resistance (Approx.)
Terminal				
4	3	Temperature	0 – 40°C (32 – 104°F)	1.56 – 2.2 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace air fuel ratio (A/F) sensor. Refer to [EM-319. "Removal and installation"](#).

P0180 FUEL TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0180 FUEL TEMPERATURE SENSOR

DTC Logic

INFOID:0000000014267921

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0180	FUEL TEMPERATURE SENSOR CIRCUIT (Fuel temperature sensor "A" circuit)	• 2.DEF • 3.DEF • 4.DEF • 5.DEF • 6.DEF • 7.DEF • Sensor voltage sent to ECM is 4.9 V or more for 1 second or more. • Sensor voltage sent to ECM is 0.05 V or less for 1 second or more. • An excessively difference between minimum and maximum fuel temperature signal from the sensor is sent to ECM while engine running. • ECM detects improper fuel temperature signal.

POSSIBLE CAUSE

- Harness or connectors (The fuel temperature sensor heater circuit is open or shorted.)
- Fuel temperature sensor heater
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0180 can not duplicate.

>> Proceed to [EC-616, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267922

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection F139.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair error-detected parts.

2.CHECK FUEL TEMPERATURE SENSOR HARNESS CONNECTOR CONNECTIONS

Check fuel temperature sensor harness connector connection F93.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair error-detected parts.

3.CHECK FUEL TEMPERATURE SENSOR CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector and fuel temperature sensor harness connector.
2. Check fuel temperature sensor circuit for open and short.

ECM		Fuel temperature sensor		Continuity
Connector	Terminal	Connector	Terminal	
F55	33	F105	2	Existed
	18		1	

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

P0180 FUEL TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

4.CHECK FUEL TEMPERATURE SENSOR

Check fuel temperature sensor. Refer to [EC-617, "Component Inspection \(Fuel Temperature Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (Fuel Temperature Sensor)

INFOID:0000000014267923

1.CHECK FUEL TEMPERATURE SENSOR

1. Turn ignition switch OFF.
2. Disconnect fuel temperature sensor.
3. Check the resistance between fuel temperature sensor terminals.

Fuel temperature sensor		Resistance
Terminal		
1	2	77 Ω - 49 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel temperature sensor. Refer to [FL-44, "Exploded View"](#).

P0190 FRP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0190 FRP SENSOR

DTC Description

INFOID:0000000014267924

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0190	RAIL PRESSURE SENSOR CIRCUIT (Fuel rail pressure sensor "A" circuit)	• 1.DEF • 2.DEF • 3.DEF • 4.DEF • 5.DEF • An excessively low voltage from the sensor is sent to ECM. • An excessively high voltage from the sensor is sent to ECM. • An improper voltage signal from sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (Fuel rail pressure sensor circuit is open or shorted.)
- Fuel rail pressure sensor
- Fuel piping

FAIL-SAFE

- DPF regeneration forbidden
- Freeshift inhibited
- ASCD deactivation
- Rail pressure limitation
- After sale routines forbidden
- EGR valve closed
- Throttle valve opened
- VDC deactivated

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0190 can not duplicate.

>> [EC-618, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267925

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair error-detected parts.

2.CHECK FUEL RAIL PRESSURE SENSOR HARNESS CONNECTOR CONNECTIONS

Check fuel rail pressure sensor harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair error-detected parts.

3.CHECK FUEL PIPING

Check fuel hoses and fuel tubes for clogging.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4.CHECK FUEL RAIL PRESSURE SENSOR POWER SUPPLY CIRCUIT

P0190 FRP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

1. Disconnect fuel rail pressure sensor harness connector.
2. Turn ignition switch ON.
3. Check the power supply of the fuel rail pressure sensor.

+		-	Voltage (Approx.)
Fuel rail pressure sensor			
Connector	Terminal		
F123	3	Ground	5.0 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> Perform trouble diagnosis for power supply circuit.

5.CHECK FUEL RAIL PRESSURE SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check fuel rail pressure sensor circuit for open and short.

ECM		Fuel rail pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	74	F123	1	Existed
	73		2	
	116		3	

Is the inspection result normal?

YES >> Replace fuel rail pressure sensor. Refer to [EM-338. "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

P0200 FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0200 FUEL INJECTOR

DTC Description

INFOID:0000000014267926

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0200	INJECTOR CONTROL CIRCUIT (Injector circuit/open)	1.DEF • ECM detects fuel injectors circuit malfunction. • Injector code is not stored into ECM.

POSSIBLE CAUSE

- Harness or connectors
- Injector

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- VDC deactivated
- ASCD deactivation with dashboard message
- DPF regeneration forbidden
- Increased idle speed

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-620, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267927

1.CHECK ENGINE START

Start the engine.

Did the engine start normally?

- YES >> GO TO 3.
NO >> GO TO 2.

2.CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Disconnect suspicious fuel injector harness connector.
3. Start the engine.

Did the engine start?

- YES >> Replace malfunctioning injector(s).
NO >> GO TO 3.

3.CHECK ECM HARNESS CONNECTOR CONNECTION

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

P0200 FUEL INJECTOR

[YS23DDT/YS23DDTT (M9T)]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair error-detected parts.

4.CHECK FUEL INJECTOR HARNESS CONNECTOR CONNECTION

Check fuel injector harness connector connection.

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair error-detected parts.

5.CHECK FUEL INJECTOR

Refer to [EC-621, "Component Inspection \(Fuel Injector\)"](#).

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Replace malfunctioning injector(s). Refer to [EM-338, "Removal and Installation"](#).

6.CHECK FUEL INJECTOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and fuel injector harness connector.
3. Check fuel injector circuit for open and short.

Cylinder	ECM		Fuel injector		Continuity
	Connector	Terminal	Connector	Terminal	
No.1	F55	15	F111	1	Existed
		16		2	
No.2		63	F113	1	
		64		2	
No.3		31	F114	1	
		32		2	
No.4		47	F112	1	
		48		2	

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

Component Inspection (Fuel Injector)

INFOID:0000000014267928

1.CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Disconnect fuel injector harness connector.
3. Check the resistance between fuel injector terminals.

Fuel injector		Condition		Resistance
Terminal				
1	2	Temperature	0 - 40 °C (32 - 104 °F)	150 - 250 kΩ

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace fuel injector. Refer to [EM-338, "Removal and Installation"](#).

P0201, P0202, P0203, P0204 FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0201, P0202, P0203, P0204 FUEL INJECTOR

DTC Description

INFOID:0000000014267929

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0201	CYLINDER 1 INJECTOR CIRC (Injector circuit/open - cylinder 1)	• 2.DEF • 3.DEF • 4.DEF • 5.DEF • CO • Injector code is incorrect. • ECM detects fuel injectors circuit are open or shorted. • ECM error • ECM detects an abnormal signal of injector.
P0202	CYLINDER 2 INJECTOR CIRC (Injector circuit/open - cylinder 2)	
P0203	CYLINDER 3 INJECTOR CIRC (Injector circuit/open - cylinder 3)	
P0204	CYLINDER 4 INJECTOR CIRC (Injector circuit/open - cylinder 4)	

POSSIBLE CAUSE

- Harness or connectors (The fuel injector circuit is open.)
- Fuel injector
- Injector code error

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- ASCD deactivation
- DPF regeneration forbidden
- Increased idle speed

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0201, P0202, P0203 or P0204 is displayed with DTC P0263, P0266, P0269 or P0272, perform the trouble diagnosis for DTC P0263, P0266, P0269 or P0272.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YD23DDTT).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 5 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-622. "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267930

1.CHECK DTC PRIORITY

If DTC P0201, P0202, P0203 or P0204 is displayed with DTC P0263, P0266, P0269 or P0272, perform the trouble diagnosis for DTC P0263, P0266, P0269 or P0272.

P0201, P0202, P0203, P0204 FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YD23DDTT).

NO >> GO TO 2.

2.PERFORM FUEL INJECTOR ADJUSTMENT VALUE REGISTRATION

1. Perform FUEL INJECTOR ADJUSTMENT VALUE REGISTRATION. Refer to [EC-556, "Description"](#).

2. Perform DTC confirmation procedure. Refer to [EC-622, "DTC Description"](#).

Is DTC detected again?

YES >> GO TO 3.

NO >> INSPECTION END

3.CHECK FUEL RETURN HOSE

Check Fuel return hose.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to [EM-296, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

5.CHECK FUEL INJECTOR HARNESS CONNECTOR CONNECTION

Check fuel injector harness connector connection.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK FUEL INJECTOR

Refer to [EC-624, "Component Inspection \(Fuel Injector\)"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK FUEL INJECTOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector and fuel injector harness connector.

3. Check fuel injector circuit for open and short.

Cylinder	ECM		Fuel injector		Continuity
	Connector	Terminal	Connector	Terminal	
No.1	F55	15	F111	1	Existed
		16		2	
No.2		63	F113	1	
		64		2	
No.3		31	F114	1	
		32		2	
No.4		47	F112	1	
		48		2	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

P0201, P0202, P0203, P0204 FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Component Inspection (Fuel Injector)

INFOID:0000000014267931

1. CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Disconnect each fuel injector harness connector.
3. Check the resistance between each fuel injector terminals.

Fuel injector		Condition		Resistance
Terminal				
1	2	Temperature	0 - 40 °C (32 - 104 °F)	150 - 250 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning fuel injector(s). Refer to [EM-338, "Removal and Installation"](#).

P0217 ENGINE OVER TEMPERATURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0217 ENGINE OVER TEMPERATURE

DTC Description

INFOID:0000000014267932

DTC DETECTION LOGIC

If the cooling fan or other component in the cooling system malfunctions, engine coolant temperature will rise. When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0217	ENGINE OVERHEATING (Engine coolant over temperature condition)	1.DEF When engine coolant temperature is 110°C or more.

CAUTION:

When a malfunction is indicated, be sure to replace the coolant. Also, replace the engine oil.

1. Fill radiator with coolant up to specified level with a filling speed of 3 liters per minute. Be sure to use coolant with the proper mixture ratio.
2. After refilling coolant, run engine to ensure that no water-flow noise is emitted.

POSSIBLE CAUSE

- Cooling fan
- Fan coupling
- Radiator
- Radiator cap
- Water pump
- Thermostat
- EGR cooler bypass valve control solenoid valve
- Engine coolant temperature sensor

FAIL-SAFE

- Cooling fan activation
- Controlled shutters opening
- Warning overheating lamp activated
- Opening of the engine coolant thermostat (request of ineffective opening in that case)
- EGR control cutoff
- A/C compressor cutoff

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0217 is displayed with DTC P0115 or P2681, first perform the trouble diagnosis for DTC P0115 or P2681.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM COMPONENT FUNCTION CHECK-1

WARNING:

Never remove the reservoir tank cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator.

Wrap a thick cloth around cap. Carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then turn the cap all the way off.

P0217 ENGINE OVER TEMPERATURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Check the coolant level in the reservoir tank and radiator.

Allow engine to cool before checking coolant level.

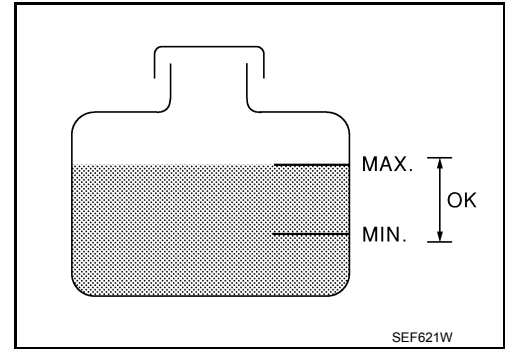
NOTE:

Use component function check to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

Is the coolant level in the reservoir tank and/or radiator below the proper range?

YES >> Proceed to [EC-626, "Diagnosis Procedure"](#).

NO >> GO TO 3.



3.PERFORM COMPONENT FUNCTION CHECK-2

Confirm whether customer filled the coolant or not.

Did customer fill the coolant?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to [EC-626, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267933

1.CHECK DTC PRIORITY

If DTC P0217 is displayed with DTC P0115 or P2681, first perform the trouble diagnosis for DTC P0115 or P2681.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK COOLING FAN OPERATION

Start engine and check cooling fan operation. Refer to [CO-76, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning part.

3.CHECK COOLING SYSTEM FOR LEAK-1

Check cooling system for leak. Refer to [CO-62, "System Inspection"](#).

Is leakage detected?

YES >> GO TO 4.

NO >> GO TO 5.

4.CHECK COOLING SYSTEM FOR LEAK-2

Check the following for leak.

- Hose
- Radiator
- Reservoir tank cap
- Water pump
- Reservoir tank

>> Repair or replace malfunctioning part.

5.CHECK RESERVOIR TANK CAP

Check reservoir tank cap. Refer to [CO-66, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace reservoir tank cap.

P0217 ENGINE OVER TEMPERATURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

6.CHECK ENGINE COOLANT BYPASS VALVE

Check engine coolant bypass valve system. Refer to [EC-762, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK THERMOSTAT

Check thermostat. Refer to [CO-77, "Thermostat"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace thermostat.

8.CHECK THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE

Check thermo management valve control solenoid valve. Refer to [EC-762, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace thermo management valve control solenoid valve.

9.CHECK THERMO MANAGEMENT VALVE

Check thermo management valve. Refer to [EC-763, "Component Inspection \(Thermo Management Valve Control Solenoid Valve\)"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Replace thermo management valve.

10.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Check engine coolant temperature sensor routing circuit. Refer to [EC-610, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Perform overheating cause analysis. Refer to [CO-60, "Troubleshooting Chart"](#).

NO >> Replace engine coolant temperature sensor.

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P0219 ENGINE OVER SPEED

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0219 ENGINE OVER SPEED

DTC Description

INFOID:0000000014267934

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0219	ENGINE OVERSPEED (Engine overspeed condition)	1.DEF	When engine speed is 4,500 rpm or more for 0.2 seconds or more.

POSSIBLE CAUSE

- Turbocharger
- Injector
- Segmentation pistons
- Oil decanter

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0219 can not duplicate

>> Clean all air ducts and replace engine assembly and exhaust line.

P0225 APP SENSOR

DTC Description

INFOID:0000000014267935

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0225	PEDAL POTENTIOMETER CIRCUIT TRACK 1 (Throttle/pedal position sensor/switch "C" circuit) • 1.DEF • 2.DEF	• An excessively low voltage from the sensor is sent to ECM. • An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (Accelerator pedal position sensor circuit is open or shorted.)
- Accelerator pedal position sensor (APP sensor 1)
- ECM

FAIL-SAFE

- Torque limitation
- After sales and factory routines inhibited
- Freeshift inhibited
- ASCD deactivation

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0225 is displayed with DTC P0641, first perform the trouble diagnosis for DTC P0641.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-521, "YS23DDTT : DTC Index"](#).
 NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-629, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267936

1.CHECK DTC PRIORITY

If DTC P0225 is displayed with DTC P0641, first perform the trouble diagnosis for DTC P0641.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-521, "YS23DDTT : DTC Index"](#).
 NO >> GO TO 2.

2.CHECK ACCELERATOR PEDAL POSITION SENSOR 1 POWER SUPPLY CIRCUIT 1

1. Turn ignition switch OFF.
2. Disconnect accelerator pedal position sensor 1 harness connector.
3. Turn ignition switch ON.
4. Check the power supply of the accelerator pedal position sensor 1.

P0225 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

+		-	Voltage (Approx.)
APP sensor			
Connector	Terminal		
E5	2	Ground	5.0 V

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 3.

3.CHECK ACCELERATOR PEDAL POSITION SENSOR 1 POWER SUPPLY CIRCUIT 2

Refer to [EC-570, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

4.CHECK ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check accelerator pedal position sensor 1 circuit for open and short.

ECM		APP sensor		Continuity
Connector	Terminal	Connector	Terminal	
E12	151	E5	2	Existed
	144		4	
	152		3	

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5.CHECK ACCELERATOR PEDAL POSITION SENSOR

Refer to [EC-630, "Component Inspection \(Accelerator Pedal Position Sensor\)"](#).

Is the inspection result normal?

YES >> Replace ECM. Refer to [EC-798, "Removal and Installation"](#).
NO >> Replace error-detected parts.

Component Inspection (Accelerator Pedal Position Sensor)

INFOID:0000000014267937

1.CHECK ACCELERATOR PEDAL POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Check the voltage between ECM harness connector terminals as per the following condition.

ECM				Condition		Voltage
Connector		+	—			
		Terminal				
Sensor 1	E12	152	144	Accelerator pedal	Fully released	0.74 V
					Fully depressed	4.54 V
Sensor 2		142	134		Fully released	0.38 V
					Fully depressed	2.25 V

Is the inspection result normal?

YES >> INSPECTION END

P0225 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Replace accelerator pedal assembly. Refer to [ACC-3. "Removal and Installation"](#).

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P0226 APP SENSOR

DTC Description

INFOID:0000000014267938

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0226	BRAKE/ACCELERATOR PEDAL POSITIONS (Throttle/pedal position sensor/switch "C" circuit Range/Performance)	• 1.DEF • 2.DEF • 3.DEF • 4.DEF • ECM does not receive a signal sent from APP sensor 1 and 2. • ECM detects a invalid signal sent from APP sensor 1 and 2. • No pedal position variation.

POSSIBLE CAUSE

- Harness or connectors (APP sensor 1 and 2 circuit is open or shorted.)
- Accelerator pedal position sensor
- Accelerator pedal
- ECM

FAIL-SAFE

- Torque limitation
- Pedal limp home activated
- After sales and factory routines inhibited
- Freeshift Inhibited
- ASCD deactivation

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0226 can not duplicate.

>> Proceed to [EC-632, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267939

1.CHECK ACCELERATOR PEDAL STATE

Check that the accelerator pedal is not stuck with the driver side floor mat.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair malfunction.

2.CHECK ACCELERATOR PEDAL POSITION SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect accelerator pedal position sensor harness connector.
3. Turn ignition switch ON.
4. Check the power supply of the accelerator pedal position sensor.

+		-	Voltage (Approx.)
APP sensor			
Connector	Terminal		
E5	1	Ground	5.0 V
	2		

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Perform trouble diagnosis for power supply circuit.

P0226 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

3.CHECK ACCELERATOR PEDAL POSITION SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check accelerator pedal position sensor circuit for open and short.

Sensor	ECM		APP sensor		Continuity
	Connector	Terminal	Connector	Terminal	
1	E12	151	E5	2	Existed
		144		4	
		152		3	
2		134		5	
		142		6	
		150		1	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4.CHECK ACCELERATOR PEDAL

Refer to [ACC-3, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Replace error-detected parts.

5.CHECK ACCELERATOR PEDAL POSITION SENSOR

Refer to [EC-633, "Component Inspection \(Accelerator Pedal Position Sensor\)"](#).

Is the inspection result normal?

- YES >> Replace ECM. Refer to [EC-798, "Removal and Installation"](#).
NO >> Replace error-detected parts.

Component Inspection (Accelerator Pedal Position Sensor)

INFOID:0000000014267940

1.CHECK ACCELERATOR PEDAL POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Check the voltage between ECM harness connector terminals as per the following condition.

ECM				Condition		Voltage
Connector		+	—			
		Terminal				
Sensor 1	E12	152	144	Accelerator pedal	Fully released	0.74 V
					Fully depressed	4.54 V
Sensor 2		142	134		Fully released	0.38 V
					Fully depressed	2.25 V

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace accelerator pedal assembly. Refer to [ACC-3, "Removal and Installation"](#).

P025A FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P025A FUEL PUMP

DTC Description

INFOID:0000000014267941

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P025A	FUEL PUMP MODULE A (Fuel Pump Module "A" Control Circuit/Open) • CO • CC.0 • CC.1	• Fuel pump relay circuit is open • Fuel pump relay circuit is short to ground or power

POSSIBLE CAUSE

- Harness or connectors (Fuel pump relay circuit is open or shorted.)
- Fuel pump relay

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Turn ignition switch OFF and wait at least 1 minuets.
3. Turn ignition switch ON and wait at least 1 second.
4. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-634, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267942

1.CHECK 15A FUSE

1. Disconnect 15A fuse (No. 40) from IPDM E/R.
2. Check 15A fuse.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace 15A fuse.

2.CHECK GROUND CONNECTION

1. Turn ignition switch OFF.
2. Check ground connection. Refer to Ground Inspection in [GI-47, "Circuit Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair ground connection.

3.CHECK ECM HARNESS CONNECTOR CONNECTION

Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair error-detected parts.

P025A FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

4.CHECK IPDM E/R HARNESS CONNECTOR CONNECTION

Check IPDM E/R harness connector connection.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair error-detected parts.

5.CHECK FUEL PUMP RELAY CIRCUIT 1

1. Disconnect ECM harness connector.
2. Turn ignition switch ON.
3. Check the voltage between ECM harness connector and ground.

ECM				Voltage
+		-		
Connector	Terminal	Connector	Terminal	
F59	127	E12	160	Battery voltage

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK FUEL PUMP RELAY CIRCUIT 2

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between ECM harness connector and IPDM E/R harness connector.

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F59	127	E122	45	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

P0263, P0266, P0269, P0272 COMBUSTION DISORDER

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0263, P0266, P0269, P0272 COMBUSTION DISORDER

DTC Description

INFOID:0000000014267943

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0263	FUEL INJECTION CALIBRATION FOR CYLINDER No.1 (Cylinder 1 contribution/balance)	• 1.DEF • 2.DEF	The fuel calibration value for fuel injector is excessively high
P0266	FUEL INJECTION CALIBRATION FOR CYLINDER No.2 (Cylinder 2 contribution/balance)		
P0269	FUEL INJECTION CALIBRATION FOR CYLINDER No.3 (Cylinder 3 contribution/balance)		
P0272	FUEL INJECTION CALIBRATION FOR CYLINDER No.4 (Cylinder 4 contribution/balance)		

POSSIBLE CAUSE

- Fuel injector
- Injector code error

FAIL-SAFE

- ASCD deactivation
- Freeshift inhibited
- DPF regeneration forbidden
- EGR valve closed
- Throttle valve opened
- VDC deactivation
- A/T in limp home
- Increased idle speed

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 30 seconds.
2. Select "DATA MONITOR" mode of "ENGINE" using CONSULT.
3. Check that "WATER TEMP" indicates more than 70°C (158°F).
4. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-636, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267944

1.CHECK FUEL LEVEL

Check that the fuel level is enough.

Is the inspection result normal?

P0263, P0266, P0269, P0272 COMBUSTION DISORDER

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> GO TO 2.
NO >> Refuel.

A

2.CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to [EM-296, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.
NO >> Check pistons, piston rings, valves, valve seats and cylinder head gaskets.

EC

C

3.CHECK VALVE CLEARANCE

Check valve clearance. Refer to [EM-414, "Cylinder Head"](#).

Is the inspection result normal?

YES >> GO TO 4.
NO >> Make it conform.

D

E

4.CHECK INTAKE AIR DUCTS

Check intake air ducts.

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

F

5.CHECK EGR VOLUME CONTROL VALVE

Check EGR volume control valve. Refer to [EC-646, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

G

H

6.PERFORM FUEL INJECTOR ADJUSTMENT VALUE REGISTRATION

1. Perform FUEL INJECTOR ADJUSTMENT VALUE REGISTRATION. Refer to [EC-556, "Description"](#).
2. Perform DTC confirmation procedure. Refer to [EC-636, "DTC Description"](#).

Is DTC detected again?

YES >> GO TO 7.
NO >> INSPECTION END

I

J

7.PERFORM INJECTOR INSPECTION

Perform injector inspection for malfunctioning cylinder. Refer to [EC-568, "Work Procedure \(Fuel Injectors Leak Check\)"](#) and [EC-569, "Work Procedure \(Fuel Injection Quantity Check\)"](#).

Is DTC detected?

YES >> GO TO 8.
NO >> INSPECTION END

K

L

8.CHECK FUEL RETURN HOSE

Check Fuel return hose. Refer to [EM-338, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair or replace error-detected parts.

M

N

9.CHECK FUEL INJECTOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and fuel injector harness connector.
3. Check fuel injector circuit for open and short.

O

P

P0263, P0266, P0269, P0272 COMBUSTION DISORDER

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Cylinder	ECM		Fuel injector		Continuity
	Connector	Terminal	Connector	Terminal	
No.1	F55	15	F111	1	Existed
		16		2	
No.2		63	F113	1	
		64		2	
No.3		31	F114	1	
		32		2	
No.4		47	F112	1	
		48		2	

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace error-detected parts.

10.CHECK FUEL INJECTOR HARNESS CONNECTOR STATE

Check fuel injector harness connector state.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair error-detected parts.

11.CHECK FUEL INJECTORRefer to [EM-340. "Inspection"](#).Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (Fuel Injector)

INFOID:0000000014267945

1.CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Disconnect each fuel injector harness connector.
3. Check the resistance between each fuel injector terminals.

Fuel injector		Condition		Resistance
Terminal				
1	2	Temperature	0 - 40 °C (32 - 104 °F)	150 - 250 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning fuel injector(s). Refer to [EM-338. "Removal and Installation"](#).

P0335 CKP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0335 CKP SENSOR

DTC Description

INFOID:0000000014267946

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0335	ENGINE SPEED SENSOR SIGNAL (Crankshaft position sensor "A" circuit)	• 1.DEF • 2.DEF • 3.DEF • 4.DEF • 5.DEF • 6.DEF • 7.DEF • 8.DEF • CO • Crankshaft position sensor signal is not detected by ECM when engine is running. • Crankshaft position sensor signal is not in the normal pattern when engine is running.

POSSIBLE CAUSE

- Harness or connectors (The sensor circuit is open or shorted.)
- Crankshaft position sensor
- Signal plate

FAIL-SAFE

- Throttle valve opened
- EGR valve closed
- DPF regeneration forbidden
- Engine speed limitation
- Torque limitation
- VDC deactivation

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0335 can not duplicate.

>> Proceed to [EC-639, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267947

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair error-detected parts.

2.CHECK CKP SENSOR HARNESS CONNECTOR CONNECTIONS

Check crankshaft position (CKP) sensor harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair error-detected parts.

3.CHECK CKP SENSOR

Refer to [EC-640, "Component Inspection \(Crankshaft Position Sensor\)"](#).

Is the inspection result normal?

- YES >> GO TO 4.

P0335 CKP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Replace error-detected parts.

4.CHECK GEAR TOOTH

Visually check for chipping flywheel gear tooth.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-45. "Intermittent Incident"](#).

NO >> Replace signal plate.

Component Inspection (Crankshaft Position Sensor)

INFOID:0000000014267948

1.CHECK CRANKSHAFT POSITION (CKP) SENSOR

1. Disconnect CKP sensor harness connector.
2. Check resistance between CKP sensor terminals as follows.

CKP sensor		Resistance
Terminal		
1	2	1.0 - 1.2 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace CKP sensor.

P0340 CMP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0340 CMP SENSOR

DTC Description

INFOID:0000000014267949

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0340	CAMSHAFT SENSOR CIRCUIT (Camshaft position sensor "A" circuit)	• 6.DEF • 7.DEF • 9.DEF • 10.DEF • Camshaft position sensor signal is not detected by ECM when engine is running. • Camshaft position sensor signal is not in the normal pattern when engine is running.

POSSIBLE CAUSE

- Harness or connectors (The sensor circuit is open or shorted.)
- Camshaft position sensor
- Signal plate

FAIL-SAFE

- Synchronization on the exhaust CAM
- Intake variable valve timing control deactivation
- Inhibition of the variable valve timing control (setpoint = 0)
- Inhibition of the variable valve timing control command (% PWM = 0)
- variable valve timing control angular position set to 0 and inhibition of the variable valve timing control

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0340 is displayed with DTC P0016, P0335, P0560, P0641, P0651 or P0657, first perform the trouble diagnosis for DTC P0016, P0335, P0560, P0641, P0651 or P0657.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0340 can not duplicate.

>> Proceed to [EC-641, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267950

1.CHECK DTC PRIORITY

If DTC P0340 is displayed with DTC P0016, P0335, P0560, P0641, P0651 or P0657, first perform the trouble diagnosis for DTC P0016, P0335, P0560, P0641, P0651 or P0657.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK CMP SENSOR-1

Visually check camshaft position (CMP) sensor for chipping.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK CMP SENSOR HARNESS CONNECTOR CONNECTIONS

P0340 CMP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Check CMP sensor harness connector connection.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair error-detected parts.

4.CHECK CMP SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and CMP sensor harness connector.
3. Check CMP sensor circuit for open and short.

ECM		CMP sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	115	F119	1	Existed
	101		2	
	99		3	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK CMP SENSOR-2

Refer to [EC-642. "Component Inspection \(Camshaft Position Sensor\)"](#).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-45. "Intermittent Incident"](#).

NO >> Replace error-detected parts.

Component Inspection (Camshaft Position Sensor)

INFOID:0000000014267951

1.CHECK CAMSHAFT POSITION (CMP) SENSOR

1. Disconnect CMP sensor harness connector.
2. Check the resistance between CMP sensor terminals as follows.

CMP sensor		Resistance
Terminal		
3	2	More than 100 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace CMP sensor. Refer to [EM-358. "Exploded View"](#).

P0380 GLOW CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0380 GLOW CONTROL SYSTEM

DTC Description

INFOID:0000000014267952

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0380	Preheating unit DIAG CONN (Glow plug/heater circuit "A")	• 1.DEF • 2.DEF • CC.0 • CC.1 • CO	• ECM detects glow plug control circuit is open for 30 seconds or more. • ECM detects glow plug circuit is short to ground for 30 seconds or more. • ECM detects glow plug circuit is short to power for 30 seconds or more. • ECM detects glow control unit error for 1 second or more.

POSSIBLE CAUSE

- Harness or connectors
- Glow plug control circuit is open or shorted.
- Glow control unit input signal circuit is open or shorted.
- Glow plug
- Glow control unit

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0380 is displayed with DTC P0560 or P0657, first perform the trouble diagnosis for DTC P0560 or P0657.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minutes before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 2 seconds.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-643, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267953

1.CHECK DTC PRIORITY

If DTC P0380 is displayed with DTC P0560 or P0657, first perform the trouble diagnosis for DTC P0560 or P0657.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

P0380 GLOW CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

2. CHECK GLOW CONTROL UNIT POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect glow control unit harness connector.
3. Turn ignition switch ON.
4. Check the power supply of the glow control unit.

+		-	Voltage
Glow control unit			
Connector	Terminal		
E28	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform trouble diagnosis for power supply circuit.

3. CHECK GLOW CONTROL UNIT CIRCUIT FOR OPEN AND SHORT-1

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between glow control unit harness connector and ECM harness connector.

ECM		Glow control unit		Continuity
Connector	Terminal	Connector	Terminal	
F59	70	E28	8	Existed
F55	52		3	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4. CHECK GLOW CONTROL UNIT CIRCUIT FOR OPEN AND SHORT-2

1. Disconnect glow plug harness connector.
2. Check the continuity between glow control unit harness connector and glow plug harness connector.

Glow control unit		Glow plug		Continuity
Connector	Terminal	Connector	Terminal	
E28	1	F115	1	Existed
	2	F117	1	
	7	F116	1	
	6	F118	1	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. CHECK GLOW PLUG

Refer to [EC-645, "Component Inspection \(Glow Plug\)"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace error-detected parts.

6. CHECK INTERMITTENT INCIDENT

Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace glow control unit.

NO >> Repair or replace.

P0380 GLOW CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Component Inspection (Glow Plug)

INFOID:0000000014267954

1.CHECK GLOW PLUG

1. Disconnect glow plug harness connector.
2. Check resistance between glow plug terminals as follows.

Glow plug	—	Condition		Resistance (Approx.)
Terminal				
1	Ground	Temperature	20°C (68°F)	0.2 - 0.8 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning glow plug(s). Refer to [EM-332. "Removal and Installation"](#).

P0402 EGR VOLUME CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0402 EGR VOLUME CONTROL VALVE

DTC Description

INFOID:0000000014267955

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0402	EGR VALVE JAMMED OPEN (EGR "A" Flow Excessive Detected)	ECM detects an incorrect closed position of high pressure EGR volume control valve.

POSSIBLE CAUSE

- Harness or connectors
- EGR volume control valve

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regenerations forbidden
- ASCD deactivation with dashboard message
- Freeshift inhibited

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine.
2. Maintain the following conditions for at least 10 consecutive seconds. Hold the steady as possible.

ENGINE SPEED	3,500 rpm
--------------	-----------

3. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-646, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267956

1.CHECK EGR VOLUME CONTROL VALVE

Visually check EGR volume control valve for chipping.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

2.CHECK ECM HARNESS CONNECTOR CONNECTIONS

Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair error-detected parts.

3.CHECK EGR VOLUME CONTROL VALVE HARNESS CONNECTOR CONNECTIONS

Check EGR volume control valve harness connector connection.

P0402 EGR VOLUME CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair error-detected parts.

4.CHECK EGR VOLUME CONTROL VALVE CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and EGR volume control valve harness connector.
3. Check EGR volume control valve circuit for open and short.

ECM		EGR volume control valve		Continuity
Connector	Terminal	Connector	Terminal	
F59	122	F122	1	Existed
	106		2	
	91		3	

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5.DTC CONFIRMATION PROCEDURE

1. Erase DTC.
2. Perform DTC confirmation procedure again. Refer to [EC-646, "DTC Description"](#).

Is the DTC P0402 displayed again?

- YES >> GO TO 6.
NO >> INSPECTION END

6.CHECK EGR VOLUME CONTROL VALVE MOTOR

Refer to [EC-647, "Component Inspection \(EGR Volume Control Valve Motor\)"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace error-detected parts.

Component Inspection (EGR Volume Control Valve Motor)

INFOID:0000000014267957

1.CHECK EGR VOLUME CONTROL VALVE MOTOR

1. Turn ignition switch OFF.
2. Disconnect EGR volume control valve harness connector.
3. Check resistance between EGR volume control valve terminals as follows.

EGR volume control valve		Condition		Resistance (Approx.)
Terminal				
5	6	Temperature	20°C (68°F)	1.41 – 1.69 Ω

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace EGR volume control valve. Refer to [EM-317, "Removal and Installation"](#).

P0403 EGR VOLUME CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0403 EGR VOLUME CONTROL VALVE

DTC Description

INFOID:0000000014267958

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0403	EGR VLV CMD CIRC (EGR "A" control circuit/Open) • 1.DEF • 2.DEF	• ECM detects EGR volume control valve command circuit is short to ground. • ECM detects EGR volume control valve command circuit is short to power. • ECM detects an over temperature of EGR volume control valve.

POSSIBLE CAUSE

- Harness or connectors (EGR volume control valve command circuit is open or shorted.)
- EGR volume control valve

FAIL-SAFE

- EGR valve closed
- Throttle valve opened

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0403 is displayed with DTC P0641, first perform the trouble diagnosis for DTC P0641.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-648, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267959

1.CHECK DTC PRIORITY

If DTC P0403 is displayed with DTC P0641, first perform the trouble diagnosis for DTC P0641.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK EGR VOLUME CONTROL VALVE

Visually check EGR volume control valve for chipping.

Is the inspection result normal?

P0403 EGR VOLUME CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

- YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3.CHECK ECM HARNESS CONNECTOR CONNECTIONS

Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair error-detected parts.

4.CHECK EGR VOLUME CONTROL VALVE HARNESS CONNECTOR CONNECTIONS

Check EGR volume control valve harness connector connection.

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair error-detected parts.

5.CHECK EGR VOLUME CONTROL VALVE CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and EGR volume control valve harness connector.
3. Check EGR volume control valve circuit for open and short.

ECM		EGR volume control valve		Continuity
Connector	Terminal	Connector	Terminal	
F59	122	F122	1	Existed
	106		2	
	91		3	

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

6.DTC CONFIRMATION PROCEDURE

1. Erase DTC.
2. Perform DTC confirmation procedure again. Refer to [EC-648, "DTC Description"](#).

Is the DTC P0403 displayed again?

- YES >> GO TO 7.
NO >> INSPECTION END

7.CHECK EGR VOLUME CONTROL VALVE MOTOR

Refer to [EC-649, "Component Inspection \(EGR Volume Control Valve Motor\)"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace error-detected parts.

Component Inspection (EGR Volume Control Valve Motor)

INFOID:0000000014267960

1.CHECK EGR VOLUME CONTROL VALVE MOTOR

1. Turn ignition switch OFF.
2. Disconnect EGR volume control valve harness connector.
3. Check resistance between EGR volume control valve terminals as follows.

EGR volume control valve		Condition		Resistance (Approx.)
Terminal				
5	6	Temperature	20°C (68°F)	1.41 – 1.69 Ω

Is the inspection result normal?

- YES >> INSPECTION END

P0403 EGR VOLUME CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Replace EGR volume control valve. Refer to [EM-317. "Removal and Installation"](#).

P0409 EGR VOLUME CONTROL VALVE POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0409 EGR VOLUME CONTROL VALVE POSITION SENSOR

DTC Description

INFOID:0000000014267961

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0409	EGR VALVE POSITION SEN CIRC (EGR Sensor "A" circuit)	- A Voltage of EGR volume control valve position sensor remains more than 4.7 V. - A Voltage of EGR volume control valve position sensor remains less than 0.2 V.

POSSIBLE CAUSE

- Harness or connectors (EGR volume control valve control position sensor circuit is open or shorted.)
- EGR volume control valve control position sensor
- EGR volume control valve

FAIL-SAFE

- EGR valve closed
- Stop closed-loop control
- DPF regeneration forbidden
- ASCD deactivation
- Freeshift inhibited

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-651, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267962

1. CHECK EGR VOLUME CONTROL VALVE

Visually check EGR volume control valve for chipping.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

2. CHECK ECM HARNESS CONNECTOR CONNECTIONS

Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair error-detected parts.

3. CHECK EGR VOLUME CONTROL VALVE HARNESS CONNECTOR CONNECTIONS

Check EGR volume control valve harness connector connection.

Is the inspection result normal?

P0409 EGR VOLUME CONTROL VALVE POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

- YES >> GO TO 4.
NO >> Repair error-detected parts.

4. CHECK EGR VOLUME CONTROL VALVE POSITION SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and EGR volume control valve connector.
3. Check EGR volume control valve position sensor circuit for open and short.

ECM		EGR volume control valve		Continuity
Connector	Terminal	Connector	Terminal	
F59	122	F122	1	Existed
	106		3	
	91		2	

Is the inspection result normal?

- YES >> Replace EGR volume control valve. Refer to [EM-317, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

P040A EGR TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P040A EGR TEMPERATURE SENSOR

DTC Description

INFOID:0000000014267963

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P040A	HIGH PRESS EGR TEMP SEN (EGR temperature sensor "A" circuit)	1.DEF 2.DEF 3.DEF 4.DEF 5.DEF 6.DEF	- ECM detect a short or open circuit to battery - EGR temperature is more than 380°C (716°F)

POSSIBLE CAUSE

- Harness or connectors
- EGR temperature sensor
- EGR coolant bypass valve control solenoid valve
- EGR volume control valve
- Electric EGR cooling water pump 1 and 2
- EGR cooler

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P040A can not duplicate.

>> Proceed to [EC-653. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267964

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair error-detected parts.

2.CHECK EGR TEMPERATURE SENSOR HARNESS CONNECTOR CONNECTIONS

Check EGR temperature sensor harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK EGR TEMPERATURE SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect EGR temperature sensor harness connector.
3. Turn ignition switch ON.
4. Check the voltage between EGR temperature sensor harness connector and ground.

+		-	Voltage (Approx.)
EGR temperature sensor			
Connector	Terminal		
F106	2	Ground	5 V

P040A EGR TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Is the inspection result normal?

- YES >> GO TO 5.
NO >> GO TO 4.

4.CHECK EGR TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between ECM harness connector and EGR temperature sensor harness connector.

ECM		EGR temperature sensor		Continuity
Connector	Terminal	Connector	Terminal	
F55	22	F106	2	Existed

4. Also check harness for short to power and short to ground.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

5.CHECK EGR TEMPERATURE SENSOR SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between ECM harness connector and EGR temperature sensor harness connector.

ECM		EGR temperature sensor		Continuity
Connector	Terminal	Connector	Terminal	
F55	38	F106	1	Existed

4. Also check harness for short to power and short to ground.

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Replace error-detected parts.

6.CHECK EGR TEMPERATURE SENSOR

Refer to [EC-655, "Component Inspection \(EGR Temperature Sensor\)"](#).

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Replace error-detected parts.

7.CHECK EGR VOLUME CONTROL VALVE ROUTING CIRCUIT

Refer to [EC-662, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 8.
NO >> Replace error-detected parts.

8.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE ROUTING CIRCUIT

Refer to [EC-747, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 9.
NO >> Replace error-detected parts.

9.CHECK ELECTRIC EGR COOLING WATER PUMP 1 AND 2 ROUTING CIRCUIT

Refer to [EC-750, "Diagnosis Procedure"](#) (Electric EGR cooling water pump 1), [EC-754, "Diagnosis Procedure"](#) (Electric EGR cooling water pump 2).

Is the inspection result normal?

- YES >> GO TO 10.
NO >> Replace error-detected parts.

P040A EGR TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

10. VISUALLY CHECK EGR COOLER

Visually check for EGR cooler.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace error-detected parts.

Component Inspection (EGR Temperature Sensor)

INFOID:0000000014267965

1. CHECK EGR TEMPERATURE SENSOR

1. Turn ignition switch OFF.
2. Disconnect EGR temperature sensor harness connector.
3. Check resistance between EGR temperature sensor terminals as follows.

EGR temperature sensor		Condition		Resistance (Approx.)
Terminal				
2	1	Temperature	20°C (68°F)	23.9301 – 35.8168 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EGR temperature sensor. Refer to [EM-316, "Exploded View"](#).

P0470 EXHAUST GAS PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0470 EXHAUST GAS PRESSURE SENSOR

DTC Description

INFOID:0000000014267966

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0470	TBN UPSTR PRS SEN CIRC (Exhaust pressure sensor "A" circuit)	• 2.DEF • 3.DEF • An excessively low voltage from the sensor is sent to ECM. • An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (Exhaust gas pressure sensor circuit)
- Exhaust gas pressure sensor
- ECM

FAIL-SAFE

- Boost pressure limitation
- EGR valve closed
- Throttle valve opened
- ASCD deactivation
- Freeshift inhibited
- DPF regeneration forbidden

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0470 is displayed with DTC P0651 or P2263, first perform the trouble diagnosis for DTC P0651 or P2263.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-656, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267967

1.CHECK DTC PRIORITY

If DTC P0470 is displayed with DTC P0651 or P2263, first perform the trouble diagnosis for DTC P0651 or P2263.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

P0470 EXHAUST GAS PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

2. CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair error-detected parts.

3. CHECK EXHAUST GAS PRESSURE SENSOR HARNESS CONNECTOR CONNECTIONS

Check exhaust gas pressure sensor harness connector connection.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair error-detected parts.

4. CHECK EXHAUST GAS PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect exhaust gas pressure sensor harness connector.
3. Turn ignition switch ON.
4. Check the power supply of the exhaust gas pressure sensor.

+		-	Voltage (Approx.)
Exhaust gas pressure sensor			
Connector	Terminal		
F126	3	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Perform trouble diagnosis for power supply circuit.

5. CHECK EXHAUST GAS PRESSURE SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check exhaust gas pressure sensor circuit for open and short.

ECM		Exhaust gas pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	124	F126	3	Existed
	108		1	
	93		2	

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

6. CHECK EXHAUST GAS PRESSURE SENSOR

Refer to [EC-658, "Component Inspection \(Exhaust Gas Pressure Sensor\)"](#).

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Replace error-detected parts.

7. DTC CONFIRMATION PROCEDURES

1. Erase DTC.
2. Perform DTC confirmation procedure again. Refer to [EC-656, "DTC Description"](#).

Is the DTC P0470 displayed again?

- YES >> GO TO 8.
NO >> INSPECTION END

P0470 EXHAUST GAS PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

8.CHECK TURBOCHARGER

Check turbocharger. Refer to [EM-327. "Inspection"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace malfunctioning parts.

Component Inspection (Exhaust Gas Pressure Sensor)

INFOID:0000000014267968

1.CHECK EXHAUST GAS PRESSURE SENSOR

1. Disconnect exhaust gas pressure sensor harness connector.
2. Check the resistance between exhaust gas pressure sensor terminals as follows.

Exhaust gas pressure sensor		Resistance (Approx.)
Terminal		
2	1	more than 100 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace exhaust gas pressure sensor. Refer to [EM-322. "Removal and Installation"](#).

P0471 EXHAUST PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0471 EXHAUST PRESSURE SENSOR

DTC Description

INFOID:0000000014267969

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0471	PRS UPSTR OF TBN (Exhaust Pressure Sensor "A" Circuit Range/Performance) • 1.DEF • 2.DEF	• Difference between barometric pressure and exhaust pressure while engine stopped. • Difference between barometric pressure and exhaust pressure is excessively low while engine is running.

POSSIBLE CAUSE

- Harness or connectors (Exhaust gas pressure sensor circuit)
- Exhaust gas pressure sensor
- ECM

FAIL-SAFE

- Boost pressure limitation
- EGR valve closed
- Throttle valve opened
- ASCD deactivation
- Freeshift inhibited
- DPF regeneration forbidden
- Torque limitation

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0471 is displayed with DTC P0335, P0470 or P2226, first perform the trouble diagnosis for DTC P0335, P0470 or P2226.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0471 can not duplicate.

>> Proceed to [EC-659, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267970

1.CHECK DTC PRIORITY

If DTC P0471 is displayed with DTC P0335, P0470 or P2226, first perform the trouble diagnosis for DTC P0335, P0470 or P2226.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

P0471 EXHAUST PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Repair error-detected parts.

3.CHECK EXHAUST GAS PRESSURE SENSOR HARNESS CONNECTOR CONNECTIONS

Check exhaust gas pressure sensor harness connector connection.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair error-detected parts.

4.CHECK EXHAUST GAS PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect exhaust gas pressure sensor harness connector.
2. Turn ignition switch ON.
3. Check the power supply of the exhaust gas pressure sensor.

+		-	Voltage (Approx.)
Exhaust gas pressure sensor			
Connector	Terminal		
F126	3	Ground	5 V

Is the inspection result normal?

YES >> GO TO 5.

NO >> Perform trouble diagnosis for power supply circuit.

5.CHECK EXHAUST GAS PRESSURE SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check exhaust gas pressure sensor circuit for open and short.

ECM		Exhaust gas pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	124	F126	3	Existed
	108		1	
	93		2	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK EXHAUST GAS PRESSURE SENSOR

Refer to [EC-658, "Component Inspection \(Exhaust Gas Pressure Sensor\)"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace error-detected parts.

7.DTC CONFIRMATION PROCEDURES

1. Erase DTC.
2. Perform DTC confirmation procedure again. Refer to [EC-659, "DTC Description"](#).

Is the DTC P0471 displayed again?

YES >> GO TO 8.

NO >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

8.CHECK TURBOCHARGER

Check turbocharger. Refer to [EM-327, "Inspection"](#).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

NO >> Repair or replace malfunctioning parts.

P0471 EXHAUST PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Component Inspection (Exhaust Gas Pressure Sensor)

INFOID:0000000014267971

1.CHECK EXHAUST GAS PRESSURE SENSOR

1. Disconnect exhaust gas pressure sensor harness connector.
2. Check the resistance between exhaust gas pressure sensor terminals as follows.

Exhaust gas pressure sensor		Resistance (Approx.)
Terminal		
2	1	more than 100 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace exhaust gas pressure sensor. Refer to [EM-322. "Removal and Installation"](#).

P0487 EGR VOLUME CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0487 EGR VOLUME CONTROL VALVE

DTC Description

INFOID:0000000014267972

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0487	EGR VLV CMD CIRC (EGR Throttle Control Circuit "A"/Open)	ECM detects abnormally closed position of EGR volume control valve.

POSSIBLE CAUSE

- Harness or connectors
- EGR volume control valve
- EGR valve position sensor

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- Stop closed-loop control
- Freeshift inhibited
- DPF regeneration forbidden
- ASCD deactivation

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-662, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267973

1.CHECK EGR VOLUME CONTROL VALVE

Visually check EGR volume control valve for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK ECM HARNESS CONNECTOR CONNECTIONS

Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK EGR VOLUME CONTROL VALVE HARNESS CONNECTOR CONNECTIONS

Check EGR volume control valve harness connector connection.

Is the inspection result normal?

YES >> GO TO 4.

P0487 EGR VOLUME CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Repair error-detected parts.

4.CHECK EGR VOLUME CONTROL VALVE CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and EGR volume control valve harness connector.
3. Check EGR volume control valve circuit for open and short.

ECM		EGR volume control valve		Continuity
Connector	Terminal	Connector	Terminal	
F55	13	F122	6	Existed
	29		5	
F59	91		3	
	122		1	
	106		2	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.DTC CONFIRMATION PROCEDURE

1. Erase DTC.
2. Perform DTC confirmation procedure again. Refer to [EC-662, "DTC Description"](#).

Is the DTC P0487 displayed again?

YES >> GO TO 6.

NO >> INSPECTION END

6.CHECK EGR VOLUME CONTROL VALVE MOTOR

Refer to [EC-663, "Component Inspection \(EGR Volume Control Valve Motor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace error-detected parts.

Component Inspection (EGR Volume Control Valve Motor)

INFOID:0000000014267974

1.CHECK EGR VOLUME CONTROL VALVE MOTOR

1. Turn ignition switch OFF.
2. Disconnect EGR volume control valve harness connector.
3. Check resistance between EGR volume control valve terminals as follows.

EGR volume control valve		Condition		Resistance (Approx.)
Terminal				
5	6	Temperature	20°C (68°F)	1.41 – 1.69 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EGR volume control valve. Refer to [EM-317, "Removal and Installation"](#).

P0488 EGR SYSTEM

DTC Description

INFOID:0000000014267975

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0488	EGR VALVE POSITION CNTRL (EGR Throttle Control Circuit "A" Range/ Performance) • 5.DEF • 6.DEF	ECM detects high pressure EGR volume control valve regulation error.

POSSIBLE CAUSE

- Harness or connectors
- EGR volume control valve
- EGR volume control valve position sensor

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- Freeshift inhibited
- ASCD deactivation
- DPF regeneration forbidden

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 3 seconds.
2. Start the engine and warm it up to the normal operating temperature.
3. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-664. "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267976

1. CHECK EGR VOLUME CONTROL VALVE

Visually check EGR volume control valve for chipping.

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Repair or replace error-detected parts.

2. CHECK ECM HARNESS CONNECTOR CONNECTIONS

Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair error-detected parts.

3. CHECK EGR VOLUME CONTROL VALVE HARNESS CONNECTOR CONNECTIONS

Check EGR volume control valve harness connector connection.

Is the inspection result normal?

P0488 EGR SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

- YES >> GO TO 4.
NO >> Repair error-detected parts.

4.CHECK EGR VOLUME CONTROL VALVE CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and EGR volume control valve harness connector.
3. Check EGR volume control valve circuit for open and short.

ECM		EGR volume control valve		Continuity
Connector	Terminal	Connector	Terminal	
F55	13	F122	6	Existed
	29		5	
F59	91		3	
	122		1	
	106		2	

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5.DTC CONFIRMATION PROCEDURE

1. Erase DTC.
2. Perform DTC confirmation procedure again. Refer to [EC-664, "DTC Description"](#).

Is the DTC P0488 displayed again?

- YES >> GO TO 6.
NO >> INSPECTION END

6.CHECK EGR VOLUME CONTROL VALVE MOTOR

Refer to [EC-665, "Component Inspection \(EGR Volume Control Valve Motor\)"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace error-detected parts.

Component Inspection (EGR Volume Control Valve Motor)

INFOID:0000000014267977

1.CHECK EGR VOLUME CONTROL VALVE MOTOR

1. Turn ignition switch OFF.
2. Disconnect EGR volume control valve harness connector.
3. Check resistance between EGR volume control valve terminals as follows.

EGR volume control valve		Condition		Resistance (Approx.)
Terminal				
5	6	Temperature	20°C (68°F)	1.41 – 1.69 Ω

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace EGR volume control valve. Refer to [EM-317, "Removal and Installation"](#).

P0500 VEHICLE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0500 VEHICLE SPEED SIGNAL

DTC Logic

INFOID:0000000014267978

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0500	VEHICLE SPEED INFORMATION (Vehicle speed sensor "A") • 1.DEF • 2.DEF • 3.DEF	Vehicle speed signal is more than the specified range for 1 second or more while running the engine.

POSSIBLE CAUSE

- Harness or connectors (Vehicle speed sensor circuit is open or shorted)
- Vehicle speed sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0500 can not duplicate.

>> Proceed to [EC-666, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267979

1.CHECK CAN COMMUNICATION LINE

Check CAN communication line. Refer to [LAN-39, "CAN COMMUNICATION SYSTEM : CAN System Specification Chart"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform the trouble diagnosis for CAN communication system. Refer to [LAN-24, "Trouble Diagnosis Flow Chart"](#).

2.CHECK DTC WITH "ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)"

Check the self-diagnosis result of ABS actuator and electric unit (control unit) with CONSULT. Refer to [BRC-25, "CONSULT Function"](#) (Without VDC), [BRC-153, "CONSULT Function"](#) (With VDC).

Is any DTC detected?

YES >> Perform trouble diagnosis of detected DTC.

NO >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

P0504 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0504 STOP LAMP SWITCH

DTC Description

INFOID:0000000014267980

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0504	BRAKE SWITCH SIGNAL CONSISTENCY (Brake switch "A"/"B" correlation) • 1.DEF • 2.DEF • 5.DEF	ECM detects ON signals sent from the stop lamp switch and the brake pedal position switch at the same time.

POSSIBLE CAUSE

- Harness or connectors
(The stop lamp switch circuit is open or shorted.)
(The brake pedal position switch circuit is open or shorted.)
- Stop lamp switch
- Brake pedal position switch
- Incorrect stop lamp switch installation
- Incorrect brake pedal position switch installation

FAIL-SAFE

- No coherency between wiring and CAN information for brake pedal
- ASCD deactivation

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0504 is displayed with DTC P0571, P0703 or Uxxxx, first perform the trouble diagnosis for DTC P0571, P0703 or Uxxxx.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0504 can not duplicate.

>> Proceed to [EC-667, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267981

1.CHECK DTC PRIORITY

If DTC P0504 is displayed with DTC P0571, P0703 or Uxxxx, first perform the trouble diagnosis for DTC P0571, P0703 or Uxxxx.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH

Check the stop lamp switch. Refer to [BRC-85, "Component Inspection \(Stop lamp Switch\)"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK BRAKE PEDAL POSITION SWITCH

P0504 STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Check the brake pedal position switch. Refer to [EC-668, "Component Inspection \(Brake Pedal Position Switch\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (Brake Pedal Position Switch)

INFOID:0000000014267982

1. CHECK BRAKE PEDAL POSITION SWITCH-1

1. Turn ignition switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Check the continuity between brake pedal position switch terminals as per the following conditions.

Brake pedal position switch Terminals		Condition		Continuity
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2. CHECK BRAKE PEDAL POSITION SWITCH-2

1. Adjust brake pedal position switch installation. Refer to [BR-10, "Inspection"](#).
2. Check the continuity between brake pedal position switch terminals as per the following conditions.

Brake pedal position switch Terminals		Condition		Continuity
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20, "Removal and Installation"](#).

P0525 ASCD SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0525 ASCD SYSTEM

DTC Description

INFOID:0000000014267983

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0525	CRUISE CONTROL DATA MONITORING (Cruise control servo control circuit range/ performance)	Correlation between two signals is inconsistency.

POSSIBLE CAUSE

ECM

FAIL-SAFE

ASCD deactivation

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0525 can not duplicate.

>> Proceed to [EC-669, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267984

1.REPLACE ECM

1. Turn ignition switch OFF and wait at least 1 minute.
2. Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

>> INSPECTION END

P0530 REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0530 REFRIGERANT PRESSURE SENSOR

DTC Description

INFOID:0000000014267985

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0530	RFRG TEMP PRESS SEN VOLT (A/C refrigerant pressure sensor "A" circuit)	- Refrigerant pressure sensor signal voltage remains more than 4.75 V for 2 seconds or more. - Refrigerant pressure sensor signal voltage remains less than 0.1 V for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connectors (Refrigerant pressure sensor circuit is open or shorted.)
- Refrigerant pressure sensor

FAIL-SAFE

A/C deactivation

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 2 seconds.
- Check DTC.

Is DTC detected?

YES >> Proceed to [EC-670, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267986

1. CHECK REFRIGERANT PRESSURE SENSOR POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect refrigerant pressure sensor harness connector.
- Turn ignition switch ON.
- Check the voltage between refrigerant pressure sensor connector and ground.

+		-	Voltage (Approx.)
Refrigerant pressure sensor			
Connector	Terminal		
E49	3	Ground	5.0 V

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

2. CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

- Turn ignition switch OFF and wait at least 1 minute.
- Disconnect ECM harness connector.
- Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

P0530 REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Refrigerant pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E49	1	F55	56	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

Refrigerant pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E49	2	F55	17	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4.CHECK INTERMITTENT INCIDENT

Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace refrigerant pressure sensor. Refer to [HAC-120. "Removal and Installation"](#) (With automatic air conditioning), [HAC-210. "Removal and Installation"](#) (With manual A/C FULL-ELC), or [HAC-273. "Removal and Installation"](#) (With manual A/C SEMI-ELC).

NO >> Repair or replace error-detected parts.

P0544 EGT SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0544 EGT SENSOR 1

DTC Description

INFOID:0000000014267987

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0544	TBN UPSTR TEMP SEN CIRC (Exhaust gas temperature sensor circuit bank 1 sensor 1)	• 1.DEF • 2.DEF	• An excessively low voltage from Exhaust Gas Temperature sensor is sent to ECM for 15 seconds or more. • An excessively high voltage from Exhaust Gas Temperature sensor is sent to ECM for 1 second or more.

POSSIBLE CAUSE

- Harness or connectors (Exhaust gas temperature sensor 1 circuit is open or shorted.)
- Exhaust gas temperature sensor 1

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden
- ASCD deactivation
- Freeshift inhibited
- After sales and factory routines inhibited

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0544 can not duplicate.

>> Proceed to [EC-672. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267988

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair error-detected parts.

2.CHECK EXHAUST GAS TEMPERATURE SENSOR 1 HARNESS CONNECTOR CONNECTIONS

Check exhaust gas temperature sensor 1 control valve harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK EXHAUST GAS TEMPERATURE SENSOR 1 CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and exhaust gas temperature sensor 1 harness connector.
3. Check exhaust gas temperature sensor 1 circuit for open and short.

ECM		EGT sensor 1		Continuity
Connector	Terminal	Connector	Terminal	
F55	37	F103	1	Existed
	21		2	

P0544 EGT SENSOR 1

[YS23DDT/YS23DDTT (M9T)]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Repair or replace error-detected parts.

4.CHECK EXHAUST GAS TEMPERATURE SENSOR 1

Refer to [EC-728. "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-45. "Intermittent Incident"](#).
- NO >> Replace error-detected parts.

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P0560 BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0560 BATTERY VOLTAGE

DTC Description

INFOID:0000000014267989

DTC DETECTION LOGIC

NOTE:

If this DTC is detected, first confirm self-diagnostic result in IPDM E/R.

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0560	COMPUTER SUPPLY VOLTAGE (System Voltage)	• 1.DEF • 2.DEF • 3.DEF	• A battery power supply voltage remains more than 17 V or more for 2.5 seconds or more. • A battery power supply voltage remains less than 9 V or more for 10 seconds or more.

POSSIBLE CAUSE

- Harness or connectors (ECM power supply circuit is open or shorted.)
- Battery
- Battery terminal
- Alternator
- IPDM E/R

FAIL-SAFE

- Mechanically activated throttle limp-home
- Torque limitation
- VDC deactivation
- Glow plug circuit deactivation
- Inhibition of idle speed control
- Factory and after sales routines inhibited
- Freeshift Inhibited
- ASCD deactivation
- Wastegate cutoff
- A/T in limp home
- Deactivation of the variable valve timing control

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0560 is displayed with IPDM E/R related DTC, first perform the trouble diagnosis for IPDM E/R related DTC.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [PCS-16, "CONSULT Function \(IPDM E/R\)"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 10 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-675, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

P0560 BATTERY VOLTAGE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Diagnosis Procedure

INFOID:0000000014267990

1.CHECK DTC PRIORITY

If DTC P0560 is displayed with IPDM E/R related DTC, first perform the trouble diagnosis for IPDM E/R related DTC.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [PCS-16, "CONSULT Function \(IPDM E/R\)"](#).

NO >> GO TO 2.

2.CHECK BATTERY VOLTAGE

1. Turn ignition switch ON.

2. Check battery voltage.

Voltage: Above 11 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Recharge the battery.

3.CHECK BATTERY TERMINALS

1. Turn ignition switch OFF.

2. Check battery terminals condition.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair the battery terminals.

4.CHECK BATTERY AND ALTERNATOR AND CHARGING CIRCUIT

Check that the proper type of battery and type of alternator are installed.

Refer to, [PG-140, "How to Handle Battery"](#) and [CHG-41, "Inspection Procedure"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace with a proper one.

P0564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0564 ASCD STEERING SWITCH

DTC Description

INFOID:0000000014267991

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0564	SL LMTR/CC FNC (Cruise Control Multi-Function Input "A" Circuit)	1.DEF 2.DEF - CO.1	- An ASCD steering switch signal voltage is out of the specified range. - ASCD steering switch signal circuit is open. - ASCD steering switch signal circuit is short to battery. - ECM cannot detect the ASCD steering switch signal.

POSSIBLE CAUSE

- Harness or connectors (The switch circuit is open or shorted.)
- ASCD steering switch

FAIL-SAFE

ASCD deactivation

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 10 seconds.
- Press ACCEL/RES switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press COAST/SET switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
- Check DTC.

Is DTC detected?

YES >> Proceed to [EC-676, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267992

1.CHECK ASCD STEERING SWITCH CIRCUIT

- Turn ignition switch OFF.
- Disconnect combination switch (spiral cable) harness connector.
- Turn ignition switch ON.
- Check the voltage between ECM harness connector terminals as follows.

ECM			Condition	Voltage (Approx.)
Connector	+	-		
	Terminal			
E12	148	140	ASCD main switch: Pressed	0 V
			CANCEL switch: Pressed	1.0 V
			COAST/SET switch: Pressed	2.0 V
			ACCEL/RES switch: Pressed	3.0 V
			All ASCD steering switches: Released	4.0 V

P0564 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 2.

2.CHECK ASCD STEERING SWITCH GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF and wait at least 1 minute.
2. Disconnect ECM harness connector.
3. Check the continuity between combination switch (spiral cable) harness connector and ECM harness connector.

Combination switch (spiral cable)		ECM		Continuity
Connector	Terminal	Connector	Terminal	
M73	7	E12	140	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between combination switch (spiral cable) harness connector and ECM harness connector.

Combination switch (spiral cable)		ECM		Continuity
Connector	Terminal	Connector	Terminal	
M73	10	E12	148	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4.CHECK ASCD STEERING SWITCH

Refer to [EC-677, "Component Inspection \(ASCD Steering Switch\)"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace ASCD steering switch. Refer to [ST-21, "WITH AIR BAG : Exploded View"](#).

Component Inspection (ASCD Steering Switch)

INFOID:0000000014267993

1.CHECK ASCD STEERING SWITCH

1. Disconnect combination switch (spiral cable) harness connector.
2. Check the continuity between combination switch (spiral cable) harness connector terminals under following conditions.

Combination switch			Condition	Resistance (Approx.)
Connector	Terminals			
M149	15	18	ASCD main switch: Pressed	0 Ω
			CANCEL switch: Pressed	250 Ω
			COAST/SET switch: Pressed	660 Ω
			ACCEL/RES switch: Pressed	1,480 Ω
			All ASCD steering switches: Released	4,000 Ω

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace ASCD steering switch. Refer to [ST-21, "WITH AIR BAG : Exploded View"](#).

P0571 BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0571 BRAKE SWITCH

DTC Description

INFOID:0000000014267994

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0571	BRAKE SWITCH CIRCUIT (Brake Switch "A" Circuit)	1.DEF	A brake switch signal is not sent to ECM for extremely long time while the vehicle is traveling.

POSSIBLE CAUSE

- Harness and connectors
- Brake pedal position switch

FAIL-SAFE

ASCD deactivation

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0571 is displayed with DTC UXXXX and P0703, first perform the trouble diagnosis for DTCUXXXX and P0703.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0571 can not duplicate.

>> Proceed to [EC-678, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014267995

1.CHECK DTC PRIORITY

If DTC P0571 is displayed with DTC UXXXX and P0703, first perform the trouble diagnosis for DTCUXXXX and P0703.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK BRAKE PEDAL POSITION SWITCH SIGNAL

1. Turn ignition switch ON.
2. Check voltage between ECM harness connector and ground.

+		-	Condition		Voltage
ECM					
Connector	Terminal				
E12	133	Ground	Brake pedal	Fully released	Battery voltage
				Slightly depressed	Approx. 0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

P0571 BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

3.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Turn ignition switch ON.
4. Check voltage between brake pedal position switch harness connector and ground.

+		-	Voltage
Brake pedal position switch			
Connector	Terminal		
E37	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK BRAKE PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between brake pedal position switch harness connector and ECM harness connector.

Brake pedal position switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E37	2	E12	133	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK BRAKE PEDAL POSITION SWITCH

Check brake pedal position switch. Refer to [EC-679, "Component Inspection \(Brake Pedal Position Switch\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (Brake Pedal Position Switch)

INFOID:0000000014267996

1.CHECK BRAKE PEDAL POSITION SWITCH

1. Adjust brake pedal position switch installation.
2. Turn ignition switch OFF.
3. Disconnect brake pedal position switch harness connector.
4. Check the continuity between brake pedal position switch terminals under the following conditions.

Brake pedal position switch		Condition		Continuity
Terminal				
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20, "Removal and Installation"](#).

P0575 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0575 ASCD STEERING SWITCH

DTC Description

INFOID:0000000014267997

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0575	CC/SL LMTR BUTTONS (Cruise control input circuit)	DEF	ECM receives incoherent ASCD MAIN switch signal.

POSSIBLE CAUSE

ASCD steering switch

FAIL-SAFE

ASCD deactivation

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-680, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014267998

1.CHECK ASCD STEERING SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect combination switch (spiral cable) harness connector.
3. Turn ignition switch ON.
4. Check the voltage between ECM harness connector terminals as follows.

ECM			Condition	Voltage (Approx.)
Connector	+	-		
	Terminal			
E12	148	140	ASCD main switch: Pressed	0 V
			CANCEL switch: Pressed	1.0 V
			COAST/SET switch: Pressed	2.0 V
			ACCEL/RES switch: Pressed	3.0 V
			All ASCD steering switches: Released	4.0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2.CHECK ASCD STEERING SWITCH GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF and wait at least 1 minute.
2. Disconnect ECM harness connector.

P0575 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

3. Check the continuity between combination switch (spiral cable) harness connector and ECM harness connector.

Combination switch (spiral cable)		ECM		Continuity
Connector	Terminal	Connector	Terminal	
M73	7	E12	140	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between combination switch (spiral cable) harness connector and ECM harness connector.

Combination switch (spiral cable)		ECM		Continuity
Connector	Terminal	Connector	Terminal	
M73	10	E12	148	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

4.CHECK ASCD STEERING SWITCH

Refer to [EC-677, "Component Inspection \(ASCD Steering Switch\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD steering switch. Refer to [ST-21, "WITH AIR BAG : Exploded View"](#).

P0606 ECM

DTC Description

INFOID:0000000014267999

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0606	COMPUTER (Control module processor)	1.DEF	Internal error.

POSSIBLE CAUSE

ECM

FAIL-SAFE

- Freeshift inhibited
- ASCD deactivation

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P0606 can not duplicate.

>> Proceed to [EC-682, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268000

1.INSPECTION START

1. Turn ignition switch ON.
2. Erase DTC.
3. Turn ignition switch OFF and wait for 20 seconds.
4. Turn ignition switch ON and perform the self-diagnosis.

Is the DTC P0606 displayed again?

- YES >> GO TO 2.
NO >> INSPECTION END

2.REPLACE ECM

Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

>> INSPECTION END

P060A ECM

DTC Description

INFOID:0000000014268001

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P060A	COMPUTER (Internal control module monitoring processor performance) • 1.DEF • 2.DEF • 3.DEF • 4.DEF	Internal monitoring processor error.

POSSIBLE CAUSE
ECM

FAIL-SAFE

- Reset ECM
- VDC deactivation

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-683, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268002

1.INSPECTION START

1. Turn ignition switch ON.
2. Erase DTC.
3. Turn ignition switch OFF and wait for 1 minute.
4. Turn ignition switch ON and wait at least 1 second.
5. Perform the self-diagnosis.

Is the DTC P060A displayed again?

- YES >> GO TO 2.
 NO >> INSPECTION END

2.REPLACE ECM

Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

>> INSPECTION END

P060B ECM

DTC Description

INFOID:0000000014268003

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
	CONSULT	CONSULT	
P060B	COMPUTER (Internal control module A/D processing performance)	1.DEF	ECM internal malfunction

POSSIBLE CAUSE

ECM

FAIL-SAFE

- Engine speed limitation
- ASCD deactivation
- Freeshift inhibited

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-684, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268004

1.INSPECTION START

1. Turn ignition switch ON.
2. Erase DTC.
3. Turn ignition switch OFF and wait for 20 seconds.
4. Turn ignition switch ON and perform the self-diagnosis.

Is the DTC P060B displayed again?

- YES >> GO TO 2.
 NO >> INSPECTION END

2.REPLACE ECM

Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

>> INSPECTION END

P061A ECM

DTC Description

INFOID:0000000014268005

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P061A	COMP (Internal control module torque performance)	• 1.DEF • 2.DEF • 3.DEF • 4.DEF • 5.DEF • 6.DEF ECM detects internal error.

POSSIBLE CAUSE

ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P061A can not duplicate.

>> Proceed to [EC-685, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268006

1.INSPECTION START

1. Turn ignition switch ON.
2. Erase DTC.
3. Turn ignition switch OFF and wait for 1 minute.
4. Turn ignition switch ON and wait at least 1 second.
5. Perform the self-diagnosis.

Is the DTC P061A displayed again?

YES >> GO TO 2.

NO >> INSPECTION END

2.REPLACE ECM

Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

>> INSPECTION END

P062B ECM

DTC Description

INFOID:0000000014268007

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P062B	COMPUTER (Internal control module fuel injector control performance) • 1.DEF • 2.DEF • 3.DEF • 4.DEF • 5.DEF	ECM calculation function is malfunctioning.

POSSIBLE CAUSE

ECM

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden
- Increased idle speed
- ASCD deactivation
- Freeshift inhibited
- VDC deactivation and A/T in limp home mode

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P062B is displayed with DTC P0201, P0202, P0203 or P0204, first perform the trouble diagnosis for DTC P0201, P0202, P0203 or P0204.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 2 seconds.
2. Check DTC.

Is DTC detected?

YES >> [EC-686, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268008

1.CHECK DTC PRIORITY

If DTC P062B is displayed with DTC P0201, P0202, P0203 or P0204, first perform the trouble diagnosis for DTC P0201, P0202, P0203 or P0204.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK FUEL INJECTOR

1. Check fuel injector. Refer to [EC-621, "Component Inspection \(Fuel Injector\)"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace error-detected parts.

3.CHECK ECM HARNESS CONNECTOR STATE

1. Turn ignition switch OFF.

2. Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair error-detected parts.

4.REPLACE ECM

Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

>> INSPECTION END

A

EC

C

D

E

F

G

H

I

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L

M

N

O

P

P0638 ELECTRIC THROTTLE CONTROL ACTUATOR FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0638 ELECTRIC THROTTLE CONTROL ACTUATOR FUNCTION

DTC Description

INFOID:0000000014268009

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P0638	Inlet air flap position CTRL (Throttle Actuator Control Range/Performance Bank 1)	• 1.DEF • 2.DEF • 3.DEF • 4.DEF	• Throttle valve regulation error • ECM detects an incorrect closed position of the throttle valve. • ECM detects an incorrect fully open position of the throttle valve.

POSSIBLE CAUSE

- Electric throttle control actuator
- Throttle valve stuck
- Throttle chamber clogged

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden
- Compression test routine inhibited
- Airflow regulation cutoff
- ASCD deactivation with dashboard message
- Freeshift inhibited

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0638 is displayed with DTC P0120 or P2100, first perform the trouble diagnosis for DTC P0120 or P2100.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 3 seconds.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-688, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268010

1.CHECK DTC PRIORITY

If DTC P0638 is displayed with DTC P0120 or P2100, first perform the trouble diagnosis for DTC P0120 or P2100.

Is applicable DTC detected?

P0638 ELECTRIC THROTTLE CONTROL ACTUATOR FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR HARNESS CONNECTOR CONNECTIONS

Check electric throttle control actuator harness connector connection.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair error-detected parts.

4.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector and electric throttle control actuator harness connector.
2. Check electric throttle control actuator circuit for open and short.

ECM		Electric throttle control actuator		Continuity
Connector	Terminal	Connector	Terminal	
F59	89	F120	2	Existed
	90		3	
	120		1	
F55	27		5	
	11		6	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.DTC CONFIRMATION PROCEDURES

1. Erase DTC.
2. Perform DTC confirmation procedure again. Refer to [EC-688, "DTC Description"](#).

Is the DTC P0638 displayed again?

YES >> GO TO 6.

NO >> INSPECTION END

6.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR

Perform [EC-613, "Component Inspection \(Throttle Position Sensor\)"](#) (throttle position sensor), [EC-730, "Diagnosis Procedure"](#) (throttle control motor).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 7.

7.REPLACE ELECTRIC THROTTLE CONTROL ACTUATOR

1. Replace electric throttle control actuator.
2. Perform [EC-558, "Description"](#).

>> INSPECTION END

P0641 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0641 SENSOR POWER SUPPLY

DTC Description

INFOID:0000000014268011

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
	SEN SUPPLY N-1 VOL (Sensor reference voltage "A" circuit/open)	• 1.DEF • 2.DEF	
P0641			• A voltage of sensor power supply is 5.43 V or more. • A voltage of sensor power supply is 4.56 V or less.

POSSIBLE CAUSE

- Harness or connectors (The sensor power supply 1 circuit is shorted.)
- EGR volume control valve position sensor
- Throttle position sensor
- DPF differential pressure sensor
- TC boost sensor
- Camshaft position sensor
- APP sensor 1
- ECM
- MAF sensor
- G sensor
- Crankshaft position sensor

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden
- Limited boost pressure regulation
- Torque limitation
- ASCD deactivation
- Boost pressure limitation

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-690. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268012

1.CHECK SENSOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector and ground.

P0641 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

+		-	Voltage (Approx.)
ECM			
Connectors	Terminal		
E12	151	Ground	5 V
F59	115		
	118		
	120		
	122		
	123		
F55	50		
	59		
	43		

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK SENSOR POWER SUPPLY CIRCUITS

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and following terminals harness connector.
3. Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor		
Connector	Terminal	Name	Connector	Terminal
E12	151	Accelerator pedal position sensor (sensor 1)	E5	2
F59	115	Camshaft position sensor	F119	1
	118	DPF differential pressure sensor	E100	1
	120	Throttle position sensor	F120	1
	122	EGR volume control valve position sensor	F122	1
	123	MAF sensor	F121	3
F55	50	Turbocharger boost sensor	F110	1
	59	G sensor	M95	3
	43	Crankshaft position sensor	F125	3

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair short to ground or short to power in harness or connectors.

3.CHECK COMPONENTS

Check the following.

- Accelerator pedal position sensor (sensor 1). Proceed to [EC-735, "Component Inspection \(Accelerator Pedal Position Sensor\)"](#).
- Camshaft position sensor. Proceed to [EC-642, "Component Inspection \(Camshaft Position Sensor\)"](#).
- DPF differential pressure sensor. Proceed to [EC-744, "Diagnosis Procedure"](#).
- Throttle position sensor. Proceed to [EC-613, "Component Inspection \(Throttle Position Sensor\)"](#).
- EGR volume control valve position sensor. Proceed to [EC-651, "Diagnosis Procedure"](#).
- MAF sensor. Proceed to [EC-599, "Diagnosis Procedure"](#).
- Turbocharger boost sensor. Proceed to [EC-606, "Component Inspection \(Turbocharger Boost Sensor\)"](#).
- G sensor. Proceed to [TM-252, "Diagnosis Procedure"](#).
- Crankshaft position sensor. Proceed to [EC-640, "Component Inspection \(Crankshaft Position Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

P0641 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Replace malfunctioning component.

P0651 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0651 SENSOR POWER SUPPLY

DTC Description

INFOID:0000000014268013

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0651	SEN SUPPLY N-2 VOL (Sensor Reference Voltage "B" Circuit/ Open) • 1.DEF • 2.DEF	• A voltage of sensor power supply is 5.43 V or more. • A voltage of sensor power supply is 4.56 V or less.

POSSIBLE CAUSE

- Harness or connectors (The sensor power supply 2 circuit is shorted.)
- Refrigerant pressure sensor
- Exhaust gas pressure sensor
- Accelerator pedal position sensor 2
- ECM

FAIL-SAFE

- A/C deactivation
- Torque limitation
- ASCD deactivation with dashboard message
- Freeshift inhibited
- After sales routines forbidden
- FAN 2 activation

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-693, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268014

1.CHECK SENSOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector and ground.

+		−	Voltage (Approx.)
ECM			
Connectors	Terminal		
E12	150	Ground	5.0 V
F59	124		
F55	49		

Is the inspection result normal?

P0651 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> INSPECTION END
NO >> GO TO 2.

2.CHECK SENSOR POWER SUPPLY CIRCUITS

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and following terminals harness connector.
3. Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor		
Connector	Terminal	Name	Connector	Terminal
E12	150	Accelerator pedal position sensor 2	E5	1
F55	49	Refrigerant pressure sensor	E49	3
F59	124	Exhaust gas pressure sensor	F126	3

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair short to ground or short to power in harness or connectors.

3.CHECK COMPONENTS

Check the following.

- Accelerator pedal position sensor. Refer to [EC-630, "Component Inspection \(Accelerator Pedal Position Sensor\)"](#).
- Refrigerant pressure sensor. Proceed to [EC-670, "Diagnosis Procedure"](#).
- Exhaust gas pressure sensor. Proceed to [EC-658, "Component Inspection \(Exhaust Gas Pressure Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace malfunctioning component.

P0657 ECM RELAY

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0657 ECM RELAY

DTC Description

INFOID:0000000014268015

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
	MAIN RELAY CONTROL CIRCUIT (Actuator supply voltage "A" circuit/open)	CC.0	
P0657			• ECM detects ECM relay control circuit is short to ground. (ECM relay always ON)

POSSIBLE CAUSE

- Harness or connectors (ECM relay control circuit is shorted.)
- ECM relay

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0657 is displayed with IPDM/ER related DTC, first perform the trouble diagnosis for IPDM/ER related DTC.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [PCS-25, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and ON and wait at least 1 second.
2. Turn ignition switch OFF and wait at least 1 minute.
3. Turn ignition switch ON and wait at least 1 second.
4. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-695, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268016

1.CHECK DTC PRIORITY

If DTC P0657 is displayed with IPDM/ER related DTC, first perform the trouble diagnosis for IPDM/ER related DTC.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [PCS-25, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK ECM RELAY CONTROL SIGNAL

1. Turn ignition switch OFF.
2. Check the voltage between ECM harness connector and ground.

P0657 ECM RELAY

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

+		-	Voltage
ECM			
Connector	Terminal		
F59	65	Ground	Battery voltage

3. Turn ignition switch ON.
4. Check the voltage between ECM harness connector and ground.

+		-	Voltage (Approx.)
ECM			
Connector	Terminal		
F59	65	Ground	0 V

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3. CHECK ECM RELAY CONTROL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between ECM harness connector and IPDM E/R harness connector.

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F59	65	E121	31	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

- YES >> Check IPDM E/R.
NO >> Repair or replace error-detected parts.

4. CHECK ECM POWER SUPPLY CIRCUIT

Refer to [EC-570, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> Replace IPDM E/R (ECM relay malfunction). Refer to [PCS-40, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

P0697 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0697 SENSOR POWER SUPPLY

DTC Description

INFOID:0000000014268017

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
	SEN SUPPLY N-3 VOL (Sensor reference voltage "C" circuit/open)	• 1.DEF • 2.DEF	
P0697			• A voltage of sensor power supply is more than 5.43 V. • A voltage of sensor power supply is less than 4.56 V.

POSSIBLE CAUSE

- Harness or connectors (Fuel rail pressure sensor circuit is shorted.)
- Fuel rail pressure sensor
- ECM

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- Rail pressure limitation
- DPF regeneration forbidden
- After sales routines forbidden
- ASCD deactivation
- Freeshift inhibited
- VDC deactivation

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-697, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268018

1.CHECK SENSOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector and ground.

+		-	Voltage (Approx.)
ECM			
Connectors	Terminal		
F59	116	Ground	5 V

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 2.

P0697 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

2.CHECK SENSOR POWER SUPPLY CIRCUITS

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and following terminals harness connector.
3. Check harness for short to power and short to ground, between the following terminals.

ECM		Fuel rail pressure sensor	
Connector	Terminal	Connector	Terminal
F59	116	F123	3

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair short to ground or short to power in harness or connectors.

3.CHECK COMPONENTS

Check the following.

- Fuel rail pressure sensor. Proceed to [EC-618, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning component.

P0703 BRAKE SWITCH B

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0703 BRAKE SWITCH B

DTC Description

INFOID:0000000014268019

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0703	BRAKE PEDAL CONTACT CIRCUIT (Brake Switch "B" Circuit) 1.DEF	A brake switch signal is not sent to ECM for extremely long time while the vehicle is traveling.

POSSIBLE CAUSE

- Harness and connectors
- Brake pedal position switch

FAIL-SAFE

- Engine speed limitation
- No coherency between wiring and CAN information for brake pedal

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0703 is displayed with DTC P0571, first perform the trouble diagnosis for DTC P0571.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-678, "Diagnosis Procedure"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and let it idle for at least 30 seconds.
2. Depress the brake pedal more than 10 times.
3. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-699, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-42, "How to Check Terminal"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268020

1.CHECK DTC PRIORITY

If DTC P0703 is displayed with DTC P0571, first perform the trouble diagnosis for DTC P0571.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-678, "Diagnosis Procedure"](#).
NO >> GO TO 2.

2.CHECK BRAKE PEDAL POSITION SWITCH SIGNAL

1. Turn ignition switch ON.
2. Check voltage between ECM harness connector and ground.

P0703 BRAKE SWITCH B

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

+		-	Condition		Voltage
ECM					
Connector	Terminal				
E12	133	Ground	Brake pedal	Fully released	Battery voltage
				Slightly depressed	Approx. 0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Check voltage between brake pedal position switch harness connector and ground.

+		-	Voltage
Brake pedal position switch			
Connector	Terminal		
E37	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK BRAKE PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector.
2. Check harness continuity between brake pedal position switch harness connector and ECM harness connector.

Brake pedal position switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E37	2	E12	133	Existed

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK BRAKE PEDAL POSITION SWITCH

Check brake pedal position switch. Refer to [EC-700, "Component Inspection \(Brake Pedal Position Switch\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (Brake Pedal Position Switch)

INFOID:0000000014268021

1.CHECK BRAKE PEDAL POSITION SWITCH

1. Adjust brake pedal position switch installation. Refer to [BR-10, "Adjustment"](#).
2. Turn ignition switch OFF.
3. Disconnect brake pedal position switch harness connector.
4. Check the continuity between brake pedal position switch terminals under the following conditions.

P0703 BRAKE SWITCH B

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Brake pedal position switch		Condition		Continuity
Terminal				
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20. "Removal and Installation"](#).

A

EC

C

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P

P0833 CPP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P0833 CPP SWITCH

DTC Description

INFOID:0000000014268022

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0833	CLUTCH SWITCH SIGNAL CONSISTENCY (Clutch pedal switch "B" circuit) • 1.DEF • 2.DEF	Correlation of two clutch pedal position switch signal is inconsistency.

POSSIBLE CAUSE

- Harness or connectors
- Clutch pedal position switch

FAIL-SAFE

ASCD not available

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and let it idle for 1 second.
2. Fully depress clutch pedal.
3. Fully release clutch pedal.
4. Repeat step 2 and 3 for five times.
5. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-702, "Diagnosis Procedure"](#).

NO >> GO TO 3.

3.PERFORM COMPONENT FUNCTION CHECK

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals under the following conditions.

NOTE:

Use component function check to check the overall function of the clutch switch circuit. During this check, a DTC might not be confirmed.

ECM			Condition		Voltage
Connector	+	–			
	Terminal				
E12	131	Ground	Clutch pedal	Fully released	Approx. 0 V
				Fully depressed	Battery voltage

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to [EC-702, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268023

1.CHECK CLUTCH PEDAL POSITION SWITCH GROUND CIRCUIT

P0833 CPP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

1. Turn ignition switch OFF.
2. Disconnect clutch pedal position switch harness connector.
3. Check the continuity between clutch pedal position switch harness connector and ground.

Clutch pedal position switch		—	Continuity
Connector	Terminal		
E43	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to power in harness or connectors.

2.CHECK CLUTCH PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connectors.
2. Check the continuity between clutch pedal position switch harness connector and ECM harness connector.

Clutch pedal position switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E43	1	E12	131	Existed

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK CLUTCH PEDAL POSITION SWITCH

Refer to [EC-703. "Component Inspection \(Clutch Pedal Position Switch\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (Clutch Pedal Position Switch)

INFOID:0000000014268024

1.CHECK CLUTCH PEDAL POSITION SWITCH-1

1. Turn ignition switch OFF.
2. Disconnect clutch pedal position switch harness connector.
3. Check the continuity between clutch pedal position switch terminals under the following conditions.

Clutch pedal position switch		Condition		Continuity
Terminal				
1	2	Clutch pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK CLUTCH PEDAL POSITION SWITCH-2

1. Adjust clutch pedal position switch installation. Refer to [CL-9. "Inspection and Adjustment"](#).
2. Check the continuity between clutch pedal position switch terminals under the following conditions.

P0833 CPP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Clutch pedal position switch		Condition		Continuity
Terminal				
1	2	Clutch pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace clutch pedal position switch. Refer to [CL-14. "Removal and Installation"](#).

P1130 A/F SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P1130 A/F SENSOR

DTC Description

INFOID:0000000014268025

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P1130	PROPOR RICH SEN CIRC (Proportional richness sensor circuit)	1.DEF	- PWM value for the sensor heater is out of specified range for 2 seconds or more. - Air fuel mixture ratio is out of specified range for 3 seconds or more.

POSSIBLE CAUSE

- Harness and connectors
- A/F sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1130 is displayed with DTC P0001, P0002, P0089, P0100, P0101, P0110, P0120, P0190, P0200, P0201, P0202, P0203, P0204, P0402, P0403, P0409, P0487, P0488, P0638, P2100, and P2119, perform the trouble diagnosis for DTC P0001, P0002, P0089, P0100, P0101, P0110, P0120, P0190, P0200, P0201, P0202, P0203, P0204, P0402, P0403, P0409, P0487, P0488, P0638, P2100 and P2119.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P1130 can not duplicate.

>> Proceed to [EC-705. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268026

1.CHECK DTC PRIORITY

If DTC P1130 is displayed with DTC P0001, P0002, P0089, P0100, P0101, P0110, P0120, P0190, P0200, P0201, P0202, P0203, P0204, P0402, P0403, P0409, P0487, P0488, P0638, P2100, and P2119, perform the trouble diagnosis for DTC P0001, P0002, P0089, P0100, P0101, P0110, P0120, P0190, P0200, P0201, P0202, P0203, P0204, P0402, P0403, P0409, P0487, P0488, P0638, P2100 and P2119.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK ECM HARNESS CONNECTOR CONNECTIONS

- Turn ignition switch OFF.
- Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK AIR FUEL RATIO (A/F) SENSOR HARNESS CONNECTOR CONNECTIONS

Check A/F sensor harness connector connection.

P1130 A/F SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair error-detected parts.

4. CHECK A/F SENSOR CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector and A/F sensor harness connector.
2. Check A/F sensor circuit for open and short.

A/F sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F124	1	F55	41	Existed
	2		8	
	3	F59	95	

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5. CHECK INTERMITTENT INCIDENT

Perform [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace A/F sensor. Refer to [EM-322, "Removal and Installation"](#).

NO >> Repair or replace error-detected parts.

P1131 A/F SENSOR HEATER

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P1131 A/F SENSOR HEATER

DTC Description

INFOID:0000000014268027

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P1131	PROPOR RICH SEN HEAT CIRC (Proportional richness sensor heating circuit)	1.DEF	Sensor temperature exceeds the maximum or minimum limit for 1 second or more.

POSSIBLE CAUSE

- Harness and connectors
- A/F sensor heater

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P1131 can not duplicate.

>> Proceed to [EC-707, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268028

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair error-detected parts.

2.CHECK AIR FUEL RATIO (A/F) SENSOR HARNESS CONNECTOR CONNECTIONS

Check A/F sensor harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair error-detected parts.

3.CHECK A/F SENSOR HEATER CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector and A/F sensor harness connector.
2. Check A/F sensor circuit for open and short.

ECM		A/F sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	95	F124	3	Existed

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4.CHECK A/F SENSOR HEATER

Check A/F sensor heater. Refer to [EC-708, "Component Inspection \(A/F Sensor Heater\)"](#).

Is the inspection result normal?

P1131 A/F SENSOR HEATER

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> INSPECTION END
NO >> GO TO 5.

5.CHECK INTERMITTENT INCIDENT

Perform [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace A/F sensor. Refer to [EM-322, "Removal and Installation"](#).
NO >> Repair or replace error-detected parts.

Component Inspection (A/F Sensor Heater)

INFOID:0000000014268029

CAUTION:

- Discard any air fuel ratio (A/F) sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new air fuel ratio (A/F) sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner tool and approved anti-seize lubricant.

1.CHECK AIR FUEL RATIO (A/F) SENSOR

1. Turn ignition switch OFF.
2. Disconnect A/F sensor harness connector.
3. Check the resistance between A/F sensor terminals.

A/ F sensor		Condition		Resistance (Approx.)
Terminal				
4	3	Temperature	0 – 40°C (32 – 104°F)	1.56 – 2.2 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace air fuel ratio (A/F) sensor. Refer to [EM-322, "Removal and Installation"](#).

P1453 DIESEL PARTICULATE FILTER PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P1453 DIESEL PARTICULATE FILTER PRESSURE SENSOR

DTC Description

INFOID:0000000014268030

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1453	DIFF. PRESSURE SENSOR CIRCUIT, PARTICLE FILTER (DIFF. pressure sensor circuit, particle filter) • 1.DEF • 2.DEF • 3.DEF • 4.DEF	ECM detects an abnormal pressure of DPF.

POSSIBLE CAUSE

- Harness or connectors
- DPF differential pressure sensor

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

NOTE:

DTC P1453 can not duplicate.

>> Proceed to [EC-709, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268031

1.VISUALLY CHECK DPF DIFFERENTIAL PRESSURE SENSOR

Visually check for chipping DPF (Diesel Particulate Filter) differential pressure sensor.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning parts.

2.CHECK DPF DIFFERENTIAL PRESSURE SENSOR TUBE

1. Remove DPF differential pressure sensor tube. Refer to [EM-319, "Removal and installation"](#).

2. Check DPF differential pressure sensor tube for clogging.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair DPF differential pressure sensor tube.

3.CHECK DPF DIFFERENTIAL PRESSURE SENSOR HARNESS CONNECTOR CONNECTIONS

Check DPF differential pressure sensor harness connector connection.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair error-detected parts.

4.CHECK DPF DIFFERENTIAL PRESSURE SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector and DPF differential pressure sensor harness connector.

3. Check DPF differential pressure sensor circuit for open and short.

P1453 DIESEL PARTICULATE FILTER PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

ECM		DPF differential pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	118	E100	1	Existed
	103		2	
	76		3	

Is the inspection result normal?

- YES >> Replace DPF differential pressure sensor. Refer to [EM-319, "Removal and installation"](#).
NO >> Repair or replace error-detected parts.

P1525 ASCD SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P1525 ASCD SYSTEM

DTC Description

INFOID:0000000014268032

DTC DETECTION LOGIC

NOTE:

DTC P1525 is displayed with another DTC.

Perform the trouble diagnosis for the corresponding DTC.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1525	CONSISTENT MULTIPLEX SIGNALS FOR CC/SL (Consistent multiplex signals for CC/SL)	• 1.DEF Other DTC that illuminates MIL is detected while ASCD is operating.

POSSIBLE CAUSE

- Harness or connectors
- Others systems
- ECM

FAIL-SAFE

ASCD deactivation

Diagnosis Procedure

INFOID:0000000014268033

DTC P1525 is displayed with another DTC.

Perform trouble diagnosis for the corresponding DTC. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

P1544 EGT SENSOR 2

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P1544 EGT SENSOR 2

DTC Description

INFOID:0000000014268034

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1544	TEMP SEN UPSTREAM OF PF (Temp. sensor upstream of particle filter)	• 1.DEF • 2.DEF • 3.DEF • Diesel particulate filter temperature is more than 900 °C (1,652 °F). • ECM detects an abnormal temperature upstream of Diesel particulate filter.

POSSIBLE CAUSE

- Harness or connectors (Exhaust gas temperature sensor 2)
- Exhaust gas temperature sensor 2
- TC boost sensor
- A/F sensor
- Exhaust electric throttle control actuator
- Injector(s)
- Exhaust leakage
- Catalytic converter and DPF (Diesel Particulate Filter)

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden
- ASCD deactivation
- Freeshift inhibited

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1544 is displayed with DTC P0002, P0095 P0100, P0101, P0120, P0190, P0201, P0202, P0203, P0204, P0402, P0403, P0488, P0638, P2100, P2226, P2263 or P2A06, perform the trouble diagnosis for DTC P0002, P0095 P0100, P0101, P0120, P0190, P0201, P0202, P0203, P0204, P0402, P0403, P0488, P0638, P2100, P2226, P2263 or P2A06.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P1544 can not duplicate.

>> Proceed to [EC-712, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268035

1.CHECK DTC PRIORITY

If DTC P1544 is displayed with DTC P0002, P0095 P0100, P0101, P0120, P0190, P0201, P0202, P0203, P0204, P0402, P0403, P0488, P0638, P2100, P2226, P2263 or P2A06, perform the trouble diagnosis for DTC P0002, P0095 P0100, P0101, P0120, P0190, P0201, P0202, P0203, P0204, P0402, P0403, P0488, P0638, P2100, P2226, P2263 or P2A06.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

P1544 EGT SENSOR 2

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

2.CHECK EXHAUST LEAKAGE

Check exhaust leakage. Refer to [EX-17. "Checking Exhaust System"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK HARNESS CONNECTOR CONNECTIONS

Check harness connector connection of the following items.

- ECM
- Exhaust gas temperature sensor 2
- TC boost sensor
- A/F sensor
- Exhaust electric throttle control actuator
- Injectors

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair error-detected parts.

4.CHECK EXHAUST GAS TEMPERATURE (EGT) SENSOR 2 POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect EGT sensor 2 harness connector.
3. Turn ignition switch ON.
4. Check the voltage between EGT sensor 2 harness connector and ground.

+		−	Voltage (Approx.)
EGT sensor 2			
Connector	Terminal		
E13	2	Ground	5 V

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5.CHECK EXHAUST GAS TEMPERATURE (EGT) SENSOR 2 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between ECM harness connector and EGT sensor 2 harness connector.

ECM		EGT sensor 2		Continuity
Connector	Terminal	Connector	Terminal	
F55	3	E13	2	Existed

4. Also check harness for short to power and short to ground.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

6.CHECK EXHAUST GAS TEMPERATURE (EGT) SENSOR 2 GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between ECM harness connector and EGT sensor 2 harness connector.

ECM		EGT sensor 2		Continuity
Connector	Terminal	Connector	Terminal	
F55	23	E13	1	Existed

P1544 EGT SENSOR 2

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

4. Also check harness for short to power and short to ground.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace error-detected parts.

7. CHECK EXHAUST GAS TEMPERATURE SENSOR 2

NOTE:

WITH CONSULT

1. Start engine and warm it up to the normal operating temperature.

2. Maintain the following conditions for at least 2 consecutive minutes. Hold the steady as possible.

Engine speed

2,500 rpm

3. Select "TEMP.UPSTREAM OF PF" of "DATA MONITOR" mode of "ENGINE" using CONSULT.

4. Check there is a value variance given by the temperature sensor

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace error-detected parts.

8. CHECK TC BOOST SENSOR ROUTING CIRCUIT

Refer to [EC-605, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace error-detected parts.

9. CHECK AIR FUEL RATIO (A/F) SENSOR ROUTING CIRCUIT

Refer to [EC-705, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 10.

NO >> Replace error-detected parts.

10. CHECK FUEL INJECTOR ROUTING CIRCUIT

Refer to [EC-622, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace error-detected parts.

11. CHECK EXHAUST LINE

Refer to [EX-17, "Checking Exhaust System"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace error-detected parts.

P1546 EXHAUST GAS TEMPERATURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P1546 EXHAUST GAS TEMPERATURE

DTC Description

INFOID:0000000014268036

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1546	TEMP. UPSTREAM OF PF (Temp. upstream of particle filter)	1.DEF Upstream of DPF temperature is more than 505 °C (941°F).

POSSIBLE CAUSE

Diesel particulate filter

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1546 is displayed with following DTC, first perform the trouble diagnosis for following DTC.

- DTC P0001, P0002, P0101, P0190, P0200, P0201, P0202, P0203, P0204, P1453, P1544 and P2002

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P1546 can not duplicate.

>> Proceed to [EC-715. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268037

1.CHECK OTHER DTC

If DTC P1546 is displayed with following DTC, first perform the trouble diagnosis for following DTC.

- DTC P0001, P0002, P0101, P0190, P0200, P0201, P0202, P0203, P0204, P1453, P1544 and P2002

>> INSPECTION END.

P1560 ENGINE OIL PUMP CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P1560 ENGINE OIL PUMP CONTROL

DTC Description

INFOID:0000000014268038

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1560	ENGINE OIL PRESSURE (Engine oil pressure)	• ECM detects engine oil pump control valve circuit is open for 1 second. • ECM detects engine oil pump control valve circuit is short to ground for 1 second. • ECM detects engine oil pump control valve circuit is short to battery for 1 second.

POSSIBLE CAUSE

- Harness or connectors (Engine oil pump control valve circuit is open or shorted.)
- Engine oil pump control valve
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-716, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268039

1.CHECK ECM HARNESS CONNECTOR CONNECTION

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair ECM harness connector connection.

2.CHECK ENGINE OIL PUMP CONTROL VALVE HARNESS CONNECTOR CONNECTION

Check engine oil pump control valve harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair engine oil pump control valve harness connector connection.

3.CHECK ENGINE OIL PUMP CONTROL VALVE POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect engine oil pump control valve harness connector.
3. Turn ignition switch ON.
4. Check the voltage between engine oil pump control valve harness connector and ground.

P1560 ENGINE OIL PUMP CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

+		-	Voltage
Engine oil pump control valve			
Connector	Terminal		
F104	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Perform trouble diagnosis for power supply circuit.

4.CHECK ENGINE OIL PUMP CONTROL VALVE GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between engine oil pump control valve harness connector and ECM harness connector.

Engine oil pump control valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F104	1	F59	71	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK ENGINE OIL PUMP CONTROL VALVE

Check the engine oil pump control valve. Refer to [EC-717, "Component Inspection \(Engine Oil Pump Control Valve\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (Engine Oil Pump Control Valve)

INFOID:0000000014268040

1.CHECK ENGINE OIL PUMP CONTROL VALVE

1. Turn ignition switch OFF.
2. Disconnect engine oil pump control valve harness connector.
3. Check resistance between engine oil pump control valve terminals as follows.

Engine oil pump control valve		Condition		Resistance (Approx.)
Terminals				
2	1	Temperature	25°C (77°F)	23.4 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine oil pump (With engine oil pump control valve). Refer to [LU-50, "Removal and Installation"](#).

P160C ECM

DTC Description

INFOID:0000000014268041

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P160C	COMPUTER (Computer)	1.DEF ECM function is malfunctioning.

POSSIBLE CAUSE

ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P160C displayed with DTC U0415, P0002, P0101, P0135, P0180, P0190, P0201, P0202, P0203, P0204, P0217, P0226, P0340, P0471, P0544, P1544, P2002, P2080, P2244, P2263, P2626 or P2A06, first perform the trouble diagnosis for DTC U0415, P0002, P0101, P0135, P0180, P0190, P0201, P0202, P0203, P0204, P0217, P0226, P0340, P0471, P0544, P1544, P2002, P2080, P2244, P2263, P2626 or P2A06.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-718, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268042

1.CHECK BATTERY TERMINALS

1. Turn ignition switch ON.
2. Turn ignition switch OFF and wait at least 1 minute.
3. Check the battery terminals for damage and looseness.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair malfunction(s) and GO TO 2.

2.CHECK OTHER DTC-1

1. Turn ignition switch ON.
2. Check DTC.

Is DTC P160C displayed with U0415, P0002, P0101, P0135, P0180, P0190, P0201, P0202, P0203, P0204, P0217, P0226, P0340, P0471, P0544, P1544, P2002, P2080, P2244, P2263, P2626 or P2A06 displayed?

P160C ECM

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> Perform the trouble diagnosis for DTC U0415, P0002, P0101, P0135, P0180, P0190, P0201, P0202, P0203, P0204, P0217, P0226, P0340, P0471, P0544, P1544, P2002, P2080, P2244, P2263, P2626 or P2A06, and GO TO 3. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 3.

3.CHECK DTC

1. Turn ignition switch OFF and wait at least 1 minute.
2. Turn ignition switch ON.
3. Check DTC.

Is the DTC P160C displayed again?

YES >> GO TO 4.

NO >> GO TO 5.

4.REPLACE ECM

Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

>> INSPECTION END

5.CHECK OTHER DTC-2

1. Start engine and let it idle for at least 1 minutes.
2. Check DTC.

Is the DTC U0415, P0002, P0101, P0135, P0180, P0190, P0201, P0202, P0203, P0204, P0217, P0226, P0340, P0471, P0544, P1544, P2002, P2080, P2244, P2263, P2626 or P2A06 displayed?

YES >> Perform the trouble diagnosis for DTC U0415, P0002, P0101, P0135, P0180, P0190, P0201, P0202, P0203, P0204, P0217, P0226, P0340, P0471, P0544, P1544, P2002, P2080, P2244, P2263, P2626 or P2A06, and GO TO 3. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 6.

6.CHECK RESULT OF PROCEDURE 2

Check result of procedure 2.

Is result of procedure 2 "YES"?

YES >> GO TO 7.

NO >> INSPECTION END

7.PERFORM DTC CONFIRMATION PROCEDURE

1. Select "DATA MONITOR" mode with CONSULT.
2. Drive the vehicle for at least 15 minutes at 0 - 50 km/h (0 - 31 MPH).

CAUTION:

Always drive vehicle at a safe speed.

3. Check DTC.

Is DTC detected?

YES >> Perform the trouble diagnosis for DTC U0415, P0002, P0101, P0135, P0180, P0190, P0201, P0202, P0203, P0204, P0217, P0226, P0340, P0471, P0544, P1544, P2002, P2080, P2244, P2263, P2626 or P2A06, and GO TO 3. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> INSPECTION END

P1620 ECM**DTC Description**

INFOID:0000000014268043

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1620	PROPOR RICH SEN FNC (Proportional richness sensor function) • 1.DEF • 2.DEF • 3.DEF • 4.DEF • 5.DEF	ECM function is malfunctioning.

POSSIBLE CAUSE

ECM

FAIL-SAFE

Stop closed-loop control

DTC CONFIRMATION PROCEDURE**1.PERFORM DIAGNOSIS PROCEDURE****NOTE:**

DTC P1620 can not duplicate.

>> Proceed to [EC-720. "Diagnosis Procedure"](#).**Diagnosis Procedure**

INFOID:0000000014268044

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

- YES >> GO TO 2.
 NO >> Repair error-detected parts.

2.CHECK AIR FUEL RATIO (A/F) SENSOR HARNESS CONNECTOR CONNECTIONS

Check A/F sensor harness connector connection.

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair error-detected parts.

3.CHECK A/F SENSOR CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector and A/F sensor harness connector.
2. Check A/F sensor circuit for open and short.

ECM		A/F sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	95	F124	3	Existed
F55	8		2	
	41		1	

Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Repair or replace error-detected parts.

4.CHECK INTERMITTENT INCIDENT

< DTC/CIRCUIT DIAGNOSIS >

Perform [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.REPLACE A/F SENSOR

Replace A/F sensor. Refer to [EM-322, "Removal and Installation"](#).

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner tool and approved anti-seize lubricant.

>> INSPECTION END

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P1656 CAN COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P1656 CAN COMMUNICATION

DTC Description

INFOID:0000000014268045

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1656	MULTIPLEXED E.T.C. CONNECTION (Multiplexed E.T.C. connection) • 1.DEF • 2.DEF • 3.DEF	When ECM is not transmitting or receiving CAN communication signal with transfer control unit.

POSSIBLE CAUSE

- CAN communication line between transfer control unit and ECM
- Transfer control unit

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-722, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268046

Perform trouble diagnosis for CAN communication system. Refer to [LAN-39, "CAN COMMUNICATION SYSTEM: CAN System Specification Chart"](#).

P1675 ENGINE COOLANT TEMPERATURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P1675 ENGINE COOLANT TEMPERATURE

DTC Description

INFOID:0000000014268047

DTC DETECTION LOGIC

If the cooling fan or other component in the cooling system malfunctions, engine coolant temperature will rise. When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1675	ENGINE COOLANT TEMPERATURE (Engine coolant temperature)	1.DEF Engine coolant temperature is 140°C (284°F) or more for 1 second while engine is idling.

CAUTION:

When a malfunction is indicated, be sure to replace the coolant. Also, replace the engine oil.

1. Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Be sure to use coolant with the proper mixture ratio.
2. After refilling coolant, run engine to ensure that no water-flow noise is emitted.

POSSIBLE CAUSE

- Cooling fan
- Fan coupling
- Radiator hose
- Radiator
- Reservoir tank cap
- Water pump
- Thermostat
- Engine coolant temperature sensor
- Harness or connectors (Thermo management valve control solenoid valve circuit is open or shorted.)
- Thermo management valve control solenoid valve
- Thermo management valve

FAIL-SAFE

Stop closed-loop control

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-723, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268048

1.CHECK COOLING FAN OPERATION

Check cooling fan operation.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace malfunctioning part.

2.CHECK COOLING SYSTEM FOR LEAK-1

Check cooling system for leak. Refer to [CO-62, "System Inspection"](#).

Is leakage detected?

YES >> GO TO 3.

NO >> GO TO 4.

P1675 ENGINE COOLANT TEMPERATURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

3.CHECK COOLING SYSTEM FOR LEAK-2

Check the following for leak.

- Hose
- Radiator
- Reservoir tank cap
- Water pump
- Reservoir tank

>> Repair or replace malfunctioning part.

4.CHECK RESERVOIR TANK CAP

Check reservoir tank cap. Refer to [CO-70. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace reservoir tank cap. Refer to [CO-67. "Removal and Installation"](#).

5.CHECK THERMOSTAT

Check thermostat. Refer to [CO-77. "Thermostat"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace thermostat (water outlet). Refer to [CO-73. "Removal and Installation"](#).

6.CHECK THERMO MANAGEMENT VALVE

Check thermo management valve. Refer to [CO-74. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace thermo management valve. Refer to [CO-73. "Exploded View"](#).

7.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Check engine coolant temperature sensor routing circuit. Refer to [EC-610. "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace engine coolant temperature sensor (water outlet). Refer to [CO-73. "Exploded View"](#).

8.CHECK ECM HARNESS CONNECTOR CONNECTIONS

Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair error-detected parts.

9.CHECK THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE HARNESS CONNECTOR CONNECTIONS

Check thermo management valve control solenoid valve harness connector connection.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace error-detected parts.

10.CHECK THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE CIRCUIT POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect thermo management valve control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check the voltage between thermo management valve control solenoid valve harness connector and ground.

P1675 ENGINE COOLANT TEMPERATURE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

+		-	Voltage
Thermo management valve control solenoid valve			
Connector	Terminal		
F100	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 11.

NO >> Perform trouble diagnosis for power supply circuit.

11. CHECK THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check thermo management valve control solenoid valve circuit for open and short.

ECM		Thermo management valve control solenoid valve		Continuity
Connector	Terminal	Connector	Terminal	
F59	68	F100	1	Existed

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace error-detected parts.

12. CHECK THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE

Refer to [EC-725, "Component Inspection \(Thermo Management Valve Control Solenoid Valve\)"](#).

Is the inspection result normal?

YES >> Perform overheating cause analysis. Refer to [CO-60, "Troubleshooting Chart"](#).

NO >> Repair or replace error-detected parts.

Component Inspection (Thermo Management Valve Control Solenoid Valve)

INFOID:0000000014268049

1. CHECK THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE

1. Turn ignition switch OFF.
2. Disconnect thermo management valve control solenoid valve harness connector.
3. Check the resistance between thermo management valve control solenoid valve terminals.

thermo management valve control solenoid valve		Condition		Resistance (Approx.)
Terminal				
2	1	Temperature	20 °C (68°F)	43 – 49 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace thermo management valve control solenoid valve. Refer to [EM-314, "Removal and Installation"](#)

P2002 DIESEL PARTICULATE FILTER

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2002 DIESEL PARTICULATE FILTER

DTC Description

INFOID:0000000014268050

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2002	PARTICLE FILTER (Diesel particulate filter efficiency below threshold bank 1) • 1.DEF • 2.DEF • 3.DEF • 4.DEF	Diesel particulate filter function does not operate properly.

POSSIBLE CAUSE

Diesel particulate filter

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden
- ASCD deactivation
- Freeshift inhibited

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2002 is displayed with following DTC, first perform the trouble diagnosis for following DTC.

- DTC U0101, U0121, U0415, P0001, P0002, P0045, P0100, P0101, P0105, P0106, P0115, P0190, P0200, P0201, P0202, P0203, P0204, P0225, P0226, P0335, P0402, P0470, P0471, P0487, P0488, P0544, P0560, P060A, P061A, P062B, P0638, P0641, P0651, P0697, P1544, P160C, P2080, P2100, P2119, P2120, P2226, P2263 and P253F.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P2002 can not duplicate.

>> Proceed to [EC-726, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268051

1.CHECK DTC PRIORITY

If DTC P2002 is displayed with following DTC, first perform the trouble diagnosis for following DTC.

- DTC U0101, U0121, U0415, P0001, P0002, P0045, P0100, P0101, P0105, P0106, P0115, P0190, P0200, P0201, P0202, P0203, P0204, P0225, P0226, P0335, P0402, P0470, P0471, P0487, P0488, P0544, P0560, P060A, P061A, P062B, P0638, P0641, P0651, P0697, P1544, P160C, P2080, P2100, P2119, P2120, P2226, P2263 and P253F.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK DIESEL PARTICULATE FILTER

Refer to [EC-727, "Component Inspection \(Diesel Particulate Filter\)"](#).

Is the inspection result normal?

YES >> GO TO 3.

P2002 DIESEL PARTICULATE FILTER

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Replace diesel particulate filter.

3.CHECK INTAKE AIR SYSTEM

Check the intake air system for leakage.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts and then GO TO 4.

4.PERFORM SELF-DIAGNOSIS

Perform "Self-diagnostic results" of "ENGINE" using CONSULT.

Is any DTC detected?

YES >> Replace diesel particulate filter.

NO >> Perform "SERVICE REGENERATION". Refer to [EC-561. "Description"](#).

Component Inspection (Diesel Particulate Filter)

INFOID:0000000014268052

1.CHECK DIESEL PARTICULATE FILTER

Check diesel particulate filter for damage.

Is the inspection result normal?

YES >> Perform "SERVICE REGENERATION". Refer to [EC-561. "Description"](#).

NO >> Replace diesel particulate filter.

P2080 EGT SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2080 EGT SENSOR 1

DTC Description

INFOID:0000000014268053

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2080	TBN DOWNS TEMP REG (Exhaust gas temperature sensor circuit range/performance bank 1 sensor 1)	1.DEF Temperature before the turbine is more than 810 °C (1,490 °F) for 3 minutes or more.

POSSIBLE CAUSE

- Intake air leaks
- Electric throttle actuator
- Fuel injector
- Exhaust gas leaks

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2080 is displayed with DTC P0544 or P2002, first perform the trouble diagnosis for DTC P0544 or P2002.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YS23DDTT).
- NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P2080 can not be duplicate.

>> Proceed to [EC-728. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268054

1.CHECK DTC PRIORITY

If DTC P2080 is displayed with DTC P0544 or P2002, first perform the trouble diagnosis for DTC P0544 or P2002.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YS23DDTT).
- NO >> GO TO 2.

2.CHECK INTAKE AIR SYSTEM

1. Check the air cleaner for clogging.
2. Check the air duct for connection and cracks.

Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair or replace error-detected parts.

3.CHECK ELECTRIC THROTTLE ACTUATOR

Check the electric throttle actuator. Refer to [EC-688. "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> GO TO 4.

P2080 EGT SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Repair or replace error-detected parts.

4.CHECK FUEL INJECTOR

Check the fuel injector. Refer to [EC-622, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK EXHAUST SYSTEM

Check the exhaust gas leakage. Refer to [EX-17, "Checking Exhaust System"](#).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

NO >> Repair or replace error-detected parts.

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P2100 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2100 THROTTLE CONTROL MOTOR

DTC Description

INFOID:0000000014268055

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2100	INLET AIR FLAP CIRCUIT (Throttle actuator "A" control motor circuit/open) • 1.DEF • 2.DEF	• ECM detects throttle control motor circuit is open circuit. • ECM detects throttle control motor circuit is short circuit to ground. • ECM detects throttle control motor circuit is short circuit to battery. • Overheating of electric throttle control actuator.

POSSIBLE CAUSE

- Harness or connectors (Throttle control motor circuit is open or shorted.)
- Electric throttle control actuator

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden
- Compression test routine inhibited
- Airflow regulation cut off
- ASCD deactivation
- Free shift inhibited

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-1

1. Turn ignition ON at least 2 seconds.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-730. "Diagnosis Procedure"](#).
NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-2

1. Start engine and let it idle for at least 2 seconds.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-730. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
NO-1 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268056

1.CHECK ECM HARNESS CONNECTOR CONNECTION

1. Turn ignition switch OFF.
2. Check the ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair error-detected parts.

2.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR HARNESS CONNECTOR CONNECTION

P2100 THROTTLE CONTROL MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Check the electric throttle control actuator harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR CIRCUIT

1. Disconnect ECM harness connector and electric throttle control actuator harness connector.
2. Check the electric throttle control actuator circuit for open and short.

ECM		Electric throttle control actuator		Continuity
Connector	Terminal	Connector	Terminal	
F59	89	F120	1	Existed
	90		2	
	120		3	
F55	27		5	
	11		6	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

P2119 ELECTRIC THROTTLE CONTROL FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2119 ELECTRIC THROTTLE CONTROL FUNCTION

DTC Description

INFOID:0000000014268057

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P2119	AIR INLET FLAP (Throttle actuator control throttle body range/performance)	1.DEF	ECM detects abnormally closed position of throttle control valve.

POSSIBLE CAUSE

- Harness or connectors (Throttle control motor circuit is open or shorted.)
- Electric throttle control actuator

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden
- Compression test routine inhibited
- Airflow regulation cut off
- ASCD deactivation
- Freeshift inhibited

Diagnosis Procedure

INFOID:0000000014268058

1.CHECK ECM HARNESS CONNECTOR CONNECTION

1. Turn ignition switch OFF.
2. Check the ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair error-detected parts.

2.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR HARNESS CONNECTOR CONNECTION

Check the electric throttle control actuator harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK ELECTRIC THROTTLE CONTROL ACTUATOR CIRCUIT

1. Disconnect ECM harness connector and electric throttle control actuator harness connector.
2. Check the electric throttle control actuator circuit for open and short.

ECM		Electric throttle control actuator		Continuity
Connector	Terminal	Connector	Terminal	
F59	89	F120	1	Existed
	90		2	
	120		3	
F55	27		5	
	11		6	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

P2119 ELECTRIC THROTTLE CONTROL FUNCTION

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

4. LEARNING ELECTRIC THROTTLE CONTROL ACTUATOR

Perform [EC-558. "Description"](#).

>> INSPECTION END

A

EC

C

D

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P

P2120 APP SENSOR

DTC Description

INFOID:0000000014268059

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P2120	PEDAL POTENTIOMETER CIRCUIT TRACK 2 (Throttle/pedal position sensor/switch "D" circuit)	• 1.DEF • 2.DEF	• An excessively low voltage from the accelerator pedal position (APP) sensor 2 is sent to ECM. • An excessively high voltage from the accelerator pedal position (APP) sensor 2 is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (APP sensor 2 circuit is open or shorted.)
- APP sensor 2
- ECM

FAIL-SAFE

- Torque limitation
- Free shift inhibited
- ASCD deactivation
- After sales and factory routines inhibited

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-734, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
 NO-1 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268060

1.CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect APP sensor harness connector.
3. Turn ignition switch ON.
4. Check the power supply of the APP sensor.

+		-	Voltage (Approx.)
APP sensor			
Connector	Terminal		
E5	1	Ground	5.0 V
	2		

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> GO TO 2.

P2120 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

2.CHECK APP SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check APP sensor circuit for open and short.

ECM		APP sensor		Continuity
Connector	Terminal	Connector	Terminal	
E12	151	E5	2	Existed
	150		1	

Is the inspection result normal?

YES >> Check ECM power supply circuit. Refer to [EC-570, "Diagnosis Procedure"](#).

NO >> Repair or replace error-detected parts.

3.CHECK APP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check APP sensor circuit for open and short.

ECM		APP sensor		Continuity
Connector	Terminal	Connector	Terminal	
E12	152	E5	3	Existed
	144		4	
	142		6	
	134		5	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK APP SENSOR

Refer to [EC-735, "Component Inspection \(Accelerator Pedal Position Sensor\)"](#).

Is the inspection result normal?

YES >> Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

NO >> Replace error-detected parts.

Component Inspection (Accelerator Pedal Position Sensor)

INFOID:0000000014268061

1.CHECK ACCELERATOR PEDAL POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Check the voltage between ECM harness connector terminals as per the following condition.

ECM				Condition		Voltage
Connector		+	—			
		Terminal				
Sensor 1	E12	152	144	Accelerator pedal	Fully released	0.74 V
					Fully depressed	4.54 V
Sensor 2		142	134		Fully released	0.38 V
					Fully depressed	2.25 V

Is the inspection result normal?

YES >> INSPECTION END

P2120 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Replace accelerator pedal assembly. Refer to [ACC-3. "Removal and Installation"](#).

P2226 ATMOSPHERIC PRESSURE [BARO SEN]

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2226 ATMOSPHERIC PRESSURE [BARO SEN]

DTC Description

INFOID:0000000014268062

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P2226	ATMOS PRESS SEN (Barometric pressure sensor "A" circuit)	• 1.DEF • 2.DEF • 3.DEF	• Atmospheric pressure sensor (Built-into ECM) voltage sent to ECM is 4.9 V or more for 2.5 seconds or more. • Atmospheric pressure sensor (Built-into ECM) voltage sent to ECM is 0.2 V or less for 2.5 seconds or more.

POSSIBLE CAUSE

ECM

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-737, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
- NO-1 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268063

1.CHECK ECM AIR INLET VISUALLY

Check if foreign matter is blocking the air inlet for ECM.

Is the inspection result normal?

- YES >> Replace ECM. Refer to [EC-798, "Removal and Installation"](#).
- NO >> Remove foreign matter.

P2244 A/F SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2244 A/F SENSOR

DTC Description

INFOID:0000000014268064

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P2244	PROPOR RICH SEN CIRC (O2 sensor reference voltage performance bank 1 sensor 1)	• CC.0 • CC.1 • CO	• ECM detects air fuel ratio (A/F) sensor circuit is short circuit to ground. • ECM detects air fuel ratio (A/F) sensor circuit is short circuit to battery.

POSSIBLE CAUSE

- Harness or connectors (A/F sensor circuit is shorted.)
- A/F sensor
- ECM

FAIL-SAFE

Stop closed-loop control

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 2 seconds.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-738, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-1 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268065

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair error-detected parts.

2.CHECK AIR FUEL RATIO (A/F) SENSOR HARNESS CONNECTOR CONNECTIONS

Check A/F sensor harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK A/F SENSOR CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector and A/F sensor harness connector.
2. Check A/F sensor circuit for open and short.

P2244 A/F SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

ECM		A/F sensor		Continuity
Connector	Terminal	Connector	Terminal	
F55	8	F124	2	Existed
	41		1	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.REPLACE A/F SENSOR

Replace A/F sensor. Refer to [EM-322, "Removal and Installation"](#).

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner tool and approved anti-seize lubricant.

>> INSPECTION END

P2263 TC SYSTEM

DTC Description

INFOID:0000000014268066

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P2263	Boost pressure circuit (Turbocharger/supercharger boost system performance)	• 1.DEF • 2.DEF • 3.DEF • 4.DEF	• Differences between boost pressure and target value are less than -150 hPa. (Boost pressure is too high) • Differences between boost pressure and target value are more than 150 hPa. (Boost pressure is too low)

POSSIBLE CAUSE

- Harness or connectors (Turbocharger boost sensor circuit is open or shorted.)
- Turbocharger boost sensor (with intake air temperature sensor 2)
- Vacuum air circuit
- Air filter
- Turbocharger
- Intake air leaks
- Exhaust gas leaks
- EGR circuit
- Fuel flow actuator
- Turbocharger boost control solenoid valve

FAIL-SAFE

- EGR valve is closed
- Throttle valve opened
- Torque limitation
- ASCD deactivation
- Free shift is inhibited
- Wastegate activation is inhibited
- VDC deactivation
- DPF regeneration forbidden

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2263 is displayed with following DTC, first perform the trouble diagnosis for following DTC.

- P0001, P0002, P0033, P0045, P004A, P0087, P0089, P0105, P0106, P0115, P0180, P0190, P0200, P0201, P0202, P0203, P0204, P0217, P0263, P0266, P0269, P0272, P025A, P0402, P0409, P0487, P0488, P0641 and P0651

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P2263 can not be duplicate.

>> Proceed to [EC-740, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268067

1.CHECK DTC PRIORITY

If DTC P2263 is displayed with following DTC, first perform the trouble diagnosis for following DTC.

P2263 TC SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

- P0001, P0002, P0033, P0045, P004A, P0087, P0089, P0105, P0106, P0115, P0180, P0190, P0200, P0201, P0202, P0203, P0204, P0217, P0263, P0266, P0269, P0272, P025A, P0402, P0409, P0487, P0488, P0641 and P0651

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK AIR FILTER

Check that air filter is not obstructed.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK INTAKE AIR DUCT

Check that intake air duct is not obstructed.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK EXHAUST GAS LEAK

Check exhaust gas leak.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK TURBOCHARGER BOOST SENSOR

Check the turbocharger boost sensor. Refer to [EC-603, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace turbocharger boost sensor.

6.CHECK TURBOCHARGER BOOST CONTROL SOLENOID VALVE

Check the turbocharger boost control solenoid valve. Refer to [EC-584, "YS23DDT : Diagnosis Procedure"](#) (YS23DDT), [EC-586, "YS23DDTT : Diagnosis Procedure"](#) (YS23DDTT).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK TURBOCHARGER

Check the turbocharger. Refer to [EM-327, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8.CHECK EGR SYSTEM

Visually check the EGR system. Refer to [EM-316, "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9.CHECK FUEL FLOW ACTUATOR CIRCUIT

Check fuel flow actuator circuit. Refer to [EC-575, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

NO >> Repair or replace error-detected parts.

P2264 WATER IN FUEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2264 WATER IN FUEL SENSOR

DTC Description

INFOID:0000000014268068

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P2264	WATER IN DIESEL DETECTOR (Water in fuel sensor circuit)	1.DEF	- A signal from the detection sensor is sent to ECM - ECM detects detection sensor circuit is open circuit.

POSSIBLE CAUSE

- Harness or connectors (Detection sensor circuit is open.)
- Water in fuel level sensor
- Fuel filter
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine.
2. Drive the vehicle at least 15 seconds at 5 km/h (3.11 MPH) or more.

CAUTION:

Always drive the vehicle at safe speed.

3. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-742, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-1 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268069

1.PERFORM DIESEL FUEL FILTER WATER DRAINING

Perform diesel fuel filter water draining. Refer to [FL-46, "Draining Water from Fuel Filter"](#).

Water has been detected in the fuel filter?

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK FUEL CONFORMITY

Check fuel conformity.

Is fuel normal?

YES >> Replace fuel filter.

NO >> Drain the fuel circuit and replace the fuel filter.

3.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

P2264 WATER IN FUEL SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

- YES >> GO TO 4.
NO >> Repair error-detected parts.

4.CHECK WATER IN FUEL SENSOR HARNESS CONNECTOR CONNECTIONS

Check water in fuel sensor harness connector connections.

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair error-detected parts.

5.CHECK WATER IN FUEL SENSOR CIRCUIT FOR OPEN AND SHORT

1. Disconnect ECM harness connector and water in fuel sensor harness connector.
2. Check water in fuel sensor circuit for open and short.

ECM		Water in fuel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E12	158	E108	2	Existed

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair or replace error-detected parts.

6.CHECK WATER IN FUEL SENSOR GROUND CIRCUIT

Check water in fuel sensor ground circuit for open and short.

Water in fuel sensor		—	Continuity
Connector	Terminal		
E108	1	Ground	Existed

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Repair or replace error-detected parts.

7.CHECK WATER IN FUEL SENSOR POWER SUPPLY CIRCUIT FOR OPEN AND SHORT

Check water in fuel sensor power supply circuit for open and short.

ECM		Water in fuel sensor		Continuity
Connector	Terminal	Connector	Terminal	
E12	159	E108	3	Existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

P2452 DIESEL PARTICULATE FILTER PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2452 DIESEL PARTICULATE FILTER PRESSURE SENSOR

DTC Description

INFOID:0000000014268070

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2452	P/FLT DIFF PRS SEN (Particulate filter pressure sensor "A" circuit) • 1.DEF • 2.DEF	• An excessively high voltage (more than 4.87 V) from diesel particulate filter pressure sensor is sent to ECM. • An excessively low voltage (less than 0.22 V) from diesel particulate filter pressure sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (Diesel particulate filter differential pressure sensor circuit is open or shorted.)
- Diesel particulate filter differential pressure sensor
- ECM

FAIL-SAFE

- EGR valve closed
- Throttle valve opened
- DPF regeneration forbidden

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2452 is displayed with DTC P0641, P0651 or P0697, first perform the trouble diagnosis for DTC P0641, P0651 or P0697.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.

2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-744, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-1 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268071

1.CHECK DTC PRIORITY

If DTC P2452 is displayed with DTC P0641, P0651 or P0697, first perform the trouble diagnosis for DTC P0641, P0651 or P0697.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.

P2452 DIESEL PARTICULATE FILTER PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

2. Check the ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK DPF (DIESEL PARTICULATE FILTER) DIFFERENTIAL PRESSURE SENSOR HARNESS CONNECTOR CONNECTIONS

Check the DPF differential pressure sensor harness connector connection.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair error-detected parts.

4.CHECK DPF DIFFERENTIAL PRESSURE SENSOR POWER SUPPLY

1. Turn ignition switch OFF.

2. Disconnect DPF differential pressure sensor harness connector.

3. Turn ignition switch ON.

4. Check the DPF differential pressure sensor power supply.

+		-	Voltage (Approx.)
DPF differential pressure sensor			
Connector	Terminal		
E100	1	Ground	5.0 V

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5.CHECK DPF DIFFERENTIAL PRESSURE SENSOR POWER SUPPLY AND GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the DPF differential pressure sensor harness connector and ECM harness connector.

ECM		DPF differential pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	118	E100	1	Existed
	103		2	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

6.CHECK DPF DIFFERENTIAL PRESSURE SENSOR SIGNAL CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect ECM harness connector.

3. Check the DPF differential pressure sensor signal circuit for open and short.

ECM		DPF differential pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	76	E100	3	Existed

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.REPLACE DPF DIFFERENTIAL PRESSURE SENSOR

P2452 DIESEL PARTICULATE FILTER PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Replace DPF differential pressure sensor. Refer to [EM-319, "Removal and installation"](#).

>> GO TO 8.

8.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC Confirmation Procedure.

See [EC-744, "DTC Description"](#).

Is the DTC P2452 detected again?

YES >> Replace ECM. Refer to [EC-798, "Removal and Installation"](#).

NO >> INSPECTION END

P245A EGR COOLER BYPASS CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P245A EGR COOLER BYPASS CONTROL SOLENOID VALVE

DTC Logic

INFOID:000000014268072

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P245A	EGR BYPASS CIRCUIT (EGR cooler bypass control circuit/open bank 1)	1.DEF 2.DEF - A signal from the detection sensor is sent to ECM - ECM detects detection sensor circuit is open circuit.

POSSIBLE CAUSE

- Harness or connectors (EGR cooler bypass valve control solenoid valve circuit is open.)
- EGR cooler bypass valve control solenoid valve
- ECM

FAIL-SAFE

- EGR regulation cut off
- EGR valve closed
- Throttle valve opened

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P245A is displayed with DTC P0560 or P0657, first perform trouble diagnosis for DTC P0560 or P0657.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YS23DDTT)

NO >> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine.
2. Drive the vehicle at least 15 seconds at 5 km/h (3.11 MPH) or more.

CAUTION:

Always drive the vehicle at safe speed.

3. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-742. "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).

NO-1 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000014268073

1.CHECK DTC PRIORITY

If DTC P245A is displayed with DTC P0560 or P0657, first perform trouble diagnosis for DTC P0560 or P0657.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YS23DDTT)

NO >> GO TO 2.

2.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE HARNESS CONNECTOR CON-

P245A EGR COOLER BYPASS CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NECTIONS

Check EGR cooler bypass valve control solenoid valve harness connector connection

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair error-detected parts.

4.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EGR cooler bypass valve control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check the voltage between EGR cooler bypass valve control solenoid valve harness connector and ground.

+		-	Voltage
EGR cooler bypass valve control solenoid valve			
Connector	Terminal		
F102	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connectors.
3. Check the continuity between EGR cooler bypass valve control solenoid valve harness connector and ECM harness connector.

EGR cooler bypass valve control solenoid valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F102	1	F59	126	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

6.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE

Refer to [EC-748, "Component Inspection \(EGR Cooler Bypass Valve Control Solenoid Valve\)".](#)

Is the inspection result normal?

YES >> Replace ECM. Refer to [EC-798, "Removal and Installation".](#)

NO >> Repair or replace error-detected parts.

Component Inspection (EGR Cooler Bypass Valve Control Solenoid Valve) INFOID:0000000014268074

1.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE

1. Turn ignition switch OFF.
2. Disconnect EGR cooler bypass valve control solenoid valve harness connector.
3. Check the resistance between EGR cooler bypass valve control solenoid valve as per the following conditions.

P245A EGR COOLER BYPASS CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

EGR cooler bypass valve control solenoid valve		Condition		Resistance (Approx.)
Terminal				
1	2	Temperature	0 - 40 °C (32 - 104 °F)	43 - 49 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EGR cooler bypass valve control solenoid valve. Refer to [EM-317, "Removal and Installation"](#).

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P24A7 ELECTRIC EGR COOLING WATER PUMP 1

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P24A7 ELECTRIC EGR COOLING WATER PUMP 1

DTC Description

INFOID:0000000014268075

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P24A7	1ST EGR WATER PUMP CNT CIRC (EGR cooler coolant pump control circuit/ open)	• CO • CC.0 • CC.1 • 1.DEF • 2.DEF • 3.DEF • 4.DEF • 5.DEF • 6.DEF • When engine coolant temperature is too high. • ECM detects an abnormal operation of electric EGR cooling water pump. • Electric EGR cooling water pump circuit is open. • Electric EGR cooling water pump circuit is short to battery. • Electric EGR cooling water pump circuit is short to ground.

POSSIBLE CAUSE

- Harness or connectors (Electric EGR cooling water pump circuit is open or shorted.)
- Electric EGR cooling water pump

FAIL-SAFE

- Electric EGR cooling water pump at maximum speed
- Electric EGR cooling water pump blocked, no flow
- Electric EGR cooling water pump cut off
- Above 137 °C (278.6 °F), Electric EGR water pump speed reduction (at 77%).

DTC CONFIRMATION PROCEDURE

NOTE:

If this DTC is detected, first confirm self-diagnostic result in IPDM E/R. Refer to [PCS-25, "DTC Index"](#).

1.CHECK DTC PRIORITY

If DTC P24A7 is displayed with DTC P0217, P0560 or P0651, first perform the trouble diagnosis for DTCP0217, P0560 or P0651.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-494, "YS23DDT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P24A7 can not duplicate.

>> Proceed to [EC-750, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268076

NOTE:

If this DTC is detected, first confirm self-diagnostic result in IPDM E/R. Refer to [PCS-25, "DTC Index"](#).

1.CHECK DTC PRIORITY

If DTC P24A7 is displayed with DTC P0217, P0560 or P0651, first perform the trouble diagnosis for DTCP0217, P0560 or P0651.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-494, "YS23DDT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.VISUALLY CHECK ELECTLIC EGR COOLING WATER PUMP 1 AND ELECTLIC EGR COOLING WATER PUMP 2

P24A7 ELECTRIC EGR COOLING WATER PUMP 1

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Visually check the electric EGR cooling water pump 1, electric EGR cooling water pump 2, and pipes.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK ENGINE COOLANT CIRCUIT

Refer to [CO-62. "System Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK IPDM E/R HARNESS CONNECTOR CONNECTION

1. Turn ignition switch OFF.

2. Check IPDM E/R harness connector connection.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair error-detected parts.

5.CHECK ECM HARNESS CONNECTOR CONNECTION

Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair error-detected parts.

6.CHECK ELECTRIC EGR COOLING WATER PUMP 1 AND ELECTRIC EGR COOLING WATER PUMP 2 HARNESS CONNECTOR CONNECTION

Check electric EGR cooling water pump 1 and electric EGR cooling water pump 2 harness connector connection.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK ELECTRIC EGR COOLING WATER PUMP 1 CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect EGR cooling water pump 1 harness connector.

3. Check electric EGR cooling water pump 1 circuit for open and short.

Electric EGR cooling water pump 1		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E103	2	F59	114	Existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8.CHECK ELECTRIC EGR COOLING WATER PUMP 2 CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect EGR cooling water pump 2 harness connector.

3. Check electric EGR cooling water pump 2 sensor circuit for open and short.

Electric EGR cooling water pump 2		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E104	2	F59	107	Existed

Is the inspection result normal?

P24A7 ELECTRIC EGR COOLING WATER PUMP 1

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9.CHECK ELECTRIC EGR COOLING WATER PUMP 1 GROUND CIRCUIT

Check the continuity between electric EGR cooling water pump 1 sensor harness connector and ground.

Electric EGR cooling water pump 1		—	Continuity
Connector	Terminal		
E103	3	Ground	Existed

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace error-detected parts.

10.CHECK ELECTRIC EGR COOLING WATER PUMP 2 GROUND CIRCUIT

Check the continuity between electric EGR cooling water pump 2 sensor harness connector and ground.

Electric EGR cooling water pump 2		—	Continuity
Connector	Terminal		
E104	3	Ground	Existed

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace error-detected parts.

11.CHECK ELECTRIC EGR COOLING WATER PUMP 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check the power supply of the electric EGR cooling water pump 1.

+		-	Voltage
Electric EGR cooling water pump 1			
Connector	Terminal	Ground	Battery voltage
E103	1		

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace error-detected parts.

12.CHECK ELECTRIC EGR COOLING WATER PUMP 2 POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check the power supply of the electric EGR cooling water pump 2.

+		-	Voltage
Electric EGR cooling water pump 2			
Connector	Terminal	Ground	Battery voltage
E104	1		

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair or replace error-detected parts.

13.CHECK ELECTRIC EGR COOLING WATER PUMP 1

NOTE:

 **WITH CONSULT**

Perform "FIRST EGR COOLING PUMP" in "ACTIVE TEST" mode.

Is the inspection result normal?

P24A7 ELECTRIC EGR COOLING WATER PUMP 1

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> GO TO 14.

NO >> Replace electric EGR cooling water pump 1. Refer to [EM-317. "Removal and Installation"](#).

14.CHECK ELECTRIC EGR COOLING WATER PUMP 2

NOTE:

WITH CONSULT

Perform "SECOND EGR COOLING PUMP" in "ACTIVE TEST" mode.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric EGR cooling water pump 2. Refer to [EM-317. "Removal and Installation"](#).

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P24A8 ELECTRIC EGR COOLING WATER PUMP 2

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P24A8 ELECTRIC EGR COOLING WATER PUMP 2

DTC Description

INFOID:0000000014268077

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P24A8	EGR CLNT PUMP 2 CNT CIRC (EGR cooler coolant pump control circuit/ open)	• CO • CC.0 • CC.1 • 1.DEF • 2.DEF • 3.DEF • 4.DEF • 5.DEF • 6.DEF • When engine coolant temperature is too high. • ECM detects an abnormal operation of electric EGR cooling water pump. • Electric EGR cooling water pump circuit is open. • Electric EGR cooling water pump circuit is short to battery. • Electric EGR cooling water pump circuit is short to ground.

POSSIBLE CAUSE

- Harness or connectors (Electric EGR cooling water pump circuit is open or shorted.)
- Electric EGR cooling water pump

FAIL-SAFE

- Electric EGR cooling water pump at maximum speed
- Electric EGR cooling water pump blocked, no flow
- Electric EGR cooling water pump cut off
- Above 137 °C (278.6 °F), Electric EGR cooling water pump speed reduction (at 77%).

DTC CONFIRMATION PROCEDURE

NOTE:

If this DTC is detected, first confirm self-diagnostic result in IPDM E/R. Refer to [PCS-25, "DTC Index"](#).

1.CHECK DTC PRIORITY

If DTC P24A8 is displayed with DTC P0217, P0560 or P0651, first perform the trouble diagnosis for DTC P0217, P0560 or P0651.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-494, "YS23DDT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P24A8 can not duplicate.

>> Proceed to [EC-754, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268078

NOTE:

If this DTC is detected, first confirm self-diagnostic result in IPDM E/R. Refer to [PCS-25, "DTC Index"](#).

1.CHECK DTC PRIORITY

If DTC P24A8 is displayed with DTC P0217, P0560 or P0651, first perform the trouble diagnosis for DTC P0217, P0560 or P0651.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-494, "YS23DDT : DTC Index"](#) (YS23DDTT).

NO >> GO TO 2.

2.VISUALLY CHECK ELECTRIC EGR COOLING WATER PUMP 1 AND ELECTRIC EGR COOLING WATER PUMP 2

P24A8 ELECTRIC EGR COOLING WATER PUMP 2

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Visually check the electric EGR cooling water pump 1, electric EGR cooling water pump 2, and pipes.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK ENGINE COOLANT CIRCUIT

Refer to [CO-57. "Engine Cooling System"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK IPDM E/R HARNESS CONNECTOR CONNECTION

1. Turn ignition switch OFF.

2. Check IPDM E/R harness connector connection.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair error-detected parts.

5.CHECK ECM HARNESS CONNECTOR CONNECTION

Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair error-detected parts.

6.CHECK ELECTRIC EGR COOLING WATER PUMP 1 AND ELECTRIC EGR COOLING WATER PUMP 2 HARNESS CONNECTOR CONNECTION

Check electric EGR cooling water pump 1 and electric EGR cooling water pump 2 harness connector connection.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected parts.

7.CHECK ELECTRIC EGR COOLING WATER PUMP 1 CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect EGR cooling water pump 1 harness connector.

3. Check electric EGR cooling water pump 1 circuit for open and short.

Electric EGR cooling water pump 1		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E103	2	F59	114	Existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace error-detected parts.

8.CHECK ELECTRIC EGR COOLING WATER PUMP 2 CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.

2. Disconnect EGR cooling water pump 2 harness connector.

3. Check electric EGR cooling water pump 2 circuit for open and short.

Electric EGR cooling water pump 2		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E104	2	F59	107	Existed

Is the inspection result normal?

P24A8 ELECTRIC EGR COOLING WATER PUMP 2

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> GO TO 9.

NO >> Repair or replace error-detected parts.

9.CHECK ELECTRIC EGR COOLING WATER PUMP 1 GROUND CIRCUIT

Check the continuity between electric EGR cooling water pump 1 sensor harness connector and ground.

Electric EGR cooling water pump 1		—	Continuity
Connector	Terminal		
E103	3	Ground	Existed

Is the inspection result normal?

YES >> GO TO 10.

NO >> Perform trouble diagnosis for power supply circuit.

10.CHECK ELECTRIC EGR COOLING WATER PUMP 2 GROUND CIRCUIT

Check the continuity between electric EGR cooling water pump 2 sensor harness connector and ground.

Electric EGR cooling water pump 2		—	Continuity
Connector	Terminal		
E104	3	Ground	Existed

Is the inspection result normal?

YES >> GO TO 11.

NO >> Perform trouble diagnosis for power supply circuit.

11.CHECK ELECTRIC EGR COOLING WATER PUMP 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check the power supply of the electric EGR cooling water pump 1.

+		-	Voltage
Electric EGR cooling water pump 1			
Connector	Terminal	Ground	Battery voltage
E103	1		

Is the inspection result normal?

YES >> GO TO 12.

NO >> Perform trouble diagnosis for power supply circuit.

12.CHECK ELECTRIC EGR COOLING WATER PUMP 2 POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check the power supply of the electric EGR cooling water pump 2.

+		-	Voltage
Electric EGR cooling water pump 2			
Connector	Terminal	Ground	Battery voltage
E104	1		

Is the inspection result normal?

YES >> GO TO 13.

NO >> Repair or replace error-detected parts.

13.CHECK ELECTRIC EGR COOLING WATER PUMP 1

NOTE:

 **WITH CONSULT**

Perform "FIRST EGR COOLING PUMP" in "ACTIVE TEST" mode.

Is the inspection result normal?

P24A8 ELECTRIC EGR COOLING WATER PUMP 2

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> GO TO 14.

NO >> Replace electric EGR cooling water pump 1. Refer to [EM-317. "Removal and Installation"](#).

14. CHECK ELECTRIC EGR COOLING WATER PUMP 1

NOTE:

WITH CONSULT

Perform "SECOND EGR COOLING PUMP" in "ACTIVE TEST" mode.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace electric EGR cooling water pump 2. Refer to [EM-317. "Removal and Installation"](#).

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P253F ENGINE OIL DETERIORATED

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P253F ENGINE OIL DETERIORATED

DTC Description

INFOID:0000000014268079

DTC DETECTION LOGIC

NOTE:

If DTC P253F is displayed with DTC P0115, first perform the trouble diagnosis for DTC P0115. Refer to [EC-610, "DTC Description"](#).

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P253F	ENG OIL DILUTION (Engine oil deteriorated)	When engine oil is too much quantity.

POSSIBLE CAUSE

Too much engine oil

FAIL-SAFE

- DPF regeneration forbidden
- Torque limitation
- EGR valve closed
- Throttle valve opened

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P253F is displayed with DTC P0115, first perform the trouble diagnosis for DTC P0115.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-610, "Diagnosis Procedure"](#).
NO >> GO TO 2.

2..PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-758, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).
NO-1 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268080

1.CHECK DTC PRIORITY

If DTC P253F is displayed with DTC P0115, first perform the trouble diagnosis for DTC P0115.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-610, "Diagnosis Procedure"](#).
NO >> GO TO 2.

2.CHECK ENGINE OIL LEVEL

Check the engine oil level. Refer to [LU-43, "Inspection"](#).

CAUTION:

If after performed service regeneration, exchange the engine oil and engine oil filter.

Is the inspection result normal?

P253F ENGINE OIL DETERIORATED

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> GO TO 3.

NO >> Drain or refill engine oil. Refer to [LU-44, "Draining"](#) or [LU-44, "Refilling"](#).

3.CHECK OIL LEVEL SENSOR

Check oil level sensor. Refer to [MWI-93, "COMBINATION METER \(WITH INTELLIGENT KEY SYSTEM\) : Diagnosis Procedure"](#) (With intelligent key system), [MWI-95, "COMBINATION METER \(WITHOUT INTELLIGENT KEY SYSTEM\) : Diagnosis Procedure"](#) (With color display models without intelligent key system), [MWI-198, "Diagnosis Procedure"](#) (With monochrome display models without intelligent key system).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

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P2626 A/F SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2626 A/F SENSOR

DTC Description

INFOID:0000000014268081

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
	PROPOR RICH SEN CIRC (O2 sensor pumping current trim circuit/ open bank 1 sensor 1)	CO	
P2626			ECM detects air fuel ratio (A/F) sensor circuit is open circuit.

POSSIBLE CAUSE

- Harness or connectors (A/F sensor circuit is open.)
- A/F sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-760, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268082

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair error-detected parts.

2.CHECK AIR FUEL RATIO (A/F) SENSOR HARNESS CONNECTOR CONNECTIONS

Check A/F sensor harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK A/F SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect A/F sensor harness connector.
3. Check A/F sensor circuit for open and short.

ECM		A/F sensor		Continuity
Connector	Terminal	Connector	Terminal	
F59	95	F124	3	Existed
F55	8		2	
	41		1	

Is the inspection result normal?

YES >> GO TO 4.

P2626 A/F SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Repair or replace error-detected parts.

4.CHECK INTERMITTENT INCIDENT

Perform [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.REPLACE A/F SENSOR

Replace A/F sensor. Refer to [EM-322, "Removal and Installation"](#).

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner tool and approved anti-seize lubricant.

>> INSPECTION END

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P2681 THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2681 THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE

DTC Description

INFOID:0000000014268083

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2681	COOLANT CIRC SWITCHING S/V (Engine coolant bypass valve "A" control circuit/open)	• CC.0 • CC.1 • CO • 1.DEF • ECM detects thermo management valve control solenoid valve circuit is short circuit to ground. • ECM detects thermo management valve control solenoid valve circuit is short circuit to battery. • ECM detects thermo management valve control solenoid valve circuit is open circuit.

POSSIBLE CAUSE

- Harness or connectors (Thermo management valve control solenoid valve circuit is open or shorted.)
- Thermo management valve control solenoid valve

FAIL-SAFE

- Engine cooling fan activation
- EGR valve closed
- Throttle valve opened

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2681 is displayed with DTC P0651, first perform the trouble diagnosis for DTC P0651.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-693. "Diagnosis Procedure"](#).
NO >> GO TO 2.

2.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 1 second.
2. Start the engine.
3. Depressed accelerator pedal (full depressed), and then released accelerator pedal.
4. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-762. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [GI-45. "Intermittent Incident"](#).
NO-1 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268084

1.CHECK DTC PRIORITY

If DTC P2681 is displayed with DTC P0651, first perform the trouble diagnosis for DTC P0651.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-693. "Diagnosis Procedure"](#).
NO >> GO TO 2.

2.CHECK BATTERY VOLTAGE

Check the battery voltage.

Is the inspection result normal?

P2681 THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> GO TO 3.

NO >> Perform trouble diagnosis for battery. Refer to [PG-140, "How to Handle Battery"](#).

3.CHECK THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect thermo management valve control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check the voltage between thermo management valve control solenoid valve harness connector and ground.

+		-	Voltage
Thermo management valve control solenoid valve			
Connector	Terminal		
F100	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE CONTROL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between thermo management valve control solenoid valve harness connector and ECM harness connector.

Thermo management valve control solenoid valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F100	1	F59	68	Existed

4. Also check harness for short to power and short to ground.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE

Check the thermo management valve control solenoid valve. Refer to [EC-763, "Component Inspection \(Thermo Management Valve Control Solenoid Valve\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace error-detected parts.

Component Inspection (Thermo Management Valve Control Solenoid Valve)

INFOID:0000000014268085

1.CHECK THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE

1. Turn ignition switch OFF.
2. Disconnect thermo management valve control solenoid valve harness connector.
3. Check the resistance between thermo management valve control solenoid valve as per the following conditions.

Thermo management valve control solenoid valve		Condition		Resistance (Approx.)
Terminal				
1	2	Temperature	0 – 40°C (32 – 104°F)	43 – 49 Ω

Is the inspection result normal?

P2681 THERMO MANAGEMENT VALVE CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

YES >> **INSPECTION END**

NO >> Replace thermo management valve control solenoid valve. Refer to [EM-314, "Removal and Installation"](#).

P2688 FUEL HEATER

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2688 FUEL HEATER

DTC Description

INFOID:0000000014268086

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P2688	FUEL SUPPLY HEATER CONTROL (Fuel supply heater control circuit low)	• CO • CC.0 • CC.1	• ECM detects fuel heater circuit is open when transmits deactivating command for 2 seconds. • ECM detects fuel heater circuit is short to ground when transmits deactivating command for 2 seconds. • ECM detects fuel heater circuit is short to battery when transmits activating command for 2 seconds.

POSSIBLE CAUSE

- Harness or connectors
(Fuel heater relay circuit is open or shorted.)
- Fuel heater relay
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always turn ignition switch OFF and wait at least 4 minute before conducting the next test.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON at least 1 second.
2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-765, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268087

1. CHECK FUSE

1. Turn ignition switch OFF.
2. Check that the following fuse is not blowing.

Fuse No.	Capacity
#60	30 A

Is the fuse blown (open)?

YES >> Replace the fuse after repairing the applicable circuit.

NO >> GO TO 2.

2. CHECK FUEL HEATER RELAY POWER SUPPLY

1. Turn ignition switch OFF.
2. Remove fuel heater relay.
3. Turn ignition switch ON.
4. Check the voltage between fuel heater relay harness connector and ground.

P2688 FUEL HEATER

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

+		-	Voltage
Fuel heater relay			
Connector	Terminal		
E109	1	Ground	Battery voltage
	3		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform the trouble diagnosis for power supply circuit.

3.CHECK FUEL HEATER RELAY CIRCUIT-1

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between fuel heater relay harness connector and ECM harness connector.

Fuel heater relay		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E109	2	F59	86	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK FUEL HEATER RELAY CIRCUIT-2

1. Disconnect fuel heater harness connector.
2. Check the continuity between fuel heater harness connector and fuel heater relay harness connector.

Fuel heater		Fuel heater relay		Continuity
Connector	Terminal	Connector	Terminal	
E106	1	E109	5	Existed

3. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK FUEL HEATER RELAY

Check the fuel heater relay. Refer to [EC-766, "Component Inspection \(Fuel Heater Relay\)"](#)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace error-detected parts.

Component Inspection (Fuel Heater Relay)

INFOID:0000000014268088

1.CHECK FUEL HEATER RELAY

1. Turn ignition switch OFF.
2. Remove fuel heater relay.

P2688 FUEL HEATER

< DTC/CIRCUIT DIAGNOSIS >

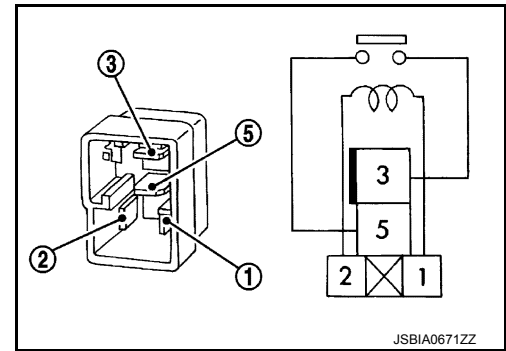
[YS23DDT/YS23DDTT (M9T)]

- Check continuity between fuel heater relay terminals as per the following condition.

Fuel heater relay		Condition	Continuity
Terminal			
3	5	12 V direct current supply between terminals 1 and 2	Existed
		No current supply	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Replace fuel heater relay.



P2A06 A/F SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

P2A06 A/F SENSOR

DTC Description

INFOID:000000014268089

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detecting condition
P2A06	PROPOR RICH SEN CIRC (O2 sensor negative voltage bank 1 sensor 1)	CO	ECM detects air fuel ratio (A/F) sensor ground circuit is open circuit.

POSSIBLE CAUSE

- Harness or connectors (A/F sensor circuit is open.)
- A/F sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DIAGNOSIS PROCEDURE

NOTE:

DTC P2A06 can not duplicate.

>> Proceed to [EC-768, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000014268090

1.CHECK ECM HARNESS CONNECTOR CONNECTIONS

1. Turn ignition switch OFF.
2. Check ECM harness connector connection.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair error-detected parts.

2.CHECK AIR FUEL RATIO (A/F) SENSOR HARNESS CONNECTOR CONNECTIONS

Check A/F sensor harness connector connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair error-detected parts.

3.CHECK A/F SENSOR CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect A/F sensor harness connector.
3. Check A/F sensor circuit for open and short.

ECM		A/F sensor		Continuity
Connector	Terminal	Connector	Terminal	
F55	8	F124	2	Existed
	41		1	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK INTERMITTENT INCIDENT

Perform [GI-45, "Intermittent Incident"](#).

P2A06 A/F SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.REPLACE A/F SENSOR

Replace A/F sensor. Refer to [EM-322. "Removal and Installation"](#).

CAUTION:

- Discard any A/F sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.
- Before installing new A/F sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner tool and approved anti-seize lubricant.

>> INSPECTION END

A

EC

C

D

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F

G

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M

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O

P

FUEL PUMP

Component Function Check

INFOID:0000000014268091

1.CHECK FUEL PUMP FUNCTION

1. Turn ignition switch ON.
2. Pinch fuel feed hose with two fingers.

NOTE:

Fuel pressure pulsation should be felt on the fuel feed hose for 1 second after ignition switch is turned ON.

Is the inspection result normal?

YES >> INSPECTION END

NO >> [EC-770, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268092

1.CHECK FPCM POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect FPCM harness connector.
3. Turn ignition switch ON.
4. Check the voltage between FPCM harness connector and ground.

+		-	Voltage
FPCM			
Connector	Terminal		
C21	7	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform the trouble diagnosis for power supply circuit. Refer to [EC-570, "Diagnosis Procedure"](#).

2.CHECK FPCM GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check the continuity between FPCM harness connector and ground.

FPCM		—	Continuity
Connector	Terminal		
C21	8		
C21	8	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to power in harness or connectors.

3.CHECK FUEL PUMP RELAY CIRCUIT

Refer to [EC-634, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK FPCM INPUT CIRCUIT

1. Disconnect IPDM E/R harness connector.
2. Check the continuity between FPCM harness connector and IPDM E/R harness connector.

IPDM E/R		FPCM		Continuity
Connector	Terminal	Connector	Terminal	
E119	10	C21	7	
E119	10	C21	7	Existed

FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

3. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace error-detected parts.

5.CHECK FUEL PUMP CONTROL CIRCUIT

1. Disconnect fuel level sensor unit (fuel pump) harness connector.

2. Check the continuity between FPCM harness connector and fuel level sensor unit (fuel pump) harness connector.

FPCM		Fuel level sensor unit (fuel pump)		Continuity
Connector	Terminal	Connector	Terminal	
C20	3	C19	3	Existed
	4		6	
	1		5	
	2		4	

3. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected parts.

6.CHECK FUEL PUMP

Refer to [EC-771, "Component Inspection \(Fuel Pump\)"](#).

Is the inspection result normal?

YES >> Replace FPCM. Refer to [EC-800, "Removal and Installation"](#).

NO >> Replace fuel pump. Refer to [FL-47, "Removal and Installation"](#).

Component Inspection (Fuel Pump)

INFOID:0000000014268093

1.CHECK FUEL PRESSURE REGULATOR

1. Turn ignition switch OFF.

2. Check low fuel pressure.

Is inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK FUEL PUMP

1. Turn ignition switch OFF.

2. Disconnect fuel level sensor unit (fuel pump).

3. Check continuity between fuel level sensor unit (fuel pump) terminals as follows.

Fuel level sensor unit (fuel pump)		Continuity
Terminals		
3	4	Existed
	5	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace Fuel pump. Refer to [FL-47, "Removal and Installation"](#).

BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

BRAKE SWITCH

Component Function Check

INFOID:0000000014268094

1.CHECK BRAKE SWITCH FUNCTION

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals as per the following.

ECM			Condition		Voltage (Approx.)
Connector	+	−			
	Terminal				
E12	133	135	Brake pedal	Slightly de- pressed	0 V
				Fully released	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to [EC-772, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268095

1.CHECK BRAKE SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Turn ignition switch ON.
4. Check the voltage between brake pedal position switch harness connector and ground.

+		-	Voltage
Brake pedal position switch			
Connector	Terminal		
E37	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform the trouble diagnosis for power supply circuit.

2.CHECK BRAKE SWITCH INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between brake pedal position switch harness connector and ECM harness connector.

Brake pedal position switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E37	2	E12	133	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK BRAKE PEDAL POSITION SWITCH

Check the brake pedal position switch. Refer to [EC-773, "Component Inspection \(Brake Pedal Position Switch\)"](#).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

NO >> Repair or replace error-detected parts.

Component Inspection (Brake Pedal Position Switch)

INFOID:0000000014268096

1.CHECK BRAKE PEDAL POSITION SWITCH-1

1. Turn ignition switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Check the continuity between brake pedal position switch terminals as per the following conditions.

Brake pedal position switch		Condition		Continuity
Terminals				
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 2.

2.CHECK BRAKE PEDAL POSITION SWITCH-2

1. Adjust brake pedal position switch installation. Refer to [BR-10. "Adjustment"](#).
2. Check the continuity between brake pedal position switch terminals as per the following conditions.

Brake pedal position switch		Condition		Continuity
Terminals				
1	2	Brake pedal	Fully released	Existed
			Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20. "Removal and Installation"](#).

CLUTCH PEDAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

CLUTCH PEDAL POSITION SWITCH

Component Function Check

INFOID:0000000014268097

1.CHECK CLUTCH PEDAL POSITION SWITCH FUNCTION

With CONSULT

1. Turn ignition switch ON.
2. Select "CL START OF TRAVEL SW" in "DATA MONITOR" mode with CONSULT.
3. Check "CL START OF TRAVEL SW" indication as per the following conditions.

Monitor item	Condition		Indication
CL START OF TRAVEL SW	Clutch pedal	Fully depressed	PRESSED
		Fully released	RELSD

Without CONSULT

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage (Approx.)
Connector	+	-		
	Terminal			
E12	131	135	Clutch pedal Fully depressed	Battery voltage
			Fully released	0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to [EC-774, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268098

1.CHECK CLUTCH PEDAL POSITION SWITCH POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect clutch pedal position switch harness connector.
3. Turn ignition switch ON.
4. Check the voltage between clutch pedal position switch harness connector and ground.

+		–	Voltage
Clutch pedal position switch			
Connector	Terminal		
E43	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2.CHECK CLUTCH PEDAL POSITION SWITCH SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between clutch pedal position switch harness connector and ECM harness connector.

Clutch pedal position switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E43	1	E12	131	Existed

Is the inspection result normal?

CLUTCH PEDAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

- YES >> GO TO 3.
NO >> Repair or replace error-detected parts.

3.CHECK CLUTCH PEDAL POSITION SWITCH GROUND CIRCUIT

Check the continuity between clutch pedal position switch harness connector and ground.

Clutch pedal position switch		—	Continuity
Connector	Terminal		
E43	2	Ground	Existed

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace error-detected parts.

4.CHECK CLUTCH PEDAL POSITION SWITCH

Check clutch pedal position switch. Refer to [EC-775, "Component Inspection \(Clutch Pedal Position Switch\)"](#)

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair or replace error-detected parts.

Component Inspection (Clutch Pedal Position Switch)

INFOID:0000000014268099

1.CHECK CLUTCH PEDAL POSITION SWITCH-I

1. Turn ignition switch OFF.
2. Disconnect clutch pedal position switch harness connector.
3. Check the continuity between clutch pedal position switch terminals as per the following conditions.

Clutch pedal position switch		Condition		Continuity
Terminals				
1	2	Clutch pedal	Fully released	Existed
			Fully depressed	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 2.

2.CHECK CLUTCH PEDAL POSITION SWITCH-II

1. Adjust clutch pedal position switch installation. Refer to [CL-9, "Inspection and Adjustment"](#).
2. Check the continuity between clutch pedal position switch terminals as per the following conditions.

Clutch pedal position switch		Condition		Continuity
Terminals				
1	2	Clutch pedal	Fully released	Existed
			Fully depressed	Not existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace clutch pedal position switch. Refer to [CL-14, "Removal and Installation"](#).

DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH

Description

INFOID:0000000014268100

Diesel particulate filter manual regeneration switch is located on the instrument panel. For details about performing diesel particulate filter manual regeneration, refer to [EC-560, "Description"](#).

Component Function Check

INFOID:0000000014268101

1.CHECK DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH FUNCTION

1. Start the engine.
2. Check the voltage between ECM harness connector terminals as per the following.

ECM				Condition	Voltage
+		−			
Connector	Terminal	Connector	Terminal		
F55	53	E12	135	Diesel particulate filter manual regeneration switch: ON	Approx. 0V
				Diesel particulate filter manual regeneration switch: OFF	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to [EC-776, "Diagnosis Procedure"](#).

2.CHECK DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH INDICATOR FUNCTION

1. Turn ignition switch ON.
2. Check that diesel particulate filter manual regeneration switch indicator illuminates.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Go to [EC-776, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268102

1.CHECK DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect diesel particulate filter manual regeneration switch harness connector.
3. Turn ignition switch ON.
4. Check the voltage between diesel particulate filter manual regeneration switch harness connector and ground.

+		-	Voltage
Diesel particulate filter manual regeneration switch			
Connector	Terminal		
M150	5	Ground	Battery voltage
	6		

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

2.CHECK DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.

DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

3. Check the continuity between diesel particulate filter manual regeneration switch harness connector and ECM harness connector.

Diesel particulate filter manual re-generation switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	
M150	3	F59	80	Existed
	8	F55	53	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit, short to ground or short to power in harness or connectors.

3.CHECK DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH

Refer to [EC-777, "Component Inspection \(DPF Manual Regeneration Switch\)"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace diesel particulate filter manual regeneration switch.

4.CHECK INTERMITTENT INCIDENT

Refer to [GI-45, "Intermittent Incident"](#).

>> INSPECTION END

Component Inspection (DPF Manual Regeneration Switch)

INFOID:0000000014268103

1.CHECK DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH

1. Turn ignition switch OFF.
2. Disconnect diesel particulate filter manual regeneration switch harness connector.
3. Check the continuity between diesel particulate filter manual regeneration switch harness connectors under the following conditions.

Terminal		Condition		Continuity
3	5 and 6	Diesel particulate filter manual regeneration switch	ON	Not existed
8			OFF	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace diesel particulate filter manual regeneration switch. Refer to [EC-801, "Removal and Installation"](#).

DIESEL PARTICULATE FILTER WARNING LIGHT

< DTC/CIRCUIT DIAGNOSIS >

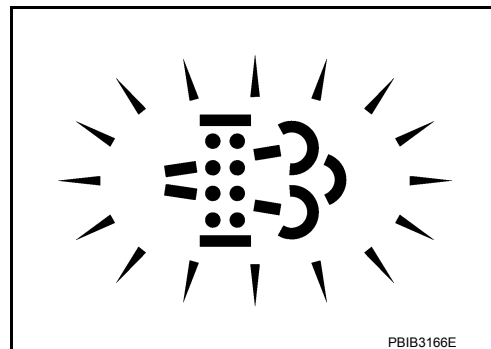
[YS23DDT/YS23DDTT (M9T)]

DIESEL PARTICULATE FILTER WARNING LIGHT

Description

INFOID:0000000014268104

Diesel particulate filter warning light is located on combination meter. When ignition switch turns ON without starting engine, diesel particulate filter warning light turns ON. Bulb is checked by this. After engine is started, diesel particulate filter warning light turns OFF. If diesel particulate filter warning lights stays ON, diesel particulate filter manual regeneration must be performed. For details about performing diesel particulate filter manual regeneration, refer to [EC-560, "Description"](#).



Component Function Check

INFOID:0000000014268105

1.CHECK DIESEL PARTICULATE FILTER WARNING LIGHT FUNCTION

1. Turn ignition switch ON.
2. Check that diesel particulate filter warning light illuminates.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Go to [EC-778, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268106

1.CHECK DTC WITH ECM

Check the self-diagnosis result with CONSULT. Check the ECM does not detect any DTCs. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

Is any DTC detected?

- YES >> Perform trouble diagnosis of detected DTC.
NO >> GO TO 2.

2.CHECK COMBINATION METER

Refer to [MWI-82, "Work flow"](#) (with color information display), [MWI-189, "Work flow"](#) (with monochrome information display).

Is the inspection result normal?

- YES >> Refer to [GI-45, "Intermittent Incident"](#).
NO >> Repair or replace error-detected parts.

GLOW CONTROL SYSTEM

Diagnosis Procedure

INFOID:0000000014268107

1.CHECK INSTALLATION

Check that glow plug terminals (nuts) are installed properly.

Are glow plug terminals (nuts) installed properly?

YES >> GO TO 2.

NO >> Install properly.

2.CHECK DTC WITH ECM

Check the self-diagnosis result with CONSULT. Check the ECM does not detect any DTCs. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

Is any DTC detected?

YES >> Perform trouble diagnoses for detected DTC.

NO >> GO TO 3.

3.CHECK HARNESS CONTINUITY BETWEEN GLOW CONTROL UNIT AND GLOW PLUG FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect glow control unit harness connector and glow plug terminals (nuts).
3. Check harness continuity between glow control unit harness connector and glow plug terminals.

Glow control unit		Glow plug		Continuity
Connector	Terminal	Connector	Terminal	
E28	2	F117 (No. 1)	1	Existed
	7	F116 (No. 2)	1	
	1	F115 (No. 3)	1	
	6	F118 (No. 4)	1	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK GLOW PLUG

Check glow plug. Refer to [EC-779, "Component Inspection \(Glow Plug\)"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace glow plug. Refer to [EM-332, "Removal and Installation"](#).

5.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace glow control unit. Refer to [EC-799, "Removal and Installation"](#).

NO >> INSPECTION END

Component Inspection (Glow Plug)

INFOID:0000000014268108

CAUTION:

- Do not bump glow plug heating element. If it is bumped, replace glow plug with a new one.
- If glow plug is dropped from a height of 10 cm (3.94 in) or higher, replace with a new one.
- If glow plug installation hole is contaminated with carbon, remove it with a reamer or suitable tool.

GLOW CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

- **Hand-tighten glow plug by turning it two or three times, then tighten using a tool to specified torque.**

1. CHECK GLOW PLUG

1. Turn ignition switch OFF.
2. Disconnect glow plug terminals (nuts).
3. Remove a glow plug.
4. Check resistance between glow plug terminal and glow plug stem.

Terminals	Condition		Resistance (Approx.)
1 and glow plug stem	Temperature	20°C (68°F)	0.1 – 1 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning glow plug. Refer to [EM-332. "Removal and Installation"](#).

GLOW INDICATOR

Component Function Check

INFOID:0000000014268109

1.CHECK GLOW INDICATOR FUNCTION

1. Turn ignition switch ON.
2. Check the glow indicator is turned ON, and then glow indication turned OFF.

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Proceed to [EC-781, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268110

1.CHECK DTC WITH "ECM"

Check the self-diagnosis result with CONSULT. Check the ECM does not detect any DTCs. Refer to [EC-494, "YS23DDT : DTC Index"](#) (YS23DDT) or [EC-521, "YS23DDTT : DTC Index"](#) (YS23DDTT).

Is any DTC detected?

- YES >> Perform trouble diagnosis of detected DTC.
 NO >> GO TO 2.

2.CHECK CAN COMMUNICATION LINE

Check CAN communication line. Refer to [LAN-24, "Trouble Diagnosis Flow Chart"](#).

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace malfunctioning parts.

3.CHECK DTC WITH "COMBINATION METER"

Check the self-diagnosis result with CONSULT. Check the combination meter does not detect any DTCs. Refer to [MWI-39, "DTC Index"](#) (With intelligent key system), [MWI-46, "EXCEPT BCM FUNCTION : DTC Index"](#) (With color display models without intelligent key system), [MWI-171, "EXCEPT BCM FUNCTION : DTC Index"](#) (With monochrome display models without intelligent key system).

Is any DTC detected?

- YES >> Perform trouble diagnosis of detected DTC.
 NO >> GO TO 4.

4.CHECK INTERMITTENT INCIDENT

Perform [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace combination meter. Refer to [MWI-137, "Removal and Installation"](#) (With color display), [MWI-217, "Removal and Installation"](#) (With monochrome display).
 NO >> Repair or replace malfunctioning parts.

REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

REFRIGERANT PRESSURE SENSOR

Component Function Check

INFOID:0000000014268111

NOTE:

If DTC P0530 is displayed, first perform the trouble diagnosis for DTC P0530. Refer to [EC-670, "Diagnosis Procedure"](#).

1.CHECK OVERALL FUNCTION

With CONSULT

1. Start the engine.
2. Select "REFRIGERANT PRESSURE" in "DATA MONITOR" mode of "ECM" with CONSULT.
3. Turn A/C switch and blower fan switch ON.
4. Check the monitor status.

Monitor Item		Indication
REFRIGERANT PRESSURE		Indicates refrigerant pressure

Without CONSULT

1. Start the engine.
2. Turn A/C switch and blower fan switch ON.
3. Check voltage between ECM harness connector and ground.

+		-	Voltage (Approx.)
ECM			
Connector	Terminal		
F55	17	Ground	1.2 – 1.3 V

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 2.

2.CHECK REFRIGERANT PRESSURE

Check refrigerant pressure. Refer to [HA-119, "Trouble Diagnosis For Unusual Pressure"](#).

Is the inspection result normal?

- YES >> Proceed to [EC-782, "Diagnosis Procedure"](#).
NO >> Repair refrigerant system.

Diagnosis Procedure

INFOID:0000000014268112

1.CHECK REFRIGERANT PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect refrigerant pressure sensor harness connector and ECM harness connector.
3. Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

Refrigerant pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E49	3	F55	49	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2.CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

1. Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

Refrigerant pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E49	1	F55	56	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Harness for open or short between ECM and refrigerant pressure sensor.

3. CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between ECM harness connector and refrigerant pressure sensor harness connector.

Refrigerant pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E49	2	F55	17	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Replace refrigerant pressure sensor. Refer to [HAC-120. "Removal and Installation"](#) (Automatic air conditioned), [HAC-210. "Removal and Installation"](#) (Manual A/C type 1), or [HAC-273. "Removal and Installation"](#) (Manual A/C type 2).

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

MALFUNCTION INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

MALFUNCTION INDICATOR LAMP

Component Function Check

INFOID:0000000014268113

1.CHECK MIL FUNCTION

1. Turn ignition switch ON.
2. Check that MIL illuminates.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Proceed to [EC-784. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268114

1.CHECK DTC WITH ECM

Check the self-diagnosis result with CONSULT. Check the ECM does not detect any DTCs. Refer to [EC-494. "YS23DDT : DTC Index"](#) (YS23DDT), [EC-521. "YS23DDTT : DTC Index"](#) (YS23DDTT).

Is any DTC detected?

- YES >> Perform trouble diagnosis of detected DTC.
NO >> GO TO 2.

2.CHECK DTC WITH COMBINATION METER

Refer to [MWI-39. "DTC Index"](#) (With intelligent key system), [MWI-46. "EXCEPT BCM FUNCTION : DTC Index"](#) (With color display models without intelligent key system), [MWI-171. "EXCEPT BCM FUNCTION : DTC Index"](#) (With monochrome display models without intelligent key system).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Perform trouble diagnosis for DTC indicated.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-45. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace combination meter. Refer to [MWI-137. "Removal and Installation"](#) (With control display), [MWI-217. "Removal and Installation"](#) (With monochrome display).
NO >> Repair or replace malfunctioning part.

ENGINE CONTROL SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

SYMPTOM DIAGNOSIS

ENGINE CONTROL SYSTEM SYMPTOMS

YS23DDT

YS23DDT : Symptom Table

INFOID:0000000014268115

SYSTEM — Basic engine control system	SYMPTOM												Reference page	
	HARD/NO START/RESTART (EXCP. HA)				ENGINE STALL			HESITATION/SURGING/FLAT SPOT	KNOCK/DETONATION	LACK OF POWER	POOR ACCELERATION	HI IDLE		LOW IDLE
Warranty symptom code	AA				AB			AC	AD	AE		AF		
Engine body	x	x	x	x	x	x	x		x	x	x		x	EM-366
Air cleaner and duct			x	x	x			x		x	x		x	EM-307
ECM	x	x	x	x	x	x	x	x	x	x	x	x	x	EC-683 , EC-685 , EC-686
Camshaft position sensor circuit	x	x	x	x				x	x	x	x			EC-641
Crankshaft position sensor circuit	x	x	x	x	x	x	x	x	x	x	x			EC-639
Mass air flow sensor circuit			x	x				x		x	x			EC-599 , EC-601
Intake air temperature sensor 1 circuit			x											EC-608 , EC-608
Boost pressure sensor circuit								x		x	x			EC-603 , EC-605
Intake air temperature sensor 2 circuit														EC-597

ENGINE CONTROL SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

SYSTEM — Basic engine control system	SYMPTOM												Reference page	
	HARD/NO START/RESTART (EXCP. HA)				ENGINE STALL			HESITATION/SURGING/FLAT SPOT	KNOCK/DETONATION	LACK OF POWER	POOR ACCELERATION	HI IDLE		LOW IDLE
	NO START (with first firing)	NO START (without first firing)	HARD TO START WHEN ENGINE IS COLD	HARD TO START WHEN ENGINE IS HOT	AT IDLE	DURING DRIVING	WHEN DECELERATING							
Warranty symptom code	AA				AB			AC	AD	AE	AF			
Air fuel ratio (A/F) sensor circuit			x	x					x	x	x	x	x	EC-705 , EC-738 , EC-760 , EC-768 ,
Engine coolant temperature sensor circuit			x		x		x						x	EC-610
Fuel injector circuit	x	x	x	x	x	x	x	x	x	x	x	x	x	EC-620
High pressure fuel pump	x	x	x	x	x	x	x	x		x	x		x	—
Fuel rail pressure sensor circuit		x	x	x				x			x			EC-618
Fuel temperature sensor circuit														EC-579
Fuel heater circuit														EC-765
Water in fuel sensor circuit			x	x				x	x	x	x			EC-742
Turbocharger boost control solenoid valve circuit								x		x	x			EC-584
EGR volume control valve circuit								x		x	x			EC-646 , EC-648
EGR volume control valve position sensor circuit								x		x	x			EC-651
EGR cooler bypass valve control solenoid circuit								x		x	x			EC-747
EGR temperature sensor circuit								x		x	x			EC-653
Electric throttle control actuator circuit	x	x	x	x	x	x	x	x		x	x	x	x	EC-688 , EC-732
Throttle position sensor circuit		x	x	x				x		x	x	x	x	EC-612 ,
DPF (Diesel Particulate Filter)	x	x			x		x	x		x	x		x	EC-726
Engine oil pump control valve circuit														EC-716

ENGINE CONTROL SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

SYSTEM — Basic engine control system	SYMPTOM												Reference page		
	HARD/NO START/RESTART (EXCP. HA)				ENGINE STALL			HESITATION/SURGING/FLAT SPOT	KNOCK/DETONATION	LACK OF POWER	POOR ACCELERATION	HI IDLE		LOW IDLE	
	NO START (with first firing)	NO START (without first firing)	HARD TO START WHEN ENGINE IS COLD	HARD TO START WHEN ENGINE IS HOT	AT IDLE	DURING DRIVING	WHEN DECELERATING								
Warranty symptom code	AA				AB			AC	AD	AE		AF			
Exhaust gas pressure sensor 1 circuit								x		x	x				EC-656 , EC-659
DPF differential pressure sensor circuit	x	x			x		x	x		x	x		x		EC-709 , EC-744
Exhaust gas temperature sensor 1 circuit								x		x	x				EC-672 , EC-728
Exhaust gas temperature sensor 2 circuit								x		x	x				EC-712
Glow control unit circuit	x	x	x						x						EC-643
Glow plug circuit	x	x	x						x						EC-643
Thermo management valve control solenoid valve circuit					x	x		x		x	x				EC-762
EGR cooling water pump 1 and 2 circuit					x	x		x		x	x				EC-750 , EC-754
Accelerator pedal position sensor circuit								x		x	x				EC-629 , EC-632 , EC-734
Refrigerant pressure sensor circuit					x	x	x								EC-670
NATS (Nissan Anti-theft System)		x													SEC-69 , SEC-238

YS23DDTT

YS23DDTT : Symptom Table

INFOID:0000000014268116

ENGINE CONTROL SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

SYSTEM — Basic engine control system	SYMPTOM												Reference page	
	HARD/NO START/RESTART (EXCP. HA)				ENGINE STALL			HESITATION/SURGING/FLAT SPOT	KNOCK/DETONATION	LACK OF POWER	POOR ACCELERATION	HI IDLE		LOW IDLE
	NO START (with first firing)	NO START (without first firing)	HARD TO START WHEN ENGINE IS COLD	HARD TO START WHEN ENGINE IS HOT	AT IDLE	DURING DRIVING	WHEN DECELERATING							
Warranty symptom code	AA				AB			AC	AD	AE		AF		
Engine body	x	x	x	x	x	x	x		x	x	x		x	EM-366
Air cleaner and duct			x	x	x			x		x	x		x	EM-307
ECM	x	x	x	x	x	x	x	x	x	x	x	x	x	EC-683 , EC-685 , EC-686
Camshaft position sensor circuit	x	x	x	x				x	x	x	x			EC-641
Crankshaft position sensor circuit	x	x	x	x	x	x	x	x	x	x	x			EC-639
Mass air flow sensor circuit			x	x				x		x	x			EC-599 , EC-601
Intake air temperature sensor 1 circuit			x											EC-608 , EC-608
Boost pressure sensor circuit								x		x	x			EC-603 , EC-605
Intake air temperature sensor 2 circuit														EC-597
Air fuel ratio (A/F) sensor circuit			x	x					x	x	x	x	x	EC-705 , EC-738 , EC-760 , EC-768
Engine coolant temperature sensor circuit			x		x		x						x	EC-610
Fuel injector circuit	x	x	x	x	x	x	x	x	x	x	x	x	x	EC-620
High pressure fuel pump	x	x	x	x	x	x	x	x		x	x		x	—
Fuel rail pressure sensor circuit		x	x	x				x			x			EC-618
Fuel temperature sensor circuit														EC-579
Fuel heater circuit														EC-765

ENGINE CONTROL SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

SYSTEM — Basic engine control system	SYMPTOM												Reference page	
	HARD/NO START/RESTART (EXCP. HA)				ENGINE STALL			HESITATION/SURGING/FLAT SPOT	KNOCK/DETONATION	LACK OF POWER	POOR ACCELERATION	HI IDLE		LOW IDLE
	NO START (with first firing)	NO START (without first firing)	HARD TO START WHEN ENGINE IS COLD	HARD TO START WHEN ENGINE IS HOT	AT IDLE	DURING DRIVING	WHEN DECELERATING							
Warranty symptom code	AA				AB			AC	AD	AE		AF		
Water in fuel sensor circuit			x	x				x	x	x	x			EC-742
HP compressor bypass valve control solenoid valve circuit								x		x	x			EC-584
LP wastegate valve control solenoid valve circuit								x		x	x			EC-584
HP turbine bypass valve control solenoid valve circuit								x		x	x			EC-584
EGR volume control valve circuit								x		x	x			EC-646 , EC-648
EGR volume control valve position sensor circuit								x		x	x			EC-662
EGR cooler bypass valve control solenoid circuit								x		x	x			EC-747
EGR temperature sensor circuit								x		x	x			EC-653
Electric throttle control actuator circuit	x	x	x	x	x	x	x	x		x	x	x	x	EC-688 , EC-732
Throttle position sensor circuit		x	x	x				x		x	x	x	x	EC-612 ,
DPF (Diesel Particulate Filter)	x	x			x		x	x		x	x		x	EC-726
Engine oil pump control valve circuit														EC-716
Exhaust gas pressure sensor 1 circuit								x		x	x			EC-656 , EC-659
DPF differential pressure sensor circuit	x	x			x		x	x		x	x		x	EC-709 , EC-744
Exhaust gas temperature sensor 1 circuit								x		x	x			EC-672 , EC-728

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ENGINE CONTROL SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[YS23DDT/YS23DDTT (M9T)]

SYSTEM — Basic engine control system	SYMPTOM												Reference page			
	HARD/NO START/RESTART (EXCP. HA)				ENGINE STALL			HESITATION/SURGING/FLAT SPOT	KNOCK/DETONATION	LACK OF POWER	POOR ACCELERATION	HI IDLE		LOW IDLE		
	NO START (with first firing)	NO START (without first firing)	HARD TO START WHEN ENGINE IS COLD	HARD TO START WHEN ENGINE IS HOT	AT IDLE	DURING DRIVING	WHEN DECELERATING									
	Warranty symptom code				AA			AB	AC	AD	AE			AF		
	Exhaust gas temperature sensor 2 circuit								x		x	x				EC-712
	Glow control unit circuit				x	x	x				x					EC-643
	Glow plug circuit				x	x	x				x					EC-643
	Thermo management valve control solenoid valve circuit								x	x		x		x		EC-762
	EGR cooling water pump 1 and 2 circuit								x	x		x		x		EC-750 , EC-754
	Accelerator pedal position sensor circuit											x		x		EC-629 , EC-632 , EC-734
Refrigerant pressure sensor circuit								x	x	x					EC-670	
NATS (Nissan Anti-theft System)					x										SEC-69 , SEC-238	

PERIODIC MAINTENANCE

IDLE SPEED

Inspection

INFOID:0000000014268117

EC

1. CHECK IDLE SPEED

With CONSULT

Check "ENGINE SPEED" in "DATA MONITOR" mode with CONSULT.

Idle speed: Refer to [EC-802. "Idle Speed"](#).

>> INSPECTION END

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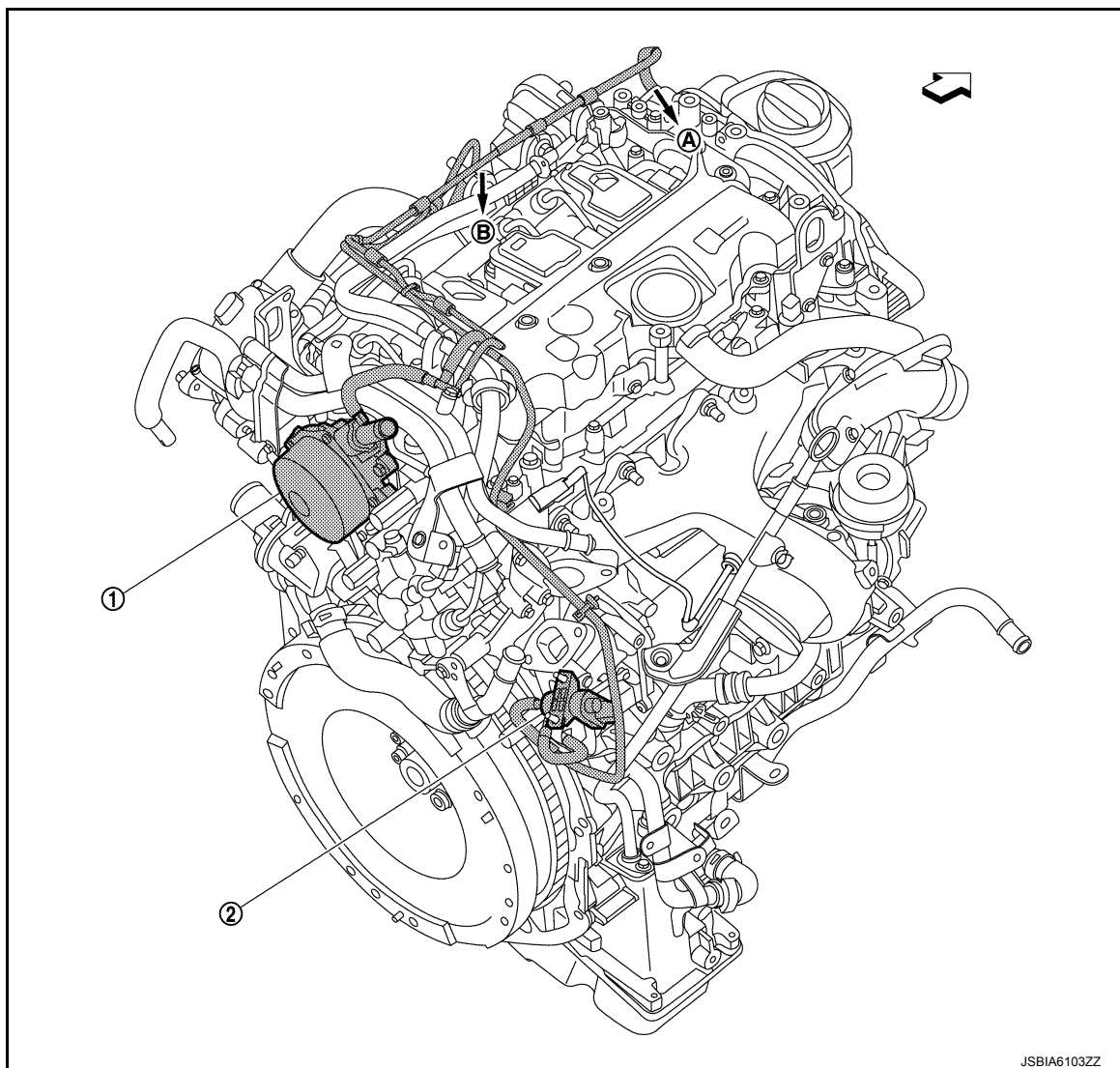
REMOVAL AND INSTALLATION

VACUUM LINES

YS23DDT

YS23DDT : Vacuum Layout

INFOID:000000014268118



① Vacuum pump

② EGR cooler bypass valve control solenoid valve

(A) To turbocharger boost control solenoid valve

(B) To thermo management valve control solenoid valve

⇐: Vehicle front

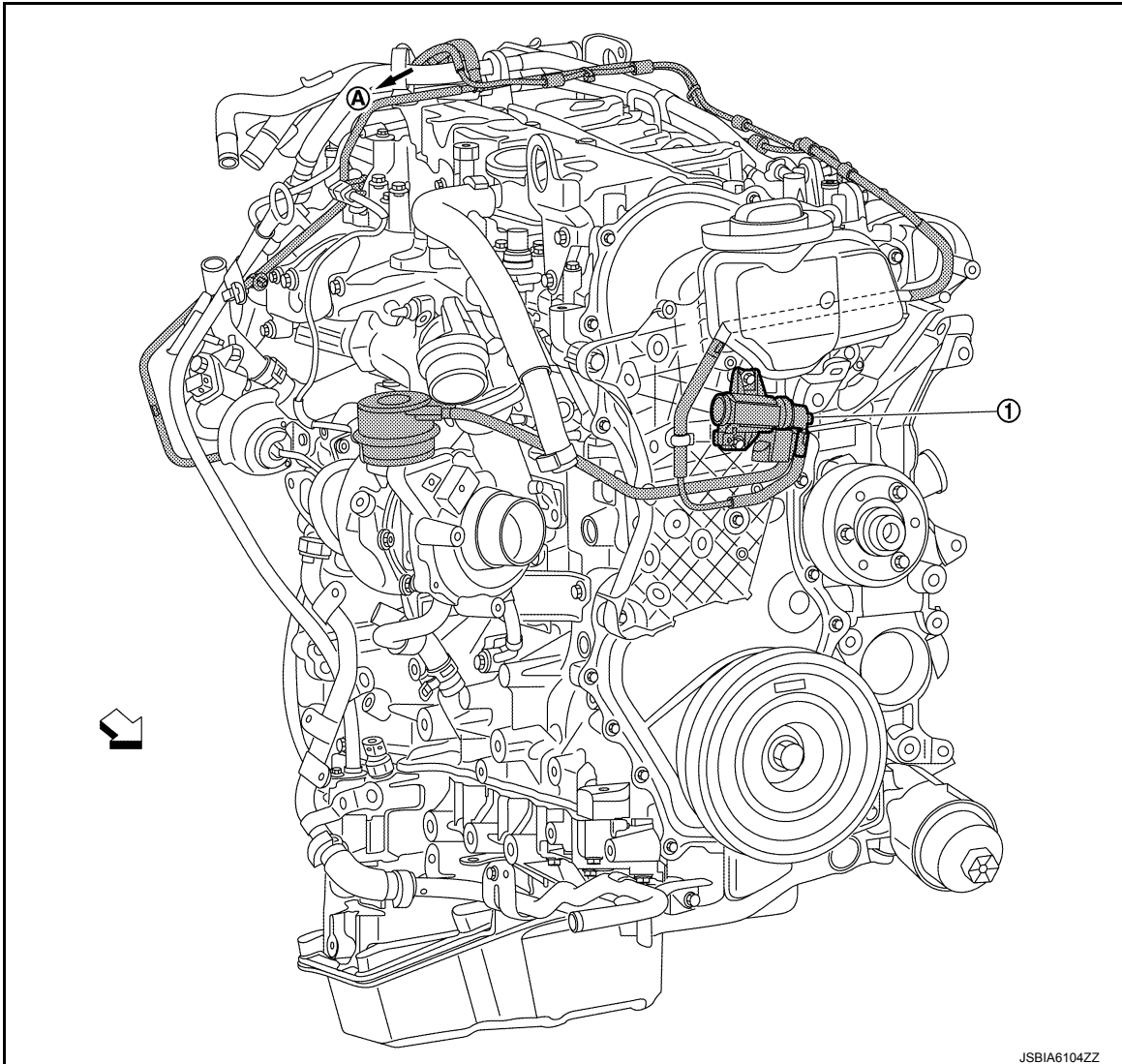
NOTE:

Do not use soapy water or any type of solvent while installing vacuum hose.

VACUUM LINES

< REMOVAL AND INSTALLATION >

[YS23DDT/YS23DDTT (M9T)]



① Turbocharger boost control solenoid valve

Ⓐ Vacuum pump

⇐: Vehicle front

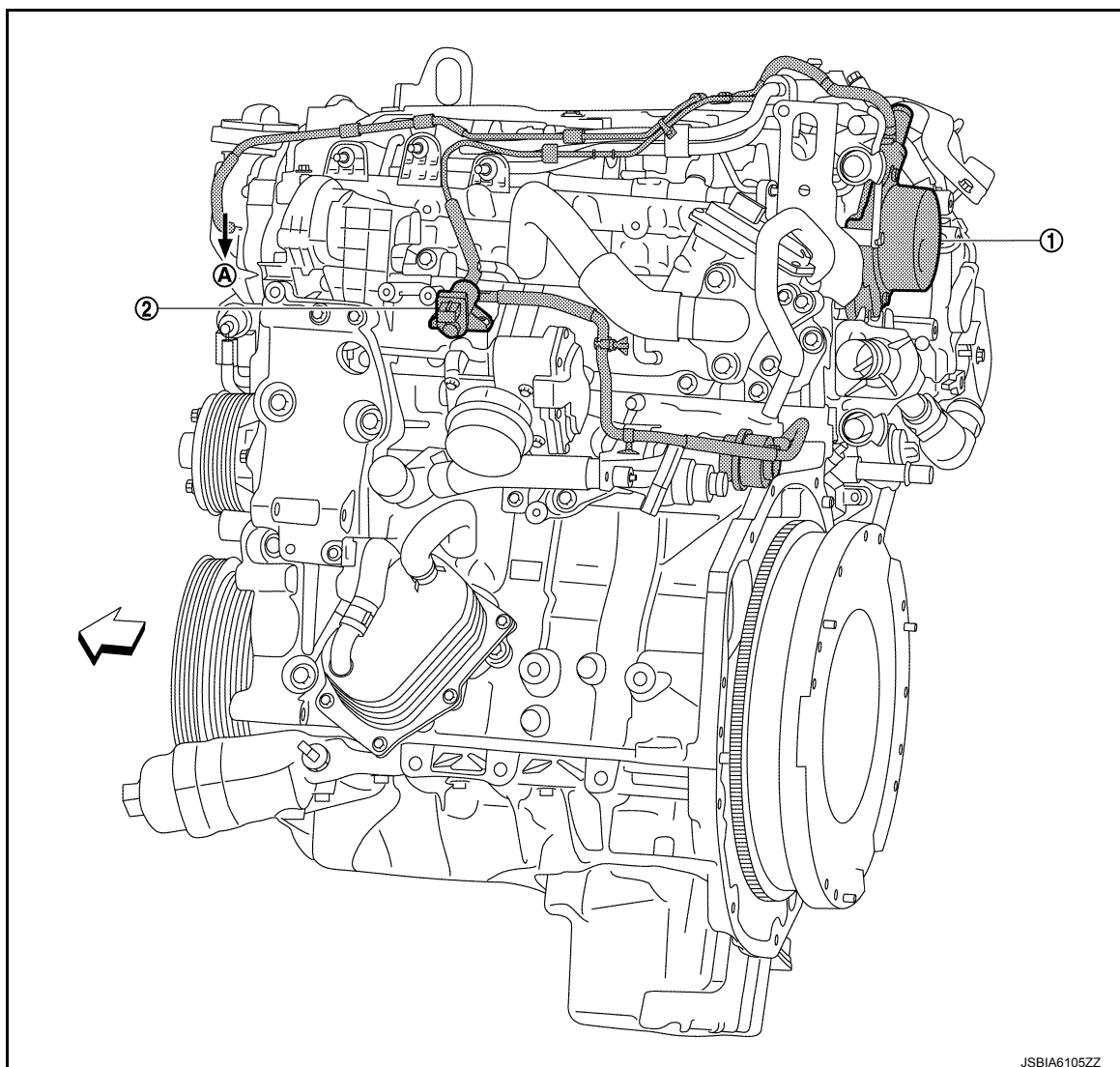
NOTE:

Do not use soapy water or any type of solvent while installing vacuum hose.

VACUUM LINES

< REMOVAL AND INSTALLATION >

[YS23DDT/YS23DDTT (M9T)]



① Vacuum pump

② Thermo management valve control solenoid valve

Ⓐ To turbocharger boost control solenoid valve

⇐: Vehicle front

NOTE:

Do not use soapy water or any type of solvent while installing vacuum hose.

YS23DDTT

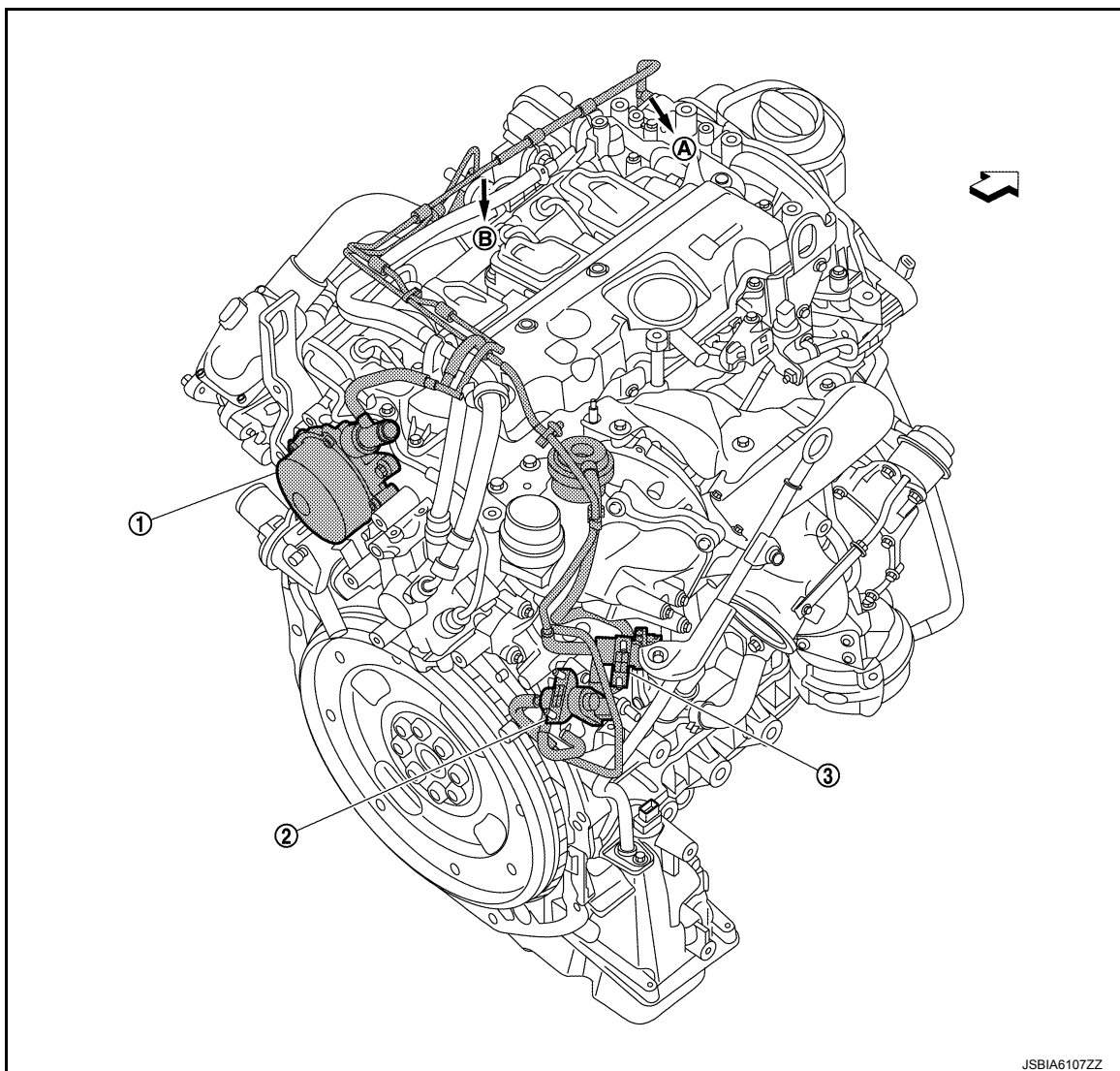
VACUUM LINES

< REMOVAL AND INSTALLATION >

[YS23DDT/YS23DDTT (M9T)]

YS23DDTT : Vacuum Layout

INFOID:0000000014268119



① Vacuum pump

② EGR cooler bypass valve control solenoid valve

③ HP compressor bypass valve control solenoid valve

Ⓐ To turbocharger system

Ⓑ To thermo management valve control solenoid valve

⇐: Vehicle front

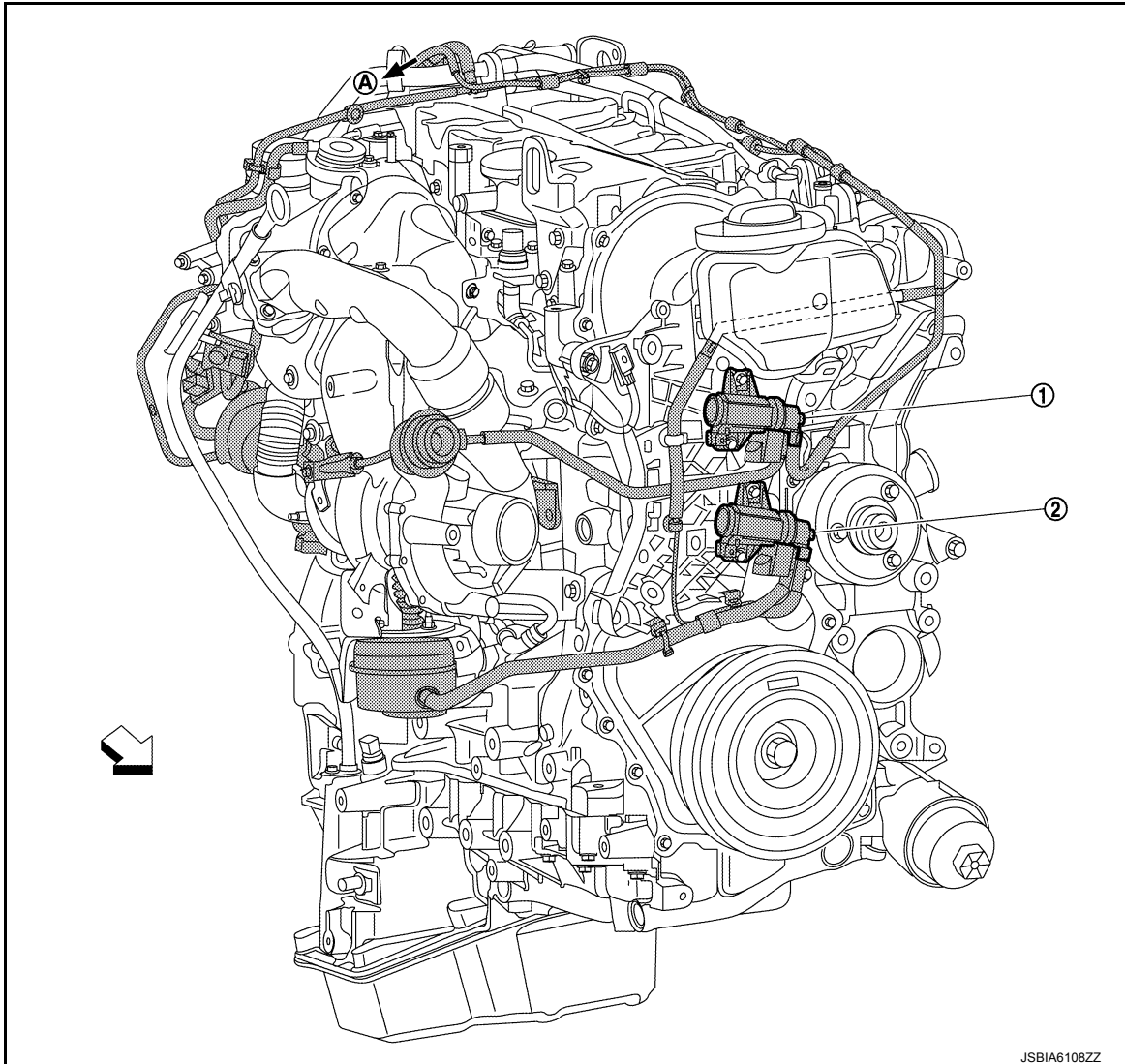
NOTE:

Do not use soapy water or any type of solvent while installing vacuum hose.

VACUUM LINES

< REMOVAL AND INSTALLATION >

[YS23DDT/YS23DDTT (M9T)]



① LP wastegate valve control solenoid valve

② HP turbine bypass valve control solenoid valve

Ⓐ Vacuum pump

⇐: Vehicle front

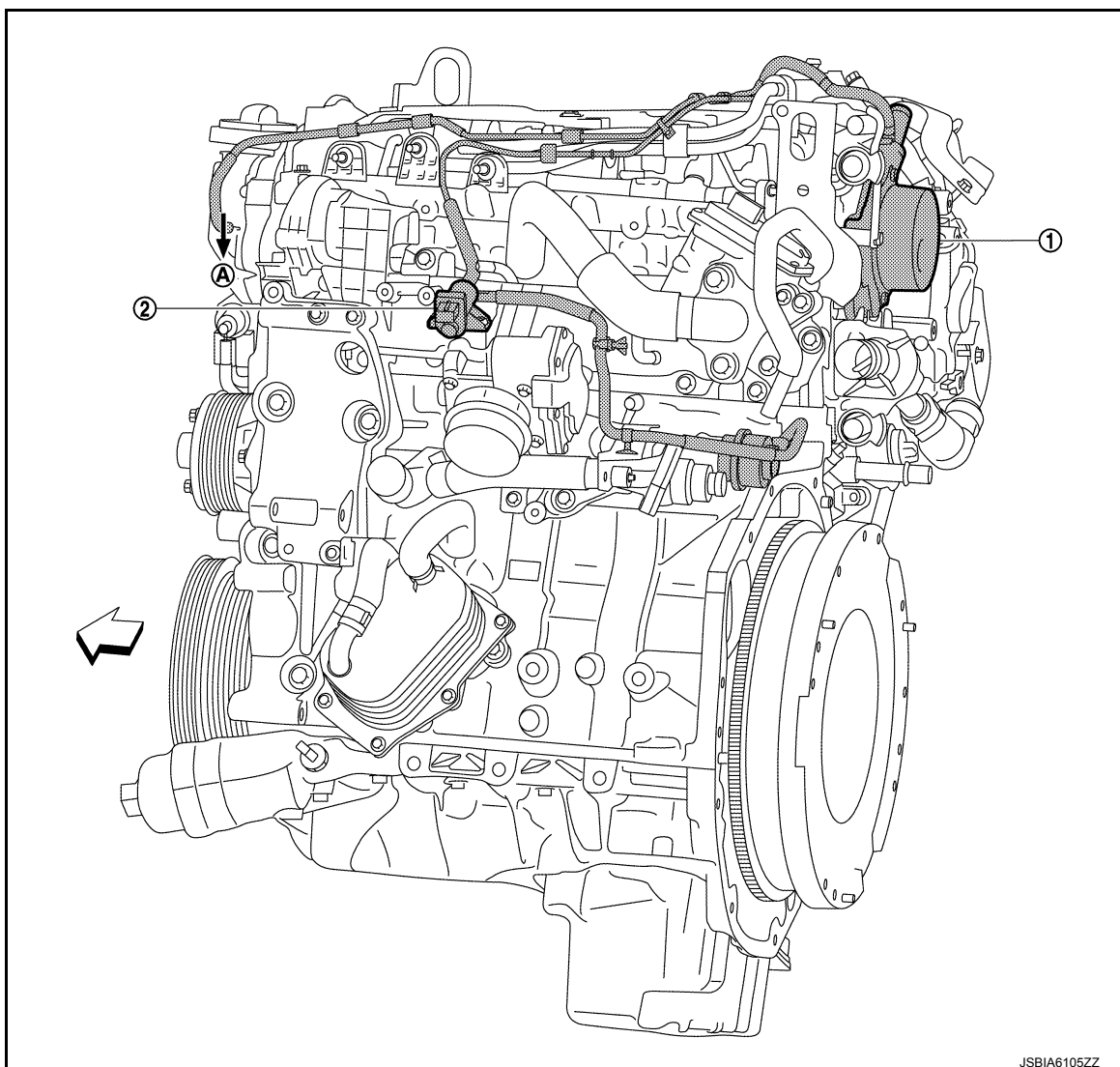
NOTE:

Do not use soapy water or any type of solvent while installing vacuum hose.

VACUUM LINES

< REMOVAL AND INSTALLATION >

[YS23DDT/YS23DDTT (M9T)]



① Vacuum pump

② Thermo management valve control solenoid valve

Ⓐ To turbocharger system

⇐: Vehicle front

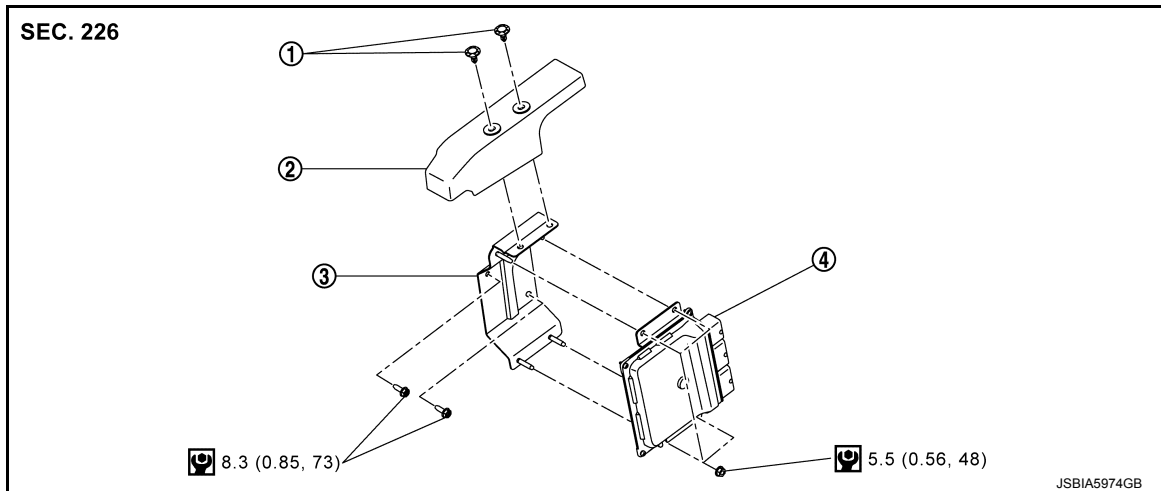
NOTE:

Do not use soapy water or any type of solvent while installing vacuum hose.

ECM

Exploded View

INFOID:000000014268120



① Clip

② ECM cover

③ ECM bracket

④ ECM

: N·m (kg·m, in-lb)

Removal and Installation

INFOID:000000014268121

CAUTION:

Perform **ADDITIONAL SERVICE WHEN REPLACING ECM**. Refer to [EC-553, "Description"](#).

REMOVAL

1. Remove ECM cover.
2. Remove air cleaner case. Refer to [EM-307, "Removal and Installation"](#).
3. Disconnect ECM harness connectors. Refer to HARNESS CONNECTOR (LEVER LOCKING TYPE) in [PG-9, "Harness Connector"](#).
4. Remove ECM mounting nuts.
5. Remove ECM from ECM bracket.

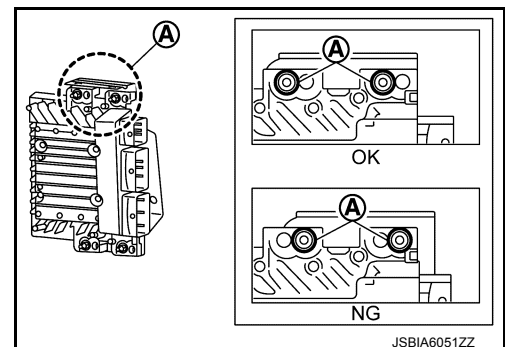
INSTALLATION

Note the following, and install in the reverse order of removal.

- Check the ECM position before installing ECM to bracket.

CAUTION:

The hole ① of ECM must be positioned as shown in the figure.



GLOW CONTROL UNIT

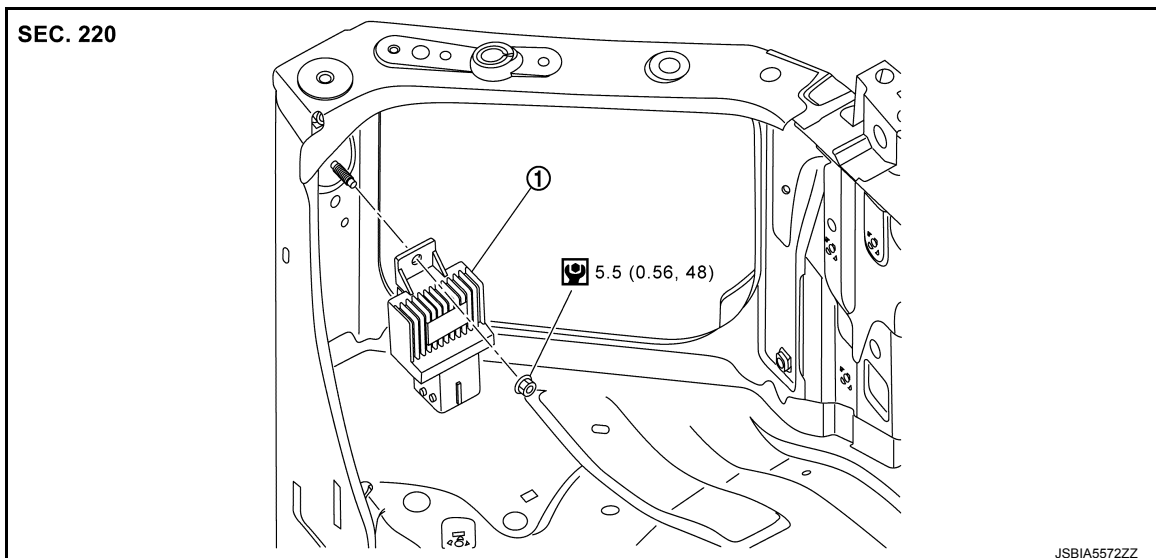
< REMOVAL AND INSTALLATION >

[YS23DDT/YS23DDTT (M9T)]

GLOW CONTROL UNIT

Exploded View

INFOID:0000000014268122



① Glow control unit

: N·m (kg-m, in-lb)

Removal and Installation

INFOID:0000000014268123

REMOVAL

1. Remove air duct (inlet). Refer to [EM-307. "Removal and Installation"](#).
2. Remove glow control unit mounting nuts.
3. Disconnect glow control unit harness connector.
4. Remove glow control unit from vehicle.

INSTALLATION

Install in the reverse order of removal.

FUEL PUMP CONTROL MODULE (FPCM)

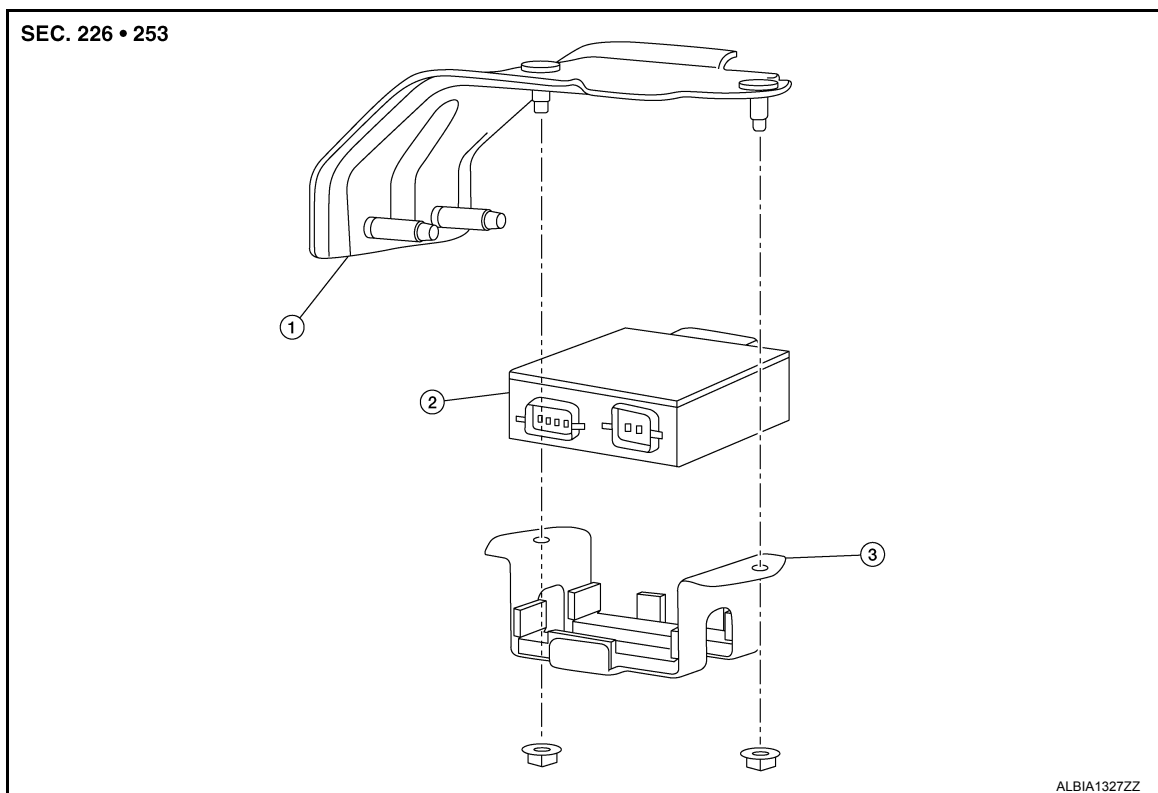
< REMOVAL AND INSTALLATION >

[YS23DDT/YS23DDTT (M9T)]

FUEL PUMP CONTROL MODULE (FPCM)

Exploded View

INFOID:0000000014268124



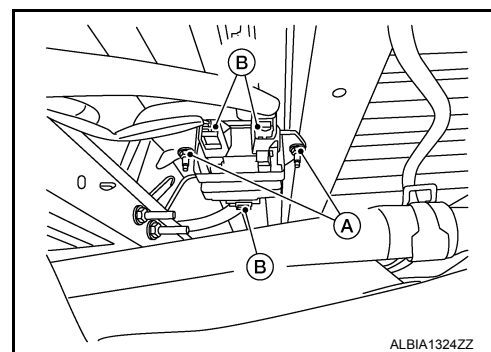
- ① Fuel pump control module bracket ② Fuel pump control module (FPCM) ③ Fuel pump control module bracket

Removal and Installation

INFOID:0000000014268125

REMOVAL

1. Disconnect the harness connectors ⑥ from the fuel pump control module (FPCM) and remove fuel pump control module bracket nuts ⑤.
2. Remove fuel pump control module (FPCM).



INSTALLATION

Install in the reverse order of removal.

DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH

< REMOVAL AND INSTALLATION >

[YS23DDT/YS23DDTT (M9T)]

DIESEL PARTICULATE FILTER MANUAL REGENERATION SWITCH

Removal and Installation

INFOID:0000000014268126

REMOVAL

1. Remove Instrument lower panel. Refer to [IP-12, "Exploded View"](#).
2. Remove DPF manual regeneration switch.

NOTE:

For design of DPF manual regeneration switch, refer to [EC-409, "DPF \(Diesel Particulate Filter\) Manual Regeneration Switch"](#).

INSTALLATION

Install in the reverse order of removal.

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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[YS23DDT/YS23DDTT (M9T)]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Idle Speed

INFOID:0000000014268127

Condition	Specification
No load* (in Neutral position)	750 ± 50 rpm

*: Under the following conditions

- A/C switch: OFF
- Electric load: OFF (Lights, glow plug, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

HOW TO USE THIS MANUAL

APPLICATION NOTICE

How to Check Vehicle Type

INFOID:0000000014268128

Check applicable parts to identify the type of service information of EC section. Refer to [EC-810, "Component Parts Location"](#).

×:Applicable —: Not applicable

Service information	Applicable part		
	Intake air temperature sensor 2	EGR volume control valve	EGR cooler bypass valve control solenoid valve
TYPE 1	×	×	×
TYPE 2	—	—	—

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:0000000014268129

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.

Precautions Necessary for Steering Wheel Rotation After Battery Disconnection

INFOID:0000000014268130

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Before removing and installing any control units, first turn the ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.

NOTE:

Supply power using jumper cables if battery is discharged.

2. Turn the ignition switch to ACC position.
(At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

Service Notice or Precautions for Steering System

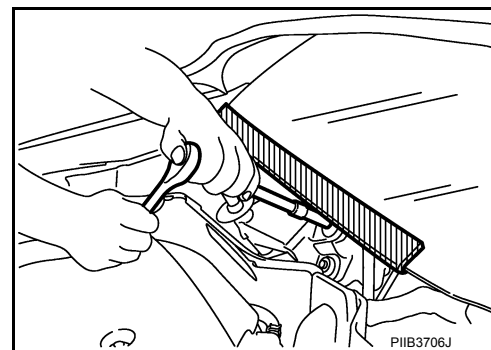
INFOID:0000000014268131

- In case of removing steering gear, make the final tightening with grounded and unloaded vehicle condition, and then check wheel alignment.
- Observe the following precautions when disassembling.
- Before disassembly, thoroughly clean the outside of the unit.
- Disassembly should be done in a clean work area. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- For easier and proper assembly, place disassembled parts in order on a parts rack.
- Use nylon cloth or paper towels to clean the parts; common shop rags can leave lint that might interfere with their operation.
- Do not reuse non-reusable parts.
- Before assembling, apply the specified grease to the directed parts.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000014268132

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



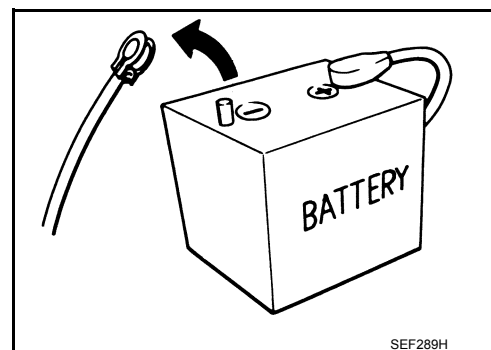
Precautions for Removing Battery Terminal

INFOID:0000000014268133

When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

BR08DE	: 4 minutes	YD25DDTi	: 2 minutes
D4D engine	: 20 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		
V9X engine	: 4 minutes		



NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
 - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
 - Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

PRECAUTIONS

[YD25DDTi]

< PRECAUTION >

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

The removal of 12V battery may cause a DTC detection error.

On Board Diagnosis (OBD) System of Engine and A/T

INFOID:0000000014268134

The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

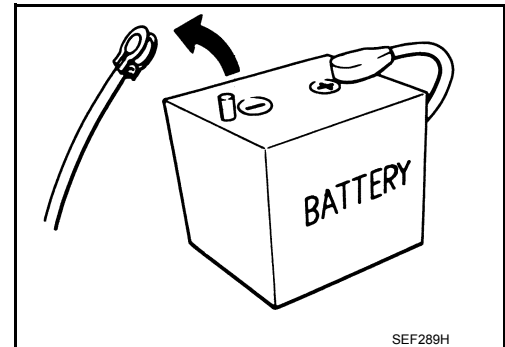
CAUTION:

- Be sure to turn the ignition switch OFF and disconnect the battery negative cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to light up.
- Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to light up due to the open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)
- Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to [PG-9. "Harness Connector"](#).
- Be sure to route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to light up due to the short circuit.
- Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to light up due to the malfunction of the fuel system, etc.
- Be sure to erase the unnecessary malfunction information (repairs completed) from the ECM and TCM before returning the vehicle to the customer.

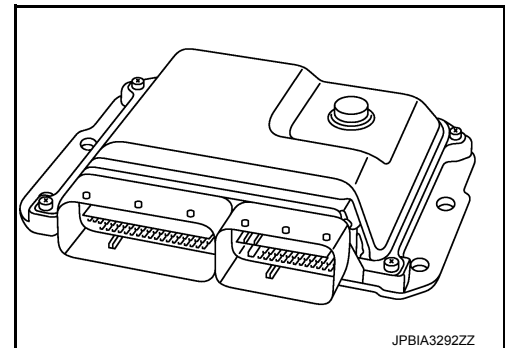
Precaution

INFOID:0000000014268135

- Always use a 12 volt battery as power source.
- Do not attempt to disconnect battery cables while engine is running.
- Before connecting or disconnecting the ECM harness connector, disconnect battery negative cable 30 seconds after turning the ignition switch OFF. Failure to do so may damage the ECM because battery voltage is applied to ECM even if ignition switch is turned off.
- Before removing parts, turn ignition switch OFF and then disconnect battery negative cable.



- Do not disassemble ECM.

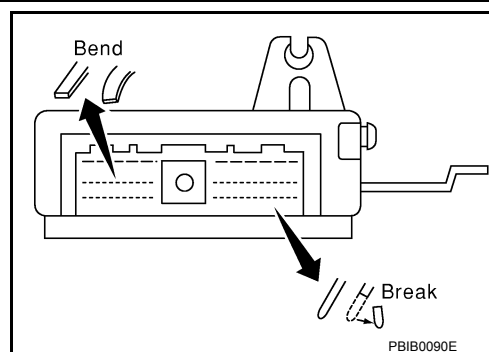


PRECAUTIONS

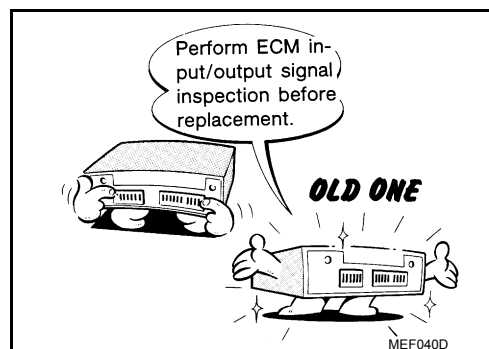
[YD25DDTi]

< PRECAUTION >

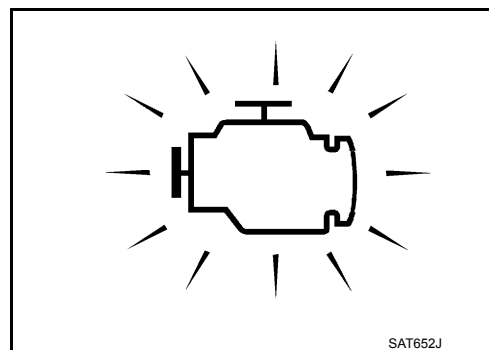
- When connecting or disconnecting pin connectors into or from ECM, take care not to damage pin terminals (bend or break).
Make sure that there are not any bends or breaks on ECM pin terminal, when connecting pin connectors.
- Securely connect ECM harness connectors.
A poor connection can cause an extremely high (surge) voltage to develop in coil and condenser, thus resulting in damage to IC's.
- Keep engine control system harness at least 10cm (4 in) away from adjacent harness, to prevent engine control system malfunctions due to receiving external noise, degraded operation of IC's, etc.
- Keep engine control system parts and harness dry.



- Before replacing ECM, perform ECM Terminals and Reference Value inspection and make sure ECM functions properly. Refer to [EC-855, "Reference Value"](#).
- Handle mass air flow sensor carefully to avoid damage.
- Do not disassemble mass air flow sensor.
- Do not clean mass air flow sensor with any type of detergent.
- Even a slight leak in the air intake system can cause serious incidents.
- Do not shock or jar the camshaft position sensor, crankshaft position sensor.



- After performing each TROUBLE DIAGNOSIS, perform DTC CONFIRMATION PROCEDURE or Component Function Check.
The DTC should not be displayed in the DTC CONFIRMATION PROCEDURE if the repair is completed. The Component Function Check should be a good result if the repair is completed.

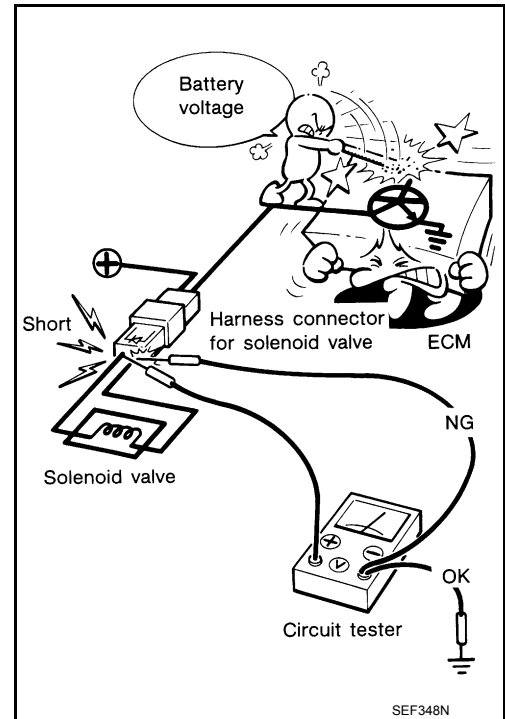


PRECAUTIONS

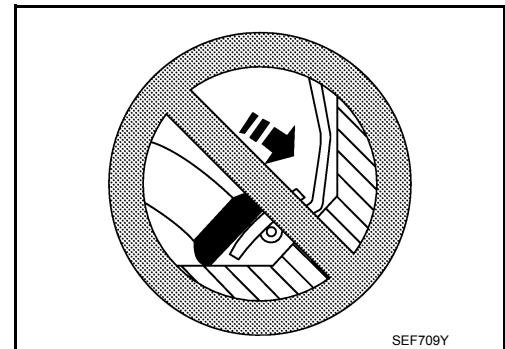
[YD25DDTi]

< PRECAUTION >

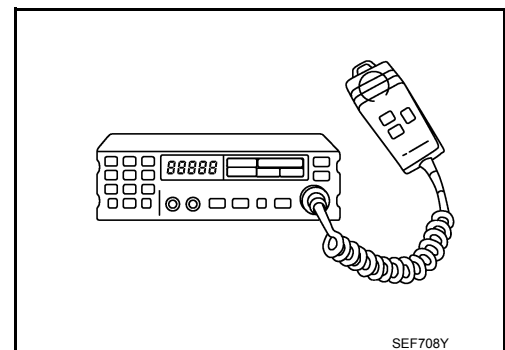
- When measuring ECM signals with a circuit tester, never allow the two tester probes to contact. Accidental contact of probes will cause a short circuit and damage the ECM power transistor.
- Do not disassemble fuel pump. If NG, take proper action.
- Do not disassemble fuel injector. If NG, replace fuel injector.



- Do not depress accelerator pedal when starting.
- Immediately after starting, do not rev up engine unnecessarily.
- Do not rev up engine just prior to shutdown.



- When installing C.B. ham radio or a mobile phone, be sure to observe the following as it may adversely affect electronic control systems depending on installation location.
- Keep the antenna as far as possible from the electronic control units.
- Keep the antenna feeder line more than 20 cm (8 in) away from the harness of electronic controls. Do not let them run parallel for a long distance.
- Adjust the antenna and feeder line so that the standingwave ratio can be kept smaller.
- Be sure to ground the radio to vehicle body.



PREPARATION

< PREPARATION >

[YD25DDTi]

PREPARATION

PREPARATION

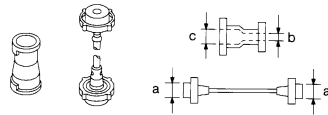
Special Service Tool

INFOID:0000000014268136

A

EC

Tool number Tool name	Description
EG17650301 Radiator cap tester adapter	Adapting radiator cap tester to radiator cap and radiator filler neck a: 28 (1.10) dia. b: 31.4 (1.236) dia. c: 41.3 (1.626) dia. Unit: mm (in)

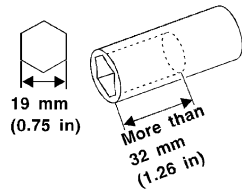


S-NT564

Commercial Service Tool

INFOID:0000000014268137

Tool name	Description
Socket wrench	Removing and installing engine coolant temperature sensor



S-NT705

SYSTEM DESCRIPTION

COMPONENT PARTS

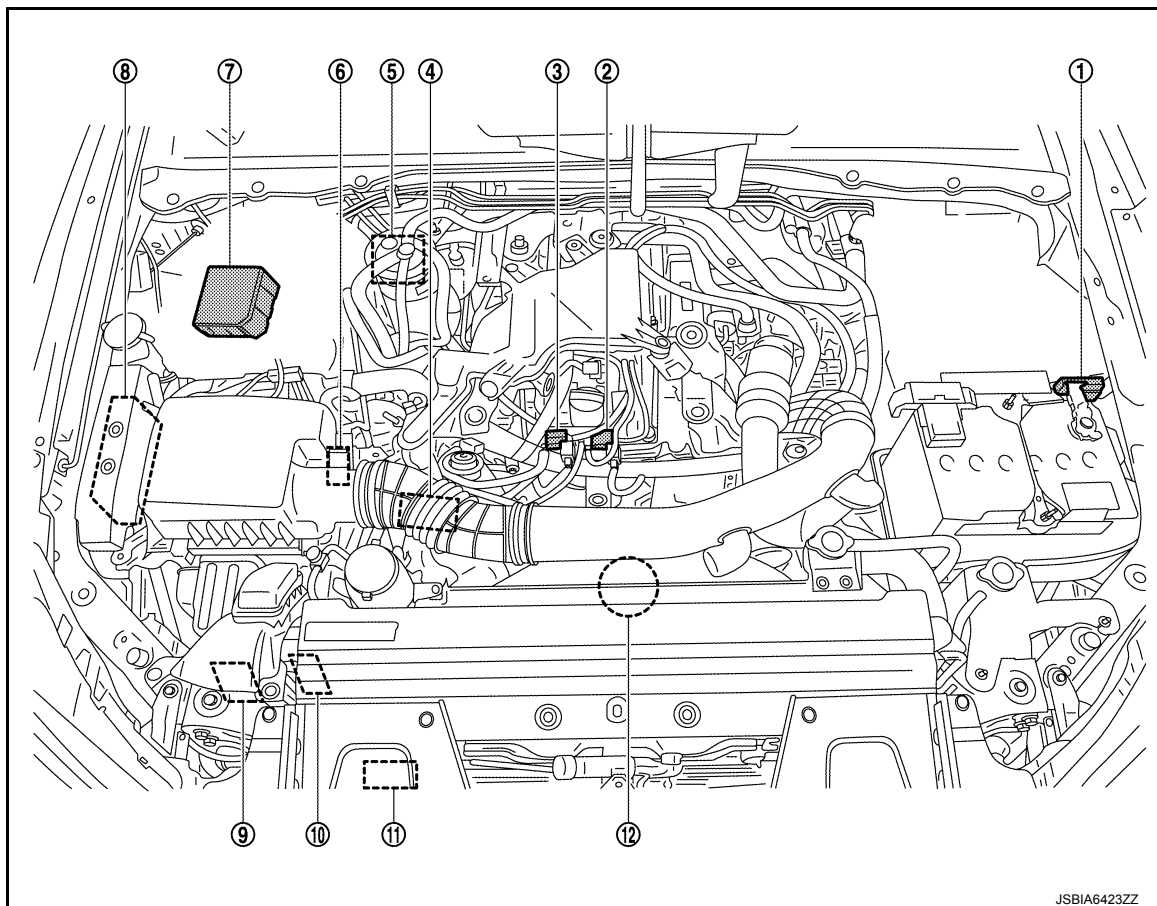
Component Parts Location

INFOID:0000000014268138

NOTE:

Refer to [EC-803, "How to Check Vehicle Type"](#), for the information of type 1 to 2.

ENGINE ROOM COMPARTMENT



No.	Component	Function
①	Battery current sensor (with battery temperature sensor)	EC-814, "Battery Current Sensor (With Battery Temperature Sensor)"
②	EGR cooler bypass valve control solenoid valve (type 2 is not applicable)	EC-816, "EGR Cooler Bypass Valve Control Solenoid Valve"
③	Intake air control valve control solenoid valve	EC-819, "Intake air control Valve actuator"
④	Throttle chamber	EC-819, "Intake air control Valve actuator"
⑤	Fuel filter pressure switch	EC-818, "Fuel Filter Pressure Switch"
⑥	Mass air flow sensor (with intake air temperature sensor 1)	EC-820, "Mass Air Flow Sensor (With Intake Air Temperature Sensor 1)"
⑦	IPDM E/R	IPDM E/R activates the internal control circuit to perform the relay ON-OFF control according to the input signals from various sensors and the request signals received from control units via CAN communication. Refer to PCS-7, "Component Parts Location" for detailed installation location.
⑧	ECM	EC-814, "ECM"

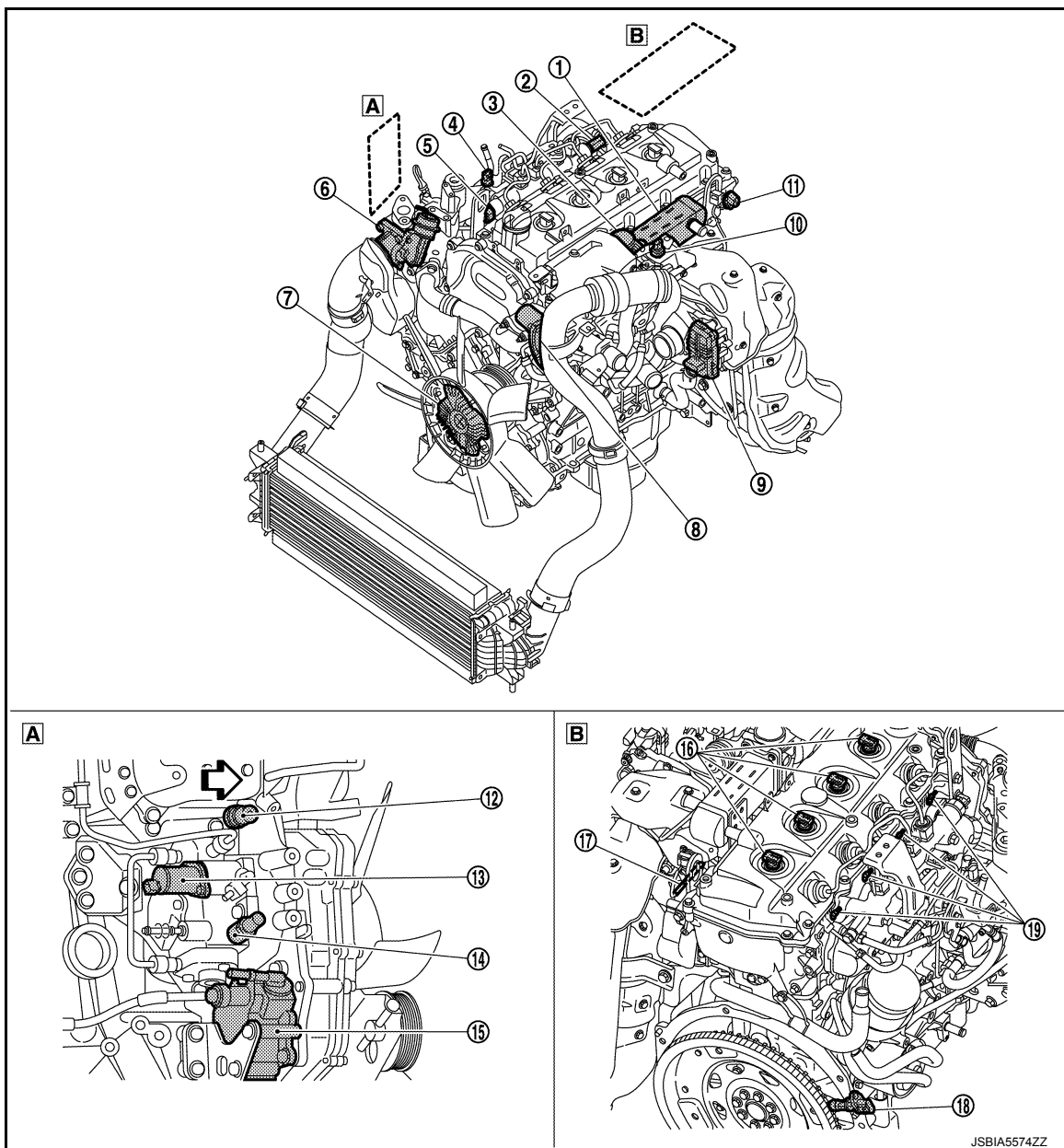
COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YD25DDTi]

No.	Component	Function
⑨	Glow control unit	EC-819, "Glow Control Unit"
⑩	Refrigerant pressure sensor	EC-820, "Refrigerant Pressure Sensor"
⑪	Turbocharger boost sensor	EC-821, "Turbocharger Boost Sensor"
⑫	Cooling fan coupling	CO-31, "ENGINE COOLING SYSTEM : System Description"

ENGINE COMPARTMENT



A View of engine right side

B View of engine back side

➡ Engine front

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YD25DDTi]

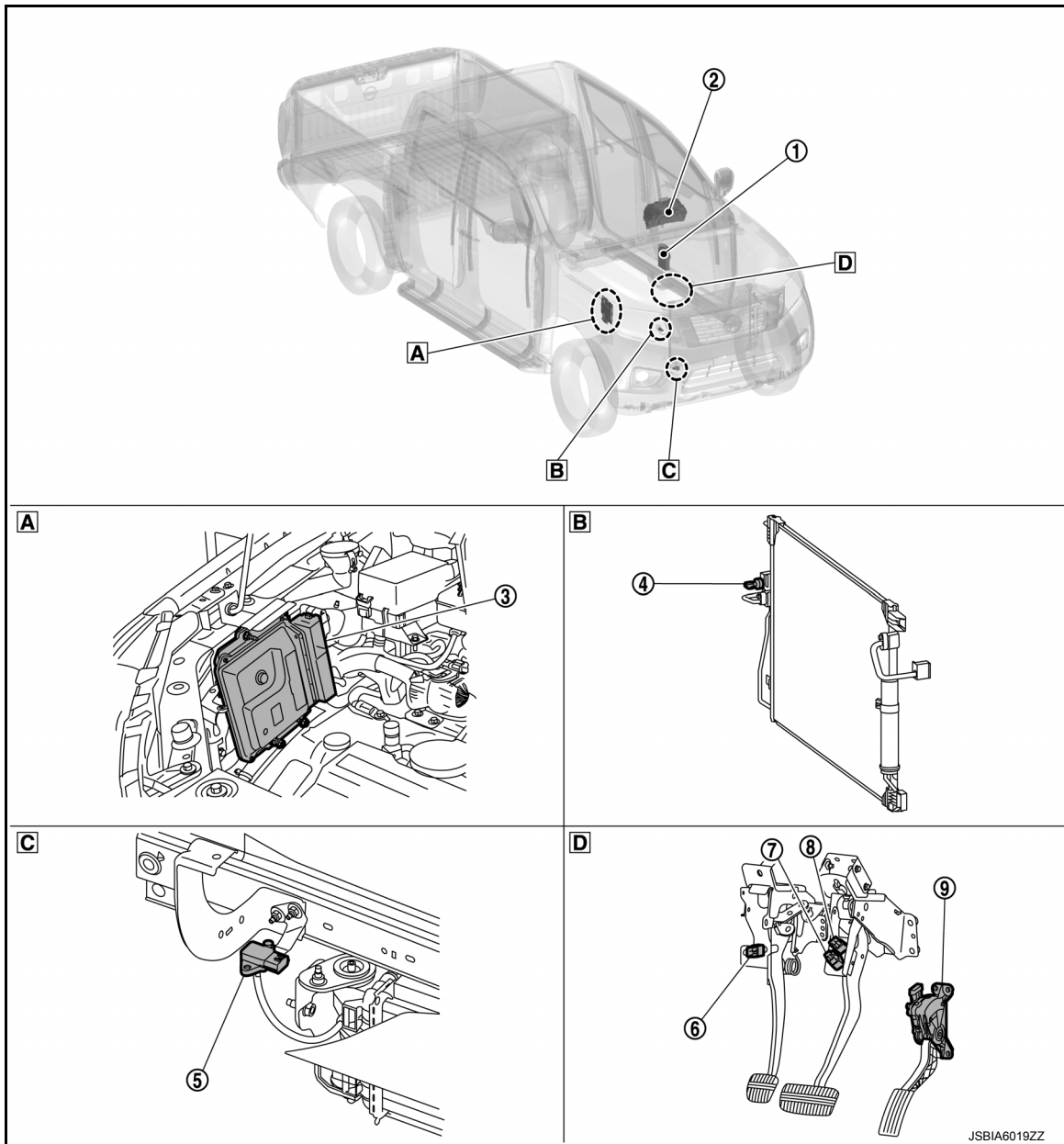
No.	Component	Function
①	EGR cooler (type 2 is not applicable)	EGR cooler efficiently cools gas circulated in the EGR system and reduces the amount of NOx contained in exhaust gases by lowering the combustion temperature.
②	Fuel rail pressure relief valve	EC-819. "Fuel Rail Pressure Sensor"
③	EGR cooler bypass valve (type 2 is not applicable)	EC-816. "EGR Cooler Bypass Valve"
④	Intake air temperature sensor 2 (type 2 is not applicable)	EC-819. "Intake Air Temperature Sensor 2"
⑤	Fuel rail pressure sensor	EC-819. "Fuel Rail Pressure Sensor"
⑥	Throttle chamber	EC-819. "Intake air control Valve actuator"
⑦	Cooling fan	Cooling fan is driven by the drive belt. And the fan speed is controlled by viscous coupling.
⑧	EGR volume control valve (type 2 is not applicable)	EC-816. "EGR Volume Control Valve"
⑨	Turbocharger boost control actuator	EC-821. "Turbocharger Boost Control Actuator"
⑩	Exhaust gas pressure sensor 1	EC-817. "Exhaust Gas Pressure Sensor 1"
⑪	Camshaft position sensor	EC-815. "Camshaft Position Sensor"
⑫	Engine coolant temperature sensor	EC-816. "Engine Coolant Temperature Sensor"
⑬	Fuel pump suction control valve	EC-818. "Fuel Pump (With fuel pump suction control valve)"
⑭	Fuel temperature sensor	EC-818. "Fuel Temperature Sensor"
⑮	Vacuum pump	Vacuum pump generates the negative pressure. The negative pressure is controlled by each solenoid and operates each actuator.
⑯	Fuel injector	EC-818. "Fuel Injector"
⑰	Exhaust gas temperature sensor 1	EC-817. "Exhaust Gas Temperature Sensor 1"
⑱	Crankshaft position sensor	EC-816. "Crankshaft Position Sensor"
⑲	Glow plug	EC-819. "Glow Plug"

BODY COMPARTMENT

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YD25DDTi]



- A** Engine room RH side **B** Engine room front center **C** Periphery of charge air cooler
D Periphery of pedals

No.	Component	Function
①	BCM [With NISSAN anti-theft system (NATS)]	BCM transmits A/C ON signal to ECM via CAN communication line. Refer to BCS-7, "BODY CONTROL SYSTEM : Component Parts Location" (with intelligent key system) or BCS-76, "BODY CONTROL SYSTEM : Component Parts Location" (without intelligent key system) for detailed installation location.
②	Combination meter	EC-846, "DIAGNOSIS DESCRIPTION : Malfunction Indicator Lamp (MIL)"
③	ECM	EC-814, "ECM"
④	Refrigerant pressure sensor	EC-820, "Refrigerant Pressure Sensor"
⑤	Turbocharger boost sensor	EC-821, "Turbocharger Boost Sensor"

COMPONENT PARTS

< SYSTEM DESCRIPTION >

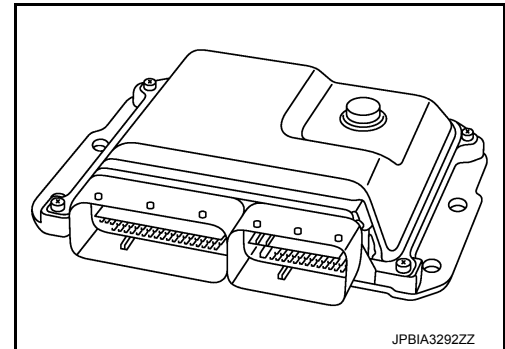
[YD25DDTi]

No.	Component	Function
⑥	Clutch pedal position switch	EC-815, "Clutch Pedal Position Switch"
⑦	Brake pedal position switch	EC-821, "Stop Lamp Switch & Brake Pedal Position Switch"
⑧	Stop lamp switch	EC-821, "Stop Lamp Switch & Brake Pedal Position Switch"
⑨	Accelerator pedal position sensor	EC-814, "Accelerator Pedal Position Sensor"

ECM

INFOID:0000000014268139

The ECM consists of a microcomputer and connectors for signal input and output and for power supply. The ECM controls the engine.

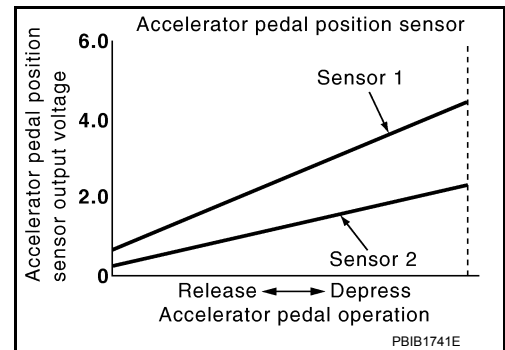


JPBIA329ZZ

Accelerator Pedal Position Sensor

INFOID:0000000014268140

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensors detect the accelerator pedal position and sends a signal to the ECM. The ECM uses the signal to determine the amount of fuel to be injected.



PBIB1741E

ASCD Steering Switch

INFOID:0000000014268141

ASCD steering switch has variant values of electrical resistance for each button. ECM reads voltage variation of switch, and determines which button is operated.

Barometric Pressure Sensor

INFOID:0000000014268142

The barometric pressure sensor is built into ECM. The sensor detects ambient barometric pressure and sends the voltage signal to the microcomputer.

Battery Current Sensor (With Battery Temperature Sensor)

INFOID:0000000014268143

OUTLINE

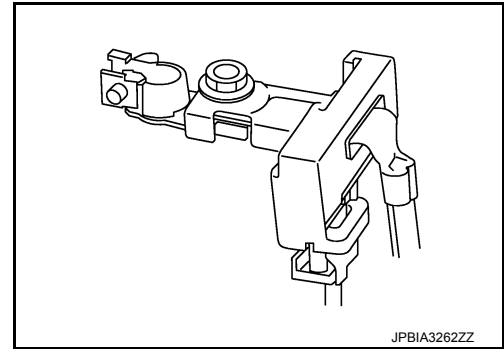
COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YD25DDTi]

The power generation voltage variable control enables fuel consumption to be decreased by reducing the engine load which is caused by the power generation of the generator.

Based on sensor signals, ECM judges whether or not the power generation voltage variable control is performed. When performing the power generation voltage variable control, ECM calculates the target power generation voltage based on the sensor signal. And ECM sends the calculated value as the power generation command value to IPDM E/R.



CAUTION:

Never connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power generation voltage variable control, and then the battery discharge may occur.

BATTERY CURRENT SENSOR

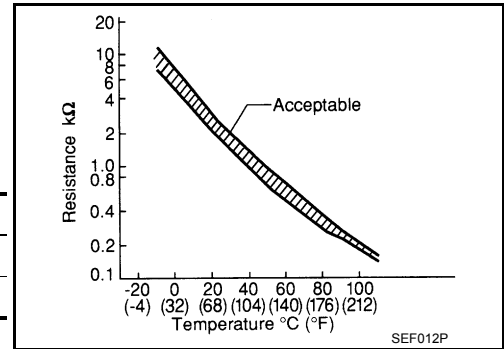
The battery current sensor is installed to the battery cable at the negative terminal. The sensor measures the charging/discharging current of the battery.

BATTERY TEMPERATURE SENSOR

Battery temperature sensor is integrated in battery current sensor. The sensor measures ambient temperature around the battery. The electrical resistance of the thermistor decreases as temperature increases.

<Reference data>

Temperature [°C (°F)]	Voltage (V)	Resistance (kΩ)
25 (77)	3.333	1.9 – 2.1
90 (194)	0.969	0.222 – 0.258



Camshaft Position Sensor

INFOID:0000000014268144

The camshaft position (CMP) sensor senses the protrusion of the signal plate installed to the exhaust camshaft to identify a particular cylinder. The camshaft position sensor senses the piston position.

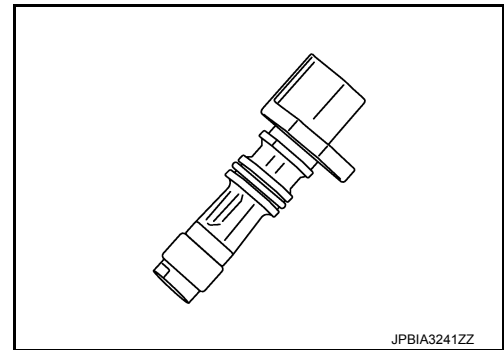
When the crankshaft position sensor system becomes inoperative, the camshaft position sensor provides various controls of engine parts instead, utilizing timing of cylinder identification signals.

The sensor consists of a permanent magnet and Hall IC.

When engine is running, the high and low parts of the teeth cause the gap with the sensor to change.

The changing gap causes the magnetic field near the sensor to change.

Due to the changing magnetic field, the voltage from the sensor changes.



Clutch Pedal Position Switch

INFOID:0000000014268145

Clutch pedal position switch are installed to clutch pedal bracket.

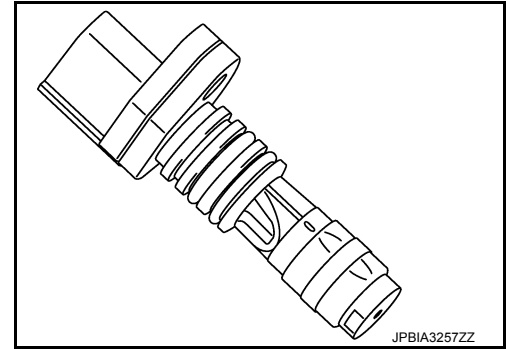
ECM detects the state of the clutch pedal by those two types of input signal (ON/OFF).

Clutch pedal	Clutch pedal position switch
Released	ON
Depressed	OFF

Crankshaft Position Sensor

INFOID:0000000014268146

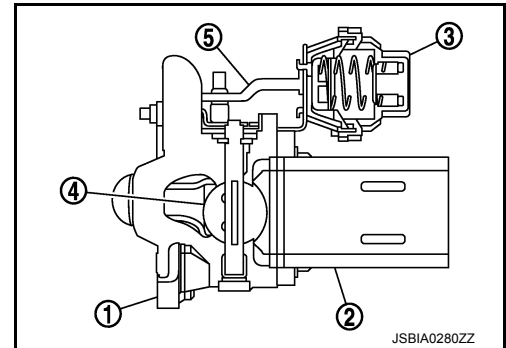
The crankshaft position (CKP) sensor is located on the converter housing. And the signal plate installed to the drive plate. The ECM receives the voltage signal and detects the fluctuation of the engine revolution.



EGR Cooler Bypass Valve

INFOID:0000000014268147

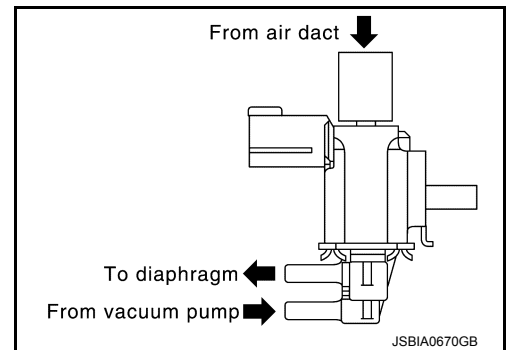
EGR cooler bypass valve ① is integral with the EGR cooler ②. This valve closes the EGR cooler bypass at the engine start and supplies gas not by way of the EGR cooler to raise combustion temperature efficiently. ECM controls EGR cooler bypass valve control solenoid valve. And then, the negative pressure is applied to diaphragm ③ to open the flap ④ through the rod ⑤.



EGR Cooler Bypass Valve Control Solenoid Valve

INFOID:0000000014268148

EGR cooler bypass valve control solenoid valve is controlled by ECM and controls negative pressure exerted on the diaphragm of the EGR cooler bypass valve. When the EGR cooler bypass valve control solenoid valve is energized, the solenoid valve opens and negative pressure sent from the vacuum pump is exerted on the diaphragm of the EGR cooler bypass valve.



EGR Volume Control Valve

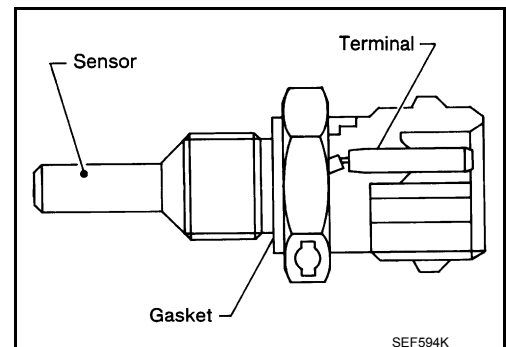
INFOID:0000000014268149

The EGR volume control valve used a DC motor and controls the flow rate of EGR from exhaust manifold. ECM controls the DC motor to make the valve opening angle in response to driving conditions.

Engine Coolant Temperature Sensor

INFOID:0000000014268150

The engine coolant temperature (ECT) sensor is used to detect the engine coolant temperature. The sensor modifies a voltage signal from the ECM. The modified signal returns to the ECM as the engine coolant temperature input. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



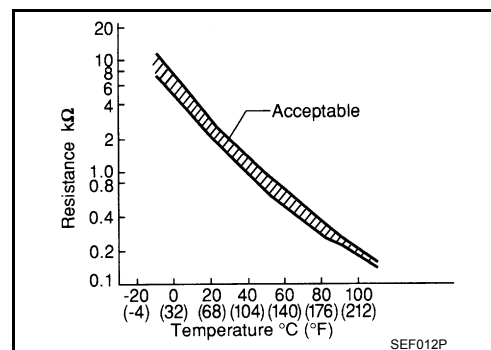
COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YD25DDTi]

<Reference data>

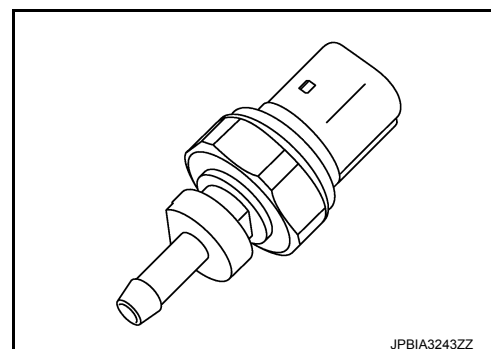
Engine coolant temperature [°C (°F)]	Voltage (V)	Resistance (kΩ)
-10 (14)	4.4	7.0 – 11.4
20 (68)	3.5	2.35 – 2.73
50 (122)	2.3	0.68 – 1.00
90 (194)	1.0	0.236 – 0.260



INFOID:000000014268151

Exhaust Gas Pressure Sensor 1

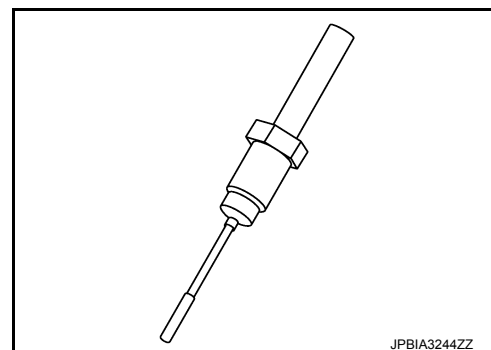
Exhaust gas pressure sensor 1 is connected turbocharger with exhaust gas pressure tube. Exhaust gas pressure sensor 1 detects the exhaust gas pressure and send to voltage signal to the ECM. As the pressure increases, the voltage rises.



INFOID:000000014268152

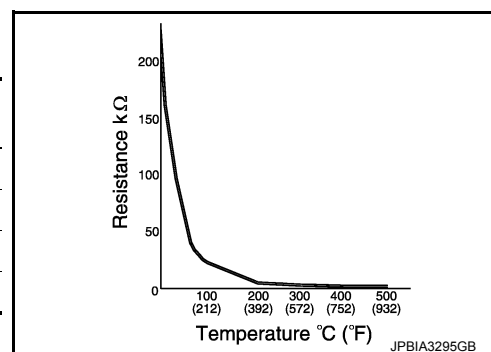
Exhaust Gas Temperature Sensor 1

Exhaust gas temperature (EGT) sensor 1 is installed exhaust manifold. Exhaust gas temperature sensor 1 uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rises.



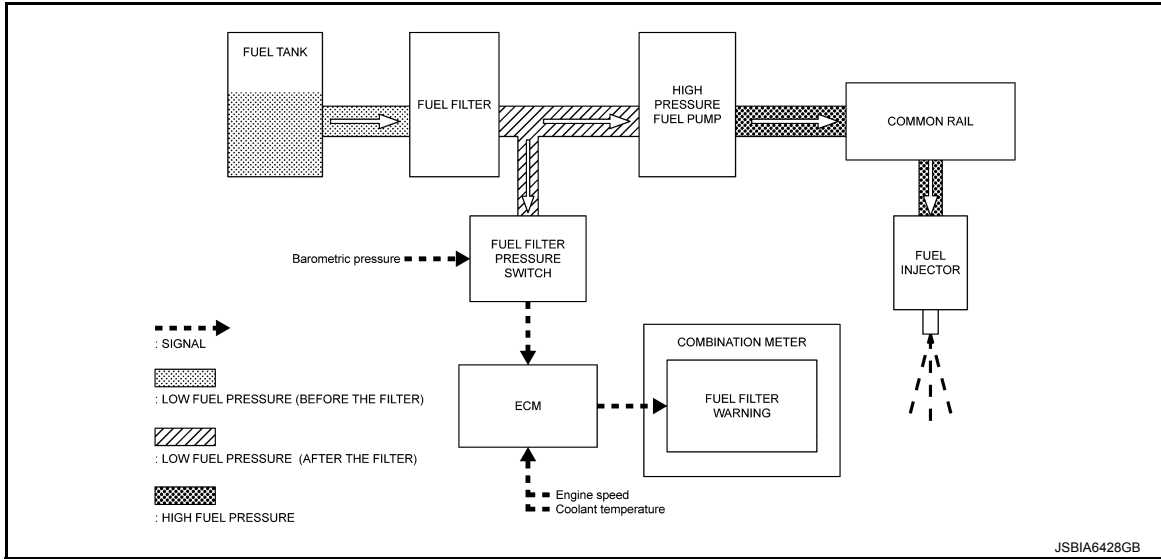
<Reference data>

Exhaust gas temperature [°C (°F)]	Voltage (V)	Resistance (kΩ)
100 (212)	4.7	18.2
200 (392)	4.0	4.0
400 (752)	2.0	0.65
600 (1112)	0.9	0.21



Fuel Filter Pressure Switch

INFOID:0000000014268153



The fuel filter pressure switch is installed to the top lid of fuel filter.

This switch is activated by the differential pressure between fuel negative pressure on the fuel filter exit side and atmospheric pressure.

When the fuel filter is clogged, negative pressure between fuel filter and high pressure fuel pump increases, and this turns the switch ON.

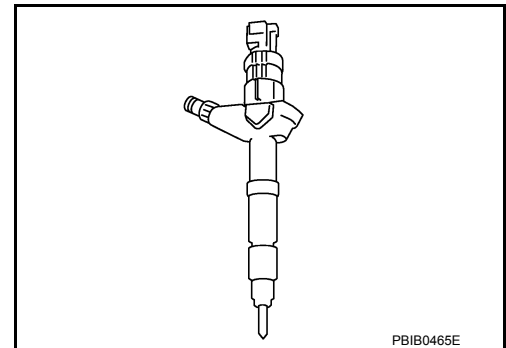
ECM judges the timing of fuel filter replacement according to a signal received from the fuel filter pressure switch, engine speed, and coolant temperature and transmits a fuel filter warning lamp signal to the combination meter.

When receiving a fuel filter warning lamp signal, the combination meter turns ON the fuel filter warning lamp to inform the driver of the timing of fuel filter replacement.

Fuel Injector

INFOID:0000000014268154

The fuel injector is a small, precise solenoid valve. When the ECM supplies a ground to the fuel injector circuit, the coil in the fuel injector is energized. The energized coil pulls the needle valve back and allows fuel to flow through the fuel injector into the cylinder. The amount of fuel injected depends upon the injection pulse duration. Pulse duration is the length of time the fuel injector remains open. The ECM controls the injection pulse duration based on engine fuel needs.



Fuel Temperature Sensor

INFOID:0000000014268155

Fuel temperature sensor is built in the fuel pump. The sensor detects the fuel temperature in the fuel pump and calibrates the fuel injection amount change by fuel temperature.

Fuel Pump (With fuel pump suction control valve)

INFOID:0000000014268156

The fuel pump is installed in the engine. Utilizing the revolutions of the engine via gears, the fuel pump discharges high-pressure fuel to the fuel rail. The fuel pressure is controlled by the fuel pump suction control valve.

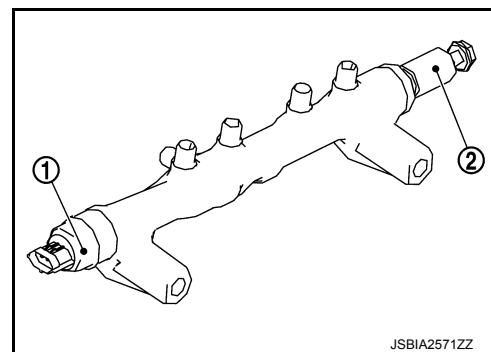
Fuel Rail Pressure Sensor

INFOID:0000000014268157

The fuel rail pressure sensor ① is installed to the fuel rail and measures the fuel pressure of the fuel rail.

The fuel rail pressure sensor sends a signal voltage to ECM. Voltage increases as fuel pressure increases. ECM controls fuel rail pressure, according to information from the fuel rail pressure sensor.

When fuel rail pressure increases, fuel rail pressure is decreased by the fuel rail pressure relief valve ②.



Glow Control Unit

INFOID:0000000014268158

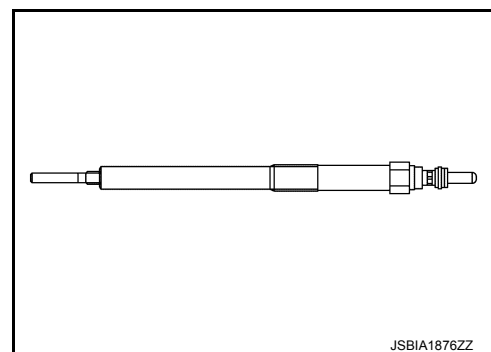
Glow control unit is controlled by ECM via PWM signal and improves performance in engine start. Furthermore, this unit incorporates self-diagnosis function.

When malfunction is detected, glow control unit outputs malfunction signal to ECM

Glow Plug

INFOID:0000000014268159

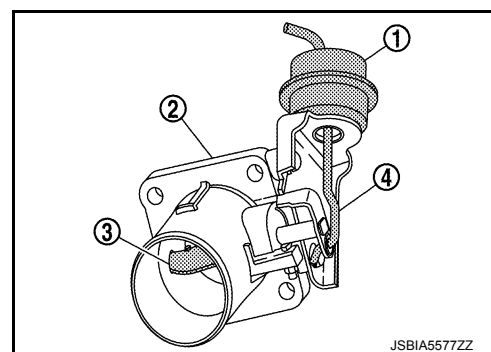
The glow plug is provided with a metallic heating element to obtain a high-temperature resistance. It glows in response to a signal sent from the ECM, allowing current to flow through the glow plug via the glow control unit.



Intake air control Valve actuator

INFOID:0000000014268160

Intake air control valve actuator ① is integral with the throttle chamber ②. ECM controls intake air control valve control solenoid valve. And then, the negative pressure is applied to intake air control valve actuator to close the throttle valve ③ through the rod ④.

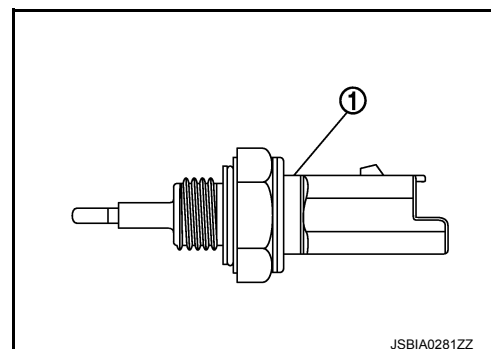


Intake Air Temperature Sensor 2

INFOID:0000000014268161

The intake air temperature (IAT) sensor 2 ① detects intake air temperature and transmits a signal to the ECM.

The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the temperature rise.



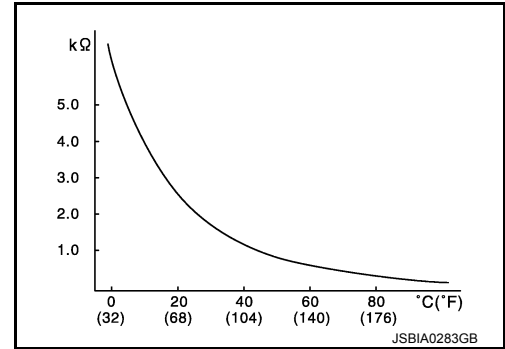
COMPONENT PARTS

[YD25DDTi]

< SYSTEM DESCRIPTION >

<Reference data>

Intake air temperature [°C (°F)]	Resistance (kΩ)
25 (77)	2.0 – 2.13
80 (176)	0.312 – 0.346



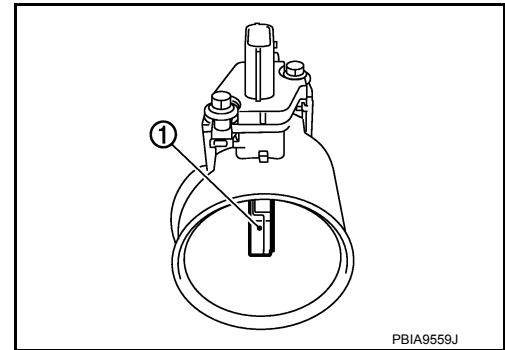
Mass Air Flow Sensor (With Intake Air Temperature Sensor 1)

INFOID:0000000014268162

MASS AIR FLOW SENSOR

The mass air flow sensor ① is placed in the stream of intake air. It measures the intake flow rate by measuring a part of the entire intake flow. The mass air flow sensor controls the temperature of the hot wire to a certain amount. The heat generated by the hot wire is reduced as the intake air flows around it. The greater air flow, the greater the heat loss.

Therefore, the electric current supplied to hot wire is changed to maintain the temperature of the hot wire as air flow increases. The ECM detects the air flow by means of this current change.



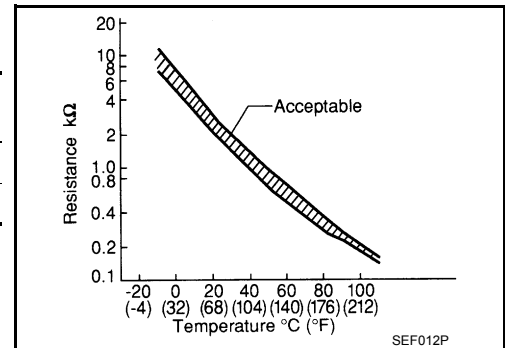
INTAKE AIR TEMPERATURE SENSOR 1

The intake air temperature (IAT) sensor 1 is built-into the mass air flow sensor. The sensor detects intake air temperature and transmits a signal to the ECM.

The temperature sensing unit uses a thermistor which is sensitive to the change in temperature. Electrical resistance of the thermistor decreases in response to the rise in temperature.

<Reference data>

Intake air temperature [°C (°F)]	Voltage (V)	Resistance (kΩ)
25 (77)	3.3	2.003 – 2.127
80 (176)	1.2	0.312 – 0.346



Refrigerant Pressure Sensor

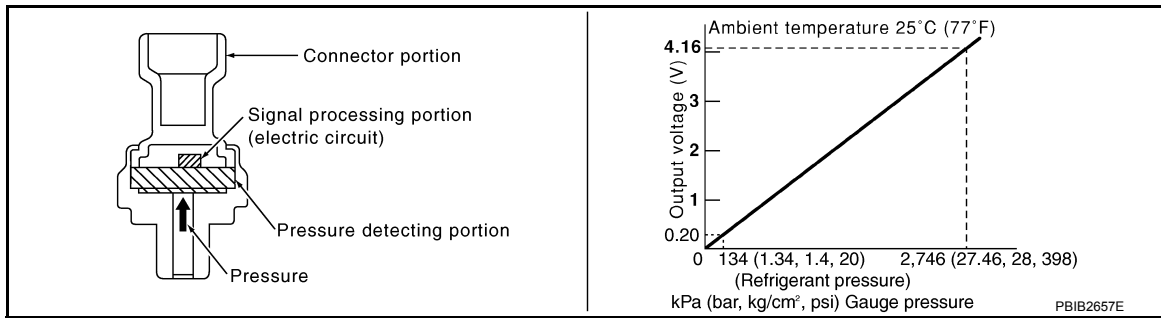
INFOID:0000000014268163

The refrigerant pressure sensor is installed at the liquid tank of the air conditioner system. The sensor uses an electrostatic volume pressure transducer to convert refrigerant pressure to voltage. The voltage signal is sent to ECM, and ECM controls the air conditioner cut control and the cooling fan control.

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YD25DDTi]



Stop Lamp Switch & Brake Pedal Position Switch

INFOID:0000000014268164

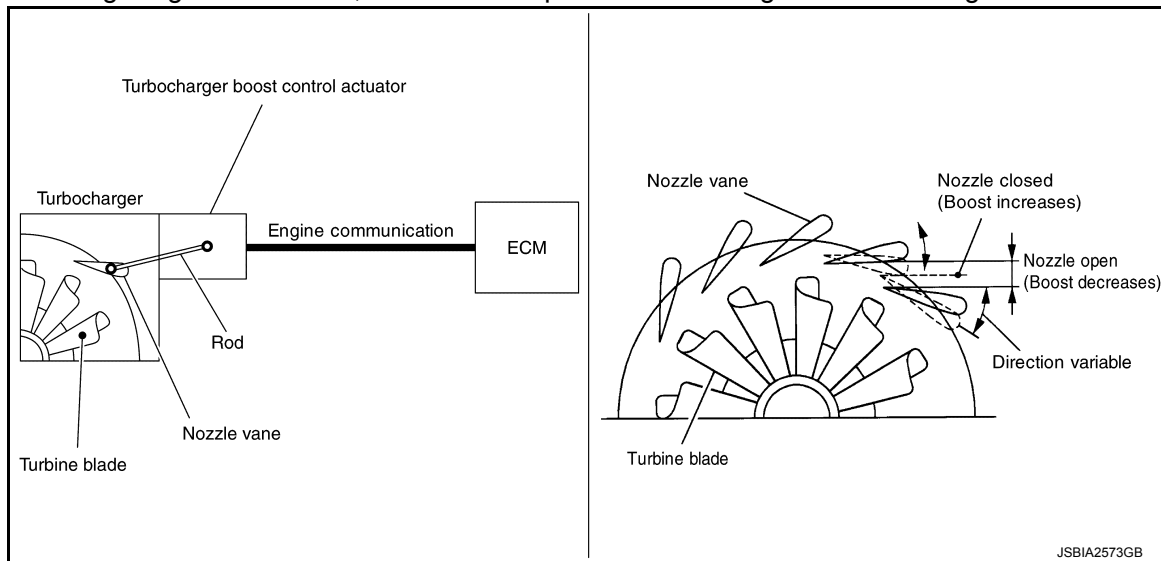
Stop lamp switch and brake pedal position switches installed to brake pedal bracket. ECM detects the state of the brake pedal by those two types of input (ON/OFF signal).

Brake pedal	Brake pedal position switch	Stop lamp switch
Released	ON	OFF
Depressed	OFF	ON

Turbocharger Boost Control Actuator

INFOID:0000000014268165

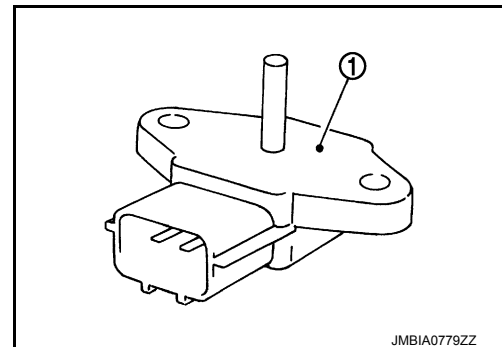
The turbocharger boost control actuator is integral with the turbocharger and consists of the control unit, motor, and position sensor which detects gear system and rod position. The turbocharger boost control actuator communicates with ECM via ENG communication, receives a target nozzle bane angle signal from ECM, and transmits position sensor signal and self-diagnosis information.



Turbocharger Boost Sensor

INFOID:0000000014268166

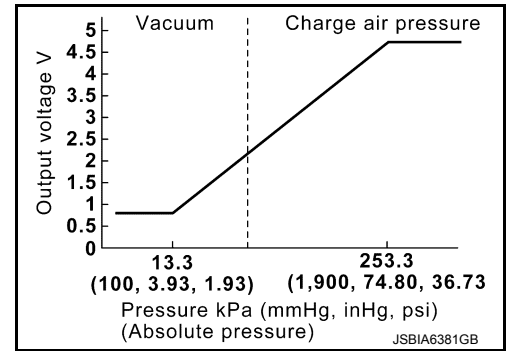
The turbocharger (TC) boost sensor ① detects pressure in the charge air cooler outlet area. The sensor send to voltage signal to the ECM. As the pressure increases, the voltage rises.



COMPONENT PARTS

< SYSTEM DESCRIPTION >

[YD25DDTi]



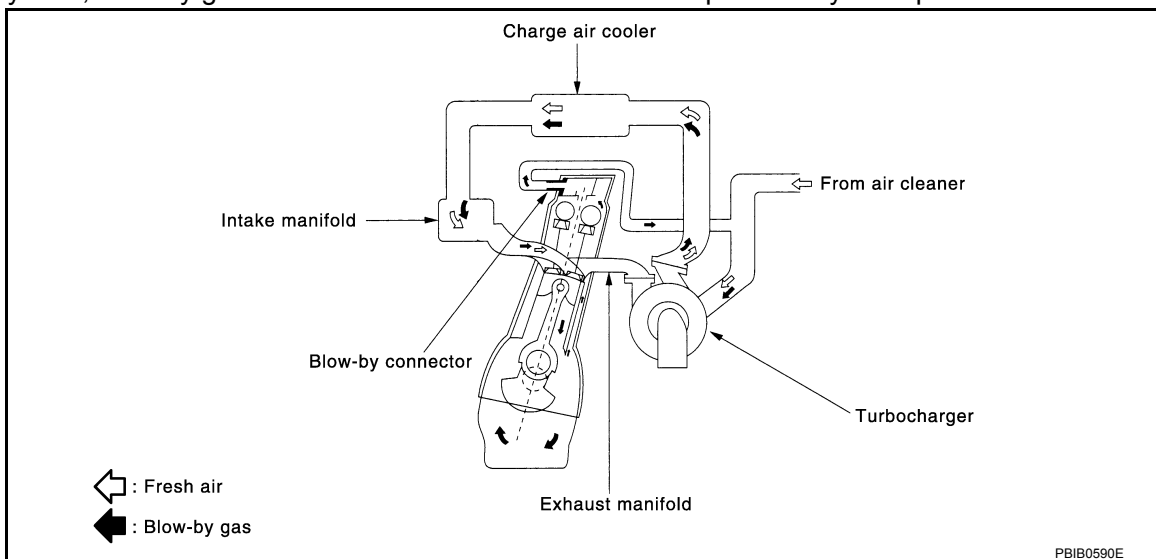
STRUCTURE AND OPERATION

Crankcase Ventilation System

INFOID:0000000014268167

DESCRIPTION

In this system, blow-by gas is sucked into the air duct after oil separation by oil separator in the rocker cover.



SYSTEM

ENGINE CONTROL SYSTEM

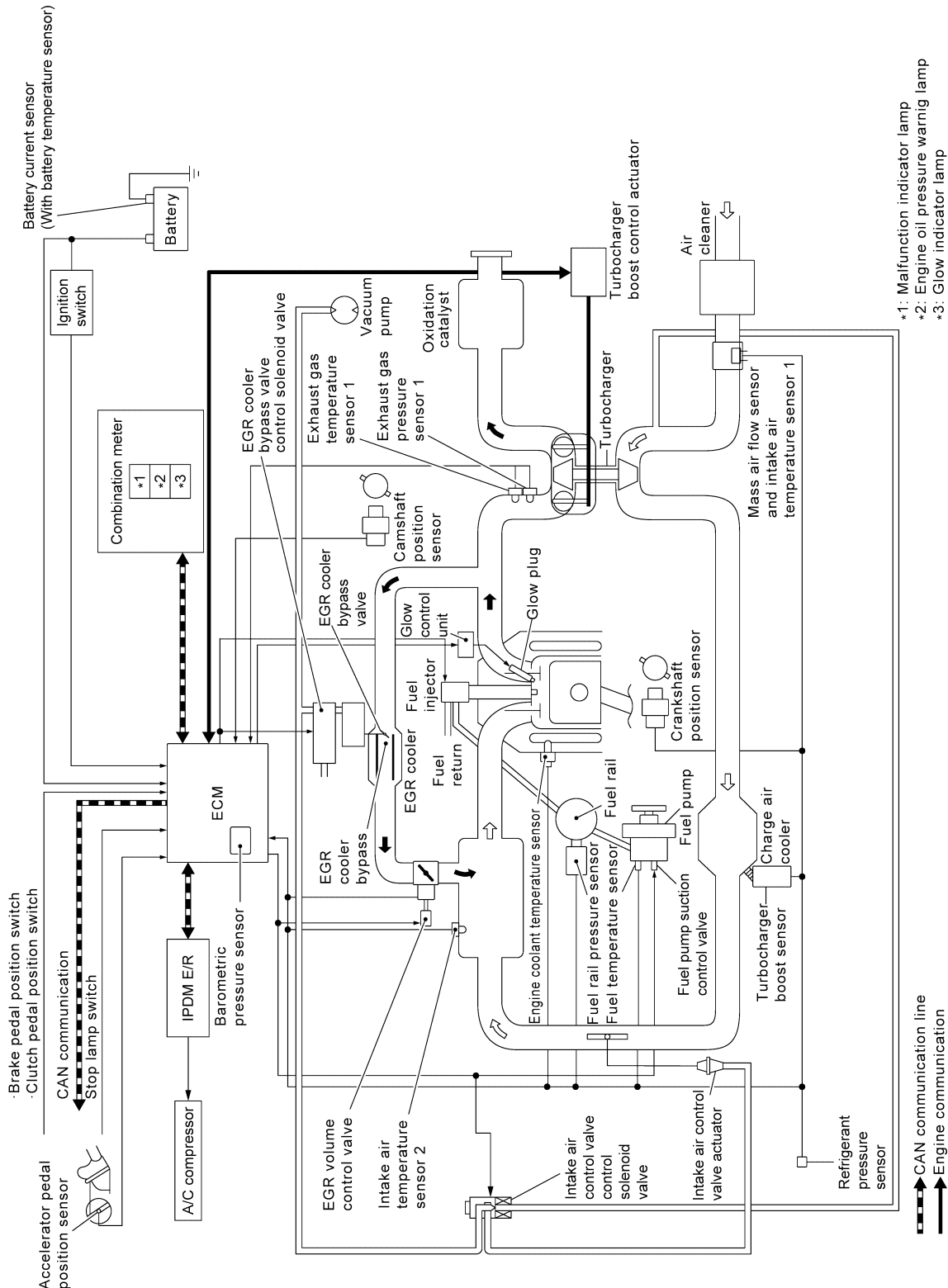
ENGINE CONTROL SYSTEM : System Description

INFOID:0000000014268168

NOTE:

Refer to [EC-803, "How to Check Vehicle Type"](#), for the information of type 1 and 2.

SYSTEM DIAGRAM



JSBIA6382GB

SYSTEM

< SYSTEM DESCRIPTION >

[YD25DDTi]

NOTE:

- EGR cooler and EGR cooler bypass valve is not applicable (type 2)
- EGR volume control valve and intake air temperature sensor 2 is not applicable (type 2)

SYSTEM DESCRIPTION

ECM controls the engine by various functions.

Function	Description	Reference
Fuel Injection control (Common rail system)	• Enables both reduction in emission gas and improvement in fuel economy and torque by accumulating ultra-high pressure in the fuel rail via fuel pump and performing injection of mist several times with an injector. • Optimizes the injection amount, according to the engine load, fuel rail pressure, intake air temperature, engine coolant temperature, vehicle speed, and the depth of accelerator pedal depression when starting the engine, running at idle, or driving the vehicle. • Controls injection timing for optimum timing, according to engine speeds and fuel injection amount.	EC-827, "FUEL INJECTION CONTROL SYSTEM : System Description"
Turbocharger boost control	Includes an electrically controlled variable capacity turbocharger and performs accurate boost control according to engine speeds.	EC-830, "TURBOCHARGER BOOST CONTROL : System Description"
Glow control	Performs the pre-glow control when the ignition switch is turned ON and the after-glow control when the engine is started.	EC-832, "GLOW CONTROL : System Description"
EGR system	ECM adjusts the amount of exhaust gas recirculation to reduce the amount of NOx and PM (Particulate Matter) by controlling the EGR volume control valve installed to the path between the exhaust manifold and the intake manifold. (Type 2 is not applicable)	EC-832, "EGR SYSTEM : System Description"
Air conditioning cut control	Improves acceleration and reduces engine load by turning OFF the air conditioner compressor and reduces during acceleration and the rise in refrigerant pressure.	EC-835, "AIR CONDITIONING CUT CONTROL : System Description"
Automatic speed control device (ASCD)	Automatic Speed Control Device (ASCD) allows a driver to keep vehicle at predetermined constant speed without depressing accelerator pedal by driver's setting of vehicle speed.	EC-836, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description"
Throttle control	The intake air control valve control solenoid valve controls the ON-OFF load of the intake air control valve actuator.	EC-837, "THROTTLE CONTROL : System Description"
CAN communication	CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability.	EC-837, "CAN COMMUNICATION : System Description"

SYSTEM

< SYSTEM DESCRIPTION >

[YD25DDTi]

Function	Description	Reference
Information display (combination meter)	The Information display displays status, according to system malfunction or vehicle condition.	EC-841, "INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator" EC-841, "INFORMATION DISPLAY (COMBINATION METER) : Engine Oil Pressure Warning"
Warning/indicator/chime list	The warning/indicator/chime turns ON or turns OFF, according to system malfunction or vehicle condition.	EC-843, "WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps" EC-843, "WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)"

ENGINE CONTROL SYSTEM : Fail safe

INFOID:000000014268169

DTC RELATED ITEM

DTC No.	Detected items	Engine operating condition in fail-safe mode
U1025	ENG communication circuit	ECM limits the amount control of fuel injected.
P0088 P1272	Fuel rail pressure control	- ECM limits the amount control of fuel injected. - ECM limits fuel rail pressure control (upper limit). - ECM stops the EGR volume control valve control (fully closed position). (P1272)
P0089 P0628 P0629 P1275	Fuel pump	- ECM limits the amount control of fuel injected. - ECM limits fuel rail pressure control (upper limit).
P0093	Fuel system leak	- ECM limits the amount control of fuel injected. - ECM limits fuel rail pressure control (upper limit).
P0122 P0123 P0222 P0223 P2135	Accelerator pedal position sensor	ECM recognizes the accelerator pedal position for 10% and controls fuel injected.
P012B	Intake air leak	- ECM limits the amount control of fuel injected. - ECM stops the EGR volume control valve control (fully closed position).
P0192 P0193	Fuel rail pressure control	- ECM limits the amount control of fuel injected. - ECM limits fuel rail pressure control (upper limit). - ECM limits fuel rail pressure control (lower limit).

SYSTEM

< SYSTEM DESCRIPTION >

[YD25DDTi]

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0200	Fuel injector power supply circuit	- ECM limits the amount control of fuel injected. - ECM limits fuel rail pressure control (upper limit). - ECM limits fuel rail pressure control (lower limit). - ECM limits the fuel injected pattern.
P0201 P0202 P0203 P0204 P1268 P1269 P1270 P1271 P2147 P2148	Fuel injector	- ECM limits the amount control of fuel injected. - ECM limits fuel rail pressure control (upper limit).
P0234	Turbocharger system	ECM limits the amount control of fuel injected.
P0335 P0336	Crankshaft position sensor circuit	ECM limits the amount control of fuel injected.
P0340 P0341	Camshaft position sensor circuit	ECM limits the amount control of fuel injected.
P0605 P0606	ECM	- ECM recognizes the accelerator pedal position for 10% and controls fuel injected. - ECM limits fuel rail pressure control (upper limit).
P1020 P1022 P1023 P1024 P1025 P1026	TC control actuator	ECM limits the amount control of fuel injected.
P1028 P102B	Exhaust gas pressure sensor 1	ECM limits the amount control of fuel injected.
P1029	TC boost sensor	ECM limits the amount control of fuel injected.
P102A	BARO sensor	ECM limits the amount control of fuel injected.
P1273	Fuel pump	- ECM recognizes the accelerator pedal position for 10% and controls fuel injected. - ECM limits the amount control of fuel injected. - ECM limits fuel rail pressure control (upper limit).
P1274	Fuel pump	ECM stops the engine promptly.
P1409	EGR cooler bypass valve	ECM stops the EGR volume control valve control (fully closed position).
P2146 P2149	Fuel injector power supply circuit	- ECM limits the amount control of fuel injected. - ECM limits fuel rail pressure control (upper limit).
P2426 P2427	EGR cooler bypass valve	ECM stops the EGR volume control valve control (fully closed position).
P2478	EGT sensor 1	ECM limits the amount control of fuel injected.
P2554 P2555	Trottle valve control	ECM stops the trottle valve control (fully opened position).

FUEL INJECTION CONTROL SYSTEM

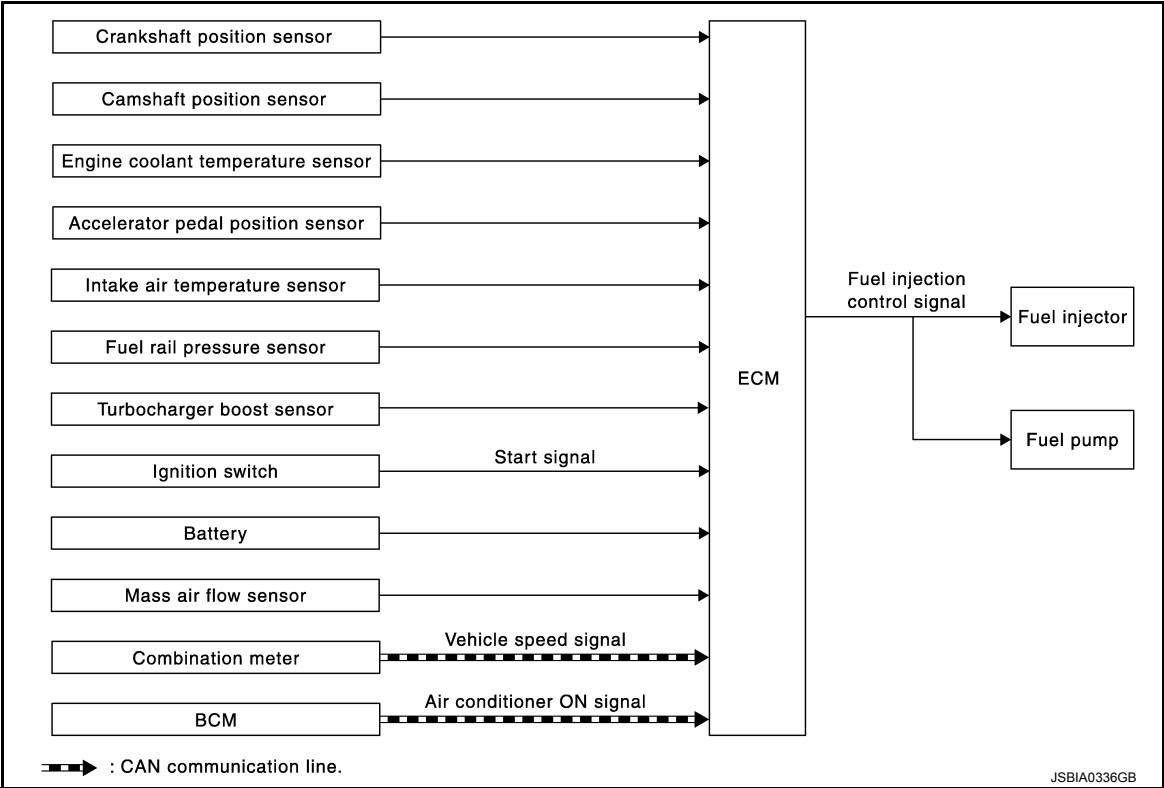
FUEL INJECTION CONTROL SYSTEM : System Description

INFOID:0000000014268170

NOTE:

Refer to [EC-803, "How to Check Vehicle Type"](#), for the information of type 1 and 2.

SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL CHART

Sensor / unit	Input signal to ECM	ECM function						Actuator
		START CONTROL	IDLE CONTROL	NORMAL CONTROL	MAXIMUM AMOUNT CONTROL	DECELERATION CONTROL	FUEL CUT CONTROL (AT NO LOAD AND HIGH ENGINE SPEED)	
Crankshaft position sensor	Engine speed	×	×	×	×	×	×	- Fuel injector - Fuel pump (Fuel pump suction control valve)
Camshaft position sensor	Piston position	×						
Engine coolant temperature sensor	Engine coolant temperature	×	×	×	×			
Accelerator pedal position sensor	Accelerator pedal position		×		×	×	×	
Intake air temperature sensor 1	Intake air temperature							
Intake air temperature sensor 2*1								
Fuel rail pressure sensor	Fuel rail pressure	×	×	×				
Turbocharger boost sensor	Turbocharger boost							
Ignition switch	Start signal	×						
Battery	Battery voltage		×					
Mass air flow sensor	Amount of intake air				×			
Combination meter	Vehicle speed*2		×				×	
BCM	Air conditioner ON signal*2		×					

*1: Type 2 is not applicable

*2: This signal is sent to the ECM via CAN communication line.

DESCRIPTION

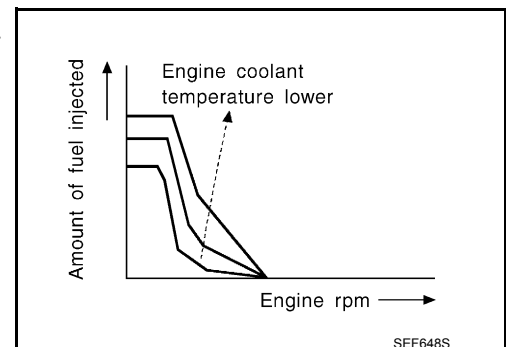
Three types of fuel injection control are provided to accommodate engine operating conditions; normal control, idle control and start control. ECM determines the appropriate fuel injection control. Under each control, the amount of fuel injected is adjusted to improve engine performance.

Pulse signals are sent to fuel injectors according to the input signals to adjust the amount of fuel injected to preset value.

START CONTROL

When ECM receives a start signal from the ignition switch, ECM adapts the fuel injection system for the start control. The amount of fuel injected at engine starting is a preset program value in ECM. The program is determined by the engine speed, engine coolant temperature and fuel rail pressure.

For better start ability under cool engine conditions, the lower the coolant temperature becomes, the greater the amount of fuel injected. ECM ends the start control when the engine speed reaches the specific value, and shifts the control to the normal or idle control.



IDLE CONTROL

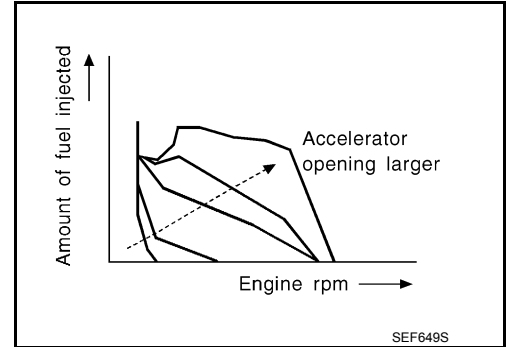
When ECM determines that the engine speed is at idle, the fuel injection system is adapted for the idle control. ECM regulates the amount of fuel injected corresponding to changes in load applied to the engine to keep

< SYSTEM DESCRIPTION >

engine speed constant. ECM also provides the system with a fast idle control in response to the engine coolant temperature signal.

NORMAL CONTROL

The amount of fuel injected under normal driving conditions is determined according to sensor signals. The crankshaft position sensor detects engine speed, the accelerator pedal position sensor detects accelerator pedal position and fuel rail pressure sensor detects fuel rail pressure. These sensors send signals to ECM.



MAXIMUM AMOUNT CONTROL

The maximum injection amount is controlled to an optimum by the engine speed, intake air amount, engine coolant temperature, and accelerator opening in accordance with the driving conditions. This prevents the oversupply of the injection amount caused by decreased air density at a high altitude or during a system failure.

DECELERATION CONTROL

ECM sends a fuel cut signal to the fuel injectors and fuel pump during deceleration for better fuel efficiency. ECM determines the time of deceleration according to signals from the accelerator pedal position sensor and crankshaft position sensor.

TURBOCHARGER BOOST CONTROL

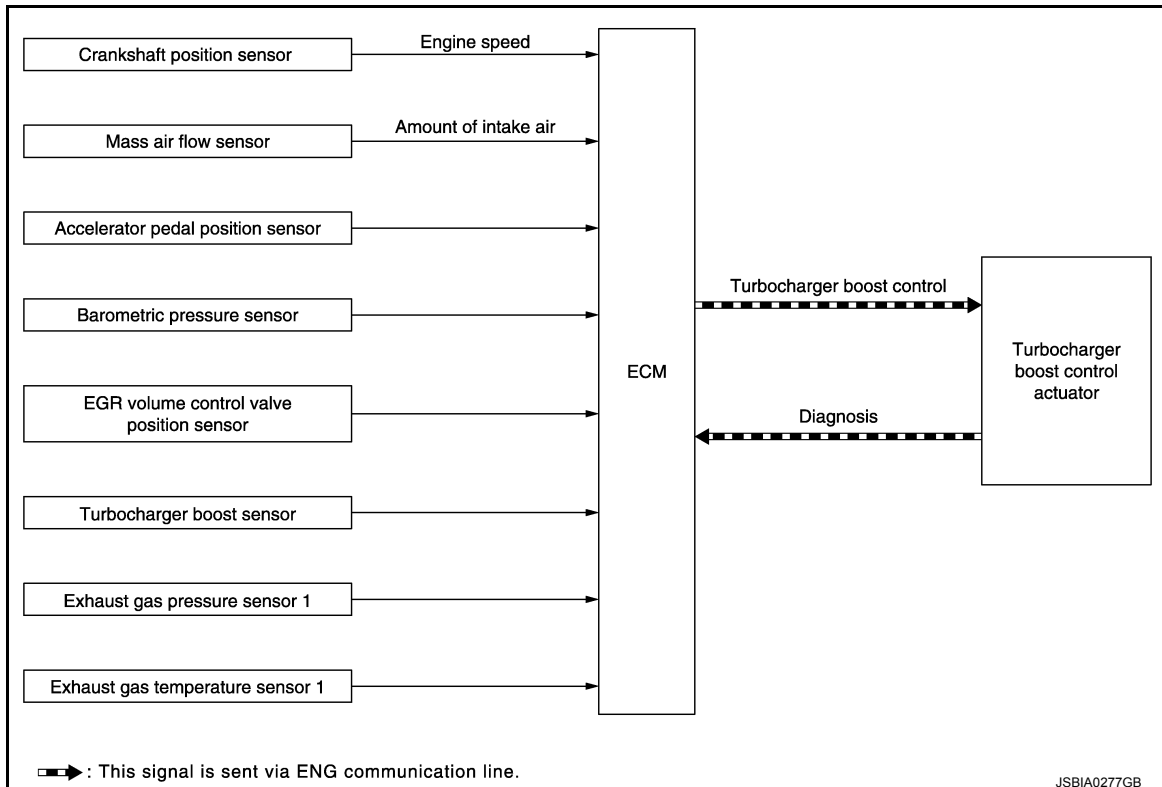
TURBOCHARGER BOOST CONTROL : System Description

INFOID:0000000014268171

NOTE:

Refer to [EC-803, "How to Check Vehicle Type"](#), for the information of type 1 and 2.

SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL CHART

SYSTEM

< SYSTEM DESCRIPTION >

[YD25DDTi]

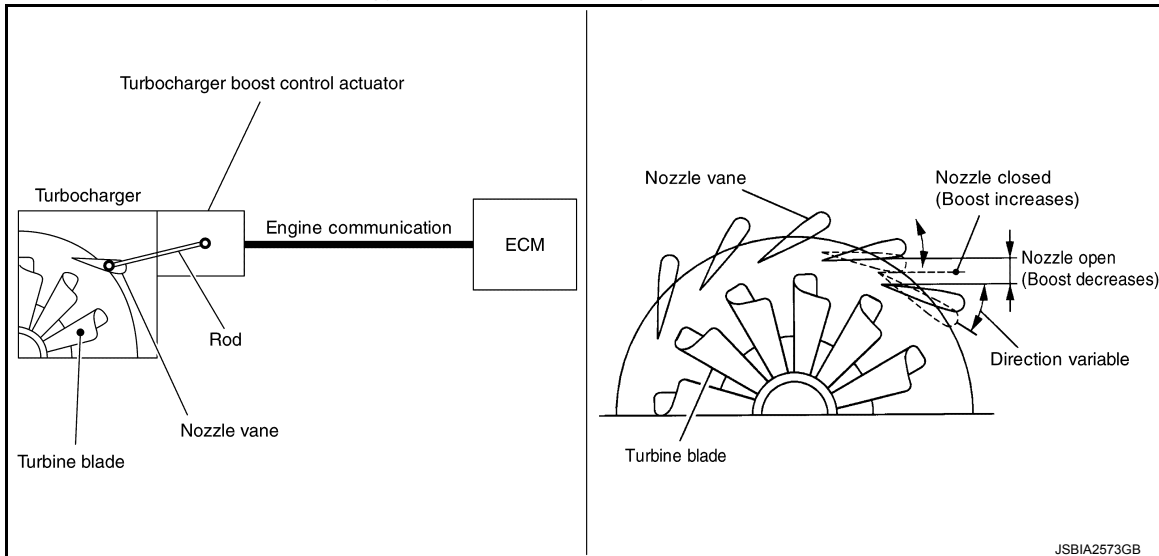
Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor	Engine speed	Turbocharger boost control	Turbocharger boost control actuator
Mass air flow sensor	Amount of intake air		
Accelerator pedal position sensor	Accelerator pedal position		
Barometric pressure sensor	Barometric pressure		
EGR volume control valve position sensor*	EGR volume control valve position		
Turbocharger boost sensor	Turbocharger boost		
Exhaust gas pressure sensor 1	Exhaust gas pressure		
Exhaust gas temperature sensor 1	Exhaust gas temperature		

*: Type 2 is not applicable

SYSTEM DESCRIPTION

The ECM controls the turbocharger boost control actuator according to driving conditions. The rod connected to the turbocharger boost control actuator changes the opening angles of the nozzle vanes located around the turbine blade.

ECM determines a target boost pressure by an engine speed, accelerator pedal position, and barometric pressure. In addition, ECM calculates a turbine entrance energy based on amount of air, exhaust gas pressure, exhaust gas temperature, and barometric pressure and determines the degree of the nozzle vane opening to satisfy the target boost pressure, according to the calculated turbine entrance energy and an EGR volume control valve position. The determined nozzle vane angle signal is transmitted from ECM to the turbocharger boost control actuator via ENG communication. The turbocharger boost control actuator is activated based on the signal and opens the nozzle vane via the rod. Furthermore, more accurate control is enabled by transmitting the data of turbine entrance energy from the turbocharger boost sensor to ECM.

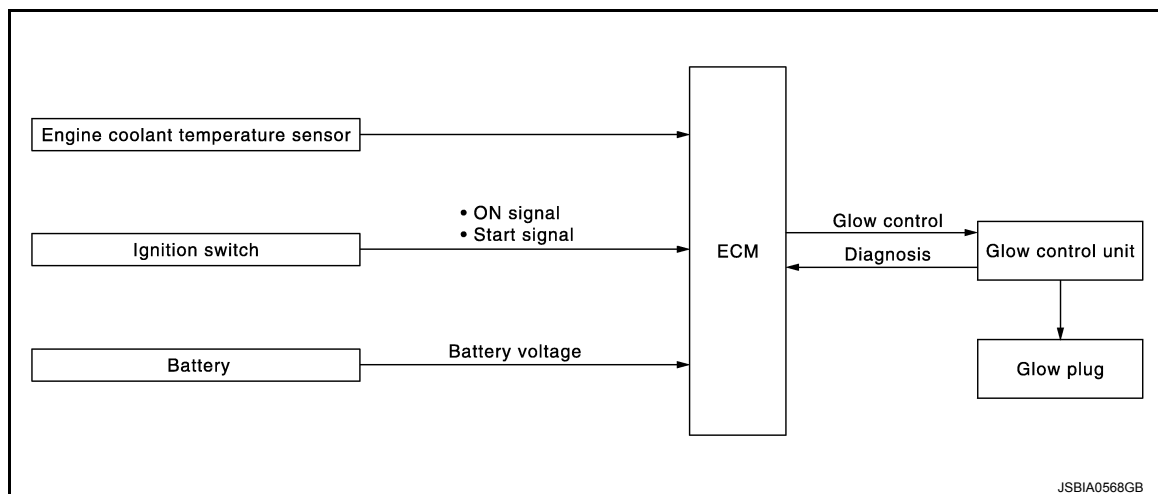


GLOW CONTROL

GLOW CONTROL : System Description

INFOID:0000000014268172

SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL CHART

Sensor	Input Signal to ECM	ECM function	Actuator
Engine coolant temperature sensor	Engine coolant temperature	Glow control	Glow control unit ↓ Glow plug
Ignition switch	• ON signal • Start signal		
Battery	Battery voltage		

SYSTEM DESCRIPTION

ECM controls glow control unit with PWM signal.

- Ignition switch ON (Pre-glow)
After ignition switch has turned ON, the glow control unit turns ON for a certain period of time in relation to engine coolant temperature, allowing current to flow through glow plug (Pre-glow time).
 - Cranking
The glow control unit turns ON, allowing current to flow through glow plug.
 - Starting (After-glow)
After engine has started, current continues to flow through glow plug (After-glow time) for a certain period in relation to engine coolant temperature.
- The glow indicator lamp turns ON for a certain period of time in relation to engine coolant temperature at the time glow control unit is turned ON.

REFERENCE VALUE

Unit: Seconds

Engine coolant temperature [°C (°F)]	Pre-glow (Approx.)	After-glow (Approx.)
-40 (-40)	40	280
-20 (-4)	40	280
0 (32)	40	245
20 (68)	20	180
40 (104)	20	30
60 (140)	20	0
80 (176)	0	0

EGR SYSTEM

EGR SYSTEM : System Description

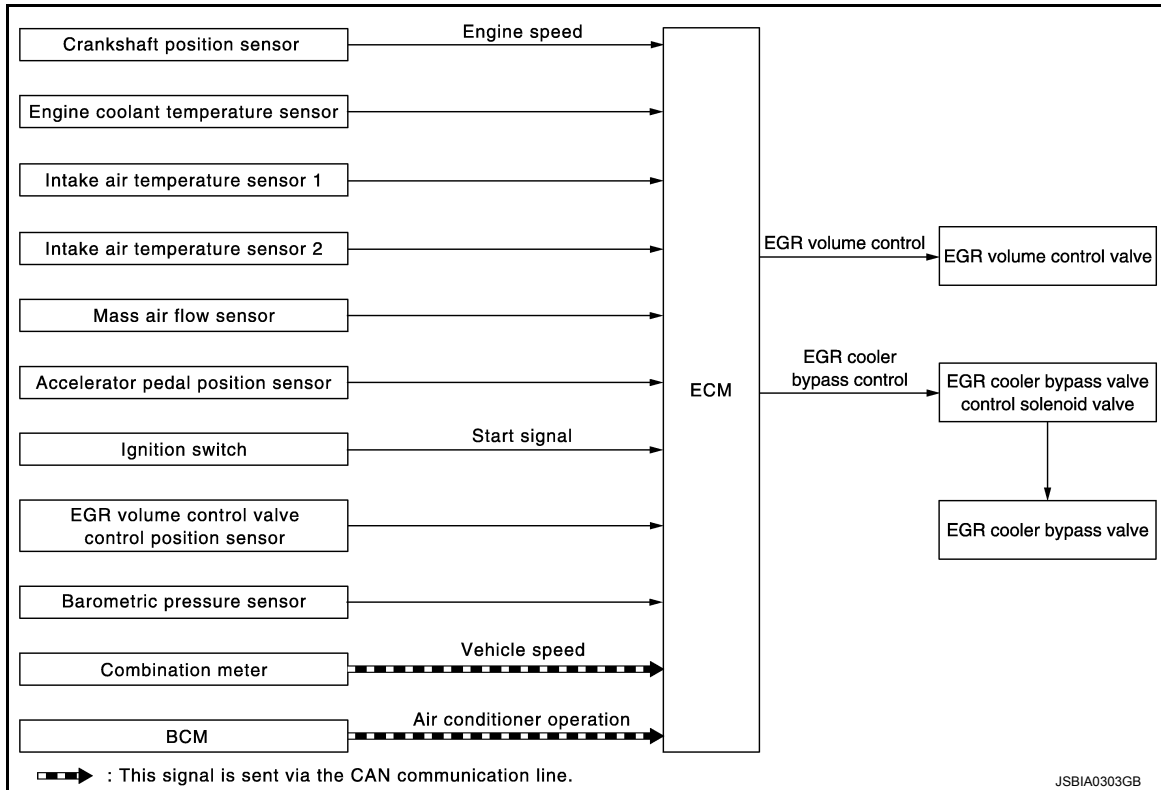
INFOID:0000000014268173

NOTE:

< SYSTEM DESCRIPTION >

- Refer to [EC-803. "How to Check Vehicle Type"](#), for the information of type 1 and 2.
- EGR control system applies to type 1.

SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL CHART

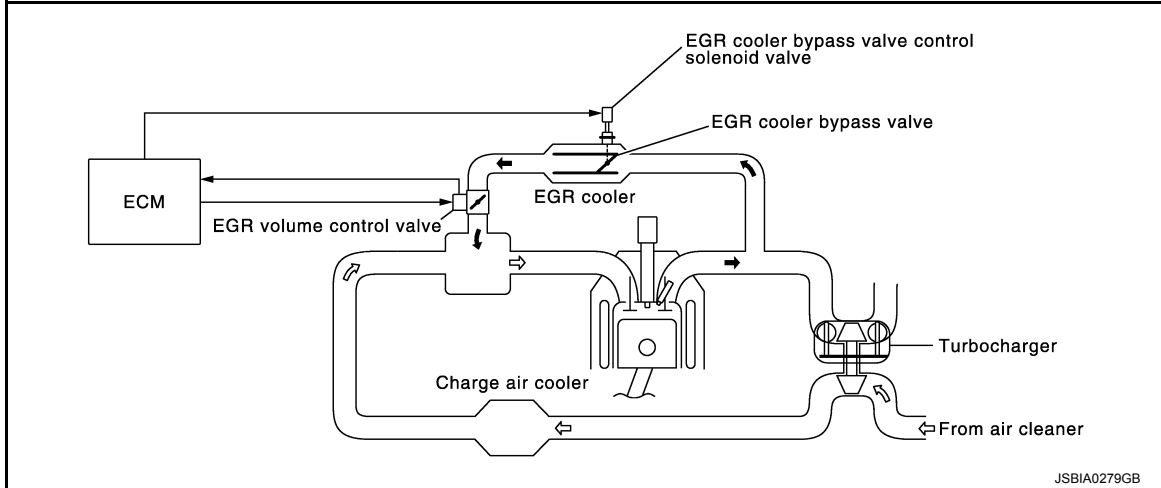
Sensor	Input Signal to ECM	ECM function	Actuator
Crankshaft position sensor	Engine speed	EGR volume control	EGR volume control valve
Engine coolant temperature sensor	Engine coolant temperature		
Intake air temperature sensor 1	Intake air temperature		
Intake air temperature sensor 2*1			
Mass air flow sensor	Amount of intake air		
Accelerator pedal position sensor	Accelerator pedal position		
Ignition switch	Start signal		
EGR volume control valve control position sensor	EGR volume control valve position		
Barometric pressure sensor	Barometric pressure		
Combination meter	Vehicle speed*2		
BCM	Air conditioner operation*2		

*1: Type 2 is not applicable

*2: This signal is sent to the ECM through CAN communication line.

< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION



EGR VOLUME CONTROL

This system controls the flow rate of EGR led from exhaust manifold to intake manifold.

The opening of the EGR passage in the EGR volume control valve changes to control the EGR flow rate.

A built-in DC motor moves the valve continuously corresponding to the ECM output signal.

The EGR volume control valve position sensor detects the valve position and sends the voltage signals to the ECM.

The ECM judges the current opening angle of the valve from this signals and the ECM controls the DC motor to make the valve opening angle properly.

The opening angle of the valve varies for optimum engine control. The optimum value stored in the ECM is determined by considering various engine conditions.

The EGR volume control valve remains close under the following conditions.

- Engine stopped
- Engine starting
- Low engine coolant temperature
- Excessively high engine coolant temperature
- High engine speed
- Accelerator pedal fully depressed

EGR COOLER CONTROL

The EGR cooler efficiently cools gas circulated in the EGR system and reduces the amount of NO_x contained in exhaust gases by lowering the combustion temperature. Furthermore, the adoption of the EGR cooler bypass valve allows the efficient rise in combustion temperature at engine start and the enhancement of combustion stability under low-load condition.

The EGR cooler bypass opens and closes fully according to the control that the ECM-controlled EGR cooler bypass valve control solenoid valve adjusts negative pressure applied on diaphragm of the EGR cooler bypass valve.

The EGR cooler bypass opens/closes based on an engine speed, engine load and engine coolant temperature.

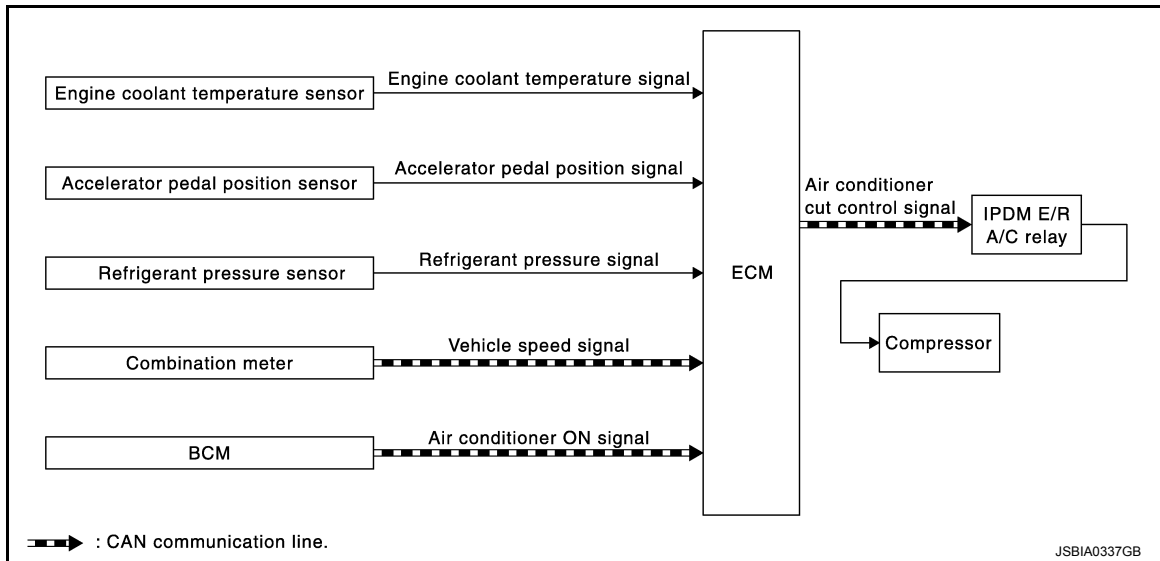
Condition	EGR cooler bypass valve
Ignition switch OFF	OFF (Cooler mode)
Engine coolant temperature 115°C (239°F) or less with the engine at idle.	ON (Bypass mode)
Engine coolant temperature 45°C (113°F) or more with engine speed 2,200 rpm or more under no load condition.	OFF (Cooler mode)

AIR CONDITIONING CUT CONTROL

AIR CONDITIONING CUT CONTROL : System Description

INFOID:000000014268174

SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Engine coolant temperature sensor	Engine coolant temperature	Air conditioner cut control	IPDM E/R (Air conditioner relay) ↓ A/C compressor
Accelerator pedal position sensor	Accelerator pedal position		
Refrigerant pressure sensor	Refrigerant pressure		
Combination meter	Vehicle speed*		
BCM	Air conditioner ON signal*		

*: This signal is sent to the ECM via CAN communication line.

SYSTEM DESCRIPTION

This system improves engine operation when the air conditioner is used.

Under the following conditions, the A/C compressor is turned OFF.

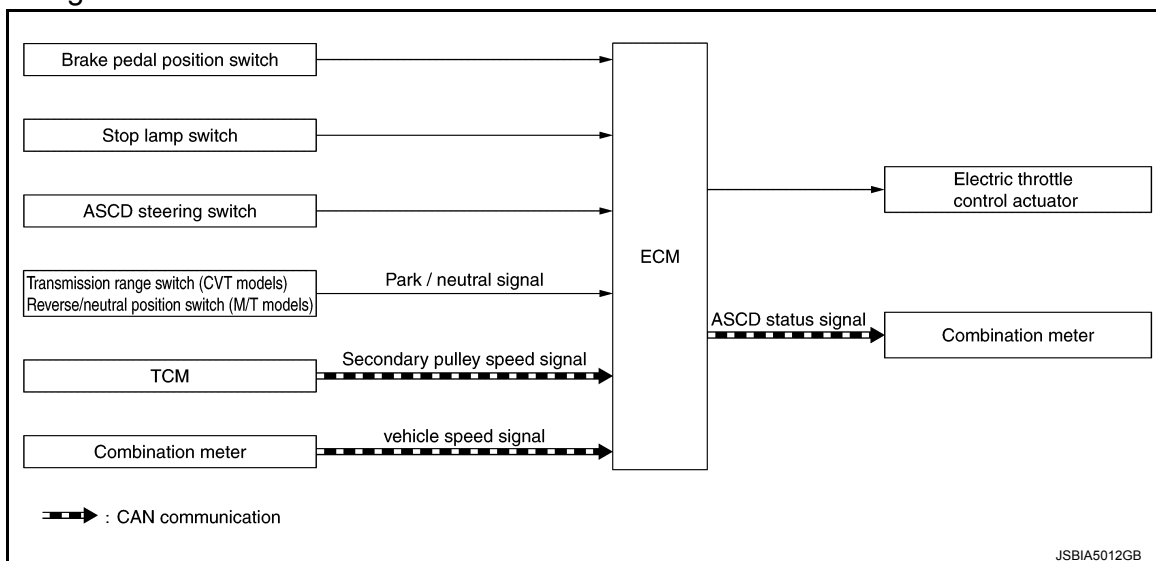
- When the accelerator pedal is fully depressed.
- When the engine coolant temperature becomes excessively high.
- When refrigerant pressure is excessively low or high.

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description

INFOID:000000014268175

System Diagram



BASIC ASCD SYSTEM

CAUTION:

Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws.

- Automatic Speed Control Device (ASCD) allows a driver to keep vehicle at predetermined constant speed without depressing accelerator pedal by driver's setting of vehicle speed*.

*: Driver can set the vehicle speed between approximately 40 km/h (25 MPH) and 177 km/h [109 MPH (for EGI B with M/T models)] or 188 km/h [116 MPH (Except for EGI B with M/T models)]. For details, refer to [GL-33, "Model Variation"](#).

- ECM transmits a ASCD operation status signal to the combination meter and operation status of ASCD is indicated on the information display in the combination meter. Refer to [EC-844, "AUTOMATIC SPEED CONTROL DEVICE \(ASCD\) : Switch Name and Function"](#).
- If any malfunction occurs in ASCD system, it automatically deactivates control.

CANCEL OPERATION

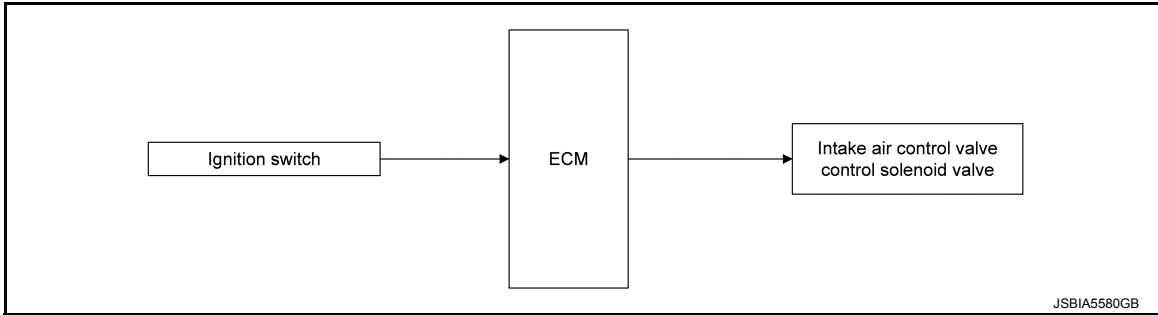
- When any of following conditions exist, cruise operation will be canceled.
 - ASCD MAIN switch is pressed (Set speed will be cleared)
 - CANCEL switch is pressed
 - More than 2 switches at ASCD steering switch are pressed at the same time (Set speed will be cleared)
 - Brake pedal is depressed
 - Gear position is changed to neutral position (M/T models)
 - Selector lever is changed to N, P or R range (A/T models)
 - Vehicle speed decreased to 13 km/h (8 MPH) lower than the set speed
 - VDC system is operated
 - Actual vehicle speed decreased to approximately 30 km/h (18 MPH) or less
- When the ECM detects any of the following conditions, the ECM will cancel the cruise operation and inform the driver by blinking ASCD indicator.
 - Engine coolant temperature is excessively higher than the normal operating temperature, ASCD indicator may blink slowly.
(When the engine coolant temperature decreases to the normal operating temperature, ASCD indicator will stop blinking and the cruise operation will be able to work by pressing COAST/SET switch or ACCEL/RES switch.)
- Malfunction for some self-diagnoses regarding ASCD control
(When ASCD is operating, all of ASCD operations will be canceled and vehicle speed memory will be erased.)

THROTTLE CONTROL

THROTTLE CONTROL : System Description

INFOID:000000014268176

System Diagram



INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to ECM	ECM function	Actuator
Ignition switch	Start signal and ignition OFF	Throttle control	Intake air control valve control solenoid valve

SYSTEM DESCRIPTION

Vibration when stopping the engine can be controlled by cutting intake air right before the fuel is cut. The intake air control valve control solenoid valve controls the ON-OFF load of the intake air control valve actuator. As a result, the intake air control valve control solenoid valve will be turned ON when the ignition switch is turned OFF with the engine running and when the engine stalls. After the engine has stopped, the intake air control valve control solenoid valve will return to fully open.

CAN COMMUNICATION

CAN COMMUNICATION : System Description

INFOID:000000014268177

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

Refer to [LAN-42. "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart"](#), about CAN communication for detail.

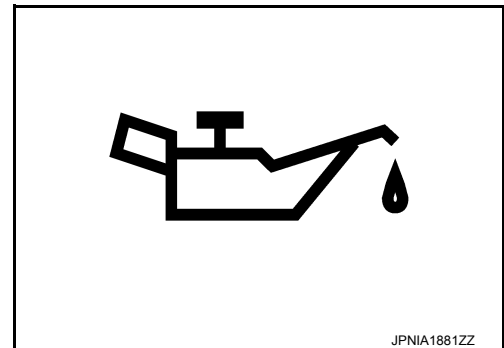
WARNING LAMPS/INDICATOR LAMPS

WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp

INFOID:000000014268178

DESIGN/PURPOSE

When engine oil pressure is low, the oil pressure warning lamp informs the driver of low oil pressure to prevent damage to the engine.



BULB CHECK

Not applicable

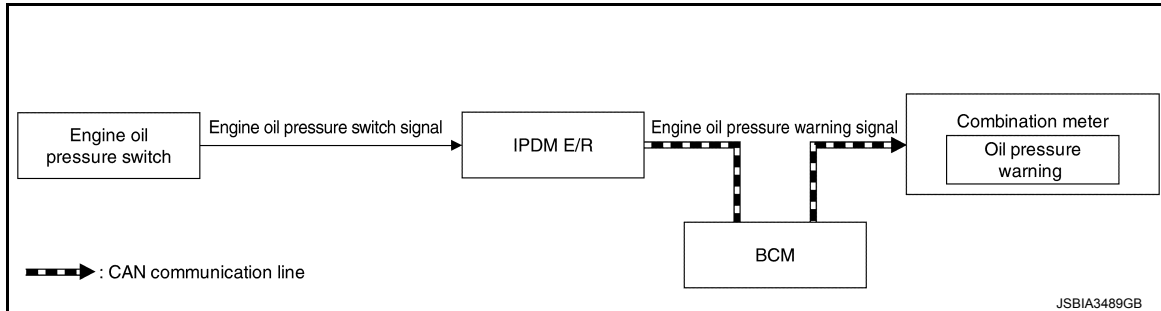
OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIG-

< SYSTEM DESCRIPTION >

NAL

For the operation for CAN communications blackout or abnormal signal reception, refer to [MWI-38. "Fail-Safe"](#) [with color display (with intelligent key)], [MWI-45. "EXCEPT BCM FUNCTION : Fail-Safe"](#) [with color display (without intelligent key)], [MWI-170. "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with monochrome display).

SYSTEM DIAGRAM



SIGNAL PATH

IPDM E/R received the engine oil pressure switch status from the oil pressure switch. After engine running when the oil pressure switch is OFF and at least 5 seconds, IPDM E/R transmits the engine oil pressure warning signal to combination meter via CAN communication through BCM. Then the engine oil pressure warning displays.

LIGHTING CONDITION

When any of the following conditions is satisfied:

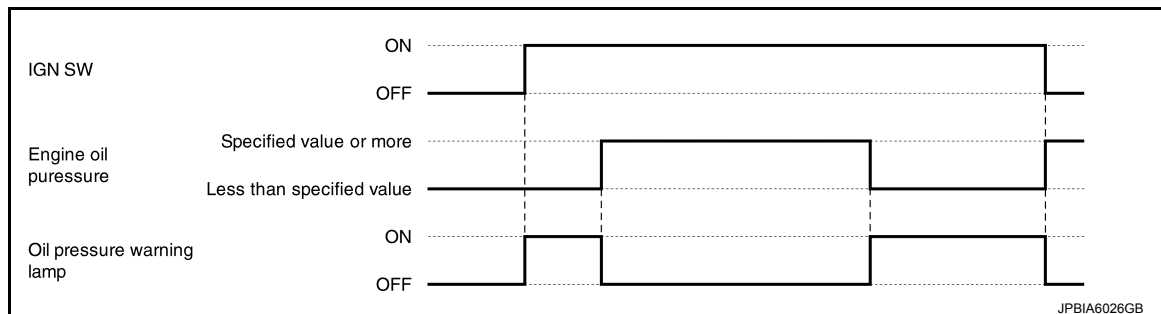
- Ignition switch: OFF
- Engine oil pressure is the specified value or more.

SHUTOFF CONDITION

When any of the following conditions is satisfied:

- Ignition switch: OFF
- Engine oil pressure is the specified value or more.

TIMING CHART



WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)

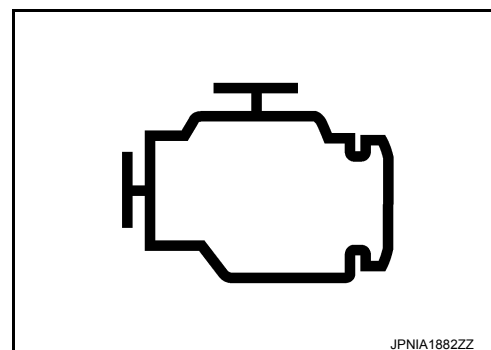
INFOID:0000000014268179

DESIGN/PURPOSE

When a malfunction which increases exhaust gases is detected, ECM turns ON MIL and informs the driver of the necessity of inspection and repair.

< SYSTEM DESCRIPTION >

When a malfunction which causes damage to the catalyst is detected, ECM immediately blinks MIL to alert the driver.



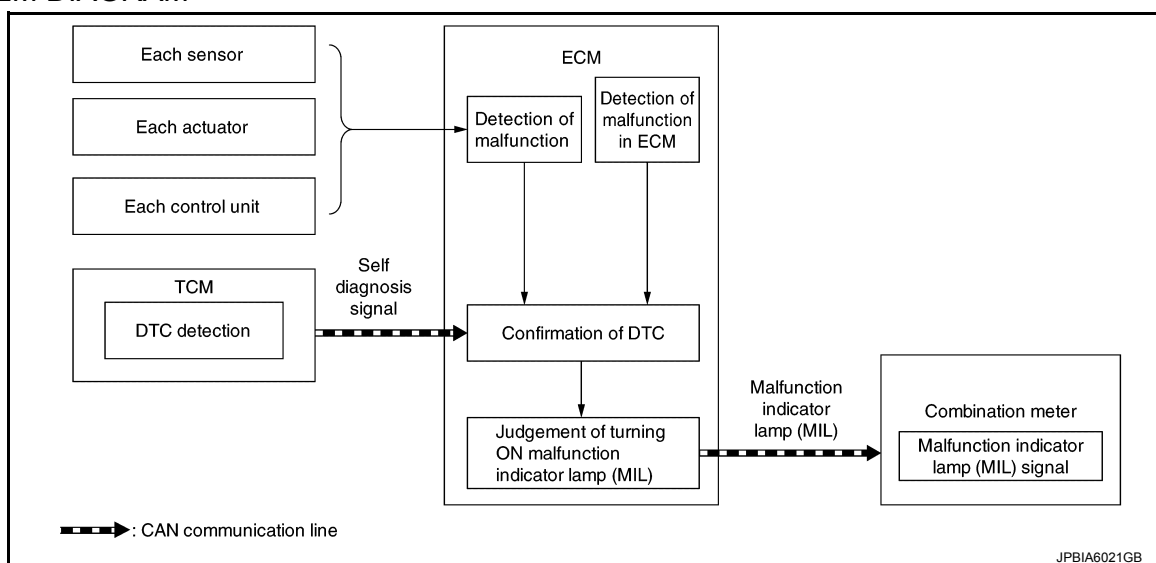
BULB CHECK

The bulb turns ON after turning ON the ignition switch (engine stop) and turns OFF after restarting the engine.

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communication blackout in the combination meter, refer to [MWI-38, "Fail-Safe"](#) [with color display (with intelligent key)], [MWI-45, "EXCEPT BCM FUNCTION : Fail-Safe"](#) [with color display (without intelligent key)], [MWI-170, "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with monochrome display).

SYSTEM DIAGRAM



SIGNAL PATH

- When the lighting conditions of the malfunction indicator lamp (MIL) are satisfied, ECM transmits a malfunction indicator lamp (MIL) signal to the combination meter via CAN communication.
- The combination meter turns ON or blinks the malfunction indicator lamp (MIL), according to a signal received from ECM.

LIGHTING CONDITION

When all of the following conditions are satisfied:

- Ignition switch: ON
- DTC which influences on exhaust gasses is judged.

For DTCs that the malfunction indicator lamp turns ON and the number of DTC diagnosis trips, refer to [EC-869, "DTC Index"](#).

SHUTOFF CONDITION

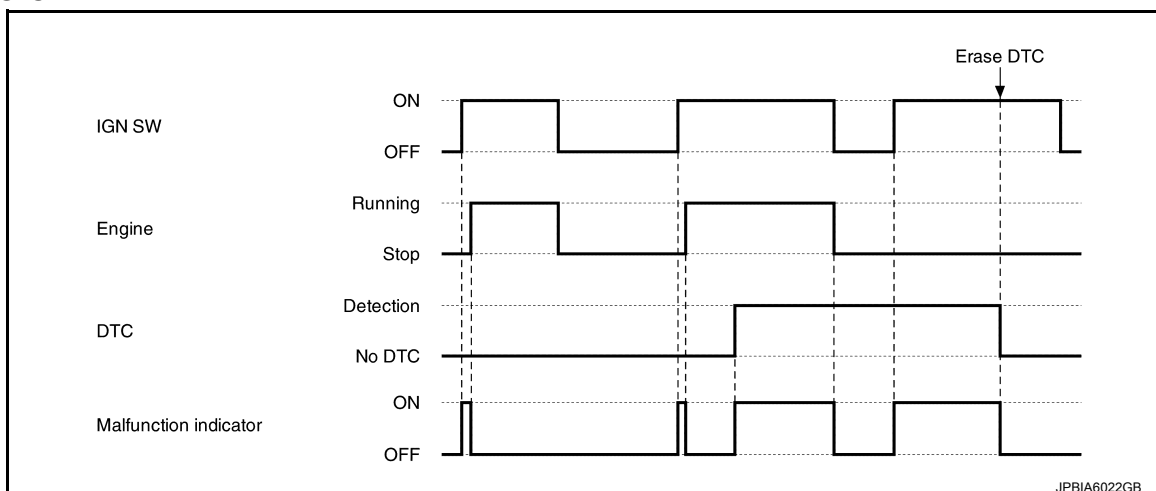
When any of the following conditions is satisfied:

- Ignition switch: OFF
- Erase DTC

NOTE:

For the conditions of erasing DTC, refer to , [EC-845, "DIAGNOSIS DESCRIPTION : DTC And Freeze Frame Data"](#).

TIMING CHART

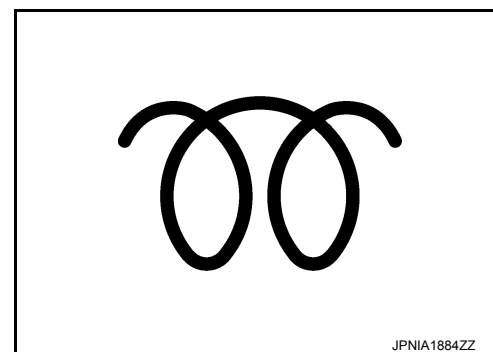


WARNING LAMPS/INDICATOR LAMPS : Glow Indicator Lamp

INFOID:000000014268180

DESIGN/PURPOSE

The glow indicator lamp turns ON in quick preheat mode and informs the driver that the glow plug is under preheating condition.



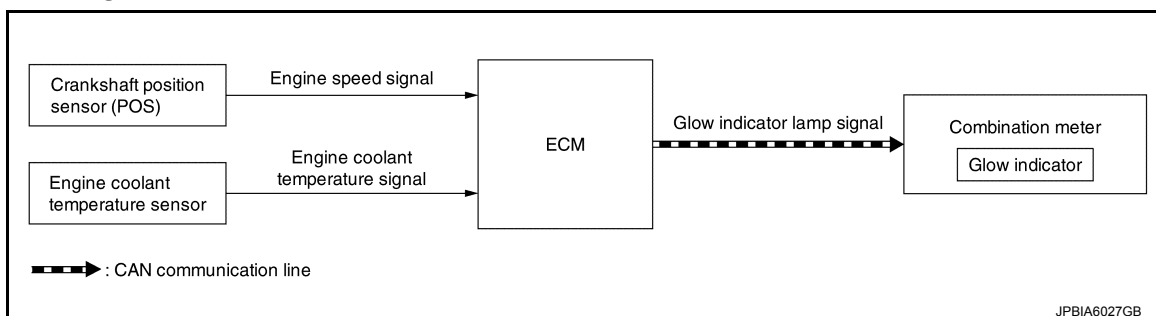
BULB CHECK

Not applicable

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communications blackout or abnormal signal reception, refer to [MWI-38, "Fail-Safe"](#) [with color display (with intelligent key)], [MWI-45, "EXCEPT BCM FUNCTION : Fail-Safe"](#) [with color display (without intelligent key)], [MWI-170, "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with monochrome display).

SYSTEM DIAGRAM



SIGNAL PATH

- ECM performs the glow control, according to an IGN ON signal, water temperature signal, and engine speed signal. ECM transmits a glow indicator lamp signal to the combination meter in quick preheat mode via CAN communication.
- The combination meter turns ON the glow indicator lamp, according to a glow indicator lamp signal received from ECM via CAN communication.

LIGHTING CONDITION

When any of the following conditions is satisfied:

- Ignition switch: ON
- Mode: Quick preheat mode

NOTE:

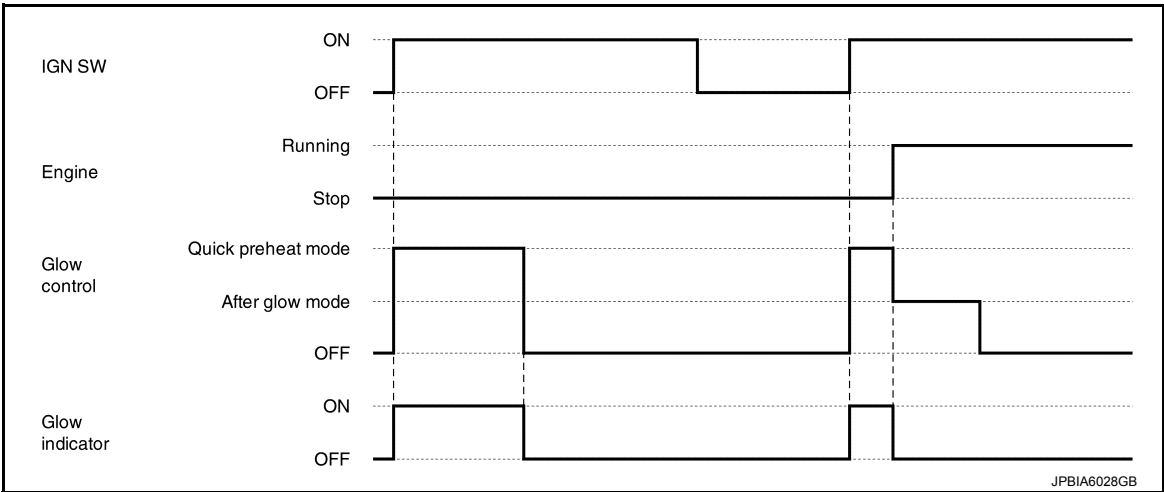
The glow indicator lamp does not turn ON in after glow mode.

SHUTOFF CONDITION

When any of the following conditions is satisfied:

- Ignition switch: OFF
- Quick preheat mode is complete.
- Engine start

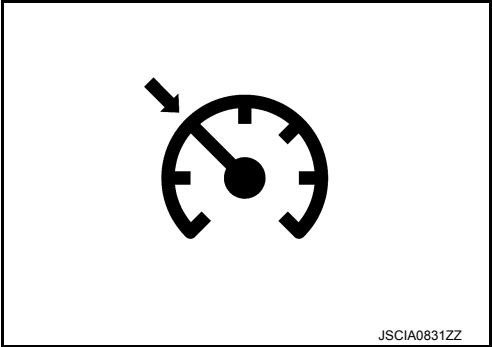
TIMING CHART



INFORMATION DISPLAY (COMBINATION METER)

INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator

INFOID:0000000014268181

Item	Symbol	Function
ASCD indicator	 Message: - - Km/h / - - MPH	For detail of ASCD function, refer to EC-836, "AUTOMATIC SPEED CONTROL DEVICE (ASCD) : System Description" .

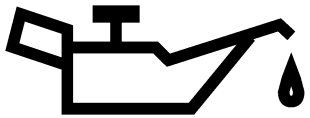
INFORMATION DISPLAY (COMBINATION METER) : Engine Oil Pressure Warning

INFOID:0000000014268182

DESIGN/PURPOSE

When engine oil pressure is low, the engine oil pressure warning informs the driver of low oil pressure to prevent damage to the engine.

A
EC
C
D
E
F
G
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J
K
L
M
N
O
P

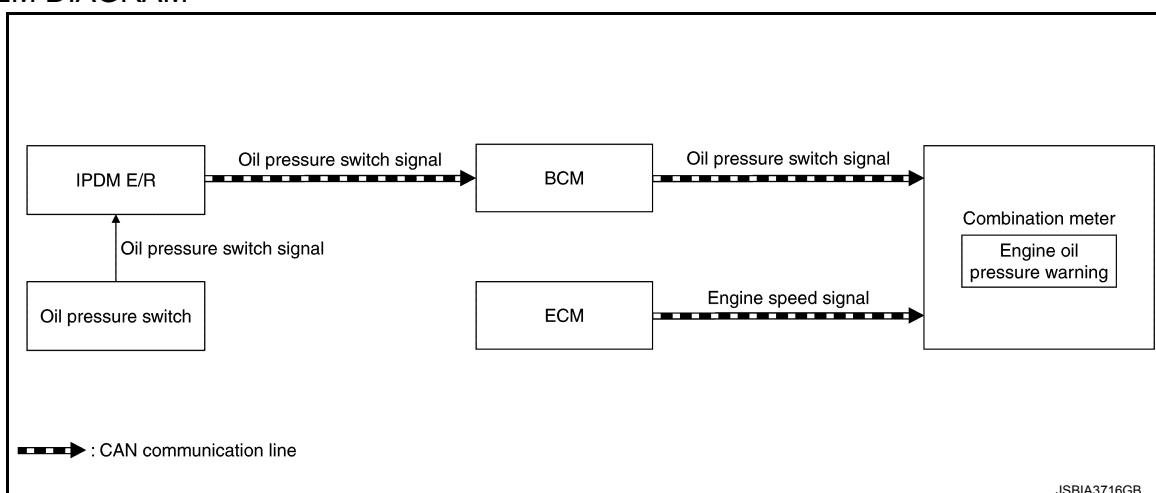
Symbol	Message
 JPNIA1881ZZ	• Low Oil Pressure • Stop Vehicle

BULB CHECK

Not applicable

OPERATION AT COMBINATION METER CAN COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For the operation for CAN communications blackout or abnormal signal reception, refer to [MWI-38, "Fail-Safe"](#) [with color display (with intelligent key)], [MWI-45, "EXCEPT BCM FUNCTION : Fail-Safe"](#) [with color display (without intelligent key)], [MWI-170, "EXCEPT BCM FUNCTION : Fail-Safe"](#) (with monochrome display).

SYSTEM DIAGRAM**SIGNAL PATH**

- IPDM E/R receives a signal from the engine oil pressure switch and transmits an oil pressure switch signal to BCM via CAN communication.
- BCM transmits the received oil pressure switch signal to the combination meter via CAN communication.
- The information display (on combination meter) is SHOWN/HIDDEN the engine oil pressure warning, according to the oil pressure switch signal received from BCM.

LIGHTING CONDITION

When all of the following conditions for at least 5 seconds are satisfied:

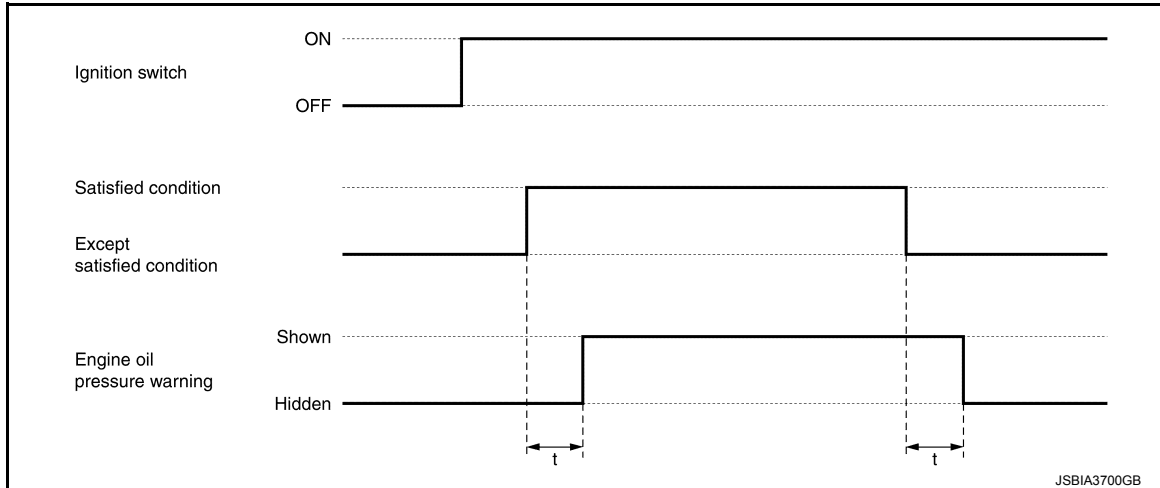
- Ignition switch: ON
- Engine oil pressure is less than specified value. (Oil pressure switch signal: ON)
- Engine speed is more than 500 rpm.

SHUTOFF CONDITION

When any of the following conditions is satisfied:

- Ignition switch: OFF
- Engine oil pressure is the specified value or more. (Oil pressure switch signal: OFF)
- Engine speed is less than 500 rpm.

TIMING CHART



t: 100 ms

WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning lamps/Indicator lamps

INFOID:0000000014268183

Name	Design	Arrangement/Function
Oil pressure warning lamp		Regarding the arrangement. Refer to MWI-10, "METER SYSTEM : Design" (with color display) or MWI-145, "METER SYSTEM : Design" (with monochrome display). Regarding the function. Refer to EC-837, "WARNING LAMPS/INDICATOR LAMPS : Engine Oil Pressure Warning Lamp".
Malfunction indicator lamp (MIL)		Regarding the arrangement. Refer to MWI-10, "METER SYSTEM : Design" (with color display) or MWI-145, "METER SYSTEM : Design" (with monochrome display). Regarding the function. Refer to EC-838, "WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)".
Glow indicator lamp		Regarding the arrangement. Refer to MWI-10, "METER SYSTEM : Design" (with color display) or MWI-145, "METER SYSTEM : Design" (with monochrome display). Regarding the function. Refer to EC-840, "WARNING LAMPS/INDICATOR LAMPS : Glow Indicator Lamp".

WARNING/INDICATOR/CHIME LIST : Warning/Indicator (On Information Display)

INFOID:0000000014268184

Name	Function
ASCD Indicator	Refer to EC-841, "INFORMATION DISPLAY (COMBINATION METER) : ASCD Indicator".
Oil pressure warning	Refer to EC-841, "INFORMATION DISPLAY (COMBINATION METER) : Engine Oil Pressure Warning".

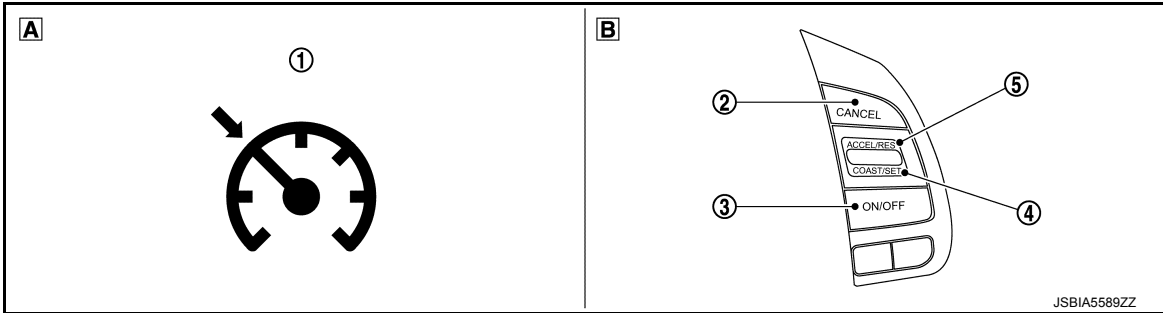
OPERATION

AUTOMATIC SPEED CONTROL DEVICE (ASCD)

AUTOMATIC SPEED CONTROL DEVICE (ASCD) : Switch Name and Function

INFOID:0000000014268185

SWITCHES AND INDICATORS



A On the combination meter

B On the steering wheel

① ASCD indicator

② CANCEL switch

③ ASCD MAIN switch

④ COAST/SET switch

⑤ ACCEL/RES switch

SET SPEED RANGE

ASCD system can be set the following vehicle speed.

Minimum speed (Approx.)	Maximum speed (Approx.)	
40 km/h (25 MPH)	EGI B with M/T models*	177 km/h (109 MPH)
	Except for above models*	188 km/h (116 MPH)

*: For details, refer to [GI-33, "Model Variation"](#).

SWITCH OPERATION

Item	Function
CANCEL switch	Cancels the cruise control driving.
ACCEL/RES switch	- Resumes the set speed. - Increases speed incrementally during cruise control driving.
COAST/SET switch	- Sets desired cruise speed. - Decreases speed incrementally during cruise control driving.
ASCD MAIN switch	Master switch to activate the ASCD system.

Refer to [EC-836, "AUTOMATIC SPEED CONTROL DEVICE \(ASCD\) : System Description"](#) for ASCD operating instructions.

DIAGNOSIS SYSTEM (ECM)

DIAGNOSIS DESCRIPTION

DIAGNOSIS DESCRIPTION : Introduction

INFOID:0000000014268186

The ECM has an on board diagnostic system, which detects malfunctions related to engine sensors or actuators. The ECM also records various emission-related diagnostic information including:

Emission-related diagnostic information	ISO Standard
Diagnostic Trouble Code (DTC)	Service \$03 of SAE J1979/ISO 15031-5
Freeze Frame data	Service \$02 of SAE J1979/ISO 15031-5
1st/2nd Trip Diagnostic Trouble Code (1st/2nd Trip DTC)	Service \$07 of SAE J1979/ISO 15031-5
Calibration ID	Service \$09 of SAE J1979/ISO 15031-5

The above information can be checked using procedures listed in the table below.

×: Applicable —: Not applicable

	DTC	1st trip DTC	2nd trip DTC	Freeze Frame data
CONSULT	×	×	×	×
ECM	×	×	×	—

The malfunction indicator lamp (MIL) on the instrument panel lights up when the same malfunction is detected in three consecutive trips (Three trip detection logic).

DIAGNOSIS DESCRIPTION : Three Trip Detection Logic And One Trip Detection Logic

INFOID:0000000014268187

On board diagnosis (OBD) system of this vehicle has “Three Trip Detection Logic” and “One Trip Detection Logic”. For which logic each self-diagnosis corresponds with, refer to [EC-869, "DTC Index"](#). “Trip” of “Three Trip Detection Logic” means a driving mode in which the self-diagnosis is performed while driving.

THREE TRIP DETECTION LOGIC

When a malfunction is detected for the first time, 1st trip DTC and Freeze Frame data are stored in the ECM memory. MIL does not illuminate at this stage. <1st trip>

When the same malfunction is detected again during the next driving, 2nd trip DTC is stored in the ECM memory and 1st trip DTC is cleared from the ECM memory. MIL does not illuminate at this stage. <2nd trip>

When the same malfunction is detected again at the third driving, DTC is stored in the ECM memory and 2nd trip DTC is cleared from the ECM memory. MIL illuminates at the same time when DTC is stored. <3rd trip>

In other words, DTC is stored and MIL illuminates when the same malfunction occurs in 3 consecutive trips. This is called “Three Trip Detection Logic”.

ONE TRIP DETECTION LOGIC

When a malfunction is detected for the first time, DTC and Freeze Frame Data are stored in the ECM memory and MIL lights up. This is called “One Trip Detection Logic”.

Some self-diagnoses will not illuminate MIL when DTC is stored. (Refer to [EC-869, "DTC Index"](#).)

1st/2nd trip DTC is not stored for one trip detection logic.

DIAGNOSIS DESCRIPTION : DTC And Freeze Frame Data

INFOID:0000000014268188

DTC AND 1ST/2ND TRIP DTC

The number of 1st/2nd trip DTC is the same as the number of DTC.

When a malfunction is detected during 1st trip, 1st trip DTC is stored in the ECM memory. MIL does not illuminate at this time. When the same malfunction is detected in the next trip (2nd trip), 2nd trip DTC is stored in the ECM memory and 1st trip DTC is cleared from the ECM memory. MIL does not illuminate at this time. In addition, DTC is stored in the ECM memory and MIL lights up when the same malfunction is detected during the following consecutive trip (3rd trip).

The procedure for erasing DTC, 1st trip DTC, and 2nd trip DTC from the ECM memory is described in “How to Erase DTC”.

For malfunctions in which 1st/2nd trip DTC are displayed, Refer to [EC-869, "DTC Index"](#).

< SYSTEM DESCRIPTION >

1st/2nd trip DTC is specified in Service \$07 of ISO15031-5. 1st/2nd trip DTC detection occurs without lighting up MIL and therefore does not warn the driver of a malfunction.

When 1st/2nd trip DTC is detected, check, print out or write down, and erase 1st/2nd trip DTC as specified with step 2 of Work Flow, refer to [EC-892. "Work Flow"](#). Then perform DTC CONFIRMATION PROCEDURE or Component Function Check to try to duplicate the malfunction. If the malfunction is duplicated, it is necessary to investigate the cause again.

FREEZE FRAME DATA

ECM records driving conditions such as calculated load value, engine coolant temperature, engine speed, etc., at the moment a malfunction is detected.

The data stored together with DTC is called Freeze Frame Data, and is displayed on CONSULT.

Only a set of Freeze Frame Data can be stored in the ECM memory. When ECM records Freeze Frame Data, and another Freeze Frame Data is generated after that, the first (original) Freeze Frame Data is not updated in ECM and it remains.

When the DTC is erased from ECM memory, Freeze Frame Data is erased with DTC. The procedure for erasing DTC is described in "How to Erase DTC".

HOW TO READ DTC AND 1ST/2ND TRIP DTC

DTC and 1st/2nd trip DTC can be read by the following procedures.

With CONSULT

No Tools

The number of blinks of the MIL in the Diagnostic Test Mode II (Self-Diagnostic Results) indicates the DTC. Example: 0016, 0335, 1409, etc.

These DTCs are controlled by NISSAN.

- **1st/2nd trip DTC No. is the same as DTC No.**
- **Output of a DTC indicates a malfunction. However, the Diagnostic Test Mode II do not indicate whether the malfunction is still occurring or has occurred in the past and has returned to normal. CONSULT can identify malfunction status. Therefore, using CONSULT (if available) is recommended.**

DTC and 1st/2nd trip DTC are displayed in the "SELF-DIAG RESULTS" mode of CONSULT.

"TIME" data indicates how many times the vehicle was driven after the last detection of DTC or 1st/2nd trip DTC. When DTC or 1st/2nd trip DTC has been detected currently, "TIME" becomes "CRNT" or "1t".

HOW TO ERASE DTC AND 1ST/2ND TRIP DTC

With CONSULT

NOTE:

If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 2 minutes and then turn it ON (engine stopped) again.

1. Select "ENGINE" with CONSULT.
2. Select "SELF-DIAG RESULTS".
3. Touch "ERASE". (DTC in ECM will be erased.)

No Tools

NOTE:

If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 2 minutes and then turn it ON (engine stopped) again.

1. Erase DTC in ECM. Refer to How to Erase Diagnostic Test Mode II (Self-diagnostic Results).
- **If the battery is disconnected, the emission-related diagnostic information will be lost within 24 hours.**
- **The following data are cleared when the ECM memory is erased.**
 - Diagnostic trouble codes
 - 1st/2nd trip diagnostic trouble codes
 - Freeze frame data

Actual work procedures are explained using a DTC as an example. Be careful so that not only the DTC, but all of the data listed above, are cleared from the ECM memory during work procedures.

DIAGNOSIS DESCRIPTION : Malfunction Indicator Lamp (MIL)

INFOID:0000000014268189

DESCRIPTION

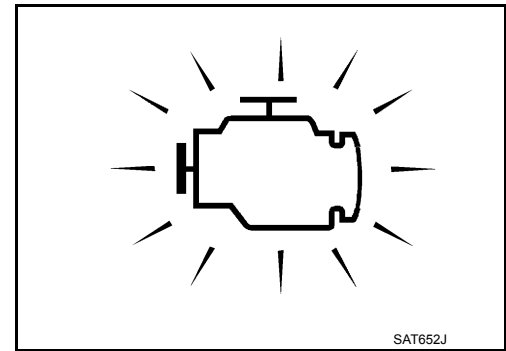
DIAGNOSIS SYSTEM (ECM)

[YD25DDTi]

< SYSTEM DESCRIPTION >

The MIL is located on the combination meter.

1. The MIL will light up when the ignition switch is turned ON without the engine running. This is a bulb check.
2. When the engine is started, the MIL should go off. If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



On Board Diagnosis Function

INFOID:000000014268190

ON BOARD DIAGNOSTIC SYSTEM FUNCTION

The on board diagnostic system has the following three functions.

Diagnostic Test Mode	KEY and ENG. Status	Function	Explanation of Function
Mode I	Ignition switch in ON position  Engine stopped 	BULB CHECK	This function checks the MIL bulb for damage (blown, open circuit, etc.). If the MIL does not come on, check MIL circuit.
	Engine running 	MALFUNCTION WARNING	This is a usual driving condition. When a DTC is detected, the MIL will light up to inform the driver that a malfunction has been detected.
Mode II	Ignition switch in ON position  Engine stopped 	SELF-DIAGNOSTIC RESULTS	This function allows DTCs and 1st/2nd trip DTCs to be read.

DIAGNOSTIC TEST MODE I — BULB CHECK

In this mode, the MIL on the instrument panel should stay ON.

DIAGNOSTIC TEST MODE I — MALFUNCTION WARNING

MIL	Condition
ON	When the malfunction is detected.
OFF	No malfunction.

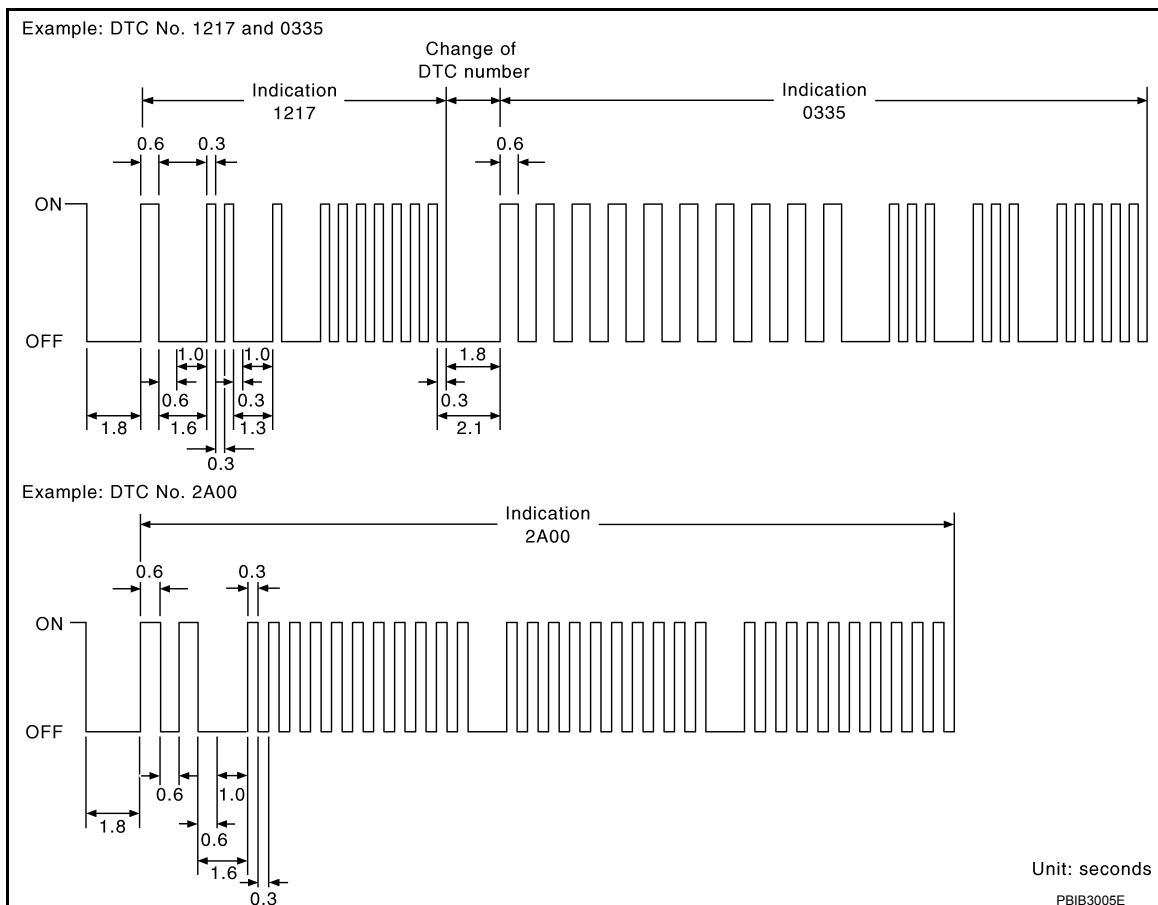
This DTC number is clarified in Diagnostic Test Mode II (SELF-DIAGNOSTIC RESULTS)

DIAGNOSTIC TEST MODE II — SELF-DIAGNOSTIC RESULTS

In this mode, the DTC and 1st/2nd trip DTC are indicated by the number of blinks of the MIL as shown below. The DTC and 1st/2nd trip DTC are displayed at the same time. If the MIL does not illuminate in diagnostic test mode I (Malfunction warning), all displayed items are 1st trip DTCs. If only one code is displayed when the MIL illuminates in diagnostic test mode II (SELF-DIAGNOSTIC RESULTS), it is a DTC; if two or more codes are displayed, they may be either DTCs or 1st/2nd trip DTCs. DTC No. is same as that of 1st/2nd trip DTC. These

< SYSTEM DESCRIPTION >

unidentified codes can be identified by using the CONSULT. A DTC will be used as an example for how to read a code.



A particular trouble code can be identified by the number of four-digit numeral flashes as follows.

Number	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Flashes	10	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16

The length of time the 1,000th-digit numeral flashes on and off is 1.2 seconds consisting of an ON (0.6-second) - OFF (0.6-second) cycle.

The 100th-digit numeral and lower digit numerals consist of a 0.3-second ON and 0.3-second OFF cycle.

A change from one digit numeral to another occurs at an interval of 1.0-second OFF. In other words, the later numeral appears on the display 1.3 seconds after the former numeral has disappeared.

A change from one trouble code to another occurs at an interval of 1.8-second OFF.

In this way, all the detected malfunctions are classified by their DTC numbers. The DTC 0000 refers to no malfunction. (See [EC-869, "DTC Index"](#))

HOW TO SWITCH DIAGNOSTIC TEST MODE

NOTE:

- It is better to count the time accurately with a clock.
- It is impossible to switch the diagnostic mode when an accelerator pedal position sensor circuit has a malfunction.
- Always ECM returns to Diagnostic Test Mode I after ignition switch is turned OFF.

HOW TO SET DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)

1. Confirm that accelerator pedal is fully released, turn ignition switch ON and wait 3 seconds.
2. Repeat the following procedure quickly five times within 5 seconds.
 - Fully depress the accelerator pedal.
 - Fully release the accelerator pedal.
3. Wait 7 seconds, fully depress the accelerator pedal and keep it for approx. 10 seconds until the MIL starts blinking.
4. Fully release the accelerator pedal.
ECM has entered to Diagnostic Test Mode II (Self-diagnostic results).

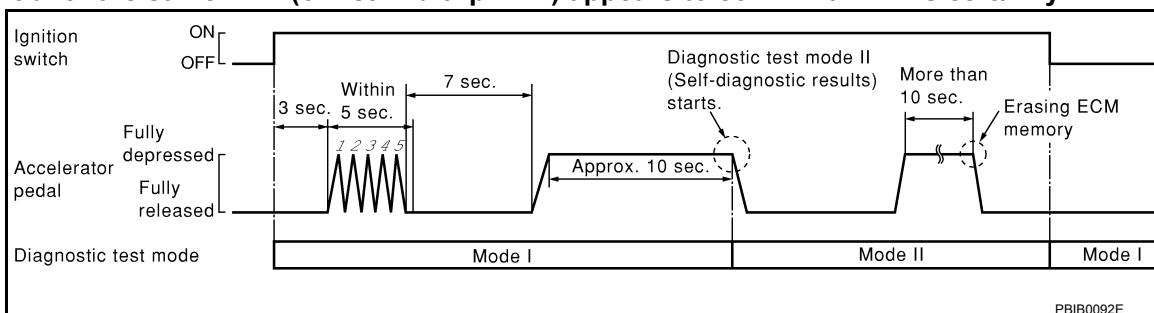
NOTE:

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YD25DDTi]

Wait until the same DTC (or 1st/2nd trip DTC) appears to confirm all DTCs certainly.



HOW TO ERASE DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)

1. Set ECM in Diagnostic Test Mode II (Self-diagnostic results). Refer to "How to Set Diagnostic Test Mode II (Self-diagnostic Results)".
2. Fully depress the accelerator pedal and keep it for more than 10 seconds.
The emission-related diagnostic information has been erased from the backup memory in the ECM.
3. Fully release the accelerator pedal, and confirm the DTC 0000 is displayed.

HOW TO ERASE DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)

The DTC can be erased from the back up memory in the ECM by depressing accelerator pedal. Refer to "HOW TO ERASE DIAGNOSTIC TEST MODE II (SELF-DIAGNOSTIC RESULTS)".

- If the battery is disconnected, the DTC will be lost from the backup memory within 24 hours.
- Be careful not to erase the stored memory before starting trouble diagnoses.

CONSULT Function

INFOID:0000000014268191

FUNCTION

NOTE:

Refer to [EC-803. "How to Check Vehicle Type"](#), for the information of type 1 and 2.

Diagnostic test mode	Function
Self-diagnostic results	Self-diagnostic results such as DTC and freeze frame data can be read and erased quickly.*
Data monitor	Input/Output data in the ECM can be read.
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on the CONSULT unit.
Active test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ECMs and also shifts some parameters in a specified range.
ECM part number	ECM part number can be read.

*: The following emission-related diagnostic information is cleared when the ECM memory is erased.

- Diagnostic trouble codes
- Freeze frame data

WORK SUPPORT MODE

Work Item

Work item	Description	Usage
ENTER INJECTR CALIB DATA	Injector adjustment value is written onto ECM memory.	When performing Injector Adjustment Value Registration.
PUMP LEANT CLEAR	Fuel pump learning value stored in ECM is cleared.	Fuel Pump Learning Value Clearing should be performed under the following conditions. • Fuel pump is changed.

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YD25DDTi]

Work item	Description	Usage
EGR/V LEARN CLR (Type 2 is not applicable)	EGR volume control valve learning value stored in ECM is cleared.	EGR volume control valve closed position learning value should be cleared under the following cases. - EGR volume control valve is removed. - EGR volume control valve is replaced.
OC DATA CLEAR	Three way catalyst and lean NOx trap catalyst converter data stored in ECM memory is cleared.	Always perform after three way catalyst and lean NOx trap catalyst converter is replaced as new one.
CONFIG CLR	ASCD, ESP and PTC heater application status stored in ECM is initialized. NOTE: After the status is initialized, ECM recognizes ASCD, ESP and PTC heater application status when the following conditions are met. - For ASCD: ASCD MAIN switch is pressed. - For VDC: VDC switch* is ON. - For PTC heater: Ignition switch ON.	When initializing ASCD, ESP and PTC heater application status stored in ECM.
E/R AIR TEMP SEN LEARN CLR	NOTE: The item is indicated, but not used.	
FUEL INJ QUANTITY LEARNING	Adjustment of fuel injection quantity under various conditions.	Injector fuel injection quantity learning must be performed after the following cases. - Injector(s) are replaced. - ECM is replaced.
INJ ADJ VAL CLR	Injector adjustment value stored in ECM is initialized.	Before changing injector adjustment value stored in ECM, it is recommended to perform this work item.
A/F SEN 1 LEARN CLR	NOTE: The item is indicated, but not used.	
DF EXH PRES SEN LEARN CLR	NOTE: The item is indicated, but not used.	
SAVING DATA FOR REPLC CPU	In this mode, save data that is in ECM.	When ECM is replaced.*
WRITING DATA FOR REPLC CPU	In this mode, write data stored by "SAVING DATA REPLC CPU" in work support mode to ECM.	When ECM is replaced.*
TC BOOST CONTROL ACTUATOR POSITION LEARNING	NOTE: The item is indicated, but not used.	

*: The necessary operation is different depending on the operation result of ECM data save or write. Always perform the operation according to procedures. Refer to [EC-898, "Description"](#).

SELF-DIAGNOSTIC MODE

Self Diagnostic Item

Regarding items of DTC and 1st/2nd trip DTC, refer to [EC-869, "DTC Index"](#).

Freeze Frame Data

Freeze frame data item	Description
DIAG TROUBLE CODE [PXXXX]	The engine control component part/control system has a trouble code, it is displayed as "PXXXX". (Refer to EC-869, "DTC Index" .)
CAL/LD VALUE [%]	The calculated load value at the moment a malfunction is detected is displayed.
COOLANT TEMP [°C] or [°F]	The engine coolant temperature at the moment a malfunction is detected is displayed.
ENGINE SPEED [rpm]	The engine speed at the moment a malfunction is detected is displayed.
VEHICL SPEED [km/h] or [mph]	The vehicle speed at the moment a malfunction is detected is displayed.

DIAGNOSIS SYSTEM (ECM)

[YD25DDTi]

< SYSTEM DESCRIPTION >

Freeze frame data item	Description
INT MANI PRES [kPa]	The intake manifold pressure at the moment a malfunction is detected is displayed.
INT/A TEMP SE [°C] or [°F]	The intake air temperature at the moment a malfunction is detected is displayed.
FUEL/R PRESS [kPa]	The fuel rail pressure at the moment a malfunction is detected is displayed.
MASS AIRFLOW [g/s]	The mass air flow at the moment a malfunction is detected is displayed.

DATA MONITOR MODE

NOTE:

- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- For reference values of the following items, refer to [EC-855, "Reference Value"](#).

Monitored item	Unit	Description	Remarks
CKPS-RPM (TDC)	rpm	The engine speed computed from the crankshaft position sensor signal is displayed.	
COOLAN TEMP/S	°C or °F	The engine coolant temperature (determined by the signal voltage of the engine coolant temperature sensor) is displayed.	When the engine coolant temperature circuit is open or short, ECM enters fail-safe mode. The engine coolant temperature determined by the ECM is displayed.
FUEL TEMP SEN	°C or °F	The fuel temperature (determined by the signal voltage of the fuel temperature sensor) is displayed.	
ACCEL POS SEN	V	The accelerator pedal position sensor 1 signal voltage is displayed.	
ACCEL SEN 2	V	The accelerator pedal position sensor 2 signal voltage is displayed.	
ACT CR PRESS	MPa	The Fuel rail pressure (determined by the signal voltage of the fuel rail pressure sensor) is displayed.	
BATTERY VOLT	V	The power supply voltage of ECM is displayed.	
P/N POSI SW	ON/OFF	Indicates [ON/OFF] condition from the park/neutral position switch signal.	
START SIGNAL	ON/OFF	Indicates [ON/OFF] condition from the starter signal.	
AIR COND SIG	ON/OFF	Indicates [ON/OFF] condition of the air conditioner switch as determined by the air conditioner signal.	
BRAKE SW	ON/OFF	Indicates [ON/OFF] condition from the stop lamp switch signal.	
BRAKE SW2	ON/OFF	Indicates [ON/OFF] condition from the brake pedal position switch signal.	
IGN SW	ON/OFF	Indicates [ON/OFF] condition from ignition switch signal.	
MAS AIR/FL SE	V	The signal voltage of the mass air flow sensor is displayed.	
MAIN INJ WID	μsec	Indicates the actual main fuel injection pulse width compensated by ECM according to the input signals.	
PUMP CURRENT	mA	Indicates the fuel pump power supply current from the ECM.	
GLOW RLY	ON/OFF	The glow relay control condition (determined by ECM according to the input signal) is displayed.	
COOLING FAN	LOW/HI/OFF	Indicates the control condition of the A/C condenser fans. LOW: Operates at low speed. HI: Operates at high speed. OFF: Stopped	

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YD25DDTi]

Monitored item	Unit	Description	Remarks
ALTERNATOR DUTY	%	Indicates the duty ratio of the power generation command value. The ratio is calculated by ECM based on the battery current sensor signal.	
INT/A VOLUME	mg/st	The intake air volume computed from the mass air flow sensor signal is displayed.	
BARO SEN	kPa	The barometric pressure (determined by the signal voltage from the absolute pressure sensor built into the ECM) is displayed.	
BATTERY TEMP SEN	V	The battery temperature sensor signal voltage is displayed.	
INT/M PRES SE	kPa	Turbocharger boost (determined by the signal voltage from the turbocharger boost sensor) is displayed.	
BAT CURRENT SEN	V	The battery current sensor signal voltage is displayed.	
VHCL SPEED SE	km/h or mph	Indicates a vehicle speed used for ASCD system.	
SET VHCL SPD	km/h or mph	The preset vehicle speed is displayed.	This item is not used.
INJ Q/L CYL 1 - A	—	The fuel injection quantity learning value in the fuel injection area A of cylinder 1 is displayed.	
INJ Q/L CYL 2 - A	—	The fuel injection quantity learning value in the fuel injection area A of cylinder 2 is displayed.	
INJ Q/L CYL 3 - A	—	The fuel injection quantity learning value in the fuel injection area A of cylinder 3 is displayed.	
INJ Q/L CYL 4 - A	—	The fuel injection quantity learning value in the fuel injection area A of cylinder 4 is displayed.	
INJ Q/L CYL 1 - B	—	The fuel injection quantity learning value in the fuel injection area B of cylinder 1 is displayed.	
INJ Q/L CYL 2 - B	—	The fuel injection quantity learning value in the fuel injection area B of cylinder 2 is displayed.	
INJ Q/L CYL 3 - B	—	The fuel injection quantity learning value in the fuel injection area B of cylinder 3 is displayed.	
INJ Q/L CYL 4 - B	—	The fuel injection quantity learning value in the fuel injection area B of cylinder 4 is displayed.	
INJ Q/L CYL 1 - C	—	The fuel injection quantity learning value in the fuel injection area C of cylinder 1 is displayed.	
INJ Q/L CYL 2 - C	—	The fuel injection quantity learning value in the fuel injection area C of cylinder 2 is displayed.	
INJ Q/L CYL 3 - C	—	The fuel injection quantity learning value in the fuel injection area C of cylinder 3 is displayed.	
INJ Q/L CYL 4 - C	—	The fuel injection quantity learning value in the fuel injection area C of cylinder 4 is displayed.	
INJ Q/L CYL 1 - D	—	The fuel injection quantity learning value in the fuel injection area D of cylinder 1 is displayed.	
INJ Q/L CYL 2 - D	—	The fuel injection quantity learning value in the fuel injection area D of cylinder 2 is displayed.	
INJ Q/L CYL 3 - D	—	The fuel injection quantity learning value in the fuel injection area D of cylinder 3 is displayed.	
INJ Q/L CYL 4 - D	—	The fuel injection quantity learning value in the fuel injection area D of cylinder 4 is displayed.	
CYL COUNT	1/2/3/4	The cylinder being injected is displayed. 1: Cylinder No.1 is injected. 2: Cylinder No.2 is injected. 3: Cylinder No.3 is injected. 4: Cylinder No.4 is injected.	

DIAGNOSIS SYSTEM (ECM)

[YD25DDTi]

< SYSTEM DESCRIPTION >

Monitored item	Unit	Description	Remarks
EXH GAS PRS SEN 1	V	The exhaust gas pressure sensor 1 signal voltage is displayed.	
TRVL AFTER MIL	km or mile	Distance traveled while MIL is activated.	
SET SW	ON/OFF	Indicates [ON/OFF] condition from COAST/SET switch signal.	This item is not used.
RESUME/ACC SW	ON/OFF	Indicates [ON/OFF] condition from ACCEL/RES switch signal.	This item is not used.
CANCEL SW	ON/OFF	Indicates [ON/OFF] condition from CANCEL switch signal.	This item is not used.
MAIN SW	ON/OFF	Indicates [ON/OFF] condition from MAIN switch signal.	This item is not used.
FR EX TMP SEN	°C or °F	The exhaust gas temperature before DPF (determined by the signal voltage of the exhaust gas temperature sensor 2) is displayed.	
RR EX TMP SEN	°C or °F	The rear exhaust gas temperature after DPF (determined by the signal voltage of the exhaust gas temperature sensor 3) is displayed.	
ASCD APPLY	YES/NO	Displaying ASCD application status stored in ECM.	
VDC APPLY	YES/NO	Displaying ESP application status stored in ECM.	
KICKDOWN POSI	ON/OFF	Indicates [ON/OFF] condition of kickdown determined by the ECM according to the input signals.	
ALT DUTY SIGNAL	ON/OFF	Indicates the duty ratio of the power generation command value. The ratio is calculated by ECM based on the battery current sensor signal.	
LOAD SIGNAL	ON/OFF	Indicates [ON/OFF] condition from the electrical load signal. • ON: Rear window defogger switch is ON and/or lighting switch is in 2nd position. • OFF: Both rear window defogger switch and lighting switch are OFF.	
AC PRESS SEN	V	The signal voltage from the refrigerant pressure sensor is displayed.	
EGR/V ANGLE	°	• The opening angle of EGR volume control value is displayed. • The opening becomes larger as the value increases.	
EGR V/POS SEN	mV	The EGR volume control valve position sensor signal voltage is displayed.	
IAT SENSOR 2	V	The intake air temperature sensor 2 signal voltage is displayed.	
EGT SENSOR 1	V	The exhaust gas temperature sensor 1 signal voltage is displayed.	
A/F SENSOR 1	mV	The air fuel ratio (A/F) sensor 1 signal voltage is displayed.	
ENGINE STATUS	TRNST/ STEADY	Indicates the state of engine. • TRNST: Engine revolution is fluctuating. • STEADY: Engine runs under steady revolution.	
EXH LEAK DIAG1	INCMP/CM- PLT	Indicates DTC P102B self-diagnosis condition. • INCMP: Self-diagnosis is incomplete. • CMPLT: Self-diagnosis is complete	
BST PRSR DIAG1 B1	INCMP/CM- PLT	Indicates DTC P2279 self-diagnosis condition. • INCMP: Self-diagnosis is incomplete. • CMPLT: Self-diagnosis is complete	

NOTE:

Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

ACTIVE TEST MODE

DIAGNOSIS SYSTEM (ECM)

< SYSTEM DESCRIPTION >

[YD25DDTi]

Test item	Condition	Judgement	Check item (Remedy)
POWER BAL- ANCE	- Engine: After warming up, idle the engine. - A/C switch: OFF - Selector lever: P or N (A/T), Neutral (M/T) - Cut off each injector signal one at a time using CONSULT.	Engine runs rough or dies.	- Harness and connectors - Compression - Fuel injector
COOLING FAN	- Ignition switch: ON - Operate the A/C condenser fan at LOW, HI speed and turn OFF using CONSULT.	A/C condenser fan moves at LOW, HI speed and stops.	- Harness and connectors - A/C condenser fan motor - A/C condenser fan relay
ENG COOLANT TEMP	- Engine: Return to the original trouble condition - Change the engine coolant temperature using CONSULT.	If trouble symptom disappears, see CHECK ITEM.	- Harness and connectors - Engine coolant temperature sensor - Fuel injector
GLOW RLY	- Ignition switch: ON (Engine stopped) - Turn the glow relay ON and OFF using CONSULT and listen to operating sound.	Glow relay makes the operating sound.	- Harness and connectors - Glow relay
FUEL/T TEMP SEN	- Engine: Return to the original trouble condition - Change the fuel tank temperature using CONSULT.	If trouble symptom disappears, see CHECK ITEM.	- Harness and connectors - Fuel tank temperature sensor - Fuel injector
ALTERNATOR DUTY	- Engine: Idle - Change duty ratio using CONSULT.	Battery voltage changes.	- Harness and connectors - IPDM E/R - Alternator
PRES REGULA- TOR	- Ignition switch: ON - Change fuel rail pressure using CONSULT.	Fuel leaks.	- Fuel line - Fuel rail pressure relief valve
TRG EGR/V AN- GLE	- Ignition switch: ON - Change EGR volume control valve opening angle (within the range of 0 – 70°) using CONSULT.	EGR volume control valve makes an operating sound.	- Harness and connectors - EGR volume control valve
TC BOOST CON- TROL ACTUA- TOR	- Ignition switch: ON - Change operating angle of turbocharger boost control actuator.	Turbocharger boost control rod is moved.	- Harness and connectors - Turbocharger boost control actuator
EGR COOLER BYPASS VALVE (Type 2 is not ap- plicable)	- Engine: Running - Operate the EGR cooler bypass valve.	EGR cooler bypass valve control rod is moved.	- Harness and connectors - EGR cooler bypass valve - EGR cooler bypass valve control solenoid valve

ECU DIAGNOSIS INFORMATION

ECM

Reference Value

INFOID:0000000014268192

VALUES ON THE DIAGNOSIS TOOL

NOTE:

- Numerical values in the following table are reference values.
- These values are input/output values that ECM receives/transmits and may differ from actual operations.
- The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.
- For outlines of following items, refer to [EC-849, "CONSULT Function"](#).

Monitor item	Condition		Specification
CKPS-RPM (TDC)	Run engine and compare CONSULT value with the tachometer indication.		Almost the same speed as the tachometer indication
COOLAN TEMP/S	Engine: After warming up		More than 70°C (158°F)
FUEL TEMP SEN	Engine: After warming up		More than 40°C (104°F)
ACCEL POS SEN	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.65 – 0.87 V
		Accelerator pedal: Fully depressed	More than 4.3 V
ACCEL SEN 2	Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.28 – 0.48 V
		Accelerator pedal: Fully depressed	More than 2.0 V
ACT CR PRESS	• Engine: After warming up • Air conditioner switch: OFF • Selector lever: P or N (A/T), Neutral (M/T) • No load	Idle	25 – 35 MPa
		2,000 rpm	40 – 50 MPa
BATTERY VOLT	Ignition switch: ON (Engine stopped)		11 – 14 V
P/N POSI SW	Ignition switch: ON	Selector lever: P or N (A/T), Neutral (M/T)	ON
		Except above	OFF
START SIGNAL	Ignition switch: ON → START → ON		OFF → ON → OFF
AIR COND SIG	Engine: After warming up, idle the engine	Air conditioner switch: OFF	OFF
		Air conditioner switch: ON (Compressor operates.)	ON
BRAKE SW	Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON
BRAKE SW2	Ignition switch: ON	Brake pedal: Fully released	ON
		Brake pedal: Slightly depressed	OFF
IGN SW	Ignition switch: ON → OFF		ON → OFF
MAS AIR/FL SE	• Engine: After warming up • Air conditioner switch: OFF • Selector lever: P or N (A/T), Neutral (M/T) • No load	Ignition switch: ON (Engine stopped)	Approx. 0.4 V
		Idle	1.1 – 2.1 V
		Engine is revving from idle to about 4,000 rpm.	1.1 – 2.1 V to 4.0V (Check for liner voltage rise in response to engine being increased to about 4,000 rpm)
MAIN INJ WID	• Engine: After warming up • Selector lever: P or N (A/T), Neutral (M/T) • Idle speed	No load	0.50 – 0.70 msec
		Blower fan switch: ON Rear window defogger switch: ON	0.50 – 0.80 μsec

ECM

< ECU DIAGNOSIS INFORMATION >

[YD25DDTi]

Monitor item	Condition		Specification
PUMP CURRENT	- Engine: After warming up - Air conditioner switch: OFF - Selector lever: P or N (A/T), Neutral (M/T) - No load	Idle	1,600 – 2,000 mA
		2,000 rpm	1,500 – 1,900 mA
GLOW RLY	Refer to EC-832, "GLOW CONTROL : System Description" .		
COOLING FAN	When A/C condenser fan is stopped.		OFF
	When A/C condenser fan operate at low speed.		LOW
	When A/C condenser fan operate at high speed.		HI
ALTERNATOR DUTY	Engine: Idle		0 – 80 %
INT/A VOLUME	Engine: After warming up, idle the engine		150 – 450 mg/st
BARO SEN	Ignition switch: ON		Altitude Approx. 0m: Approx. 100.62 kPa (1.0062 bar, 1.026 kg/cm ² , 14.59 psi) Approx. 1,000 m: Approx. 88.95 kPa (0.8895 bar, 0.907 kg/cm ² , 12.90 psi) Approx. 1,500 m: Approx. 83.16 kPa (0.8316 bar, 0.848 kg/cm ² , 12.06 psi) Approx. 2,000 m: Approx. 78.36 kPa (0.7836 bar, 0.799 kg/cm ² , 11.36 psi)
BATTERY TEMP SEN	Engine: Running		0.2 – 4.8 V Voltage varies with battery temperature
INT/M PRES SE	- Engine: After warming up - Air conditioner switch: OFF - Selector lever: P or N (A/T), Neutral (M/T) - No load	Idle	Approx. 100.00 kPa
		3,600 rpm	Approx. 140.00 kPa
		4,000 rpm	Approx. 135.00 kPa
BAT CURRENT SEN	- Engine speed: Idle - Battery: Fully charged - Selector lever: P or N (A/T), Neutral (M/T) - Air conditioner switch: OFF - No load		Approx. 2.6 – 3.5 V
VHCL SPEED SE	Turn drive wheels and compare speedometer indication with the CONSULT value.		Almost the same speed as the CONSULT value
SET VHCL SPD*1	Engine: Running	ASCD: Operating.	The preset vehicle speed is displayed.
INJ Q/L CYL 1 - A	Ignition switch: ON		–0.067 – 0.090
INJ Q/L CYL 2 - A	Ignition switch: ON		–0.067 – 0.090
INJ Q/L CYL 3 - A	Ignition switch: ON		–0.067 – 0.090
INJ Q/L CYL 4 - A	Ignition switch: ON		–0.067 – 0.090
INJ Q/L CYL 1 - B	Ignition switch: ON		–0.032 – 0.053
INJ Q/L CYL 2 - B	Ignition switch: ON		–0.032 – 0.053
INJ Q/L CYL 3 - B	Ignition switch: ON		–0.032 – 0.053
INJ Q/L CYL 4 - B	Ignition switch: ON		–0.032 – 0.053
INJ Q/L CYL 1 - C	Ignition switch: ON		–0.018 – 0.038
INJ Q/L CYL 2 - C	Ignition switch: ON		–0.018 – 0.038
INJ Q/L CYL 3 - C	Ignition switch: ON		–0.018 – 0.038
INJ Q/L CYL 4 - C	Ignition switch: ON		–0.018 – 0.038

ECM

< ECU DIAGNOSIS INFORMATION >

[YD25DDTi]

Monitor item	Condition		Specification
INJ Q/L CYL 1 - D	Ignition switch: ON		-0.017 – 0.034
INJ Q/L CYL 2 - D	Ignition switch: ON		-0.017 – 0.034
INJ Q/L CYL 3 - D	Ignition switch: ON		-0.017 – 0.034
INJ Q/L CYL 4 - D	Ignition switch: ON		-0.017 – 0.034
CYL COUNT	Engine is running		1 → 3 → 4 → 2
EXH GAS PRS SEN 1	- Engine: After warming up - Selector lever: P or N (A/T), Neutral (M/T)	Idle	1.0 V
TRVL AFTER MIL	Ignition switch: ON	Vehicle has traveled after MIL has turned ON.	0 – 65,535 km (0 – 40,723 mile)
SET SW*1	Ignition switch: ON	COAST/SET switch: Pressed	ON
		COAST/SET switch: Released	OFF
RESUME/ACC SW*1	Ignition switch: ON	ACCEL/RES switch: Pressed	ON
		ACCEL/RES switch: Released	OFF
CANCEL SW*1	Ignition switch: ON	CANCEL switch: Pressed	ON
		CANCEL switch: Released	OFF
MAIN SW*1	Ignition switch: ON	ASCD MAIN switch: Pressed	ON
		ASCD MAIN switch: Released	OFF
FR EX TMP SEN	Engine: After warming up		More than 120°C (248°F)
RR EX TMP SEN	Engine: After warming up		More than 100°C (212°F)
ASCD APPLY	Ignition switch: ON	Models with ASCD	YES
		Models without ASCD	NO
VDC APPLY	Ignition switch: ON	Models with ESP	YES
		Models without ESP	NO
KICKDOWN POSI*2	Ignition switch: ON	Accelerator pedal: Fully released	OFF
		Accelerator pedal: Fully depressed	ON
AC PRESS SEN	- Engine: Idle - Both A/C switch and blower fan switch: ON (Compressor operates)		1.0 – 4.0 V
EGR/V ANGLE	Ignition switch: ON (Engine stopped)		Approx. 0°
EGR V/POS SEN	Ignition switch: ON (Engine stopped)		1,050 – 1,350 mV
IAT SENSOR 2	Engine: After warming up		0.1 – 4.9 V
EGT SENSOR 1	Engine: After warming up	Idle	0.1 – 5.0 V
A/F SENSOR 1	- Engine: After warming up - Air conditioner switch: OFF - Selector lever: P or N (A/T), Neutral (M/T) - No load	Idle	Approx. 2200 mV
ENGINE STATUS	Engine revolution is fluctuating.		TRNST
	Engine runs under steady revolution.		STEADY
ALT DUTY SIGNAL	Power generation voltage variable control	Operating	ON
		Not operating	OFF
LOAD SIGNAL	Ignition switch: ON	Rear window defogger switch: ON	ON
		Rear window defogger switch: OFF	OFF
EXH LEAK DIAG1	DTC P102B self-diagnosis is incomplete.		INCMP
	DTC P102B self-diagnosis is complete.		CMPLT
BST PRSR DIAG1 B1	DTC P2279 self-diagnosis is incomplete.		INCMP
	DTC P2279 self-diagnosis is complete.		CMPLT

< ECU DIAGNOSIS INFORMATION >

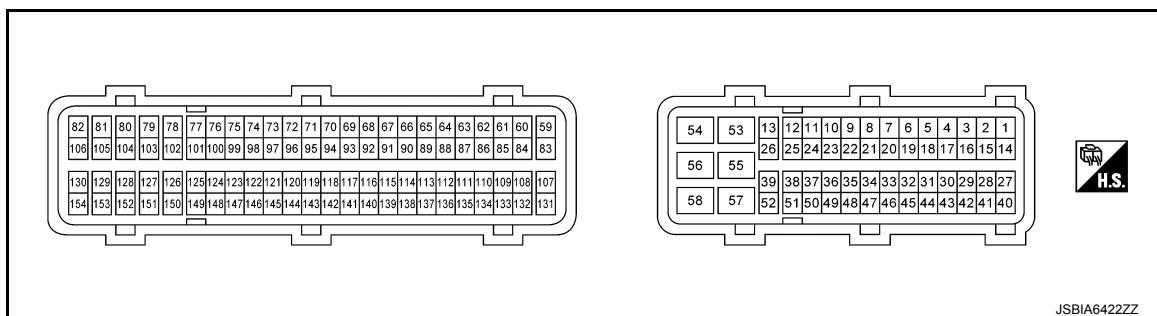
*1: This item is not used.

*2: A/T models only

NOTE:

Any monitored item that does not match the vehicle being diagnosed is deleted from the display automatically.

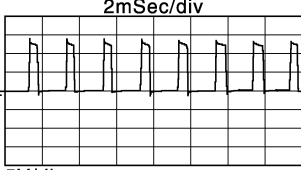
TERMINAL LAYOUT

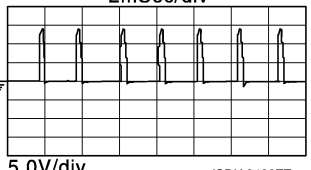
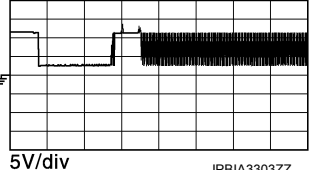


PHYSICAL VALUES

NOTE:

- Specification data are reference values.
- Specification data are output/input values which are detected or supplied by the ECM at the connector.
- * Specification data may not be directly related to their components signals/values/operations.

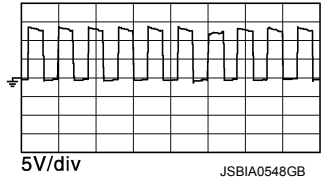
Terminal No.		Description		Condition	Value (Approx.)
+	—	Signal name	Input/Output		
1 (O)	41 (B)	EGR volume control valve (Open)	Output	[Ignition switch: OFF] • Warm-up condition • For 2 minutes after turning ignition switch OFF.	1.0 - 2.0 V ↑↓ (Periodically changes) BATTERY VOLTAGE (11 - 14V)  2mSec/div 5V/div JPBIA3306ZZ
4 (G)*1 (G/Y)*2	41 (B)	Park/Neutral position switch	Input	[Ignition switch: ON] • Selector lever: P or N (A/T), Neutral (M/T)	0 V
5 (SB)	41 (B)	Start signal	Input	[Ignition switch: ON]	0 V
				[Ignition switch: START]	BATTERY VOLTAGE (11 - 14 V)
7 (P)	—	CAN communication line	Input/Output	—	—
8 (L)	—	CAN communication line	Input/Output	—	—
10 (W/R)	97 (B)	Intake air temperature sensor 2	Input	[Engine is running] • Warm-up condition	0 - 4.8 V Voltage varies with intake air temperature
12 (R)	41 (B)	Ignition switch	Input	[Ignition switch: OFF]	0 V
				[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
13 (Y)	41 (B)	Power supply for ECM (Back-up)	Input	[Ignition switch: OFF]	BATTERY VOLTAGE (11 - 14 V)

Terminal No.		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
14 (Y)	41 (B)	EGR volume control valve (Close)	Output	[Ignition switch: OFF] • For 2 minutes after turning ignition switch OFF.	1.0 - 2.0 V★ ↑↓ (Periodically changes) BATTERY VOLTAGE (11 - 14V) 2mSec/div  5.0V/div JSBIA0406ZZ
18 (G)	—	Glow control	Input	—	—
19 (Y)	41 (B)	Stop lamp switch	Input	[Ignition switch: OFF] • Brake pedal: Fully released	0 V
				[Ignition switch: OFF] • Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14 V)
20 (P)	—	Engine communication line (Turbocharger actuator)	Input/ Output	—	—
21 (L)	—	Engine communication line (Turbocharger actuator)	Input/ Output	—	—
24 (GR)	41 (B)	Glow control	Output	[Ignition switch: ON] • Engine coolant temperature: Less than 55 °C (131 °F) • For 2 minutes after turning ignition switch ON.	Approximately 7.0 V ★ 1Sec/div  5V/div JPBIA3303ZZ
25 (BR)	41 (B)	ECM relay (self shut-off)	Output	For 2 minutes after turning ignition switch OFF	0 - 1.0 V
				More than 2 minutes after turning igni- tion switch OFF	BATTERY VOLTAGE (11 - 14 V)
26 (BR)	41 (B)	ECM relay (self shut-off)	Output	For 2 minutes after turning ignition switch OFF	0 - 1.0 V
				More than 2 minutes after turning igni- tion switch OFF	BATTERY VOLTAGE (11 - 14 V)
28 (Shield)	—	Sensor shield	—	—	—
30 (V)	43 (LG)	Mass air flow sensor	Input	[Ignition switch: ON] • Engine speed: Stopped	0.4 V
				[Engine is running] • Warm-up condition • Engine speed: Idle speed	1.1 - 2.1 V
				[Engine is running] • Warm-up condition • Engine speed: Idle to 4,000 rpm	1.1 - 2.1 V to Approximately 4.0 V (Check for liner voltage rise in re- sponse to engine being in- creased to about 4,000 rpm)
34 (B)	—	Accelerator pedal position sensor 2 ground	—	—	—

ECM

< ECU DIAGNOSIS INFORMATION >

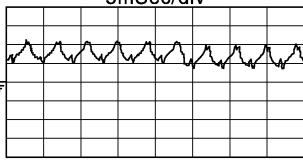
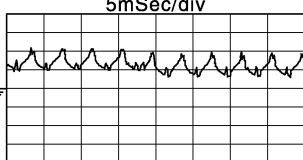
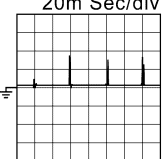
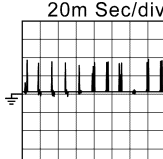
[YD25DDTi]

Terminal No.		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
35 (R)	34 (B)	Accelerator pedal position sensor 2	Input	[Ignition switch: ON] • Engine: Stopped • Accelerator pedal: Fully released	0.28 - 0.48 V
				[Ignition switch: ON] • Engine: Stopped • Accelerator pedal: Fully depressed	More than 2.0 V
36 (W)	34 (B)	Accelerator pedal position sensor 2 power supply	—	[Ignition switch: ON]	5.0 V
38 (G/B)	44 (W)	Battery temperature sensor	Input	[Engine is running]	0 - 4.8 V Voltage varies with battery temperature
39 (G/R)	41 (B)	Fuel pump suction control valve	Output	[Engine is running] • Warm-up condition • Engine speed: Idle speed	Approximately 5.8 V ★ 
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	Approximately 5.5 V ★ 
41 (B)	—	ECM ground	—	—	—
43 (LG)	—	Mass air flow sensor ground	—	—	—
44 (W)	—	Battery current sensor ground	—	—	—
47 (L)	—	Accelerator pedal position sensor 1 ground	—	—	—
48 (L/R)	47 (L)	Accelerator pedal position sensor 1	Input	[Ignition switch: ON] • Engine: Stopped • Accelerator pedal: Fully released	0.65 - 0.87 V
				[Ignition switch: ON] • Engine: Stopped • Accelerator pedal: Fully depressed	More than 4.3 V
49 (L/W)	47 (L)	Accelerator pedal position sensor 1 power supply	—	[Ignition switch: ON]	5.0 V
50 (SB)	44 (W)	Battery current sensor power supply	—	[Ignition switch: ON]	5.0 V
51 (V)	44 (W)	Battery current sensor	Input	[Engine is running] • Battery: Fully charged • Engine speed: Idle speed NOTE: Before measuring the terminal voltage, confirm that the battery is fully charged.	2.6 - 3.5 V

ECM

< ECU DIAGNOSIS INFORMATION >

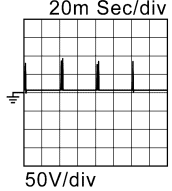
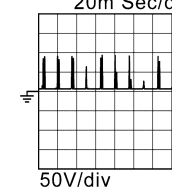
[YD25DDTi]

Terminal No.		Description		Condition	Value (Approx.)
+	−	Signal name	Input/Output		
52 (B)	41 (B)	Fuel pump suction control valve	Input	[Engine is running] • Warm-up condition • Engine speed: Idle speed	Approximately 0.3 V ★ 5mSec/div  500mV/div JPBIA3296ZZ
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	Approximately 0.3 V ★ 5mSec/div  500mV/div JPBIA3297ZZ
53 (G)	41 (B)	Power supply 2 for ECM	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
54 (R)	41 (B)	Power supply 1 for ECM	Input	[Ignition switch: ON]	BATTERY VOLTAGE (11 - 14 V)
55 (B)	—	ECM ground	—	—	—
56 (B)	—	ECM ground	—	—	—
57 (B)	—	ECM ground	—	—	—
58 (B)	—	ECM ground	—	—	—
62 (BG)	41 (B)	Intake air control valve control solenoid valve	Output	[Engine is running]	BATTERY VOLTAGE (11 - 14V)
75 (LG)	41 (B)	Brake pedal position switch (A/T), brake pedal position switch and clutch pedal position switch (M/T)	Input	[Ignition switch: ON] • Clutch pedal and brake pedal: Fully released	BATTERY VOLTAGE (11 - 14 V)
				[Ignition switch: ON] • Clutch pedal and brake pedal: Slightly depressed	0 V
81 (L)	41 (B)	Fuel injector (Cylinder No. 1)	Output	[Engine is running] • Warm-up condition • Engine speed: Idle speed NOTE: The pulse cycle changes depending on rpm at idle	Approximately 0.4 V ★ 20m Sec/div  50V/div JSBIA5583GB
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	Approximately 0.8 V ★ 20m Sec/div  50V/div JSBIA5584GB

ECM

< ECU DIAGNOSIS INFORMATION >

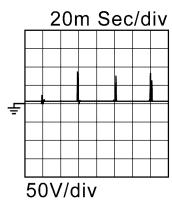
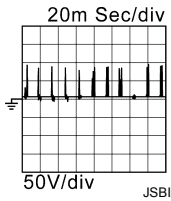
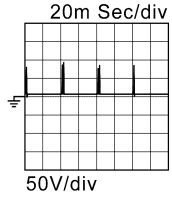
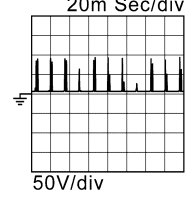
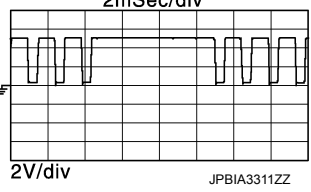
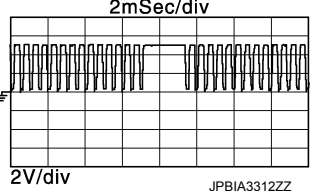
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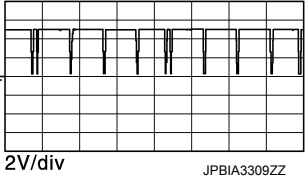
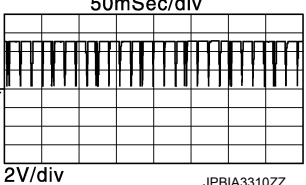
Terminal No.		Description		Condition	Value (Approx.)
+	—	Signal name	Input/ Output		
82 (G)	41 (B)	Fuel injector power supply (Cylinder No. 1 and No. 3)	Input	[Engine is running] • Warm-up condition • Engine speed: Idle speed NOTE: The pulse cycle changes depending on rpm at idle	Approximately 0.4 V ★  JSBIA5587GB
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	Approximately 0.8 V ★  JSBIA5588GB
84 (BR)	41 (B)	EGR cooler bypass valve control solenoid valve	Output	[Engine is running] • Warm-up condition • Engine speed: Idle speed	BATTERY VOLTAGE (11 - 14 V)
				[Engine is running] • Engine coolant temperature: More than 45°C (113°F) • Engine speed: 2,200 rpm	0 V
94 (Y)	100 (L)	Turbocharger boost sensor	Input	[Engine is running] • Warm-up condition • Engine speed: Idle speed	1.8 - 2.1 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	2.0 - 2.3 V
95 (G)	101 (P)	Exhaust gas pressure sensor 1	Input	[Engine is running] • Warm-up condition • Engine speed: Idle speed	1.0 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.1 V
97 (B)	—	Intake air temperature sensor 2 ground	—	—	—
100 (L)	—	Turbocharger boost sensor ground	—	—	—
101 (P)	—	Exhaust gas pressure sensor 1 ground	—	—	—

ECM

< ECU DIAGNOSIS INFORMATION >

[YD25DDTi]

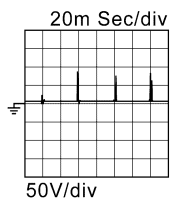
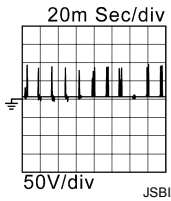
Terminal No.		Description		Condition	Value (Approx.)
+	−	Signal name	Input/Output		
104 (W)	41 (B)	Fuel injector (Cylinder No. 3)	Output	[Engine is running] • Warm-up condition • Engine speed: Idle speed NOTE: The pulse cycle changes depending on rpm at idle	Approximately 0.4 V ★  JSBIA5583GB
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	Approximately 0.8 V ★  JSBIA5584GB
106 (GR)	41 (B)	Fuel injector power supply (Cylinder No. 2 and No. 4)	Input	[Engine is running] • Warm-up condition • Engine speed: Idle speed NOTE: The pulse cycle changes depending on rpm at idle	Approximately 0.4 V ★  JSBIA5587GB
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	Approximately 0.8 V ★  JSBIA5588GB
107 (V)	100 (L)	Turbocharger boost sensor power supply	—	[Ignition switch: ON]	5.0 V
109 (G)	139 (W)	Fuel rail pressure sensor power supply	—	[Ignition switch: ON]	5.0 V
110 (W)	137 (B)	Camshaft position sensor power supply	—	[Ignition switch: ON]	5.0 V
112 (R)	136 (B)	Crankshaft position sensor	Input	[Engine is running] • Warm-up condition • Engine speed: Idle speed NOTE: The pulse cycle changes depending on rpm at idle	Approximately 3.5 V ★  JPBIA3311ZZ
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	Approximately 3.5 V ★  JPBIA3312ZZ

Terminal No.		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
113 (R)	137 (B)	Camshaft position sensor	Input	[Engine is running] • Warm-up condition • Engine speed: Idle speed NOTE: The pulse cycle changes depending on rpm at idle	Approximately 4.7 V ★ 
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	Approximately 4.7 V ★ 
115 (R)	139 (W)	Fuel rail pressure sensor	Input	[Engine is running] • Warm-up condition • Engine speed: Idle speed	1.3 – 1.7 V
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	1.7 – 2.0 V
116 (SB)	140 (LG)	Engine coolant temperature sensor	Input	[Engine is running] • Warm-up condition	0 – 5.0 V Voltage varies with engine coolant temperature
117 (G)	141 (R)	Intake air temperature sensor 1	Input	[Engine is running] • Warm-up condition	0 – 4.8 V Voltage varies with intake air temperature
118 (W)	142 (BR)	Refrigerant pressure sensor	Input	[Engine is running] • Warm-up condition • Both A/C switch and blower switch: ON (Compressor operates)	1.0 – 4.0 V
121 (SB)	145 (B)	ASCD steering switch	Input	[Ignition switch ON] • ASCD steering switch: All OFF	4.0 V
				[Ignition switch ON] • ACCEL/RES switch: Pressed	3.0 V
				[Ignition switch ON] • COAST/SET switch: Pressed	2.0 V
				[Ignition switch ON] • CANCEL switch: Pressed	1.0 V
122 (GR)	146 (Y)	EGR volume control valve position sensor	Input	[Ignition switch: OFF] • Warm-up condition • For 2 minutes after turning ignition switch OFF.	Voltage should fluctuates between 0.5 and 2.5 V, then drop to 0 V.
124 (Y)	148 (GR)	Fuel temperature sensor	Input	[Engine is running]	0 - 4.8 V Voltage varies with fuel temperature
126 (R)	41 (B)	Fuel filter pressure switch	Input	[Ignition switch: ON]	5.0 V

ECM

< ECU DIAGNOSIS INFORMATION >

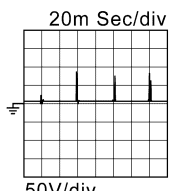
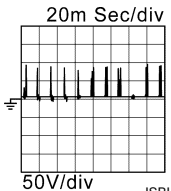
[YD25DDTi]

Terminal No.		Description		Condition	Value (Approx.)
+	–	Signal name	Input/Output		
129 (P)	41 (B)	Fuel injector (Cylinder No. 2)	Output	[Engine is running] • Warm-up condition • Engine speed: Idle speed NOTE: The pulse cycle changes depending on rpm at idle	Approximately 0.4 V ★  JSBIA5583GB
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	Approximately 0.8 V ★  JSBIA5584GB
132 (V)	146 (Y)	EGR volume control valve position sensor power supply	—	[Ignition switch: ON]	5.0 V
133 (W)	136 (B)	Crankshaft position sensor power supply	—	[Ignition switch: ON]	5.0 V
134 (GR)	101 (P)	Exhaust gas pressure sensor 1 power supply	—	[Ignition switch: ON]	5.0 V
135 (B)	142 (BR)	Refrigerant pressure sensor power supply	—	[Ignition switch: ON]	5.0 V
136 (B)	—	Crankshaft position sensor ground	—	—	—
137 (B)	—	Camshaft position sensor ground	—	—	—
138 (L)	—	Sensor shield	—	—	—
139 (W)	—	Fuel rail pressure sensor ground	—	—	—
140 (LG)	—	Engine coolant temperature sensor ground	—	—	—
141 (R)	—	Intake air temperature sensor 1 ground	—	—	—
142 (BR)	—	Refrigerant pressure sensor ground	—	—	—
145 (B)	—	ASCD steering switch ground	—	—	—
146 (Y)	—	EGR volume control valve position sensor ground	—	—	—
148 (GR)	—	Fuel temperature sensor ground	—	—	—
149 (P)	—	Exhaust gas temperature sensor 1 ground, fuel filter pressure switch ground	—	—	—
150 (G)	149 (P)	Exhaust gas temperature sensor 1	Input	[Engine is running] • Warm-up condition • Engine speed: Idle speed	0.3 – 5.0 V Voltage varies with exhaust gas temperature

ECM

< ECU DIAGNOSIS INFORMATION >

[YD25DDTi]

Terminal No.		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
152 (W)	41 (B)	Fuel injector (Cylinder No. 4)	Output	[Engine is running] • Warm-up condition • Engine speed: Idle speed NOTE: The pulse cycle changes depending on rpm at idle	Approximately 0.4 V ★  JSBIA5583GB
				[Engine is running] • Warm-up condition • Engine speed: 2,000 rpm	Approximately 0.8 V ★  JSBIA5584GB

★: Average voltage for pulse signal (Actual pulse signal can be confirmed by oscilloscope.)

*1: M/T models

*2: A/T models

Fail safe

INFOID:0000000014268193

DTC RELATED ITEM

DTC No.	Detected items	Engine operating condition in fail-safe mode
U1025	ENG communication circuit	ECM limits the amount control of fuel injected.
P0088 P1272	Fuel rail pressure control	• ECM limits the amount control of fuel injected. • ECM limits fuel rail pressure control (upper limit). • ECM stops the EGR volume control valve control (fully closed position). (P1272)
P0089 P0628 P0629 P1275	Fuel pump	• ECM limits the amount control of fuel injected. • ECM limits fuel rail pressure control (upper limit).
P0093	Fuel system leak	• ECM limits the amount control of fuel injected. • ECM limits fuel rail pressure control (upper limit).
P0122 P0123 P0222 P0223 P2135	Accelerator pedal position sensor	ECM recognizes the accelerator pedal position for 10% and controls fuel injected.
P012B	Intake air leak	• ECM limits the amount control of fuel injected. • ECM stops the EGR volume control valve control (fully closed position).
P0192 P0193	Fuel rail pressure control	• ECM limits the amount control of fuel injected. • ECM limits fuel rail pressure control (upper limit). • ECM limits fuel rail pressure control (lower limit).
P0200	Fuel injector power supply circuit	• ECM limits the amount control of fuel injected. • ECM limits fuel rail pressure control (upper limit). • ECM limits fuel rail pressure control (lower limit). • ECM limits the fuel injected pattern.

ECM

< ECU DIAGNOSIS INFORMATION >

[YD25DDTi]

DTC No.	Detected items	Engine operating condition in fail-safe mode
P0201 P0202 P0203 P0204 P1268 P1269 P1270 P1271 P2147 P2148	Fuel injector	- ECM limits the amount control of fuel injected. - ECM limits fuel rail pressure control (upper limit).
P0234	Turbocharger system	ECM limits the amount control of fuel injected.
P0335 P0336	Crankshaft position sensor circuit	ECM limits the amount control of fuel injected.
P0340 P0341	Camshaft position sensor circuit	ECM limits the amount control of fuel injected.
P0605 P0606	ECM	- ECM recognizes the accelerator pedal position for 10% and controls fuel injected. - ECM limits fuel rail pressure control (upper limit).
P1020 P1022 P1023 P1024 P1025 P1026	TC control actuator	ECM limits the amount control of fuel injected.
P1028 P102B	Exhaust gas pressure sensor 1	ECM limits the amount control of fuel injected.
P1029	TC boost sensor	ECM limits the amount control of fuel injected.
P102A	BARO sensor	ECM limits the amount control of fuel injected.
P1273	Fuel pump	- ECM recognizes the accelerator pedal position for 10% and controls fuel injected. - ECM limits the amount control of fuel injected. - ECM limits fuel rail pressure control (upper limit).
P1274	Fuel pump	ECM stops the engine promptly.
P1409	EGR cooler bypass valve	ECM stops the EGR volume control valve control (fully closed position).
P2146 P2149	Fuel injector power supply circuit	- ECM limits the amount control of fuel injected. - ECM limits fuel rail pressure control (upper limit).
P2426 P2427	EGR cooler bypass valve	ECM stops the EGR volume control valve control (fully closed position).
P2478	EGT sensor 1	ECM limits the amount control of fuel injected.
P2554 P2555	Trottle valve control	ECM stops the trottle valve control (fully opened position).

DTC Inspection Priority Chart

INFOID:0000000014268194

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart.

Priority	DTC	Detected items
1	U0100, U1000	CAN communication line
	U1025	ENG communication line
	P0016	Crankshaft position - camshaft position correlation
	P0097, P0098	Intake air temperature sensor 2
	P0102, P0103	Mass air flow sensor
	P0112, P0113	Intake air temperature sensor
	P0117, P0118	Engine coolant temperature sensor
	P0122, P0123, P0222, P0223, P2135	Accelerator pedal position sensor
	P0182, P0183	Fuel temperature sensor
	P018C, P018D	Fuel filter pressure switch
	P0192, P0193	Fuel rail pressure sensor
	P0237, P0238	Turbocharger boost sensor
	P0335, P0336	Crankshaft position sensor
	P0340, P0341	Camshaft position sensor
	P0405, P0406	EGR volume control valve position sensor
	P0473	Exhaust gas pressure sensor 1
	P0545, P0546	Exhaust gas temperature sensor 1
	P0563	Battery voltage
	P0605, P0606, P0607, P0668, P0669, P1616	ECM
	P0642, P0643, P0652, P0653	Sensor power supply
	P1610, P1611, P1612, P1614, P1615	NATS
	P1622, P1623	Injector adjustment value
	P1805	Brake switch
	P2228, P2229	Barometric pressure sensor
2	P0089, P0628, P0629, P1272, P1273, P1274, P1275	Fuel pump
	P0200, P0201, P0202, P0203, P0204, P1268, P1269, P1270, P1271, P2146, P2147, P2148, P2149	Fuel injector
	P0301, P0302, P0303, P0304	Misfire
	P0380, P0670	Glow control unit
	P0686	ECM relay
	P0705, P0710, P0717, P0720, P0729, P0730, P0731, P0732, P0733, P0734, P0735, P0740, P0744, P0745, P0750, P0775, P0780, P0795, P1730, P1734, P2713, P2722, P2731, P2807	AT related sensors, solenoid valves and switches
	P1020, P1022, P1023, P1024, P1025, P1026	TC boost control actuator
	P1409	EGR cooler bypass valve
	P2426, P2427	EGR cooler bypass valve control solenoid valve
	P2554, P2555	Intake air control valve control solenoid valve

ECM

< ECU DIAGNOSIS INFORMATION >

[YD25DDTi]

Priority	DTC	Detected items
3	P0088, P0093	Fuel system
	P012B	Intake air system
	P0217	Engine over temperature (OVERHEAT)
	P0234	Turbocharger system
	P0403, P0409	EGR volume control valve
	P0488	EGR driving
	P0501, P0502, P0503	ASCD vehicle speed sensor
	P0580, P0581	ASCD steering switch
	P1028, P102B	Exhaust gas pressure sensor 1
	P1029	Turbocharger boost sensor
	P102A	Barometric pressure sensor
	P1572	ASCD brake switch
	P2478	Exhaust gas temperature sensor 1

DTC Index

INFOID:0000000014268195

×:Applicable —: Not applicable

DTC*1		Items (CONSULT screen terms)	Trip	MIL	Reference page
CONSULT	ECM*2				
U0100	0100*3	LOST COMM (ECM A)	1	—	TM-202
U1000	1000*3	CAN COMM CIRCUIT	1	—	EC-913
U1025	1025	TC BOOST COMM LINE	1	×	EC-914
P0016	0016	CMP/CKP RELATION	1	—	EC-917
P0088	0088	HIGH FUEL PRES	1	×	EC-920
P0089	0089	FUEL PUMP	1	×	EC-923
P0093	0093	FUEL LEAK	1	×	EC-926
P0097	0097	IAT SENSOR 2 B1	1	—	EC-929
P0098	0098	IAT SENSOR 2 B1	1	—	
P0102	0102	MAF SEN/CIRCUIT	1	—	EC-932
P0103	0103	MAF SEN/CIRCUIT	1	—	
P0112	0112	IAT SEN/CIRCUIT	1	—	EC-935
P0113	0113	IAT SEN/CIRCUIT	1	—	
P0117	0117	ECT SEN/CIRCUIT	1	—	EC-937
P0118	0118	ECT SEN/CIRCUIT	1	—	
P0122	0122	APP SEN 1/CIRCUIT	1	×	EC-939
P0123	0123	APP SEN 1/CIRCUIT	1	×	
P012B	012B	TC INLET PRESSURE SEN	1	×	EC-942
P0182	0182	FUEL TEMP SEN/CIRC	1	—	EC-944
P0183	0183	FUEL TEMP SEN/CIRC	1	—	
P018C	018C	Fuel Pressure Sensor "B" Circuit Low	1	—	EC-946
P018D	018D	Fuel Pressure Sensor "B" Circuit High	1	—	EC-949
P0192	0192	FRP SEN/CIRC	1	×	EC-952
P0193	0193	FRP SEN/CIRC	1	×	
P0200	0200	INJECTOR	1	×	EC-955

ECM

< ECU DIAGNOSIS INFORMATION >

[YD25DDTi]

DTC*1		Items (CONSULT screen terms)	Trip	MIL	Reference page
CONSULT	ECM*2				
P0201	0201	CYL1 INJECTOR	1	×	EC-956
P0202	0202	CYL2 INJECTOR	1	×	
P0203	0203	CYL3 INJECTOR	1	×	
P0204	0204	CYL4 INJECTOR	1	×	
P0217	0217	ENG OVER TEMP	1	×	EC-957
P0222	0222	APP SEN 2/CIRCUIT	1	×	EC-959
P0223	0223	APP SEN 2/CIRCUIT	1	×	
P0234	0234	TC SYSTEM	1	×	EC-962
P0237	0237	TC BOOST SEN/CIRC	1	—	EC-964
P0238	0238	TC BOOST SEN/CIRC	1	—	
P0301	0301	INJ/CIRC1	1	—	EC-966
P0302	0302	INJ/CIRC2	1	—	
P0303	0303	INJ/CIRC3	1	—	
P0304	0304	INJ/CIRC4	1	—	
P0335	0335	CKP SEN/CIRCUIT	1	×	EC-968
P0336	0336	CKP SENSOR	1	×	
P0340	0340	CMP SEN/CIRCUIT	1	×	EC-971
P0341	0341	CMP SENSOR	1	×	
P0380	0380	GLOWRELAY	1	—	EC-974
P0403	0403	EGR SYSTEM	1	—	EC-977
P0405	0405	EGR SENSOR	1	—	EC-979
P0406	0406	EGR SENSOR	1	—	
P0409	0409	EGR SYSTEM	1	—	EC-981
P0473	0473	EXH PRESSURE SEN A	1	—	EC-983
P0488	0488	EGR SYSTEM	1	—	EC-986
P0501	0501	VEHICLE SPEED	1	—	EC-987
P0502	0502	VEHICLE SPEED	1	—	
P0503	0503	VEHICLE SPEED	1	—	
P0545	0545	EGT SENSOR 1 B1	1	×	EC-989
P0546	0546	EGT SENSOR 1 B1	1	×	
P0563	0563	BATTERY VOLTAGE	1	—	EC-992
P0580	0580	STRG SW/CIRC	1	—	EC-993
P0581	0581	STRG SW/CIRC	1	—	
P0605	0605	ECM	1	×	EC-996
P0606	0606	ECM	1	×	
P0607	0607	ECM	1	—	EC-997
P0628	0628	FUEL PUMP/CIRC	1	×	EC-998
P0629	0629	FUEL PUMP/CIRC	1	×	
P0642	0642	SENSOR PWR/CIRC1	1	—	EC-1000
P0643	0643	SENSOR PWR/CIRC1	1	—	
P0652	0652	SENSOR PWR/CIRC2	1	—	EC-1002
P0653	0653	SENSOR PWR/CIRC2	1	—	

ECM

< ECU DIAGNOSIS INFORMATION >

[YD25DDTi]

DTC*1		Items (CONSULT screen terms)	Trip	MIL	Reference page
CONSULT	ECM*2				
P0668	0668	ECM	1	—	EC-1004
P0669	0669	ECM	1	—	
P0670	0670	GLOW PLUG CONT MDL	1	—	EC-974
P0686	0686	ECM RELAY	1	—	EC-1005
P0705	0705	T/M RANGE SENSOR A	1	—	TM-209
P0710	0710	FLUID TEMP SENSOR A	1	—	TM-211
P0717	0717	INPUT SPEED SENSOR A	1	—	TM-213
P0720	0720	OUTPUT SPEED SENSOR	1	—	TM-215
P0729	0729	6GR INCORRECT RATIO	1	—	TM-219
P0730	0730	INCORRECT GR RATIO	1	—	TM-222
P0731	0731	1GR INCORRECT RATIO	1	—	TM-224
P0732	0732	2GR INCORRECT RATIO	1	—	TM-227
P0733	0733	3GR INCORRECT RATIO	1	—	TM-230
P0734	0734	4GR INCORRECT RATIO	1	—	TM-233
P0735	0735	5GR INCORRECT RATIO	1	—	TM-236
P0740	0740	TORQUE CONVERTER	1	—	TM-239
P0744	0744	TORQUE CONVERTER	1	—	TM-241
P0745	0745	PC SOLENOID A	1	—	TM-243
P0750	0750	SHIFT SOLENOID A	1	—	TM-244
P0775	0775	PC SOLENOID B	1	—	TM-246
P0780	0780	SHIFT	1	—	TM-248
P0795	0795	PC SOLENOID C	1	—	TM-250
P1020	1020	TC BOOST CONT ACT	1	×	EC-1007
P1022	1022	TC BOOST CONT ACT	1	×	EC-1007
P1023	1023	TC BOOST CONT ACT	1	×	
P1024	1024	TC BOOST CONT ACT	1	×	
P1025	1025	TC BOOST CONT ACT	1	×	
P1026	1026	TC BOOST CONT ACT	1	×	
P1028	1028	EXH PRESSURE SEN A	1	—	EC-1008
P1029	1029	TC BOOST SENSOR A	1	—	EC-1010
P102A	102A	BARO SENSOR A	1	—	EC-1013
P102B	102B	EXHAUST GAS SYSTEM	1	×	EC-1015
P1268	1268	INJECTOR 1	1	×	EC-1017
P1269	1269	INJECTOR 2	1	×	
P1270	1270	INJECTOR 3	1	×	
P1271	1271	INJECTOR 4	1	×	
P1272	1272	FRP RELIEF VALVE	1	×	EC-1020
P1273	1273	FUEL PUMP	1	×	EC-1024
P1274	1274	FUEL PUMP	1	×	EC-1027
P1275	1275	FUEL PUMP	1	×	EC-1030
P1409	1409	EGR COOLING BYPASS/V	1	—	EC-1033
P1572	1572	ASCD BRAKE SW	1	—	EC-1035

DTC*1		Items (CONSULT screen terms)	Trip	MIL	Reference page
CONSULT	ECM*2				
P1610	1610	LOCK MODE	1	—	SEC-74 SEC-242
P1611	1611	ID DISCORD,IMMU-ECM	1	—	SEC-76 SEC-244
P1612	1612	CHAIN OF ECM-IMMU	1	—	SEC-78 SEC-246
P1614	1614	CHAIN OF IMMU-KEY	1	—	SEC-80 SEC-248
P1615	1615	DIFFERENCE OF KEY	1	—	SEC-82 SEC-251
P1616	1616	ECM	1	—	SEC-83 SEC-252
P1622	1622	INJ ADJ VAL UNRGST	1	—	EC-1042
P1623	1623	INJ ADJ VAL ERROR	1	—	EC-1043
P1805	1805	BRAKE SWITCH	1	×	EC-1045
P1730	1730	INTERLOCK	1	—	TM-260
P1734	1734	7GR INCORRECT RATIO	1	—	TM-262
P2135	2135	APP SENSOR	1	×	EC-1048
P2146	2146	INJ PWR/CIRC	1	×	EC-1051
P2147	2147	INJECTOR/CIRC	1	×	EC-1052
P2148	2148	INJECTOR/CIRC	1	×	
P2149	2149	INJ PWR/CIRC	1	×	EC-1051
P2228	2228	BARO SEN/CIRC	1	—	EC-1053
P2229	2229	BARO SEN/CIRC	1	—	
P2426	2426	EGR COOLING VALVE	1	—	EC-1054
P2427	2427	EGR COOLING VALVE	1	—	
P2478	2478	EGT SENSOR 1 B1	1	×	EC-1056
P2554	2554	TROTTLE/FUEL INHIBIT	1	—	EC-1058
P2555	2555	TROTTLE/FUEL INHIBIT	1	—	EC-1061
P2713	2713	PC SOLENOID D	1	—	TM-269
P2722	2722	PC SOLENOID E	1	—	TM-271
P2731	2731	PC SOLENOID F	1	—	TM-273
P2807	2807	PC SOLENOID G	1	—	TM-275

*1: 1st trip DTC No. is the same as DTC No.

*2: In Diagnostic Test Mode II (Self-diagnostic results), this number is controlled by NISSAN.

*3: The troubleshooting for this DTC needs CONSULT.

WIRING DIAGRAM

ENGINE CONTROL SYSTEM

Wiring Diagram

INFOID:0000000014268196

EC

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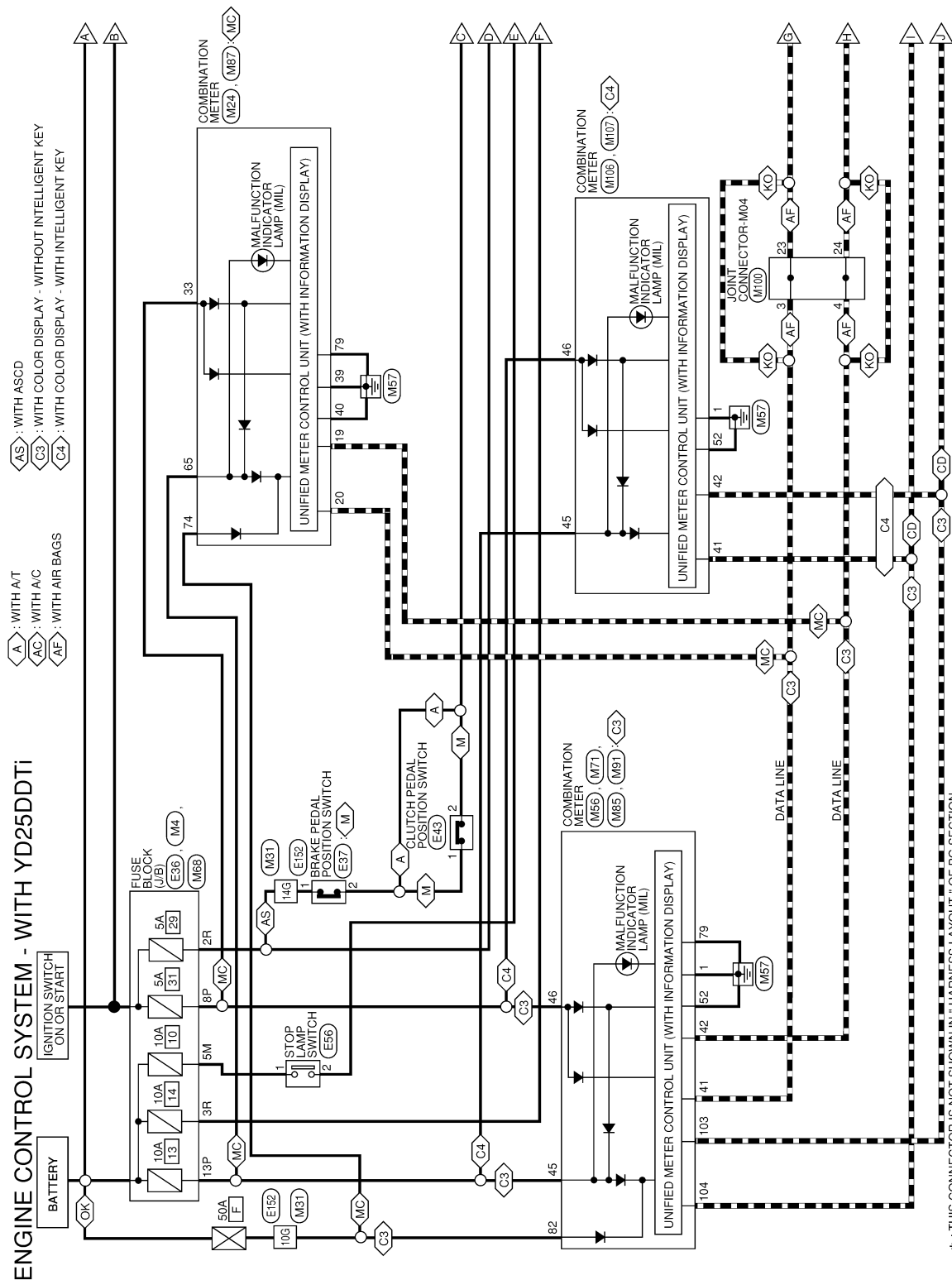
L

M

N

O

P



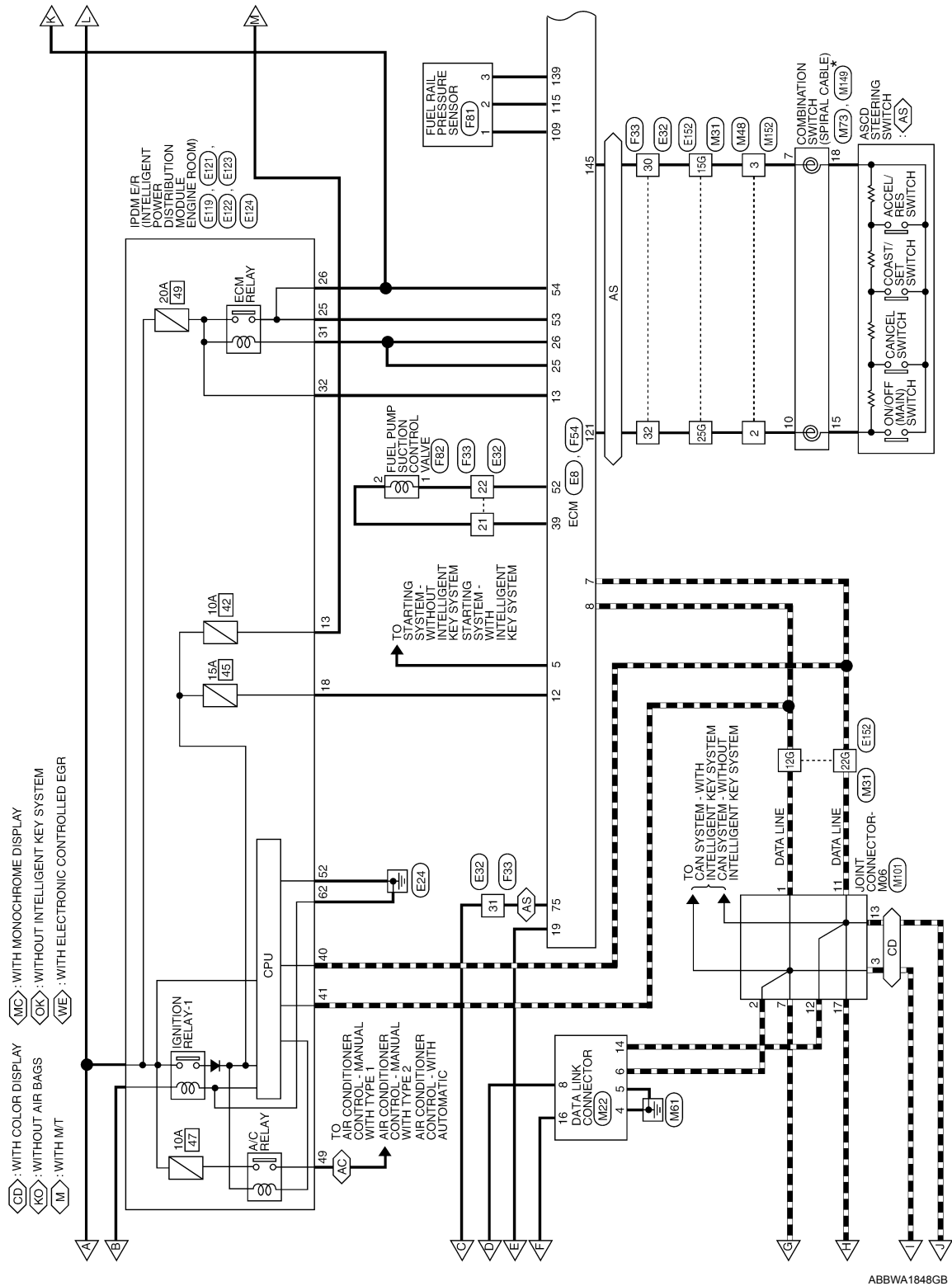
* : THIS CONNECTOR IS NOT SHOWN IN " HARNESS LAYOUT " OF PG SECTION.

ABBWA1847GB

ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YD25DDTi]

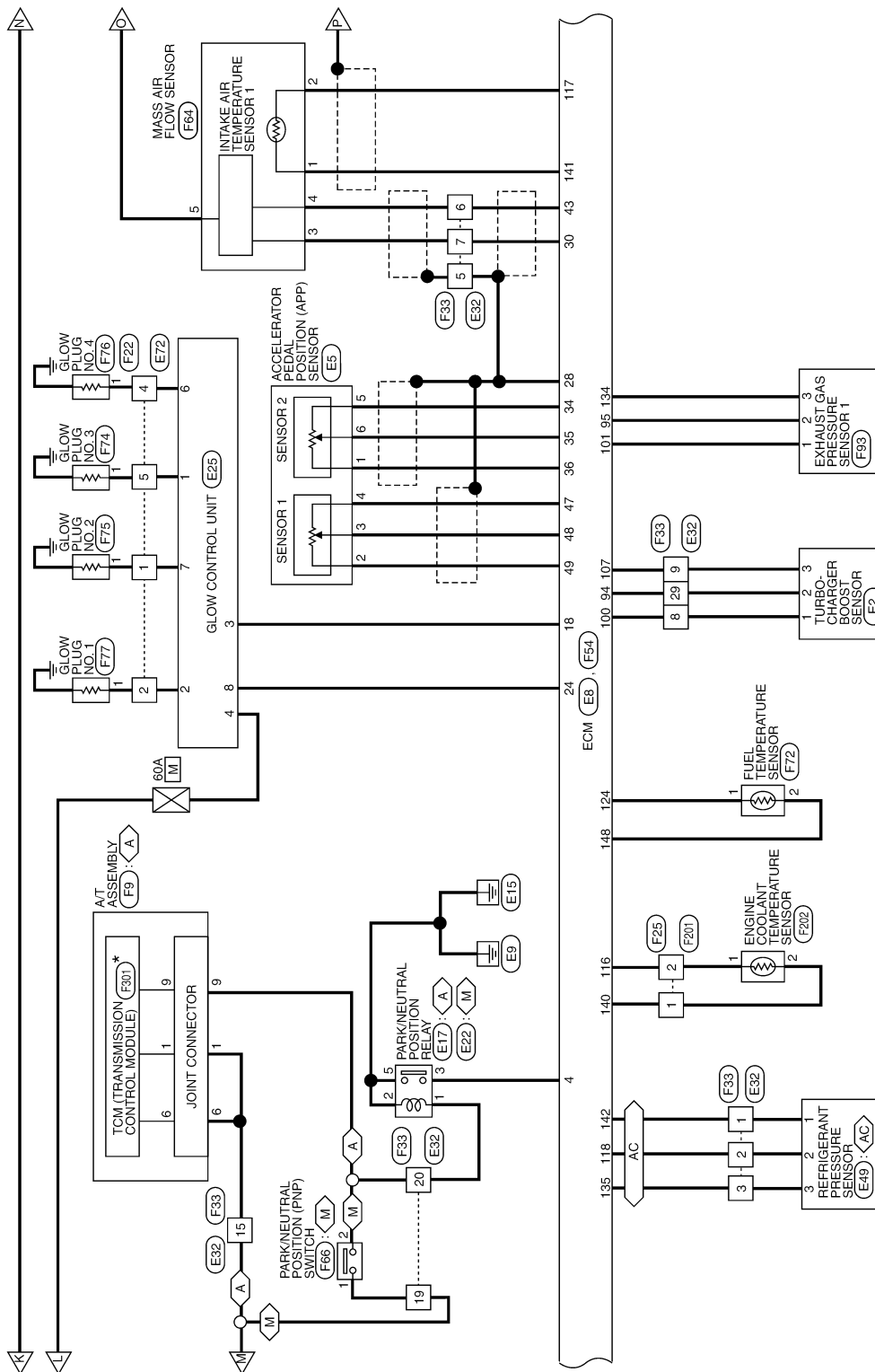


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ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YD25DDTi]

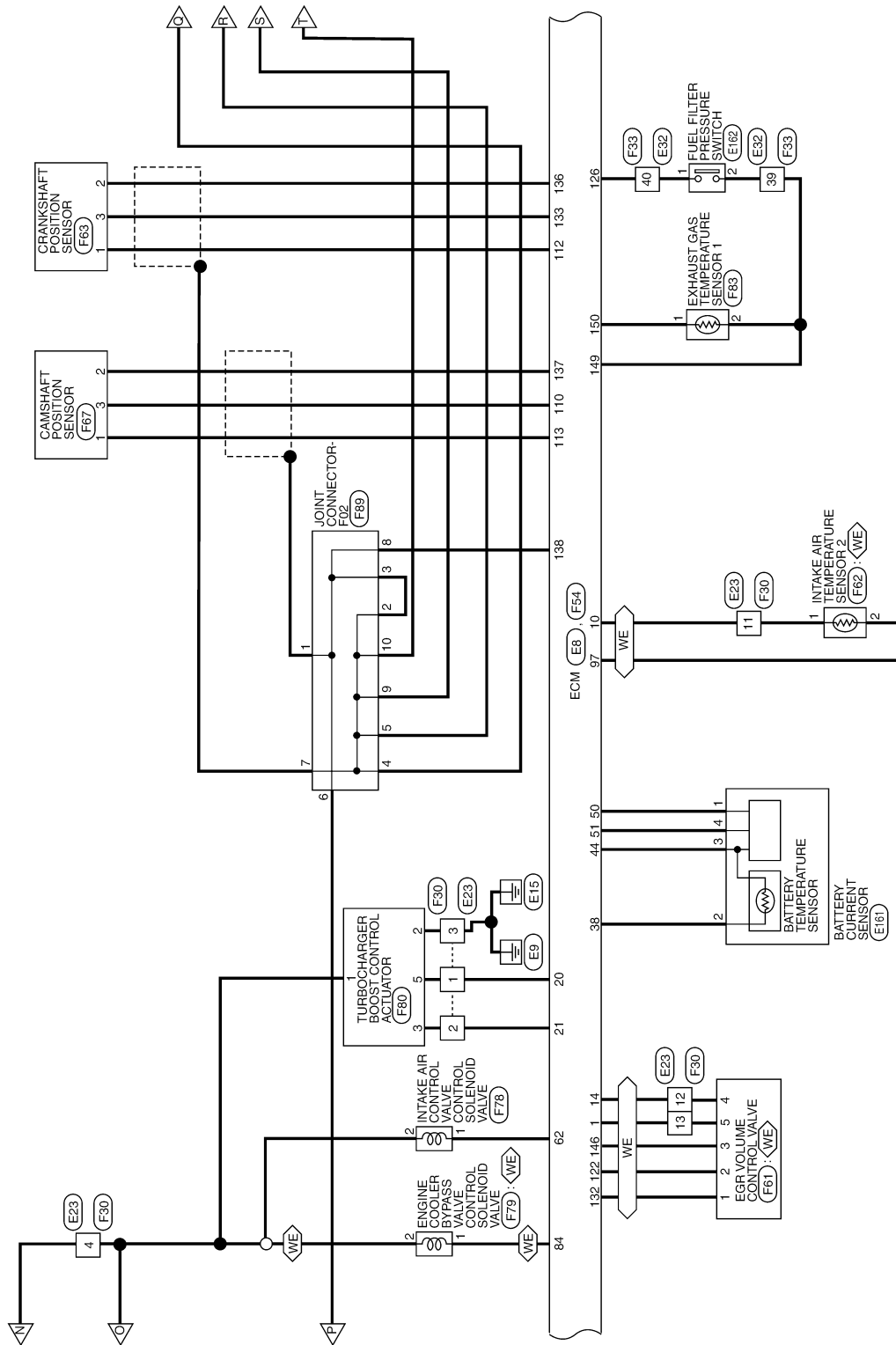


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ENGINE CONTROL SYSTEM

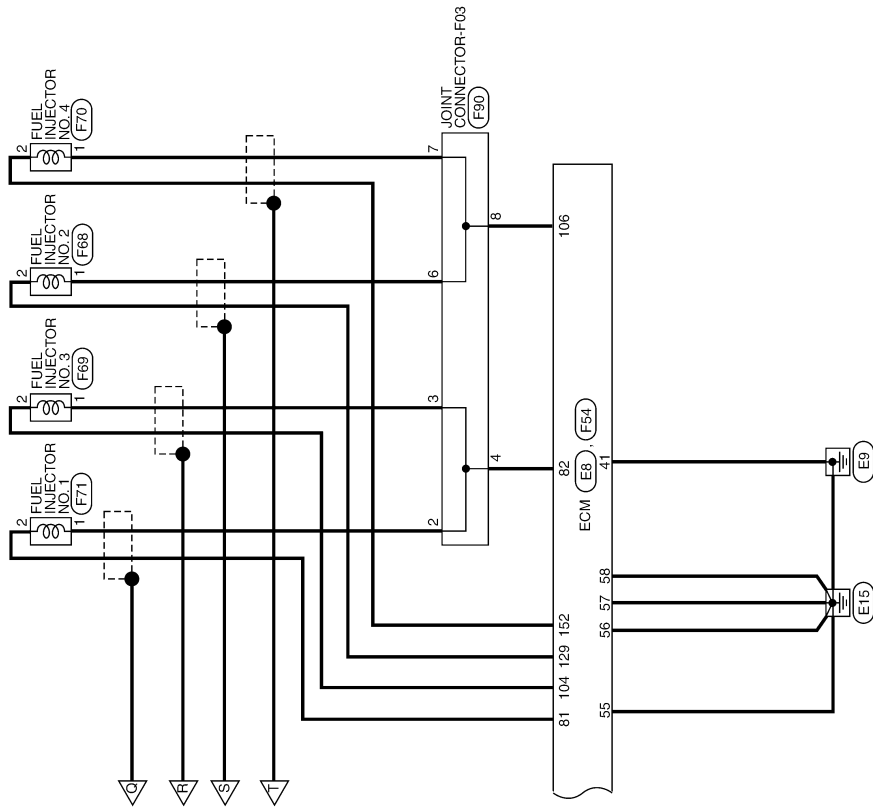
< WIRING DIAGRAM >

[YD25DDTi]



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ABBWA1851GB

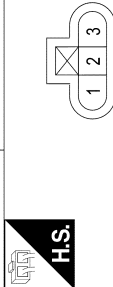
ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YD25DDTi]

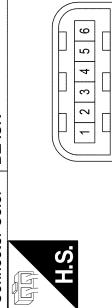
ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	E2
Connector Name	TURBOCHARGER BOOST SENSOR
Connector Type	E03FGY-RS
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	L	SENSOR GROUND
2	BR/LG	TURBOCHARGER BOOST SENSOR
3	V	SENSOR POWER SUPPLY

Connector No.	E5
Connector Name	ACCELERATOR PEDAL POSITION SENSOR (APP) SENSOR
Connector Type	AEY08FB-RH
Connector Color	BLACK

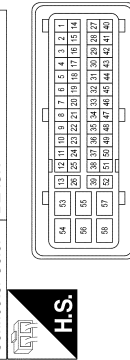


Terminal No.	Color of Wire	Signal Name
1	GR	SENSOR POWER SUPPLY (WITH QR25DE)
1	W	SENSOR POWER SUPPLY (EXCEPT FOR QR25DE)
2	V	SENSOR POWER SUPPLY (WITH QR25DE)
2	L/W	SENSOR POWER SUPPLY (WITH YD25DDTi)
2	L	SENSOR POWER SUPPLY (WITH M9T)
3	SB	ACCELERATOR PEDAL POSITION SENSOR 1 (WITH QR25DE)
3	L/R	ACCELERATOR PEDAL POSITION SENSOR 1 (WITH YD25DDTi)
3	P	ACCELERATOR PEDAL POSITION SENSOR 1 (WITH M9T)
4	L	SENSOR GROUND (WITH YD25DDTi)
4	B	GND PEDAL POSI (WITH M9T)
5	G	SENSOR GROUND (WITH QR25DE)

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5	B	SENSOR GROUND (WITH YD25DDTi)
5	GR	SENSOR GROUND (WITH M9T)
6	P	ACCELERATOR PEDAL POSITION SENSOR 2 (WITH QR25DE)
6	R	ACCELERATOR PEDAL POSITION SENSOR 2 (EXCEPT FOR QR25DE)

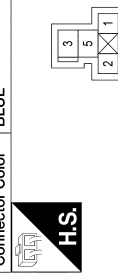
Connector No.	E8
Connector Name	ECM (WITH YD25DDTi)
Connector Type	ADA52FB-AHZ6
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	O	EGR VOLUME CONTROL VALVE (OPEN)
2	-	-
3	-	-
4	G/Y	PARK/NEUTRAL POSITION SIGNAL (WITH A/T)
4	G	PARK/NEUTRAL POSITION SIGNAL (WITH M/T)
5	SB	START SIGNAL
6	-	-
7	P	CAN-L
8	L	CAN-H
9	-	-
10	W/R	INTAKE AIR TEMPERATURE SENSOR 2
11	-	-
12	R	IGNITION SWITCH
13	Y	POWER SUPPLY FOR ECM (BACK-UP)
14	Y	EGR VOLUME CONTROL VALVE (CLOSE)
15	-	-
16	-	-
17	-	-
18	G	GLOW PLUG CONTROL
19	Y	STOP LAMP SWITCH
20	P	ENGINE COMMUNICATION LINE
21	L	ENGINE COMMUNICATION LINE
22	-	-
23	-	-
24	GR	GLOW PLUG CONTROL
25	BR	ECM RELAY (SELF SHUT-OFF)
26	BR	ECM RELAY (SELF SHUT-OFF)
27	-	-

28	SHIELD	SENSOR SHIELD
29	-	-
30	V	MASS AIR FLOW SENSOR
31	-	-
32	-	-
33	-	-
34	B	SENSOR GROUND
35	R	ACCELERATOR PEDAL POSITION SENSOR 2
36	W	SENSOR POWER SUPPLY
37	-	-
38	G/B	BATTERY TEMPERATURE SENSOR
39	GR	FUEL PUMP SUCTION CONTROL VALVE
40	-	-
41	B	ECM GROUND
42	-	-
43	LG	SENSOR GROUND
44	W	SENSOR GROUND
45	-	-
46	-	-
47	L	SENSOR GROUND
48	L/R	ACCELERATOR PEDAL POSITION SENSOR 1
49	L/W	SENSOR POWER SUPPLY
50	SB	SENSOR POWER SUPPLY
51	V	BATTERY CURRENT SENSOR
52	B	FUEL PUMP SUCTION CONTROL VALVE
53	G	POWER SUPPLY 2 FOR ECM
54	R	POWER SUPPLY 1 FOR ECM
55	B	ECM GROUND
56	B	ECM GROUND
57	B	ECM GROUND
58	B	ECM GROUND

Connector No.	E17
Connector Name	PARK/NEUTRAL POSITION RELAY (WITH A/T)
Connector Type	MS02F-M2-LC
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	BR	PARK/NEUTRAL POSITION (PNP) SWITCH OUTPUT
2	B	GROUND

3	G	PARK/NEUTRAL POSITION (PNP) SWITCH
5	B	GROUND OUTPUT

Connector No.	E22
Connector Name	PARK/NEUTRAL POSITION RELAY
Connector Type	MS02FL-M2-LC
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	G/Y	PARK/NEUTRAL POSITION (PNP) SWITCH OUTPUT
2	B	GROUND
3	G/Y	PARK/NEUTRAL POSITION (PNP) SWITCH
5	B	GROUND OUTPUT

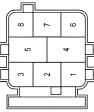
ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	E23
Connector Name	WIRE TO WIRE
Connector Type	NS16MW-CS
Connector Color	WHITE



1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16					

Connector No.	E25
Connector Name	GLOW CONTROL UNIT
Connector Type	FX08FB-ANZ2
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	P	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
1	V	TO ENGINE CONTROL HARNESS - (WITH M9T)
2	L	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
2	G	TO ENGINE CONTROL HARNESS - (WITH M9T)
3	B	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
3	G	TO ENGINE CONTROL HARNESS - (WITH M9T)
4	R	TO ENGINE CONTROL HARNESS
5	G/Y	TO ENGINE CONTROL HARNESS
6	SHIELD	TO ENGINE CONTROL HARNESS
7	O	TO ENGINE CONTROL HARNESS
8	-	TO ENGINE CONTROL HARNESS
9	B	TO ENGINE CONTROL HARNESS
10	L/R	TO ENGINE CONTROL HARNESS
11	W/R	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
11	P	TO ENGINE CONTROL HARNESS - (WITH M9T)
12	Y	TO ENGINE CONTROL HARNESS
13	O	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
13	BR	TO ENGINE CONTROL HARNESS - (WITH M9T)
14	G/R	TO ENGINE CONTROL HARNESS
15	V/R	TO ENGINE CONTROL HARNESS
16	W	TO ENGINE CONTROL HARNESS

Terminal No.	Color of Wire	Signal Name
1	SB	GLOW PLUG NO.3
2	V	GLOW PLUG NO.1
3	G	GLOW PLUG CONTROL
4	R	BATTERY
5	-	-
6	Y	GLOW PLUG NO.4
7	G	GLOW PLUG NO.2
8	GR	GLOW PLUG CONTROL

Connector No.	E32
Connector Name	WIRE TO WIRE
Connector Type	TH40MW-NH
Connector Color	WHITE



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

Terminal No.	Color of Wire	Signal Name
1	BR/W	TO ENGINE CONTROL HARNESS
2	W/G	TO ENGINE CONTROL HARNESS
3	B	TO ENGINE CONTROL HARNESS
4	B	TO ENGINE CONTROL HARNESS
5	SHIELD	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
5	BR	TO ENGINE CONTROL HARNESS - (WITH M9T)
6	LG	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
6	G	TO ENGINE CONTROL HARNESS - (WITH M9T)
7	V	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
7	BR/R	TO ENGINE CONTROL HARNESS - (WITH M9T)

8	L	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
8	W	TO ENGINE CONTROL HARNESS - (WITH M9T)
9	V	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
9	Y	TO ENGINE CONTROL HARNESS - (WITH M9T)
10	BR/Y	TO ENGINE CONTROL HARNESS
11	LG/B	TO ENGINE CONTROL HARNESS - (WITH A/T)
11	V/W	TO ENGINE CONTROL HARNESS - (WITH M/T)
12	SB/R	TO ENGINE CONTROL HARNESS
13	P	TO ENGINE CONTROL HARNESS
14	L	TO ENGINE CONTROL HARNESS
15	R/W	TO ENGINE CONTROL HARNESS
16	R	TO ENGINE CONTROL HARNESS
17	G/B	TO ENGINE CONTROL HARNESS
18	R/B	TO ENGINE CONTROL HARNESS
19	GR	TO ENGINE CONTROL HARNESS - (WITH M/T)
19	SB/Y	TO ENGINE CONTROL HARNESS - (WITH A/T)
20	G/Y	TO ENGINE CONTROL HARNESS - (WITH M/T)
20	BR	TO ENGINE CONTROL HARNESS - (WITH A/T)
21	GR	TO ENGINE CONTROL HARNESS
22	W	TO ENGINE CONTROL HARNESS - (WITH M9T)
22	B	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
23	B	TO ENGINE CONTROL HARNESS
24	W	TO ENGINE CONTROL HARNESS
25	P	TO ENGINE CONTROL HARNESS
26	SB/O	TO ENGINE CONTROL HARNESS
27	GR/R	TO ENGINE CONTROL HARNESS
28	B	TO ENGINE CONTROL HARNESS
29	BR/LG	TO ENGINE CONTROL HARNESS
30	B	TO ENGINE CONTROL HARNESS
30	R/Y	TO ENGINE CONTROL HARNESS - (WITH M9T)
31	LG/O	TO ENGINE CONTROL HARNESS - (WITH A/T)
31	LG/W	TO ENGINE CONTROL HARNESS - (WITH M/T AND INTELLIGENT KEY)
32	SB/W	TO ENGINE CONTROL HARNESS
33	L	TO ENGINE CONTROL HARNESS - (WITH ABS)
33	SHIELD	TO ENGINE CONTROL HARNESS - (WITHOUT ABS)
34	BR/Y	TO ENGINE CONTROL HARNESS
35	W/B	TO ENGINE CONTROL HARNESS
36	LG/Y	TO ENGINE CONTROL HARNESS
37	BR/SB	TO ENGINE CONTROL HARNESS
38	W/L	TO ENGINE CONTROL HARNESS

39	W	TO ENGINE CONTROL HARNESS - (WITH M9T)
39	B	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
40	BR	TO ENGINE CONTROL HARNESS - (WITH M9T)
40	R	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)

Connector No.	E36
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FW-CS
Connector Color	WHITE



4M	3M	2M	1M
10M	9M	8M	7M
			6M
			5M

Terminal No.	Color of Wire	Signal Name
1M	W/B	IGNITION
2M	-	-
3M	-	-
4M	-	-
5M	LG	BATTERY
6M	-	-
7M	-	-
8M	-	-
9M	-	-
10M	W	IGNITION

ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YD25DDTi]

ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	E37
Connector Name	BRAKE PEDAL POSITION SWITCH
Connector Type	M02BR-LC
Connector Color	BROWN



2	1
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Connector No.	E49
Connector Name	REFRIGERANT PRESSURE SENSOR
Connector Type	RK03FB
Connector Color	BLACK



1	2	3
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Terminal No.	Color of Wire	Signal Name
1	R	CLUTCH PEDAL POSITION SWITCH OUTPUT (WITH QR25DE)
1	G	IGNITION (EXCEPT QR25DE)
2	LG	BRAKE PEDAL POSITION SWITCH (WITH M9T)
2	LG	BRAKE/CLUTCH PEDAL POSITION SWITCH (WITH QR25DE)
2	R	BRAKE/CLUTCH PEDAL POSITION SWITCH (FOR YD25DDTi WITH M9T)
2	LG/O	BRAKE/CLUTCH PEDAL POSITION SWITCH (FOR YD25DDTi WITH A/1)

Connector No.	E43
Connector Name	CLUTCH PEDAL POSITION SWITCH
Connector Type	S02FL
Connector Color	BLUE



2	1
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Terminal No.	Color of Wire	Signal Name
1	R	CLUTCH PEDAL POSITION SWITCH OUTPUT
2	LG/W	ASCD BRAKE SWITCH AND ASCD CLUTCH SWITCH

Connector No.	E72
Connector Name	WIRE TO WIRE
Connector Type	M06MW-LC
Connector Color	WHITE



1	2	3
4	5	6

Terminal No.	Color of Wire	Signal Name
1	G	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
1	GR	TO ENGINE CONTROL HARNESS - (WITH M9T)
2	V	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
2	Y	TO ENGINE CONTROL HARNESS - (WITH M9T)
3	Y	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
4	Y	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
4	P	TO ENGINE CONTROL HARNESS - (WITH M9T)
5	SB	TO ENGINE CONTROL HARNESS - (WITH YD25DDTi)
5	BG	TO ENGINE CONTROL HARNESS - (WITH M9T)
6	-	TO ENGINE CONTROL HARNESS - (WITH M9T)

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS16FW-CS
Connector Color	WHITE



9	8	7	6	5	4	3
18	17	16	15	14	13	12
11	10	9	8	7	6	5
4	3	2	1	0	0	0

Terminal No.	Color of Wire	Signal Name
3	-	-
4	BR	NP SW (WITH A/T)
4	G	NP SW (WITH M/T)
5	Y	HLAMP HI RH
6	R/Y	HLAMP HI LH
7	L	HLAMP LO LH

8	LG/W	HLAMP LO RH
9	W	FR FOG/L LH
10	L	FUEL PUMP
11	W	ETC VB
12	V	FR FOG/L RH
13	R/W	A/T ECU (WITH A/T)
13	GR	A/T ECU (WITH M/T)
14	V/W	REVERSE LAMP
15	BR	ABS ECU
16	V/R	ETC RLY CONT
17	R	IGN COIL
18	LG	INJECTOR (EXCEPT M9T)
18	BG	INJECTOR (WITH M9T)

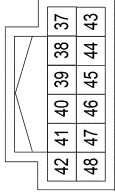
Connector No.	E121
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS12FBR-CS
Connector Color	BROWN



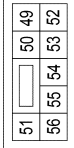
28	28	27	26	25
36	35	34	33	32
31	30	29	28	27

Terminal No.	Color of Wire	Signal Name
25	G	ECM VB
26	R	O2 SENS
27	R/W	CLEARANCE/L RH
28	-	-
29	L	FR WIPEER HI
30	-	-
31	BR/R	ECM RLY CONT (WITH M9T)
32	Y	ECM BAT (EXCEPT M9T)
32	V	ECM BAT (WITH M9T)
33	R	CLEARANCE/L LH
34	O	TAIL 2
35	GR	FR WIPEER LO
36	O	ESCL

ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	E122	IGN SW (G1)
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	
Connector Type	TH12FW-NH	
Connector Color	WHITE	
 		

Terminal No.	Color of Wire	Signal Name
37	-	-
38	GR/R	OIL PRESSURE SW
39	G	WIPER AUTO STOP
40	P	CAN-L
41	L	CAN-H
42	G/B	DRL RLY
43	-	-
44	SB/R	START CONT
45	P/Y	FUEL RLY CONT
46	-	-
47	O	ALT C
48	BR	HORN RLY CONT

Connector No.	E123	
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	
Connector Type	NS08FBR-CS	
Connector Color	BROWN	
 		

Terminal No.	Color of Wire	Signal Name
49	W	A/C COMP
50	-	-
51	-	-
52	B/W	S-GND
53	-	-
54	-	-
55	-	-

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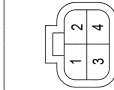
2G	SHIELD	TO MAIN HARNESS
3G	R	TO MAIN HARNESS
4G	BR	TO MAIN HARNESS
5G	R	TO MAIN HARNESS
6G	Y	TO MAIN HARNESS
7G	-	TO MAIN HARNESS
8G	-	TO MAIN HARNESS
9G	P	TO MAIN HARNESS
10G	R/Y	TO MAIN HARNESS
11G	L	TO MAIN HARNESS
12G	Y/R	TO MAIN HARNESS
13G	G	TO MAIN HARNESS
14G	B	TO MAIN HARNESS
15G	G	TO MAIN HARNESS
16G	L	TO MAIN HARNESS
17G	SB/R	TO MAIN HARNESS
18G	Y/L	TO MAIN HARNESS
19G	SB/O	TO MAIN HARNESS
20G	R	TO MAIN HARNESS
21G	BR	TO MAIN HARNESS
22G	P	TO MAIN HARNESS
23G	W	TO MAIN HARNESS
24G	GR	TO MAIN HARNESS
25G	SB/W	TO MAIN HARNESS
26G	-	TO MAIN HARNESS
27G	BR/Y	TO MAIN HARNESS
28G	B	TO MAIN HARNESS
29G	P	TO MAIN HARNESS
30G	-	TO MAIN HARNESS
31G	LQ/O	TO MAIN HARNESS
32G	-	TO MAIN HARNESS
33G	Y	TO MAIN HARNESS
34G	-	TO MAIN HARNESS
35G	R/B	TO MAIN HARNESS
36G	BR	TO MAIN HARNESS
37G	-	TO MAIN HARNESS
38G	BR	TO MAIN HARNESS
39G	-	TO MAIN HARNESS
40G	-	TO MAIN HARNESS
41G	-	TO MAIN HARNESS
42G	G	TO MAIN HARNESS
43G	-	TO MAIN HARNESS
44G	-	TO MAIN HARNESS
45G	G/B	TO MAIN HARNESS
46G	R/W	TO MAIN HARNESS
47G	LG	TO MAIN HARNESS
48G	-	TO MAIN HARNESS
49G	-	TO MAIN HARNESS
50G	-	TO MAIN HARNESS
51G	L/R	TO MAIN HARNESS
52G	LG	TO MAIN HARNESS
53G	V	TO MAIN HARNESS
54G	SB/R	TO MAIN HARNESS

Terminal No.	Color of Wire	Signal Name
1G	V	TO MAIN HARNESS

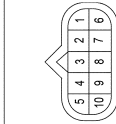
55G	SB/Y	TO MAIN HARNESS
56G	LG	TO MAIN HARNESS
57G	SB	TO MAIN HARNESS
58G	L	TO MAIN HARNESS
59G	W	TO MAIN HARNESS
60G	GR/R	TO MAIN HARNESS
61G	R	TO MAIN HARNESS
62G	L	TO MAIN HARNESS
63G	GR	TO MAIN HARNESS
64G	P	TO MAIN HARNESS
65G	G	TO MAIN HARNESS
66G	BR	TO MAIN HARNESS
67G	O	TO MAIN HARNESS
68G	O	TO MAIN HARNESS
69G	P/B	TO MAIN HARNESS
70G	R	TO MAIN HARNESS
71G	-	TO MAIN HARNESS
72G	LG	TO MAIN HARNESS
73G	P	TO MAIN HARNESS
74G	BR	TO MAIN HARNESS
75G	G	TO MAIN HARNESS
76G	W	TO MAIN HARNESS
77G	V	TO MAIN HARNESS
78G	Y	TO MAIN HARNESS
79G	W	TO MAIN HARNESS
80G	-	TO MAIN HARNESS
81G	-	TO MAIN HARNESS
82G	Y	TO MAIN HARNESS
83G	W	TO MAIN HARNESS
84G	GR	TO MAIN HARNESS
85G	R	TO MAIN HARNESS
86G	B	TO MAIN HARNESS
87G	BR	TO MAIN HARNESS
88G	L/W	TO MAIN HARNESS
89G	BR	TO MAIN HARNESS
90G	-	TO MAIN HARNESS
91G	-	TO MAIN HARNESS
92G	P	TO MAIN HARNESS
93G	P	TO MAIN HARNESS
94G	-	TO MAIN HARNESS
95G	-	TO MAIN HARNESS
96G	G	TO MAIN HARNESS
97G	-	TO MAIN HARNESS
98G	R/W	TO MAIN HARNESS
99G	-	TO MAIN HARNESS
100G	R	TO MAIN HARNESS

ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	E161
Connector Name	BATTERY CURRENT SENSOR
Connector Type	SAZ04FGY
Connector Color	GRAY

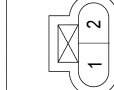


Connector No.	F9
Connector Name	AT ASSEMBLY
Connector Type	FK10FG-DGY
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	SB	SENSOR POWER SUPPLY (WITH YD25DDTi)
1	SB/R	SENSOR POWER SUPPLY (FOR CHILE) (WITH QR25DE)
2	G/B	BATTERY TEMPERATURE SENSOR
3	W	SENSOR GROUND
4	V	BATTERY CURRENT SENSOR

Connector No.	E162
Connector Name	FUEL FILTER PRESSURE SWITCH
Connector Type	E02FB-RS
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	R	FUEL FILTER PRESSURE SWITCH
2	B	SENSOR GROUND

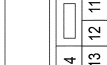
4	P	TO ENGINE ROOM HARNESS - (WITH M9T)
5	SB	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
5	BG	TO ENGINE ROOM HARNESS - (WITH M9T)
6	R	TO ENGINE ROOM HARNESS

Connector No.	F25
Connector Name	WIRE TO WIRE
Connector Type	RS02FLGY
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	LG	TO ENGINE CONTROL SUB HARNESS
2	SB	TO ENGINE CONTROL SUB HARNESS

Connector No.	F30
Connector Name	WIRE TO WIRE
Connector Type	NS16FW-CS
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	P	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
1	V	TO ENGINE ROOM HARNESS - (WITH M9T)
2	L	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
2	G	TO ENGINE ROOM HARNESS - (WITH M9T)
3	GR	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
3	LG	TO ENGINE ROOM HARNESS - (WITH M9T)
4	R	TO ENGINE ROOM HARNESS
5	G/Y	TO ENGINE ROOM HARNESS
6	B	TO ENGINE ROOM HARNESS

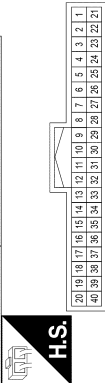
Terminal No.	Color of Wire	Signal Name
1	G	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
1	GR	TO ENGINE ROOM HARNESS - (WITH M9T)
2	V	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
2	Y	TO ENGINE ROOM HARNESS - (WITH M9T)
3	R	TO ENGINE ROOM HARNESS
4	Y	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)



Connector No.	F22
Connector Name	WIRE TO WIRE
Connector Type	M06FW-LC
Connector Color	WHITE

ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	F33
Connector Name	WIRE TO WIRE
Connector Type	TH40FW-NH
Connector Color	WHITE

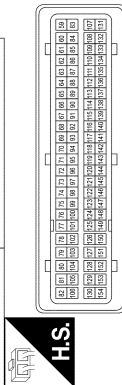


Terminal No.	Color of Wire	Signal Name
1	BR	TO ENGINE ROOM HARNESS
2	W	TO ENGINE ROOM HARNESS
3	B	TO ENGINE ROOM HARNESS
4	B	TO ENGINE ROOM HARNESS - (WITH M9T)
5	GR	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
5	BR	TO ENGINE ROOM HARNESS - (WITH M9T)
6	B	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
6	G	TO ENGINE ROOM HARNESS - (WITH M9T)
7	W	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
7	BR	TO ENGINE ROOM HARNESS - (WITH M9T)
8	L	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
8	W	TO ENGINE ROOM HARNESS - (WITH M9T)
9	V	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
9	Y	TO ENGINE ROOM HARNESS - (WITH M9T)
10	BR	TO ENGINE ROOM HARNESS - (WITH OR25DE)
10	Y	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
10	GR	TO ENGINE ROOM HARNESS - (WITH M9T)
11	Lg	TO ENGINE ROOM HARNESS - (WITH A/T)
11	P	TO ENGINE ROOM HARNESS - (WITH M/T)
12	SB	TO ENGINE ROOM HARNESS
13	P	TO ENGINE ROOM HARNESS
14	L	TO ENGINE ROOM HARNESS
15	R	TO ENGINE ROOM HARNESS
16	G	TO ENGINE ROOM HARNESS - (WITH YD25DDTi)
16	V	TO ENGINE ROOM HARNESS - (WITH M9T)
17	Bg	TO ENGINE ROOM HARNESS
18	R	TO ENGINE ROOM HARNESS

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ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	F54
Connector Name	ECM (WITH YD25DDTi)
Connector Type	ADA96FB
Connector Color	BLACK



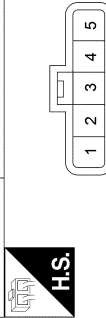
Terminal No.	Color of Wire	Signal Name
59	-	-
60	-	-
61	-	-
62	BG	INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE
63	-	-
64	-	-
65	-	-
66	-	-
67	-	-
68	-	-
69	-	-
70	-	-
71	-	-
72	-	-
73	-	-
74	-	-
75	LG	ASC/D BRAKE SWITCH (M/T), ASC/D BRAKE SWITCH AND ASC/D CLUTCH SWITCH (M/T)
76	-	-
77	-	-
78	-	-
79	-	-
80	-	-
81	L	FUEL INJECTOR (CYLINDER NO.1)
82	G	FUEL INJECTOR POWER SUPPLY (CYLINDER NO.1 AND CYLINDER NO.3)
83	-	-
84	BR	EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE
85	-	-
86	-	-
87	-	-
88	-	-
89	-	-
90	-	-
91	-	-
92	-	-

ABBIA3676GB

93	-	-	TURBOCHARGER BOOST SENSOR
94	Y	-	EXHAUST GAS PRESSURE SENSOR 1
95	G	-	-
96	-	-	-
97	B	-	ASC/D STEERING SWITCH GROUND
98	-	-	-
99	-	-	-
100	L	-	SENSOR GROUND
101	P	-	SENSOR GROUND
102	-	-	-
103	-	-	-
104	W	-	FUEL INJECTOR (CYLINDER NO.3)
105	-	-	-
106	GR	-	FUEL INJECTOR POWER SUPPLY (CYLINDER NO.2 AND CYLINDER NO.4)
107	V	-	SENSOR POWER SUPPLY
108	-	-	-
109	G	-	SENSOR POWER SUPPLY
110	W	-	SENSOR POWER SUPPLY
111	-	-	-
112	R	-	CRANKSHAFT POSITION SENSOR
113	R	-	CAKSHAFT POSITION SENSOR
114	-	-	-
115	R	-	FUEL RAIL PRESSURE SENSOR
116	SB	-	ENGINE COOLANT TEMPERATURE SENSOR
117	G	-	INTAKE AIR TEMPERATURE SENSOR 1
118	W	-	REFRIGERANT PRESSURE SENSOR
119	-	-	-
120	-	-	-
121	SB	-	ASC/D STEERING SWITCH
122	GR	-	EGR VOLUME CONTROL VALVE POSITION SENSOR
123	-	-	-
124	Y	-	FUEL PUMP TEMPERATURE SENSOR
125	-	-	-
126	R	-	FUEL FILTER PRESSURE SWITCH
127	-	-	-
128	-	-	-
129	P	-	FUEL INJECTOR (CYLINDER NO.2)
130	-	-	-
131	-	-	-
132	V	-	SENSOR POWER SUPPLY
133	W	-	SENSOR POWER SUPPLY
134	GR	-	SENSOR POWER SUPPLY
135	B	-	SENSOR POWER SUPPLY
136	B	-	SENSOR GROUND
137	B	-	SENSOR GROUND
138	L	-	SENSOR SHIELD
139	W	-	SENSOR GROUND

140	LG	-	SENSOR GROUND
141	R	-	SENSOR GROUND
142	BR	-	SENSOR GROUND
143	-	-	-
144	-	-	-
145	B	-	ASC/D STEERING SWITCH GROUND
146	Y	-	SENSOR GROUND
147	-	-	-
148	GR	-	SENSOR GROUND
149	P	-	SENSOR GROUND
150	G	-	EXHAUST GAS TEMPERATURE SENSOR 1
151	-	-	-
152	B	-	FUEL INJECTOR (CYLINDER NO.4)
153	-	-	-
154	-	-	-

Connector No.	F61
Connector Name	EGR VOLUME CONTROL VALVE
Connector Type	HS05FB-1V
Connector Color	BLACK



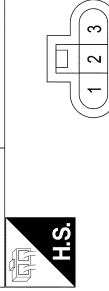
Terminal No.	Color of Wire	Signal Name
1	V	SENSOR POWER SUPPLY
2	GR	EGR VOLUME CONTROL VALVE POSITION SENSOR
3	Y	SENSOR GROUND
4	Y	EGR VOLUME CONTROL VALVE (CLOSE)
5	BG	EGR VOLUME CONTROL VALVE (OPEN)

Connector No.	F62
Connector Name	INTAKE AIR TEMPERATURE SENSOR 2
Connector Type	FEA02FG-LC
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
1	W	INTAKE AIR TEMPERATURE SENSOR 2
2	B	SENSOR GROUND

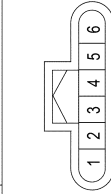
Connector No.	F63
Connector Name	CRANKSHAFT POSITION SENSOR (WITH YD25DDTi)
Connector Type	HS03FB-1V
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	R	CRANKSHAFT POSITION SENSOR
2	B	SENSOR GROUND
3	W	SENSOR POWER SUPPLY

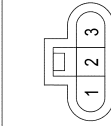
ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	F64
Connector Name	MASS AIR FLOW SENSOR (WITH YD25DDTi)
Connector Type	RH06FB
Connector Color	BLACK



H.S.

Connector No.	F67
Connector Name	CAMSHAFT POSITION SENSOR (WITH YD25DDTi)
Connector Type	HS03FB-1V
Connector Color	BLACK



H.S.

Terminal No.	Color of Wire	Signal Name
1	R	SENSOR GROUND
2	G	INTAKE AIR TEMPERATURE SENSOR 1
3	W	MASS AIR FLOW SENSOR
4	B	SENSOR GROUND
5	L	O2 SENS
6	-	-

Connector No.	F66
Connector Name	PARK NEUTRAL POSITION (PNP) SWITCH
Connector Type	W02FB
Connector Color	BLACK

H.S.



Terminal No.	Color of Wire	Signal Name
1	W	IGNITION
2	G	PNP SIGNAL (WITH QR25DE)
2	V	PARK/NEUTRAL POSITION (PNP) SWITCH OUTPUT (WITH YD25DDTi)
2	L	PARK/NEUTRAL POSITION (PNP) SWITCH OUTPUT (WITH M5T)

1	B	FUEL INJECTOR POWER SUPPLY (CYLINDER NO.2 AND CYLINDER NO.3)
2	W	FUEL INJECTOR (CYLINDER NO.3)

Connector No.	F70
Connector Name	FUEL INJECTOR NO. 4
Connector Type	HS02FLGY
Connector Color	GRAY

H.S.



Terminal No.	Color of Wire	Signal Name
1	W	FUEL INJECTOR POWER SUPPLY (CYLINDER NO.2 AND CYLINDER NO.4)
2	B	FUEL INJECTOR (CYLINDER NO.4)

Connector No.	F71
Connector Name	FUEL INJECTOR NO. 1
Connector Type	HS02FLGY
Connector Color	GRAY

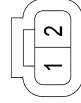
H.S.



Terminal No.	Color of Wire	Signal Name
1	G	FUEL INJECTOR POWER SUPPLY (CYLINDER NO.2 AND CYLINDER NO.3)
2	L	FUEL INJECTOR (CYLINDER NO.1)

Connector No.	F72
Connector Name	FUEL TEMPERATURE SENSOR
Connector Type	W02FW
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1	Y	FUEL PUMP TEMPERATURE SENSOR
2	GR	SENSOR GROUND

Connector No.	F74
Connector Name	GLOW PLUG NO. 3
Connector Type	AZZ01FB-3V
Connector Color	BLACK

H.S.



Terminal No.	Color of Wire	Signal Name
1	SB	GLOW PLUG NO.3

Connector No.	F75
Connector Name	GLOW PLUG NO. 2
Connector Type	AZZ01FB-3V
Connector Color	BLACK

H.S.



Terminal No.	Color of Wire	Signal Name
1	G	GLOW PLUG NO.2

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ENGINE CONTROL SYSTEM

[YD25DDTi]

< WIRING DIAGRAM >

ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	F76
Connector Name	GLOW PLUG NO. 4
Connector Type	AZZ01FB-3V
Connector Color	BLACK



H.S.

Terminal No.	Color of Wire	Signal Name
1	Y	GLOW PLUG NO.4

Connector No.	F77
Connector Name	GLOW PLUG NO. 1
Connector Type	AZZ01FB-3V
Connector Color	BLACK



H.S.

Terminal No.	Color of Wire	Signal Name
1	V	GLOW PLUG NO.1

Connector No.	F78
Connector Name	INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE
Connector Type	E02FB-RS
Connector Color	BLACK

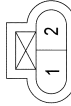


H.S.

Terminal No.	Color of Wire	Signal Name
1	BG	INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE
2	G	O2 SENS

ABBIA3678GB

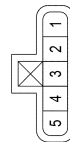
Connector No.	F79
Connector Name	ENGINE COOLER BYPASS VALVE CONTROL SOLENOID VALVE (WITH YD25DDTi)
Connector Type	E02FB-RS
Connector Color	BLACK



H.S.

Terminal No.	Color of Wire	Signal Name
1	BR	EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE
2	R	O2 SENS

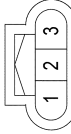
Connector No.	F80
Connector Name	TURBOCHARGER BOOST CONTROL ACTUATOR
Connector Type	E05FGY-RS
Connector Color	GRAY



H.S.

Terminal No.	Color of Wire	Signal Name
1	R	O2 SENS
2	GR	GROUND
3	L	ENGINE COMMUNICATION LINE
4	-	-
5	P	ENGINE COMMUNICATION LINE

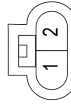
Connector No.	F81
Connector Name	FUEL RAIL PRESSURE SENSOR (WITH YD25DDTi)
Connector Type	RH03FB
Connector Color	BLACK



H.S.

Terminal No.	Color of Wire	Signal Name
1	G	SENSOR POWER SUPPLY
2	R	FUEL RAIL PRESSURE SENSOR
3	W	SENSOR GROUND

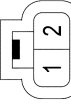
Connector No.	F82
Connector Name	FUEL PUMP SUCTION CONTROL VALVE
Connector Type	HS02FGY
Connector Color	GRAY



H.S.

Terminal No.	Color of Wire	Signal Name
1	B	FUEL PUMP SUCTION CONTROL VALVE
2	G	FUEL PUMP SUCTION CONTROL VALVE

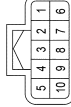
Connector No.	F83
Connector Name	EXHAUST GAS TEMPERATURE SENSOR 1
Connector Type	HS02MW-1V
Connector Color	WHITE



H.S.

Terminal No.	Color of Wire	Signal Name
1	G	EXHAUST GAS TEMPERATURE SENSOR 1
2	P	SENSOR GROUND

Connector No.	F89
Connector Name	JOINT CONNECTOR-F02
Connector Type	RH10FB
Connector Color	BLACK



H.S.

Terminal No.	Color of Wire	Signal Name
1	G	SENSOR SHIELD
2	SB	SENSOR SHIELD
3	SB	SENSOR SHIELD
4	B	SENSOR SHIELD
5	B	SENSOR SHIELD
6	B	SENSOR SHIELD
7	L	SENSOR SHIELD
8	L	SENSOR SHIELD
9	B	SENSOR SHIELD
10	B	SENSOR SHIELD

ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	F90
Connector Name	JOINT CONNECTOR-F03
Connector Type	WJ08FGY
Connector Color	GRAY



H.S.

Connector No.	F201
Connector Name	WIRE TO WIRE
Connector Type	RS02MLGY
Connector Color	GRAY



H.S.

Terminal No.	Color of Wire	Signal Name
1	-	-
2	G	FUEL INJECTOR POWER SUPPLY (CYLINDER NO.1 AND CYLINDER NO.3)
3	B	FUEL INJECTOR POWER SUPPLY (CYLINDER NO.1 AND CYLINDER NO.3)
4	G	FUEL INJECTOR POWER SUPPLY (CYLINDER NO.1 AND CYLINDER NO.3)
5	-	-
6	L	FUEL INJECTOR POWER SUPPLY (CYLINDER NO.2 AND CYLINDER NO.4)
7	W	FUEL INJECTOR POWER SUPPLY (CYLINDER NO.2 AND CYLINDER NO.4)
8	GR	FUEL INJECTOR POWER SUPPLY (CYLINDER NO.2 AND CYLINDER NO.4)

Connector No.	F93
Connector Name	EXHAUST GAS PRESSURE SENSOR 1
Connector Type	AZ03FB1-S
Connector Color	BLACK



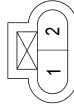
H.S.

Terminal No.	Color of Wire	Signal Name
1	P	SENSOR GROUND
2	G	EXHAUST GAS PRESSURE SENSOR 1
3	GR	SENSOR POWER SUPPLY

ABBIA3679GB

Terminal No.	Color of Wire	Signal Name
1	LG	TO ENGINE CONTROL HARNESS
2	SB	TO ENGINE CONTROL HARNESS

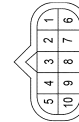
Connector No.	F202
Connector Name	ENGINE COOLANT TEMPERATURE SENSOR (WITH YD25DDTi)
Connector Type	E02FGY-RS
Connector Color	GRAY



H.S.

Terminal No.	Color of Wire	Signal Name
1	SB	ENGINE COOLANT TEMPERATURE SENSOR
2	LG	SENSOR GROUND

Connector No.	F301
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Type	-
Connector Color	-

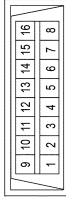


H.S.

Terminal No.	Color of Wire	Signal Name
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1	-	IGNITION POWER SUPPLY
2	-	BATTERY POWER SUPPLY (MEMORY BACK-UP)
3	-	CAN-H
4	-	K-LINE
5	-	GROUND
6	-	IGNITION POWER SUPPLY
7	-	BACK-UP LAMP RELAY
8	-	CAN-L
9	-	STARTER RELAY
10	-	GROUND

H.S.



Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1P	R	IGNITION
2P	G	IGNITION
3P	W	IGNITION (WITHOUT INTELLIGENT KEY SYSTEM)
3P	R	IGNITION (WITH INTELLIGENT KEY SYSTEM)
4P	-	-
5P	-	-
6P	G	RELAY CONTROL
7P	-	-
8P	BG	IGNITION
9P	BG	BATTERY
10P	SB	IGNITION
11P	-	-
12P	-	-
13P	R	BATTERY
14P	-	-
15P	-	-
16P	GR	RELAY CONTROL (WITHOUT INTELLIGENT KEY SYSTEM)
16P	Y	RELAY CONTROL (WITH INTELLIGENT KEY SYSTEM)

Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	-	-
4	B	GROUND
5	B	GROUND
6	L	CAN-H
7	LG	K-LINE
8	G	IGNITION
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	P	CAN-L
15	-	-
16	GR	BATTERY

ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YD25DDTi]

ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

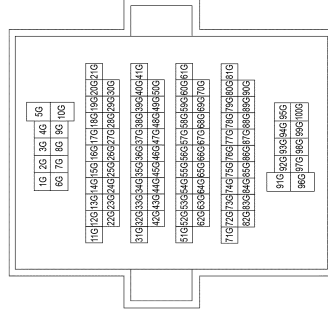
Connector No.	M24
Connector Name	COMBINATION METER (WITH MONOCHROME DISPLAY)
Connector Type	TH40FW-NH
Connector Color	WHITE



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

37	B	FUEL SENSOR GND
38	-	-
39	B	GND (POWER)
40	B	GND (SENS)

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE



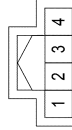
Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	-	-
4	V	WASHER LEVEL SW
5	R	FILTER
6	R	ACC
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12	W	DR BELT SW
13	-	-
14	B	AIR BAG (WITH OUT AIR BAGS)
15	Y	AIR BAG (WITH AIR BAGS)
16	G	FUEL SENSOR
17	SB	SPEED SENS +
18	-	-
19	P	CAN-L
20	L	CAN-H
21	-	-
22	-	-
23	SB	OIL LEVEL GND
24	L	OIL LEVEL
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	W	BRAKE OIL SW
32	G	PKB SW
33	BG	IGN
34	Y	BRAKE SW
35	R	SPEED SENS -
36	BR	CHG

ABBIA3680GB

22G	P	TO ENGINE ROOM HARNESS
23G	W	TO ENGINE ROOM HARNESS
24G	GR	TO ENGINE ROOM HARNESS
25G	SB	TO ENGINE ROOM HARNESS
26G	-	TO ENGINE ROOM HARNESS
27G	BR	TO ENGINE ROOM HARNESS
28G	B	TO ENGINE ROOM HARNESS
29G	L	TO ENGINE ROOM HARNESS
30G	-	TO ENGINE ROOM HARNESS
31G	L	TO ENGINE ROOM HARNESS
32G	-	TO ENGINE ROOM HARNESS
33G	Y	TO ENGINE ROOM HARNESS
34G	-	TO ENGINE ROOM HARNESS
35G	R	TO ENGINE ROOM HARNESS
36G	GR	TO ENGINE ROOM HARNESS
37G	-	TO ENGINE ROOM HARNESS
38G	GR	TO ENGINE ROOM HARNESS
39G	-	TO ENGINE ROOM HARNESS
40G	-	TO ENGINE ROOM HARNESS
41G	-	TO ENGINE ROOM HARNESS
42G	G	TO ENGINE ROOM HARNESS
43G	-	TO ENGINE ROOM HARNESS
44G	-	TO ENGINE ROOM HARNESS
45G	G	TO ENGINE ROOM HARNESS
46G	SB	TO ENGINE ROOM HARNESS
47G	V	TO ENGINE ROOM HARNESS
48G	-	TO ENGINE ROOM HARNESS
49G	-	TO ENGINE ROOM HARNESS
50G	-	TO ENGINE ROOM HARNESS
51G	R	TO ENGINE ROOM HARNESS
52G	LG	TO ENGINE ROOM HARNESS
53G	V	TO ENGINE ROOM HARNESS
54G	SB	TO ENGINE ROOM HARNESS
55G	LG	TO ENGINE ROOM HARNESS
56G	P	TO ENGINE ROOM HARNESS
57G	R	TO ENGINE ROOM HARNESS
58G	W	TO ENGINE ROOM HARNESS
59G	V	TO ENGINE ROOM HARNESS
60G	R	TO ENGINE ROOM HARNESS
61G	BR	TO ENGINE ROOM HARNESS
62G	BG	TO ENGINE ROOM HARNESS
63G	GR	TO ENGINE ROOM HARNESS
64G	P	TO ENGINE ROOM HARNESS
65G	G	TO ENGINE ROOM HARNESS
66G	BG	TO ENGINE ROOM HARNESS
67G	V	TO ENGINE ROOM HARNESS
68G	BR	TO ENGINE ROOM HARNESS
69G	P	TO ENGINE ROOM HARNESS
70G	W	TO ENGINE ROOM HARNESS
71G	-	TO ENGINE ROOM HARNESS
72G	LG	TO ENGINE ROOM HARNESS
73G	P	TO ENGINE ROOM HARNESS
74G	BR	TO ENGINE ROOM HARNESS



Connector No.	M48
Connector Name	WIRE TO WIRE
Connector Type	TH04FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	GR	TO MAIN HARNESS
2	SB	TO MAIN HARNESS
3	B	TO MAIN HARNESS
4	BR	TO MAIN HARNESS
5	-	TO MAIN HARNESS
6	-	TO MAIN HARNESS
7	B	TO MAIN HARNESS
8	V	TO MAIN HARNESS

ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	M56
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITHOUT INTELLIGENT KEY)
Connector Type	FEA09FW-FHA6-SA
Connector Color	WHITE



76	75	74	73	72	71	70	69	68
82	81	80	79	78	77			

Terminal No.	Color of Wire	Signal Name
68	P	FLASHER OUTPUT (LEFT)
69	GR	FLASHER OUTPUT (RIGHT)
70	BG	BATTERY (FUSE)
71	BR	ROOM LAMP OUTPUT
72	-	-
73	-	-
74	-	-
75	-	-
76	-	-
77	SB	DOOR UNLOCK OUTPUT (ALL)
78	BG	DOOR LOCK OUTPUT (ALL)
79	B	GND
80	L	POWER WINDOW POWER SUPPLY OUTPUT (LINKED TO IGN)
81	P	POWER WINDOW POWER SUPPLY OUTPUT (BAT)
82	Y	BATTERY (F/L)

Connector No.	M68
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FBR-CS
Connector Color	BROWN



7R	6R	5R	4R	3R	2R	1R
16R	15R	14R	13R	12R	11R	10R
9R	8R					

Terminal No.	Color of Wire	Signal Name
1R	-	-
2R	G	IGNITION
3R	GR	BATTERY
4R	-	-

ABBIA3681GB

5R	Y	BATTERY
6R	R	ACCESSORY
7R	-	-
8R	-	-
9R	-	-
10R	-	-
11R	-	-
12R	P	BATTERY
13R	B	IGNITION
14R	-	-
15R	BR	BATTERY
16R	R	ACCESSORY

Connector No.	M71
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITHOUT INTELLIGENT KEY)
Connector Type	TH40FW-NH
Connector Color	WHITE



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

24	V	WASHER SW
25	W	BRAKE OIL SW
26	G	PKB SW
27	-	-
28	W	DR BELT SW
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	R	ILL UP SW
37	G	ILL DOWN SW
38	SB	8P/R OUTPUT
39	-	-
40	-	-

Connector No.	M73
Connector Name	COMBINATION SWITCH (SPIRAL CABLE)
Connector Type	TK08FGY-1V
Connector Color	GRAY



10	9	8	7
14	13	12	11

Terminal No.	Color of Wire	Signal Name
7	B	ASCOD STEERING SWITCH GROUND
8	BG	STRG SW B
9	V	STRG SW A
10	SB	ASCOD STEERING SWITCH
11	B	GND (STRG/SATELLITE SW GND)
12	-	-
13	-	-
14	-	-

Connector No.	M85
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITHOUT INTELLIGENT KEY)
Connector Type	TH12EW-NH
Connector Color	WHITE



41	42	43	44	45	46
47	48	49	50	51	52

Terminal No.	Color of Wire	Signal Name
41	L	CAN-H
42	P	CAN-L
43	-	-
44	B	FUEL SENSOR GND
45	R	BAT
46	BG	IGN
47	SB	M-CAN H
48	LG	M-CAN L
49	L	OIL LEVEL
50	SB	OIL LEVEL GND
51	Y	FUEL SENSOR
52	B	GI

ENGINE CONTROL SYSTEM

< WIRING DIAGRAM >

[YD25DDTi]

ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTi

Connector No.	M87
Connector Name	COMBINATION METER (WITH MONOCHROME DISPLAY)
Connector Type	FEA09FW-FHA6-SA
Connector Color	WHITE

65	66	67	68	69	70	71	72	73
74	75	76	77	78	79			



Terminal No.	Color of Wire	Signal Name
65	R	BATTERY (FUSE)
66	-	-
67	-	-
68	-	-
69	L	AIRCON SW
70	R	BLOWER FAN SW
71	-	-
72	-	-
73	BR	ROOM LAMP OUTPUT (GND)
74	Y	BATF/L
75	-	-
76	-	-
77	P	FLASHER OUTPUT (LEFT)
78	GR	FLASHER OUTPUT (RIGHT)
79	B	GND

Connector No.	M91
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITHOUT INTELLIGENT KEY)
Connector Type	TH40FB-NH
Connector Color	BLACK



102	101	100	99	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83
122	121	120	119	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103

Terminal No.	Color of Wire	Signal Name
83	V	KEYLESS & AUTO LIGHT SENSOR GND
84	-	-
85	BG	AUTO LIGHT SENSOR INPUT 1

ABBIA3682GB

86	Y	AUTO LIGHT SENSOR POWER SUPPLY OUTPUT
87	R	SECURITY INDICATOR OUTPUT
88	G	KEY SW
89	-	-
90	-	-
91	LG	KEYLESS TUNNER SIGNAL
92	BG	KEYLESS TUNER POWER SUPPLY
93	BG	IGN SW
94	-	-
95	-	-
96	Y	BRAKE SW
97	-	-
98	V	HAZARD SW
99	Y	AIR CON SW
100	LG	BLOWER FAN SW
101	L	COMBINATION SW OUTPUT 5
102	GR	COMBINATION SW OUTPUT 4
103	P	CAN-L
104	L	CAN-H
105	R	ACC SW
106	-	-
107	-	-
108	G	IMMOBILIZER ONE WAY COMMUNICATION (GLOCK)
109	W	IMMOBILIZER TWO WAY COMMUNICATION
110	R	DOOR LOCK STATUS SW (DR)
111	BR	REAR DEFROGGER SW
112	G	CENTRAL DOOR UNLOCK SW
113	Y	CENTRAL DOOR LOCK SW
114	-	-
115	SB	COMBINATION SW INPUT 1
116	R	COMBINATION SW INPUT 2
117	V	COMBINATION SW INPUT 3
118	Y	COMBINATION SW INPUT 4
119	LG	COMBINATION SW INPUT 5
120	W	COMBINATION SW OUTPUT 1
121	G	COMBINATION SW OUTPUT 2
122	SB	COMBINATION SW OUTPUT 3

Connector No.	M100
Connector Name	JOINT CONNECTOR-M04
Connector Type	NH24FGY-J
Connector Color	GRAY

4	3	2	1
8	7	6	5
12	11	10	9
16	15	14	13
20	19	18	17
24	23	22	21



Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	L	CAN-H
4	P	CAN-L
5	V	IGN
6	BR	AIR BAG
7	L	CAN-H
8	P	CAN-L
9	R	IGNITION
10	BR	W/L
11	-	-
12	-	-
13	B	GROUND
14	-	-
15	L	CAN-H
16	P	CAN-L
17	B	GND
18	-	-
19	L	CAN-H
20	P	CAN-L
21	B	GROUND
22	-	-
23	L	CAN-H
24	P	CAN-L

Connector No.	M101
Connector Name	JOINT CONNECTOR-M06
Connector Type	NH20FL-DC
Connector Color	BLUE



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Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
2	L	CAN-H
3	L	CAN-H
4	L	CAN-H
5	L	CAN-H
6	-	-
7	L	CAN-H
8	-	-
9	-	-
10	-	-
11	P	CAN-L
12	P	CAN-L
13	P	CAN-L
14	P	CAN-L
15	P	CAN-L
16	-	-
17	P	CAN-L
18	LG	BATTERY SAVER OUTPUT
19	LG	BATTERY SAVER OUTPUT
20	LG	BATTERY SAVER OUTPUT

ENGINE CONTROL SYSTEM CONNECTORS - WITH YD25DDTI

Connector No.	M106
Connector Name	COMBINATION METER WITH COLOR DISPLAY - WITH INTELLIGENT KEY)
Connector Type	TH40FW-NH
Connector Color	WHITE



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

Terminal No.	Color of Wire	Signal Name
1	B	GND (STRG/SATELLITE SW GND)
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	R	SECURITY
8	-	-
9	-	-
10	-	-
11	BR	CHG
12	LG	LED HEAD LAMP-R
13	BG	LED HEAD LAMP-L
14	R	ACC
15	-	-
16	BR	AIR BAG
17	-	-
18	P	TRIP RESET SW
19	-	-
20	-	-
21	R	FILTER
22	V	STRG SW A
23	BG	STRG SW B
24	V	WASHER SW
25	W	BRAKE OIL SW
26	G	PKG SW
27	-	-
28	W	DR BELT SW
29	-	-
30	LG	M RANGE
31	Y	NOT M RANGE
32	V	AT SHIFT UP
33	BG	AT SHIFT DOWN
34	-	-
35	-	-
36	R	ILL UP SW
37	G	III DOWN SW

Conne

38	SB	8P/R OUTPUT
39	-	-
40	-	-

Connector No.	M107
Connector Name	COMBINATION METER (WITH COLOR DISPLAY - WITH INTELLIGENT KEY)
Connector Type	TH12FW-NH
Connector Color	WHITE



И

41	42	43	44	45	46
47	48	49	50	51	52

Terminal No.	Color of Wire	Signal Name
41	L	CANH
42	P	CAN-L
43	-	-
44	B	FUEL SENSOR GND
45	R	BAT
46	BG	IGN
47	SB	M-CANH
48	LQ	M-CAN-L
49	L	OIL LEVEL
50	SB	OIL LEVEL GND
51	Y	FUEL SENSOR
52	R	G1



H

Connector No.	M149
Connector Name	COMBINATION SWITCH (SPIRAL CABLE)
Connector Type	TK08FGY-X
Connector Color	GRAY



22	21	20	19	18	17	16	15
----	----	----	----	----	----	----	----

Terminal No.	Color of Wire	Signal Name
15	R	ASCD STEERING SWITCH
16	W	STRG SW A
17	L	HORN RELAY OUTPUT
18	B	ASCD STEERING SWITCH GROUND

19	R	GND (STRG/SATELLITE SW GND)
20	G	STRG SW B
21	P	GROUND
22	Y	CLEARANCE/L RH

Connector No.	M152
Connector Name	WIRE TO WIRE
Connector Type	TH04MW-NH
Connector Color	WHITE



SH

Terminal No.	Color of Wire	Signal Name
1	GR	TO MAIN HARNESS
2	SB	TO MAIN HARNESS
3	B	TO MAIN HARNESS
4	BR	TO MAIN HARNESS

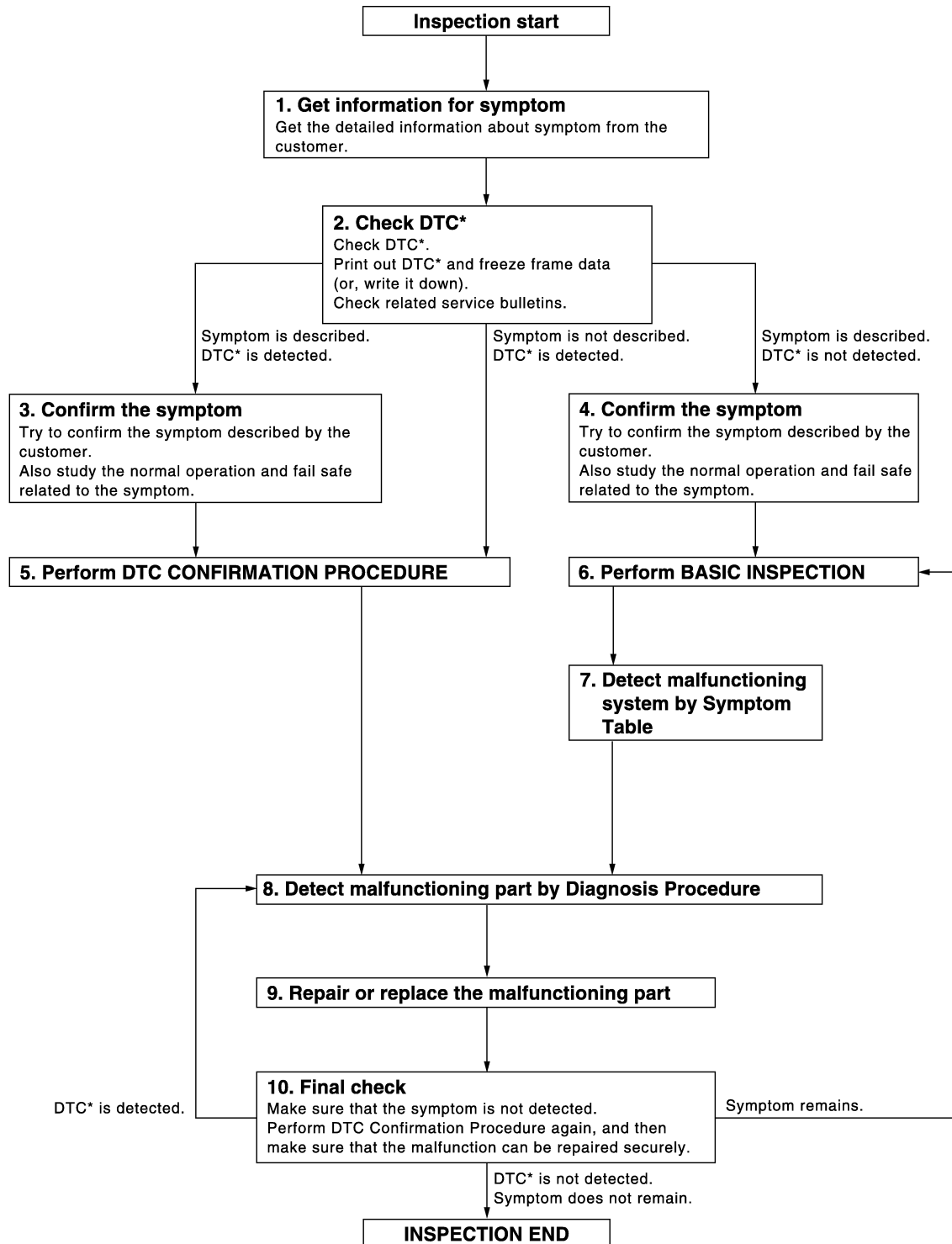
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000014268197

OVERALL SEQUENCE



*: Include 1st/2nd trip DTC.

JMBIA1206GB

DETAILED FLOW

DIAGNOSIS AND REPAIR WORK FLOW

[YD25DDTi]

< BASIC INSPECTION >

1.GET INFORMATION FOR SYMPTOM

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the "Diagnostic Work Sheet". (Refer to [EC-894, "Diagnostic Work Sheet"](#).)

>> GO TO 2.

2.CHECK DTC

1. Check DTC.
2. Perform the following procedure if DTC is displayed.
 - Record DTC and freeze frame data. (Print them out with CONSULT.)
 - Erase DTC. (Refer to [EC-845, "DIAGNOSIS DESCRIPTION : Introduction"](#).)
 - Study the relationship between the cause detected by DTC and the symptom described by the customer. (Symptom Matrix Chart is useful. Refer to [EC-1085, "Symptom Table"](#).)
3. Check related service bulletins for information.

Is any symptom described and is any DTC detected?

Symptom is described, DTC is detected>>GO TO 3.

Symptom is described, DTC is not detected>>GO TO 4.

Symptom is not described, DTC is detected>>GO TO 5.

3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer (except MIL ON).

Also study the normal operation related to the symptom. Refer to [EC-1091, "Description"](#).

Diagnostic Work Sheet is useful to verify the incident.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

4.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.

Also study the normal operation related to the symptom.

Diagnostic Work Sheet is useful to verify the incident.

Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

5.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the displayed DTC, and then make sure that DTC is detected again.

If two or more DTCs are detected, refer to [EC-867, "DTC Inspection Priority Chart"](#) and determine trouble diagnosis order.

NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.
 - If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIRMATION PROCEDURE.

Is DTC detected?

YES >> GO TO 8.

NO >> Check according to [EC-896, "Description"](#).

6.PERFORM BASIC INSPECTION

Perform [EC-907, "Work Procedure"](#).

>> GO TO 7.

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[YD25DDTi]

7. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM TABLE

Detect malfunctioning system according to [EC-1085, "Symptom Table"](#) based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

>> GO TO 8.

8. DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

NOTE:

The Diagnosis Procedure in EC section described based on open circuit inspection. A short circuit inspection is also required for the circuit check in the Diagnosis Procedure.

Is malfunctioning part detected?

YES >> GO TO 9.

NO >> Monitor input data from related sensors or check voltage of related ECM terminals using CONSULT. Refer to [EC-855, "Reference Value"](#).

9. REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement.
3. Check DTC. If DTC is displayed, erase it. Refer to [EC-845, "DIAGNOSIS DESCRIPTION : Introduction"](#).

>> GO TO 10.

10. FINAL CHECK

When DTC was detected in step 2, perform DTC CONFIRMATION PROCEDURE or Component Function Check again, and then make sure that the malfunction have been repaired securely.

When symptom was described from the customer, refer to confirmed symptom in step 3 or 4, and make sure that the symptom is not detected.

Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 8.

YES-2 >> Symptom remains: GO TO 6.

NO >> Before returning the vehicle to the customer, make sure to erase unnecessary DTC in ECM. (Refer to [EC-845, "DIAGNOSIS DESCRIPTION : Introduction"](#).)

Diagnostic Work Sheet

INFOID:000000014268198

DESCRIPTION

There are many operating conditions that lead to the malfunction of engine components. A good grasp of such conditions can make troubleshooting faster and more accurate.

In general, each customer feels differently about a incident. It is important to fully understand the symptoms or conditions for a customer complaint.

Utilize a diagnostic worksheet like the one on the next page in order to organize all the information for troubleshooting.

Some conditions may cause the MIL to come on steady and DTC to be detected. Examples:

- Vehicle ran out of fuel, which caused the engine to misfire.
- Fuel filler cap was left off or incorrectly screwed on, allowing fuel to evaporate into the atmosphere.

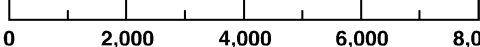
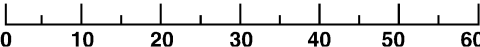
KEY POINTS

WHAT		Vehicle & engine model
WHEN		Date, Frequencies
WHERE		Road conditions
HOW		Operating conditions, Weather conditions, Symptoms

SEF907L

[YD25DDTi]

WORKSHEET SAMPLE

Customer name MR/MS		Model & Year	VIN
Engine #		Trans.	Mileage
Incident Date		Manuf. Date	In Service Date
Fuel and fuel filler cap		☐ Vehicle ran out of fuel causing misfire ☐ Fuel filler cap was left off or incorrectly screwed on.	
Symptoms	☐ Startability	☐ Impossible to start ☐ No combustion ☐ Partial combustion ☐ Partial combustion affected by throttle position ☐ Partial combustion NOT affected by throttle position ☐ Possible but hard to start ☐ Others []	
	☐ Idling	☐ No fast idle ☐ Unstable ☐ High idle ☐ Low idle ☐ Others []	
	☐ Driveability	☐ Stumble ☐ Surge ☐ Knock ☐ Lack of power ☐ Intake backfire ☐ Exhaust backfire ☐ Others []	
	☐ Engine stall	☐ At the time of start ☐ While idling ☐ While accelerating ☐ While decelerating ☐ Just after stopping ☐ While loading	
Incident occurrence		☐ Just after delivery ☐ Recently ☐ In the morning ☐ At night ☐ In the daytime	
Frequency		☐ All the time ☐ Under certain conditions ☐ Sometimes	
Weather conditions		☐ Not affected	
	Weather	☐ Fine ☐ Raining ☐ Snowing ☐ Others []	
	Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold ☐ Humid °F	
Engine conditions		☐ Cold ☐ During warm-up ☐ After warm-up Engine speed  0 2,000 4,000 6,000 8,000 rpm	
Road conditions		☐ In town ☐ In suburbs ☐ Highway ☐ Off road (up/down)	
Driving conditions		☐ Not affected ☐ At starting ☐ While idling ☐ At racing ☐ While accelerating ☐ While cruising ☐ While decelerating ☐ While turning (RH/LH) Vehicle speed  0 10 20 30 40 50 60 MPH	
Malfunction indicator lamp		☐ Turned on ☐ Not turned on	

MTBL0017

TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT

< BASIC INSPECTION >

[YD25DDTi]

TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT

Description

INFOID:0000000014268199

Intermittent incidents may occur. In many cases, the incident resolves itself (the part or circuit function returns to normal without intervention). It is important to realize that the symptoms described in the customer's complaint often do not recur on (1st/2nd trip) DTC visits. Realize also that the most frequent cause of intermittent incidents occurrences is poor electrical connections. Because of this, the conditions under which the incident occurred may not be clear. Therefore, circuit checks made as part of the standard diagnostic procedure may not indicate the specific malfunctioning area.

COMMON INTERMITTENT INCIDENTS REPORT SITUATIONS

STEP in Work Flow	Situation
II	The CONSULT is used. The SELF-DIAG RESULTS screen shows time data other than "0".
III	The symptom described by the customer does not recur.
IV	(1st/2nd trip) DTC does not appear during the DTC Confirmation Procedure.
VI	The Diagnostic Procedure for XXXX does not indicate the malfunctioning area.

Diagnosis Procedure

INFOID:0000000014268200

1.INSPECTION START

Erase (1st/2nd trip) DTCs. Refer to [EC-845, "DIAGNOSIS DESCRIPTION : Introduction"](#).

>> GO TO 2.

2.CHECK GROUND TERMINALS

Check ground terminals for corroding or loose connection.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace.

3.SEARCH FOR ELECTRICAL INCIDENT

Perform [GI-41, "Work Flow"](#), "INCIDENT SIMULATION TESTS".

Is the inspection result normal?

YES >> **INSPECTION END**

NO >> Repair or replace.

SERVICE AFTER REPLACING OR REMOVING ENGINE PARTS

< BASIC INSPECTION >

[YD25DDTi]

SERVICE AFTER REPLACING OR REMOVING ENGINE PARTS

Description

INFOID:000000014268201

NOTE:

Refer to [EC-803, "How to Check Vehicle Type"](#), for the information of type 1 and 2.

×:Applicable

Part name		Service performed		Required service	Reference
		Replace- ment	Removal* ¹		
ECM	Brand-new	×		Additional service when replacing ECM	EC-898
	Used	×		Additional service when replacing ECM	EC-898
				Fuel pump learning value clearing	EC-904
Fuel injector		×		Injector adjustment value registration	EC-905
				Fuel injection quantity learning	EC-902
Fuel pump suction control valve		×	×	Fuel pump learning value clearing	EC-904
EGR volume control valve* ²		×	×	EGR volume control valve closed position learning	EC-901
				EGR volume control valve closed position learning value clear	EC-900

*1:Harness connector disconnection included.

*2:Type 2 is not applicable

ADDITIONAL SERVICE WHEN REPLACING ECM

Description

INFOID:0000000014268202

When replacing ECM, this procedure must be performed.

NOTE:

- Refer to [EC-803, "How to Check Vehicle Type"](#), for the information of type 1 and 2.
- The necessary operation is different depending on the operation result of ECM data save or write. Always perform the operation according to procedures. Refer to [EC-898, "Work Procedure"](#).

Work Procedure

INFOID:0000000014268203

1. SAVE ECM DATA

1. Turn ignition switch OFF and wait at least 2 minutes.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Select "SAVING DATA FOR REPLC CPU" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
5. Follow the instruction of CONSULT display.

NOTE:

Necessary data in ECM is copied and saved to CONSULT.

Is operation completed successfully?

- YES >> GO TO 2.
NO >> GO TO 6.

2. REPLACE ECM

1. Turn ignition switch OFF and wait at least 2 minutes.
2. Replace ECM. Refer to [EC-1094, "Removal and Installation"](#).

>> GO TO 3.

3. PERFORM PROGRAMMING

Refer to "CONSULT Operation Manual".

>> GO TO 4.

4. PERFORM INITIALIZATION OF NATS SYSTEM AND REGISTRATION OF ALL NATS IGNITION KEY IDS

Perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to "CONSULT Operation Manual NATS-IVIS/NVIS".

>> GO TO 5.

5. WRITE ECM DATA

1. Select "WRITING DATA FOR REPLC CPU" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
2. Follow the instruction of CONSULT display.

NOTE:

The data saved by "SAVING DATA FOR REPLC CPU" is written to ECM.

Is operation completed successfully?

- YES >> GO TO 10.
NO >> GO TO 9.

6. REPLACE ECM

1. Turn ignition switch OFF and wait at least 2 minutes.
2. Replace ECM. Refer to [EC-1094, "Removal and Installation"](#).

>> GO TO 7.

7. PERFORM PROGRAMMING

Refer to "CONSULT Operation Manual".

ADDITIONAL SERVICE WHEN REPLACING ECM

< BASIC INSPECTION >

[YD25DDTi]

>> GO TO 8.

8.PERFORM INITIALIZATION OF NATS SYSTEM AND REGISTRATION OF ALL NATS IGNITION KEY IDS

Perform initialization of NATS system and registration of all NATS ignition key IDs. Refer to "CONSULT Operation Manual NATS-IVIS/NVIS".

>> GO TO 9.

9.PERFORM INJECTOR ADJUSTMENT VALUE REGISTRATION

Perform injector adjustment value registration. Refer to [EC-905, "Description"](#).

>> GO TO 10.

10.PERFORM FUEL INJECTOR QUANTITY LEARNING

Perform fuel injector quantity learning. Refer to [EC-902, "Description"](#).

>> GO TO 11.

11.PERFORM EGR VOLUME CONTROL VALVE CLOSED POSITION LEARNING

Perform EGR volume control valve closed position learning. Refer to [EC-901, "Description"](#).

NOTE:

Type 2 is not applicable. Go to step 12.

>> GO TO 12.

12.PERFORM CONFIGURATION CLEAR

1. Turn ignition switch ON.
2. Select "CONFIG CLR" in "WORK SUPPORT" mode of "ENGINE" using CONSULT.
3. Follow the instruction of CONSULT display.

>> END

EGR VOLUME CONTROL VALVE CLOSED POSITION LEARNING VALUE CLEAR

< BASIC INSPECTION >

[YD25DDTi]

EGR VOLUME CONTROL VALVE CLOSED POSITION LEARNING VALUE CLEAR

Description

INFOID:0000000014268204

“EGR Volume Control Valve Closed Position Learning Value Clear” should be cleared under the following cases.

- EGR volume control valve is removed.
- EGR volume control valve is replaced.

For details, refer to [EC-900, "Work Procedure"](#).

Work Procedure

INFOID:0000000014268205

1.START

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 2 minutes.
3. Turn ignition switch ON.
4. Select “EGR/V LEARN CLR” in “WORK SUPPORT” mode with CONSULT.
5. Touch “CLEAR” and wait a few seconds.
6. Make sure the “CMPLT” is displayed on CONSULT screen.

>> END

EGR VOLUME CONTROL VALVE CLOSED POSITION LEARNING

< BASIC INSPECTION >

[YD25DDTi]

EGR VOLUME CONTROL VALVE CLOSED POSITION LEARNING

Description

INFOID:0000000014268206

“EGR Volume Control Valve Closed Position Learning” is an operation to learn the fully closed position of the EGR volume control valve by monitoring the EGR volume control valve position sensor output signal. It must be performed under any of the following conditions:

- EGR volume control valve is removed.
- EGR volume control valve is replaced.
- ECM is replaced.

For details, refer to [EC-901, "Work Procedure"](#).

Work Procedure

INFOID:0000000014268207

1.START

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 2 minutes.
Make sure that EGR volume control valve moves during above 30 seconds by confirming the operating sound.

>> END

FUEL INJECTION QUANTITY LEARNING

Description

INFOID:0000000014268208

DESCRIPTION

Fuel injection quantity learning is performed to adjust fuel injection quantity deviated during the use of injectors under various conditions to properly adjust the injection quantity. If this learning is not performed, then malfunctions, such as knocking and poor acceleration may occur.

Injector fuel injection quantity learning must be performed after the following cases.

NOTE:

If the learning is performed at high altitudes (atmospheric pressure is low), there is the case the learning does not complete. In this case, perform learning value clear only. The clear function is in the fuel injection quantity learning function.

- Injector(s) are replaced.

NOTE:

- If all injectors are replaced, then perform learning value clear only. The clear function is in the fuel injection quantity learning function.
- ECM is replaced.
- ECM detected some DTC. (After work completion)

ERROR LIST

If errors listed below are indicated, diagnose and eliminate possible causes before restarting the learning.

Detection	detecting condition
CONDITION ARE NOT SATISFIED	Learning permission conditions are not satisfied. Refer to EC-902. "Work Procedure" .
BOOST PRESSURE ERROR	Error in boost pressure
INTAKE AIR TEMPERATURE ERROR	Error in intake air pressure
ENGINE SPEED ERROR	While engine speed is unstable
FUEL RAIL PRESSURE ERROR	Actual rail pressure is extremely deviated from the target rail pressure
CYLINDER XX LEARNING NOT SUCCEEDED	Learning of Cylinder XX is unsuccessful NOTE: When this error message is shown, perform the learning again. If an error is detected in the same cylinder, perform EC-1069. "Diagnosis Procedure" .

For details, refer to [EC-902. "Work Procedure"](#).

Work Procedure

INFOID:0000000014268209

1. ERASE FUEL INJECTION QUANTITY LEARNING VALUE

1. Turn ignition switch OFF and wait at least 2 minutes.
2. Turn ignition switch ON (engine stopped).
3. Select "FUEL INJ QUANTITY LEARNING" in "WORK SUPPORT" mode with CONSULT.
4. Touch "START".

NOTE:

When touching "START", CONSULT erases fuel injection quantity learning value stored in ECM.

Is this work after replacing all fuel injectors?

YES >> Touch "END".

NO >> GO TO 2.

2. VEHICLE CONDITION CHECK

1. Start the engine and warm it up to the normal operating temperature.
2. Check that the vehicle is in the following conditions.

Engine speed	At idle
Vehicle speed	0 km/h (0 MPH)
DTC	Not detected
Engine coolant temperature	70°C (158°F) or more

FUEL INJECTION QUANTITY LEARNING

[YD25DDTi]

< BASIC INSPECTION >

Fuel temperature	Between 20°C (68°F) and 60°C (140°F)
Intake air temperature	−15°C (5°F) or more
Gear position	N or P (A/T), Neutral (M/T)
Brake pedal	Released
Accelerator pedal	Released
Electrical load	OFF

3. Open the engine room cover. Refer to [EM-154, "Exploded View"](#).

4. Touch "START".

NOTE:

When touching "START", CONSULT automatically checks the vehicle condition to evaluate the feasibility of the learning.

Is an error message displayed?

YES >> Check the error. Refer to [EC-902, "Description"](#).

NO >> GO TO 3.

3.START FUEL INJECTION QUANTITY LEARNING

1. Touch "NEXT".

CAUTION:

Ensure the safety before starting fuel injection quantity learning. Engine speed increases to around 3,500 rpm after touching "NEXT".

2. Let stand until the learning completes.

NOTE:

Learning time is approximately 8 to 30 minutes.

3. Check the completion message.

Is "COMPLETE" displayed?

YES >> END

NO >> Touch "NEXT" and check the error. Refer to [EC-902, "Description"](#).

FUEL PUMP LEARNING VALUE CLEARING

Description

INFOID:0000000014268210

In order to always keep optimum fuel pressure in fuel rail, the ECM controls fuel pump in high precision with monitoring the signal of fuel rail pressure sensor.

Accordingly, the ECM always learns characteristic value of fuel pump. Fuel Pump Learning Value Clearing is an operation to clear the value of the fuel pump learning.

Fuel Pump Learning Value Clearing should be performed under the following conditions.

- Fuel pump is changed.
- ECM is replaced with used one which stores the fuel pump learning value of other fuel pump.

For details, refer to [EC-904, "Work Procedure"](#).

Work Procedure

INFOID:0000000014268211

NOTE:

When removing fuel pump, perform Fuel Pump Learning Value Clearing before starting the engine.

1. FUEL PUMP LEARNING VALUE CLEAR

⊗ Without CONSULT

Fuel pump learning value can be erased from the back up memory in the ECM by the same operation as erasing DTC. In detail, refer to [EC-845, "DIAGNOSIS DESCRIPTION : Introduction"](#).

>> WORK END

INJECTOR ADJUSTMENT VALUE REGISTRATION

< BASIC INSPECTION >

[YD25DDTi]

INJECTOR ADJUSTMENT VALUE REGISTRATION

Description

INFOID:0000000014268212

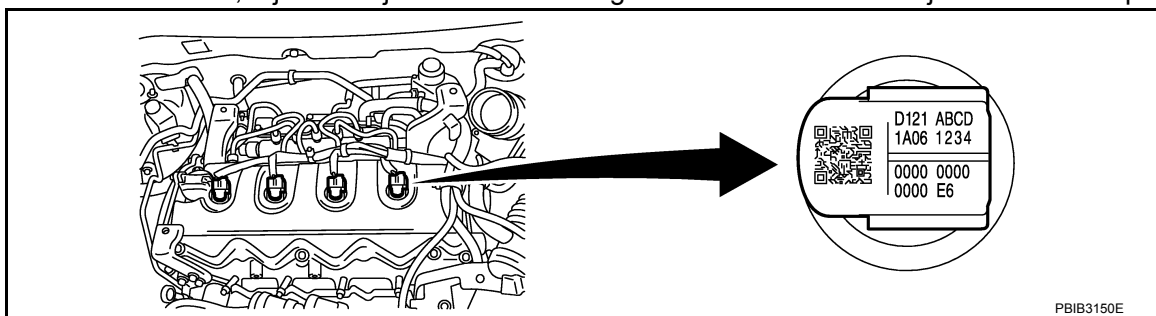
Injector adjustment value indicates manufacturing tolerance and the value is printed on the top of fuel injector. The injector adjustment value which is correctly stored in ECM is needed for precise fuel injection control. A performance of emission control and a drivability may effect when there is a mismatch between the following two values.

- The injector adjustment value stored in ECM
- The injector adjustment value of the injector which is installed on the vehicle

Injector adjustment value registration must be performed after the following cases.

- Injector(s) are replaced.
- ECM is replaced.

For the first case, Injector Adjustment Value Registration for the replaced fuel injector must be performed. And for the second case, Injector Adjustment Value Registration for all the fuel injectors must be performed.



Example: Injector adjustment value = D121ABCD1A061234000000000000E6

For details, refer to [EC-905. "Work Procedure"](#).

Work Procedure

INFOID:0000000014268213

1. START

NOTE:

- Before performing this procedure, record injector adjustment value printed on a fuel injector.
- When all fuel injectors are replaced or ECM is replaced, it is recommended to perform "INJ ADJ VAL CLR" in "WORK SUPPORT" mode before performing this procedure. By performing "INJ ADJ VAL CLR" in "WORK SUPPORT" mode, injector adjustment value stored in ECM is initialized.

1. Turn ignition switch ON (engine stopped).
2. Select "ENTER INJECTR CALIB DATA" in "WORK SUPPORT" mode with CONSULT.
3. Touch "START".

NOTE:

When touching "START", CONSULT reads injector adjustment values stored in ECM.

4. Select the number of the cylinder which needs injector adjustment value registration.
5. Input injector adjustment value, and touch "ENTER".

NOTE:

Input injector adjustment value is stored in CONSULT.

6. Repeat step 4 - 5 till there is no cylinder which needs injector adjustment value registration, and touch "START".

NOTE:

When touching "START", injector adjustment values stored in CONSULT are written onto ECM memory.

7. After "CMND FINISHED" is displayed, make sure that the following values are same for each cylinder.
 - Injector adjustment value which is printed on a fuel injector.
 - Injector adjustment value which is displayed on CONSULT screen.

NOTE:

- In this step, CONSULT reads injector adjustment values stored in ECM and displays the values on the CONSULT screen. This is for checking if injector adjustment values are written onto ECM memory correctly.
- If DTC is detected, perform DTC Confirmation Procedure for the DTC, and check if the same DTC is detected again.

INJECTOR ADJUSTMENT VALUE REGISTRATION

< BASIC INSPECTION >

[YD25DDTi]

>> END

BASIC INSPECTION

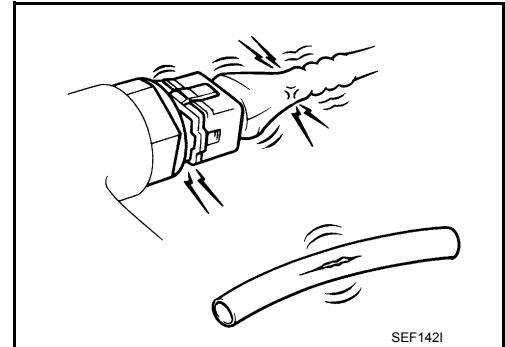
Work Procedure

INFOID:000000014268214

1.INSPECTION START

1. Check service records for any recent repairs that may indicate a related incident.
2. Check the current need for scheduled maintenance, especially for fuel filter and air cleaner filter. Refer to [MA-14, "EXCEPT MEXICO AND BRAZIL : Periodic Maintenance"](#).
3. Open engine hood and check the following:
 - Harness connectors for improper connections
 - Vacuum hoses for splits, kinks, or improper connections
 - Wiring for improper connections, pinches, or cuts
4. Confirm that electrical or mechanical loads are not applied.
 - Headlamp switch is OFF.
 - Air conditioner switch is OFF.
 - Steering wheel is in the straight-ahead position, etc.
5. Start engine and warm it up to the normal operating temperature.

>> GO TO 2.



2.CHECK IDLE SPEED

Check idle speed.

For procedure, refer to [EC-1092, "Inspection"](#).For specification, refer to [EC-1097, "General Specification"](#).Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3.CHECK FOR INTAKE AIR LEAK

Listen for an intake air leak after the mass air flow sensor.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning part.

4.BLEED AIR FROM FUEL SYSTEM

1. Stop engine.
2. Use priming pump to bleed air from fuel system. Refer to [FL-23, "Air Bleeding"](#).

>> GO TO 5.

5.CHECK IDLE SPEED AGAIN

1. Start engine.
2. Check idle speed.
 - For procedure, refer to [EC-1092, "Inspection"](#).
 - For specification, refer to [EC-1097, "General Specification"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 6.

6.DRAIN WATER FROM FUEL FILTER

1. Stop engine.
2. Drain water from fuel filter. Refer to [FL-28, "Draining Water from Fuel Filter"](#).

>> GO TO 7.

< BASIC INSPECTION >

7. CHECK IDLE SPEED AGAIN

1. Start engine.
2. Check idle speed.
 For procedure, refer to [EC-1092, "Inspection"](#).
 For specification, refer to [EC-1097, "General Specification"](#).

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> GO TO 8.

8. CHECK AIR CLEANER FILTER

1. Stop engine.
2. Check air cleaner filter for clogging or breaks.

Is the inspection result normal?

- YES >> GO TO 9.
 NO >> Replace air cleaner filter.

9. CHECK BATTERY VOLTAGE

Check battery voltage.

Voltage: More than 12.13V

Is the inspection result normal?

- YES >> GO TO 11.
 NO >> GO TO 10.

10. CHECK BATTERY

Refer to [PG-140, "How to Handle Battery"](#).

Is the inspection result normal?

- YES >> Check charging system. Refer to [CHG-35, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-38, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\)"](#). For details, refer to [CHG-5, "Special Service Tools"](#).
 NO >> Repair or replace the malfunctioning part.

11. CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to [EM-145, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 12.
 NO >> Follow the instruction of "CHECKING COMPRESSION PRESSURE". Refer to [EM-145, "Inspection"](#).

12. CHECK IDLE SPEED AGAIN

Check idle speed.
 For procedure, refer to [EC-1092, "Inspection"](#).
 For specification, refer to [EC-1097, "General Specification"](#).

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Check fuel injector. Refer to [EC-1069, "Diagnosis Procedure"](#). And then, GO TO 2.

DTC/CIRCUIT DIAGNOSIS**POWER SUPPLY AND GROUND CIRCUIT****Diagnosis Procedure**

INFOID:0000000014268215

EC

1.CHECK FUSE

Check that the following fuse is not blowing.

Location	Fuse No.	Capacity
IPDM E/R	#45	15A
	#49	20A

Is the fuse blown (open)?

YES >> Replace the fuse after repairing the applicable circuit.

NO >> GO TO 2.

2.CHECK GROUND CONNECTION

1. Turn ignition switch OFF.
2. Check ground connection E9 and E15.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace ground connection.

3.CHECK ECM GROUND CIRCUIT FOR OPEN

1. Disconnect ECM harness connector.
2. Check the continuity between ECM harness connector and ground.

ECM		Ground	Continuity
Connector	Terminal		
E8	41	Ground	Existed
	55		
	56		
	57		
	58		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit in harness or connectors.

4.CHECK ECM POWER SUPPLY (MAIN)-I

1. Reconnect ECM harness connector.
2. Turn ignition switch ON.
3. Check the voltage between ECM harness connector terminals as per the following.

ECM				Voltage (Approx.)
+		-		
Connector	Terminal	Connector	Terminal	
E8	53	E8	41	Battery volt- age
	54			

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

POWER SUPPLY AND GROUND CIRCUIT

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

5.CHECK ECM POWER SUPPLY (MAIN) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and IPDM E/R harness connector.
3. Check the continuity between ECM harness connector and IPDM E/R harness connector.

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E8	53	E121	25	Existed
	54		26	

4. Also check harness for short to power.

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-40, "Removal and Installation"](#).

NO >> Repair harness or connectors.

6.CHECK ECM POWER SUPPLY (MAIN)-II

Check the voltage between ECM harness connector terminals as per the following.

ECM				Condition	Voltage (Approx.)
+		−			
Connector	Terminal	Connector	Terminal		
E8	53	E8	41	After turning ignition switch OFF, battery voltage will exist for 2 minutes	Drop to 0 V.
	54				

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 7.

7.CHECK ECM RELAY CONTROL SIGNAL

1. Check the voltage between ECM harness connector terminals as per the following.

ECM				Condition	Voltage (Approx.)
+		−			
Connector	Terminal	Connector	Terminal		
E8	25	E8	41	Ignition switch ON	0 V
				Turn ignition switch OFF and wait at least 2 minutes.	Battery voltage
	26			Ignition switch ON	0 V
				Turn ignition switch OFF and wait at least 2 minutes.	Battery voltage

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [EC-896, "Description"](#).

NO >> GO TO 8.

8.CHECK ECM RELAY CONTROL CIRCUIT

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between ECM harness connector and IPDM E/R harness connector.

POWER SUPPLY AND GROUND CIRCUIT

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E8	25	E121	31	Existed
	26			

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-40. "Removal and Installation"](#).

NO >> Repair harness or connectors.

9.CHECK IGNITION SWITCH SIGNAL (IGN)

1. Reconnect ECM harness connector.
2. Turn ignition switch ON.
3. Check the voltage between ECM harness connectors.

ECM				Condition	Voltage (Approx.)
+		−			
Connector	Terminal	Connector	Terminal		
E8	12	E8	41	Ignition switch OFF	0 V
				Ignition switch ON	Battery voltage

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 10.

10.CHECK ECM POWER SUPPLY CIRCUIT (IGN) FOR OPEN

1. Disconnect ECM harness connector and IPDM E/R harness connector.
2. Check the continuity between ECM harness connector and IPDM E/R harness connector.

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E8	12	E119	18	Existed

3. Also check harness for short to power.

Is the inspection result normal?

YES >> Check power supply routing circuit for ignition power supply.

NO >> Repair open circuit or short to power in harness or connectors.

11.CHECK ECM POWER SUPPLY (BACK-UP)

1. Reconnect ECM harness connector.
2. Turn ignition switch OFF.
3. Check the voltage between ECM harness connector and ground.

ECM		Ground	Voltage
Connector	Terminal		
E8	13	Ground	Battery voltage

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 12.

12.CHECK ECM POWER SUPPLY (BACK-UP) CIRCUIT

1. Disconnect ECM harness connector.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between ECM harness connector and IPDM E/R harness connector.

POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E8	13	E121	32	Existed

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-40. "Removal and Installation"](#).
NO >> Repair harness or connectors.

U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:0000000014268216

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
U1000	CAN COMM CIRCUIT (Manufacturer controlled DTC)	When ECM is not transmitting or receiving CAN communication signal to other control units for 2 seconds or more.

POSSIBLE CAUSE

Harness or connectors (CAN communication line is open or shorted.)

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 3 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-913, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268217

Perform the trouble diagnosis for CAN communication system. Refer to [LAN-39, "CAN COMMUNICATION SYSTEM : CAN System Specification Chart"](#).

U1025 ENG COMMUNICATION

Description

INFOID:0000000014268218

ENG communication is a serial communication line for real time application. It is a multiplex communication line with high data communication speed and excellent error detection ability. ECM and turbocharger boost control actuator are connected with two communication lines (ENG communication H-line and ENG communication L-line) and transmit/receive data. ECM shares information and links with the turbocharger boost control actuator during operation.

DTC Description

INFOID:0000000014268219

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
U1025	TC BOOST COMM LINE (Turbocharger communication line)	- ECM cannot receive ENG communication signal for approx. 1 second or more. - Turbocharger boost control actuator cannot receive ENG communication signal for 0.2 seconds or more.

POSSIBLE CAUSE

- Harness or connectors (ENG communication line is open or shorted.)
- Turbocharger boost control actuator
- ECM

FAIL-SAFE

ECM limits the amount control of fuel injected.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

- Turn ignition switch ON and wait at least 3 seconds.
- Check 1st trip DTC.

Is DTC detected?

YES >> Proceed to [EC-914, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268220

1.CHECK TC BOOST CONTROL ACTUATOR POWER SUPPLY-I

- Turn ignition switch OFF.
- Disconnect TC boost control actuator harness connector.
- Turn ignition switch ON.
- Check the voltage between TC boost control actuator harness connector terminals.

TC boost control actuator			Voltage
Connector	+	-	
	Terminal		
F80	1	2	Battery voltage

Is inspection result normal?

YES >> GO TO 5.

NO >> GO TO 2.

2.CHECK TC BOOST CONTROL ACTUATOR POWER SUPPLY-II

Check the voltage between TC boost control actuator harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

+		−	Voltage
TC boost control actuator			
Connector	Terminal		
F80	1	Ground	Battery voltage

Is inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK TC BOOST CONTROL ACTUATOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between TC boost control actuator harness connector and IPDM E/R harness connector.

+		-		Continuity
TC boost control actuator		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F80	1	E121	26	Existed

4. Also check the harness short to ground.

Is inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace the malfunctioning part.

4.CHECK TC BOOST CONTROL ACTUATOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between TC boost control actuator harness connector and ground.

+		-	Continuity
TC boost control actuator			
Connector	Terminal		
F80	2	Ground	Existed

Is inspection result normal?

YES >> Check intermittent incident. Refer to [EC-896. "Description"](#).

NO >> Repair or replace the malfunctioning part.

5.CHECK ECM COMMUNICATION CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between ECM harness connector and TC boost control actuator harness connector.

ECM		TC boost control actuator		Continuity
Connector	Terminal	Connector	Terminal	
E8	21	F80	3	Existed
	20		5	

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace the malfunctioning part.

6.REPLACE TC BOOST CONTROL ACTUATOR

U1025 ENG COMMUNICATION

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

1. Replace turbocharger assembly. Refer to [EM-167, "Removal and Installation"](#).
2. Perform confirmation procedure. Refer to [EC-914, "DTC Description"](#).

Is the DTC U1025 detected again?

- YES >> Replace ECM. Refer to [EC-1094, "Removal and Installation"](#).
NO >> INSPECTION END

P0016 CKP - CMP CORRELATION

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0016 CKP - CMP CORRELATION

DTC Description

INFOID:0000000014268221

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0016	CMP/CKP RELATION (Crankshaft position - camshaft position correlation bank 1 sensor A)	The correlation between crankshaft position sensor signal and camshaft position sensor signal is out of the normal range.

POSSIBLE CAUSE

- Camshaft position sensor
- Crankshaft position sensor
- Drive belts
- Signal plate

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0016 is displayed with DTC P0642, P0643, P0652 or P0653, first perform the trouble diagnosis for DTC P0642, P0643, P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869. "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 5 seconds.

NOTE:

If the engine does not start, keep ignition switch at START position for at least 5 seconds.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-917. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896. "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268222

1.CHECK DTC PRIORITY

If DTC P0016 is displayed with DTC P0642, P0643, P0652 or P0653, first perform the trouble diagnosis for DTC P0642, P0643, P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869. "DTC Index"](#).
NO >> GO TO 2.

2.CHECK CAMSHAFT POSITION SENSOR

Check camshaft position sensor. Refer to [EC-919. "Component Inspection \(Camshaft Position Sensor\)"](#).

Is the inspection result normal?

- YES >> GO TO 3.

P0016 CKP - CMP CORRELATION

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace camshaft position sensor. Refer to [EM-195, "Exploded View"](#).

3.CHECK CRANKSHAFT POSITION SENSOR

Check crankshaft position sensor. Refer to [EC-918, "Component Inspection \(Crankshaft Position Sensor\)"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace crankshaft position sensor. Refer to [EM-214, "Exploded View"](#).

4.CHECK TIMING CHAIN

Check timing chain. Refer to [EM-220, "Removal and Installation"](#) (Primary timing chain), or [EM-182, "Removal and Installation"](#) (Secondary timing chain).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace timing chain.

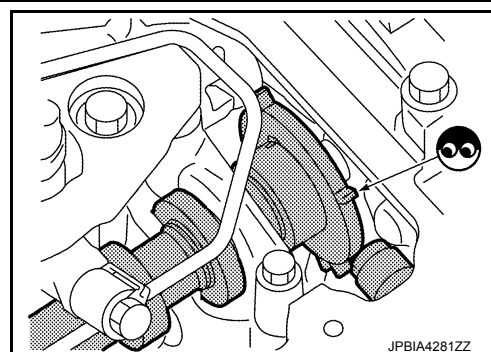
5.CHECK SIGNAL PLATE FOR CAMSHAFT POSITION SENSOR

Visually check for chipping signal plate gear tooth.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Remove debris and clean the signal plate or replace camshaft. Refer to [EM-195, "Removal and Installation"](#).



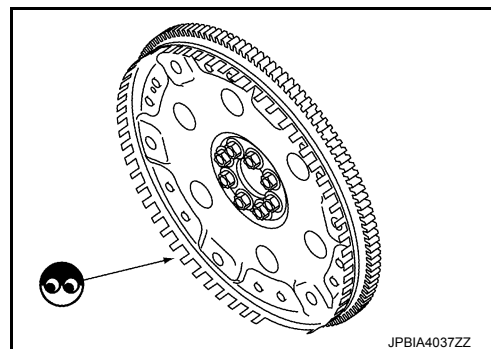
6.CHECK SIGNAL PLATE FOR CRANKSHAFT POSITION SENSOR

Visually check for chipping signal plate gear tooth.

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

NO >> Replace the drive plate. Refer to [EM-235, "Removal and Installation"](#).



Component Inspection (Crankshaft Position Sensor)

INFOID:0000000014268223

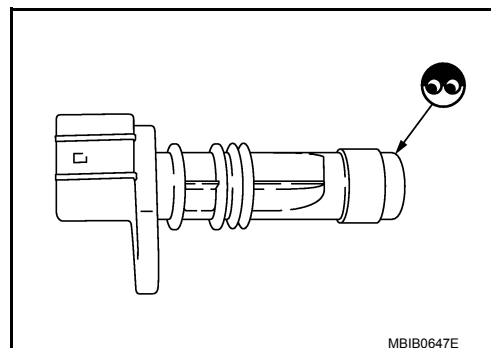
1.VISUALLY CHECK

1. Turn ignition switch OFF.
2. Loosen the fixing bolt of the sensor.
3. Disconnect crankshaft position sensor harness connector.
4. Remove the sensor. Refer to [EM-214, "Exploded View"](#).
5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace crankshaft position sensor.



P0016 CKP - CMP CORRELATION

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

2.CHECK RESISTANCE

Check resistance between crankshaft position sensor terminal.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) – 2 (–)	Except 0 or ∞
3 (+) – 1 (–)	
3 (+) – 2 (–)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace crankshaft position sensor. Refer to [EM-214, "Exploded View"](#).

Component Inspection (Camshaft Position Sensor)

INFOID:0000000014268224

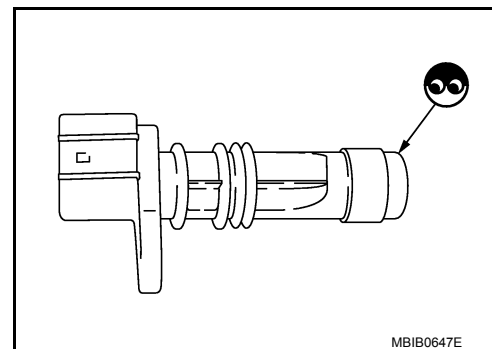
1.VISUALLY CHECK

1. Turn ignition switch OFF.
2. Loosen the fixing bolt of the sensor.
3. Disconnect camshaft position sensor harness connector.
4. Remove the sensor. Refer to [EM-195, "Exploded View"](#).
5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace camshaft position sensor. Refer to [EM-195, "Exploded View"](#).



2.CHECK RESISTANCE

Check the resistance between camshaft position sensor terminal as follows.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) – 2 (–)	Except 0 or ∞
3 (+) – 1 (–)	
3 (+) – 2 (–)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace camshaft position sensor. Refer to [EM-195, "Exploded View"](#).

P0088 FUEL SYSTEM

DTC Description

INFOID:0000000014268225

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0088	HIGH FUEL PRESS (Fuel rail/system pressure - too high)	Fuel pressure is too much higher than the specified value.

POSSIBLE CAUSE

- Fuel pump
- Fuel pump suction control valve
- Fuel injector
- Fuel rail pressure sensor
- Air mixed with fuel

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0088 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and warm it up to normal operating temperature.
2. Keep engine speed more than 2,000 rpm for at least 20 seconds.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-920, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268226

1.CHECK DTC PRIORITY

If DTC P0088 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.CHECK AIR MIXED WITH FUEL

Check the fuel filter condition. Refer to [FL-26, "Disassembly and Assembly"](#).

Is fuel filter maintenance according to the manual?

- YES >> Perform air-bleeding from fuel line. Refer to [FL-23, "Air Bleeding"](#). And then, GO TO 3.

< DTC/CIRCUIT DIAGNOSIS >

NO >> Maintenance fuel filter. Refer to [FL-26, "Disassembly and Assembly"](#).

3.PERFORM FUEL PUMP LEARNING VALUE CLEARING**NOTE:**

If the DTC is detected because of air mixed with fuel (i.e.: caused by lack of fuel), it may become normal by performing following procedure.

With CONSULT

1. Turn ignition switch ON.
2. Perform "Fuel Pump Learning Value Clearing". Refer to [EC-904, "Description"](#).
3. Start engine and let it idle for at least 60 seconds.
4. Select "SELF-DIAG RESULT" mode with CONSULT.
5. Touch "ERASE".
6. Perform DTC confirmation procedure, again. Refer to [EC-920, "DTC Description"](#).
7. Check DTC.

Without CONSULT

1. Turn ignition switch ON.
2. Perform Fuel Pump Learning Value Clearing. Refer to [EC-904, "Description"](#).
3. Start engine and let it idle for at least 60 seconds.
4. Erase the Diagnostic Test Mode II (Self-diagnostic results) memory.
5. Perform DTC confirmation procedure, again. Refer to [EC-920, "DTC Description"](#).
6. Check DTC.

Is 1st trip DTC displayed again?

YES >> GO TO 4.

NO >> **INSPECTION END**

4.CHECK FUEL RAIL PRESSURE SENSOR

Check fuel rail pressure sensor. Refer to [EC-921, "Component Inspection \(Fuel Rail Pressure Sensor\)"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

5.CHECK FUEL PUMP SUCTION CONTROL VALVE

Check fuel pump suction control valve. Refer to [EC-922, "Component Inspection \(Fuel Pump Suction Control Valve\)"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

6.CHECK FUEL INJECTOR

Check fuel injector. Refer to [EC-922, "Component Inspection \(Fuel Injector\)"](#).

Is the inspection result normal?

YES >> Replace fuel pump. Refer to [EM-188, "Removal and Installation"](#)

NO >> Replace fuel injector of malfunctioning cylinder. Refer to [EM-174, "Removal and Installation"](#).

Component Inspection (Fuel Rail Pressure Sensor)

INFOID:0000000014268227

1.CHECK FUEL RAIL PRESSURE SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connector disconnected.
3. Start engine and warm it up to normal operating temperature.
4. Check the voltage between ECM harness connector terminals as follows.

P0088 FUEL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

ECM			Condition	Voltage
Connector	+	-		
	Terminal	Terminal		
F54	115 (Fuel rail pressure sensor signal)	139	Idle	1.3 – 1.7 V
			2,000 rpm	1.7 – 2.0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

Component Inspection (Fuel Injector)

INFOID:0000000014268228

1. CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Disconnect fuel injector harness connector.
3. Check resistance between fuel injector terminals as follows.

Terminal	Resistance
1 and 2	0.2 – 0.8 Ω [at 10 – 60°C (50 – 140°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel injector. Refer to [EM-174, "Removal and Installation"](#).

Component Inspection (Fuel Pump Suction Control Valve)

INFOID:0000000014268229

1. CHECK FUEL PUMP SUCTION CONTROL VALVE

1. Turn ignition switch OFF.
2. Disconnect fuel pump suction control valve harness connector.
3. Check the resistance between fuel pump suction control valve terminals as follows.

Terminals	Resistance
1 and 2	1.8 – 2.4 Ω [at 20°C (68°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

P0089 FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0089 FUEL PUMP

DTC Description

INFOID:0000000014268230

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0089	FUEL PUMP (Fuel pressure regulator 1 performance)	Fuel pressure is too much higher than the target value.

POSSIBLE CAUSE

- Fuel pump
- Fuel pump suction control valve
- Air mixed with fuel
- Lack of fuel
- Fuel rail pressure sensor

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and warm it up to normal operating temperature.
2. Let engine idle for at least 30 seconds.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-923, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268231

1. CHECK AIR MIXED WITH FUEL

Check the fuel filter condition. Refer to [FL-26, "Disassembly and Assembly"](#).

Is fuel filter maintenance according to the manual?

- YES >> Perform air-bleeding from fuel line. Refer to [FL-23, "Air Bleeding"](#). And then, GO TO 2.
NO >> Maintenance fuel filter. Refer to [FL-26, "Disassembly and Assembly"](#).

2. PERFORM FUEL PUMP LEARNING VALUE CLEARING

NOTE:

If the DTC is detected because of air mixed with fuel (i.e.: caused by lack of fuel), it may become normal by performing following procedure.

With CONSULT

1. Turn ignition switch ON.
2. Perform "Fuel Pump Learning Value Clearing". Refer to [EC-904, "Description"](#).
3. Start engine and let it idle for at least 60 seconds.
4. Select "SELF-DIAG RESULT" mode with CONSULT.
5. Touch "ERASE".
6. Perform DTC confirmation procedure, again. Refer to [EC-923, "DTC Description"](#).

Without CONSULT

1. Turn ignition switch ON.

P0089 FUEL PUMP

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

2. Perform Fuel Pump Learning Value Clearing. Refer to [EC-904, "Description"](#).
3. Start engine and let it idle for at least 60 seconds.
4. Erase the Diagnostic Test Mode II (Self-diagnostic results) memory.
5. Perform DTC confirmation procedure, again. Refer to [EC-923, "DTC Description"](#).

Is 1st trip DTC displayed again?

YES >> GO TO 3.

NO >> **INSPECTION END**

3.CHECK FUEL RAIL PRESSURE SENSOR

Check fuel rail pressure sensor. Refer to [EC-924, "Component Inspection \(Fuel Rail Pressure Sensor\)"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

4.CHECK FUEL PUMP SUCTION CONTROL VALVE

Check fuel pump suction control valve. Refer to [EC-924, "Component Inspection \(Fuel Pump Suction Control Valve\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5.REPLACE SUCTION CONTROL VALVE OF FUEL PUMP

1. Replace suction control valve of fuel pump.
2. Perform fuel pump learning value clearing. Refer to [EC-904, "Description"](#).
3. Perform DTC confirmation procedure. Refer to [EC-923, "DTC Description"](#).

Is 1st DTC detected?

YES >> Replace fuel pump. Refer to [EM-188, "Removal and Installation"](#)

NO >> INSPECTION END

Component Inspection (Fuel Rail Pressure Sensor)

INFOID:0000000014268232

1.CHECK FUEL RAIL PRESSURE SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connector disconnected.
3. Start engine and warm it up to normal operating temperature.
4. Check the voltage between ECM harness connector terminals as follows.

ECM			Condition	Voltage
Connector	+	-		
	Terminal	Terminal		
F54	115 (Fuel rail pressure sensor signal)	139	Idle	1.3 – 1.7 V
			2,000 rpm	1.7 – 2.0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

Component Inspection (Fuel Pump Suction Control Valve)

INFOID:0000000014268233

1.CHECK FUEL PUMP SUCTION CONTROL VALVE

1. Turn ignition switch OFF.
2. Disconnect fuel pump suction control valve harness connector.
3. Check the resistance between fuel pump suction control valve terminals as follows.

Terminals	Resistance
1 and 2	1.8 – 2.4 Ω [at 20°C (68°F)]

P0089 FUEL PUMP

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

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P0093 FUEL SYSTEM

DTC Description

INFOID:0000000014268234

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0093	FUEL LEAK (Fuel system leak detected -large leak)	ECM detects a fuel system leak. (The relation between the output voltage to the fuel pump and input voltage from the fuel rail pressure sensor is out of the normal range.)

POSSIBLE CAUSE

- Fuel pump
- Fuel pump suction control valve
- Fuel rail
- Fuel pipe
- Fuel rail pressure relief valve
- Air mixed with fuel
- Lack of fuel

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).

DTC CONFIRMATION PROCEDURE

1. CHECK DTC PRIORITY

If DTC P0093 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2. PERFORM COMPONENT FUNCTION CHECK-I

Check the overall function of the fuel system.

WARNING:

- **Make sure that there is no fire hazard near the vehicle.**
- **Before performing the following procedure, cool down engine.**

NOTE:

Use this procedure to check the overall function of the fuel system. During this check, a 1st trip DTC might not be confirmed.

Open engine room cover and check if there are any signs of fuel leakage or not. Refer to [FL-22, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Proceed to [EC-927, "Diagnosis Procedure"](#).

3. PERFORM COMPONENT FUNCTION CHECK-II

Check oil level. Refer to [LU-24, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Proceed to [EC-927, "Diagnosis Procedure"](#).

4. PERFORM COMPONENT FUNCTION CHECK-III

Start engine and check fuel leakage in the engine room.

Is the inspection result normal?

- YES >> GO TO 5.
 NO >> Proceed to [EC-927, "Diagnosis Procedure"](#).

< DTC/CIRCUIT DIAGNOSIS >

5.PERFORM COMPONENT FUNCTION CHECK-IV**With CONSULT**

1. Select "ACT CR PRESS" in "DATA MONITOR" mode with CONSULT
2. Check the display of the idle speed.

Monitor item	Condition	Indication
ACT CR PRESS	Idle	25 – 35 MPa

Is the inspection result normal?

YES >> INSPECTION END

NO >> Proceed to [EC-927, "Diagnosis Procedure"](#).**Diagnosis Procedure**

INFOID:0000000014268235

1.CHECK DTC PRIORITY

If DTC P0093 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK AIR MIXED WITH FUEL

Check the fuel filter condition. Refer to [FL-26, "Disassembly and Assembly"](#).

Is fuel filter maintenance according to the manual?YES >> Perform air-bleeding from fuel line. Refer to [FL-23, "Air Bleeding"](#). And then, GO TO 3.NO >> Replace fuel filter. Refer to [FL-26, "Disassembly and Assembly"](#).**3.PERFORM FUEL PUMP LEARNING VALUE CLEARING****NOTE:**

If the DTC is detected because of air mixed with fuel (i.e.: caused by lack of fuel), it may become normal by performing following procedure.

With CONSULT

1. Turn ignition switch ON.
2. Perform Fuel Pump Learning Value Clearing. Refer to [EC-904, "Description"](#).
3. Start engine and let it idle for at least 60 seconds.
4. Select "SELF-DIAG RESULT" mode with CONSULT.
5. Touch "ERASE".
6. Perform Component Function Check again. Refer to [EC-926, "DTC Description"](#).

Without CONSULT

1. Turn ignition switch ON.
2. Perform Fuel Pump Learning Value Clearing. Refer to [EC-904, "Description"](#).
3. Start engine and let it idle for at least 60 seconds.
4. Erase the Diagnostic Test Mode II (Self-diagnostic results) memory.
5. Perform Component Function Check again. Refer to [EC-926, "DTC Description"](#).

Is DTC displayed again?

YES >> GO TO 4.

NO >> **INSPECTION END****4.CHECK FUEL LINE FOR LEAK**

1. Start engine.
2. Visually check the following for fuel leak.
 - Fuel tube from fuel pump to fuel rail
 - Fuel rail
 - Fuel tube from fuel rail to fuel injector
3. Also check for improper connection or pinches.

Is the inspection result normal?

YES >> GO TO 5.

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair malfunctioning part.

5. CHECK FUEL RAIL PRESSURE RELIEF VALVE

Check fuel rail pressure relief valve. Refer to [EC-928, "Component Inspection \(Fuel Rail Pressure Relief Valve\)"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

6. REPLACE SUCTION CONTROL VALVE OF FUEL PUMP

1. Replace suction control valve of fuel pump.
2. Perform fuel pump learning value clearing. Refer to [EC-904, "Description"](#).
3. Perform DTC confirmation procedure. Refer to [EC-926, "DTC Description"](#).

Is 1st DTC detected?

YES >> Replace fuel pump. Refer to [EM-188, "Removal and Installation"](#).

NO >> INSPECTION END

Component Inspection (Fuel Rail Pressure Relief Valve)

INFOID:0000000014268236

WARNING:

- Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- Prepare pans or saucers under the disconnected fuel line because the fuel may spill out.

1. CHECK FUEL RAIL PRESSURE RELIEF VALVE

With CONSULT

1. Turn ignition switch OFF.
2. Remove fuel hose from fuel rail pressure relief valve ①.
3. Attach a hose clip (A) or a blind cap to removed hose.
4. Turn ignition switch ON.
5. Select "PRES REGULATOR" in "ACTIVE TEST MODE" with CONSULT.
6. Start engine and keep engine speed 2,000 rpm.
7. Raise fuel pressure to 180 MPa with touching "UP" or "Qu" on the CONSULT screen.
8. Confirm that the fuel does not come out from the fuel rail pressure relief valve.

WARNING:

- Be careful not to allow leaked fuel to contaminate engine compartment. Especially, ensure to keep engine mount insulator clear of fuel.
- If the fuel comes out, stop the engine immediately.

Without CONSULT

1. Turn ignition switch OFF.
2. Remove fuel hose from fuel rail pressure relief valve ①.
3. Attach a hose clip (A) or a blind cap to removed hose.
4. Start engine and keep engine speed more than 4,000 rpm for at least 5 seconds.
5. Confirm that the fuel does not come out from the fuel rail pressure relief valve.

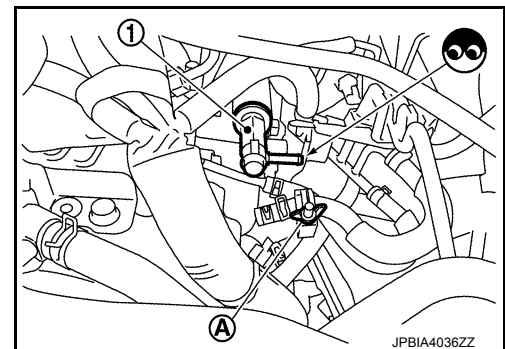
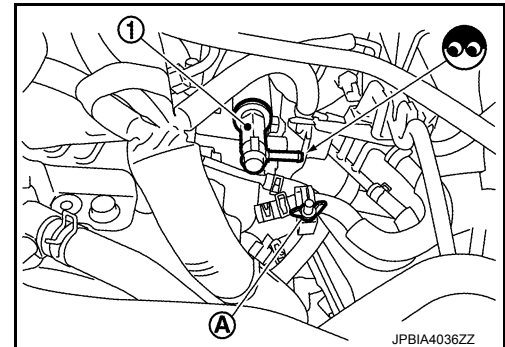
WARNING:

- Be careful not to allow leaked fuel to contaminate engine compartment. Especially, ensure to keep engine mount insulator clear of fuel.
- If the fuel comes out, stop the engine immediately.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).



P0097, P0098 IAT SENSOR 2

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0097, P0098 IAT SENSOR 2

DTC Description

INFOID:0000000014268237

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0097	IAT SENSOR 2 B1 (Intake air temperature sensor 2 circuit low)	Signal voltage from IAT sensor 2 remains 0.1V or less for 2 seconds or more
P0098	IAT SENSOR 2 B1 (Intake air temperature sensor 2 circuit high)	Signal voltage from IAT sensor 2 remains 4.95V or more for 2 seconds or more

POSSIBLE CAUSE

- Harness or connectors (IAT sensor 2 circuit is open or shorted.)
- IAT sensor 2

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and let it idle for 10 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-929, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268238

1. CHECK IAT SENSOR 2 POWER SUPPLY-I

1. Turn ignition switch OFF.
2. Disconnect IAT sensor 2 connector.
3. Turn ignition switch ON.
4. Check the voltage between IAT sensor 2 harness connector terminals.

IAT sensor 2			Voltage (Approx.)
Connector	+	–	
	terminal		
F62	1	2	5 V

Inspection result normal?

- YES >> GO TO 6.
NO >> GO TO 2.

2. CHECK IAT SENSOR 2 POWER SUPPLY-II

Check the voltage between IAT sensor 2 harness connector and ground.

P0097, P0098 IAT SENSOR 2

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

+		-	Voltage (Approx.)
IAT sensor 2			
Connector	Terminal		
F62	1	Ground	5 V

Is inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK IAT SENSOR 2 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between IAT sensor 2 harness connector and ECM harness connector.

+		-		Continuity
IAT sensor 2		ECM		
Connector	Terminal	Connector	Terminal	
F62	1	E8	10	Existed

4. Also check harness for short to ground.

Is inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace the malfunctioning part.

4.CHECK IAT SENSOR 2 GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between IAT sensor 2 harness connector and ECM harness connector.

+		-		Continuity
IAT sensor 2		ECM		
Connector	Terminal	Connector	Terminal	
F62	2	F54	97	Existed

Is inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace the malfunctioning part.

5.CHECK ECM GROUND CIRCUIT

Check the continuity between ECM harness connector and ground.

+		-	Continuity
ECM			
Connector	Terminal		
E8	58	Ground	Existed
	57		
	56		
	55		
	41		

Is inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace the malfunctioning part.

P0097, P0098 IAT SENSOR 2

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

6.CHECK IAT SENSOR 2

Refer to [EC-931. "Component Inspection \(IAT sensor 2\)"](#).

Is inspection result normal?

YES >> INSPECTION END

NO >> Replace IAT sensor 2. Refer to [EM-160. "Exploded View"](#).

Component Inspection (IAT sensor 2)

INFOID:0000000014268239

1.CHECK IAT SENSOR 2

1. Turn ignition switch OFF.
2. Disconnect IAT sensor 2 harness connector.
3. Check the resistance between IAT sensor 2 connector terminals.

+	−	Condition	Resistance (kΩ)
IAT sensor 2			
Terminal			
1	2	Temperature: 25°C (77°F)	2.00 – 2.13
		Temperature: 80°C (176°F)	0.312 – 0.346

Is the inspection result normal?

YES >> INSPECTION END.

NO >> Replace IAT sensor 2. Refer to [EM-160. "Exploded View"](#).

P0102, P0103 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0102, P0103 MAF SENSOR

DTC Description

INFOID:0000000014268240

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0102	MAF SEN/CIRCUIT (Mass or volume air flow“A” circuit low)	An excessively low voltage from the sensor is sent to ECM.
P0103	MAF SEN/CIRCUIT (Mass or volume air flow“A” circuit high)	An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (The sensor circuit is open or shorted.)
- Mass air flow sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-932, "Diagnosis Procedure"](#).

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-II

1. Start engine and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-932, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268241

1.CHECK MAF SENSOR POWER SUPPLY CIRCUIT

1. Disconnect mass air flow (MAF) sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between MAF sensor harness connector and ground.

MAF sensor		Ground	Voltage
Connector	Terminal		
F64	5	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2.CHECK MAF SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

P0102, P0103 MAF SENSOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between MAF sensor harness connector and ECM harness connector.

MAF sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F64	4	E8	43	Existed

4. Also check harness for short to ground and short power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK MASS AIR FLOW SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between MAF sensor harness connector and ECM harness connector.

MAF sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F64	3	E8	30	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK MASS AIR FLOW SENSOR

Check mass air flow sensor. Refer to [EC-933, "Component Inspection \(Mass Air Flow Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor. Refer to [EM-156, "Removal and Installation"](#)

Component Inspection (Mass Air Flow Sensor)

INFOID:0000000014268242

1.CHECK MASS AIR FLOW SENSOR

With CONSULT

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Start engine and warm it up to normal operating temperature.
4. Connect CONSULT and select "DATA MONITOR" mode.
5. Select "MAS AIR/FL SE" and check indication under the following conditions.

Data monitor item	Condition	Voltage
MAS AIR/FL SE	Ignition switch ON (Engine stopped.)	Approx. 0.4 V
	Idle (Engine is warmed-up to normal operating temperature.)	1.1 – 2.1 V
	Idle to about 4,000 rpm	1.1 – 2.1 V to Approx. 4.0 V*

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

Without CONSULT

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Start engine and warm it up to normal operating temperature.
4. Check the voltage between ECM harness connector terminals as per the following conditions.

P0102, P0103 MAF SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

(+)		(-)		Condition	Voltage
Connector	Terminal	Connector	Terminal		
E8	30 (MAF sensor signal)	E8	43	Ignition switch ON (Engine stopped.)	Approx. 0.4 V
				Idle (Engine is warmed-up to normal operating temperature.)	1.1 – 2.1 V
				Idle to about 4,000 rpm	1.1 – 2.1 V to Approx. 4.0 V*

*: Check for linear voltage rise in response to engine being increased to about 4,000 rpm.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor. Refer to [EM-156, "Removal and Installation"](#).

P0112, P0113 IAT SENSOR1

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0112, P0113 IAT SENSOR1

DTC Description

INFOID:0000000014268243

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0112	IAT SEN/CIRCUIT (Intake air temperature sensor 1 circuit low bank 1)	An excessively low voltage from the sensor is sent to ECM.
P0113	IAT SEN/CIRCUIT (Intake air temperature sensor 1 circuit high bank 1)	An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (The sensor circuit is open or shorted.)
- Intake air temperature sensor 1

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-935, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268244

1.CHECK INTAKE AIR TEMPERATURE SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect mass air flow sensor (intake air temperature sensor 1 is built-into) harness connector.
2. Turn ignition switch ON.
3. Check the voltage between mass air flow sensor harness connector and ground.

MAF sensor		Ground	Voltage
Connector	Terminal		
F64	2	Ground	Approx. 5 V

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair open circuit or short to ground or short to power in harness to connectors.

2.CHECK INTAKE AIR TEMPERATURE SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between mass air flow sensor harness connector and ECM harness connector.

P0112, P0113 IAT SENSOR1

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

MAF sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F64	1	F54	141	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness to connectors.

3.CHECK INTAKE AIR TEMPERATURE SENSOR 1

Refer to [EC-936. "Component Inspection \(Intake Air Temperature Sensor 1\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (with intake air temperature sensor 1). Refer to [EM-156. "Removal and Installation"](#).

Component Inspection (Intake Air Temperature Sensor 1)

INFOID:0000000014268245

1.CHECK INTAKE AIR TEMPERATURE SENSOR 1

1. Turn ignition switch OFF.
2. Disconnect mass air flow sensor harness connector.
3. Check resistance between mass air flow sensor terminals as follows.

Terminals	Condition		Resistance
1 and 2	Temperature	25°C (77°F)	2.003 – 2.127 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace mass air flow sensor (with intake air temperature sensor 1). Refer to [EM-156. "Removal and Installation"](#).

P0117, P0118 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0117, P0118 ECT SENSOR

DTC Description

INFOID:0000000014268246

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0117	ECT SEN/CIRCUIT (Engine coolant temperature sensor 1 circuit low)	An excessively low voltage from the sensor is sent to ECM.
P0118	ECT SEN/CIRCUIT (Engine coolant temperature sensor 1 circuit high)	An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (The sensor circuit is open or shorted.)
- Engine coolant temperature sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-937, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268247

1.CHECK ENGINE COOLANT TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect engine coolant temperature sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between engine coolant temperature sensor harness connector and ground.

Engine coolant temperature sensor		Ground	Voltage
Connector	Terminal		
F202	1	Ground	Approx. 5 V

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2.CHECK ENGINE COOLANT TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between engine coolant temperature sensor harness connector and ECM harness connector.

P0117, P0118 ECT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Engine coolant temperature sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F202	2	F54	140	Existed

4. Also check harness for short to ground and power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Check engine coolant temperature sensor. Refer to [EC-938. "Component Inspection \(Engine Coolant Temperature Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor. Refer to [EM-203. "Exploded View"](#).

Component Inspection (Engine Coolant Temperature Sensor)

INFOID:0000000014268248

1.CHECK ENGINE COOLANT TEMPERATURE SENSOR

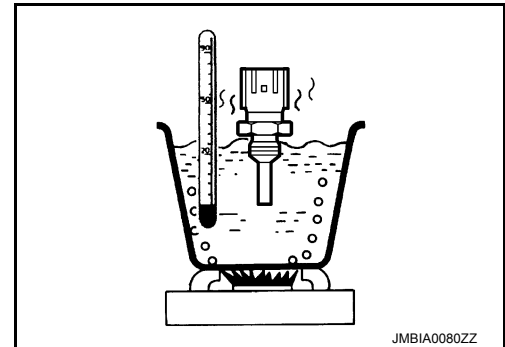
1. Turn ignition switch OFF.
2. Disconnect engine coolant temperature sensor harness connector.
3. Remove engine coolant temperature sensor.
4. Check resistance between engine coolant temperature sensor terminals by heating with hot water as shown in the figure.

Terminals	Condition		Resistance (k Ω)
1 and 2	Temperature [$^{\circ}$ C ($^{\circ}$ F)]	20 (68)	2.35 – 2.73
		50 (122)	0.68 – 1.00
		90 (194)	0.236 – 0.260

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace engine coolant temperature sensor. Refer to [EM-203. "Exploded View"](#).



P0122, P0123 APP SENSOR

DTC Description

INFOID:0000000014268249

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0122	APP SEN 1/CIRCUIT (Throttle/pedal position sensor/switch "A" circuit low)	An excessively low voltage from the APP sensor 1 is sent to ECM.
P0123	APP SEN 1/CIRCUIT (Throttle/pedal position sensor/switch "A" circuit high)	An excessively high voltage from the APP sensor 1 is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (The APP sensor 1 circuit is open or shorted.)
- Accelerator pedal position sensor (Accelerator pedal position sensor 1)

FAIL-SAFE

ECM recognizes the accelerator pedal position for 10% and controls fuel injected.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0122 or P0123 is displayed with DTC P0652 or P0653, first perform the trouble diagnosis for DTC P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-939, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268250

1.CHECK DTC PRIORITY

If DTC P0122 or P0123 is displayed with DTC P0652 or P0653, first perform the trouble diagnosis for DTC P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.CHECK APP SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between APP sensor harness connector and ground.

P0122, P0123 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

APP sensor		Ground	Voltage
Connector	Terminal		
E5	2	Ground	Approx. 5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK APP SENSOR 1 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E5	4	E8	47	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK APP SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E5	3	E8	48	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK APP SENSOR

Check accelerator pedal assembly. Refer to [EC-940, "Component Inspection \(Accelerator Pedal Position Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3, "Removal and Installation"](#).

Component Inspection (Accelerator Pedal Position Sensor)

INFOID:0000000014268251

1.CHECK ACCELERATOR PEDAL POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Check the voltage between ECM harness connector.

P0122, P0123 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

(+)		(−)		Condition		Voltage
Connector	Terminal	Connector	Terminal			
E8	48 (APP sensor 1 signal)	E8	47	Accelerator pedal	Fully released	0.65 – 0.87 V
					Fully depressed	More than 4.3 V
	35 (APP sensor 2 signal)		34	Accelerator pedal	Fully released	0.28 – 0.48 V
					Fully depressed	More than 2.0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3, "Removal and Installation"](#).

P012B INTAKE AIR SYSTEM

DTC Description

INFOID:0000000014268252

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P012B	TC INLET PRESSURE SEN (Turbocharger/Supercharger inlet pressure sensor circuit range/performance)	When the difference between actual boost pressure and target boost pressure is more than a diagnosis threshold.

POSSIBLE CAUSE

- Turbocharger
- Turbocharger boost sensor
- Intake air leaks
- Charge air cooler

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM stops the EGR volume control valve control (fully closed position).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and drive the vehicle under the following condition for at least 10 seconds.

CAUTION:

Always drive at a safe speed.

Vehicle speed	60 km/h (38 MPH)
Selector lever	D position (A/T) or 2nd position (M/T)

2. Stop the vehicle and check DTC.

Is DTC detected?

YES >> Proceed to [EC-942, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268253

1. CHECK INTAKE AIR SYSTEM

1. Check air cleaner for clogging.
2. Check the air duct for connection and cracks.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace error-detected parts.

2. CHECK FOR CHARGE AIR LEAK

1. Start the engine and let it idle.
2. Listen for an charge air leak.

Is intake air leak detected?

YES >> Repair or replace error-detected parts.

NO >> GO TO 3.

P012B INTAKE AIR SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

3.CHECK TURBOCHARGER

Check if foreign matter is caught between the turbocharger. Refer to [EM-167. "Removal and Installation"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Remove the foreign matter and clean the turbocharger. Refer to [EM-167. "Removal and Installation"](#).

4.CHECK INSTALLATION CONDITION OF TURBOCHARGER BOOST SENSOR

Check the installation condition of turbocharger boost sensor. Refer to [EM-158. "Exploded View"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Install turbocharger boost sensor definitely.

5.CHECK TURBOCHARGER BOOST SENSOR

Check turbocharger boost sensor. Refer to [EC-943. "Component Inspection \(Turbocharger Boost Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace turbocharger boost sensor. Refer to [EM-158. "Exploded View"](#).

Component Inspection (Turbocharger Boost Sensor)

INFOID:0000000014268254

1.CHECK TURBOCHARGER BOOST SENSOR

1. Turn ignition switch OFF.
2. Reconnect harness connectors disconnected.
3. Remove turbocharger boost sensor with its harness connected.
4. Use pump to apply pressure to sensor.

NOTE:

- Always calibrate the pressure pump gauge when using it.
- Inspection should be done at room temperature [10 – 30°C (50 - 86°F)].

5. Check the voltage between ECM harness connector.

ECM			Condition (pressure gauge)	Voltage
Connector	+	-		
	Terminal	Terminal		
F54	94	100	0 kPa (0 mbar, 0 mmHg, 0 inHg)	Approx. 2.1 V
	(Turbocharger boost sensor signal)		40 kPa (400 mbar, 300 mmHg, 11.81 inHg)	Approx. 2.7 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace turbocharger boost sensor. Refer to [EM-158. "Exploded View"](#).

P0182, P0183 FUEL TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0182, P0183 FUEL TEMPERATURE SENSOR

DTC Description

INFOID:0000000014268255

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0182	FUEL TEMP SEN/CIRC (Fuel temperature sensor "A" circuit low)	An excessively low voltage from the sensor is sent to ECM.
P0183	FUEL TEMP SEN/CIRC (Fuel temperature sensor "A" circuit high)	An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (The sensor circuit is open or shorted.)
- Fuel temperature sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-I

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-944, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268256

1. CHECK FUEL TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect fuel temperature sensor harness connector.
2. Turn ignition switch ON.
3. Check voltage between fuel temperature sensor harness connector and ground.

Fuel temperature sensor		Ground	Voltage
Connector	Terminal		
F72	1	Ground	Approx. 5 V

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2. CHECK FUEL TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between fuel temperature sensor harness connector and ECM harness connector.

P0182, P0183 FUEL TEMPERATURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Fuel temperature sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F72	2	F54	148	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Replace fuel pump. Refer to [EM-188. "Removal and Installation"](#).

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

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P018C FUEL FILTER PRESSURE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P018C FUEL FILTER PRESSURE SWITCH

DTC Logic

INFOID:0000000014268257

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P018C	Fuel Pressure Sensor "B" Circuit Low (Fuel pressure sensor B circuit low)	An excessively low voltage from the fuel filter pressure switch is sent to ECM for the specified time.

POSSIBLE CAUSE

- Harness or connectors (Fuel filter pressure switch circuit is open or shorted.)
- Fuel filter pressure switch

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-946. "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000014268258

1.CHECK FUEL FILTER PRESSURE SWITCH POWER SUPPLY

1. Disconnect fuel filter pressure switch harness connector.
2. Turn ignition switch ON.
3. Check the voltage between fuel filter pressure switch harness connector and ground.

+		-	Voltage (Approx.)
Fuel filter pressure switch			
Connector	Terminal		
E162	1	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Repair or replace error-detected parts.

2.CHECK FUEL FILTER PRESSURE SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between fuel filter pressure switch harness connector and ECM harness connector.

P018C FUEL FILTER PRESSURE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

+		-		Continuity
Fuel filter pressure switch		ECM		
Connector	Terminal	Connector	Terminal	
E162	2	F54	149	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK FUEL FILTER PRESSURE SWITCH INPUT SIGNAL CIRCUIT

1. Check the continuity between fuel filter pressure switch harness connector and ECM harness connector.

+		-		Continuity
Fuel filter pressure switch		ECM		
Connector	Terminal	Connector	Terminal	
E162	1	F54	126	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK FUEL FILTER PRESSURE SWITCH

Check the fuel filter pressure switch. Refer to [EC-947, "Component Inspection"](#).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

NO >> Replace fuel filter pressure switch. Refer to [EC-810, "Component Parts Location"](#).

Component Inspection

INFOID:000000014268259

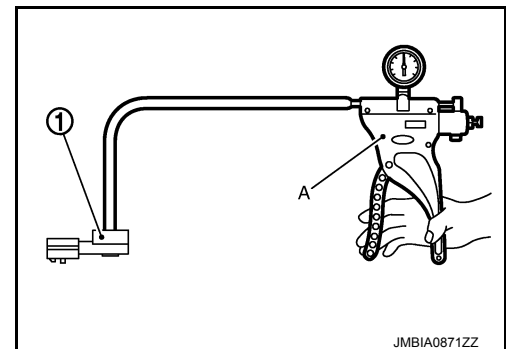
1.CHECK FUEL FILTER PRESSURE SWITCH

1. Turn ignition switch OFF.
2. Remove fuel filter pressure switch with its harness connector.
3. Install pressure pump (A) to fuel filter pressure switch ①.

CAUTION:

When insert a pressure pump hose to the sensor, be careful to the damage of the sensor housing.

4. Check the resistance between fuel filter pressure switch harness connector terminals as per the following conditions.



NOTE:

- Always calibrate the pressure pump gauge when using it.
- Inspection should be done at room temperature [10 - 30°C (50 - 86°F)].

P018C FUEL FILTER PRESSURE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Fuel filter pressure switch		Condition [Pressure (Relative to atmospheric pressure)]	Resistance
+	–		
Terminal			
1	2	Less than 21.6 kPa (216 mbar, 162 mmHg, 6.37 inHg)	1,100 Ω
		More than 31.6 kPa (316 mbar, 237 mmHg, 9.34 inHg)	1,611 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel filter pressure switch. Refer to [EC-810, "Component Parts Location"](#).

P018D FUEL FILTER PRESSURE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P018D FUEL FILTER PRESSURE SWITCH

DTC Logic

INFOID:0000000014268260

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P018D	Fuel Pressure Sensor "B" Circuit High (Fuel pressure sensor B circuit high)	An excessively high voltage from the fuel filter pressure switch is sent to ECM for the specified time.

POSSIBLE CAUSE

- Harness or connectors (Fuel filter pressure switch circuit is open or shorted.)
- Fuel filter pressure switch

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If DTC Confirmation Procedure has been previously conducted, always perform the following procedure before conducting the next test.

1. Turn ignition switch OFF and wait at least 10 seconds.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-946. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000014268261

1.CHECK FUEL FILTER PRESSURE SWITCH POWER SUPPLY

1. Disconnect fuel filter pressure switch harness connector.
2. Turn ignition switch ON.
3. Check the voltage between fuel filter pressure switch harness connector and ground.

+		-	Voltage (Approx.)
Fuel filter pressure switch			
Connector	Terminal		
E162	1	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace error-detected parts.

2.CHECK FUEL FILTER PRESSURE SWITCH GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between fuel filter pressure switch harness connector and ECM harness connector.

P018D FUEL FILTER PRESSURE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

+		-		Continuity
Fuel filter pressure switch		ECM		
Connector	Terminal	Connector	Terminal	
E162	2	F54	149	Existed

4. Also check harness for short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace error-detected parts.

3.CHECK FUEL FILTER PRESSURE SWITCH INPUT SIGNAL CIRCUIT

1. Check the continuity between fuel filter pressure switch harness connector and ECM harness connector.

+		-		Continuity
Fuel filter pressure switch		ECM		
Connector	Terminal	Connector	Terminal	
E162	1	F54	126	Existed

2. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace error-detected parts.

4.CHECK FUEL FILTER PRESSURE SWITCH

Check the fuel filter pressure switch. Refer to [EC-950, "Component Inspection"](#).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

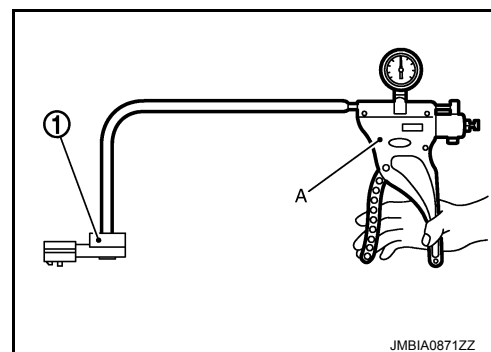
NO >> Replace fuel filter pressure switch. Refer to [EC-810, "Component Parts Location"](#).

Component Inspection

INFOID:0000000014268262

1.CHECK FUEL FILTER PRESSURE SWITCH

1. Turn ignition switch OFF.
2. Remove fuel filter pressure switch with its harness connector.
3. Install pressure pump (A) to fuel filter pressure switch ①.
CAUTION:
When insert a pressure pump hose to the sensor, be careful to the damage of the sensor housing.
4. Check the resistance between fuel filter pressure switch harness connector terminals as per the following conditions.



NOTE:

- Always calibrate the pressure pump gauge when using it.
- Inspection should be done at room temperature [10 - 30°C (50 - 86°F)].

P018D FUEL FILTER PRESSURE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Fuel filter pressure switch		Condition [Pressure (Relative to atmospheric pressure)]	Resistance
+	–		
Terminal			
1	2	Less than 21.6 kPa (216 mbar, 162 mmHg, 6.37 inHg)	1,100 Ω
		More than 31.6 kPa (316 mbar, 237 mmHg, 9.34 inHg)	1,611 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel filter pressure switch. Refer to [EC-810. "Component Parts Location"](#).

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P

P0192, P0193 FRP SENSOR

DTC Description

INFOID:0000000014268263

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0192	FRP SEN/CIRC (Fuel rail pressure sensor "A" circuit low)	An excessively low voltage from the sensor is sent to ECM.
P0193	FRP SEN/CIRC (Fuel rail pressure sensor "A" circuit high)	An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (The sensor circuit is open or shorted.)
- Fuel rail pressure sensor

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).
- ECM limits fuel rail pressure control (lower limit).

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0192 or P0193 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-I

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-952, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268264

1.CHECK DTC PRIORITY

If DTC P0192 or P0193 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.CHECK FUEL RAIL PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Disconnect fuel rail pressure sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between fuel rail pressure sensor connector and ground.

P0192, P0193 FRP SENSOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

Fuel rail pressure sensor		Ground	Voltage
Connector	Terminal		
F81	1	Ground	Approx. 5V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK FUEL RAIL PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between fuel rail pressure sensor harness connector and ECM harness connector.

Fuel rail pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F81	3	F54	139	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK FUEL RAIL PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between fuel rail pressure sensor harness connector and ECM harness connector.

Fuel rail pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F81	2	F54	115	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK FUEL RAIL PRESSURE SENSOR

Check fuel rail pressure sensor. Refer to [EC-921. "Component Inspection \(Fuel Rail Pressure Sensor\)".](#)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel rail. Refer to [EM-174. "Exploded View"](#)

Component Inspection (Fuel Rail Pressure Sensor)

INFOID:0000000014268265

1.CHECK FUEL RAIL PRESSURE SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connector disconnected.
3. Start engine and warm it up to normal operating temperature.
4. Check the voltage between ECM harness connector terminals as follows.

ECM			Condition	Voltage
Connector	+	-		
	Terminal		Terminal	
F54	115 (Fuel rail pressure sensor signal)		139	Idle 1.3 – 1.7 V
				2,000 rpm 1.7 – 2.0 V

Is the inspection result normal?

P0192, P0193 FRP SENSOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

YES >> INSPECTION END

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

P0200 FUEL INJECTOR

Description

INFOID:0000000014268266

The fuel injector is a small, precise solenoid valve. When the ECM supplies a ground to the fuel injector circuit, the coil in the fuel injector is energized. The energized coil pulls the needle valve back and allows fuel to flow through the fuel injector into the cylinder. The amount of fuel injected depends upon the injection pulse duration. Pulse duration is the length of time the fuel injector remains open. The ECM controls the injection pulse duration based on engine fuel needs.

DTC Description

INFOID:0000000014268267

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0200	INJECTOR (Injector circuit/open)	ECM detects a voltage of internal power source circuit for the fuel injector is excessively high or low.

POSSIBLE CAUSE

ECM

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).
- ECM limits fuel rail pressure control (lower limit).
- ECM limits the fuel injected pattern.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

TESTING CONDITION

Confirm the ambient temperature is more than -20°C (-4°F).

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-955, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268268

1. INSPECTION START

1. Turn ignition switch ON.
2. Erase self diag results of ECM.
3. Perform DTC confirmation procedure, again.

Is DTC P0200 displayed again?

YES >> Replace ECM. [EC-1094, "Removal and Installation"](#).

NO >> **INSPECTION END**

P0201, P0202, P0203, P0204 FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0201, P0202, P0203, P0204 FUEL INJECTOR

DTC Description

INFOID:0000000014268269

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0201	CYL1 INJECTOR (Injector circuit/open - cylinder 1)	An improper voltage signal is sent to ECM through No. 1 cylinder fuel injector.
P0202	CYL2 INJECTOR (Injector circuit/open - cylinder 2)	An improper voltage signal is sent to ECM through No. 2 cylinder fuel injector.
P0203	CYL3 INJECTOR (Injector circuit/open - cylinder 3)	An improper voltage signal is sent to ECM through No. 3 cylinder fuel injector.
P0204	CYL4 INJECTOR (Injector circuit/open - cylinder 4)	An improper voltage signal is sent to ECM through No. 4 cylinder fuel injector.

POSSIBLE CAUSE

- Harness or connectors (The fuel injector circuit is open.)
- Fuel injector

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

TESTING CONDITION

Ambient temperature is more than -20°C (-4°F).

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-956, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268270

Perform the trouble diagnosis for fuel injector circuit. Refer to [EC-1069, "Diagnosis Procedure"](#).

P0217 ENGINE OVER TEMPERATURE

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0217 ENGINE OVER TEMPERATURE

DTC Description

INFOID:0000000014268271

DTC DETECTION LOGIC

If the cooling fan or another component in the cooling system malfunctions, engine coolant temperature will rise.

When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0217	ENG OVER TEMP (Engine coolant over temperature condition)	- Cooling fan (crankshaft driven) does not operate properly (Overheat). - Cooling fan system does not operate properly (Overheat). - Engine coolant was not added to the system using the proper filling method. - Engine coolant is not within the specified range.

CAUTION:

When a malfunction is indicated, be sure to replace the coolant. Refer to [CO-36, "Changing Engine Coolant"](#). Also, replace the engine oil. Refer to [LU-25, "Changing Engine Oil"](#).

POSSIBLE CAUSE

- Cooling fan
- Fan coupling
- Radiator hose
- Radiator
- Reservoir tank cap (main or sub)
- Reservoir tank (main or sub)
- Water pump
- Thermostat

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM COMPONENT FUNCTION CHECK-I

WARNING:

Never remove a reservoir tank cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator.

Wrap a thick cloth around cap. Carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then turn the cap all the way off.

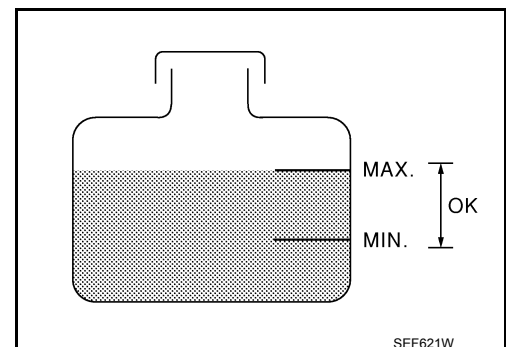
NOTE:

Use component function check to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

Check the coolant level in the sub reservoir tank.
Allow engine to cool before checking coolant level.

Is the coolant level in the sub reservoir tank below the proper range?

- YES >> Proceed to [EC-958, "Diagnosis Procedure"](#).
NO >> GO TO 2.



2.PERFORM COMPONENT FUNCTION CHECK-II

Confirm whether customer filled the coolant or not.

P0217 ENGINE OVER TEMPERATURE

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

Did customer fill the coolant?

- YES >> Proceed to [EC-958, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268272

1.CHECK COOLING FAN OPERATION

Start engine and check cooling fan operation.

Dose cooling fan operation normal?

- YES >> GO TO 2.
NO >> Check cooling fan. Refer to [CO-45, "Inspection"](#).

2.CHECK COOLING SYSTEM FOR LEAK-I

Check cooling system for leak. Refer to [CO-35, "System Inspection"](#).

Is leakage detected?

- YES >> GO TO 3.
NO >> GO TO 4.

3.CHECK COOLING SYSTEM FOR LEAK-II

Check the following for leak.

- Hose
- Radiator
- Reservoir tank cap (main or sub)
- Water pump
- Reservoir tank (main or sub)

>> Repair or replace malfunctioning part.

4.CHECK MAIN RESERVOIR TANK CAP

Check main reservoir tank cap. Refer to [CO-35, "System Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Replace main reservoir tank cap.

5.CHECK THERMOSTAT

Check thermostat. Refer to [CO-50, "Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Replace thermostat. Refer to [CO-49, "Removal and Installation"](#).

6.CHECK ENGINE COOLANT TEMPERATURE SENSOR

Check engine coolant temperature sensor. Refer to [EC-938, "Component Inspection \(Engine Coolant Temperature Sensor\)"](#).

Is the inspection result normal?

- YES >> Perform overheating cause analysis. Refer to [CO-33, "Troubleshooting Chart"](#).
NO >> Replace engine coolant temperature sensor. Refer to [EM-203, "Exploded View"](#).

P0222, P0223 APP SENSOR

DTC Description

INFOID:0000000014268273

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0222	APP SEN 2/CIRCUIT (Throttle/pedal position sensor/switch "B" circuit low)	An excessively low voltage from the APP sensor 2 is sent to ECM.
P0223	APP SEN 2/CIRCUIT (Throttle/pedal position sensor/switch "B" circuit high)	An excessively high voltage from the APP sensor 2 is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (The APP sensor 2 circuit is open or shorted.)
- Accelerator pedal position sensor (Accelerator pedal position sensor 2)

FAIL-SAFE

ECM recognizes the accelerator pedal position for 10% and controls fuel injected.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0222 or P0223 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-959, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268274

1.CHECK DTC PRIORITY

If DTC P0222 or P0223 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.CHECK APP SENSOR 2 POWER SUPPLY CIRCUIT

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between APP sensor and ground.

P0222, P0223 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

APP sensor		Ground	Voltage
Connector	Terminal		
E5	1	Ground	Approx. 5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK APP SENSOR 2 GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E5	5	E8	34	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK APP SENSOR 2 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E5	6	E8	35	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK APP SENSOR

Check APP sensor. Refer to [EC-960. "Component Inspection \(Accelerator Pedal Position Sensor\)".](#)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3. "Removal and Installation".](#)

Component Inspection (Accelerator Pedal Position Sensor)

INFOID:0000000014268275

1.CHECK ACCELERATOR PEDAL POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Check the voltage between ECM harness connector.

(+)		(–)		Condition		Voltage
Connector	Terminal	Connector	Terminal			
E8	48 (APP sensor 1 signal)	E8	47	Accelerator pedal	Fully released	0.65 – 0.87 V
					Fully depressed	More than 4.3 V
	35 (APP sensor 2 signal)		34	Accelerator pedal	Fully released	0.28 – 0.48 V
					Fully depressed	More than 2.0 V

P0222, P0223 APP SENSOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3. "Removal and Installation"](#).

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< DTC/CIRCUIT DIAGNOSIS >

P0234 TC SYSTEM

DTC Description

INFOID:0000000014268276

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0234	TC SYSTEM (Turbocharger/Supercharger "A" overboost condition)	ECM detects TC boost pressure is excessively high.

POSSIBLE CAUSE

- Turbocharger
- TC boost control actuator

FAIL-SAFE

ECM limits the amount control of fuel injected.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

- If DTC P0234 is detected with a diagnosis result of TC boost sensor, perform TC boost sensor diagnosis first.
- If DTC P0234 is detected with a diagnosis result of TC boost control actuator, perform TC boost control actuator diagnosis first.

Is applicable DTC detected?YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).

NO >> GO TO 2.

2.PERFORM COMPONENT FUNCTION CHECK

NOTE:

Use this procedure to check the overall function of the turbocharger. During this check, a DTC might not be confirmed.

 With CONSULT

1. Turn ignition switch ON.
2. Perform "TC BOOST CONTROL ACTUATOR" in "ACTIVE TEST" mode with CONSULT.
3. Activate the TC boost control actuator and visually check the rod movement.

 Without CONSULT

Make sure that TC boost control actuator rod moves slightly when engine is started.

Is the inspection result normal?YES-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Proceed to [EC-962, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268277

1.CHECK DTC PRIORITY

- If DTC P0234 is detected with a diagnosis result of TC boost sensor, perform TC boost sensor diagnosis first.
- If DTC P0234 is detected with a diagnosis result of TC boost control actuator, perform TC boost control actuator diagnosis first.

Is applicable DTC detected?YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK TC BOOST CONTROL ACTUATOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect TC boost control actuator harness connector.

P0234 TC SYSTEM

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

3. Turn ignition switch ON.
4. Check the voltage between TC boost control actuator harness connector and ground.

+		-	Voltage
TC boost control actuator			
Connector	Terminal		
F80	1	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 3.

3.CHECK TC BOOST CONTROL ACTUATOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector.
3. Check the continuity between TC boost control actuator harness connector and IPDM E/R harness connector.

+		-		Continuity
TC boost control actuator		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F80	1	E121	26	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

- YES >> Perform trouble diagnosis for TC boost control actuator power supply circuit.
NO >> Repair or replace the malfunctioning part.

4.CHECK TC BOOST CONTROL ACTUATOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between TC boost control actuator harness connector and ground.

+		-	Continuity
TC boost control actuator			
Connector	Terminal		
F80	2	Ground	Existed

Is the inspection result normal?

- YES >> Replace turbocharger assembly. Refer to [EM-167, "Removal and Installation"](#).
NO >> Repair or replace the malfunctioning part.

P0237, P0238 TC BOOST SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0237, P0238 TC BOOST SENSOR

DTC Description

INFOID:0000000014268278

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0237	TC BOOST SEN/CIRC (Turbocharger/Supercharger boost sensor "A" circuit low)	An excessively low voltage from the sensor is sent to ECM.
P0238	TC BOOST SEN/CIRC (Turbocharger/Supercharger boost sensor "A" circuit high)	An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (The sensor circuit is open or shorted.)
- Turbocharger boost sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0237 or P0238 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869. "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1010. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896. "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268279

1.CHECK DTC PRIORITY

If DTC P0237 or P0238 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869. "DTC Index"](#).
NO >> GO TO 2.

2.CHECK TURBOCHARGER BOOST SENSOR POWER SUPPLY CIRCUIT

1. Disconnect turbocharger boost sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between turbocharger boost sensor harness connector and ground.

P0237, P0238 TC BOOST SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Turbocharger boost sensor		Ground	Voltage
Connector	Terminal		
E2	3	Ground	Approx. 5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK TURBOCHARGER BOOST SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between turbocharger boost sensor harness connector and ECM harness connector.

Turbocharger boost sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E2	1	F54	100	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK TURBOCHARGER BOOST SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between turbocharger boost sensor harness connector and ECM harness connector.

Turbocharger boost sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E2	2	F54	94	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK TURBOCHARGER BOOST SENSOR

Check turbocharger boost sensor. Refer to [EC-1011, "Component Inspection \(Turbocharger Boost Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace turbocharger boost sensor. Refer to [EM-158, "Exploded View"](#).

P0301, P0302, P0303, P0304 MISFIRE

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0301, P0302, P0303, P0304 MISFIRE

Description

INFOID:0000000014268280

When a misfire occurs, engine speed will fluctuate. If the engine speed fluctuates enough to cause the crankshaft position sensor signal to vary, ECM can determine that a misfire is occurring.

Sensor	Input signal to ECM	ECM function
Crankshaft position sensor	Engine speed	On board diagnosis of misfire

DTC Description

INFOID:0000000014268281

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0301	INJ/CIRC1 (Cylinder 1 misfire detected)	No. 1 cylinder misfires.
P0302	INJ/CIRC2 (Cylinder 2 misfire detected)	No. 2 cylinder misfires.
P0303	INJ/CIRC3 (Cylinder 3 misfire detected)	No. 3 cylinder misfires.
P0304	INJ/CIRC4 (Cylinder 4 misfire detected)	No. 4 cylinder misfires.

POSSIBLE CAUSE

- Poor compression
- Incorrect fuel injector connection
- Fuel injector
- Lack of fuel

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes before conducting the next test.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch OFF and wait at least 2 minutes.
3. Restart engine and let it idle for approximately 30 seconds.
4. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-966, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268282

1. CHECK FUEL LEVEL

Check fuel level.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Refuel the vehicle.

< DTC/CIRCUIT DIAGNOSIS >

2.CHECK FOR LEAK

1. Start engine.
2. Visually check the following for fuel leak.
 - Fuel line from fuel pump to fuel rail
 - Fuel rail
 - Fuel line from fuel rail to fuel injector.

Is intake air leak detected?

- YES >> Repair or replace the malfunctioning part.
 NO >> GO TO 3.

3.CHECK FUEL INJECTOR-I**④ With CONSULT**

1. Remove two fuel injectors.

NOTE:

One is from malfunctioning cylinder and the other is from any cylinder other than the malfunctioning cylinder.

2. Swap the two fuel injectors to the other cylinder.
3. Reconnect ECM harness connector and fuel injector harness connectors.
4. Turn ignition switch ON.
5. Perform injector adjustment value registration. Refer to [EC-905, "Description"](#).
6. Select "SELF DIAG RESULTS" mode with CONSULT.
7. Touch "ERASE".
8. Perform DTC confirmation procedure again. Refer to [EC-966, "DTC Description"](#).
9. Is DTC displayed for the other cylinder?

Is DTC displayed for the other cylinder?

- YES >> GO TO 4.
 NO >> GO TO 5.

4.CHECK FUEL INJECTOR-II

Check the injector of error-detected cylinder. Refer to [EC-1069, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Replace the malfunctioning fuel injector. Refer to [EM-174, "Removal and Installation"](#).

5.CHECK COMPRESSION PRESSURE

Check compression pressure. Refer to [EM-145, "Inspection"](#).

Is the inspection result normal?

- YES >> INSPECTION END
 NO >> Follow the instruction of "CHECKING COMPRESSION PRESSURE". Refer to [EM-145, "Inspection"](#).

P0335, P0336 CRANKSHAFT POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0335, P0336 CRANKSHAFT POSITION SENSOR

DTC Description

INFOID:0000000014268283

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0335	CKP SEN/CIRCUIT (Crankshaft position sensor "A" circuit)	Crankshaft position sensor signal is not detect by the ECM when engine is running.
P0336	CKP SENSOR (Crankshaft position sensor "A" circuit range/performance)	Crankshaft position sensor signal is not in the normal pattern when engine is running.

POSSIBLE CAUSE

P0335

- Harness or connectors (The sensor circuit is open or shorted.)
- Crankshaft position sensor

P0336

- Harness or connectors (The sensor circuit is open or shorted.)
- Crankshaft position sensor
- Signal plate

FAIL-SAFE

ECM limits the amount control of fuel injected.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0335 or P0336 is displayed with DTC P0652 or P0653, first perform the trouble diagnosis for DTC P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 5 seconds.
If engine could not start, keep ignition switch at START position for 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-968, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268284

1.CHECK DTC PRIORITY

If DTC P0335 or P0336 is displayed with DTC P0652 or P0653, first perform the trouble diagnosis for DTC P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

P0335, P0336 CRANKSHAFT POSITION SENSOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

2.CHECK CKP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect crankshaft position (CKP) sensor harness connector.
3. Disconnect ECM harness connector.
4. Check the continuity between CKP sensor harness connector and ECM harness connector.

CKP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F63	1	F54	112	Existed

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK CKP SENSOR

Check CKP sensor. Refer to [EC-969, "Component Inspection \(Crankshaft Position Sensor\)"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace CKP sensor. Refer to [EM-214, "Exploded View"](#).

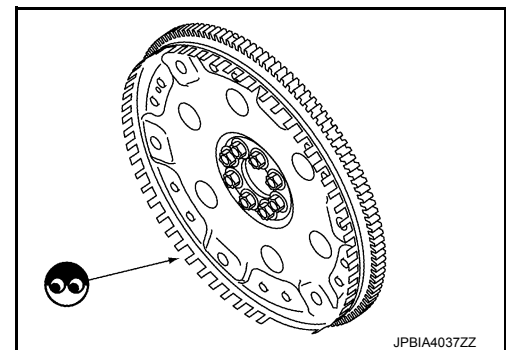
4.CHECK SIGNAL PLATE

Visually check for chipping signal plate gear tooth.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace the drive plate. Refer to [EM-235, "Removal and Installation"](#).



INFOID:000000014268285

Component Inspection (Crankshaft Position Sensor)

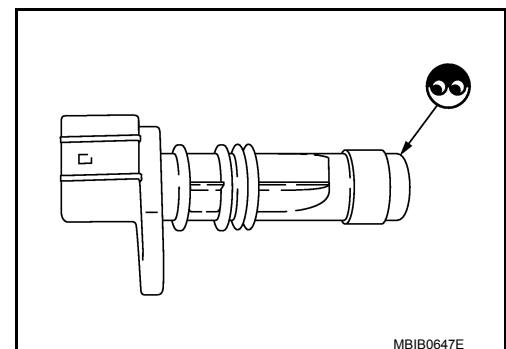
1.VISUALLY CHECK

1. Turn ignition switch OFF.
2. Loosen the fixing bolt of the sensor.
3. Disconnect crankshaft position sensor harness connector.
4. Remove the sensor. Refer to [EM-214, "Exploded View"](#).
5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace crankshaft position sensor.



2.CHECK RESISTANCE

Check resistance between crankshaft position sensor terminal.

P0335, P0336 CRANKSHAFT POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) – 2 (–)	Except 0 or ∞
3 (+) – 1 (–)	
3 (+) – 2 (–)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace crankshaft position sensor. Refer to [EM-214, "Exploded View"](#).

P0340, P0341 CAMSHAFT POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0340, P0341 CAMSHAFT POSITION SENSOR

DTC Description

INFOID:0000000014268286

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0340	CMP SEN/CIRCUIT (Camshaft position sensor "A" circuit)	Camshaft position sensor signal is not detect by the ECM when engine is running.
P0341	CMP SENSOR (Camshaft position sensor "A" circuit range/ performance)	Camshaft position sensor signal is not in the normal pattern when engine is running.

POSSIBLE CAUSE

P0340

- Harness or connectors (The sensor circuit is open or shorted.)
- Camshaft position sensor

P0341

- Harness or connectors (The sensor circuit is open or shorted.)
- Camshaft position sensor
- Signal plate
- Starting system circuit

FAIL-SAFE

ECM limits the amount control of fuel injected.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0340 or P0341 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 5 seconds.

NOTE:

If engine could start, keep ignition switch at START position for 5 seconds.

2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-971, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268287

1.CHECK DTC PRIORITY

If DTC P0340 or P0341 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

P0340, P0341 CAMSHAFT POSITION SENSOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK CMP SENSOR POWER SUPPLY CIRCUIT

1. Disconnect camshaft position (CMP) sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between CMP sensor harness connector and ground.

CMP sensor		Ground	Voltage
Connector	Terminal		
F67	3	Ground	Approx. 5 V

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK CMP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between CMP sensor harness connector and ECM harness connector.

CMP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F67	2	F54	137	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK CMP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between ECM harness connector and CMP sensor harness connector.

CMP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F67	1	F54	113	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK CAMSHAFT POSITION SENSOR

Check camshaft position sensor. Refer to [EC-973, "Component Inspection \(Camshaft Position Sensor\)"](#).

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Replace camshaft position sensor. Refer to [EM-195, "Exploded View"](#).

6.CHECK SIGNAL PLATE

P0340, P0341 CAMSHAFT POSITION SENSOR

[YD25DDTi]

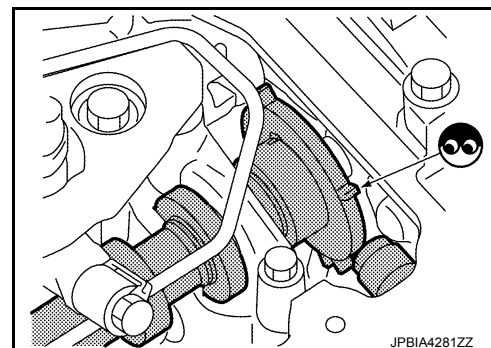
< DTC/CIRCUIT DIAGNOSIS >

Visually check for chipping signal plate of camshaft sprocket end.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace camshaft sprocket (intake). Refer to [EM-195. "Exploded View"](#).



INFOID:0000000014268288

Component Inspection (Camshaft Position Sensor)

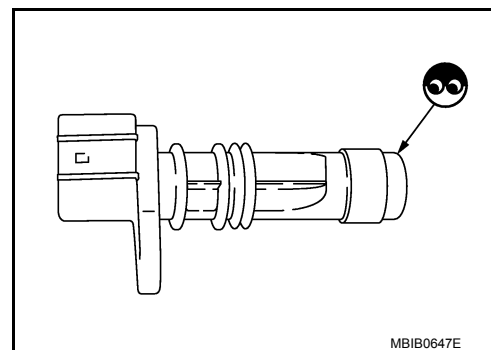
1. VISUALLY CHECK

1. Turn ignition switch OFF.
2. Loosen the fixing bolt of the sensor.
3. Disconnect camshaft position sensor harness connector.
4. Remove the sensor. Refer to [EM-195. "Exploded View"](#).
5. Visually check the sensor for chipping.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace camshaft position sensor. Refer to [EM-195. "Exploded View"](#).



2. CHECK RESISTANCE

Check the resistance between camshaft position sensor terminal as follows.

Terminal No. (Polarity)	Resistance Ω [at 25°C (77°F)]
1 (+) – 2 (-)	Except 0 or ∞
3 (+) – 1 (-)	
3 (+) – 2 (-)	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace camshaft position sensor. Refer to [EM-195. "Exploded View"](#).

P0380, P0670 GLOW CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0380, P0670 GLOW CONTROL UNIT

DTC Description

INFOID:0000000014268289

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0380	GLOWRELAY (Glow plug/heater circuit "A")	An improper voltage signal is sent to ECM from glow control unit.
P0670	GLOW PLUG CONT MDL (Glow plug control module control circuit/ open)	

POSSIBLE CAUSE

- Harness or connectors (Glow control unit input signal circuit is open or shorted.)
- Glow control unit

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-974, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268290

1. CHECK GLOW CONTROL UNIT POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect glow control unit harness connector.
3. Turn ignition switch ON.
4. Check the voltage between glow control unit harness connector and ground.

+		−	Voltage
Glow control unit			
Connector	Terminal		
E25	4	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Perform the trouble diagnosis for power supply circuit.

2. CHECK GLOW CONTROL UNIT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between glow control unit harness connector and ECM harness connector.

P0380, P0670 GLOW CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

+		-		Continuity
Glow control unit		ECM		
Connector	Terminal	Connector	Terminal	
E25	3	E8	18	Existed
	8		24	

4. Also check harness for short to ground and to power.

Is inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning part.

3.CHECK GLOW PLUG CONTROL CIRCUIT

1. Remove glow plug terminals (nuts).

2. Check the continuity between glow control unit harness connector and glow plug terminals.

+		-		Continuity
Glow control unit		Glow plug		
Connector	Terminal	Connector	Terminal	
E25	2	F77 (No.1)	1	Existed
	7	F75 (No.2)		
	1	F74 (No.3)		
	6	F76 (No.4)		

3. Also check harness for short to ground and to power.

Is inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning part.

4.CHECK GLOW PLUG

Check glow plug. Refer to [EC-975, "Component Inspection \(Glow Plug\)"](#).

Is inspection result normal?

YES >> Replace glow control unit.

NO >> Replace malfunction glow plug. Refer to [EM-173, "Removal and Installation"](#).

Component Inspection (Glow Plug)

INFOID:0000000014268291

CAUTION:

- Do not bump glow plug heating element. If it is bumped, replace glow plug with a new one.
- If glow plug is dropped from a height of 10 cm (3.94 in) or higher, replace with a new one.
- If glow plug installation hole is contaminated with carbon, remove it with a reamer or suitable tool.
- Hand-tighten glow plug by turning it two or three times, then tighten using a tool to specified torque.

1.CHECK GLOW PLUG

1. Disconnect glow plug terminals (nuts).

2. Remove a glow plug.

3. Check resistance between glow plug terminal and glow plug stem.

Terminals	Resistance
1 and glow plug stem	Approx. 0.45 Ω [at 25°C (77°F)]

Is the inspection result normal?

YES >> INSPECTION END

P0380, P0670 GLOW CONTROL UNIT

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

NO >> Replace malfunctioning glow plug. Refer to [EM-173. "Removal and Installation"](#).

P0403 EGR VOLUME CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0403 EGR VOLUME CONTROL VALVE

DTC Description

INFOID:0000000014268292

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0403	EGR SYSTEM (Exhaust gas recirculation "A" control circuit)	Excessively high duty voltage signal is sent to the valve for the specified time.

POSSIBLE CAUSE

- Harness and connector (The EGR volume control valve circuit is open or shorted.)
- EGR volume control valve stuck closed
- EGR passage clogged
- EGR volume control position sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and warm it up to normal operating temperature.
2. Stop the engine and wait at least 10 seconds.
3. Restart the engine and let it idle for 5 seconds.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-977, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268293

1.INSPECTION START

Will CONSULT be used?

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK EGR VOLUME CONTROL VALVE FUNCTION

With CONSULT

1. Turn ignition switch OFF.
2. Select "TRG EGR/V ANGLE" in "ACTIVE TEST" mode with CONSULT.
NOTE:
Select "EGR V/POS SEN" of data monitor item.
3. Activate the EGR volume control valve and check "EGR V/POS SEN" indication value is changed.

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 3.

3.CHECK EGR VOLUME CONTROL VALVE POWER SUPPLY CIRCUIT

P0403 EGR VOLUME CONTROL VALVE

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EGR volume control valve harness connector and ECM harness connector.

+				Continuity
EGR volume control valve		ECM		
Connector	Terminal	Connector	Terminal	
F61	4	E8	14	Existed
	5		1	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning part.

4.CHECK DC MOTOR

Refer to [EC-978, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace EGR volume control valve. Refer to [EM-164, "Removal and Installation"](#).

5.CHECK EGR VOLUME CONTROL VALVE POSITION SENSOR

Refer to [EC-979, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace the malfunctioning part.

6.CHECK EGR PASSAGE

Check the following for clogging and cracks.

- EGR tube
- EGR hose
- EGR cooler

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace the malfunctioning part.

Component Inspection

INFOID:0000000014268294

1.CHECK EGR VOLUME CONTROL VALVE (DC MOTOR)

1. Turn ignition switch OFF.
2. Disconnect EGR volume control valve harness connector.
3. Check the resistance between EGR volume control valve terminals.

+	–	Resistance
EGR volume control valve		
Terminal		
4	5	0.3 – 100 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EGR volume control valve. Refer to [EM-164, "Removal and Installation"](#).

P0405, P0406 EGR VOLUME CONTROL VALVE POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0405, P0406 EGR VOLUME CONTROL VALVE POSITION SENSOR

DTC Description

INFOID:0000000014268295

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0405	EGR SENSOR (Exhaust gas recirculation sensor "A" circuit low)	An excessively low voltage from the sensor is sent to ECM.
P0406	EGR SENSOR (Exhaust gas recirculation sensor "A" circuit high)	An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (The sensor circuit is open or shorted.)
- EGR volume control valve control position sensor

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0405 or P0406 is displayed with DTC P0652 or P0653, first perform the trouble diagnosis for DTC P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and warm it up to normal operating temperature.
2. Stop the engine and wait at least 10 seconds.
3. Restart the engine and let it idle for 5 seconds.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-979, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268296

1.CHECK DTC PRIORITY

If DTC P0405 or P0406 is displayed with DTC P0652 or P0653, first perform the trouble diagnosis for DTC P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK EGR VOLUME CONTROL VALVE POSITION SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EGR volume control valve harness connector.

P0405, P0406 EGR VOLUME CONTROL VALVE POSITION SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

3. Turn ignition switch ON.
4. Check voltage between EGR volume control valve harness connector and ground.

EGR volume control valve		Ground	Voltage
Connector	Terminal		
F61	1	Ground	Approx. 5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EGR VOLUME CONTROL VALVE POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EGR volume control valve harness connector and ECM harness connector.

EGR volume control valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F61	3	F54	146	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK EGR VOLUME CONTROL VALVE POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between EGR volume control valve harness connector and ECM harness connector.

EGR volume control valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F61	2	F54	122	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Replace the EGR volume control valve. Refer to [EM-164. "Removal and Installation"](#).

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

P0409 EGR VOLUME CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0409 EGR VOLUME CONTROL VALVE

DTC Description

INFOID:0000000014268297

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0409	EGR SYSTEM (Exhaust gas recirculation sensor "A" circuit)	The characteristic of EGR volume control valve is not in the specified range.

POSSIBLE CAUSE

- Harness or connectors (The EGR volume control valve circuit is open or shorted.)
- EGR volume control valve

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0409 is displayed with DTC P0652 or P0653, first perform the trouble diagnosis for DTC P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and warm it up to normal operating temperature.

NOTE:

Engine coolant temperature is more than 81°C (178°F)

2. Stop the engine and wait at least 10 seconds.
3. Restart the engine and let it idle for 5 seconds.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-981, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268298

1.CHECK DTC PRIORITY

If DTC P0409 is displayed with DTC P0652 or P0653, first perform the trouble diagnosis for DTC P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK EGR VOLUME CONTROL VALVE POSITION SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect EGR volume control valve harness connector.
3. Turn ignition switch ON.
4. Check voltage between EGR volume control valve harness connector and ground.

P0409 EGR VOLUME CONTROL VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

EGR volume control valve		Ground	Voltage
Connector	Terminal		
F61	1	Ground	Approx. 5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK EGR VOLUME CONTROL VALVE POSITION SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EGR volume control valve harness connector and ECM harness connector.

EGR volume control valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F61	3	F54	146	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK EGR VOLUME CONTROL VALVE POSITION SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between EGR volume control valve harness connector and ECM harness connector.

EGR volume control valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F61	2	F54	122	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Replace the EGR volume control valve. Refer to [EM-164, "Removal and Installation"](#).

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

P0473 EXHAUST GAS PRESSURE SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0473 EXHAUST GAS PRESSURE SENSOR 1

DTC Description

INFOID:0000000014268299

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0473	EXH PRESSURE SEN A (Exhaust pressure sensor "A" circuit high)	Signal voltage from exhaust gas pressure sensor 1 remains 4.9 V or more for 2 seconds or more

POSSIBLE CAUSE

- Harness or connectors (Exhaust gas pressure sensor 1 circuit is open or shorted.)
- Exhaust gas pressure sensor 1

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0473 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and let it idle at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-983, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268300

1.CHECK DTC PRIORITY

If DTC P0473 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK EXHAUST GAS PRESSURE SENSOR 1 POWER SUPPLY-I

1. Turn ignition switch OFF.
2. Disconnect exhaust gas pressure sensor 1 harness connector.
3. Turn ignition switch ON.
4. Check the voltage between exhaust gas pressure sensor 1 harness connector terminals.

P0473 EXHAUST GAS PRESSURE SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Exhaust gas pressure sensor 1			Voltage (Approx.)
Connector	+	−	
	terminal		
F93	3	1	5 V

Inspection result normal?

YES >> GO TO 7.

NO >> GO TO 3.

3.CHECK EXHAUST GAS PRESSURE SENSOR 1 POWER SUPPLY-II

Check the voltage between exhaust gas pressure sensor 1 harness connector and ground.

+		—	Voltage (Approx.)
Exhaust gas pressure sensor 1			
Connector	Terminal		
F93	3	Ground	5 V

Is inspection result normal?

YES >> GO TO 5.

NO >> GO TO 4.

4.CHECK EXHAUST GAS PRESSURE SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between exhaust gas pressure sensor 1 harness connector and ECM harness connector.

+		-		Continuity
Exhaust gas pressure sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F93	3	F54	134	Existed

4. Also check harness for short to ground.

Is inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace the malfunctioning part.

5.CHECK EXHAUST GAS PRESSURE SENSOR 1 GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between exhaust gas pressure sensor 1 harness connector and ECM harness connector.

+		-		Continuity
Exhaust gas pressure sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F93	1	F54	101	Existed

Is inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace the malfunctioning part.

6.CHECK ECM GROUND CIRCUIT

Check the continuity between ECM harness connector and ground.

P0473 EXHAUST GAS PRESSURE SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

+		-	Continuity
ECM			
Connector	Terminal		
E8	58	Ground	Existed
	57		
	56		
	55		
	41		

Is inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace the malfunctioning part.

7.CHECK EXHAUST GAS PRESSURE SENSOR 1 SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between exhaust gas pressure sensor 1 harness connector and ECM harness connector.

+		-		Continuity
Exhaust gas pressure sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F93	2	F54	95	Existed

4. Also check harness for short to ground and to power.

Is inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace the malfunctioning part.

8.CHECK EXHAUST GAS PRESSURE SENSOR 1

Refer to [EC-985. "Component Inspection \(Exhaust Gas Pressure Sensor 1\)".](#)

Is inspection result normal?

YES >> INSPECTION END

NO >> Replace exhaust gas pressure sensor 1. Refer to [EC-810. "Component Parts Location".](#)

Component Inspection (Exhaust Gas Pressure Sensor 1)

INFOID:0000000014268301

1.CHECK EXHAUST GAS PRESSURE SENSOR 1

1. Turn ignition switch OFF.
2. Disconnect exhaust gas pressure sensor 1 harness connector.
3. Check the continuity between exhaust gas pressure sensor 1 connector terminals.

Exhaust gas pressure sensor 1		Continuity
+	–	
Terminal		
1	2	Except 0 or $\infty \Omega$
1	3	
2	3	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace exhaust gas pressure sensor 1. Refer to [EC-810. "Component Parts Location".](#)

< DTC/CIRCUIT DIAGNOSIS >

P0488 EGR SYSTEM

DTC Description

INFOID:0000000014268302

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0488	EGR SYSTEM (Exhaust gas recirculation throttle control circuit "A" range/performance)	ECM internal circuit for driving the EGR volume control valve does not function properly due to high temperature or excessive current.

POSSIBLE CAUSE

- Harness or connectors (The EGR volume control valve circuit is open or shorted.)
- EGR volume control valve
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and warm it up to normal operating temperature.
2. Stop the engine and wait at least 10 seconds.
3. Restart the engine and let it idle for 5 seconds.
4. Check 1st trip DTC.

Is 1st trip DTC detected?YES >> Proceed to [EC-986, "Diagnosis Procedure"](#).NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268303

1. CHECK EGR VOLUME CONTROL VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect EGR volume control valve harness connector.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM terminals and EGR volume control valve terminals as follows.

EGR volume control valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F61	4	E8	14	Existed
	5		1	

Is the inspection result normal?YES >> Replace EGR volume control valve. Refer to [EC-810, "Component Parts Location"](#).

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

P0501, P0502, P0503 VEHICLE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0501, P0502, P0503 VEHICLE SPEED SIGNAL

Description

INFOID:0000000014268304

ECM receives vehicle speed signal from ABS actuator and electric unit (control unit) via CAN communication line.

ECM uses the signal for ASCD control.

DTC Description

INFOID:0000000014268305

DTC DETECTION LOGIC

The MIL will not light up for this self-diagnosis.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0501	VEHICLE SPEED (Vehicle speed sensor range/performance)	A change of vehicle speed signal is excessively large during specified time.
P0502	VEHICLE SPEED (Vehicle speed sensor circuit low input)	Vehicle speed signal is excessively low compared with the driving condition.
P0503	VEHICLE SPEED (Vehicle speed sensor circuit high input)	Vehicle speed signal is excessively high compared with the driving condition.

POSSIBLE CAUSE

- Harness or connectors (The CAN communication line is open or shorted.)
- ABS actuator and electric unit (control unit)
- Wheel sensor
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0501, P0502 or P0503 is displayed with DTC U1000 or P0606, first perform the trouble diagnosis for DTC U1000 or P0606.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

- Turn ignition switch OFF and wait at least 2 minutes.
- Turn ESP switch OFF.

>> GO TO 3.

3.DTC CONFIRMATION PROCEDURE

1. Start the engine.
2. Drive the vehicle at more than 10 km/h (7 MPH) for at least 5 seconds.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-987, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268306

1.CHECK DTC PRIORITY

P0501, P0502, P0503 VEHICLE SPEED SIGNAL

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

If DTC P0501, P0502 or P0503 is displayed with DTC U1000 or P0606, first perform the trouble diagnosis for DTC U1000 or P0606.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-869. "DTC Index"](#).

NO >> GO TO 2.

2.CHECK DTC WITH ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Check DTC with ABS actuator and electric unit (control unit). Refer to [BRC-25. "CONSULT Function"](#) (without VDC) or [BRC-153. "CONSULT Function"](#) (with VDC).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace malfunctioning part.

P0545, P0546 EGT SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0545, P0546 EGT SENSOR 1

DTC Description

INFOID:0000000014268313

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0545	EGT SENSOR 1 B1 (Exhaust gas temperature sensor circuit low)	Signal voltage from EGT sensor 1 remains 0.1V or less for 5 seconds or more
P0546	EGT SENSOR 1 B1 (Exhaust gas temperature sensor circuit high)	Signal voltage from EGT sensor 1 remains 4.95V or more for 5 seconds or more

POSSIBLE CAUSE

- Harness or connectors (EGT sensor 1 circuit is open or shorted.)
- EGT sensor 1

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE-I

1. Start the engine and let it idle for 10 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-989, "Diagnosis Procedure"](#).
NO >> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE-II

1. Warm up the engine to the normal operating temperature.
2. Drive according to the following directions for 6 seconds or more.

Condition	
Engine speed:	3,000 rpm or less
Vehicle speed:	30 km/h (19MPH) or more
Accelerator pedal:	Depress 3/8 or more

CAUTION:

Always drive safely.

3. Stop the vehicle.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-989, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268314

1. CHECK EGT SENSOR 1 POWER SUPPLY-I

1. Turn ignition switch OFF.

P0545, P0546 EGT SENSOR 1

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect EGT sensor 1 harness connector.
3. Turn ignition switch ON.
4. Check the voltage between EGT sensor 1 harness connector terminals.

EGT sensor 1			Voltage (Approx.)
Connector	+	−	
	terminal		
F83	1	2	5 V

Inspection result normal?

YES >> GO TO 6.

NO >> GO TO 2.

2.CHECK EGT SENSOR 1 POWER SUPPLY-II

Check the voltage between EGT sensor 1 harness connector and ground.

+		-	Voltage (Approx.)
EGT sensor 1			
Connector	Terminal		
F83	1	Ground	5 V

Is inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK EGT SENSOR 1 POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EGT sensor 1 harness connector and ECM harness connector.

+		-		Continuity
EGT sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F83	1	F54	150	Existed

4. Also check harness for short to ground.

Is inspection result normal?

YES >> Perform the trouble diagnosis for power supply circuit.

NO >> Repair or replace the malfunctioning part.

4.CHECK EGT SENSOR 1 GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EGT sensor 1 harness connector and ECM harness connector.

+		-		Continuity
EGT sensor 1		ECM		
Connector	Terminal	Connector	Terminal	
F83	2	F54	149	Existed

Is inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace the malfunctioning part.

5.CHECK EGT ECM GROUND CIRCUIT

Check the continuity between ECM harness connector and ground.

P0545, P0546 EGT SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

+		-	Continuity
ECM			
Connector	Terminal		
E8	58	Ground	Existed
	57		
	56		
	55		
	41		

Is inspection result normal?

YES >> Check intermittent incident. Refer to [EC-896, "Description"](#).

NO >> Repair or replace the malfunctioning part.

6.CHECK EGT SENSOR 1

Check EGT sensor 1. Refer to [EC-991, "Component Inspection \(EGT Sensor 1\)"](#).

Is inspection result normal?

YES >> INSPECTION END

NO >> Replace EGT sensor 1. Refer to [EC-810, "Component Parts Location"](#).

Component Inspection (EGT Sensor 1)

INFOID:0000000014268315

1.CHECK EGT SENSOR 1

1. Turn ignition switch OFF.
2. Disconnect EGT sensor 1 harness connector.
3. Check the resistance between EGT sensor 1 harness connector terminals.

+	—	Condition	Resistance (kΩ) (Approx.)
EGT sensor 1			
Terminal			
1	2	Temperature: 20°C (68°F)	118
		Temperature: 80°C (176°F)	27

Is the inspection result normal?

YES >> INSPECTION END.

NO >> Replace EGT sensor 1. Refer to [EC-810, "Component Parts Location"](#).

P0563 BATTERY VOLTAGE

DTC Description

INFOID:0000000014268316

DTC DETECTION LOGIC

The MIL will not light up for this self-diagnosis.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0563	BATTERY VOLTAGE (System voltage high)	An excessively high voltage from the battery is sent to ECM.

POSSIBLE CAUSE

- Battery
- Battery terminal
- Alternator
- Incorrect jump starting

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 35 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-992, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268317

1. CHECK BATTERY CABLE INSTALLATION

Check battery cable installation.

Is battery cable installed properly?

- YES >> GO TO 2.
 NO >> Install properly.

2. CHECK TYPE OF BATTERY AND ALTERNATOR

Check that the proper type of battery type of alternator are installed.
 Refer to [PG-156, "Battery"](#) and [CHG-55, "Generator"](#).

Is the inspection result normal?

- YES >> Perform the trouble diagnosis for alternator. Refer to [CHG-35, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-38, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\)"](#). For details, refer to [CHG-5, "Special Service Tools"](#).
 NO >> Replace with the proper one.

P0580, P0581 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0580, P0581 ASCD STEERING SWITCH

DTC Description

INFOID:0000000014268318

DTC DETECTION LOGIC

The MIL will not light up for these diagnoses.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0580	STRG SW/CIRC (ASCD steering switch circuit low)	ECM detects that the ASCD steering switch is stuck ON.
P0581	STRG SW/CIRC (ASCD steering switch circuit high)	An excessively high voltage signal from the ASCD steering switch is sent to ECM.

POSSIBLE CAUSE

- Harness or connectors (The switch circuit is open or shorted.)
- ASCD steering switch
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P0580 or P0581 is displayed with DTC P0606, first perform the trouble diagnosis for DTC P0606.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Wait at least 10 seconds.
3. Press ASCD MAIN switch for at least 10 seconds, then release it and wait at least 10 seconds.
4. Press ACCEL/RES switch for at least 10 seconds, then release it and wait at least 10 seconds.
5. Press COAST/SET switch for at least 10 seconds, then release it and wait at least 10 seconds.
6. Press CANCEL switch for at least 10 seconds, then release it and wait at least 10 seconds.
7. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-993, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268319

1.CHECK DTC PRIORITY

If DTC P0580 or P0581 is displayed with DTC P0606, first perform the trouble diagnosis for DTC P0606.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK ASCD STEERING SWITCH CIRCUIT

 **With CONSULT**

P0580, P0581 ASCD STEERING SWITCH

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch ON.
2. Select "MAIN SW", "RESUME/ACC SW", "SET SW" and "CANCEL SW" in "DATA MONITOR" mode with CONSULT.
3. Check each item indication under the following conditions.

Switch	Monitor item	Condition	Indication
ASCD MAIN switch	MAIN SW	Pressed	ON
		Released	OFF
CANCEL switch	CANCEL SW	Pressed	ON
		Released	OFF
ACCEL/RES switch	RESUME/ACC SW	Pressed	ON
		Released	OFF
COAST/SET switch	SET SW	Pressed	ON
		Released	OFF

Without CONSULT

1. Turn ignition switch ON.
2. Check voltage between ECM harness connector and ground.

ECM			Condition	Voltage
Connector	+	—		
	Terminal			
F54	121	145	ASCD MAIN switch: Pressed	Approx. 0V
			CANCEL switch: Pressed	Approx. 1V
			COAST/SET switch: Pressed	Approx. 2V
			ACCEL/RES switch: Pressed	Approx. 3V
			ALL ASCD steering switches: Released	Approx. 4V

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 3.

3. CHECK ASCD STEERING SWITCH GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect combination switch harness connector.
3. Disconnect ECM harness connector.
4. Check harness continuity between combination switch harness connector and ECM harness connector.

+		-		Continuity
Combination switch		ECM		
Connector	Terminal	Connector	Terminal	
M73	7	F54	145	Existed

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK ASCD STEERING SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between combination switch harness connector and ECM harness connector.

P0580, P0581 ASCD STEERING SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

+		-		Continuity
Combination switch		ECM		
Connector	Terminal	Connector	Terminal	
M73	10	F54	121	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Harness for open and short between ECM and combination switch

5.CHECK ASCD STEERING SWITCH

Check ASCD steering switch. Refer to [EC-995, "Component Inspection \(ASCD Steering Switch\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD steering switch. Refer to [ST-21, "WITH AIR BAG : Removal and Installation"](#) (WITH AIR BAG) or [ST-22, "WITHOUT AIR BAG : Removal and Installation"](#) (WITHOUT AIR BAG).

Component Inspection (ASCD Steering Switch)

INFOID:0000000014268320

1.CHECK ASCD STEERING SWITCH

1. Turn ignition switch OFF.
2. Disconnect combination switch (spiral cable) harness connector.
3. Check resistance between combination switch harness connector terminals under the following conditions.

Combination switch		Condition	Resistance (Ω)
Connector	Terminals		
M149	15 and 18	ASCD MAIN switch: Pressed	Approx. 0
		CANCEL switch: Pressed	Approx. 250
		COAST/SET switch: Pressed	Approx. 660
		ACCEL/RES switch: Pressed	Approx. 1,480
		All ASCD steering switches: Released	Approx. 4,000

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace ASCD steering switch. Refer to [ST-21, "WITH AIR BAG : Removal and Installation"](#) (WITH AIR BAG) or [ST-22, "WITHOUT AIR BAG : Removal and Installation"](#) (WITHOUT AIR BAG).

< DTC/CIRCUIT DIAGNOSIS >

P0605, P0606 ECM

DTC Description

INFOID:0000000014268321

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0605	ECM [Internal control module read only memory (ROM) error]	ECM ROM is malfunctioning.
P0606	ECM (Control module processor)	ECM calculation function is malfunctioning.

POSSIBLE CAUSE

ECM

FAIL-SAFE

- ECM recognizes the accelerator pedal position for 10% and controls fuel injected.
- ECM limits fuel rail pressure control (upper limit).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 second.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-996, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268322

1.DTC CONFIRMATION

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure. Refer to [EC-996, "DTC Description"](#).
4. Check the DTC.

Is the DTC displayed again?

- YES >> Replace ECM. Refer to [EC-1094, "Removal and Installation"](#).
 NO >> INSPECTION END

P0607 ECM

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0607 ECM

Description

INFOID:0000000014268323

This is detected when a CAN communication error occurs in ECM.

DTC Description

INFOID:0000000014268324

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0607	ECM (Control module performance)	Detecting error during the initial diagnosis of CAN controller of ECM.

POSSIBLE CAUSE

ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC P0607 detected?

- YES >> Proceed to [EC-997, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268325

1.INSPECTION START

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure. Refer to [EC-997, "DTC Description"](#).
4. Check DTC.

Is the DTC P0607 displayed again?

- YES >> Replace ECM. Refer to [EC-1094, "Removal and Installation"](#).
NO >> INSPECTION END

P0628, P0629 FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0628, P0629 FUEL PUMP

DTC Description

INFOID:0000000014268326

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0628	FUEL PUMP/CIRC (Fuel pump "A" control circuit low)	ECM detects a control circuit for the fuel pump control is open or short to ground.
P0629	FUEL PUMP/CIRC (Fuel pump "A" control circuit high)	ECM detects a control circuit for the fuel pump control is short to power.

POSSIBLE CAUSE

- Harness or connectors (Fuel pump suction control valve circuit is open or shorted.)
- Fuel pump suction control valve
- Fuel pump

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 second.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-998, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268327

1. CHECK ECM OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and fuel pump suction control valve harness connector.
3. Check harness continuity between ECM harness connector and fuel pump suction control valve harness connector.

ECM		Fuel pump suction control valve		Continuity
Connector	Terminal	Connector	Terminal	
E8	39	F82	2	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2. CHECK FUEL PUMP SUCTION CONTROL VALVE GROUND CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM harness connector and fuel pump suction control valve harness connector.

P0628, P0629 FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

ECM		Fuel pump suction control valve		Continuity
Connector	Terminal	Connector	Terminal	
E8	52	F82	1	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK FUEL PUMP SUCTION CONTROL VALVE

Check fuel pump suction control valve. Refer to [EC-999, "Component Inspection \(Fuel Pump Suction Control Valve\)"](#).

Is the inspection result normal?

YES >> Replace fuel pump. Refer to [EM-188, "Removal and Installation"](#).

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

Component Inspection (Fuel Pump Suction Control Valve)

INFOID:0000000014268328

1.CHECK FUEL PUMP SUCTION CONTROL VALVE

1. Turn ignition switch OFF.
2. Disconnect fuel pump suction control valve harness connector.
3. Check the resistance between fuel pump suction control valve terminals as follows.

Terminals	Resistance
1 and 2	1.8 – 2.4 Ω [at 20°C (68°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

P0642, P0643 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0642, P0643 SENSOR POWER SUPPLY

DTC Description

INFOID:0000000014268329

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0642	SENSOR PWR/CIRC1 (Sensor reference voltage "A" circuit low)	ECM detects a voltage of power source for sensor is excessively low.
P0643	SENSOR PWR/CIRC1 (Sensor reference voltage "A" circuit high)	ECM detects a voltage of power source for sensor is excessively high.

POSSIBLE CAUSE

- Harness or connectors for following circuit is shorted.
 - Accelerator pedal position sensor 2
 - Camshaft position sensor
 - Fuel rail pressure sensor
 - Turbocharger boost sensor
 - Refrigerant pressure sensor
 - Exhaust gas pressure sensor 1
- Accelerator pedal position sensor (Accelerator pedal position sensor 2)
- Camshaft position sensor
- Fuel rail pressure sensor
- Turbocharger boost sensor
- Refrigerant pressure sensor
- Exhaust gas pressure sensor 1

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 second.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-1000, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268330

1. CHECK SENSOR POWER SUPPLY OUTPUT

1. Turn ignition switch ON.
2. Check voltage between ECM harness connector and ground.

ECM		Ground	Voltage
Connector	Terminal		
E8	36	Ground	Approx. 5 V

Is the inspection result normal?

YES >> INSPECTION END

P0642, P0643 SENSOR POWER SUPPLY

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

NO >> GO TO 2.

2.CHECK SENSOR POWER SUPPLY ROUTING CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor		
Connector	Terminal	Name	Connector	Terminal
E8	36	Accelerator pedal position sensor 2	E5	1
F54	110	Camshaft position sensor	F67	3
	109	Fuel rail pressure sensor	F81	1
	107	Turbocharger boost sensor	E2	3
	135	Refrigerant pressure sensor	E49	3
	134	Exhaust gas pressure sensor 1	F93	3

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair short to ground or short to power in harness or connectors.

3.CHECK COMPONENTS

Check the following.

- Accelerator pedal position sensor 2 (Refer to [EC-939, "Diagnosis Procedure"](#).)
- Camshaft position sensor (Refer to [EC-971, "Diagnosis Procedure"](#).)
- Turbocharger boost sensor (Refer to [EC-964, "Diagnosis Procedure"](#).)
- Refrigerant pressure sensor (Refer to [EC-1080, "Diagnosis Procedure"](#).)
- Exhaust gas pressure sensor 1 (Refer to [EC-983, "Diagnosis Procedure"](#).)
- Fuel rail pressure sensor (Refer to [EC-952, "Diagnosis Procedure"](#).)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning component.

P0652, P0653 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0652, P0653 SENSOR POWER SUPPLY

DTC Description

INFOID:0000000014268331

DTC DETECTION LOGIC

The MIL will not light up for these self-diagnoses.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0652	SENSOR PWR/CIRC2 (Sensor reference voltage "B" circuit low)	ECM detects a voltage of power source for sensor is excessively low.
P0653	SENSOR PWR/CIRC2 (Sensor reference voltage "B" circuit high)	ECM detects a voltage of power source for sensor is excessively high.

NOTE:

Refer to [EC-803. "How to Check Vehicle Type"](#), for the information of type 1 and 2.

POSSIBLE CAUSE

- Harness or connectors for following circuit is shorted.
 - Accelerator pedal position sensor 1
 - Battery current sensor
 - Crankshaft position sensor
 - EGR volume control valve position sensor (type 2 is not applicable)
- Accelerator pedal position sensor (Accelerator pedal position sensor 1)
- Battery current sensor
- Crankshaft position sensor
- EGR volume control valve position sensor (type 2 is not applicable)

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1002. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896. "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268332

1. CHECK SENSOR POWER SUPPLY OUTPUT

1. Turn ignition switch ON.
2. Check voltage between ECM harness connector and ground.

ECM		Ground	Voltage
Connector	Terminal		
E8	49	Ground	Approx. 5 V

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 2.

P0652, P0653 SENSOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

2.CHECK SENSOR POWER SUPPLY ROUTING CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Check harness for short to power and short to ground, between the following terminals.

ECM		Sensor		
Connector	Terminal	Name	Connector	Terminal
E8	50	Battery current sensor	E161	1
	49	Accelerator pedal position sensor 1	E5	2
F54	133	Crankshaft position sensor	F63	3
	132	EGR volume control valve position sensor (Type 2 is not applicable)	F61	1

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair short to ground or short to power in harness or connectors.

3.CHECK COMPONENTS

Check the following.

- Accelerator pedal position sensor 1 (Refer to [EC-959. "Diagnosis Procedure".](#))
- Battery current sensor (Refer to [EC-1064. "Diagnosis Procedure".](#))
- Crankshaft position sensor (Refer to [EC-968. "Diagnosis Procedure".](#))
- EGR volume control valve position sensor (Refer to [EC-979. "Diagnosis Procedure".](#)) (Type 2 is not applicable)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning component.

P0668, P0669 BAROMETRIC PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0668, P0669 BAROMETRIC PRESSURE SENSOR

DTC Description

INFOID:0000000014268333

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0668	ECM (PCM/ECM/TCM internal temperature sensor "A" circuit low)	An excessively low voltage from the sensor is sent to ECM.
P0669	ECM (PCM/ECM/TCM internal temperature sensor "A" circuit high)	An excessively high voltage from the sensor is sent to ECM.

POSSIBLE CAUSE

ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Wait at least 5 seconds.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1004, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268334

1. DTC CONFIRMATION

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure. Refer to [EC-1004, "DTC Description"](#).
4. Check the DTC.

Is the DTC displayed again?

- YES >> Replace ECM. Refer to [EC-1094, "Removal and Installation"](#).
NO >> INSPECTION END

P0686 ECM RELAY

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P0686 ECM RELAY

DTC Description

INFOID:0000000014268335

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P0686	ECM RELAY (ECM/PCM power relay control circuit low)	ECM detects ECM relay is stuck closed even if ignition switch OFF.

POSSIBLE CAUSE

- Harness or connectors (The ECM relay circuit is shorted.)
- ECM relay

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch OFF and wait at least 2 minutes.
2. Turn ignition switch ON and wait at least 5 seconds.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1005, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268336

1.CHECK ECM MAIN POWER SUPPER CIRCUIT

1. Turn ignition switch ON and then OFF.
2. Check voltage between ECM harness connector terminals as follows.

ECM			Voltage
Connector	+	–	
	Terminal		
E8	54	41	After turning ignition switch OFF, battery voltage will exist for 2 minutes, then drop approximately 0V.
	53		

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 2.

2.CHECK ECM RELAY CONTROL SIGNAL CIRCUIT

1. Turn ignition switch OFF, and wait at least 2 minutes.
2. Check voltage between ECM harness connector terminals as follows.

P0686 ECM RELAY

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

ECM			Voltage
Connector	+	−	
	Terminal		
E8	26	41	Battery voltage
	25		

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK ECM RELAY CONTROL SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and IPDM E/R harness connector.
3. Check harness continuity between ECM harness connector and IPDM E/R harness connector.

+		-		Continuity
ECM		IPDM E/R		
Connector	Terminal	Connector	Terminal	
E8	26	E121	31	Existed
	25			

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-40, "Removal and Installation"](#).

NO >> Repair or replace harness or connectors.

4.CHECK ECM RELAY INPUT SIGNAL CIRCUIT FOR SHORT TO POWER

1. Disconnect ECM harness connector and IPDM E/R harness connector.
2. Check continuity between ECM harness connector and IPDM E/R harness connector.

+		-		Continuity
ECM		IPDM E/R		
Connector	Terminal	Connector	Terminal	
E8	54	E121	26	Existed
	53		25	

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-40, "Removal and Installation"](#).

NO >> Repair or replace harness or connectors.

P1020, P1022, P1023, P1024, P1025, P1026 TC BOOST CONTROL ACTUATOR

< DTC/CIRCUIT DIAGNOSIS > [YD25DDTi]

P1020, P1022, P1023, P1024, P1025, P1026 TC BOOST CONTROL ACTUATOR

DTC Description

INFOID:0000000014268337

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1020	TC BOOST CONT ACT (Turbocharger boost control actuator)	An abnormal motor locking signal from the TC boost control actuator to ECM.
P1022	TC BOOST CONT ACT (Turbocharger boost control actuator)	An abnormal position sensor signal from the TC boost control actuator to ECM.
P1023	TC BOOST CONT ACT (Turbocharger boost control actuator)	An abnormal current signal from the TC boost control actuator to ECM.
P1024	TC BOOST CONT ACT (Turbocharger boost control actuator)	An abnormal EEPROM signal from the TC boost control actuator to ECM.
P1025	TC BOOST CONT ACT (Turbocharger boost control actuator)	An abnormal ROM signal from the TC boost control actuator to ECM.
P1026	TC BOOST CONT ACT (Turbocharger boost control actuator)	An abnormal RAM signal from the TC boost control actuator to ECM.

POSSIBLE CAUSE

- Turbocharger
- TC boost control actuator

FAIL-SAFE

ECM limits the amount control of fuel injected.

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1007, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268338

1.REPLACE TURBOCHARGER ASSEMBLY

NOTE:

Replace turbocharger assembly when this DTC is detected.

>> Replace turbocharger assembly. Refer to [EM-167, "Removal and Installation"](#).

P1028 EXHAUST GAS PRESSURE SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P1028 EXHAUST GAS PRESSURE SENSOR 1

Description

INFOID:0000000014268339

The mutual diagnoses performed by comparing signals from exhaust gas pressure sensor 1, turbocharger boost sensor and BARO sensor enables the detection of malfunctioning sensors.

DTC Description

INFOID:0000000014268340

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1028	EXH PRESSURE SEN A (Exhaust pressure sensor A)	The output voltage of the exhaust gas pressure sensor 1 is out of specified range.

POSSIBLE CAUSE

- Harness or connectors (Exhaust gas pressure sensor 1 circuit.)
- Exhaust gas pressure sensor 1

FAIL-SAFE

ECM limits the amount control of fuel injected.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1028 is displayed with DTC P0473, P0642 or P0643, first perform the trouble diagnosis for DTC P0473, P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF.
3. Turn ignition switch ON and wait at least 10 seconds.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1008, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268341

1.CHECK DTC PRIORITY

If DTC P1028 is displayed with DTC P0473, P0642 or P0643, first perform the trouble diagnosis for DTC P0473, P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK EXHAUST GAS PRESSURE SENSOR CIRCUIT

Check exhaust gas pressure sensor circuit 1. Refer to [EC-983, "Diagnosis Procedure"](#).

P1028 EXHAUST GAS PRESSURE SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

>> INSPECTION END

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P1029 TC BOOST SENSOR

Description

INFOID:0000000014268342

The mutual diagnoses performed by comparing signals from exhaust gas pressure sensor 1, turbocharger boost sensor and BARO sensor enables the detection of malfunctioning sensors.

DTC Description

INFOID:0000000014268343

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1029	TC BOOST SENSOR A (Turbocharger boost sensor A)	The output voltage of the TC boost sensor is out of specified range.

POSSIBLE CAUSE

- Harness or connectors (TC boost sensor circuit)
- TC boost sensor

FAIL-SAFE

ECM limits the amount control of fuel injected.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1029 is displayed with DTC P0237, P0238, P0642 or P0643, first perform the trouble diagnosis for DTC P0237, P0238, P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF.
3. Turn ignition switch ON and wait at least 10 seconds.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1010, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268344

1.CHECK DTC PRIORITY

If DTC P1029 is displayed with DTC P0237, P0238, P0642 or P0643, first perform the trouble diagnosis for DTC P0237, P0238, P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.CHECK TURBOCHARGER BOOST SENSOR POWER SUPPLY CIRCUIT

1. Disconnect turbocharger boost sensor harness connector.
2. Turn ignition switch ON.

P1029 TC BOOST SENSOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

3. Check the voltage between turbocharger boost sensor harness connector and ground.

Turbocharger boost sensor		Ground	Voltage
Connector	Terminal		
E2	3	Ground	Approx. 5 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK TURBOCHARGER BOOST SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between turbocharger boost sensor harness connector and ECM harness connector.

Turbocharger boost sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E2	1	F54	100	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK TURBOCHARGER BOOST SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between turbocharger boost sensor harness connector and ECM harness connector.

Turbocharger boost sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E2	2	F54	94	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK TURBOCHARGER BOOST SENSOR

Check turbocharger boost sensor. Refer to [EC-1011, "Component Inspection \(Turbocharger Boost Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace turbocharger boost sensor. Refer to [EM-158, "Exploded View"](#).

Component Inspection (Turbocharger Boost Sensor)

INFOID:0000000014268345

1.CHECK TURBOCHARGER BOOST SENSOR

1. Turn ignition switch OFF.
2. Reconnect harness connectors disconnected.
3. Remove turbocharger boost sensor with its harness connected.
4. Use pump to apply pressure to sensor.
NOTE:
 - Always calibrate the pressure pump gauge when using it.
 - Inspection should be done at room temperature [10 – 30°C (50 - 86°F)].
5. Check the voltage between ECM harness connector.

P1029 TC BOOST SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

ECM			Condition (pressure gauge)	Voltage
Connector	+	–		
	Terminal	Terminal		
F54	94 (Turbocharger boost sensor signal)	100	0 kPa (0 mbar, 0 mmHg, 0 inHg)	Approx. 2.1 V
			40 kPa (400 mbar, 300 mmHg, 11.81 inHg)	Approx. 2.7 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace turbocharger boost sensor. Refer to [EM-158, "Exploded View"](#).

P102A BARO SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P102A BARO SENSOR

Description

INFOID:0000000014268346

The mutual diagnoses performed by comparing signals from exhaust gas pressure sensor 1, turbocharger boost sensor and BARO sensor enables the detection of malfunctioning sensors.

DTC Description

INFOID:0000000014268347

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P102A	BARO SENSOR A (BARO sensor A)	The output voltage of the BARO sensor is out of specified range.

POSSIBLE CAUSE

- Harness or connectors (BARO sensor circuit.)
- BARO sensor

FAIL-SAFE

ECM limits the amount control of fuel injected.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P102A is displayed with DTC P2228 or P2229, first perform the trouble diagnosis for DTC P2228 or P2229.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and warm it up to the normal operating temperature.
2. Turn ignition switch OFF.
3. Turn ignition switch ON and wait at least 10 seconds.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1013, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268348

1.CHECK DTC PRIORITY

If DTC P102A is displayed with DTC P2228 or P2229, first perform the trouble diagnosis for DTC P2228 or P2229.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK EXHAUST GAS PRESSURE SENSOR 1 CIRCUIT

Check exhaust gas pressure sensor circuit 1. Refer to [EC-983, "Diagnosis Procedure"](#).

Is inspection result normal?

P102A BARO SENSOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 3.
- NO >> Repair or replace the malfunctioning part.

3.CHECK TC BOOST SENSOR CIRCUIT

Check TC boost sensor circuit. Refer to [EC-964. "Diagnosis Procedure"](#).

Is inspection result normal?

- YES >> Replace ECM. Refer to [EC-1094. "Removal and Installation"](#).
- NO >> Repair or replace the malfunctioning part.

P102B EXHAUST GAS PRESSURE SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P102B EXHAUST GAS PRESSURE SENSOR 1

DTC Description

INFOID:0000000014268349

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P102B	EXHAUST GAS SYSTEM (Exhaust gas system)	A signal of exhaust gas pressure sensor 1 reaches the same value as atmospheric pressure.

POSSIBLE CAUSE

Poor installation of exhaust

FAIL-SAFE

ECM limits the amount control of fuel injected.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Start the engine and warm it up to the normal operating temperature.
2. Select "EXH LEAK DIAG1" in "DATA MONITOR" with CONSULT.
3. Drive the vehicle as per the following conditions for 10 seconds or more.

Vehicle speed	60 km/h (38 MPH) or more
Engine speed	Approx. 2,400 rpm

CAUTION:

Always drive safely.

4. Stop the vehicle.
5. Check that the "EXH LEAK DIAG1" indicates "CMPLT".

NOTE:

If the "EXH LEAK DIAG1" indicates "INCMP", perform Step 2 again.

6. Check 1st trip DTC.

Without CONSULT

1. Start the engine and warm it up to the normal operating temperature.
2. Drive the vehicle as per the following conditions for 10 seconds or more.

Vehicle speed	60 km/h (38 MPH) or more
Engine speed	Approx. 2,400 rpm

CAUTION:

Always drive safely.

3. Stop the vehicle.
4. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-1015, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268350

1. CHECK THE INSTALLATION CONDITION OF COMPONENT PART

P102B EXHAUST GAS PRESSURE SENSOR 1

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Check the installation condition of the exhaust system-related parts. Refer to [EX-12. "Removal and Installation"](#).

Is inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace the malfunctioning part.

P1268 P1269, P1270, P1271 FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P1268 P1269, P1270, P1271 FUEL INJECTOR

DTC Description

INFOID:0000000014268351

DTC DETECTION LOGIC

The MIL will not light up for these self-diagnoses.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1268	INJECTOR 1 (Injector 1)	The valve built into No. 1 cylinder fuel injector is not closed properly (stuck open) when the injector is not energized.
P1269	INJECTOR 2 (Injector 2)	The valve built into No. 2 cylinder fuel injector is not closed properly (stuck open) when the injector is not energized.
P1270	INJECTOR 3 (Injector 3)	The valve built into No. 3 cylinder fuel injector is not closed properly (stuck open) when the injector is not energized.
P1271	INJECTOR 4 (Injector 4)	The valve built into No. 4 cylinder fuel injector is not closed properly (stuck open) when the injector is not energized.

POSSIBLE CAUSE

- Harness or connectors (The fuel injector circuit is open or shorted.)
- Injector adjustment value
- Fuel injector

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle in safe manner according to traffic conditions and obey all traffic laws when driving.

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. DTC CONFIRMATION PROCEDURE-I

1. Start the engine and let it idle for about 15 minutes.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-1018, "Diagnosis Procedure"](#).

NO >> GO TO 3.

3. DTC CONFIRMATION PROCEDURE-II

With CONSULT

1. Turn ignition switch ON, and select "DATA MONITOR" mode with CONSULT.
2. Drive vehicle and maintain the following conditions for at least 60 seconds.

CKPS-RPM (TDC)	700 – 2,000 rpm (A constant rotation is maintained)
COOLAN TEMP/S	Less than 75°C (167°F)
Selector lever	D position (A/T) or Suitable position (M/T)
Accelerator pedal	Hold the accelerator pedal as steady as possible.

3. Check DTC.

Without CONSULT

1. Set voltmeter probes between ECM terminal 39 (engine coolant temperature sensor signal) and ground.
2. Restart engine and drive vehicle and maintain the following conditions for at least 60 seconds.

P1268 P1269, P1270, P1271 FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Engine speed	700 – 2,000 rpm (A constant rotation is maintained)
Engine coolant temperature sensor signal voltage	More than 0.6V
Selector lever	D position (A/T) or Suitable position (M/T)
Accelerator pedal	Hold the accelerator pedal as steady as possible.

3. Turn ignition switch OFF, wait at least 2 minutes and then turn ON.

4. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-1018, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268352

NOTE:

This diagnosis procedure must be used with CONSULT.

1.CHECK INJECTOR ADJUSTMENT VALUE

1. Turn ignition switch ON.
2. Select "ENTER INJECTR CALIB DATA" in "WORK SUPPORT" mode with CONSULT.
3. Check injector adjustment values displayed on CONSULT screen.

The value displayed on CONSULT screen should be same as injector adjustment value printed on each injector.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Perform Injector Adjustment Value Registration. Refer to [EC-905, "Description"](#).

2.CHECK FUEL INJECTOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect fuel injector harness connector.
4. Check harness continuity between the following terminals corresponding to the malfunctioning cylinder.

DTC	ECM		Fuel injector		Continuity
	Connector	Terminal	Connector	Terminal	
P1268	F54	82	F71 (Cylinder No.1)	1	Existed
P1269		106	F68 (Cylinder No.2)	1	
P1270		82	F69 (Cylinder No.3)	1	
P1271		106	F70 (Cylinder No.4)	1	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit in harness or connectors.

3.CHECK FUEL INJECTOR OUTPUT SIGNAL CIRCUIT FOR OPEN

Check harness continuity between the following terminals corresponding to the malfunctioning cylinder.

P1268 P1269, P1270, P1271 FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

DTC	ECM		Fuel injector		Continuity
	Connector	Terminal	Connector	Terminal	
P1268	F54	81	F71 (Cylinder No.1)	2	Existed
P1269		129	F68 (Cylinder No.2)	2	
P1270		104	F69 (Cylinder No.3)	2	
P1271		152	F70 (Cylinder No.4)	2	

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit in harness or connectors.

4.CHECK FUEL INJECTOR-I

Check fuel injector. Refer to [EC-1019, "Component Inspection \(Fuel Injector\)"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace fuel injector. Refer to [EM-174, "Removal and Installation"](#).

5.CHECK FUEL INJECTOR-II

1. Remove two fuel injectors.

NOTE:

One is from malfunctioning cylinder and the other is from any cylinder other than the malfunctioning cylinder.

2. Swap the two fuel injectors to the other cylinder.

3. Reconnect ECM harness connector and fuel injector harness connector.

4. Turn ignition switch ON.

5. Perform Injector Adjustment Value Registration. Refer to [EC-905, "Description"](#).

6. Erase DTC of ECM.

7. Perform DTC Confirmation Procedure. Refer to [EC-1017, "DTC Description"](#).

Is DTC displayed for the other cylinder?

YES >> Replace fuel injector of malfunctioning cylinder. Refer to [EM-174, "Removal and Installation"](#).

NO >> INSPECTION END

Component Inspection (Fuel Injector)

INFOID:0000000014268353

1.CHECK FUEL INJECTOR

1. Turn ignition switch OFF.

2. Disconnect fuel injector harness connector.

3. Check resistance between fuel injector terminals as follows.

Terminal	Resistance
1 and 2	0.2 – 0.8 Ω [at 10 – 60°C (50 – 140°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel injector. Refer to [EM-174, "Removal and Installation"](#).

P1272 FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P1272 FUEL PUMP

DTC Description

INFOID:0000000014268354

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1272	FRP RELIEF VALVE (Fuel rail pressure relief valve)	Fuel rail pressure relief valve is open because of fuel pressure control system malfunction.

POSSIBLE CAUSE

- Harness or connectors (Fuel pump control circuit is open or shorted.)
- Fuel pump
- Fuel pump suction control valve
- Fuel rail pressure sensor
- Fuel rail pressure relief valve
- Air mixed with fuel
- Lack of fuel

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).
- ECM stops the EGR volume control valve control (fully closed position).

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1272 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and keep engine speed more than 4,000 rpm for at least 5 seconds, then release the accelerator pedal.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1020, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268355

1.CHECK DTC PRIORITY

If DTC P1272 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK AIR MIXED WITH FUEL

P1272 FUEL PUMP

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

Check the fuel filter condition. Refer to [FL-26. "Disassembly and Assembly"](#).

Is fuel filter maintenance according to the manual?

- YES >> Perform air-bleeding from fuel line. Refer to [FL-23. "Air Bleeding"](#). And then, GO TO 3.
NO >> Maintenance fuel filter.

3.PERFORM FUEL PUMP LEARNING VALUE CLEARING

NOTE:

If the DTC is detected because of air mixed with fuel (i.e.: caused by lack of fuel), it may become normal by performing following procedure.

④With CONSULT

1. Turn ignition switch ON.
2. Perform "Fuel Pump Learning Value Clearing". Refer to [EC-904. "Description"](#).
3. Start engine and let it idle for at least 60 seconds.
4. Select "SELF-DIAG RESULT" mode with CONSULT.
5. Touch "ERASE".
6. Perform DTC confirmation procedure, again. Refer to [EC-1020. "DTC Description"](#).
7. Check DTC.

⑤Without CONSULT

1. Turn ignition switch ON.
2. Perform Fuel Pump Learning Value Clearing. Refer to [EC-904. "Description"](#).
3. Start engine and let it idle for at least 60 seconds.
4. Erase the Diagnostic Test Mode II (Self-diagnostic results) memory.
5. Perform DTC confirmation procedure, again. Refer to [EC-1020. "DTC Description"](#).
6. Check DTC.

Is 1st trip DTC displayed again?

- YES >> GO TO 4.
NO >> **INSPECTION END**

4.CHECK FUEL PUMP SUCTION CONTROL VALVE POWER SUPPLY CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and fuel pump suction control valve harness connectors.
3. Check harness continuity between ECM harness connector and fuel pump suction control valve harness connector.

ECM		Fuel pump suction control valve		Continuity
Connector	Terminal	Connector	Terminal	
E8	39	F82	2	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK FUEL PUMP SUCTION CONTROL VALVE GROUND CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM harness connector and fuel pump suction control valve harness connector.

ECM		Fuel pump suction control valve		Continuity
Connector	Terminal	Connector	Terminal	
E8	52	F82	1	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

P1272 FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

6. CHECK FUEL PUMP SUCTION CONTROL VALVE

Check fuel pump suction control valve. Refer to [EC-1022, "Component Inspection \(Fuel Pump Suction Control Valve\)"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

7. CHECK FUEL RAIL PRESSURE SENSOR

Check fuel rail pressure sensor. Refer to [EC-1022, "Component Inspection \(Fuel Rail Pressure Sensor\)"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

8. CHECK FUEL RAIL PRESSURE RELIEF VALVE

Check fuel rail pressure relief valve. Refer to [EC-1023, "Component Inspection \(Fuel Rail Pressure Relief Valve\)"](#).

Is the inspection result normal?

YES >> GO TO 9.

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

9. REPLACE SUCTION CONTROL VALVE OF FUEL PUMP

1. Replace suction control valve of fuel pump.
2. Perform fuel pump learning value clearing. Refer to [EC-904, "Description"](#).
3. Perform DTC confirmation procedure. Refer to [EC-1020, "DTC Description"](#).

Is 1st DTC detected?

YES >> Replace fuel pump. Refer to [EM-188, "Removal and Installation"](#).

NO >> INSPECTION END

Component Inspection (Fuel Pump Suction Control Valve)

INFOID:0000000014268356

1. CHECK FUEL PUMP SUCTION CONTROL VALVE

1. Turn ignition switch OFF.
2. Disconnect fuel pump suction control valve harness connector.
3. Check the resistance between fuel pump suction control valve terminals as follows.

Terminals	Resistance
1 and 2	1.8 – 2.4 Ω [at 20°C (68°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

Component Inspection (Fuel Rail Pressure Sensor)

INFOID:0000000014268357

1. CHECK FUEL RAIL PRESSURE SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connector disconnected.
3. Start engine and warm it up to normal operating temperature.
4. Check the voltage between ECM harness connector terminals as follows.

ECM			Condition	Voltage
Connector	+	-		
	Terminal	Terminal		
F54	115 (Fuel rail pressure sensor signal)	139	Idle	1.3 – 1.7 V
			2,000 rpm	1.7 – 2.0 V

P1272 FUEL PUMP

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel rail. Refer to [EM-174. "Exploded View"](#).

Component Inspection (Fuel Rail Pressure Relief Valve)

INFOID:0000000014268358

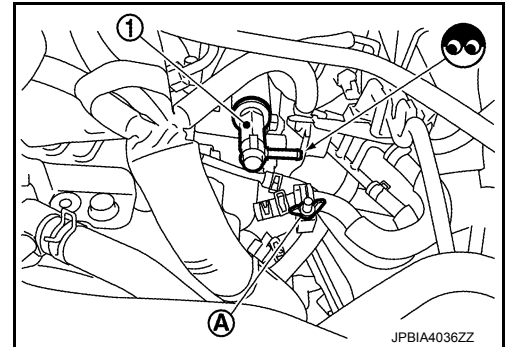
WARNING:

- Confirm that the engine is cooled down and there are no fire hazards near the vehicle.
- Prepare pans or saucers under the disconnected fuel line because the fuel may spill out.

1. CHECK FUEL RAIL PRESSURE RELIEF VALVE

With CONSULT

1. Turn ignition switch OFF.
2. Remove fuel hose from fuel rail pressure relief valve ①.
3. Attach a hose clip (A) or a blind cap to removed hose.
4. Turn ignition switch ON.
5. Select "PRES REGULATOR" in "ACTIVE TEST MODE" with CONSULT.
6. Start engine and keep engine speed 2,000 rpm.
7. Raise fuel pressure to 180 MPa with touching "UP" or "Qu" on the CONSULT screen.
8. Confirm that the fuel does not come out from the fuel rail pressure relief valve.

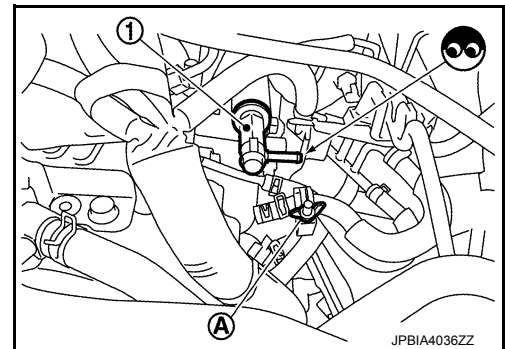


WARNING:

- Be careful not to allow leaked fuel to contaminate engine compartment. Especially, ensure to keep engine mount insulator clear of fuel.
- If the fuel comes out, stop the engine immediately.

Without CONSULT

1. Turn ignition switch OFF.
2. Remove fuel hose from fuel rail pressure relief valve ①.
3. Attach a hose clip (A) or a blind cap to removed hose.
4. Start engine and keep engine speed more than 4,000 rpm for at least 5 seconds.
5. Confirm that the fuel does not come out from the fuel rail pressure relief valve.



WARNING:

- Be careful not to allow leaked fuel to contaminate engine compartment. Especially, ensure to keep engine mount insulator clear of fuel.
- If the fuel comes out, stop the engine immediately.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel rail. Refer to [EM-174. "Exploded View"](#).

P1273 FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P1273 FUEL PUMP

DTC Description

INFOID:0000000014268359

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1273	FUEL PUMP (Fuel pump)	ECM detects the abnormal pulse of fuel pressure.

POSSIBLE CAUSE

- Harness or connectors (The fuel pump circuit is open or shorted.)
- Fuel pump
- Injector adjustment value
- Air mixed with fuel
- Lack of fuel

FAIL-SAFE

- ECM recognizes the accelerator pedal position for 10% and controls fuel injected.
- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1273 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and warm it up to normal operating temperature.
2. Keep engine speed more than 2,000 rpm for at least 10 seconds.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1024, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268360

NOTE:

This diagnosis procedure must be used with CONSULT.

1.CHECK DTC PRIORITY

If DTC P1273 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK INJECTOR ADJUSTMENT VALUE

P1273 FUEL PUMP

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch ON.
2. Select "ENTER INJECTR CALIB DATA" in "WORK SUPPORT" mode with CONSULT.
3. Check injector adjustment values displayed on CONSULT screen.

The value displayed on CONSULT screen should be same as injector adjustment value printed on each injector.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Perform "Injector Adjustment Value Registration". Refer to [EC-905, "Description"](#).

3.PERFORM FUEL PUMP LEARNING VALUE CLEARING

NOTE:

If the DTC is detected because of air mixed with fuel (i.e.: caused by lack of fuel), it may become normal by performing following procedure.

With CONSULT

1. Turn ignition switch ON.
2. Perform "Fuel Pump Learning Value Clearing". Refer to [EC-904, "Description"](#).
3. Start engine and let it idle for at least 60 seconds.
4. Select "SELF-DIAG RESULT" mode with CONSULT.
5. Touch "ERASE".
6. Perform DTC confirmation procedure, again. Refer to [EC-1024, "DTC Description"](#).
7. Check 1st trip DTC.

Is 1st trip DTC displayed again?

YES >> GO TO 4.

NO >> **INSPECTION END**

4.CHECK FUEL PUMP SUCTION CONTROL VALVE POWER SUPPLY CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and fuel pump suction control valve harness connectors.
3. Check harness continuity between ECM harness connector and fuel pump suction control valve harness connector.

ECM		Fuel pump suction control valve		Continuity
Connector	Terminal	Connector	Terminal	
E8	39	F82	2	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK FUEL PUMP SUCTION CONTROL VALVE GROUND CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM harness connector and fuel pump suction control valve harness connector.

ECM		Fuel pump suction control valve		Continuity
Connector	Terminal	Connector	Terminal	
E8	52	F82	1	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

6.CHECK FUEL PUMP SUCTION CONTROL VALVE

P1273 FUEL PUMP

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

Check fuel pump suction control valve. Refer to [EC-1026, "Component Inspection \(Fuel Pump Suction Control Valve\)"](#).

Is the inspection result normal?

YES >> Replace fuel pump. Refer to [EM-188, "Removal and Installation"](#).

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

Component Inspection (Fuel Pump Suction Control Valve)

INFOID:0000000014268361

1. CHECK FUEL PUMP SUCTION CONTROL VALVE

1. Turn ignition switch OFF.
2. Disconnect fuel pump suction control valve harness connector.
3. Check the resistance between fuel pump suction control valve terminals as follows.

Terminals	Resistance
1 and 2	1.8 – 2.4 Ω [at 20°C (68°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

P1274 FUEL PUMP

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

P1274 FUEL PUMP

DTC Description

INFOID:0000000014268362

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1274	FUEL PUMP (Fuel pump)	Fuel pressure is too much higher than the target value.

POSSIBLE CAUSE

- Harness or connectors (Fuel pump suction control valve circuit is open or shorted.)
- Fuel pump suction control valve
- Fuel pump
- Fuel rail pressure sensor

FAIL-SAFE

ECM stops the engine promptly.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1274 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let idle for at least 5 seconds.
2. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-1027, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268363

1.CHECK DTC PRIORITY

If DTC P1274 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK FUEL PUMP SUCTION CONTROL VALVE POWER SUPPLY CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and fuel pump suction control valve harness connectors.
3. Check harness continuity between ECM harness connector and fuel pump suction control valve harness connector.

P1274 FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

ECM		Fuel pump suction control valve		Continuity
Connector	Terminal	Connector	Terminal	
E8	39	F82	2	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK FUEL PUMP SUCTION CONTROL VALVE GROUND CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM harness connector and fuel pump suction control valve harness connector.

ECM		Fuel pump suction control valve		Continuity
Connector	Terminal	Connector	Terminal	
E8	52	F82	1	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK FUEL RAIL PRESSURE SENSOR

Check fuel rail pressure sensor. Refer to [EC-1028, "Component Inspection \(Fuel Rail Pressure Sensor\)"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

5.CHECK FUEL PUMP SUCTION CONTROL VALVE

Check fuel pump suction control valve. Refer to [EC-1028, "Component Inspection \(Fuel Pump Suction Control Valve\)"](#).

Is the inspection result normal?

YES >> Replace fuel pump. Refer to [EM-188, "Removal and Installation"](#).

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

Component Inspection (Fuel Pump Suction Control Valve)

INFOID:0000000014268364

1.CHECK FUEL PUMP SUCTION CONTROL VALVE

1. Turn ignition switch OFF.
2. Disconnect fuel pump suction control valve harness connector.
3. Check the resistance between fuel pump suction control valve terminals as follows.

Terminals	Resistance
1 and 2	1.8 – 2.4 Ω [at 20°C (68°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

Component Inspection (Fuel Rail Pressure Sensor)

INFOID:0000000014268365

1.CHECK FUEL RAIL PRESSURE SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connector disconnected.

P1274 FUEL PUMP

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

3. Start engine and warm it up to normal operating temperature.
4. Check the voltage between ECM harness connector terminals as follows.

ECM			Condition	Voltage
Connector	+	-		
	Terminal	Terminal		
F54	115 (Fuel rail pressure sensor signal)	139	Idle	1.3 – 1.7 V
			2,000 rpm	1.7 – 2.0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

A

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P

P1275 FUEL PUMP

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

P1275 FUEL PUMP

DTC Description

INFOID:0000000014268366

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1275	FUEL PUMP (Fuel pump)	Fuel pressure is too much higher than the target value.

POSSIBLE CAUSE

- Harness or connectors (Fuel pump suction control valve circuit is open or shorted.)
- Fuel pump suction control valve
- Fuel pump
- Fuel rail pressure sensor

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1275 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and warm it up to normal operating temperature.
2. Keep engine speed more than 2,000 rpm for at least 60 seconds.
3. Check DTC.

Is DTC detected?

- YES >> Proceed to [EC-1030, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268367

1.CHECK DTC PRIORITY

If DTC P1275 is displayed with DTC P0642 or P0643, first perform the trouble diagnosis for DTC P0642 or P0643.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK FUEL PUMP SUCTION CONTROL VALVE POWER SUPPLY CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and fuel pump suction control valve harness connectors.
3. Check harness continuity between ECM harness connector and fuel pump suction control valve harness connector.

P1275 FUEL PUMP

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

ECM		Fuel pump suction control valve		Continuity
Connector	Terminal	Connector	Terminal	
E8	39	F82	2	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK FUEL PUMP SUCTION CONTROL VALVE GROUND CIRCUIT FOR OPEN AND SHORT

1. Check harness continuity between ECM harness connector and fuel pump suction control valve harness connector.

ECM		Fuel pump suction control valve		Continuity
Connector	Terminal	Connector	Terminal	
E8	52	F82	1	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK FUEL RAIL PRESSURE SENSOR

Check fuel rail pressure sensor. Refer to [EC-1031, "Component Inspection \(Fuel Rail Pressure Sensor\)"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

5.CHECK FUEL PUMP SUCTION CONTROL VALVE

Check fuel pump suction control valve. Refer to [EC-1031, "Component Inspection \(Fuel Pump Suction Control Valve\)"](#).

Is the inspection result normal?

YES >> Replace fuel pump. Refer to [EM-188, "Removal and Installation"](#).

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

Component Inspection (Fuel Pump Suction Control Valve)

INFOID:0000000014268368

1.CHECK FUEL PUMP SUCTION CONTROL VALVE

1. Turn ignition switch OFF.
2. Disconnect fuel pump suction control valve harness connector.
3. Check the resistance between fuel pump suction control valve terminals as follows.

Terminals	Resistance
1 and 2	1.8 – 2.4 Ω [at 20°C (68°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel pump suction control valve. Refer to [EM-193, "Disassembly and Assembly"](#).

Component Inspection (Fuel Rail Pressure Sensor)

INFOID:0000000014268369

1.CHECK FUEL RAIL PRESSURE SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connector disconnected.

P1275 FUEL PUMP

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

3. Start engine and warm it up to normal operating temperature.
4. Check the voltage between ECM harness connector terminals as follows.

ECM			Condition	Voltage
Connector	+	-		
	Terminal	Terminal		
F54	115 (Fuel rail pressure sensor signal)	139	Idle	1.3 – 1.7 V
			2,000 rpm	1.7 – 2.0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel rail. Refer to [EM-174, "Exploded View"](#).

P1409 EGR COOLER BYPASS VALVE

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

P1409 EGR COOLER BYPASS VALVE

DTC Description

INFOID:0000000014268370

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1409	EGR COOLING BYPASS/V (EGR cooling bypass valve)	Extremely high temperatures indicated by a signal from the IAT sensor 2 during travel.

NOTE:

Refer to [EC-803. "How to Check Vehicle Type"](#), for the information of type 1 and 2.

POSSIBLE CAUSE

- EGR cooler (type 2 is not applicable)
- Engine coolant leak
- Charge air cooler poor radiation
- TC system
- Throttle valve system
- EGR volume control system (type 2 is not applicable)
- Catalyst

FAIL-SAFE

ECM stops the EGR volume control valve control (fully closed position).

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1409 is displayed with DTC P0097, P0098, P2426 or P2427, first perform the trouble diagnosis for DTC P0097, P0098, P2426 or P2427.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869. "DTC Index"](#).
NO >> GO TO 2.

2.PERFORM DIAGNOSIS PROCEDURE

NOTE:

Since this DTC is difficult to be confirmed, check possible causes to judge the normality.

Is inspection result normal?

- YES >> Proceed to [EC-1033. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896. "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268371

1.CHECK DTC PRIORITY

If DTC P1409 is displayed with DTC P0097, P0098, P2426 or P2427, first perform the trouble diagnosis for DTC P0097, P0098, P2426 or P2427.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869. "DTC Index"](#).
NO >> GO TO 2.

2.CHECK DTC

1. Check self-diagnosis results to see that the following systems have no malfunction.
 - TC system
 - Throttle valve system
 - EGR volume control valve system (type 2 is not applicable)

Is inspection result normal?

- YES >> GO TO 3.

P1409 EGR COOLER BYPASS VALVE

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Check error-detected system.

3.CHECK EGR COOLER BYPASS SYSTEM

Perform trouble diagnosis for EGR cooler bypass system. Refer to [EC-1067, "Component Function Check"](#).

NOTE:

Type 2 is not applicable. Go to step 4.

Is inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning part.

4.CHECK ENGINE COOLANT LEAK

1. Turn ignition switch OFF.

2. Check that the engine coolant level is normal.

3. Check water hose and EGR cooler for clogging, cracks or improper connection.

Is inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace the malfunctioning part.

5.CHECK CHARGE AIR COOLER

Check the charge air cooler fin for crushing and clogging.

Inspection result normal?

YES >> GO TO 6.

NO >> Replace charge air cooler. Refer to [EM-158, "Removal and Installation"](#).

6.CHECK CATALYST

1. Remove catalyst. Refer to [EM-166, "Removal and Installation"](#).

2. Check them for crushing and clogging.

Is inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace the malfunctioning part.

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P1572 ASCD BRAKE SWITCH

DTC Description

INFOID:0000000014664402

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1572	ASCD BRAKE SW (ASCD brake switch)	Brake pedal position switch signal is not sent to ECM for extremely long time while the vehicle is driving.

POSSIBLE CAUSE

- Harness or connectors
- Stop lamp switch circuit is shorted.
- Brake pedal position switch circuit is shorted.
- Clutch pedal position switch circuit is shorted.
- Stop lamp switch
- Brake pedal position switch
- Clutch pedal position switch
- Incorrect stop lamp switch installation
- Incorrect brake pedal position switch installation
- Incorrect clutch pedal position switch installation
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P1572 is displayed with DTC P0605, P0606 and P0607, first perform the trouble diagnosis for DTC P0605, P0606 and P0607.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).

NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION

1. Start engine.
2. Press MAIN switch and make sure that CRUISE indicator is displayed in combination meter.
3. Drive the vehicle for at least 5 consecutive seconds as per the following conditions.

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle. If a road test is expected to be easier, it is unnecessary to lift the vehicle.

Vehicle speed	More than 30 km/h (19 mph)
Selector lever	Suitable position

4. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-1036, "Diagnosis Procedure"](#).

NO >> GO TO 4.

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

4.PERFORM DTC CONFIRMATION PROCEDURE FOR MALFUNCTION

1. Drive the vehicle for at least 5 consecutive seconds as per the following conditions.

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

**This procedure may be conducted with the drive wheels lifted in the shop or by driving the vehicle.
If a road test is expected to be easier, it is unnecessary to lift the vehicle.**

Vehicle speed	More than 30 km/h (19 mph)
Selector lever	Suitable position
Driving location	Depress the brake pedal for more than five seconds so as not to come off from the above-mentioned vehicle speed.

2. Check DTC.

Is DTC detected?

YES >> Proceed to [EC-1036, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [GI-45, "Intermittent Incident"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014664403

1.CHECK DTC PRIORITY

If DTC P1572 is displayed with DTC P0605, P0606 and P0607, first perform the trouble diagnosis for DTC P0605, P0606 and P0607.

Is applicable DTC detected?

YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).

NO >> GO TO 2.

2.CHECK OVERALL FUNCTION-1

 With CONSULT

1. Turn ignition switch ON.
2. Select "BRAKE SW" in "DATA MONITOR" mode of "ENGINE" using CONSULT.
3. Check "BRAKE SW" indication as per the following conditions.

Monitor item	Condition		Indication
BRAKE SW	Brake pedal	Slightly depressed	OFF
		Fully released	ON

 Without CONSULT

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals as per the following.

ECM		Ground	Condition		Voltage
Connector	Terminal				
E8	19	Ground	Brake pedal	Fully released	Approx. 0 V
				Slightly depressed	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3.CHECK OVERALL FUNCTION-2

 With CONSULT

Select "BRAKE SW2" and check indication as per the following conditions.

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Monitor Item	Condition		Indication
BRAKE SW2	Brake pedal (Clutch is released.)	Fully released	ON
		Slightly depressed	OFF
	Clutch pedal (Brake pedal is released.)	Fully released	ON
		Slightly depressed	OFF

⊗ Without CONSULT

Check the voltage between ECM harness connector terminals as per the following conditions.

ECM		Ground	Condition		Voltage
Connector	Terminal				
F54	75	Ground	Brake pedal (Clutch is released.)	Fully released	Battery voltage
				Slightly depressed	Approx. 0 V
			Clutch pedal (Brake pedal is released.)	Fully released	Battery voltage
				Slightly depressed	Approx. 0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 8.

4.CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Check the stop lamp when depressing and releasing the brake pedal.

Brake pedal	Stop lamp
Fully released	Not illuminated
Slightly depressed	Illuminated

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 5.

5.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Disconnect stop lamp switch harness connector.
2. Check the voltage between stop lamp switch harness connector and ground.

+		-	Voltage
Stop lamp switch			
Connector	Terminal		
E56	1	Ground	Battery voltage

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace error-detected part.

6.CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Disconnect stop lamp switch harness connector.
2. Disconnect ECM harness connector.
3. Check harness continuity between stop lamp switch harness connector and ECM harness connector.

P1572 ASCD BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

+		-		Continuity
Stop lamp switch		ECM		
Connector	Terminal	Connector	Terminal	
E56	2	E8	19	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace error-detected part.

7.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to [EC-1039, "Component Inspection \(Stop Lamp Switch\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to [BR-20, "Exploded View"](#).

8.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect brake pedal position switch harness connector.
3. Check the voltage between brake pedal position switch harness connector and ground.

+		–	Voltage
Brake pedal position switch			
Connector	Terminal		
E37	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 9.

NO >> Perform the trouble diagnosis for power supply circuit.

9.CHECK BRAKE PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT-1

1. Disconnect ECM harness connector.
2. Check the continuity between brake pedal position switch harness connector and ECM harness connector.

+		-		Continuity
Brake pedal position switch		ECM		
Connector	Terminal	Connector	Terminal	
E37	2	F54	75	Existed

3. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

10.CHECK BRAKE PEDAL POSITION SWITCH INPUT SIGNAL CIRCUIT-2

1. Disconnect clutch pedal position switch harness connector.
2. Check the continuity between brake pedal position switch harness connector and clutch pedal position switch harness connector.

+		-		Continuity
Brake pedal position switch		Clutch pedal position switch		
Connector	Terminal	Connector	Terminal	
E37	2	E43	1	Existed

P1572 ASCD BRAKE SWITCH

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

11.CHECK BRAKE PEDAL POSITION SWITCH POWER SUPPLY

1. Disconnect ECM harness connector.
2. Check the voltage between clutch pedal position switch harness connector and ECM harness connector.

Clutch pedal position switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E43	2	F54	75	Existed

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

12.CHECK CLUTCH PEDAL POSITION SWITCH

Check clutch pedal position switch. Refer to [EC-1040, "Component Inspection \(Clutch Pedal Position Switch\)"](#)

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace clutch pedal position switch. Refer to [CL-14, "Exploded View"](#).

13.CHECK BRAKE PEDAL POSITION SWITCH

Check brake pedal position switch. Refer to [EC-1039, "Component Inspection \(Brake Pedal Position Switch\)"](#)

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20, "Exploded View"](#).

Component Inspection (Brake Pedal Position Switch)

INFOID:0000000014664404

1.CHECK BRAKE PEDAL POSITION SWITCH

1. Adjust brake pedal position switch installation. Refer to [BR-10, "Adjustment"](#).
2. Turn ignition switch OFF.
3. Disconnect brake pedal position switch harness connector.
4. Check the continuity between brake pedal position switch terminals as per the following conditions.

Terminals	Condition		Continuity
1 and 2	Brake pedal	Fully released	Existed
		Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace brake pedal position switch. Refer to [BR-20, "Exploded View"](#).

Component Inspection (Stop Lamp Switch)

INFOID:0000000014664405

1.CHECK STOP LAMP SWITCH

1. Adjust stop lamp switch installation. Refer to [BR-10, "Adjustment"](#).
2. Turn ignition switch OFF.
3. Disconnect stop lamp switch harness connector.
4. Check the continuity between stop lamp switch terminals as per the following conditions.

Terminals	Condition		Continuity
1 and 2	Brake pedal	Fully released	Not existed
		Slightly depressed	Existed

Is the inspection result normal?

P1572 ASCD BRAKE SWITCH

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to [BR-20, "Exploded View"](#).

Component Inspection (Clutch Pedal Position Switch)

INFOID:0000000014664406

1. CHECK CLUTCH PEDAL POSITION SWITCH

1. Adjust clutch pedal position switch installation. Refer to [CL-9, "Inspection and Adjustment"](#).
2. Turn ignition switch OFF.
3. Disconnect clutch pedal position switch harness connector.
4. Check the continuity between clutch pedal position switch terminals as per the following conditions.

Terminals	Condition		Continuity
1 and 2	Clutch pedal	Fully released	Existed
		Slightly depressed	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace clutch pedal position switch. Refer to [CL-14, "Exploded View"](#).

P1616 ECM

DTC Description

INFOID:000000014268372

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1616	ECM (Engine control module)	ECM ROM is malfunctioning.

POSSIBLE CAUSE

ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 second.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1041, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:000000014268373

1. DTC CONFIRMATION

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure. Refer to [EC-1041, "DTC Description"](#).
4. Check the DTC.

Is the DTC displayed again?

- YES >> Replace ECM. Refer to [EC-1094, "Removal and Installation"](#).
 NO >> INSPECTION END

P1622 INJECTOR ADJUSTMENT VALUE

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P1622 INJECTOR ADJUSTMENT VALUE

DTC Description

INFOID:0000000014268374

DTC DETECTION LOGIC

The MIL will not light up for this self-diagnosis.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1622	INJ ADJ VAL UNRGST (Injector adjustment value unregistration)	Injector adjustment value is not stored in ECM.

POSSIBLE CAUSE

Injector adjustment value

(Injector adjustment value has not been written onto ECM memory yet, or the value has been initialized.)

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Wait at least 5 seconds.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1042. "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896. "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268375

1. PERFORM INJECTOR ADJUSTMENT VALUE REGISTRATION

Perform "Injector Adjustment Value Registration". Refer to [EC-905. "Description"](#).

>> **INSPECTION END**

P1623 INJECTOR ADJUSTMENT VALUE

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P1623 INJECTOR ADJUSTMENT VALUE

DTC Description

INFOID:0000000014268376

DTC DETECTION LOGIC

The MIL will not light up for this self-diagnosis.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1623	INJ ADJ VAL ERROR (Injector adjustment value error)	ECM detects the abnormal value of injector adjustment value.

NOTE:

This DTC is not detected when injector adjustment value (not correct but existent) is stored in ECM.

POSSIBLE CAUSE

- CONSULT communication status
(The status of CONSULT communication becomes improper during Injector Adjustment Value Registration.)
- ECM

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1043, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268377

NOTE:

This diagnosis procedure must be used with CONSULT.

1. CHECK INJECTOR ADJUSTMENT VALUE

1. Turn ignition switch ON.
2. Select "ENTER INJCTR CALIB DATA" in "WORK SUPPORT" mode with CONSULT.
3. Check injector adjustment values displayed on CONSULT screen.

The value displayed on CONSULT screen should be same as injector adjustment value printed on each injector.

Is the inspection result normal?

- YES >> **INSPECTION END**
- NO >> GO TO 2.

2. PERFORM INJECTOR ADJUSTMENT VALUE REGISTRATION

Perform "Injector Adjustment Value Registration". Refer to [EC-905, "Description"](#).

NOTE:

When two or more injector adjustment value are improper, it is useful to perform "INJ ADJ VAL CLR" in "WORK SUPPORT" mode with CONSULT. And then perform "Injector Adjustment Value Registration".

P1623 INJECTOR ADJUSTMENT VALUE

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

>> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

1. Select "SELF DIAG RESULTS" mode with CONSULT.
2. Touch "ERASE".
3. Perform DTC confirmation procedure, again. Refer to [EC-1043, "DTC Description"](#).
4. Check DTC.

Is the DTC displayed again?

- YES >> Replace ECM. Refer to [EC-1094, "Removal and Installation"](#).
NO >> **INSPECTION END**

P1805 BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P1805 BRAKE SWITCH

DTC Description

INFOID:0000000014268378

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P1805	BRAKE SWITCH (Brake switch)	Stop lamp signal is not sent to ECM for extremely long time while the vehicle is driving.

POSSIBLE CAUSE

- Harness or connectors (Stop lamp switch circuit is open or shorted.)
- Stop lamp switch

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

NOTE:

Since this DTC is difficult to be confirmed, check component function to judge the normality.

Is the inspection result normal?

- YES >> GO TO 2.
- NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

2.CHECK BRAKE SWITCH FUNCTION

With CONSULT

1. Turn ignition switch ON.
2. Select "BRAKE SW" in "DATA MONITOR" mode with CONSULT.
3. Check "BRAKE SW" indication under the following conditions.

Monitor item	Condition		Indication
BRAKE SW	Brake pedal	Slightly depressed	ON
		Fully released	OFF

Without CONSULT

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals as per the following.

+		−	Condition		Voltage
ECM					
Conne- ctor	Terminal				
E8	19	Ground	Brake pedal	Slightly de- pressed	Battery voltage
				Fully released	Approx. 0 V

Is the inspection result normal?

- YES-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
- YES-2 >> Confirmation after repair: INSPECTION END
- NO >> Proceed to [EC-1046, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000014268379

1.CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Check the stop lamp when depressing and releasing the brake pedal.

Brake pedal	Stop lamp
Fully released	Not illuminated
Slightly depressed	Illuminated

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Disconnect stop lamp switch harness connector.
2. Check the voltage between stop lamp switch harness connector and ground.

+		-	Voltage
Stop lamp switch			
Connector	Terminal		
E56	1	Ground	Battery voltage

3. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning part.

3.CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT

1. Disconnect stop lamp switch harness connector.
2. Disconnect ECM harness connector.
3. Check harness continuity between stop lamp switch harness connector and ECM harness connector.

Stop lamp switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E56	2	E8	19	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning part.

4.CHECK STOP LAMP SWITCHCheck stop lamp switch. Refer to [EC-1046. "Component Inspection \(Stop Lamp Switch\)".](#)Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to [BR-20. "Exploded View".](#)**Component Inspection (Stop Lamp Switch)**

INFOID:000000014268380

1.CHECK STOP LAMP SWITCH

1. Adjust stop lamp switch installation. Refer to [BR-10. "Adjustment".](#)
2. Turn ignition switch OFF.
3. Disconnect stop lamp switch harness connector.
4. Check the continuity between stop lamp switch terminals under the following conditions.

P1805 BRAKE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Terminals	Condition		Continuity
1 and 2	Brake pedal	Fully released	Not existed
		Slightly depressed	Existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace stop lamp switch. Refer to [BR-20. "Exploded View"](#).

A

EC

C

D

E

F

G

H

I

J

K

L

M

N

O

P

P2135 APP SENSOR

DTC Description

INFOID:0000000014268382

DTC DETECTION LOGIC

The MIL will not light up for this self-diagnosis.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2135	APP SENSOR (Throttle/Pedal position sensor/switch "A"/ "B" voltage correlation)	The correlation between APP sensor 1 signal and APP sensor 2 signal is out of the normal range.

POSSIBLE CAUSE

- Harness or connectors (The APP sensor circuit is open or shorted.)
- Accelerator pedal position sensor

FAIL-SAFE

ECM recognizes the accelerator pedal position for 10% and controls fuel injected.

DTC CONFIRMATION PROCEDURE

1.CHECK DTC PRIORITY

If DTC P2135 is displayed with DTC P0642, P0643, P0652 or P0653, first perform the trouble diagnosis for DTC P0642, P0643, P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Depress accelerator pedal slowly spending 5 seconds, and then release it slowly spending 5 seconds.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1048, "Diagnosis Procedure"](#).
 NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
 NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268383

1.CHECK DTC PRIORITY

If DTC P2135 is displayed with DTC P0642, P0643, P0652 or P0653, first perform the trouble diagnosis for DTC P0642, P0643, P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2.CHECK APP SENSOR POWER SUPPLY CIRCUIT

1. Disconnect accelerator pedal position (APP) sensor harness connector.
2. Turn ignition switch ON.
3. Check the voltage between APP sensor harness connector and ground.

P2135 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

APP sensor		Ground	Voltage
Connector	Terminal		
E5	1	Ground	Approx. 5 V
	2		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

3.CHECK APP SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E5	4	E8	47	Existed
	5		34	

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK APP SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between APP sensor harness connector and ECM harness connector.

APP sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E5	3	E8	48	Existed
	6		35	

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

5.CHECK APP SENSOR

Check APP sensor. Refer to [EC-1049, "Component Inspection \(Accelerator Pedal Position Sensor\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3, "Removal and Installation"](#).

Component Inspection (Accelerator Pedal Position Sensor)

INFOID:0000000014268384

1.CHECK ACCELERATOR PEDAL POSITION SENSOR

1. Turn ignition switch OFF.
2. Reconnect all harness connectors disconnected.
3. Turn ignition switch ON.
4. Check the voltage between ECM harness connector.

P2135 APP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

(+) (V)		(-) (V)		Condition		Voltage	
Connector	Terminal	Connector	Terminal				
E8	48 (APP sensor 1 signal)	E8	47	Accelerator pedal	Fully released	0.65 – 0.87 V	
					Fully depressed	More than 4.3 V	
	35 (APP sensor 2 signal)		34	Accelerator pedal	Fully released	0.28 – 0.48 V	
					Fully depressed	More than 2.0 V	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace accelerator pedal assembly. Refer to [ACC-3. "Removal and Installation"](#).

P2146, P2149 FUEL INJECTOR POWER SUPPLY

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P2146, P2149 FUEL INJECTOR POWER SUPPLY

DTC Description

INFOID:0000000014268385

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2146	INJ PWR/CIRC (Fuel injector group "A" supply voltage circuit/open)	An improper voltage signal is sent to ECM through No. 1 and 4 cylinder fuel injector.
P2149	INJ PWR/CIRC (Fuel injector group "B" supply voltage circuit/open)	An improper voltage signal is sent to ECM through No. 2 and 3 cylinder fuel injector.

POSSIBLE CAUSE

Harness or connectors (The fuel injector circuit is open.)

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1051, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268386

1.CHECK FUEL INJECTOR POWER SUPPLY CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Disconnect fuel injector harness connector.
4. Check the continuity between fuel injector harness connector and ECM harness connector.

Fuel injector			ECM		Continuity
Cylinder	Connector	Terminal	Connector	Terminal	
1	F71	1	F54	82	Existed
2	F68	1		106	
3	F69	1		82	
4	F70	1		106	

5. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

P2147, P2148 FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P2147, P2148 FUEL INJECTOR

DTC Description

INFOID:0000000014268387

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2147	INJECTOR/CIRC (Fuel injector group "A" supply voltage circuit low)	ECM detects the fuel injector circuit is shorted to ground.
P2148	INJECTOR/CIRC (Fuel injector group "A" supply voltage circuit high)	ECM detects the fuel injector circuit is shorted to power.

POSSIBLE CAUSE

Harness or connectors (The fuel injector circuit is shorted.)

FAIL-SAFE

- ECM limits the amount control of fuel injected.
- ECM limits fuel rail pressure control (upper limit).

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start engine and let it idle for at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Refer to [EC-1052, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268388

Perform the trouble diagnosis for fuel injector circuit. Refer to [EC-1069, "Diagnosis Procedure"](#).

P2228, P2229 BARO SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P2228, P2229 BARO SENSOR

DTC Description

INFOID:0000000014268389

DTC DETECTION LOGIC

The MIL will not light up for these self-diagnoses.

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2228	BARO SEN/CIRC (Barometric pressure sensor "A" circuit low)	An excessively low voltage from the barometric pressure sensor (built-into ECM) is sent to ECM.
P2229	BARO SEN/CIRC (Barometric pressure sensor "A" circuit high)	An excessively high voltage from the barometric pressure sensor (built-into ECM) is sent to ECM.

POSSIBLE CAUSE

BARO sensor (built-into ECM)

FAIL-SAFE

Not applicable

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON and wait at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

- YES >> Proceed to [EC-1053, "Diagnosis Procedure"](#).
NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268390

1. DTC CONFIRMATION

1. Turn ignition switch ON.
2. Erase DTC.
3. Perform DTC confirmation procedure. Refer to [EC-1053, "DTC Description"](#).
4. Check the DTC.

Is the DTC displayed again?

- YES >> Replace ECM. Refer to [EC-1094, "Removal and Installation"](#).
NO >> INSPECTION END

P2426, P2427 EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P2426, P2427 EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE

DTC Description

INFOID:0000000014268391

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2426	EGR COOLING VALVE (Exhaust gas recirculation cooling valve control circuit low)	Short circuit between ECM and the EGR cooler bypass valve control solenoid valve circuit ground continues for 2 seconds or more.
P2427	EGR COOLING VALVE (Exhaust gas recirculation cooling valve control circuit high)	Short circuit between ECM and the battery power supply of the EGR cooler bypass valve control solenoid valve circuit continues for 2 seconds or more.

POSSIBLE CAUSE

- Harness or connectors (EGR cooler bypass valve control solenoid valve circuit is open or shorted.)
- EGR cooler bypass valve control solenoid valve

FAIL-SAFE

ECM stops the EGR volume control valve control (fully closed position).

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE-I

1. Start engine and let it idle for at least 5 seconds.
2. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-1054, "Diagnosis Procedure"](#).

NO >> GO TO 3.

3.PERFORM DTC CONFIRMATION PROCEDURE-II

1. Warm up the engine to normal operating temperature.
2. Keep the engine speed above 2,500 rpm for 5 seconds.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> Proceed to [EC-1054, "Diagnosis Procedure"](#).

NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268392

1.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect EGR cooler bypass valve control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check the voltage between EGR cooler bypass valve control solenoid valve harness connector and ground.

P2426, P2427 EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

+		-	Voltage
EGR cooler bypass valve control solenoid valve			
Connector	Terminal		
F79	2	Ground	Battery voltage

5. Also check harness for short to ground.

Is inspection result normal?

YES >> GO TO 2.

NO >> Perform the trouble diagnosis for power supply circuit.

2.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EGR cooler bypass valve harness connector and ECM harness connector.

+		-		Continuity
EGR cooler bypass valve control solenoid valve		ECM		
Connector	Terminal	Connector	Terminal	
F79	1	F54	84	Existed

4. Also check harness for short to ground and to power.

Is inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning part.

3.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE

1. Turn ignition switch OFF.
2. Perform [EC-1068, "Component Inspection \(EGR Cooler Bypass Valve Control Solenoid Valve\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EGR cooler bypass valve control solenoid valve. Refer to [EM-164, "Removal and Installation"](#).

Component Inspection (EGR Cooler Bypass Valve Control Solenoid Valve) INFOID:0000000014268393

1.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE

1. Turn ignition switch OFF.
2. Disconnect EGR cooler bypass valve control solenoid valve harness connector.
3. Check the resistance between EGR cooler bypass valve control solenoid valve terminals as follows.

Terminals	Resistance
1 and 2	43 – 49 Ω [at 25°C (77°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EGR cooler bypass valve control solenoid valve. Refer to [EM-164, "Removal and Installation"](#).

P2478 EGT SENSOR 1

DTC Description

INFOID:0000000014268394

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition
P2478	EGT SENSOR 1 B1 (Exhaust gas temperature out of range bank 1 sensor 1)	Exhaust gas temperature around the turbocharger exhaust side entrance remains 862°C (1584°F) or more for 2 seconds or more.

POSSIBLE CAUSE

- Charge air system
- EGT sensor 1

FAIL-SAFE

ECM limits the amount control of fuel injected.

DTC CONFIRMATION PROCEDURE

1. CHECK DTC PRIORITY

If DTC P2478 is detected with a diagnosis result of EGT sensor 1, perform EGT sensor 1 diagnosis first.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
 NO >> GO TO 2.

2. PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 3.

3. PERFORM DTC CONFIRMATION PROCEDURE

 With CONSULT

1. Turn ignition switch ON.
2. Select "ENGINE STATUS" of "DATA MONITOR" with CONSULT.
3. Start the engine and drive the vehicle with the constant accelerator pedal depression to maintain a constant vehicle speed.

CAUTION:

- Always drive safely.
- Never allow engine speed to be changed by 2 rpm/s or more.

NOTE:

- Vehicle speed and engine speed can be set arbitrarily.
- For better results, drive under high-load conditions.

4. Check that "ENGINE STATUS" indicates "STEADY".

NOTE:

If "ENGINE STATUS" indicates "TRNST", drive under steady engine revolution.

5. Keep the condition above for 5 seconds.
6. Check DTC.

 Without CONSULT

1. Start the engine and drive the vehicle with the constant accelerator pedal depression to maintain a constant vehicle speed for 5 seconds.

CAUTION:

- Always drive safely.
- Never allow engine speed to be changed by 2 rpm/s or more.

NOTE:

- Vehicle speed and engine speed can be set arbitrarily.
- For better results, drive under high-load conditions.

2. Check DTC.

P2478 EGT SENSOR 1

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

Is DTC detected?

- YES >> Proceed to [EC-1057, "Diagnosis Procedure"](#).
- NO-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).
- NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000014268395

EC

1.CHECK FOR CHARGE AIR LEAK

1. Start engine and let it idle.
2. Listen for an charge air leak.

Is intake air leak detected?

- YES >> Repair or replace the malfunctioning part.
- NO >> GO TO 2.

2.CHECK EGT SENSOR 1

1. Check the installation condition of EGT sensor 1. Refer to [EC-810, "Component Parts Location"](#).
2. Remove EGT sensor 1 and visually check for malfunction.

Is inspection result normal?

- YES >> INSPECTION END
- NO >> Repair or replace the malfunctioning part.

P2554 INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P2554 INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

DTC Logic

INFOID:0000000014268396

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P2554	THROTTLE/FUEL INHIBIT (Throttle/Fuel inhibit circuit low)	Short circuit between ECM and the intake air control valve control solenoid valve circuit ground continues for 2 seconds or more.	• Harness or connectors (Intake air control valve control solenoid valve circuit is open or shorted.) • Intake air control valve control solenoid valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Wait at least 2 seconds.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> INSPECTION END

NO >> Proceed to [EC-1058, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268397

1.CHECK OVERALL FUNCTION

1. Start engine and let it idle.
2. Make sure that intake air control valve actuator rod moves when turning ignition switch OFF.

Is inspection result normal?

YES >> **INSPECTION END**

NO >> GO TO 2.

2.CHECK VACUUM SOURCE

1. Turn ignition switch OFF.
2. Disconnect vacuum hose connected to intake air control valve actuator.
3. Start engine and let it idle.
4. Check vacuum hose for vacuum existence under the following conditions.

CONDITIONS	vacuum
For a few seconds after turning ignition switch OFF	should exist
Except above	should not exist

Is inspection result normal?

YES >> GO TO 8.

NO >> GO TO 3.

3.CHECK VACUUM HOSE

1. Turn ignition switch OFF.

P2554 INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

[YD25DDTi]

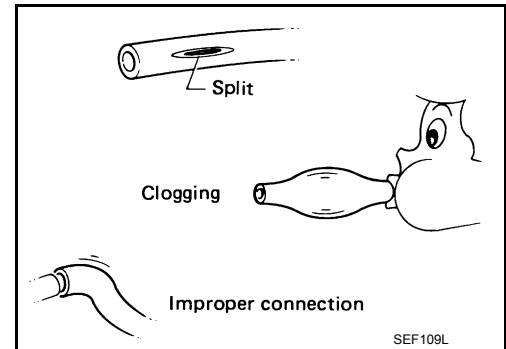
< DTC/CIRCUIT DIAGNOSIS >

2. Check vacuum hoses and vacuum gallery for clogging, cracks or improper connection.

Refer to [EC-1096, "Hydraulic Layout"](#).

Is inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace vacuum hoses and vacuum gallery.



4. CHECK INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect intake air control valve control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check voltage between intake air control valve control solenoid valve harness connector and ground.

Intake air control valve control solenoid valve		Ground	Voltage
Connector	Terminal		
F78	2	Ground	Battery voltage

Is inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5. CHECK INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM harness connector and intake air control valve control solenoid valve harness connector.

Intake air control valve control solenoid valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F78	1	F54	62	Existed

4. Also check harness for short to ground and short to power.

Is inspection result normal?

- YES >> GO TO 6.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

Refer to [EC-1060, "Component Inspection"](#).

Is inspection result normal?

- YES >> GO TO 7.
NO >> Replace intake air control valve control solenoid valve.

7. CHECK VACUUM PUMP

Refer to [EM-234, "Inspection"](#).

Is inspection result normal?

- YES >> GO TO 8.
NO >> Replace vacuum pump assembly.

8. CHECK INTAKE AIR CONTROL VALVE ACTUATOR

1. Turn ignition switch OFF.

P2554 INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

2. Install a vacuum pump A to intake air control valve actuator.
3. Make sure that the intake air control valve actuator rod moves smoothly when applying vacuum of -53.3 kPa (-533 mbar, -400 mmHg, -15.74 inHg) and releasing it.

Is inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).
NO >> Replace intake air control valve actuator.

Component Inspection

INFOID:000000014268398

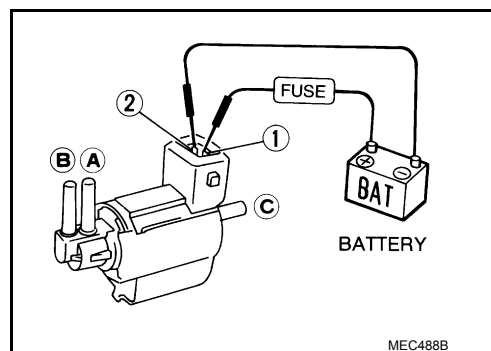
INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

1. Disconnect intake air control valve control solenoid valve harness connector.
2. Apply 12V direct current between turbocharger boost control solenoid valve terminals.
3. Check air passage continuity of intake air control valve control solenoid valve under the following conditions.

CONDITIONS	Air passage continuity between (A) and (B)	Air passage continuity between (A) and (C)
12V direct current supply between terminals ① and ②	Yes	No
No supply	No	Yes

Operation takes less than 1 second.

If NG, replace intake air control valve control solenoid valve.



P2555 INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

P2555 INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

DTC Logic

INFOID:0000000014268399

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detecting condition	Possible cause
P2555	THROTTLE/FUEL INHIBIT (Throttle/Fuel inhibit circuit high)	Short circuit between ECM and the battery power supply of intake air control valve control solenoid valve circuit continues for 2 seconds or more.	• Harness or connectors (Intake air control valve control solenoid valve circuit is open or shorted.) • Intake air control valve control solenoid valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

Turn ignition switch OFF and wait at least 2 minutes.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Wait at least 2 seconds.
3. Check 1st trip DTC.

Is 1st trip DTC detected?

YES >> INSPECTION END

NO >> Proceed to [EC-1061, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268400

1.CHECK OVERALL FUNCTION

1. Start engine and let it idle.
2. Make sure that intake air control valve actuator rod moves when turning ignition switch OFF.

Is inspection result normal?

YES >> **INSPECTION END**

NO >> GO TO 2.

2.CHECK VACUUM SOURCE

1. Turn ignition switch OFF.
2. Disconnect vacuum hose connected to intake air control valve actuator.
3. Start engine and let it idle.
4. Check vacuum hose for vacuum existence under the following conditions.

CONDITIONS	vacuum
For a few seconds after turning ignition switch OFF	should exist
Except above	should not exist

Is inspection result normal?

YES >> GO TO 8.

NO >> GO TO 3.

3.CHECK VACUUM HOSE

1. Turn ignition switch OFF.

P2555 INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

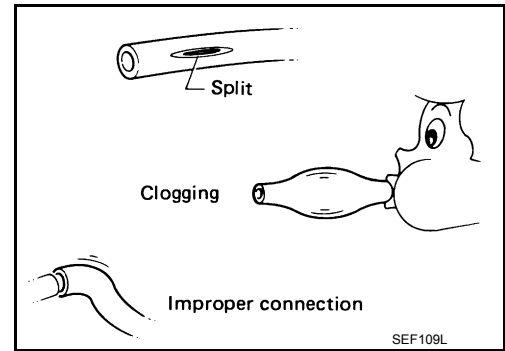
[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

2. Check vacuum hoses and vacuum gallery for clogging, cracks or improper connection.
Refer to [EC-1096, "Hydraulic Layout"](#).

Is inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace vacuum hoses and vacuum gallery.



4. CHECK INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect intake air control valve control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check voltage between intake air control valve control solenoid valve harness connector and ground.

Intake air control valve control solenoid valve		Ground	Voltage
Connector	Terminal		
F78	2	Ground	Battery voltage

Is inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace error-detected parts.

5. CHECK INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE OUTPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECM harness connector and intake air control valve control solenoid valve harness connector.

Intake air control valve control solenoid valve		ECM		Continuity
Connector	Terminal	Connector	Terminal	
F78	1	F54	62	Existed

4. Also check harness for short to ground and short to power.

Is inspection result normal?

- YES >> GO TO 6.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

Refer to [EC-1063, "Component Inspection"](#).

Is inspection result normal?

- YES >> GO TO 7.
NO >> Replace intake air control valve control solenoid valve.

7. CHECK VACUUM PUMP

Refer to [EM-234, "Inspection"](#).

Is inspection result normal?

- YES >> GO TO 8.
NO >> Replace vacuum pump assembly.

8. CHECK INTAKE AIR CONTROL VALVE ACTUATOR

1. Turn ignition switch OFF.

P2555 INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

2. Install a vacuum pump A to intake air control valve actuator.
3. Make sure that the intake air control valve actuator rod moves smoothly when applying vacuum of -53.3 kPa (-533 mbar, -400 mmHg, -15.74 inHg) and releasing it.

Is inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).
NO >> Replace intake air control valve actuator.

Component Inspection

INFOID:0000000014268401

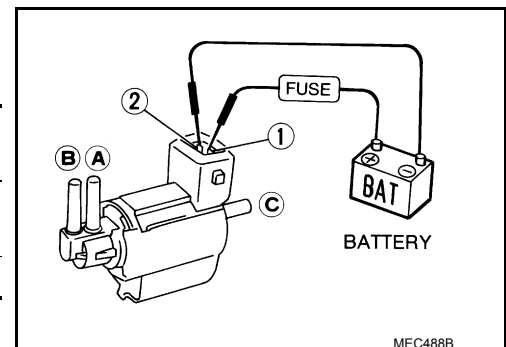
INTAKE AIR CONTROL VALVE CONTROL SOLENOID VALVE

1. Disconnect intake air control valve control solenoid valve harness connector.
2. Apply 12V direct current between turbocharger boost control solenoid valve terminals.
3. Check air passage continuity of intake air control valve control solenoid valve under the following conditions.

CONDITIONS	Air passage continuity between (A) and (B)	Air passage continuity between (A) and (C)
12V direct current supply between terminals ① and ②	Yes	No
No supply	No	Yes

Operation takes less than 1 second.

If NG, replace intake air control valve control solenoid valve.



BATTERY CURRENT SENSOR

Diagnosis Procedure

INFOID:000000014268402

1.CHECK DTC PRIORITY

If DTC P1550, P1551, P1552, P1553 or P1554 is displayed with DTC P0652 or P0653, first perform the trouble diagnosis for DTC P0652 or P0653.

Is applicable DTC detected?

- YES >> Perform diagnosis of applicable. Refer to [EC-869, "DTC Index"](#).
NO >> GO TO 2.

2.CHECK BATTERY CURRENT SENSOR POWER SUPPLY-I

1. Turn ignition switch OFF.
2. Disconnect battery current sensor connector.
3. Turn ignition switch ON.
4. Check the voltage between battery current sensor harness connector terminals.

Battery current sensor			Voltage (Approx.)
Connector	+	−	
	terminal		
E161	1	3	5 V

Inspection result normal?

- YES >> GO TO 7.
NO >> GO TO 3.

3.CHECK BATTERY CURRENT SENSOR POWER SUPPLY-II

Check the voltage between battery current sensor harness connector and ground.

+		-	Voltage (Approx.)
Battery current sensor			
Connector	Terminal		
E161	1	Ground	5 V

Is inspection result normal?

- YES >> GO TO 5.
NO >> GO TO 4.

4.CHECK BATTERY CURRENT SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	1	E8	50	Existed

4. Also check harness for short to ground.

Is inspection result normal?

- YES >> Perform the trouble diagnosis for power supply circuit.
NO >> Repair or replace the malfunctioning part.

5.CHECK BATTERY CURRENT SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.

BATTERY CURRENT SENSOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

3. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	3	E8	44	Existed

Is inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace the malfunctioning part.

6.CHECK ECM GROUND CIRCUIT

Check the continuity between ECM harness connector and ground.

+		-	Continuity
ECM			
Connector	Terminal		
E8	58	Ground	Existed
	57		
	56		
	55		
	41		

Is inspection result normal?

YES >> INSPECTION END

NO >> Repair or replace the malfunctioning part.

7.CHECK BATTERY CURRENT SENSOR SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between battery current sensor harness connector and ECM harness connector.

+		-		Continuity
Battery current sensor		ECM		
Connector	Terminal	Connector	Terminal	
E161	4	E8	51	Existed

4. Also check harness for short to ground and to power.

Is inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace the malfunctioning part.

8.CHECK BATTERY CURRENT SENSOR

Check battery current sensor. Refer to [EC-1065. "Component Inspection \(Battery Current Sensor\)".](#)

Is inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

Component Inspection (Battery Current Sensor)

INFOID:0000000014268403

1.CHECK BATTERY CURRENT SENSOR

1. Turn ignition switch OFF.
2. Reconnect harness connectors disconnected.

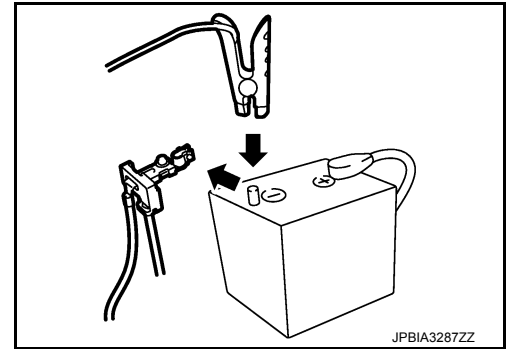
BATTERY CURRENT SENSOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

3. Disconnect battery negative cable.
4. Install jumper cable between battery negative terminal and body ground.
5. Turn ignition switch ON.
6. Check the voltage between ECM harness connector terminals under the following conditions.

ECM			Voltage (Approx.)
Connector	+	-	
	Terminal	Terminal	
E8	51 (Battery current sensor signal)	44	2.5 V



Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to [PG-140, "How to Handle Battery"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace battery negative cable assembly.

EGR COOLER BYPASS SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

EGR COOLER BYPASS SYSTEM

Component Function Check

INFOID:000000014268404

1.CHECK EGR BYPASS VALVE FUNCTION

With CONSULT

1. Turn ignition switch ON.
2. Select "EGR COOLER BYPASS VALVE" in "ACTIVE TEST" mode with CONSULT.
3. Activate the TC boost control actuator and visually check the rod movement.

Without CONSULT

1. Start the engine and warm it up to normal operating temperature.
2. Activate the EGR cooler bypass valve according to the following condition and visually check the rod movement.

Condition	EGR cooler bypass valve
Engine speed: at idle	ON (bypass mode)
Engine speed: above 2,500 rpm (no load)	OFF (cooler mode)

Is inspection result normal?

YES >> INSPECTION END

NO >> Proceed to [EC-1067, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000014268405

1.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect EGR cooler bypass valve control solenoid valve harness connector.
3. Turn ignition switch ON.
4. Check the voltage between EGR cooler bypass valve control solenoid valve harness connector and ground.

+		-	Voltage
EGR cooler bypass valve control solenoid valve			
Connector	Terminal		
F79	2	Ground	Battery voltage

5. Also check harness for short to ground.

Is inspection result normal?

YES >> GO TO 2.

NO >> Perform the trouble diagnosis for power supply circuit.

2.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between EGR cooler bypass valve harness connector and ECM harness connector.

+		-		Continuity
EGR cooler bypass valve control solenoid valve		ECM		
Connector	Terminal	Connector	Terminal	
F79	1	F54	84	Existed

4. Also check harness for short to ground and to power.

Is inspection result normal?

YES >> GO TO 3.

EGR COOLER BYPASS SYSTEM

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace the malfunctioning part.

3.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE

1. Turn ignition switch OFF.
2. Check EGR cooler bypass valve control solenoid valve. Refer to [EC-1068, "Component Inspection \(EGR Cooler Bypass Valve Control Solenoid Valve\)"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace EGR cooler bypass valve control solenoid valve. Refer to [EM-164, "Removal and Installation"](#).

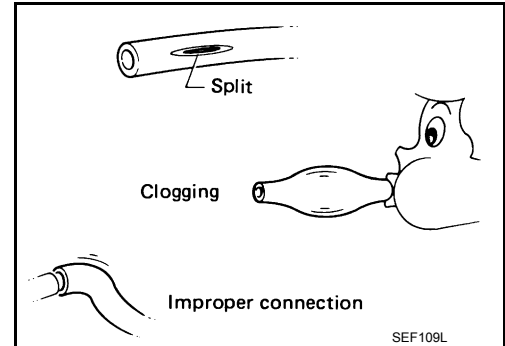
4.CHECK VACUUM HOSE AND VACUUM GALLERY

Check vacuum hose and vacuum gallery for clogging, cracks or improper connection.

Is inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace the malfunctioning part.



5.CHECK EGR COOLER BYPASS VALVE

Check EGR cooler bypass valve. Refer to [EC-1068, "Component Inspection \(EGR Cooler Bypass Valve\)"](#).

Is inspection result normal?

YES >> Check intermittent incident. Refer to [EC-896, "Description"](#).

NO >> Replace EGR cooler assembly. Refer to [EM-164, "Removal and Installation"](#).

Component Inspection (EGR Cooler Bypass Valve Control Solenoid Valve) INFOID:0000000014268406

1.CHECK EGR COOLER BYPASS VALVE CONTROL SOLENOID VALVE

1. Turn ignition switch OFF.
2. Disconnect EGR cooler bypass valve control solenoid valve harness connector.
3. Check the resistance between EGR cooler bypass valve control solenoid valve terminals as follows.

Terminals	Resistance
1 and 2	43 – 49 Ω [at 25°C (77°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace EGR cooler bypass valve control solenoid valve. Refer to [EM-164, "Removal and Installation"](#).

Component Inspection (EGR Cooler Bypass Valve) INFOID:0000000014268407

1.CHECK EGR COOLER BYPASS VALVE

1. Install a vacuum pump to EGR cooler bypass diaphragm.
2. Check that a vacuum is kept when applying the vacuum to EGR cooler bypass diaphragm.

Is inspection result normal?

YES >> INSPECTION END

NO >> Replace EGR cooler assembly. Refer to [EM-164, "Removal and Installation"](#).

FUEL INJECTOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

FUEL INJECTOR

Diagnosis Procedure

INFOID:000000014268408

1.CHECK FUEL INJECTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect fuel injector harness connector.
3. Turn ignition switch ON.
4. Check the voltage between fuel injector harness connector and ground.

+			-	Voltage
Fuel injector				
Cylinder	Connector	Terminal		
1	F71	1	Ground	Half of battery voltage
2	F68			
3	F69			
4	F70			

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK FUEL INJECTOR INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between fuel injector harness connector and ECM harness connector.

Cylinder	+		-		Continuity
	Fuel injector		ECM		
	Connector	Terminal	Connector	Terminal	
1	F71	1	F54	82	Existed
2	F68			106	
3	F69			82	
4	F70			106	

4. Also check harness for short to ground.

Is the inspection result normal?

YES >> Perform trouble diagnosis for ECM power supply.

NO >> Repair or replace the malfunctioning part.

3.CHECK FUEL INJECTOR OUTPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between fuel injector harness connector and ECM harness connector.

Cylinder	+		-		Continuity
	Fuel injector		ECM		
	Connector	Terminal	Connector	Terminal	
1	F71	2	F54	81	Existed
2	F68			129	
3	F69			104	
4	F70			152	

4. Also check harness for short to ground and short to power.

FUEL INJECTOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning part.

4.CHECK FUEL INJECTOR

Check fuel injector. Refer to [EC-1071, "Component Inspection \(Fuel Injector\)"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace malfunctioning fuel injector. Refer to [EM-174, "Removal and Installation"](#).

5.PERFORM FUEL INJECTION QUANTITY LEARNING

With CONSULT

Perform fuel injection quantity learning. Refer to [EC-902, "Description"](#).

Did the learning complete successfully?

YES >> GO TO 7.

NO-1 (learning not succeeded)>>Record the cylinder unsuccessful in learning. And then, GO TO 6.

NO-2 (other case)>>Check error-detected parts.

6.PERFORM FUEL INJECTION QUANTITY LEARNING AGAIN

With CONSULT

Perform fuel injection quantity learning again. Refer to [EC-902, "Description"](#).

Did the learning complete successfully?

YES >> GO TO 7.

NO-1 (the same cylinder unsuccessful in learning at Step 5 was again unsuccessful)>>Replace malfunctioning fuel injector.

NO-2 (other cases)>>GO TO 8.

7.RECHECK MALFUNCTION SYMPTOM

Reproduce malfunction indicated by the customer.

Has the malfunction been eliminated?

YES >> INSPECTION END

NO >> GO TO 8.

8.CHECK INDICATED VALUE ON DATA MONITOR

With CONSULT

Check the following items with CONSULT "DATA MONITOR" to see that the indicated value is within the specified value.

Data monitor item	specified value
INJ Q/L CYL 1-A	-0.067 – 0.090
INJ Q/L CYL 2-A	
INJ Q/L CYL 3-A	
INJ Q/L CYL 4-A	
INJ Q/L CYL 1-B	-0.032 – 0.053
INJ Q/L CYL 2-B	
INJ Q/L CYL 3-B	
INJ Q/L CYL 4-B	
INJ Q/L CYL 1-C	-0.018 – 0.038
INJ Q/L CYL 2-C	
INJ Q/L CYL 3-C	
INJ Q/L CYL 4-C	

FUEL INJECTOR

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

Data monitor item	specified value
INJ Q/L CYL 1-D	-0.017 – 0.034
INJ Q/L CYL 2-D	
INJ Q/L CYL 3-D	
INJ Q/L CYL 4-D	

Is the indicated value within the specified value?

YES >> Check to see if there is a malfunction other than in the fuel injector.

NO >> Replace malfunctioning fuel injector. Refer to [EM-174, "Removal and Installation"](#).

Component Inspection (Fuel Injector)

INFOID:0000000014268409

1.CHECK FUEL INJECTOR

1. Turn ignition switch OFF.
2. Disconnect fuel injector harness connector.
3. Check resistance between fuel injector terminals as follows.

Terminal	Resistance
1 and 2	0.2 – 0.8 Ω [at 10 – 60°C (50 – 140°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace fuel injector. Refer to [EM-174, "Removal and Installation"](#).

GLOW CONTROL SYSTEM

Diagnosis Procedure

INFOID:0000000014268410

1.CHECK INSTALLATION

Check that glow plug terminals (nuts) are installed properly.

Are glow plug terminals (nuts) installed properly?

YES >> GO TO 2.

NO >> Install properly.

2.CHECK DTC

Check DTC.

Is DTC detected?

YES >> Perform trouble diagnoses for detected DTC. Refer to [EC-869, "DTC Index"](#).

NO >> GO TO 3.

3.CHECK HARNESS CONTINUITY BETWEEN GLOW CONTROL UNIT AND GLOW PLUG FOR OPEN AND SHORT

1. Disconnect glow control unit harness connector and glow plug terminals (nuts).
2. Check harness continuity between glow control unit harness connector and glow plug terminals.

Glow control unit		Glow plug		Continuity
Connector	Terminal	Connector	Terminal	
E25	2	F77 (No. 1)	1	Existed
	7	F75 (No. 2)	1	
	1	F74 (No. 3)	1	
	6	F76 (No. 4)	1	

3. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

4.CHECK GLOW PLUG

Check glow plug. Refer to [EC-1072, "Component Inspection \(Glow Plug\)"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace glow plug. Refer to [EM-173, "Removal and Installation"](#).

5.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace glow control unit.

NO >> INSPECTION END

Component Inspection (Glow Plug)

INFOID:0000000014268411

CAUTION:

- Do not bump glow plug heating element. If it is bumped, replace glow plug with a new one.
- If glow plug is dropped from a height of 10 cm (3.94 in) or higher, replace with a new one.
- If glow plug installation hole is contaminated with carbon, remove it with a reamer or suitable tool.
- Hand-tighten glow plug by turning it two or three times, then tighten using a tool to specified torque.

GLOW CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

1.CHECK GLOW PLUG

1. Disconnect glow plug terminals (nuts).
2. Remove a glow plug.
3. Check resistance between glow plug terminal and glow plug stem.

Terminals	Resistance
1 and glow plug stem	Approx. 0.45 Ω [at 25°C (77°F)]

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace malfunctioning glow plug. Refer to [EM-173. "Removal and Installation"](#).

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GLOW INDICATOR

Component Function Check

INFOID:0000000014268412

1.CHECK GLOW INDICATOR FUNCTION

1. Turn ignition switch ON.
2. Check the glow indicator is turned ON, and then glow indication turned OFF.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Proceed to [EC-1074, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268413

1.CHECK DTC WITH "ECM"

Check the self-diagnosis result with CONSULT. Check the ECM does not detect any DTCs. Refer to [EC-849, "CONSULT Function"](#).

Is any DTC detected?

- YES >> Perform trouble diagnosis of detected DTC.
NO >> GO TO 2.

2.CHECK CAN COMMUNICATION LINE

Check CAN communication line. Refer to [LAN-24, "Trouble Diagnosis Flow Chart"](#).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3.CHECK DTC WITH "COMBINATION METER"

Check the self-diagnosis result with CONSULT. Check the combination meter does not detect any DTCs. Refer to [MWI-29, "CONSULT Function \(METER/M&A\)"](#) (with color display) or [MWI-161, "CONSULT Function \(METER/M&A\)"](#) (with monochrome display).

Is any DTC detected?

- YES >> Perform trouble diagnosis of detected DTC.
NO >> GO TO 4.

4.CHECK INTERMITTENT INCIDENT

Perform [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace combination meter. Refer to [MWI-137, "Removal and Installation"](#) (with color display) or [MWI-217, "Removal and Installation"](#) (with monochrome display).
NO >> Repair or replace malfunctioning parts.

MALFUNCTION INDICATOR LAMP

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

MALFUNCTION INDICATOR LAMP

Component Function Check

INFOID:0000000014268414

1.CHECK MIL FUNCTION

1. Turn ignition switch ON.
2. Check that MIL illuminates.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Proceed to [EC-1075, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268415

1.CHECK DTC

Check that DTC UXXXX is not displayed.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Perform trouble diagnosis for DTC UXXXX.

2.CHECK DTC WITH COMBINATION METER

Refer to [MWI-29, "CONSULT Function \(METER/M&A\)"](#) (with color display) or [MWI-161, "CONSULT Function \(METER/M&A\)"](#) (with monochrome display).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Perform trouble diagnosis for DTC indicated.

3.CHECK INTERMITTENT INCIDENT

Refer to [GI-45, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace combination meter. Refer to [MWI-137, "Removal and Installation"](#) (with color display) or [MWI-217, "Removal and Installation"](#) (with monochrome display).
NO >> Repair or replace malfunctioning part.

PARK/NEUTRAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

PARK/NEUTRAL POSITION SWITCH

Component Function Check

INFOID:0000000014268416

1.CHECK COMPONENT PARTS FUNCTION

With CONSULT

1. Turn ignition switch ON.
2. Select "P/N POSI SW" in "DATA MONITOR" mode with CONSULT.
3. Check the monitor status.

Selector lever position	Indication
P or N (A/T), Neutral (M/T)	ON
Except above	OFF

Without CONSULT

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector and ground.

ECM			Condition	Voltage
Connector	+	-		
	Terminal			
E8	4	41	Selector lever position P, or N (A/T), Neutral (M/T)	Approx. 0 V
			Except above	Battery voltage

Is the inspection result normal?

YES-1 >> To check malfunction symptom before repair: Refer to [EC-896, "Description"](#).

YES-2 >> Confirmation after repair: INSPECTION END

NO >> Refer to [EC-1076, "Diagnosis Procedure \(M/T Models\)"](#) (M/T models), or [EC-1078, "Diagnosis Procedure \(A/T Models\)"](#) (A/T models).

Diagnosis Procedure (M/T Models)

INFOID:0000000014268417

1.CHECK PARK/NEUTRAL POSITION SWITCH POWER SUPPLY CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect park/neutral position (PNP) switch harness connector.
3. Disconnect IPDM E/R harness connector.
4. Check the continuity between park/neutral position switch harness connector and IPDM E/R harness connector.

+		-		Continuity
Park/neutral position switch		IPDM E/R		
Connector	Terminal	Connector	Terminal	
F66	1	E119	13	Existed

5. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the malfunctioning part.

2.CHECK PARK/NEUTRAL POSITION SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-I

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between park/neutral position switch harness connector and ECM harness connector.

PARK/NEUTRAL POSITION SWITCH

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

+		-		Continuity
Park/neutral position switch		Park/neutral position relay		
Connector	Terminal	Connector	Terminal	
F66	2	E22	1	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace the malfunctioning part.

3.CHECK PARK/NEUTRAL POSITION SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II

1. Turn ignition switch ON.
2. Check the voltage between park/neutral position relay harness connector and ground.

+		–	Condition	Voltage
Park/neutral position relay				
Connector	Terminal			
E22	1	Ground	Neutral	Battery voltage
			Except above	Approx. 0 V

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning part.

4.CHECK PARK/NEUTRAL POSITION (PNP) SWITCH

Check park/neutral position (PNP) switch. Refer to [EC-1079, "Component Inspection \[Park/Neutral Position \(PNP\) Switch\]"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace park/neutral position (PNP) switch. Refer to [TM-20, "Removal and Installation"](#).

5.CHECK PARK/NEUTRAL POSITION RELAY GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect park/neutral position relay harness connector.
3. Check the continuity between park/neutral position relay harness connector and ground.

+		-	Continuity
Park/neutral position relay			
Connector	Terminal		
E22	2	Ground	Existed
	5		

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace the malfunctioning part.

6.CHECK PARK/NEUTRAL POSITION RELAY INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between park/neutral position relay harness connector and ECM harness connector.

PARK/NEUTRAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

+		-		Continuity
Park/neutral position relay		ECM		
Connector	Terminal	Connector	Terminal	
E22	3	E8	4	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace the malfunctioning part.

7.CHECK PARK/NEUTRAL POSITION RELAY

Check the park/neutral position relay. Refer to [EC-1079, "Component Inspection \(Park/Neutral Position Relay\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace park/neutral position relay.

Diagnosis Procedure (A/T Models)

INFOID:0000000014268418

1.CHECK PARK/NEUTRAL POSITION RELAY GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect park/neutral position relay harness connector.
3. Check the continuity between park/neutral position relay harness connector and ground.

+		-	Continuity
Park/neutral position relay			
Connector	Terminal		
E17	2	Ground	Existed
	5		

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace the malfunctioning part.

2.CHECK PARK/NEUTRAL POSITION RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check the voltage between park/neutral position relay harness connector and ground.

+		–	Condition	Voltage
Park/neutral position relay				
Connector	Terminal			
E17	1	Ground	P, or N	Battery voltage
			Except above	Approx. 0 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check the power supply circuit.

3.CHECK PARK/NEUTRAL POSITION RELAY INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check the continuity between park/neutral position relay harness connector and ECM harness connector.

PARK/NEUTRAL POSITION SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

+		-		Continuity
Park/neutral position relay		ECM		
Connector	Terminal	Connector	Terminal	
E17	3	E8	4	Existed

4. Also check harness for short to ground and to power.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the malfunctioning part.

4.CHECK PARK/NEUTRAL POSITION RELAY

Check the park/neutral position relay. Refer to [EC-1079, "Component Inspection \(Park/Neutral Position Relay\)"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace park/neutral position relay.

Component Inspection [Park/Neutral Position (PNP) Switch]

INFOID:000000014268419

1.CHECK PARK/NEUTRAL POSITION (PNP) SWITCH

1. Turn ignition switch OFF.
2. Disconnect park/neutral position (PNP) switch harness connector.
3. Check the continuity between park/neutral position (PNP) switch harness connector terminals.

Park/neutral position (PNP) switch		Condition		Continuity
+	–			
Terminal				
1	2	Selector lever position	Neutral	Existed
			Except above	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace park/neutral position (PNP) switch. Refer to [TM-20, "Removal and Installation"](#).

Component Inspection (Park/Neutral Position Relay)

INFOID:000000014268420

1.CHECK PARK/NEUTRAL POSITION RELAY

1. Turn ignition switch OFF.
2. Disconnect park/neutral position relay harness connector.
3. Check continuity between park/neutral position relay terminals 3 and 5 under the following conditions.

park/neutral position relay		Condition	Continuity
+	–		
Terminal			
3	5	12 V direct current supply between terminals 1 and 2	Existed
		No current supply	Not existed

NOTE:

Operation takes less than 1 second.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace park/neutral position relay.

REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

REFRIGERANT PRESSURE SENSOR

Component Function Check

INFOID:0000000014268421

NOTE:

If DTC P0642 or P0643 is displayed, first perform the trouble diagnosis for DTC P0642 or P0643. Refer to [EC-1000, "DTC Description"](#).

1.CHECK OVERALL FUNCTION

With CONSULT

1. Start the engine.
2. Select "AC PRESS SEN" in "DATA MONITOR" mode with CONSULT.
3. Turn A/C switch and blower fan switch ON.
4. Check the monitor status.

Monitor Item	Indication
AC PRESS SEN	1.0 – 4.0 V

Without CONSULT

1. Start the engine.
2. Turn A/C switch and blower fan switch ON.
3. Check voltage between ECM harness connector and ground.

ECM		Ground	Voltage
Connector	Terminal		
F54	118	Ground	Approx. 1.0 – 4.0 V

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 2.

2.CHECK REFRIGERANT PRESSURE

Check refrigerant pressure. Refer to [HA-79, "Inspection"](#).

Is the inspection result normal?

- YES >> Proceed to [EC-1080, "Diagnosis Procedure"](#).
NO >> Repair refrigerant system.

Diagnosis Procedure

INFOID:0000000014268422

1.CHECK REFRIGERANT PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect refrigerant pressure sensor harness connector and ECM harness connector.
3. Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

Refrigerant pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E49	3	F54	135	Existed

4. Also check harness for short to ground and short to power.

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair open circuit or short to ground or short to power in harness or connectors.

2.CHECK REFRIGERANT PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between refrigerant pressure sensor harness connector and ECM harness connector.

REFRIGERANT PRESSURE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

Refrigerant pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E49	1	F54	142	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Harness for open or short between ECM and refrigerant pressure sensor.

3.CHECK REFRIGERANT PRESSURE SENSOR INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Check the continuity between ECM harness connector and refrigerant pressure sensor harness connector.

Refrigerant pressure sensor		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E49	2	F54	118	Existed

2. Also check harness for short to ground and short to power.

Is the inspection result normal?

YES >> Replace refrigerant pressure sensor. Refer to [HA-92, "REFRIGERANT PRESSURE SENSOR : Removal and Installation"](#).

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

START SIGNAL

Component Function Check

INFOID:0000000014268423

1.CHECK START SIGNAL INPUT

With CONSULT

1. Turn ignition switch ON.
2. Select "START SIGNAL" in "DATA MONITOR" mode with CONSULT.
3. Check the monitor status.

Monitor Item	Condition		Indication
START SIGNAL	Ignition switch	ON	OFF
		START	ON

Without CONSULT

1. Turn ignition switch ON.
2. Check voltage between ECM harness connector and ground.

ECM		Ground	Condition		Voltage
Conne- tor	Terminal				
E8	5	Ground	Ignition switch	ON	Approx. 0 V
				START	Battery voltage

Is the inspection result normal?

YES >> **INSPECTION END**

NO >> Refer to [EC-1082, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268424

1.CHECK START SIGNAL INPUT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector and IPDM E/R harness connector.
3. Check harness continuity between ECM harness connector and IPDM E/R harness connector. For details, refer to [PCS-27, "Wiring Diagram"](#).

ECM		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E8	5	E120	19	Existed

Is the inspection result normal?

YES >> Perform trouble diagnosis for IPDM E/R. Refer to [PCS-40, "Removal and Installation"](#).

NO >> Repair open circuit or short to ground or short to power in harness or connectors.

STOP LAMP SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[YD25DDTi]

STOP LAMP SWITCH

Component Function Check

INFOID:0000000014268425

1.CHECK STOP LAMP SWITCH FUNCTION

With CONSULT

1. Turn ignition switch ON.
2. Select "BRAKE SW" in "DATA MONITOR" mode with CONSULT.
3. Check the monitor status.

Monitor Item	Condition		Indication
BRAKE SW	Brake pedal	Slightly depressed	ON
		Fully released	OFF

Without CONSULT

1. Turn ignition switch ON.
2. Check the voltage between ECM harness connector terminals.

ECM			Condition	Voltage
Connector	+	-		
	Terminal			
E8	19	41	Brake pedal	Slightly depressed Battery voltage
				Fully released Approx. 0 V

Is the inspection result normal?

YES >> INSPECTION END

NO >> Refer to [EC-1083, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:0000000014268426

1.CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Check the stop lamp when depressing and releasing the brake pedal.

Brake pedal	Stop lamp
Fully released	Not illuminated
Slightly depressed	Illuminated

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Disconnect stop lamp switch harness connector.
2. Check the voltage between stop lamp switch harness connector and ground.

+		-	Voltage
Stop lamp switch			
Connector	Terminal		
E56	1	Ground	Battery voltage

3. Also check harness for short to ground.

Is the inspection result normal?

STOP LAMP SWITCH

[YD25DDTi]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 3.
NO >> Repair or replace the malfunctioning part.

3.CHECK STOP LAMP SWITCH INPUT SIGNAL CIRCUIT

1. Disconnect stop lamp switch harness connector.
2. Disconnect ECM harness connector.
3. Check harness continuity between stop lamp switch harness connector and ECM harness connector.

Stop lamp switch		ECM		Continuity
Connector	Terminal	Connector	Terminal	
E56	2	E8	19	Existed

4. Also check harness for short to ground.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair or replace the malfunctioning part.

4.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to [EC-1084, "Component Inspection \(Stop Lamp Switch\)"](#).

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace stop lamp switch. Refer to [BR-20, "Exploded View"](#).

Component Inspection (Stop Lamp Switch)

INFOID:0000000014268427

1.CHECK STOP LAMP SWITCH -1

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch harness connector.
3. Check the continuity between stop lamp switch harness connector terminals.

Stop lamp switch		Condition		Continuity
+	-			
Terminal				
1	2	Brake pedal	Fully released	Not existed
			Slightly depressed	Existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH -2

1. Adjust the stop lamp switch. Refer to [BR-10, "Adjustment"](#).
2. Check the continuity between stop lamp switch harness connector terminals.

Stop lamp switch		Condition		Continuity
+	-			
Terminal				
1	2	Brake pedal	Fully released	Not existed
			Slightly depressed	Existed

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Replace stop lamp switch. Refer to [BR-20, "Exploded View"](#).

ENGINE CONTROL SYSTEM

< SYMPTOM DIAGNOSIS >

[YD25DDTi]

SYMPTOM DIAGNOSIS

ENGINE CONTROL SYSTEM

Symptom Table

INFOID:000000014268429

SYSTEM — BASIC ENGINE CONTROL SYSTEM

	SYMPTOM																
	HARD/NO START/RESTART (EXCP. HA)				ENGINE STALL												
Warranty symptom code	NO START (with first firing)	NO START (without first firing)	HARD TO START WHEN ENGINE IS COLD	HARD TO START WHEN ENGINE IS HOT	AT IDLE	DURING DRIVING	WHEN DECELERATING	HESITATION/SURGING/FLAT SPOT	KNOCK/DETONATION	LACK OF POWER	POOR ACCELERATION	HI IDLE	LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEAT/HIGH ENGINE COOLANT TEMPERATURE
	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BLACK SMOKE	WHITE SMOKE	DEAD BATTERY (UNDER CHARGE)	ABNORMAL SMOKE COLOR											
	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AP	HA	Refer- ence		
Fuel pump circuit	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Fuel injector circuit	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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EC-
923
EC-
998
EC-
1020
EC-
1027
EC-
1030

EC-
955
EC-
1051
EC-
1052
EC-
1069

ENGINE CONTROL SYSTEM

< SYMPTOM DIAGNOSIS >

[YD25DDTi]

	SYMPTOM																						Refer- ence
	HARD/NO START/RESTART (EXCP. HA)				ENGINE STALL																		

ENGINE CONTROL SYSTEM

< SYMPTOM DIAGNOSIS >

[YD25DDTi]

	SYMPTOM																		Refer- ence				
	HARD/NO START/RESTART (EXCP. HA)				ENGINE STALL			HESITATION/SURGING/FLAT SPOT	KNOCK/DETONATION	LACK OF POWER	POOR ACCELERATION	HI IDLE	LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEAT/HIGH ENGINE COOLANT TEMPERATURE	EXCESSIVE FUEL CONSUMPTION		EXCESSIVE OIL CONSUMPTION	ABNORMAL SMOKE COLOR		DEAD BATTERY (UNDER CHARGE)
NO START (with first firing)	NO START (without first firing)	HARD TO START WHEN ENGINE IS COLD	HARD TO START WHEN ENGINE IS HOT	AT IDLE	DURING DRIVING	WHEN DECELERATING	AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AP	HA					
Warranty symptom code	AA				AB			AC	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AP	HA				
Start signal circuit	1	1	1	1	1		1	1		1	1											EC-1082	
Ignition switch circuit		1			1	1	1															EC-909	
Power supply for ECM circuit		1			1	1	1															EC-909	
EGR volume control circuit								1		1	1							1				EC-977	
EGR cooler bypass valve control solenoid valve																3		1				EC-979 EC-981	
Glow control circuit	1	1	1	1																1		EC-1072	
Intake air temperature sensor 2 circuit																						—	
Exhaust gas temperature sensor 1 circuit								1		1	1											—	
Exhaust gas pressure sensor 1 circuit																						—	
Refrigerant pressure sensor circuit					2	2	2					3	3			3		4				EC-1080	

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ENGINE CONTROL SYSTEM

< SYMPTOM DIAGNOSIS >

[YD25DDTi]

	Warranty symptom code	ECM relay (Self-shutoff) circuit	ECM	SYMPTOM																			Reference																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
				NO START (with first firing)				NO START (without first firing)			HARD TO START WHEN ENGINE IS COLD		HARD TO START WHEN ENGINE IS HOT		ENGINE STALL			HARD/NO START/RESTART (EXCP. HA)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

1 – 5: The numbers refer to the order of inspection.

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SYSTEM — ENGINE MECHANICAL & OTHER

ENGINE CONTROL SYSTEM

< SYMPTOM DIAGNOSIS >

[YD25DDTi]

	SYMPTOM																				Reference		
	HARD/NO START/RESTART (EXCP. HA)				ENGINE STALL																	ABNORMAL SMOKE COLOR	
	NO START (with first firing)	NO START (without first firing)	HARD TO START WHEN ENGINE IS COLD	HARD TO START WHEN ENGINE IS HOT	AT IDLE	DURING DRIVING	WHEN DECELERATING	HESITATION/SURGING/FLAT SPOT	KNOCK/DETONATION	LACK OF POWER	POOR ACCELERATION	HI IDLE	LOW IDLE	ROUGH IDLE/HUNTING	IDLING VIBRATION	SLOW/NO RETURN TO IDLE	OVERHEAT/HIGH ENGINE COOLANT TEMPERATURE	EXCESSIVE FUEL CONSUMPTION	EXCESSIVE OIL CONSUMPTION	BLACK SMOKE		WHITE SMOKE	DEAD BATTERY (UNDER CHARGE)
Warranty symptom code	AA				AB			AC	AD	AE		AF		AG	AH	AJ	AK	AL	AM	AP		HA	
Fuel pump	5	5	5	5	5	5	5	5		5	5		5	5	5	5		5		5			EC-920 EC-920 EC-926
Fuel filter	1	1	1	1						1										1			FL-28
Fuel injector	3	3	3	3	3	3	3	3	3	4	4	3	3	3	3	3		4		3	3		EC-1069
Glow control system	1	1	1	1					1												1		EC-832 EC-974
Engine body	3	3	3	3	3	3	3		3	4	4		3		3	3	3	3	1		3		EM-274 EM-275 EM-275 EM-275 EM-277 EM-280 EM-282 EM-283
EGR system										3	3									3			EC-832

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ENGINE CONTROL SYSTEM

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	NO START (with first firing)		NO START (without first firing)		HARD TO START WHEN ENGINE IS COLD		HARD TO START WHEN ENGINE IS HOT		AT IDLE		DURING DRIVING		WHEN DECELERATING		HESITATION/SURGING/FLAT SPOT		KNOCK/DETONATION		LACK OF POWER		POOR ACCELERATION			HI IDLE		LOW IDLE		ROUGH IDLE/HUNTING		IDLING VIBRATION		SLOW/NO RETURN TO IDLE		OVERHEAT/HIGH ENGINE COOLANT TEMPERATURE		EXCESSIVE FUEL CONSUMPTION		EXCESSIVE OIL CONSUMPTION		BLACK SMOKE		WHITE SMOKE		ABNORMAL SMOKE COLOR		DEAD BATTERY (UNDER CHARGE)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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1 – 5: The numbers refer to the order of inspection.

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NORMAL OPERATING CONDITION

Description

INFOID:0000000014268430

FUEL CUT CONTROL (AT NO LOAD AND HIGH ENGINE SPEED)

If the engine speed is above 3,300 rpm under no load (for example, the shift position is park or neutral engine speed is over 3,300 rpm) fuel is cut off after some time. The exact time when the fuel is cut off varies based on engine speed. Fuel cut is operated until the engine speed reaches 1,500 rpm, then fuel cut is cancelled.

NOTE:

This function is different from deceleration control listed under [EC-827, "FUEL INJECTION CONTROL SYSTEM : System Description"](#).

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PERIODIC MAINTENANCE

IDLE SPEED

Inspection

INFOID:0000000014268431

1. CHECK IDLE SPEED

With CONSULT

Check "CKPS·RPM (TDC)" in "DATA MONITOR" mode with CONSULT.

>> INSPECTION END

CRANKCASE VENTILATION SYSTEM

< PERIODIC MAINTENANCE >

[YD25DDTi]

CRANKCASE VENTILATION SYSTEM

Inspection

INFOID:0000000014268432

1.CHECK LEAKAGE

Check hoses and hose connections for leakage.

Does leakage detect?

Yes >> Repair hose connection or replace the leaked hose,
NO >> GO TO 2.

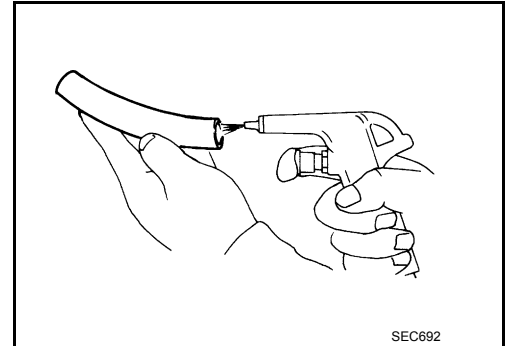
2.CLEAN HOSE

Disconnect all hoses and clean with compressed air.

NOTE:

If any hose cannot be freed of obstructions, replace the hose.

>> END



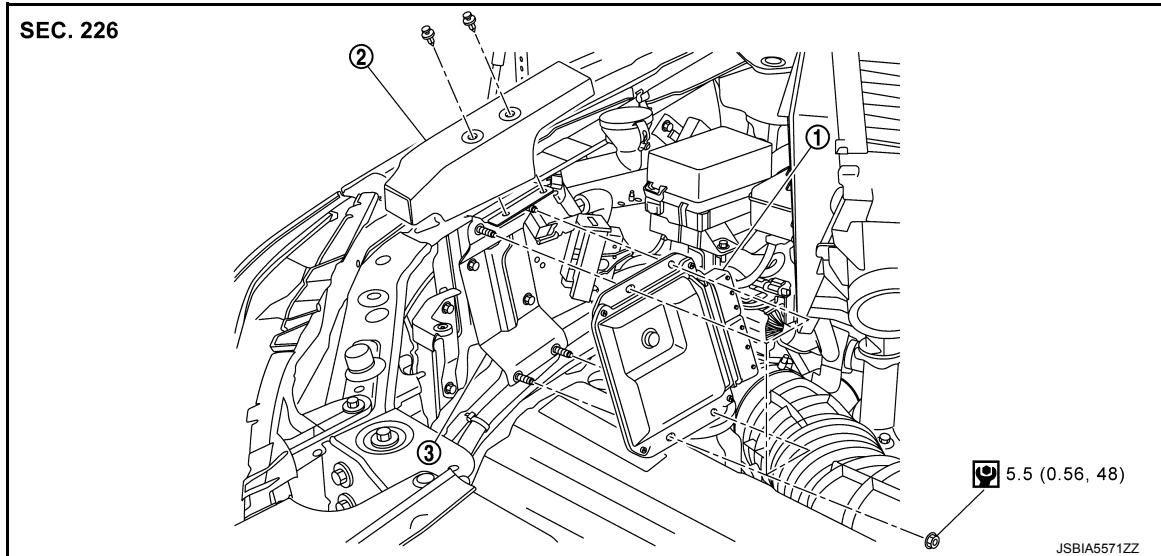
SEC692

REMOVAL AND INSTALLATION

ECM

Exploded View

INFOID:000000014268433



1. ECM

2. ECM cover

3. ECM Bracket

Removal and Installation

INFOID:000000014268434

CAUTION:

According to “SERVICE AFTER REPLACING OR REMOVING ENGINE PARTS”, perform the necessary service procedure when ECM replacement. Refer to [EC-897, "Description"](#).

REMOVAL

1. Remove ECM cover.
2. Remove air cleaner case. Refer to [EM-156, "Removal and Installation"](#).
3. Remove ECM nuts.
4. Disconnect the harness connectors from ECM. Refer to [PG-9, "Harness Connector"](#).
5. Remove ECM from ECM bracket.

INSTALLATION

Installation is in the reverse order of removal.

GLOW CONTROL UNIT

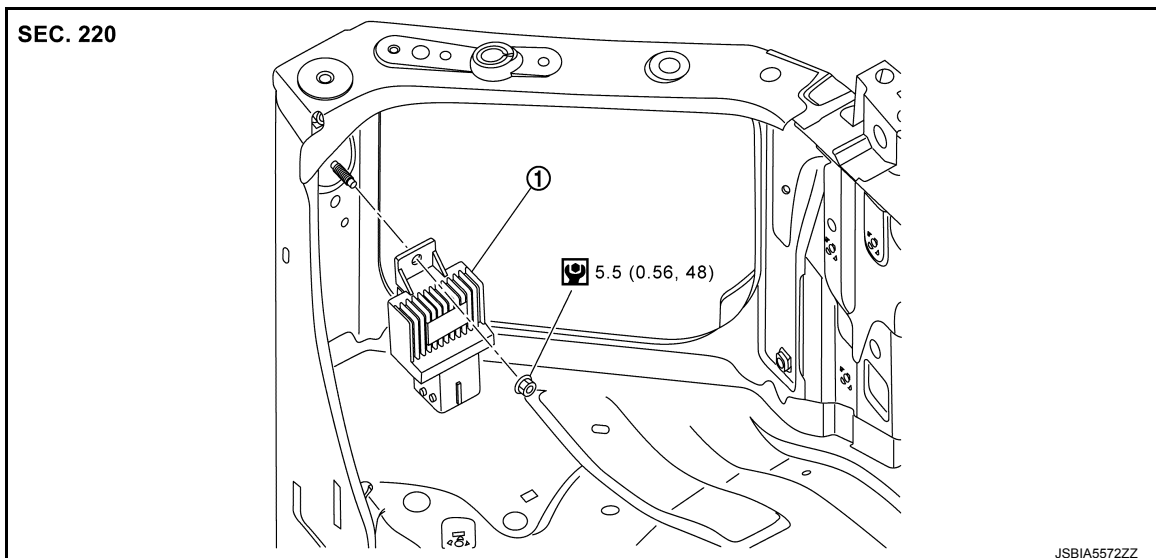
< REMOVAL AND INSTALLATION >

[YD25DDTi]

GLOW CONTROL UNIT

Exploded View

INFOID:0000000014268435



1. Glow control unit

Removal and Installation

INFOID:0000000014268436

REMOVAL

1. Remove air duct (inlet). Refer to [EM-156. "Removal and Installation"](#).
2. Remove glow control unit nuts.
3. Disconnect the harness connector from glow control unit.
4. Remove glow control unit from vehicle.

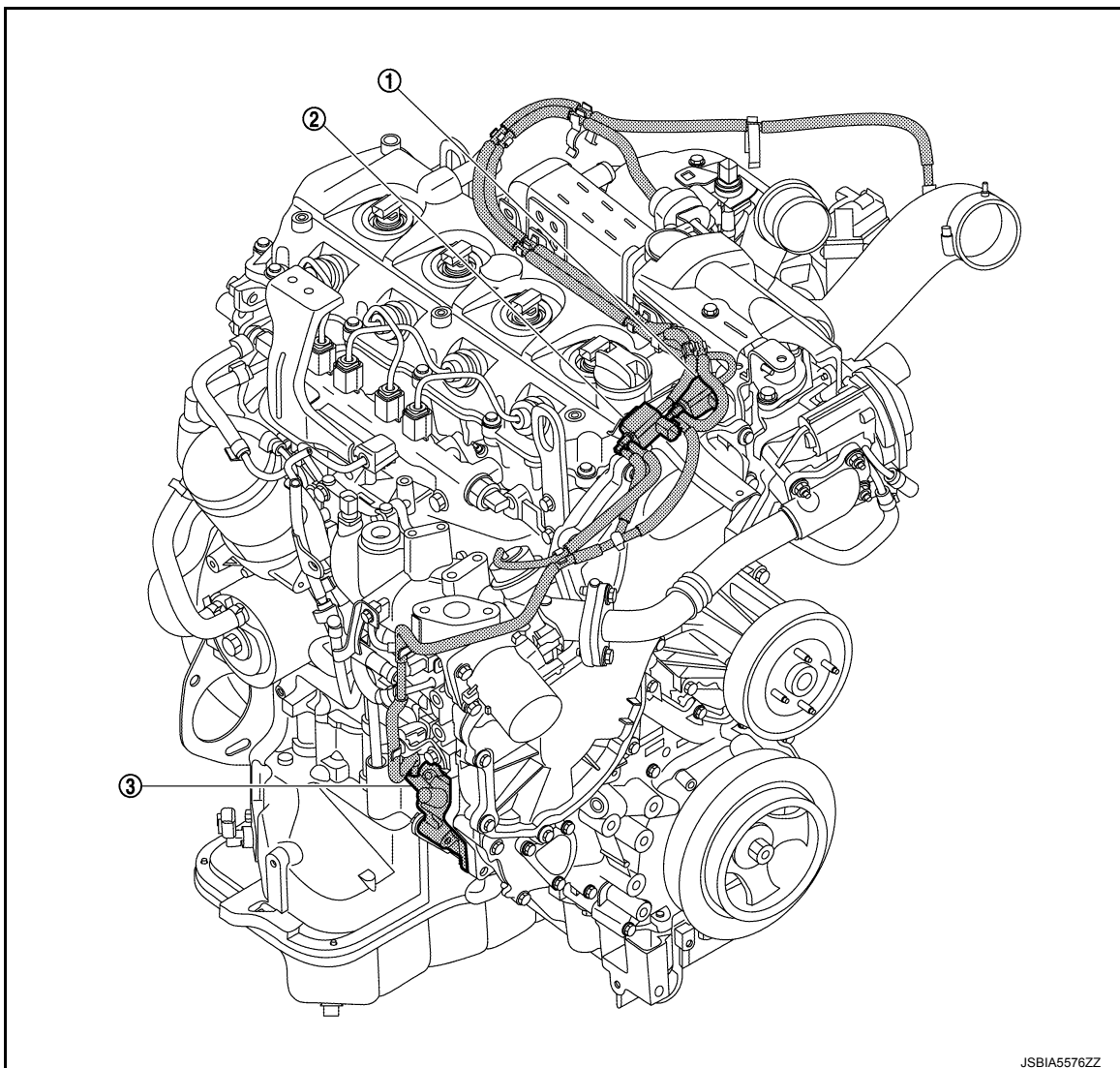
INSTALLATION

Installation is in the reverse order of removal.

VACUUM LINES

Hydraulic Layout

INFOID:000000014268437



1. EGR cooler bypass valve control solenoid valve
(Type 2 is not applicable)
2. Intake air control valve control solenoid valve
3. Vacuum pump

NOTE:

- Refer to [EC-803, "How to Check Vehicle Type"](#), for the information of type 1 and 2.
- Do not use soapy water or any type of solvent while installing vacuum hose.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[YD25DDTi]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000014268438

Target idle speed	A/T	No load* (in P or N position)	750±25 rpm
	M/T	No load* (in Neutral position)	
Air conditioner: ON	A/T	In P or N position	
	M/T	In Neutral position	
Maximum engine speed	—		4,500 rpm

*: Under the following conditions:

- Air conditioner switch: OFF
- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Mass Air Flow Sensor

INFOID:0000000014268439

Supply voltage	Battery voltage (11 – 14 V)
Ignition switch ON (Engine stopped.)	Approx. 0.4 V
Idle (Engine is warmed up to normal operating temperature.)	1.1 – 2.1 V*

*: Engine is warmed up to normal operating temperature and running under no load.

Intake Air Temperature Sensor 1

INFOID:0000000014268440

Temperature °C (°F)	Resistance kΩ
25 (77)	2.0 – 2.13
80 (176)	0.312 – 0.346

Engine Coolant Temperature Sensor

INFOID:0000000014268441

Temperature °C (°F)	Resistance kΩ
20 (68)	2.35 – 2.73
50 (122)	0.68 – 1.00
90 (194)	0.236 – 0.260

Fuel Rail Pressure Sensor

INFOID:0000000014268442

Supply voltage	Approx. 5 V
Idle (Engine is warmed up to normal operating temperature.)	1.3 – 1.7 V
2,000 rpm (Engine is warmed up to normal operating temperature.)	1.7 – 2.0 V

Fuel Injector

INFOID:0000000014268443

Resistance [at 10 – 60 °C (50 – 140°F)]	0.2 – 0.8 Ω
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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[YD25DDTi]

Glow Plug

INFOID:0000000014268444

Resistance [at 25°C (77°F)]	Approximately 0.45 Ω
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EGR Volume Control Valve

INFOID:0000000014268445

DC motor	Resistance	0.3 – 100 Ω
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Crankshaft Position Sensor

INFOID:0000000014268446

Refer to [EC-969, "Component Inspection \(Crankshaft Position Sensor\)"](#).

Camshaft Position Sensor

INFOID:0000000014268447

Refer to [EC-973, "Component Inspection \(Camshaft Position Sensor\)"](#).

Fuel Pump

INFOID:0000000014268448

Fuel pump suction control valve	Resistance [at 20 °C (68 °F)]	1.8 – 2.4 Ω
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