Section 1

Engine

CONTENTS

Precautions

Precautions

Precautions for Engine

BENF08J11000001

Refer to "General Precautions" in Section 00 (Page 00-1) and "Precautions for Electrical Circuit Service" in Section 00 (Page 00-2).

Engine General Information and Diagnosis

General Description

Injection Timing Description

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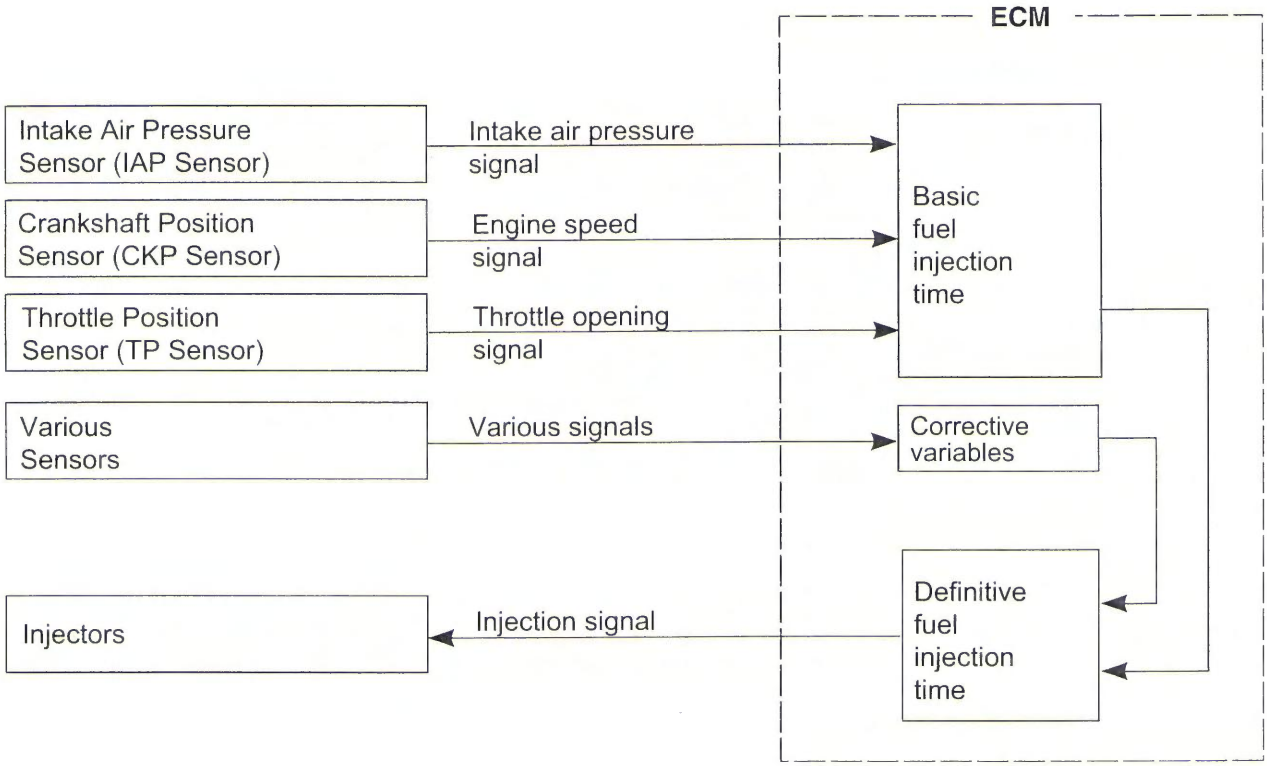
Injection Time (Injection Volume)

The factors to determine the injection time include the basic fuel injection time, which is calculated on the basis of the intake air pressure, engine speed and throttle opening angle, and various compensations. These compensations are determined according to the signals from various sensors that detect the engine and driving conditions.



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Compensation of Injection Time (Volume)

The following different signals are output from the respective sensors for compensation of the fuel injection time (volume).

Signal	Descriptions
ATMOSPHERIC PRESSURE SENSOR SIGNAL	When atmospheric pressure is low, the sensor sends the signal to the ECM and reduce the injection time (volume).
ENGINE COOLANT TEMPERATURE SENSOR SIGNAL	When engine coolant temperature is low, injection time (volume) is increased.
INTAKE AIR TEMPERATURE SENSOR SIGNAL	When intake air temperature is low, injection time (volume) is increased.
HEATED OXYGEN SENSOR SIGNAL	Air/fuel ratio is compensated to the theoretical ratio from density of oxygen in exhaust gasses. The compensation occurs in such a way that more fuel is supplied if detected air/fuel ratio is lean and less fuel is supplied if it is rich.
BATTERY VOLTAGE SIGNAL	ECM operates on the battery voltage and at the same time, it monitors the voltage signal for compensation of the fuel injection time (volume). A longer injection time is needed to adjust injection volume in the case of low voltage.
ENGINE SPEED SIGNAL	At high speed, the injection time (volume) is increased.
STARTING SIGNAL	When starting engine, additional fuel is injected during cranking engine.
ACCELERATION SIGNAL/DECELERATION SIGNAL	During acceleration, the fuel injection time (volume) is increased, in accordance with the throttle opening speed and engine speed. During deceleration, the fuel injection time (volume) is decreased.

Injection Stop Control

Signal	Descriptions
TIP-OVER SENSOR SIGNAL (FUEL SHUT-OFF)	When the motorcycle tips over, the tip-over sensor sends a signal to the ECM. Then, this signal cuts OFF current supplied to the fuel pump, fuel injectors and ignition coils.
OVER-REV. LIMITER SIGNAL	The fuel injectors stop operation when engine speed reaches rev. limit rpm. The fuel cut-off circuit is incorporated in this ECM in order to prevent over-running of engine. When engine speed reaches 11 600 r/min, this circuit cuts off fuel at the fuel injectors. But under no load, the clutch lever is pulled or the gear position is in neutral, this circuit cuts off fuel when engine speed reaches 11 200 r/min. ***NOTICE*** **Under no load, the engine can run over 11 200 r/min through the fuel cut-off circuit is effective, which may possibly cause engine damage. Do not run the engine without load over 11 200 r/min at anytime.**

Self-Diagnosis Function

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The self-diagnosis function is incorporated in the ECM. The function has two modes, "User mode" and "Dealer mode". The user can only be notified by the LCD (DISPLAY) panel and LED (FI indicator light). To check the function of the individual FI system devices, the dealer mode is provided. In this check, the special tool is necessary to read the code of the malfunction items.

User Mode

Malfunction		LCD (display) indication "A"	FI indicator light indication "B"	Indication mode
"NO"		Odd / Trip / Fuel consumption / Panel light brightness	—	—
"YES"	Engine can start	Odd / Trip / Fuel consumption / Panel light brightness and "FI" letters *1	FI indicator light turns ON.	Each 2 sec. Odd / Trip / Fuel consumption / Panel light brightness or "FI" is indicated.
	Engine can not start	"FI" letter *2	FI indicator light turns ON and blinks.	"FI" is indicated continuously.

***1**

When one of the signals is not received by ECM, the fail-safe circuit works and injection is not stopped. In this case, "FI" and Odd / Trip / Fuel consumption / Panel light brightness are indicated in the LCD panel and motorcycle can run.

***2**

The injection signal is stopped, when the camshaft position sensor signal, crankshaft position sensor signal, tip-over sensor signal, #1, #2, #3 and #4 ignition signals, #1, #2, #3 and #4 injector signals, FP relay signal or ignition switch signal is not sent to ECM. In this case, "FI" is indicated in the LCD panel. Motorcycle does not run.

"CHEC":

The LCD panel indicates "CHEC" when no communication signal from the ECM is received for 5 seconds.

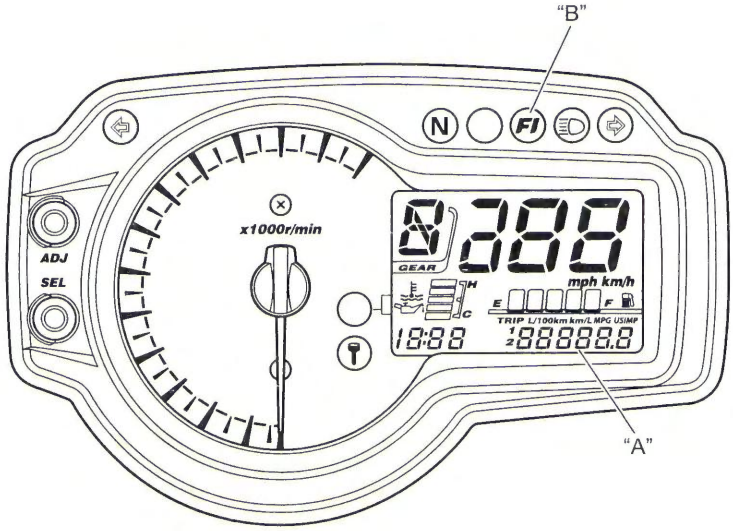
For Example:

The ignition switch is turned ON, and the engine stop switch is turned OFF. In this case, the speedometer does not receive any signal from ECM, and the panel indicates "CHEC". If CHEC is indicated, the LCD does not indicate the trouble code. It is necessary to check the wiring harness between ECM and speedometer couplers. The possible cause of this indication is as follows:

Engine stop switch is in OFF position. Side-stand/ignition inter-lock system is not working. Ignition fuse is burnt.

NOTE

Until starting the engine, the FI indicator light turns ON. The FI indicator light is also turned ON when engine temperature is high or oil pressure is low.



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Dealer Mode

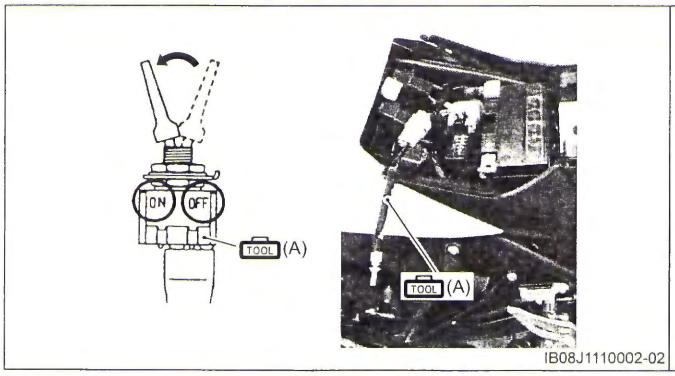
The defective function is memorized in the computer. Use the special tool's coupler to connect to the mode select switch. The memorized malfunction code is displayed on LCD (DISPLAY) panel. Malfunction means that the ECM does not receive signal from the devices. These affected devices are indicated in the code form.

NOTE

Before checking the malfunction code, do not disconnect the ECM coupler.
If the coupler from the ECM is disconnected, the malfunction code memory is erased and the malfunction code can not be checked.

Special tool

TOOL (A): 09930–82720 (Mode select switch)



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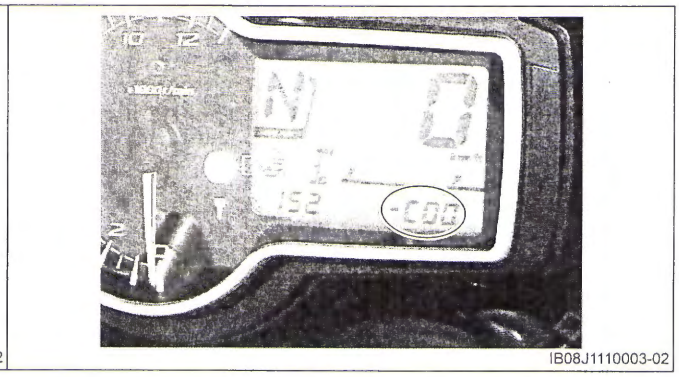

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Malfunction	LCD (display) indication	FI light indication	Indication mode
"NO"	C00	FI indicator light turns OFF.	—
"YES"	C** code is indicated from small numeral to large one.		For each 2 sec., code is indicated.

Schematic and Routing Diagram

FI System Wiring Diagram

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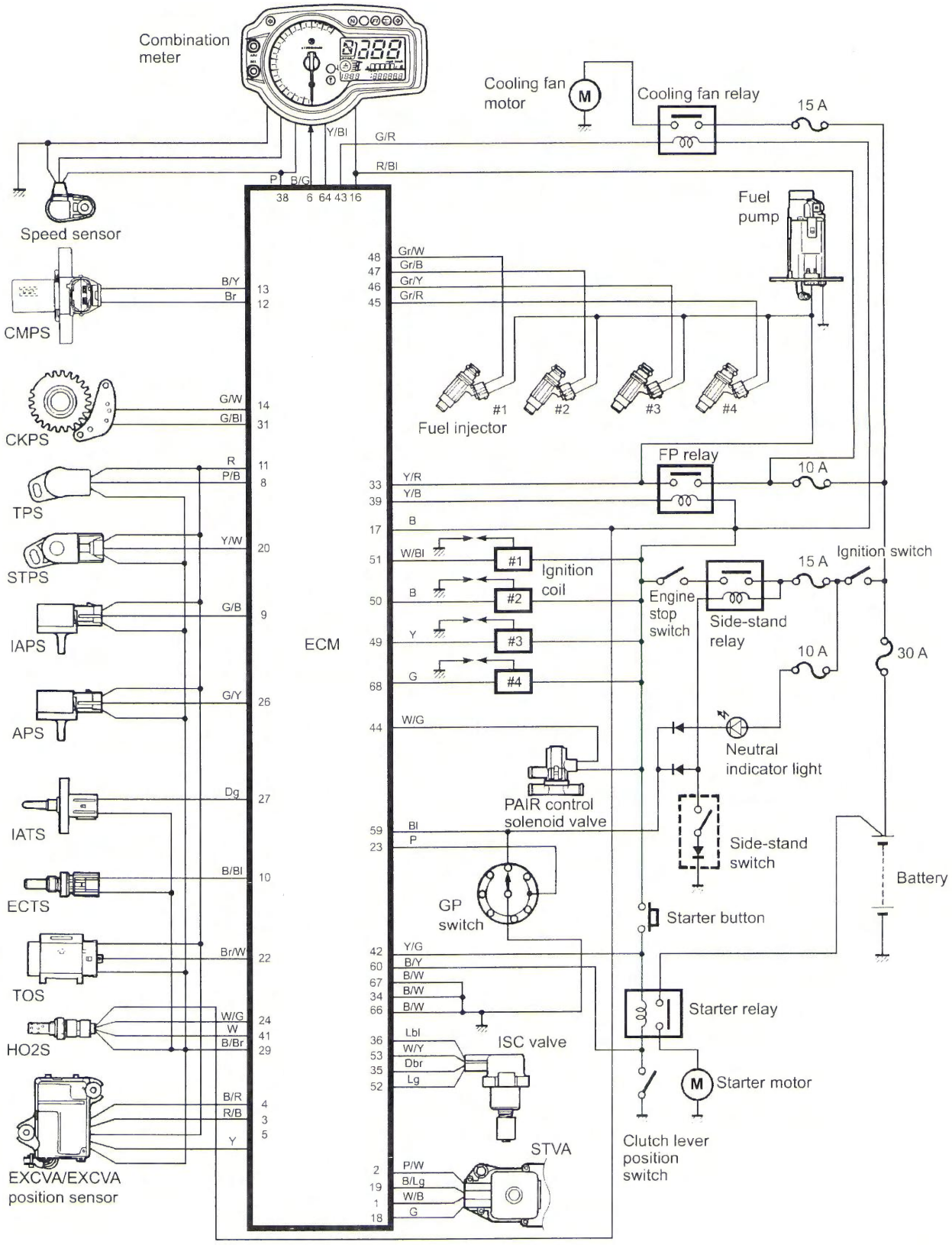

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Terminal Alignment of ECM Coupler

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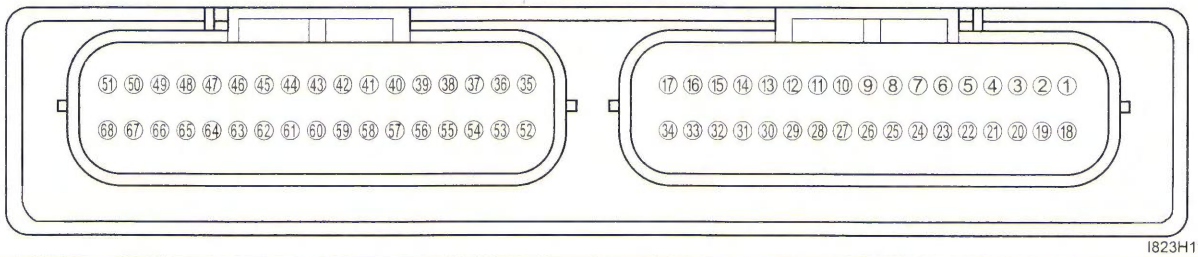

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TERMINAL NO.	CIRCUIT	TERMINAL NO.	CIRCUIT
1	STVA signal (STVA, 2A)	35	ISC valve signal (ISC, 2B)
2	STVA signal (STVA, 1A)	36	ISC valve signal (ISC, 1B)
3	EXCVA power (MO–)	37	—
4	EXCVA power (MO+)	38	Speed sensor signal
5	EXCVA position sensor (MPS)	39	Fuel pump relay (FP relay)
6	Serial data for speedometer	40	—
7	—	41	HO2 sensor heater (HO2SH)
8	TP sensor signal (TPS)	42	Starter switch
9	IAP sensor signal (IAPS)	43	Cooling fan relay (FAR)
10	ECT sensor signal (ECTS)	44	PAIR control solenoid valve (PAIR)
11	Power source for sensors (VCC)	45	Fuel injector #4
12	CMP sensor signal (CMPS–)	46	Fuel injector #3
13	CMP sensor signal (CMPS+)	47	Fuel injector #2
14	CKP sensor signal (CKPS+)	48	Fuel injector #1
15	—	49	Ignition coil #3
16	Power source for back-up (BATT)	50	Ignition coil #2
17	Power source	51	Ignition coil #1
18	STVA signal (STVA, 2B)	52	ISC valve signal (ISC, 2A)
19	STVA signal (STVA, 1B)	53	ISC valve signal (ISC, 1A)
20	STP sensor (STPS)	54	—
21	—	55	—
22	TO sensor signal (TOS)	56	—
23	GP switch signal (GP)	57	—
24	HO2 sensor signal (HO2S)	58	—
25	—	59	Neutral signal
26	AP sensor signal (APS)	60	Clutch lever switch
27	IAT sensor signal (IATS)	61	Mode select switch
28	—	62	—
29	Sensor ground (E2)	63	—
30	—	64	Tachometer
31	CKP sensor signal (CKPS–)	65	—
32	Serial data for self-diagnosis	66	General power ground (E1)
33	Power source for fuel injectors (VM)	67	Ignition system ground (E3)
34	ECM ground	68	Ignition coil #4

Component Location

FI System Parts Location

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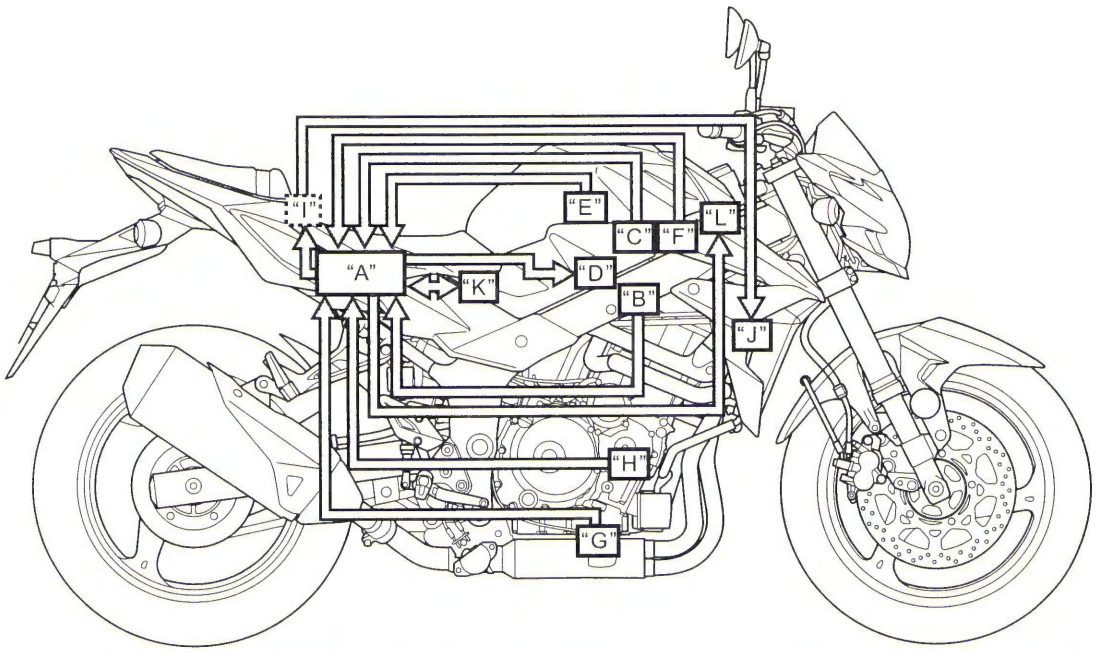

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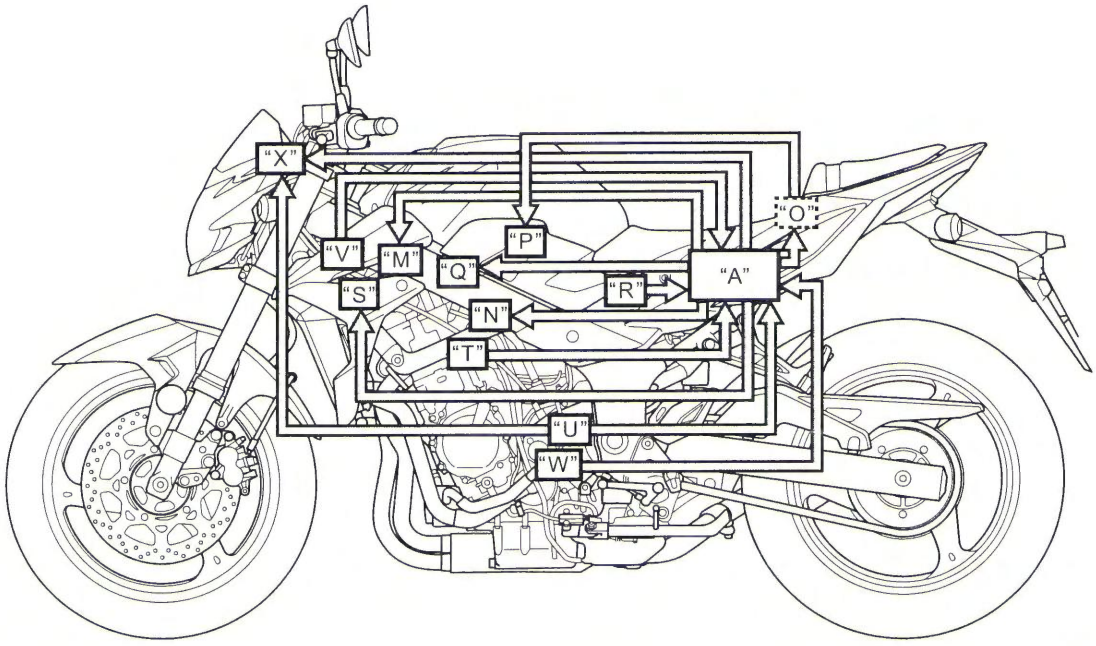
"A": ECM	"E": Intake air pressure sensor (IAPS)	"I": Cooling fan relay
"B": Throttle position sensor (TPS)	"F": Intake air temperature sensor (IATS)	"J": Cooling fan
"C": Secondary throttle position sensor (STPS)	"G": Heated oxygen sensor (HO2S)	"K": Exhaust control valve actuator (EXCVA)
"D": Secondary throttle valve actuator (STVA)	"H": Crankshaft position sensor (CKPS)	"L": PAIR control solenoid valve



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"A": ECM	"Q": ISC valve	"V": Atmospheric pressure sensor (APS)
"M": Ignition coil (IG coil)	"R": Tip-over sensor (TOS)	"W": Gear position switch (GP switch)
"N": Fuel injector	"S": Camshaft position sensor (CMPS)	"X": Combination meter
"O": Fuel pump relay (FP relay)	"T": Engine coolant temperature sensor (ECTS)	
"P": Fuel pump (FP)	"U": Speed sensor	

Diagnostic Information and Procedures

Engine Symptom Diagnosis

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Condition	Possible cause	Correction / Reference Item
Engine will not start or is hard to start (Compression too low)	Valve clearance out of adjustment.	*Adjust.*
	Worn valve guide or poor seating of valve.	*Repair or replace.*
	Mistimed valve.	*Adjust.*
	Excessively worn piston ring.	*Replace.*
	Worn-down cylinder bore.	*Replace.*
	Too slow starter motor cranking.	*Refer to "Starting System Diagram" in Section 1I (Page 1I-1).*
	Poor seating of spark plug.	*Retighten.*
Engine will not start or is hard to start (Plug not sparking)	Fouled spark plug.	*Clean.*
	Wet spark plug.	*Clean and dry.*
	Defective ignition coil.	*Replace.*
	Defective CKP sensor.	*Replace.*
	Defective ECM.	*Replace.*
	Open-circuited wiring connection.	*Repair or replace.*
Engine will not start or is hard to start (No fuel reaching the intake manifold)	Clogged fuel filter or fuel hose.	*Clean or replace.*
	Defective fuel pump.	*Replace.*
	Defective fuel pressure regulator.	*Replace.*
	Defective fuel injector.	*Replace.*
	Defective FP relay.	*Replace.*
	Defective ECM.	*Replace.*
	Open-circuited wiring connection.	*Check and repair.*
Engine will not start or is hard to start (Incorrect fuel/air mixture)	TP sensor out of adjustment.	*Adjust.*
	Defective fuel pump.	*Replace.*
	Defective fuel pressure regulator.	*Replace.*
	Defective TP sensor.	*Replace.*
	Defective CKP sensor.	*Replace.*
	Defective IAP sensor.	*Replace.*
	Defective ECM.	*Replace.*
	Defective ECT sensor.	*Replace.*
	Defective IAT sensor.	*Replace.*
	Defective AP sensor.	*Replace.*
	Clogged ISC valve air passage way.	*Repair or replace.*
Engine idles poorly	Valve clearance out of adjustment.	*Adjust.*
	Poor seating of valve.	*Replace or repair.*
	Defective valve guide.	*Replace.*
	Worn down camshaft.	*Replace.*
	Too wide spark plug gap.	*Adjust or replace.*
	Defective ignition coil/plug cap.	*Replace.*
	Defective CKP sensor.	*Replace.*
	Defective ECM.	*Replace.*
	Defective TP sensor.	*Replace.*
	Defective fuel pump.	*Replace.*
	Imbalanced throttle valve.	*Adjust.*
	Damaged or cranked vacuum hose.	*Replace.*
	Damaged or clogged ISC valve.	*Repair or replace.*
	ISC incorrect learning.	*Reset learned value.*

Condition	Possible cause	Correction / Reference Item
Engine stalls often (Incorrect fuel/air mixture)	Defective IAP sensor or circuit.	*Repair or replace.*
	Clogged fuel filter.	*Clean or replace.*
	Defective fuel pump.	*Replace.*
	Defective fuel pressure regulator.	*Replace.*
	Defective ECT sensor.	*Replace.*
	Defective thermostat.	*Replace.*
	Defective IAT sensor.	*Replace.*
	Damaged or cracked vacuum hose.	*Replace.*
	Damaged or cogged ISC valve.	*Replace or repair.*
Engine stalls often (Fuel injector improperly operating)	Defective fuel injector.	*Replace.*
	No injection signal from ECM.	*Repair or replace.*
	Open or short circuited wiring connection.	*Repair or replace.*
	Defective battery or low battery voltage.	*Replace or recharge.*
Engine stalls often (Control circuit or sensor improperly operating)	Defective ECM.	*Replace.*
	Defective fuel pressure regulator.	*Replace.*
	Defective TP sensor.	*Replace.*
	Defective IAT sensor.	*Replace.*
	Defective CMP sensor.	*Replace.*
	Defective CKP sensor.	*Replace.*
	Defective ECT sensor.	*Replace.*
	Defective FP relay.	*Replace.*
	Defective ISC valve.	*Replace.*
	ISC incorrect learning.	*Reset learned value.*
Engine stalls often (Engine internal parts improperly operating)	Fouled spark plug.	*Clean.*
	Defective CKP sensor or ECM.	*Replace.*
	Clogged fuel hose.	*Clean.*
	Out of valve clearance adjustment.	*Adjust.*
Noisy engine (Excessive valve chatter)	Too large valve clearance.	*Adjust.*
	Weakened or broken valve spring.	*Replace.*
	Worn tappet or cam surface.	*Replace.*
	Worn or burnt camshaft journal.	*Replace.*
Noisy engine (Noise seems to come from piston)	Worn down piston or cylinder.	*Replace.*
	Combustion chamber fouled with carbon.	*Clean.*
	Worn piston pin or piston pin bore.	*Replace.*
	Worn piston ring or ring groove.	*Replace.*
Noisy engine (Noise seems to come from cam chain)	Stretched cam chain.	*Replace.*
	Worn sprocket.	*Replace.*
	Worn cam chain guide	*Replace.*
	Cam chain tension adjuster not working.	*Repair or replace.*
Noisy engine (Noise seems to come from clutch)	Worn splines of countershaft or hub.	*Replace.*
	Worn teeth of clutch plate.	*Replace.*
	Distorted clutch plate.	*Replace.*
	Worn clutch release bearing.	*Replace.*
	Weakened clutch damper.	*Replace the primary driven gear.*
Noisy engine (Noise seems to come from crankshaft)	Rattling bearing due to wear.	*Replace.*
	Worn or burnt big-end bearing.	*Replace.*
	Worn or burnt journal bearing.	*Replace.*
	Too large thrust clearance.	*Replace thrust bearing.*
Noisy engine (Noise seems to come from balancer)	Worn and burnt journal bearings.	*Replace.*
Noisy engine (Noise seems to come from transmission)	Worn or rubbing gear.	*Replace.*
	Worn spline.	*Replace.*
	Worn or rubbing primary gear.	*Replace.*
	Worn bearing.	*Replace.*

Condition	Possible cause	Correction / Reference Item
Noisy engine (Noise seems to come from water pump)	Too much play on pump shaft bearing.	*Replace.*
	Worn or damaged impeller shaft.	*Replace.*
	Worn or damaged mechanical seal.	*Replace.*
	Contact between pump case and impeller.	*Replace.*
Engine runs poorly in high speed range (Defective engine internal/ electrical parts)	Weakened valve spring.	*Replace.*
	Worn camshaft.	*Replace.*
	Valve timing out of adjustment.	*Adjust.*
	Too narrow spark plug gap.	*Adjust.*
	Ignition not advanced sufficiently due to poorly. working timing advance circuit.	*Replace ECM.*
	Defective ignition coil.	*Replace.*
	Defective CKP sensor.	*Replace.*
	Defective ECM.	*Replace.*
	Clogged air cleaner element.	*Clean.*
	Clogged fuel hose, resulting in inadequate fuel. supply to injector.	*Clean and prime.*
	Defective fuel pump.	*Replace.*
	Defective TP sensor.	*Replace.*
	Defective STP sensor or STVA.	*Replace.*
Engine runs poorly in high speed range (Defective air flow system)	Clogged air cleaner element.	*Clean or replace.*
	Defective throttle valve.	*Adjust or replace.*
	Defective secondary throttle valve.	*Adjust or replace.*
	Sucking air from throttle body joint.	*Repair or replace.*
	Defective ECM.	*Replace.*
	Unbalancing throttle valve synchronization.	*Adjust.*
	Defective STP sensor or STVA.	*Replace.*
Engine runs poorly in high speed range (Defective control circuit or sensor)	Low fuel pressure.	*Repair or replace.*
	Defective TP sensor.	*Replace.*
	Defective IAT sensor.	*Replace.*
	Defective CMP sensor.	*Replace.*
	Defective CKP sensor.	*Replace.*
	Defective GP sensor.	*Replace.*
	Defective IAP sensor.	*Replace.*
	Defective ECM.	*Replace.*
	TP sensor out of adjustment.	*Adjust.*
	Defective STP sensor and/or STVA.	*Replace.*
	Defective EXCVA.	*Replace.*
Engine lacks power (Defective engine internal/ electrical parts)	Loss of valve clearance.	*Adjust.*
	Weakened valve spring.	*Replace.*
	Valve timing out of adjustment.	*Adjust.*
	Worn piston ring or cylinder.	*Replace.*
	Poor seating of valve.	*Repair.*
	Fouled spark plug.	*Clean or replace.*
	Incorrect spark plug.	*Adjust or replace.*
	Clogged fuel injector.	*Replace.*
	TP sensor out of adjustment.	*Adjust.*
	Clogged air cleaner element.	*Replace.*
	Unbalancing throttle valve synchronization.	*Adjust.*
	Sucking air from throttle valve or vacuum hose.	*Retighten or replace.*
	Too much engine oil.	*Drain out excess oil.*
	Defective fuel pump or ECM.	*Replace.*
	Defective CKP sensor and ignition coil.	*Replace.*
	Defective STP sensor or STVA.	*Replace.*

Condition	Possible cause	Correction / Reference Item
Engine lacks power (Defective control circuit or sensor)	Low fuel pressure.	*Repair or replace.*
	Defective TP sensor.	*Replace.*
	Defective IAT sensor.	*Replace.*
	Defective CKP sensor.	*Replace.*
	Defective GP switch.	*Replace.*
	Defective IAP sensor.	*Replace.*
	Defective AP sensor.	*Replace.*
	TP sensor out of adjustment.	*Adjust.*
	Defective STP sensor and/or STVA.	*Replace.*
	Defective EXCVA.	*Replace.*
Engine overheats (Defective engine internal parts)	Heavy carbon deposit on piston crown.	*Clean.*
	Not enough oil in the engine.	*Add oil.*
	Defective oil pump or clogged oil circuit.	*Replace or clean.*
	Sucking air from intake pipe.	*Retighten or replace.*
	Use of incorrect engine oil.	*Change.*
	Defective cooling system.	*See radiator section.*
Engine overheats (Lean fuel/air mixture)	Short-circuited IAP sensor/lead wire.	*Repair or replace.*
	Short-circuited IAT sensor/lead wire.	*Repair or replace.*
	Sucking air from intake pipe joint.	*Repair or replace.*
	Defective fuel injector.	*Replace.*
	Defective ECT sensor.	*Replace.*
Engine overheats (Other factors)	Ignition timing is too advanced due to defective timing advance system (ECT sensor, GP switch, CKP sensor or ECM).	*Replace.*
	Too tight drive chain.	*Adjust.*
	ISC incorrect learning.	*Reset learned value.*
Dirty or heavy exhaust smoke	Too much engine oil.	*Check with inspection window, drain out excess oil.*
	Worn piston ring or cylinder.	*Replace.*
	Worn valve guide.	*Replace.*
	Scored or scuffed cylinder wall.	*Replace.*
	Worn valve stem.	*Replace.*
	Defective stem seal.	*Replace.*
	Worn oil ring side rail.	*Replace.*

Self-Diagnostic Procedures

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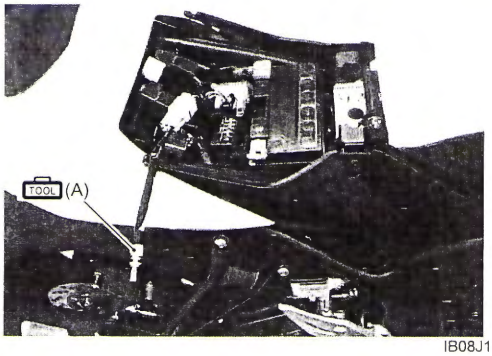
Use of Mode Select Switch

NOTE

- **Do not disconnect the coupler from ECM, battery cable from battery, ECM ground wire from engine or main fuse before confirming DTC (Diagnostic Trouble Code) stored in memory. Such disconnection will erase memorized information in ECM memory.**
- **DTC stored in ECM memory can be checked by the special tool.**
- **Before checking DTC, read self-diagnosis function "User mode and dealer mode" (Refer to "Self-Diagnosis Function" (Page 1A-3).) carefully to have good understanding as to what functions are available and how to use it.**
- **Be sure to read "Precautions for Electrical Circuit Service" (Refer to "Precautions for Electrical Circuit Service" in Section 00 (Page 00-2).) before inspection and observe what is written there.**

1) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D (Page 9D-6).
2) Connect the special tool to the mode select coupler at the wiring harness.

Special tool
TOOL (A): 09930–82720 (Mode select switch)



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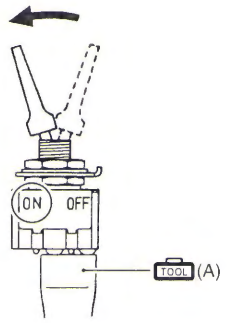
3) Start the engine or crank the engine for more than 4 seconds.
4) Turn the special tool's switch ON.
5) Check the DTC to determine the malfunction part. Refer to "DTC Table" (Page 1A-20).

Special tool
TOOL (A): 09930–82720 (Mode select switch)



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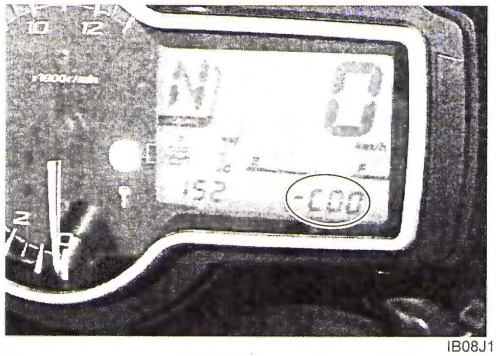

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6) After repairing the trouble, turn OFF the ignition switch and turn ON again. If DTC is indicated (C00), the malfunction is cleared.

NOTE

- **Even though DTC (C00) is indicated, the previous malfunction history DTC still remains stored in the ECM. Therefore, erase the history DTC memorized in the ECM using SDS.**
- **DTC is memorized in the ECM also when the lead wire coupler of any sensor is disconnected. Therefore, when a lead wire coupler has been disconnected at the time of diagnosis, erase the stored history DTC using SDS. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).**

7) Turn the ignition switch OFF and disconnect the special tool from the mode select switch / SDS coupler.
8) Reinstall the front seat.

Use of SDS

NOTE

- **Do not disconnect the coupler from ECM, battery cable from battery, ECM ground wire from the engine or main fuse before confirming DTC (Diagnostic Trouble Code) stored in memory. Such disconnection will erase the memorized information in ECM memory.**
- **DTC stored in ECM memory can be checked by SDS.**
- **Be sure to read "Precautions for Electrical Circuit Service" in Section 00 (Page 00-2) before inspection and observe what is written there.**

1) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D (Page 9D-6).
2) Set up the SDS tools. (Refer to the SDS operation manual for further details.)

Special tool
TOOL (A): 09904–41010 (SDS Set)
TOOL (B): 99565–01010–034 (CD-ROM Ver.34)

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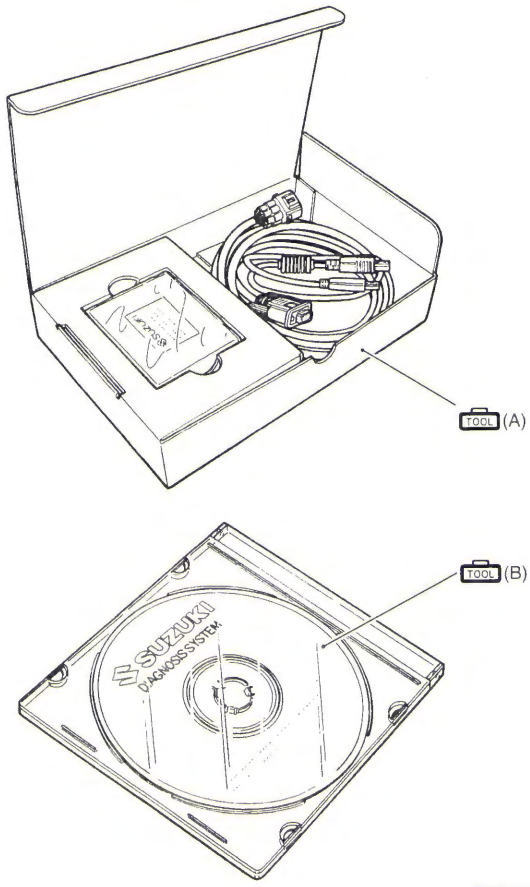

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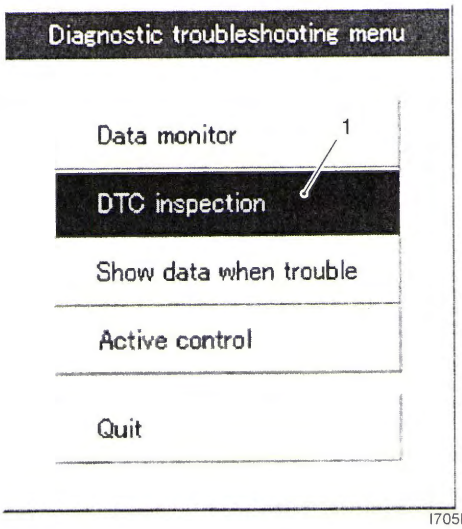
3) Click the DTC inspection button (1).



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4) Start the engine or crank the engine for more than 4 seconds.
5) Check the DTC to determine the malfunction part. Refer to "DTC Table" (Page 1A-20).

NOTE

- **Read the DTC (Diagnostic Trouble Code) and show data when trouble (displaying data at the time of DTC) according to instructions displayed on SDS.**
- **Not only SDS is used for detecting Diagnostic Trouble Codes but also for reproducing and checking on screen the failure condition as described by customers using the trigger. (Refer to "Show Data When Trouble (Displaying Data at the Time of DTC)" (Page 1A-15).)**
- **How to use trigger. (Refer to the SDS operation manual for further details.)**

6) After repairing the trouble, clear to delete history code (Past DTC). Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).
7) Close the SDS tool and turn the ignition switch OFF.
8) Disconnect the SDS tool and install the front seat.

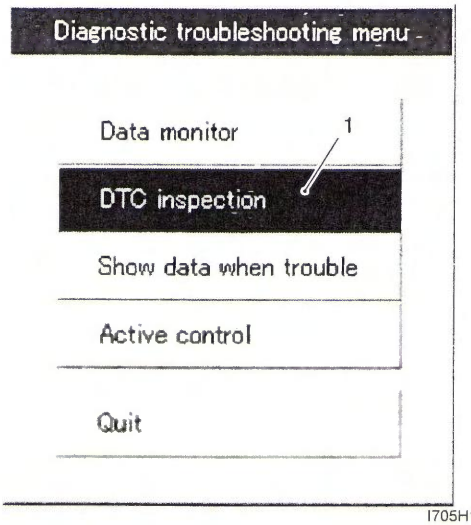
Use of SDS Diagnosis Reset Procedures

BENF08J11104003

NOTE

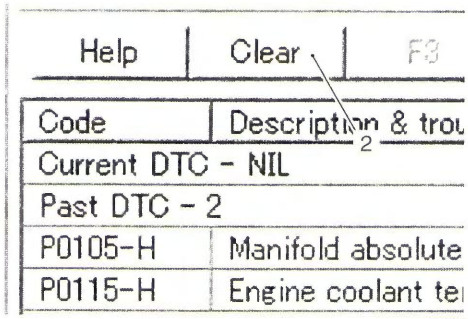
The DTC is memorized in the ECM also when the lead wire coupler of any sensor is disconnected. Therefore, when a lead wire coupler has been disconnected at the time of diagnosis, erase the stored history DTC using SDS.

1) After repairing the trouble, turn OFF the ignition switch and turn ON again.
2) Click the DTC inspection button (1).



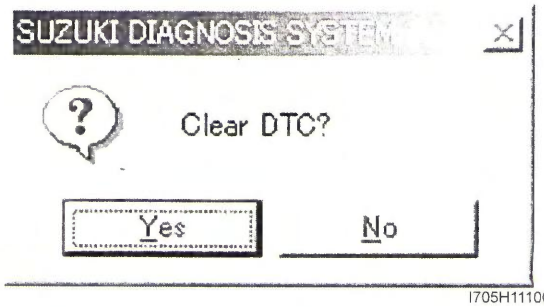
I705H1110003-01

3) Check the DTC.
4) The previous malfunction history code (Past DTC) still remains stored in the ECM. Therefore, erase the history code memorized in the ECM using SDS tool.
5) Click "Clear" (2) to delete history code (Past DTC).

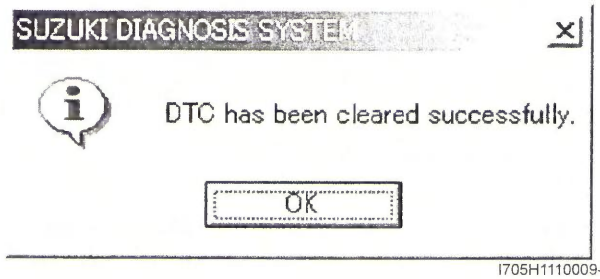


I705H1110005-01

6) Follow the displayed instructions.

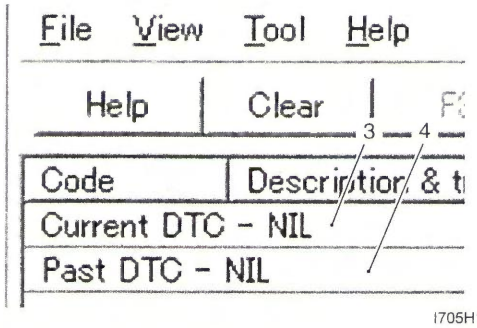


I705H1110006-01



I705H1110009-01

7) Check that both "Current DTC" (3) and "Past DTC" (4) are deleted (NIL).



I705H1110008-01

8) Close the SDS tool and turn the ignition switch OFF.
9) Disconnect the SDS tool and install the front seat.

Show Data When Trouble (Displaying Data at the Time of DTC)

BENF08J11104004

Use of SDS

ECM stores the engine and driving conditions (in the form of data as shown in the figure) at the moment of the detection of a malfunction in its memory. This data is called "Show data when trouble".
Therefore, it is possible to know engine and driving conditions (e.g., whether the engine was warm or not, where the motorcycle was running or stopped) when a malfunction was detected by checking the show data when trouble. This show data when trouble function can record the maximum of two Diagnostic Trouble Codes in the ECM.
Also, ECM has a function to store each show data when trouble for two different malfunctions in the order of occurrence as the malfunction is detected. Utilizing this function, it is possible to know the order of malfunctions that have been detected. Its use is helpful when rechecking or diagnosing a trouble.

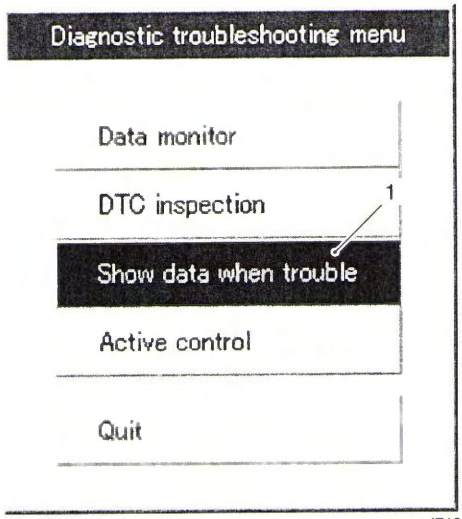
Failure #1

P0105-H Manifold absolute pressure circuit malfunction 1

Item	Pre-detect	Detect poi...	Post-dete...
Vehicle speed	0.0	0.0	0.0
Engine speed	0	0	0
Throttle position	27.9	27.9	27.9
Manifold absolute pressure 1	140.2	144.1	146.0
Engine coolant / oil temperature	67.3	67.3	67.3
Gear position	N	N	N

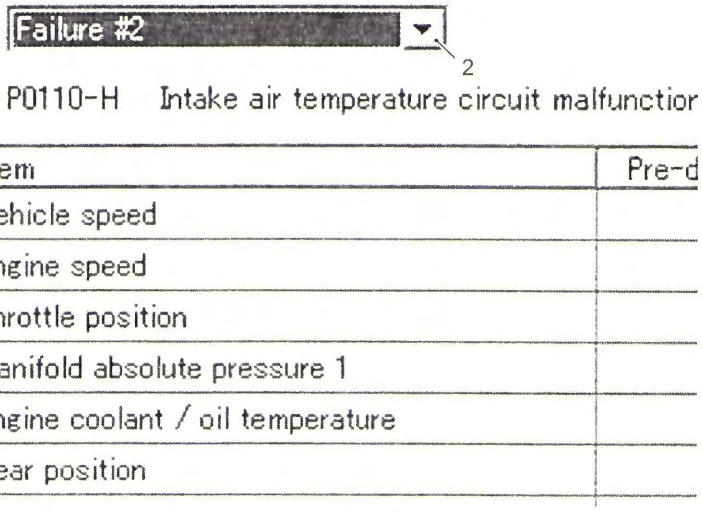
IB08J1110009-02

1) Click "Show data when trouble" (1) to display the data.



I718H1110269-02

2) Click the drop down button (2), either "Failure #1" or "Failure #2" can be selected.



IB08J1110010-02

SDS Check

BENF08J11104005

Using SDS, sample the data at the time of new and periodic vehicle inspections.
After saving the sampled data in the computer, file them by model and by user.
The periodically filed data help improve the accuracy of troubleshooting since they can indicate the condition of vehicle functions that has changed with time.
For example, when a vehicle is brought in for service but the troubleshooting of a failure is not easy, comparing the current data value to past filed data value at time of normal condition can allow the specific engine failure to be determined.
Also, in the case of a customer vehicle which is not periodically brought in for service with no past data value having been saved, if the data value of a good vehicle condition have been already saved as a master (STD), comparison between the same models helps to facilitate the troubleshooting.

1) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D (Page 9D-6).
2) Set up the SDS tool. (Refer to the SDS operation manual for further details.)

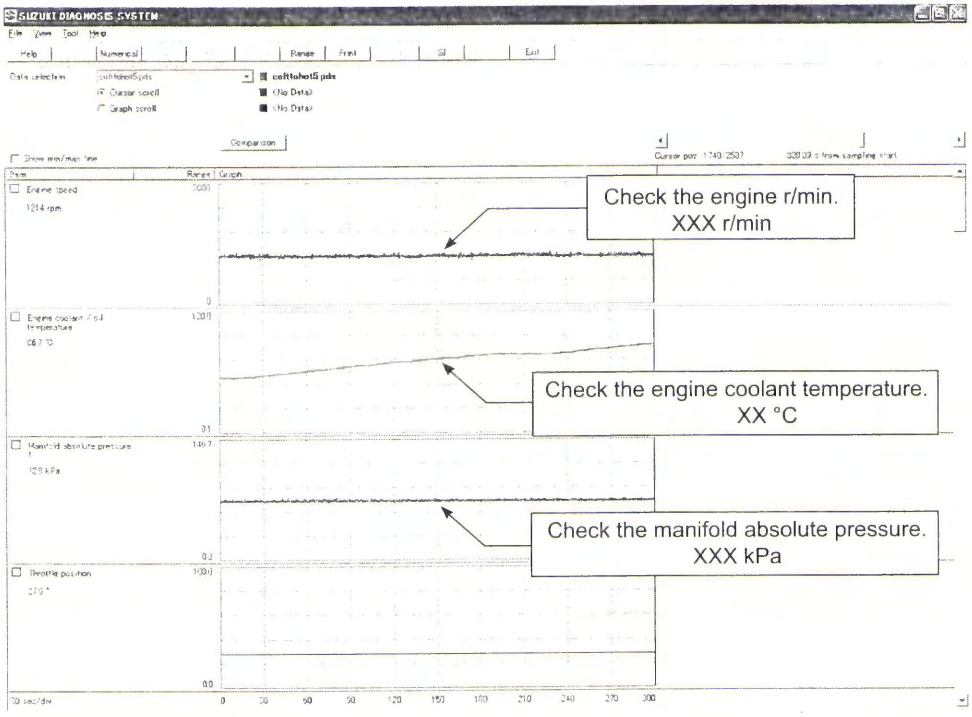
Special tool
(TOOL) : 09904–41010 (SDS set)
(TOOL) : 99565–01010–034 (CD-ROM Ver.34)

NOTE

- **Before taking the sample of data, check and clear the past DTC.**
- **A number of different data under a fixed condition as shown should be saved or filed as sample.**

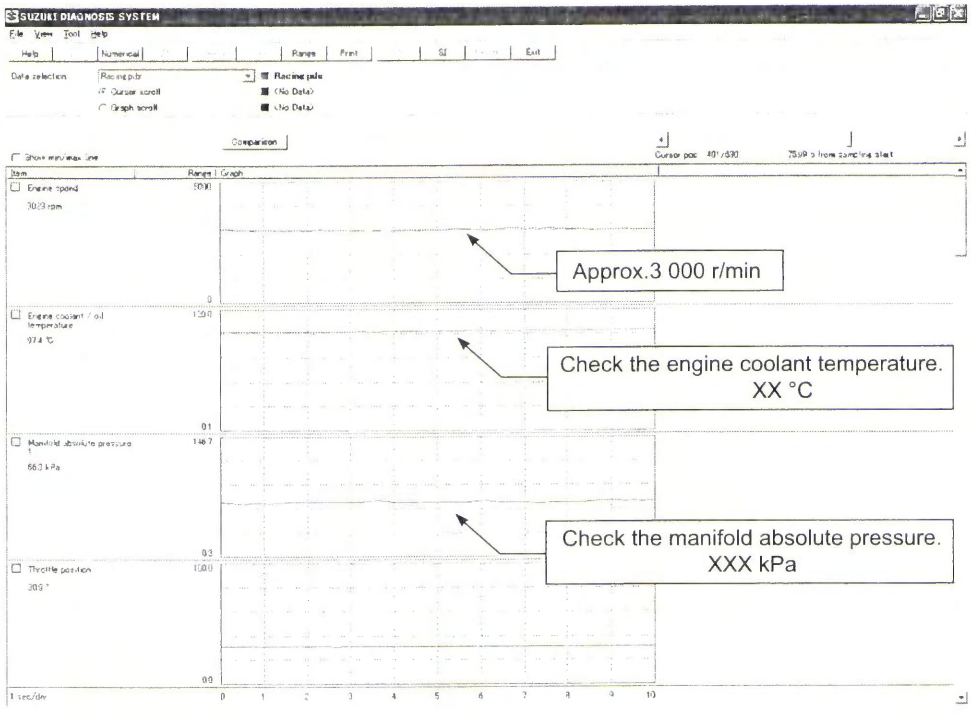
Sample

Data sampled from cold starting through warm-up



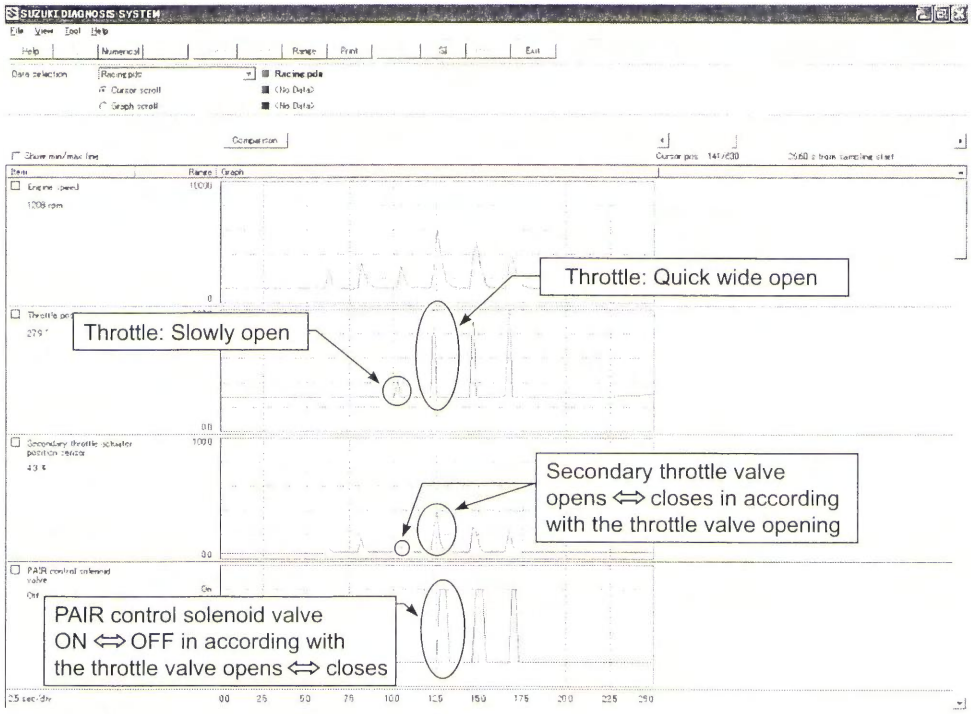
IB08J1110011-04

Data at 3 000 r/min under no load



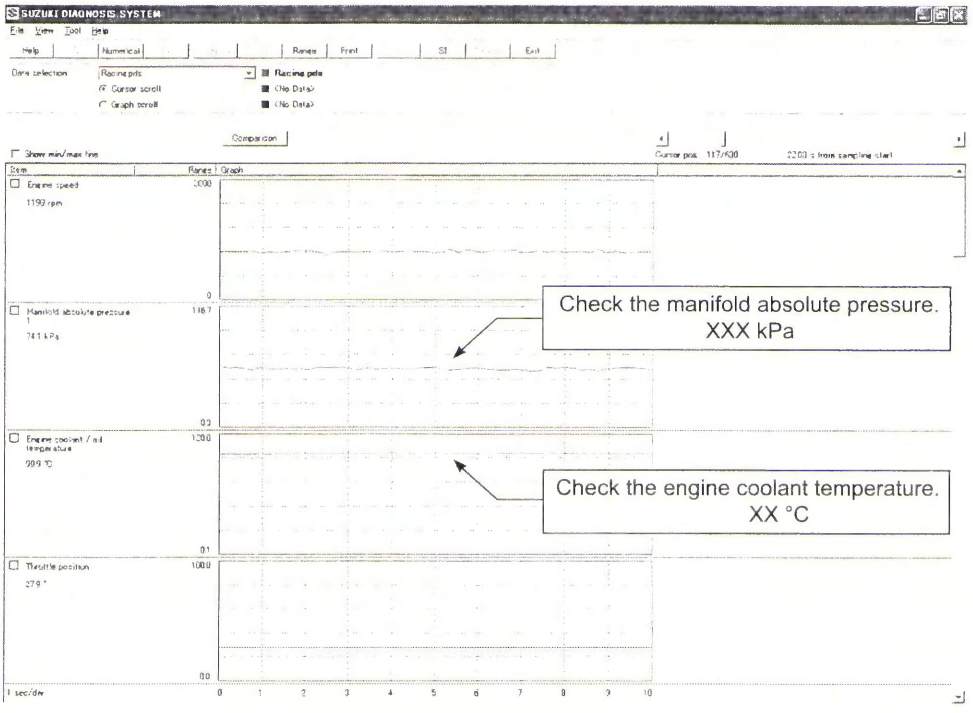
IB08J1110211-02

Data at the time of racing



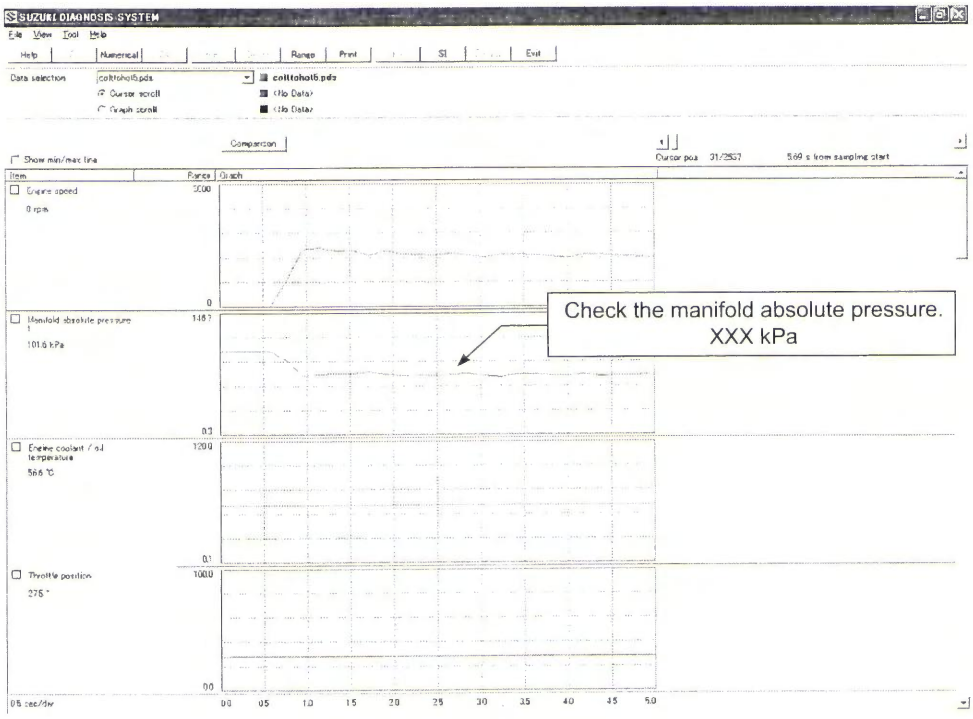
IB08J1110012-03

Data of intake negative pressure during idling (100 °C)



IB08J1110013-03

Data of manifold absolute pressure operation at the time of starting



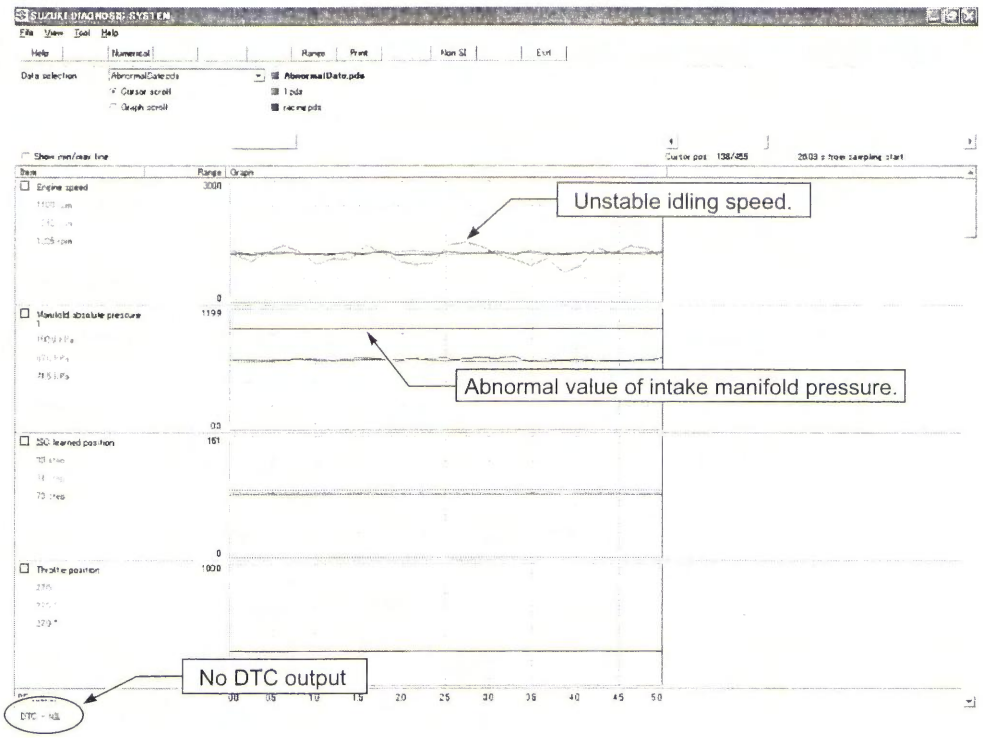
1B08J1110014-03

Example of Trouble

Three data; value 3 (current data 3), value 1 (past data 1) and value 2 (past data 2); can be made in comparison by showing them in the graph. Read the change of value by comparing the current data to the past data that have been saved under the same condition, then you may determine how changes have occurred with the passing of time and identify what problem is currently occurring.

NOTE

With DTC not output, if the engine idling speed and ISC valve stepping position are found to be abnormal than the data saved previously, the possible cause may probably lie in the hardware side such as ISC valve air inlet hose crumple, bend, etc.



IB08J1110213-02

DTC Table

BENF08J11104006

Code	Malfunction Part	Remarks
C00	None	No defective part
C11 (P0340) ☞(Page 1A-28)	Camshaft position sensor (CMPS)	
C12 (P0335) ☞(Page 1A-31)	Crankshaft position sensor (CKPS)	Pick-up coil signal, signal generator
C13 (P0105-H/L) ☞(Page 1A-34)	Intake air pressure sensor (IAPS)	
C14 (P0120-H/L) ☞(Page 1A-38)	Throttle position sensor (TPS)	*1
C15 (P0115-H/L) ☞(Page 1A-41)	Engine coolant temperature sensor (ECTS)	
C21 (P0110-H/L) ☞(Page 1A-44)	Intake air temperature sensor (IATS)	
C22 (P1450-H/L) ☞(Page 1A-47)	Atmospheric pressure sensor (APS)	
C23 (P1651-H/L) ☞(Page 1A-50)	Tip-over sensor (TOS)	
C24 (P0351) ☞(Page 1A-53)	Ignition signal #1 (IG coil #1)	For #1 cylinder

Code	Malfunction Part	Remarks
C25 (P0352) ☞(Page 1A-53)	Ignition signal #2 (IG coil #2)	For #2 cylinder
C26 (P0353) ☞(Page 1A-53)	Ignition signal #3 (IG coil #3)	For #3 cylinder
C27 (P0354) ☞(Page 1A-53)	Ignition signal #4 (IG coil #4)	For #4 cylinder
C28 (P1655) ☞(Page 1A-53)	Secondary throttle valve actuator (STVA)	
C29 (P1654-H/L) ☞(Page 1A-58)	Secondary throttle position sensor (STPS)	
C31 (P0705) ☞(Page 1A-61)	Gear position signal (GP switch)	
C32 (P0201) ☞(Page 1A-64)	Injector signal #1	For #1 cylinder
C33 (P0202) ☞(Page 1A-64)	Injector signal #2	For #2 cylinder
C34 (P0203) ☞(Page 1A-64)	Injector signal #3	For #3 cylinder
C35 (P0204) ☞(Page 1A-64)	Injector signal #4	For #4 cylinder
C40 (P0505) ☞(Page 1A-67)	Idle speed control valve (ISC valve)	
C41 (P0230-H/L, P2505) ☞(Page 1A-71) / ☞(Page 1A-73)	Fuel pump control system (FP control system), ECM/PCM power input signal	Fuel pump, FP relay
C42 (P1650) ☞(Page 1A-75)	Ignition switch signal (Anti-theft)	Immobilizer antenna (if equipped)
C44 (P0130, P0135) ☞(Page 1A-78)	Heated oxygen sensor (HO2S)	
C46 (P1657-H/L, P1658) ☞(Page 1A-86)	Exhaust control valve actuator (EXCVA)	
C49 (P1656) ☞(Page 1A-93)	PAIR control solenoid valve	
C60 (P0480) ☞(Page 1A-96)	Cooling fan control system	Cooling fan relay
C65 (P0506/P0507) ☞(Page 1A-100)	Idle speed control system	
C91 (P0500) ☞(Page 1A-101)	Vehicle speed sensor	

In the LCD (DISPLAY) panel, the malfunction code is indicated from small code to large code.
*1 To get the proper signal from the throttle position sensor, the sensor basic position is indicated in the LCD (DISPLAY) panel. The malfunction code is indicated in three digits. In front of the three digits, a line appears in any of the three positions, upper, middle or lower line. If the indication is upper or lower line when engine speed is 1 200 r/min, slightly turn the throttle position sensor and bring the line to the middle.

Fail-Safe Function Table

BENF08J11104007

FI system is provided with fail-safe function to allow the engine to start and the motorcycle to run in a minimum performance necessary even under malfunction condition.

Item	Fail-Safe Mode	Starting Ability	Running Ability
CMP sensor	When camshaft position signal has failed during running, the ECM determines the cylinder positions as # to be the same as before occurrence of such a failure.	"NO"	"YES"
		Motorcycle can run, but once engine stops, engine can not start.	
IAP sensor	Intake air pressure value is fixed to 101 KPa (760 mmHg).	"YES"	"YES"
TP sensor	The throttle opening is fixed to full open position. Ignition timing is also fixed.	"YES"	"YES"
ECT sensor	Engine coolant temperature value is fixed to 80 °C (176 °F). Cooling fan is fixed on position.	"YES"	"YES"
IAT sensor	Intake air temperature value is fixed to 40 °C (104 °F).	"YES"	"YES"
AP sensor	Atmospheric pressure is fixed to 101 kPa (760 mmHg).	"YES"	"YES"
Ignition signal	#1 fuel-cut	"YES"	"YES"
		#2, #3 & #4 cylinders can run.	
	#2 fuel-cut	"YES"	"YES"
		#1, #3 & #4 cylinders can run.	
	#3 fuel-cut	"YES"	"YES"
		#1, #2 & #4 cylinders can run.	
	#4 fuel-cut	"YES"	"YES"
		#1, #2 & #3 cylinders can run.	
Injection signal	—	"YES"	"YES"
		#2, #3 & #4 cylinders can run.	
	—	"YES"	"YES"
		#1, #3 & #4 cylinders can run.	
	—	"YES"	"YES"
		#1, #2 & #4 cylinders can run.	
	—	"YES"	"YES"
		#1, #2 & #3 cylinders can run.	
STVA	Secondary throttle valve is fixed to full close position. When motor disconnection or lock occurs, power from ECM is shut off.	"YES"	"YES"
STP sensor	Secondary throttle valve is fixed to full open position.	"YES"	"YES"
GP signal	GP signal is fixed to 6th gear.	"YES"	"YES"
HO2 sensor	Feedback compensation is inhibited. (Air/fuel ratio is fixed to normal.)	"YES"	"YES"
PAIR control solenoid valve	ECM stops controlling PAIR control solenoid valve.	"YES"	"YES"
EXCVA	EXCVA is fixed to full open position. When motor disconnection or lock occurs, power from ECM is shut off.	"YES"	"YES"
ISC valve	When motor disconnection or lock occurs, power from ECM is shut off.	"YES"	"YES"
Vehicle speed sensor	—	"YES"	"YES"

The engine can start and can run even if the signal in the table is not received from each sensor. But, the engine running condition is not complete, providing only emergency help (by fail-safe circuit). In this case, it is necessary to bring the motorcycle to the workshop for complete repair.

When two ignition signals or two injector signals are not received by ECM, the fail-safe circuit can not work and ignition or injection is stopped.

FI System Troubleshooting

BENF08J11104008

Customer Complaint Analysis

Record details of the problem (failure, complaint) and how it occurred as described by the customer. For this purpose, use of such an inspection form such as following will facilitate collecting information to the point required for proper analysis and diagnosis.

NOTE

This form is a standard sample. The form should be modified according to conditions and characteristic of each market.

EXAMPLE: CUSTOMER PROBLEM INSPECTION FORM

User name:	Model:	VIN:	
Date of issue:	Date Reg.:	Date of problem:	Mileage:

Malfunction indicator light condition (LED)	□ Always ON / □ Sometimes ON / □ Always OFF / □ Good condition
Malfunction display/code (LCD)	User mode: □ No display / □ Malfunction display ( )
	Dealer mode: □ No code / □ Malfunction code ( )

PROBLEM SYMPTOMS	
□ Difficult Starting □ No cranking □ No initial combustion □ No combustion □ Poor starting at (□ cold / □ warm / □ always) □ Other	□ Poor Driveability □ Hesitation on acceleration □ Back fire / □ After fire □ Lack of power □ Surging □ Abnormal knocking □ Engine speed jumps briefly □ Other
□ Poor Idling □ Poor fast Idle □ Abnormal idling speed (□ High / □ Low) (r/min) □ Unstable □ Hunting (r/min to r/min) □ Other	□ Engine Stall when □ Immediately after start □ Throttle valve is opened □ Throttle valve is closed □ Load is applied □ Other
□ OTHERS:	

MOTORCYCLE/ENVIRONMENTAL CONDITION WHEN PROBLEM OCCURS	
Environmental condition	
Weather **Temperature** **Frequency**	**□ Fair / □ Cloudy / □ Rain / □ Snow / □ Always / □ Other** **□ Hot / □ Warm / □ Cool / □ Cold (°C / °F) / □ Always** **□ Always / □ Sometimes (times / day, month) / □ Only once** **□ Under certain condition**
Road	**□ Urban / □ Suburb / □ Highway / □ Mountainous (□ Uphill / □ Downhill)** **□ Tarmacadam / □ Gravel / □ Other**
Motorcycle condition	
Engine condition	**□ Cold / □ Warming up phase / □ Warmed up / □ Always / □ Other at starting** **□ Immediately after start / □ Racing without load / □ Engine speed (r/min)**
Motorcycle condition	**During driving: □ Constant speed / □ Accelerating / □ Decelerating** **□ Right hand corner / □ Left hand corner** **□ At stop / □ Motorcycle speed when problem occurs (km/h, mile/h)** **□ Other:**

Visual Inspection

Prior to diagnosis using the mode select switch or SDS, perform the following visual inspections. The reason for visual inspection is that mechanical failures (such as oil leakage) cannot be displayed on the screen with the use of mode select switch or SDS.

- Engine oil level and leakage. Refer to "Engine Oil and Filter Replacement" in Section 1E (Page 1E-6).
- Engine coolant level and leakage. Refer to "Cooling Circuit Inspection" in Section 1F (Page 1F-5).
- Fuel leakage. Refer to "Fuel Hose Inspection" in Section 1G (Page 1G-7).
- Clogged air cleaner element. Refer to "Air Cleaner Element Inspection" in Section 1D (Page 1D-6).
- Battery condition.
- Throttle cable play. Refer to "Throttle Cable Play Inspection and Adjustment" in Section 1D (Page 1D-8).
- Vacuum hose looseness, bend and disconnection.
- Broken fuse.
- FI indicator light operation. Refer to "Combination Meter Inspection" in Section 9C (Page 9C-3).
- Each warning indicator light operation. Refer to "Combination Meter Inspection" in Section 9C (Page 9C-3).
- Speedometer operation. Refer to "Speedometer Inspection" in Section 9C (Page 9C-5).
- Exhaust gas leakage and noise. Refer to "Exhaust System Inspection" in Section 1K (Page 1K-15).
- Each coupler disconnection.
- Clogged radiator fins. Refer to "Radiator Inspection and Cleaning" in Section 1F (Page 1F-7).

Malfunction Code and Defective Condition Table

BENF08J11104009

Malfunction Code		Detected Item	Detected Failure Condition	Check For
C00		NO FAULT	—	—
C11		CMP sensor	The signal does not reach ECM for 3 sec. or more, after receiving the starter signal.	CMP sensor wiring and mechanical parts CMP sensor, intake cam pin, wiring/coupler connection
P0340				
C12		CKP sensor	The signal does not reach ECM for 3 sec. or more, after receiving the starter signal.	CKP sensor wiring and mechanical parts CKP sensor, rotor tip, lead wire/coupler connection
P0335				
C13		IAP sensor	The sensor should produce following voltage. 0.5 V ≤ Sensor voltage < 4.85 V In other than the above range, C13 (P0105) is indicated.	IAP sensor, lead wire/coupler connection
P0105	H		Sensor voltage is higher than specified value.	IAP sensor signal circuit shorted to VCC or ground circuit open
	L		Sensor voltage is lower than specified value.	IAP sensor signal circuit open or shorted to ground or VCC circuit open
C14		TP sensor	The sensor should produce following voltage. 0.2 V ≤ Sensor voltage < 4.8 V In other than the above range, C14 (P0120) is indicated.	TP sensor, lead wire/coupler connection
P0120	H		Sensor voltage is higher than specified value.	TP sensor signal circuit shorted to VCC or ground circuit open
	L		Sensor voltage is lower than specified value.	TP sensor signal circuit open or shorted to ground or VCC circuit open
C15		ECT sensor	The sensor voltage should be the following. 0.15 V ≤ Sensor voltage < 4.85 V In other than the above range, C15 (P0115) is indicated.	ECT sensor, lead wire/coupler connection
P0115	H		Sensor voltage is higher than specified value.	ECT sensor circuit open or ground circuit open
	L		Sensor voltage is lower than specified value.	ECT sensor circuit shorted to ground
C21		IAT sensor	The sensor voltage should be the following. 0.15 V ≤ Sensor voltage < 4.85 V In other than the above range, C21 (P0110) is indicated.	IAT sensor, lead wire/coupler connection
P0110	H		Sensor voltage is higher than specified value.	IAT sensor signal circuit open or ground circuit open
	L		Sensor voltage is lower than specified value.	IAT sensor signal circuit shorted to ground
C22		AP sensor	The sensor voltage should be the following. 0.5 V ≤ Sensor voltage < 4.85 V In other than the above range, C22 (P1450) is indicated.	AP sensor, lead wire/coupler connection
P1450	H		Sensor voltage is higher than specified value.	AP sensor signal circuit shorted to VCC or ground circuit open
	L		Sensor voltage is lower than specified value.	AP sensor signal circuit open or shorted to ground or VCC circuit open

Malfunction Code		Detected Item	Detected Failure Condition	Check For
C23		TO sensor	The sensor voltage should be the following for 2 sec. and more, after ignition switch is turned ON. 0.2 V ≤ Sensor voltage < 4.8 V In other than the above value, C23 (P1651) is indicated.	TO sensor, lead wire/coupler connection
P1651	H		Sensor voltage is higher than specified value.	TO sensor signal circuit shorted to VCC or ground circuit open
	L		Sensor voltage is lower than specified value.	TO sensor signal circuit open or shorted to ground or VCC circuit open
C24/C25 C26/C27		Ignition signal	CKP sensor (pick-up coil) signal is produced, but signal from ignition coil is interrupted 8 times or more continuously. In this case, the code C24 (P0351), C25 (P0352), C26 (P0353) or C27 (P0354) is indicated.	Ignition coil, wiring/coupler connection, power supply from the battery
P0351/P0352 P0353/P0354				
C28		STVA	When no actuator control signal is supplied from the ECM, communication signal does not reach ECM or operation voltage does not reach STVA motor, C28 (P1655) is indicated. STVA can not operate properly or its motor locked.	STVA motor, STVA lead wire/ coupler connection
P1655				
C29		STP sensor	The sensor should produce following voltage. 0.15 V ≤ Sensor voltage < 4.85 V In other than the above range, C29 (P1654) is indicated.	STP sensor, lead wire/coupler connection
P1654	H		Sensor voltage is higher than specified value.	STP sensor signal circuit shorted to VCC or ground circuit open
	L		Sensor voltage is lower than specified value.	STP sensor signal circuit open or shorted to ground or VCC circuit open
C31		GP signal	GP signal voltage should be higher than the following for 3 seconds and more. GP sensor voltage ≥ 0.6 V If lower than the above value, C31 (P0705) is indicated.	GP switch, wiring/coupler connection, gearshift cam, etc.
P0705				
C32/C33 C34/C35		Fuel injector	CKP sensor (pickup coil) signal is produced, but fuel injector signal is interrupted 4 times or more continuously. In this case, the code C32 (P0201), C33 (P0202), C34 (P0203) or C35 (P0204) is indicated.	Fuel injector, wiring/coupler connection, power supply to the injector
P0201/P0202 P0203/P0204				
C40/P0505		ISC valve	The circuit voltage of motor drive is unusual.	ISC valve circuit open or shorted to ground
C41		FP relay	No voltage is applied to the fuel pump, although FP relay is turned ON, or voltage is applied to fuel pump although FP relay is turned OFF.	FP relay, lead wire/coupler connection, power source to FP relay and fuel injectors
P0230	H		Voltage is applied to fuel pump although FP relay is turned OFF.	FP relay switch circuit shorted to power source FP relay (switch side)
	L		No voltage is applied to the fuel pump, although FP relay is turned ON.	FP relay circuit open or short FP relay (coil side)
C41/P2505		ECM/PCM power input signal	No voltage is applied to the ECM.	Lead wire/coupler connection of ECM terminal to fuel fuse

Malfunction Code	Detected Item	Detected Failure Condition	Check For
C42 P1650	Immobilizer antenna	When the I.D. agreement is not verified. ECM does not receive communication signal from the immobilizer antenna.	Immobilizer/anti-theft system (if equipped)
C44/P0130	HO2 sensor	HO2 sensor output voltage is not input to ECM during specified running condition. C44 (P0130) is indicated.	Output state of HO2 sensor
C44/P0135		The Heater can not operate so that heater operation voltage is not supplied to the HO2 sensor heater circuit, C44 (P0135) is indicated.	HO2 sensor heater circuit open or shorted to ground Battery voltage supply to the HO2 sensor
C46	EXCVA	EXCVA position sensor produces following voltage. 0.1 V ≤ sensor voltage < 4.9 V In other than the above range, C46 (P1657) is indicated. When no actuator control signal is supplied from the ECM, communication signal does not reach ECM or operation voltage does not reach EXCVA motor, C46 (P1658) is indicated. EXCVA can not operate.	EXCVA, EXCVA lead wire/ coupler
P1657 H		EXCVA position sensor voltage is higher than specified value.	EXCVA position sensor circuit shorted to VCC or ground circuit open
P1657 L		EXCVA position sensor voltage is lower than specified value.	EXCVA position sensor circuit open or shorted to ground or VCC circuit open
P1658		When no operation voltage reaches EXCVA motor, C46 (P1658) is indicated. EXCVA motor can not be operated.	EXCVA, EXCVA motor lead wire/coupler
C49 P1656	PAIR control solenoid valve	PAIR control solenoid valve voltage is not input to ECM.	PAIR control solenoid valve, lead wire/coupler connection
C60 P0480	Cooling fan relay	Cooling fan relay signal is not input to ECM.	Cooling fan relay, lead wire/ coupler connection
C65/P0506	ISC valve (Idle speed)	Idle speed dropped lower than desired idle speed by more than specified range.	Air passage clogged ISC valve is fixed ISC valve preset position is incorrect
C65/P0507		Idle speed rose higher than desired idle speed by more than specified range.	ISC valve hose connection ISC valve is fixed ISC valve preset position is incorrect
C91 P0500	Vehicle speed sensor	Speedometer does not receive signal from the vehicle speed sensor for more than 6 sec. when the motorcycle is running. ECM does not receive signal from the vehicle speed sensor for more than 6 sec. when the motorcycle is running. Failure in communication between ECM and speedometer with reference to vehicle speed.	Speed sensor and speedometer wiring/coupler connection between ECM and speedometer

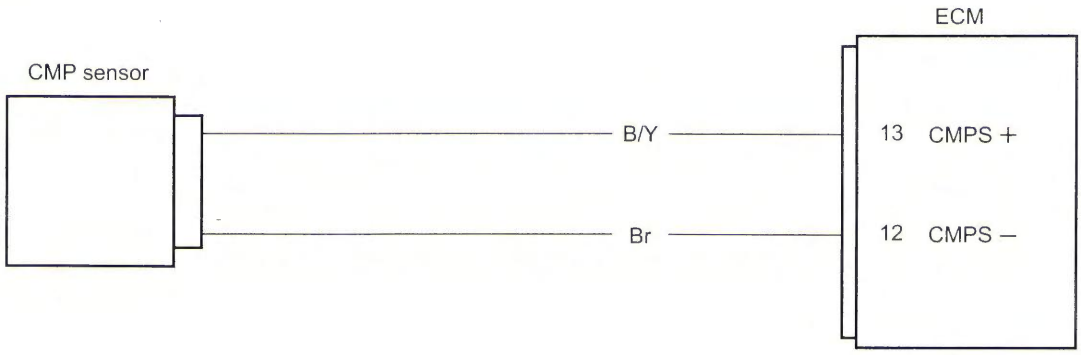
DTC "C11" (P0340): CMP Sensor Circuit Malfunction

BENF08J11104010

Detected Condition and Possible Cause

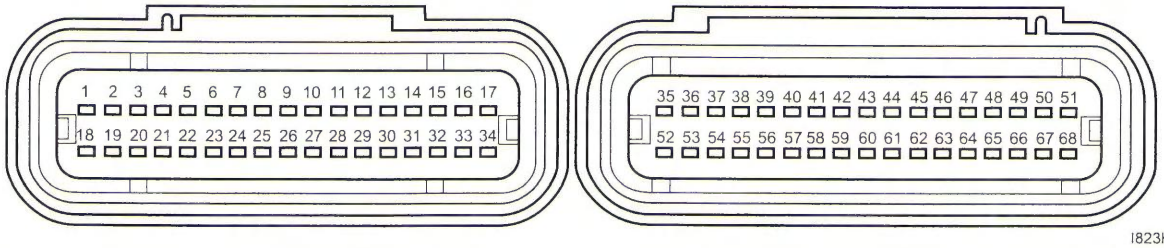
Detected Condition	Possible Cause
The signal does not reach ECM for 3 sec. or more, after receiving the starter signal.	• Metal particles or foreign material being stuck on the CMP sensor and intake cam pin. • CMP sensor circuit open or short. • CMP sensor malfunction. • ECM malfunction.

Wiring Diagram



IB08J1110015-02

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

NOTE

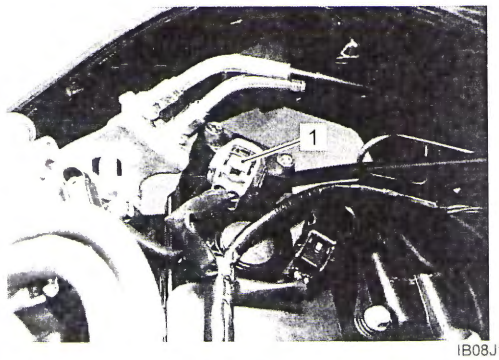
After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

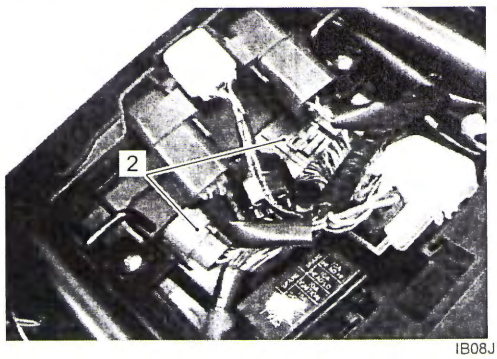
CMP sensor signal circuit check

1) Turn the ignition switch OFF.
2) Remove the air cleaner box. Refer to "Air Cleaner Box Removal and Installation" in Section 1D (Page 1D-7).

3) Disconnect the CMP sensor coupler (1) and ECM couplers (2).



IB08J1110016-02



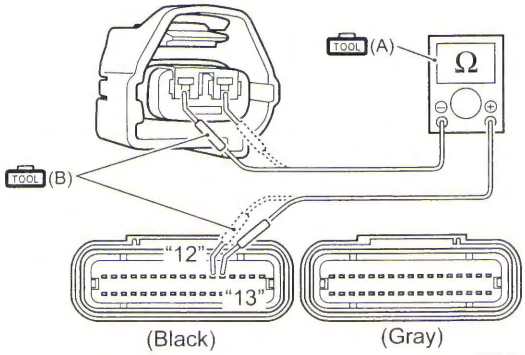
IB08J1110017-02

4) Check for proper terminal connection to the CMP sensor coupler and ECM couplers.
5) If connections are OK, check the following points.
   - Resistance

     Special tool
     TOOL (A): 09900–25008 (Multi circuit tester set)
     TOOL (B): 09900–25009 (Needle-point probe set)

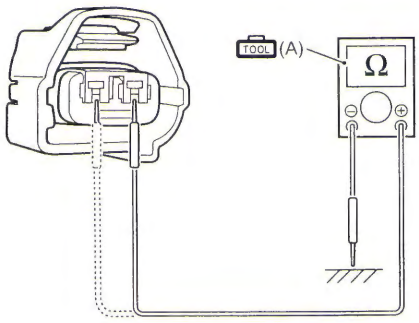
     Tester knob indication
     Resistance (Ω)

     – B/Y wire and Br wire: less than 1 Ω



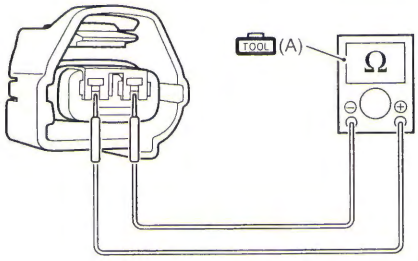
IB08J1110018-02

     – Between each of the B/Y wire and Br wire and ground: infinity



IB08J1110019-02

     – Between the B/Y wire terminal and other terminal at CMP sensor coupler: infinity



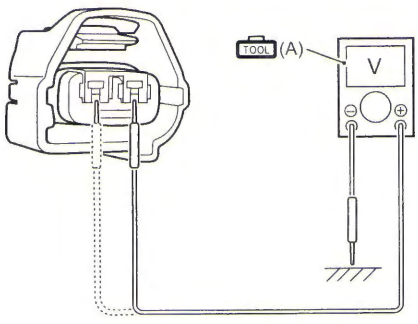
IB08J1110020-02

   - Voltage

     Special tool
     TOOL (A): 09900–25008 (Multi circuit tester set)

     Tester knob indication
     Voltage (⎓)

     – B/Y wire and Br wire: approx. 0 V (When ignition switch is ON)



IB08J1110021-02

Is check result OK?

Yes	Go to Step 2.
No	Repair or replace the defective wire harness.

Step 2

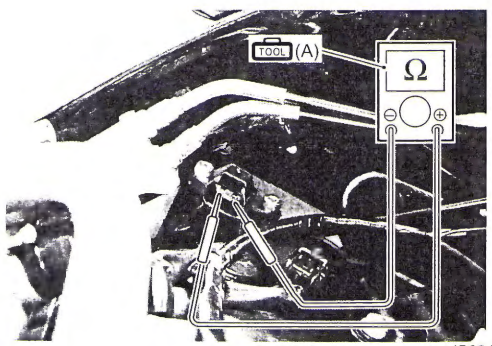
CMP sensor check

1) Measure the CMP sensor resistance.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Resistance (Ω)

CMP sensor resistance
0.9 k – 1.7 kΩ

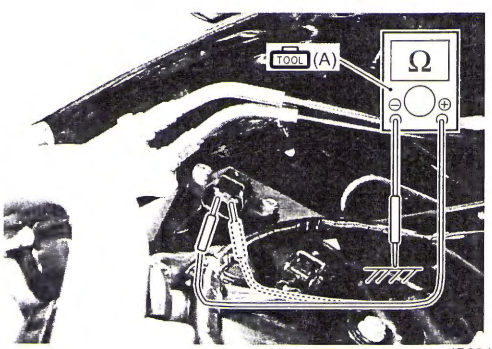


IB08J1110022-02

2) Check the continuity between each terminal and ground.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

CMP sensor continuity
∞ Ω (Infinity) (B/Y – Ground, Br – Ground)



IB08J1110023-03

Is check result OK?

Yes — Go to Step 3.

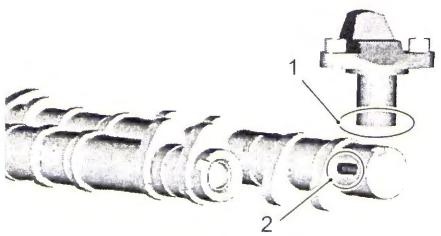
No — Replace the CMP sensor with a new one. Refer to "CMP Sensor Removal and Installation" in Section 1C (Page 1C-2).

Step 3

CMP sensor and intake cam pin check

1) Remove the CMP sensor. Refer to "CMP Sensor Removal and Installation" in Section 1C (Page 1C-2).

2) Check that end face of the CMP sensor (1) and intake cam pin (2) are free from any metal particles and damage.



IB08J1110024-02

Is check result OK?

Yes — Go to Step 4.

No — Clean or replace defective parts.

Step 4

CMP sensor peak voltage check

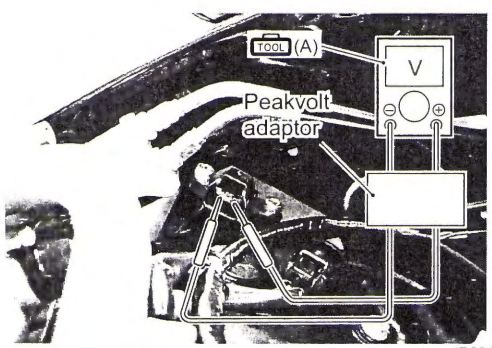
1) Connect the ECM couplers.

2) Crank the engine several seconds with the starter motor, and measure the CMP sensor peak voltage at the coupler.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

CMP sensor peak voltage
0.7 V and more



IB08J1110025-02

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Replace the CMP sensor with a new one. Refer to "CMP Sensor Removal and Installation" in Section 1C (Page 1C-2).

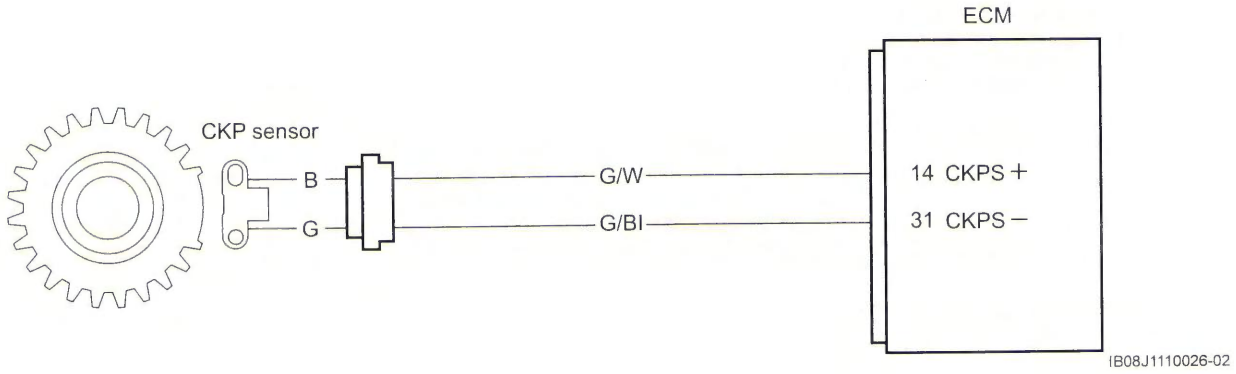
DTC "C12" (P0335): CKP Sensor Circuit Malfunction

BENF08J11104011

Detected Condition and Possible Cause

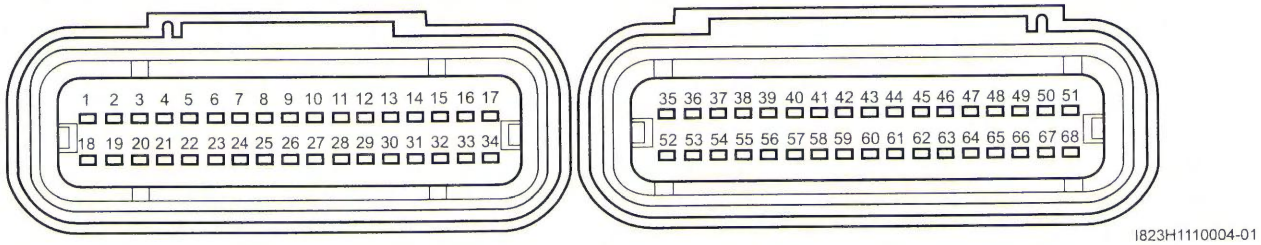
Detected Condition	Possible Cause
The signal does not reach ECM for 3 sec. or more, after receiving the starter signal.	• Metal particles or foreign material being stuck on the CKP sensor and rotor tip. • CKP sensor circuit open or short. • CKP sensor malfunction. • ECM malfunction.

Wiring Diagram



IB08J1110026-02

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

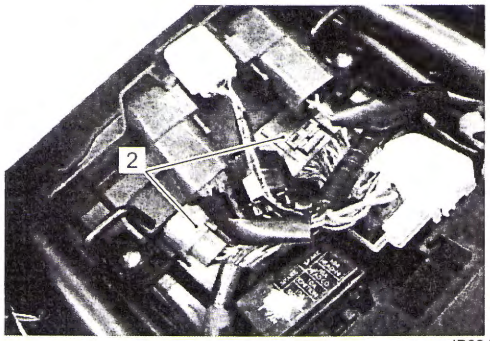
Step 1

CKP sensor signal circuit check

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).

3) Disconnect the CKP sensor coupler (1) and ECM couplers (2).

IB08J1110027-02



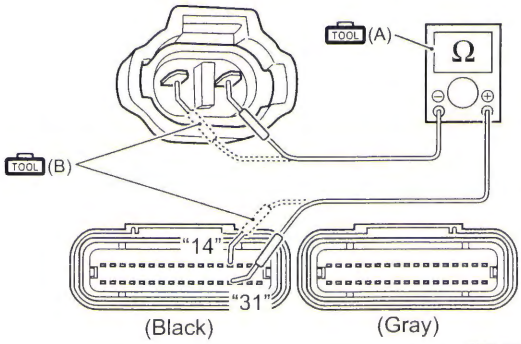
IB08J1110017-02

4) Check for proper terminal connection to the CKP sensor coupler and ECM couplers.
5) If connections are OK, check the following points.
   - Resistance

     Special tool
     TOOL (A): 09900–25008 (Multi-circuit tester set)
     TOOL (B): 09900–25009 (Needle-point probe set)

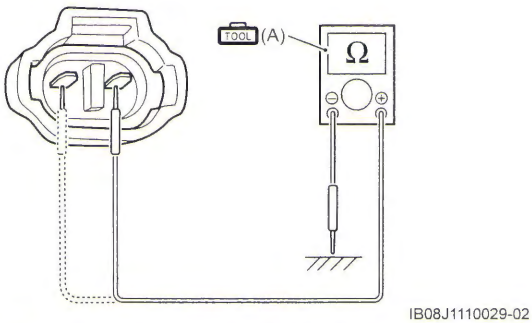
     Tester knob indication
     Resistance (Ω)

     – G/W wire and G/Bl wire: less than 1 Ω



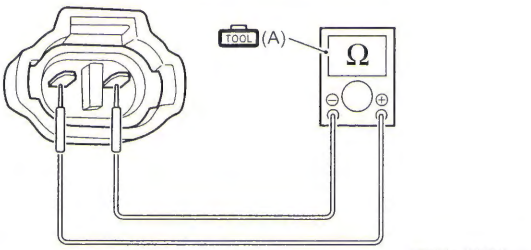
IB08J1110028-02

     – Between each of the G/W and G/L wire and ground: infinity



IB08J1110029-02

     – Between the G/W wire and other terminal at CKP sensor coupler: infinity



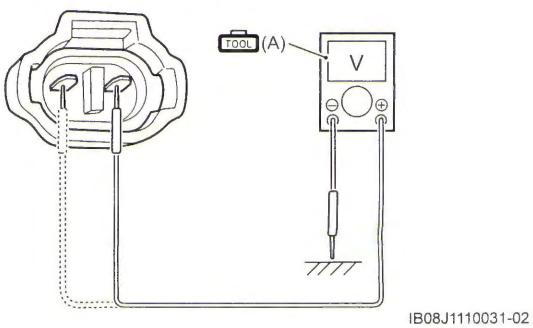
IB08J1110030-02

   - Voltage

     Special tool
     TOOL (A): 09900–25008 (Multi-circuit tester set)

     Tester knob indication
     Voltage (⎓)

     – G/W wire and G/Bl wire: approx. 0 V (When ignition switch is ON)



IB08J1110031-02

Is check result OK?

Yes	Go to Step 2.
No	Repair or replace the defective wire harness.

Step 2

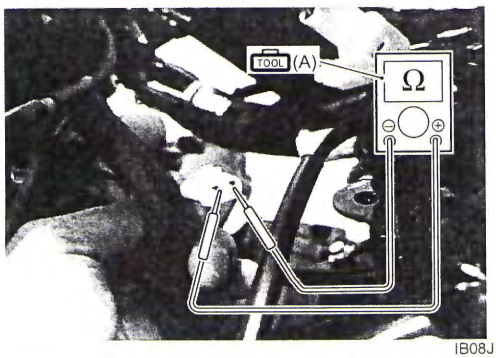
CKP sensor check

1) Measure the CKP sensor resistance.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Resistance (Ω)

CKP sensor resistance
142 – 194 Ω

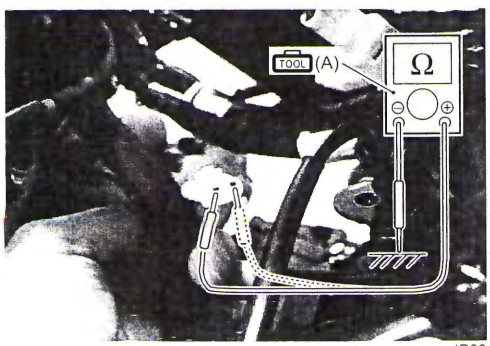


IB08J1110032-02

2) Check the continuity between each terminal and ground.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

CKP sensor continuity
∞ Ω (Infinity) (G/W – Ground, G/Bl – Ground)



IB08J1110033-03

Is check result OK?

Yes — Go to Step 3.

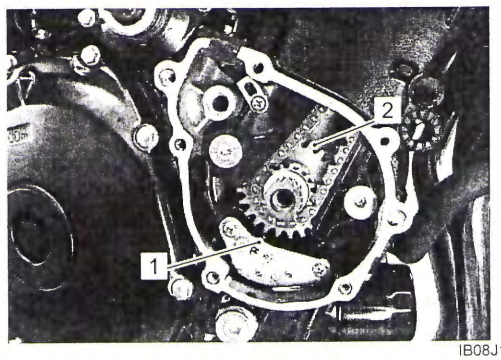
No — Replace the CKP sensor with a new one. Refer to "CKP Sensor Removal and Installation" in Section 1C (Page 1C-2).

Step 3

CKP sensor and signal rotor check

1) Remove the starter clutch. Refer to "Starter Clutch Removal and Installation" in Section 1I (Page 1I-10).

2) Check that end face of the CKP sensor (1) and signal rotor teeth (2) are free from any metal particles and damage.



IB08J1110034-02

Is check result OK?

Yes — Go to Step 4.

No — Clean or replace defective parts.

Step 4

CKP sensor signal check

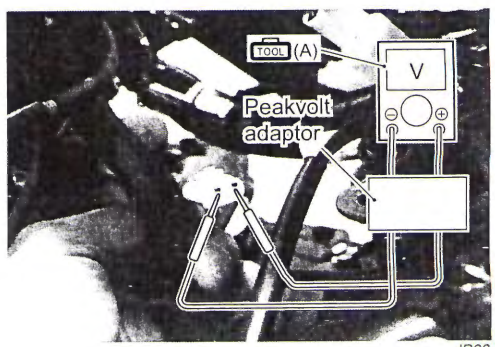
1) Connect the ECM couplers.

2) Crank the engine several seconds with the starter motor, and measure the CKP sensor peak voltage at the coupler.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

CKP sensor peak voltage
0.5 V and more



IB08J1110035-02

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Replace the CKP sensor with a new one. Refer to "CKP Sensor Removal and Installation" in Section 1C (Page 1C-2).

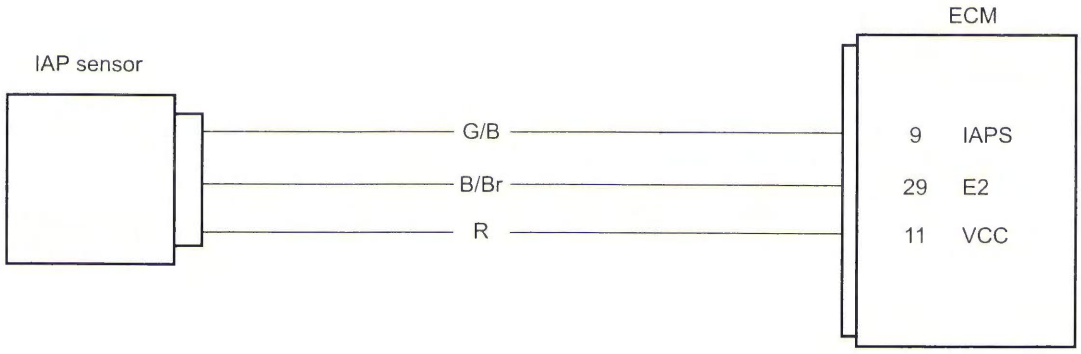
DTC "C13" (P0105-H/L): IAP Sensor Circuit Malfunction

BENF08J11104012

Detected Condition and Possible Cause

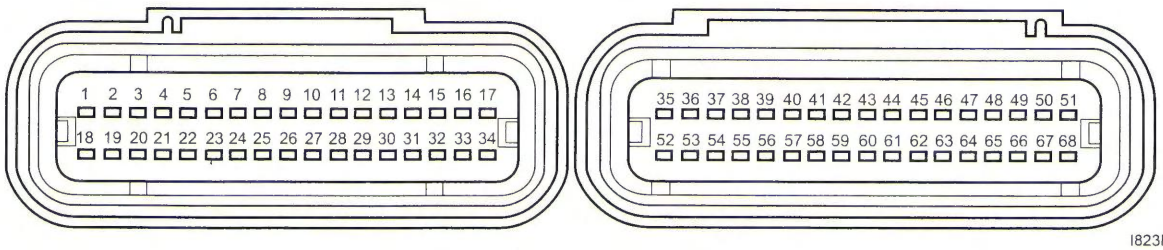
Detected Condition			Possible Cause
C13		IAP sensor voltage is not within the following range. 0.5 V ≤ Sensor voltage < 4.85 V **NOTE** **Note that atmospheric pressure varies depending on weather conditions as well as altitude. Take that into consideration when inspecting voltage.**	• Clogged vacuum passage between throttle body and IAP sensor. • Air being drawn from vacuum passage between throttle body and IAP sensor. • IAP sensor circuit open or shorted to ground. • IAP sensor malfunction. • ECM malfunction.
P0105	H	Sensor voltage is higher than specified value.	• IAP sensor signal circuit is open or shorted to VCC or ground circuit open.
	L	Sensor voltage is lower than specified value.	• IAP sensor signal circuit is shorted to ground or VCC circuit open.

Wiring Diagram



IB08J1110036-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

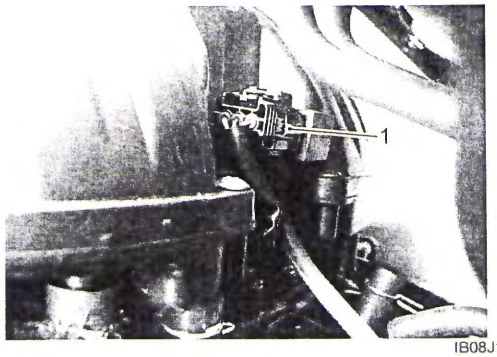
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

IAP sensor power supply circuit check

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).
3) Disconnect the IAP sensor coupler (1).



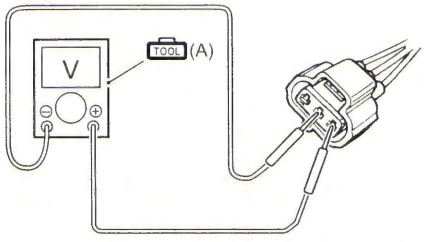
IB08J1110037-01

4) Check for proper terminal connection to the IAP sensor coupler.
5) If connections are OK, turn the ignition switch ON.
6) Measure the voltage between the R wire and B/Br wire.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

IAP sensor power supply voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: B/Br)



IB08J1110038-02

Is check result OK?

Yes Go to Step 3.

No Go to Step 2.

Step 2

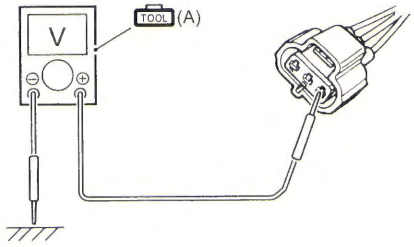
IAP sensor ground circuit check

1) Measure the voltage between the R wire and ground.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

IAP sensor power supply voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: ground)



IB08J1110068-02

Is check result OK?

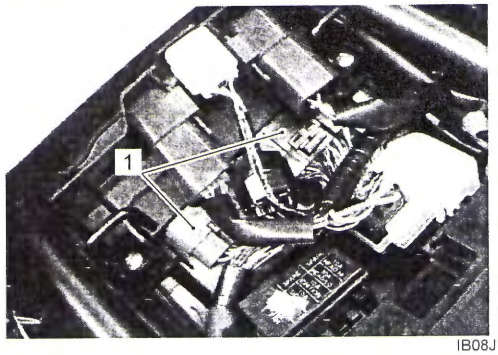
Yes Repair or replace the B/Br wire.

No Repair or replace the R wire.

Step 3

IAP sensor signal circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



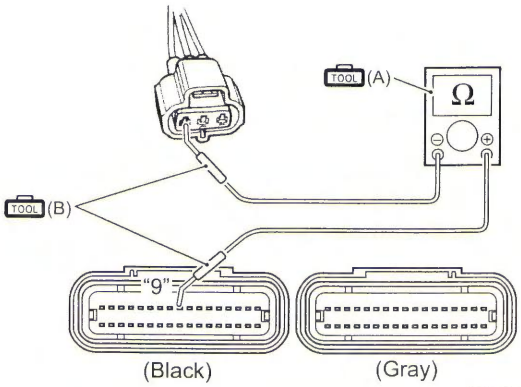
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK; check the following points.
   - Resistance

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)
     (B): 09900–25009 (Needle-point probe set)

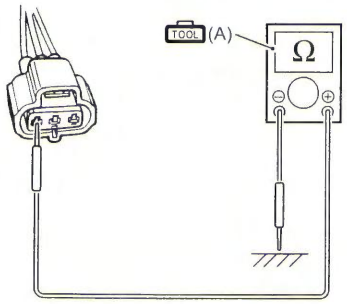
     Tester knob indication
     Resistance (Ω)

     – G/B wire: less than 1 Ω



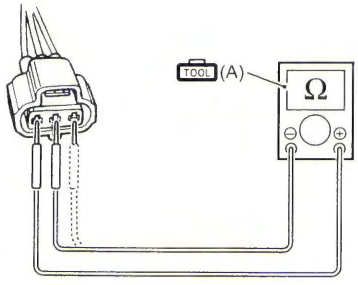
IB08J1110040-02

     – Between G/B wire and ground: infinity



IB08J1110041-03

     – G/B wire terminal and other terminal at IAP sensor connector: infinity



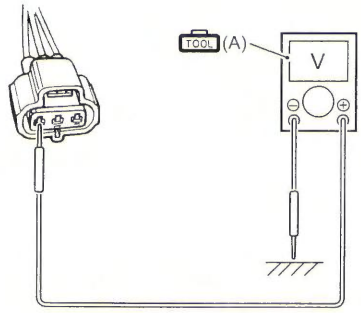
IB08J1110042-03

   - Voltage

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)

     Tester knob indication
     Voltage (⎓)

     – G/B wire: approx. 0 V (When ignition switch is ON)



IB08J1110043-03

Is check result OK?

Yes	Go to Step 4.
No	Repair or replace the G/B wire.

Step 4

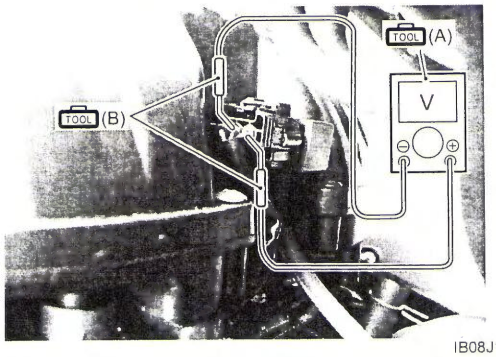
IAP sensor check 1

1) Turn the ignition switch OFF.
2) Connect the ECM couplers and IAP sensor coupler.
3) Insert the needle pointed probes to the lead wire coupler.
4) Run the engine at idle speed and measure the IAP sensor output voltage between the G/B wire and B/Br wire.

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

Tester knob indication
Voltage (⎓)

IAP sensor output voltage
Approx. 2.7 V at idle speed (atmospheric pressure: approx. 100 kPa (760 mmHg))
((+) terminal: G/B – (–) terminal: B/Br)



IB08J1110044-01

Is check result OK?

Yes — Go to Step 5.

No — Check the vacuum hoses for crack or damage.

If vacuum hoses are OK, replace the IAP sensor with a new one. Refer to "IAP Sensor Removal and Installation" in Section 1C (Page 1C-3).

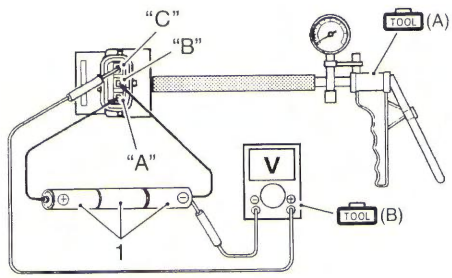
Step 5

IAP sensor check 2

1) Turn the ignition switch OFF.
2) Remove the IAP sensor. Refer to "IAP Sensor Removal and Installation" in Section 1C (Page 1C-3).
3) Connect the vacuum pump gauge to the vacuum port of the IAP sensor.
4) Arrange 3 new 1.5 V batteries (1) in series (check that total voltage is 4.5 – 5.0 V) and connect (–) terminal to the ground terminal "B" and (+) terminal to the VCC terminal "A".
5) Check the voltage between Vout terminal "C" and ground. Also, check if voltage reduces when vacuum is applied using the vacuum pump gauge.

Special tool
(A): 09917–47011 (Vacuum pump gauge set)
(B): 09900–25008 (Multi circuit tester set)

Tester knob indication
Voltage (⎓)



I718H1110030-02

ALTITUDE (Reference)		ATOMOSPHERIC PRESSURE		OUTPUT VOLTAGE
m	ft	kPa	mmHg	V
0 – 610	0 – 2 000	100 – 94	760 – 707	3.1 – 3.6
611 – 1 524	2 001 – 5 000	94 – 85	707 – 634	2.8 – 3.4
1 525 – 2 438	5 001 – 8 000	85 – 76	634 – 567	2.6 – 3.1
2 439 – 3 048	8 001 – 10 000	76 – 70	567 – 526	2.4 – 2.9

I823H1110023-02

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Replace the IAP sensor with a new one. Refer to "IAP Sensor Removal and Installation" in Section 1C (Page 1C-3).

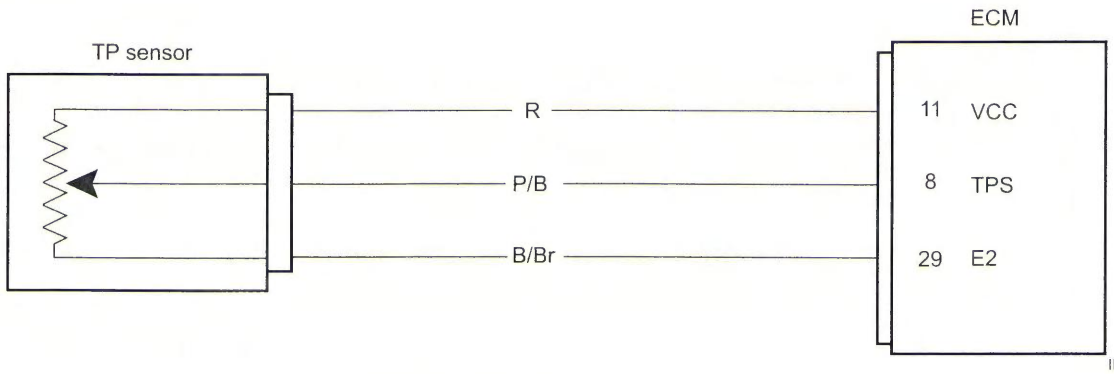
DTC "C14" (P0120-H/L): TP Sensor Circuit Malfunction

BENF08J11104013

Detected Condition and Possible Cause

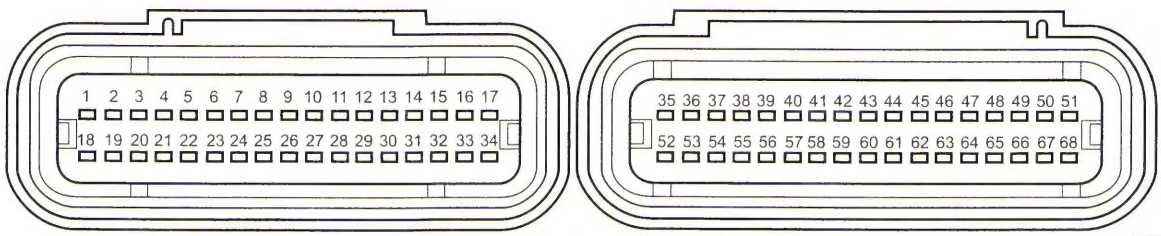
Detected Condition			Possible Cause
C14		Output voltage is not within the following range. 0.2 V ≤ Sensor voltage < 4.8 V	• TP sensor maladjusted. • TP sensor circuit open or short. • TP sensor malfunction. • ECM malfunction.
P0120	H	Sensor voltage is higher than specified value.	• TP sensor signal circuit is shorted to VCC or ground circuit is open.
	L	Sensor voltage is lower than specified value.	• TP sensor signal circuit is open or shorted to ground or VCC circuit is open.

Wiring Diagram



IB08J1110045-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

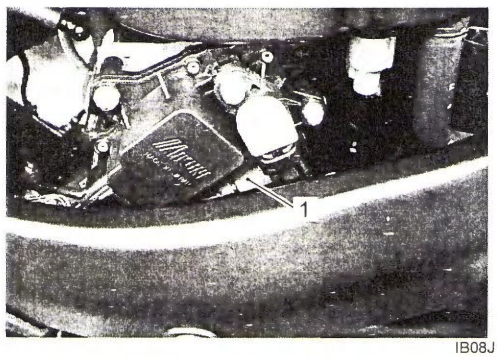
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

TP sensor power supply circuit check

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).
3) Disconnect the TP sensor coupler (1).



IB08J1110046-02

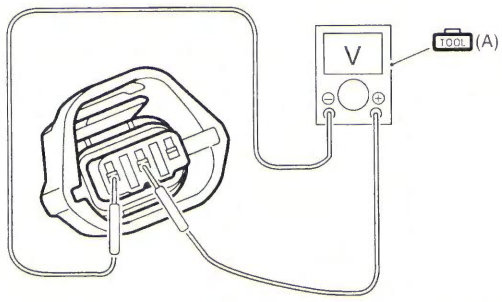
4) Check for proper terminal connection to the TP sensor coupler.
5) If connections are OK, turn the ignition switch ON.

6) Measure the voltage between the R wire and B/Br wire.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

TP sensor power supply voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: B/Br)



1B08J1110047-01

Is check result OK?

Yes Go to Step 3.

No Go to Step 2.

Step 2

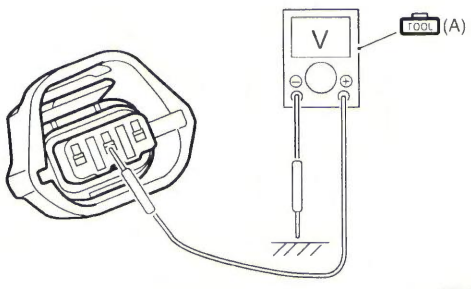
TP sensor ground circuit check

1) Measure the voltage between the R wire and ground.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

TP sensor power supply voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: ground)



1B08J1110048-02

Is check result OK?

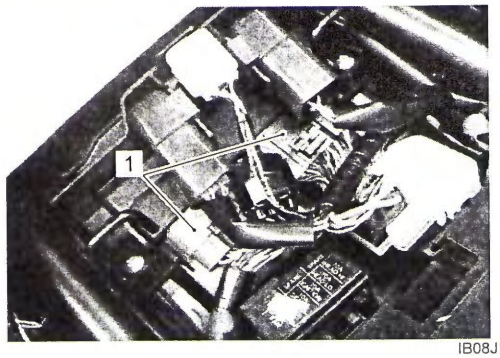
Yes Repair or replace the B/Br wire.

No Repair or replace the R wire.

Step 3

TP sensor signal circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



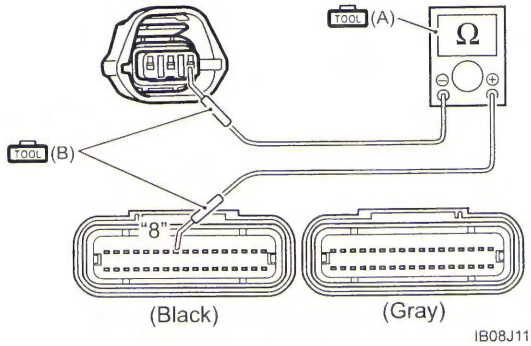
1B08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

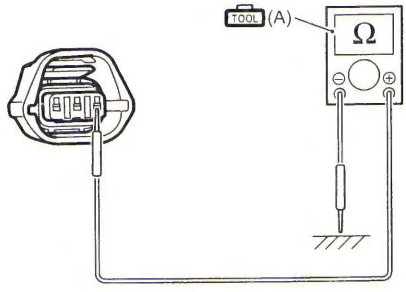
Tester knob indication
Resistance (Ω)

– P/B wire: less than 1 Ω



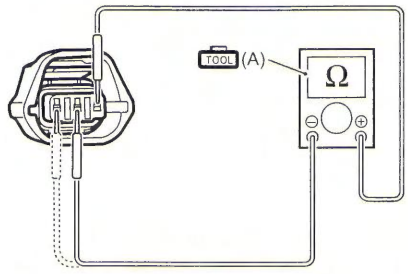
1B08J1110049-02

– Between P/B wire and ground: infinity



1B08J1110050-02

– Between P/B wire terminal and other terminal at TP sensor connector: infinity



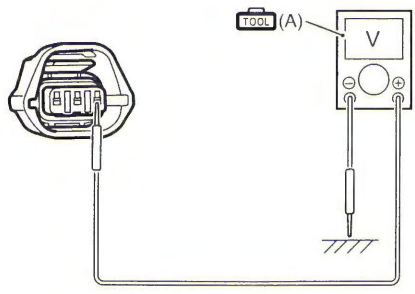
IB08J1110051-02

• Voltage

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– P/B wire: approx. 0 V (When ignition switch is ON)



IB08J1110052-03

Is check result OK?

Yes Go to Step 4.

No Repair or replace the P/B wire.

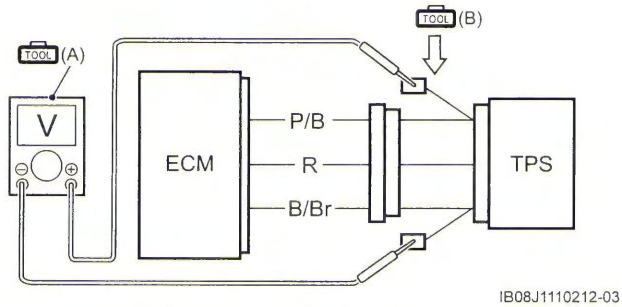
Step 4
TP sensor check

1) Turn the ignition switch OFF.
2) Connect the special tool between the TP sensor and its coupler.
3) Turn the ignition switch ON.
4) Measure the TP sensor output voltage between the P/B wire terminal (+) and B/Br wire terminal (–) with turning the throttle grip open and close.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)
TOOL (B): 09900–28630 (TP Sensor test lead)

Tester knob indication
Voltage (⎓)

TP sensor output voltage
Throttle valve is closed: Approx. 1.1 V
Throttle valve is opened: Approx. 4.3 V
((+) terminal: P/B – (–) terminal: B/Br)



IB08J1110212-03

Is check result OK?

Yes Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No Replace the TP sensor with a new one. Refer to "Throttle Body Disassembly and Assembly" in Section 1D (Page 1D-12).

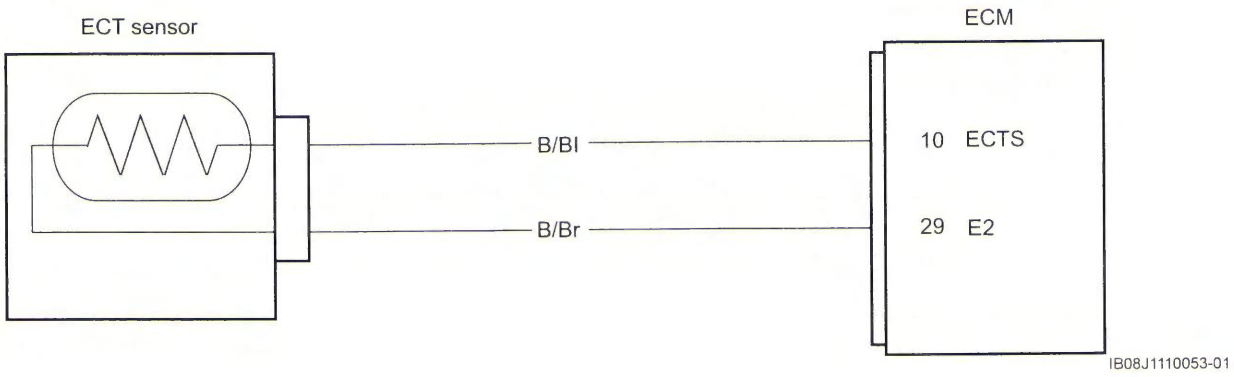
DTC "C15" (P0115-H/L): ECT Sensor Circuit Malfunction

BENF08J11104014

Detected Condition and Possible Cause

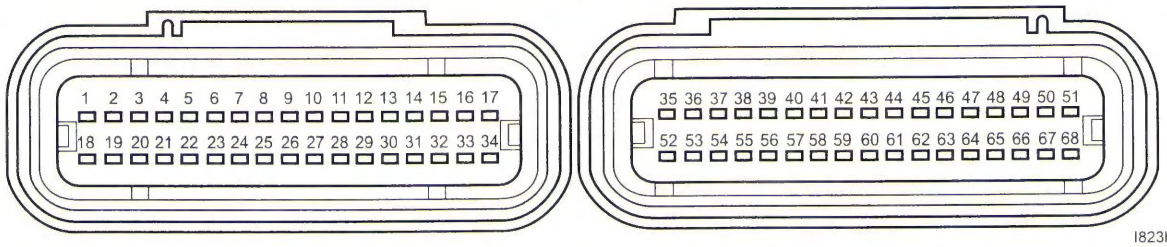
Detected Condition			Possible Cause
C15		Output voltage is not with in the following range. 0.15 V ≤ Sensor voltage < 4.85 V	• ECT sensor circuit open or short. • ECT sensor malfunction. • ECM malfunction.
P0115	H	Sensor voltage is higher than specified value.	• ECT sensor circuit is open or ground circuit open.
	L	Sensor voltage is lower than specified value.	• ECT sensor circuit shorted to ground.

Wiring Diagram



IB08J1110053-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

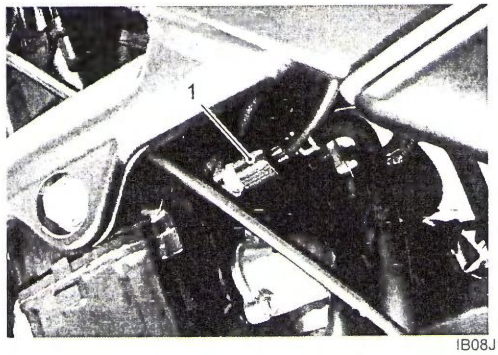
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

ECT sensor input voltage check

1) Turn the ignition switch OFF.
2) Disconnect the ECT sensor coupler (1).



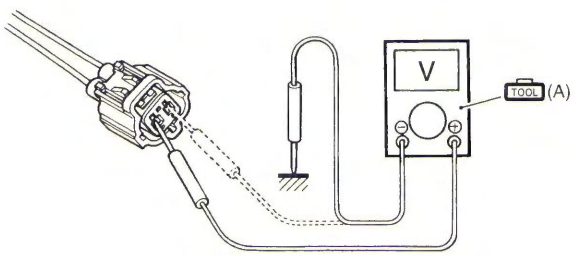
IB08J1110058-02

3) Check for proper terminal connection to the ECT sensor coupler.
4) If connections are OK, turn the ignition switch ON.
5) Measure the input voltage between the B/Bl wire and ground.
6) If OK, measure the input voltage between the B/Bl wire and B/Br wire.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

ECT sensor input voltage
4.5 – 5.5 V
((+) terminal: B/Bl – (–) terminal: Ground, (+) terminal: B/Bl – (–) terminal: B/Br)



I718H1110048-03

Is check result OK?

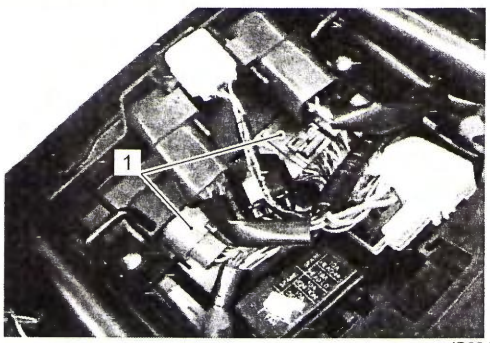
Yes Go to Step 3.

No Go to Step 2.

Step 2

ECT sensor circuit check

1) Turn the ignition switch OFF.
2) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D (Page 9D-6).
3) Disconnect the ECM couplers (1).



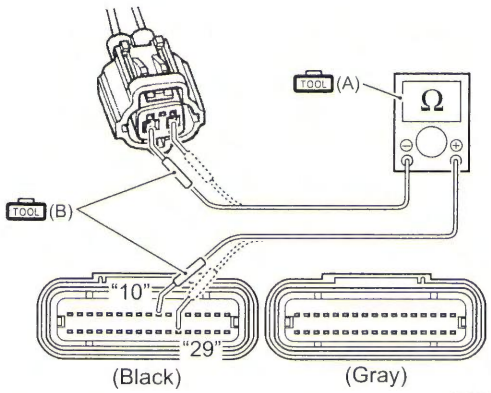
IB08J1110039-02

4) Check for proper terminal connection to the ECM couplers.
5) If connections are OK, check the following points.
   - Resistance

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

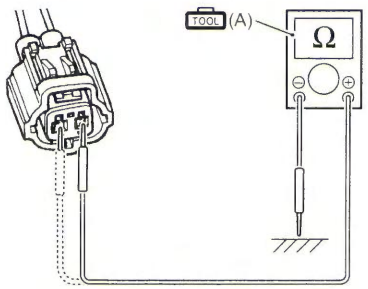
Tester knob indication
Resistance (Ω)

– B/Bl wire and B/Br wire: less than 1 Ω



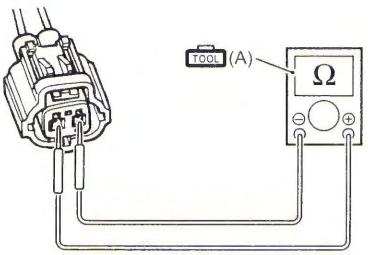
IB08J1110054-02

– Between each of B/Bl and B/Br wire and ground: infinity



IB08J1110055-03

– Between B/Bl wire terminal and other terminal at ECT sensor coupler: infinity



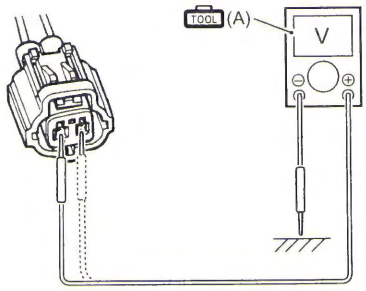
IB08J1110056-03

- Voltage

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– B/Bl wire and B/Br wire: approx. 0 V (When ignition switch is ON)



IB08J1110057-03

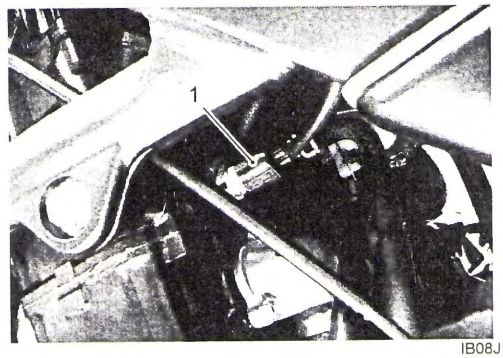
Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Repair or replace the defective wire harness.

Step 3
ECT sensor check

1) Turn the ignition switch OFF.
2) Disconnect the ECT sensor coupler (1).



IB08J1110058-02

3) Measure the ECT sensor resistance.

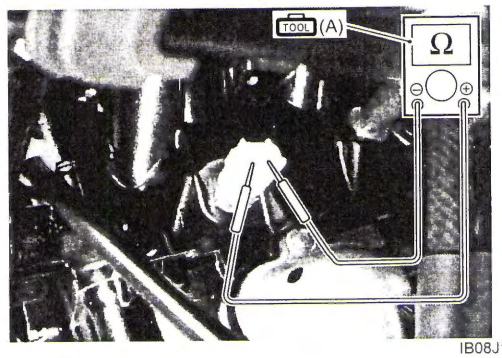
NOTE

Refer to "ECT Sensor Inspection" in Section 1C (Page 1C-5) for details.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Resistance (Ω)

ECT sensor resistance
Approx. 2.45 kΩ at 20 °C (68 °F)
(Terminal – Terminal)



IB08J1110059-01

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Replace the ECT sensor with a new one. Refer to "ECT Sensor Removal and Installation" in Section 1C (Page 1C-4).

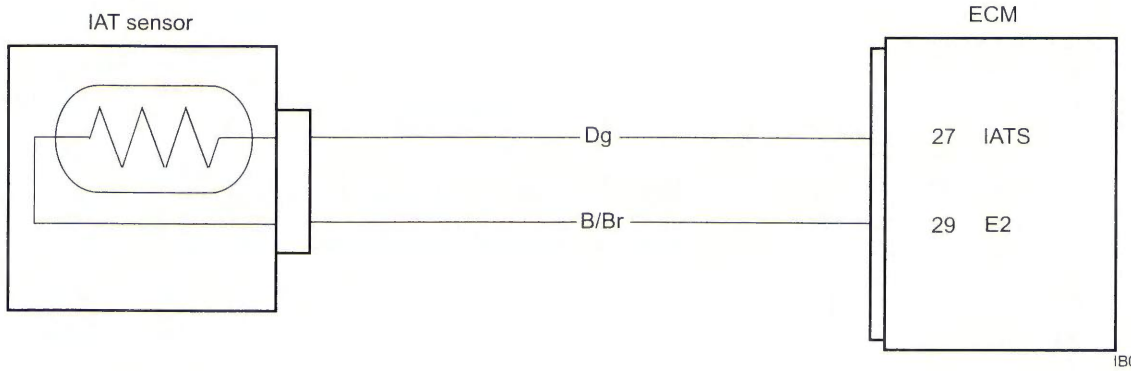
DTC "C21" (P0110-H/L): IAT Sensor Circuit Malfunction

BENF08J11104015

Detected Condition and Possible Cause

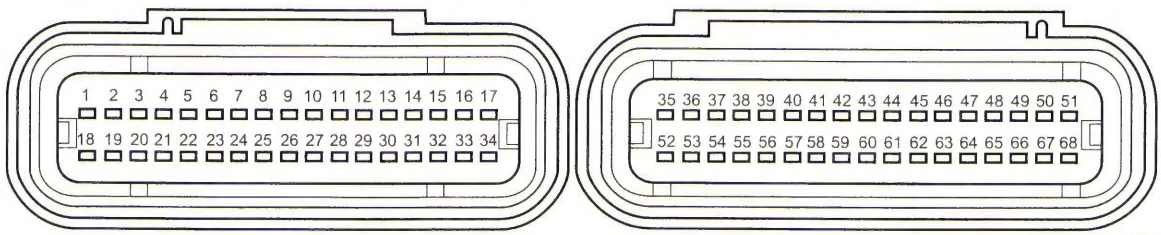
Detected Condition			Possible Cause
C21		Output voltage is not with in the following range. 0.15 V ≤ Sensor voltage < 4.85 V	• IAT sensor circuit open or short. • IAT sensor malfunction. • ECM malfunction.
P0110	H	Sensor voltage is higher than specified value.	• IAT sensor signal circuit open or ground circuit open.
	L	Sensor voltage is lower than specified value.	• IAT sensor signal circuit shorted to ground.

Wiring Diagram



IB08J1110060-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

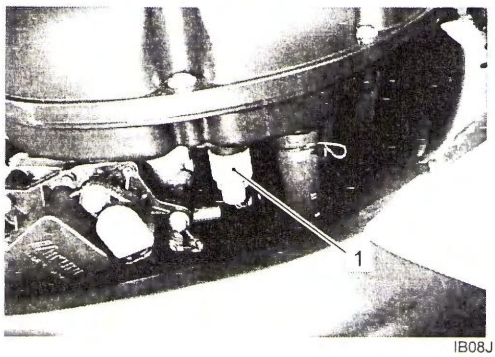
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

IAT sensor input voltage check

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).
3) Disconnect the IAT sensor coupler (1).



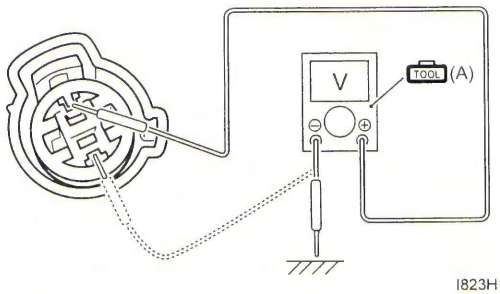
IB08J1110061-02

4) Check for proper terminal connection to the IAT sensor coupler.
5) If connections are OK, turn the ignition switch ON.
6) Measure the input voltage between the Dg wire and ground.
7) If OK, measure the input voltage between the Dg wire and B/Br wire.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

IAT sensor input voltage
4.5 – 5.5 V
((+) terminal: Dg – (–) terminal: Ground, (+) terminal: Dg – (–) terminal: B/Br)



I823H1110040-04

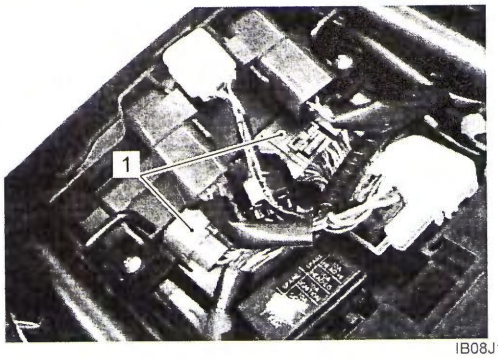
Is check result OK?

Yes Go to Step 3.

No Go to Step 2.

Step 2
IAT sensor circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



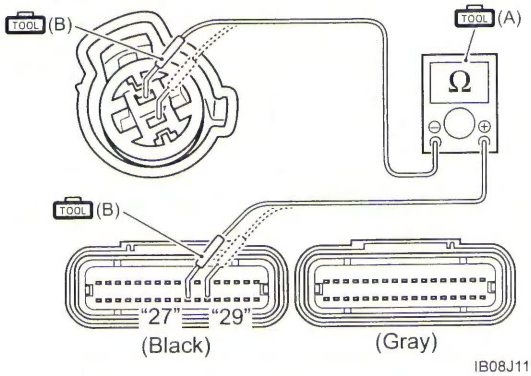
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

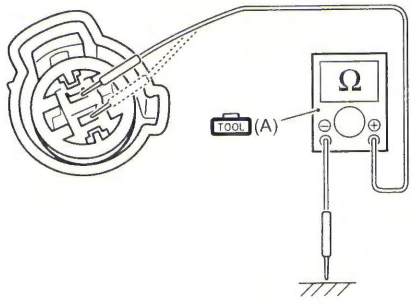
Tester knob indication
Resistance (Ω)

– Dg wire and B/Br wire: less than 1 Ω



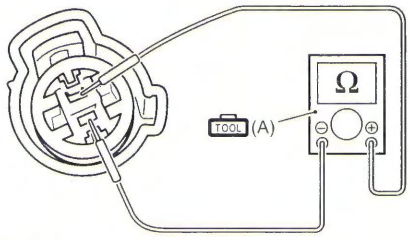
IB08J1110062-02

– Between each of Dg and B/Br wire and ground: infinity



IB08J1110063-05

– Between Dg wire terminal and other terminal at IAT sensor coupler: infinity



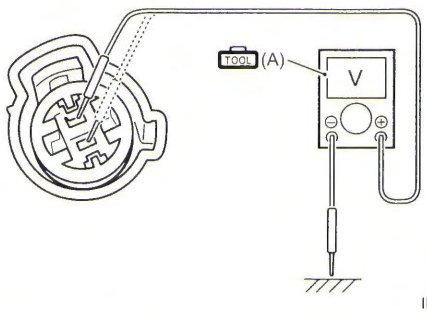
IB08J1110064-02

- Voltage

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– Dg wire and B/Br wire: approx. 0 V (When ignition switch is ON)



IB08J1110065-02

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Repair or replace the defective wire harness.

Step 3
IAT sensor check

1) Turn the ignition switch OFF.
2) Measure the IAT sensor resistance.

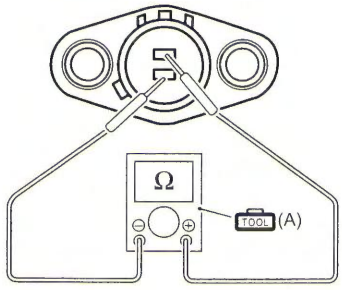
NOTE

Refer to "IAT Sensor Inspection" in Section 1C (Page 1C-6) for details.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Resistance (Ω)

IAT sensor resistance
Approx. 2.58 kΩ at 20 °C (68 °F)
(Terminal – Terminal)



I815H1110031-01

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Replace the IAT sensor with a new one. Refer to "IAT Sensor Removal and Installation" in Section 1C (Page 1C-5).

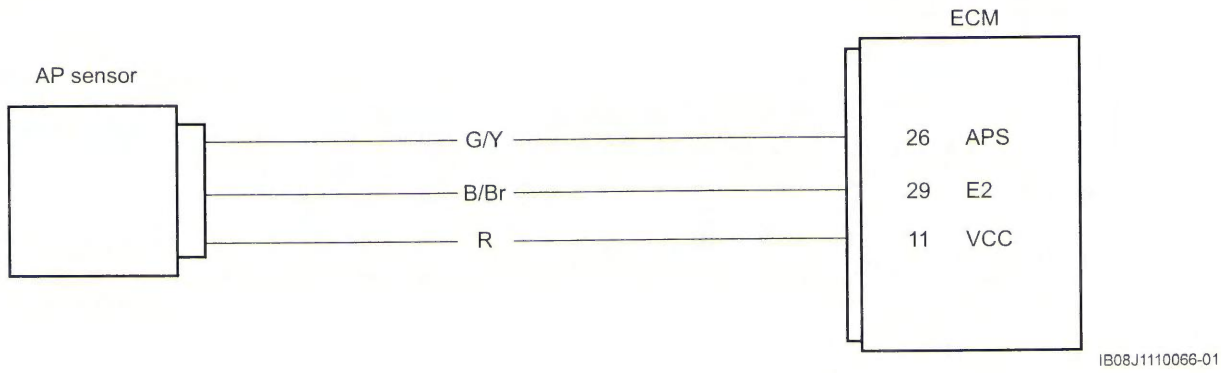
DTC "C22" (P1450-H/L): AP Sensor Circuit Malfunction

BENF08J11104016

Detected Condition and Possible Cause

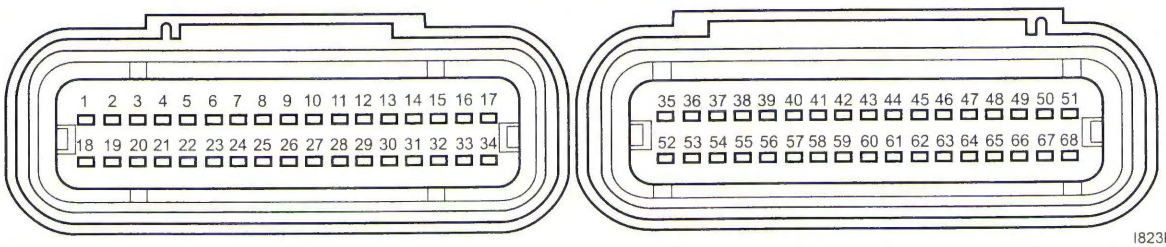
Detected Condition			Possible Cause
C22		AP sensor voltage is not within the following range. 0.5 V ≤ Sensor voltage < 4.85 V **NOTE** **Note that atmospheric pressure varies depending on weather conditions as well as altitude. Take that into consideration when inspecting voltage.**	• Clogged vacuum passage with dust. • AP sensor circuit open or shorted to ground. • AP sensor malfunction. • ECM malfunction.
P1450	H	Sensor voltage is higher than specified value.	• AP sensor signal circuit is open or shorted to VCC or ground circuit open. • AP sensor signal circuit is shorted to ground or VCC circuit open.
	L	Sensor voltage is lower than specified value.	

Wiring Diagram



IB08J1110066-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

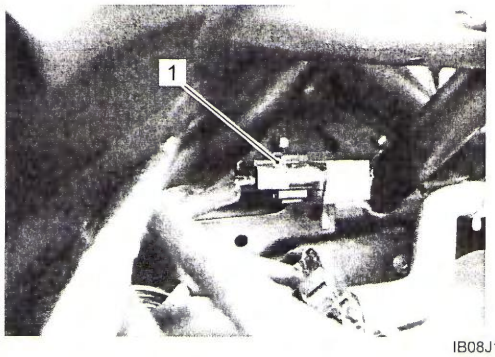
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

AP sensor power supply circuit check

1) Turn the ignition switch OFF.
2) Remove the air cleaner box. Refer to "Air Cleaner Box Removal and Installation" in Section 1D (Page 1D-7).
3) Disconnect the AP sensor coupler (1).



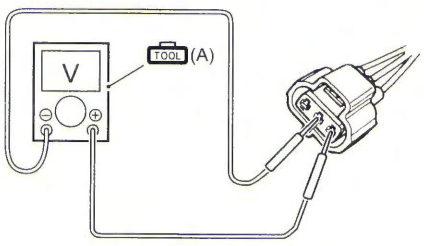
IB08J1110067-02

4) Check for proper terminal connection to the AP sensor coupler.
5) If connections are OK, turn the ignition switch ON.
6) Measure the voltage between the R wire and B/Br wire.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

AP sensor input voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: B/Br)



IB08J1110038-02

Is check result OK?

Yes Go to Step 3.

No Go to Step 2.

Step 2

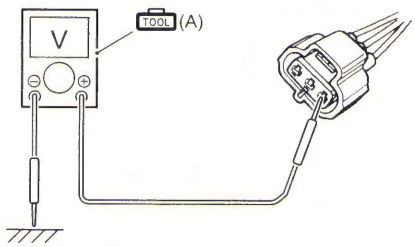
AP sensor ground circuit check

1) Measure the voltage between the R wire and ground.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

AP sensor power supply voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: ground)



IB08J1110068-02

Is check result OK?

Yes Repair or replace the B/Br wire.

No Repair or replace the R wire.

Step 3

AP sensor signal circuit check

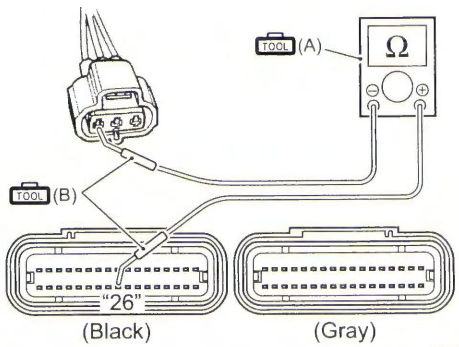
1) Turn the ignition switch OFF.
2) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D (Page 9D-6).
3) Disconnect the ECM couplers.
4) Check for proper terminal connection to the ECM couplers.

5) If connections are OK, check the following points.
   - Resistance

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)
     (B): 09900–25009 (Needle-point probe set)

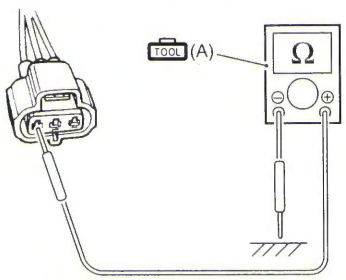
     Tester knob indication
     Resistance (Ω)

     – G/Y wire: less than 1 Ω



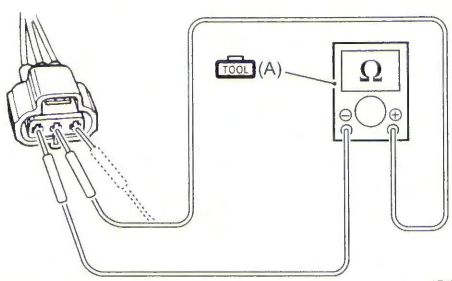
IB08J1110069-02

     – Between G/Y wire and ground: infinity



IB08J1110070-03

     – Between G/Y wire terminal and other terminal at AP sensor connector: infinity



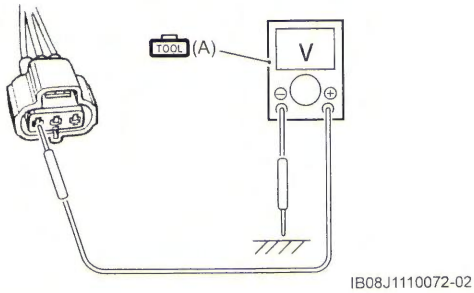
IB08J1110071-03

   - Voltage

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)

     Tester knob indication
     Voltage (⎓)

     – G/Y wire: approx. 0 V (When ignition switch is ON)



IB08J1110072-02

Is check result OK?

Yes	Go to Step 4.
No	Repair or replace the G/Y wire.

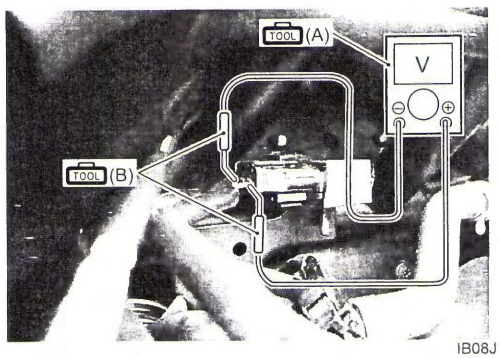
Step 4
AP sensor check

1) Turn the ignition switch OFF.
2) Connect the ECM couples and AP sensor coupler.
3) Insert the needle pointed probes to the lead wire coupler.
4) Measure the AP sensor output voltage between the G/Y wire and B/Br wire.

   Special tool
   (A): 09900–25008 (Multi-circuit tester set)
   (B): 09900–25009 (Needle-point probe set)

   Tester knob indication
   Voltage (⎓)

   AP sensor output voltage
   Approx. 3.6 V at 100 kPa (760 mmHg)
   ((+) terminal: G/Y – (–) terminal: B/Br)



IB08J1110073-02

Is check result OK?

Yes	Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).
No	Replace the AP sensor with a new one. Refer to "AP Sensor Removal and Installation" in Section 1C (Page 1C-6).

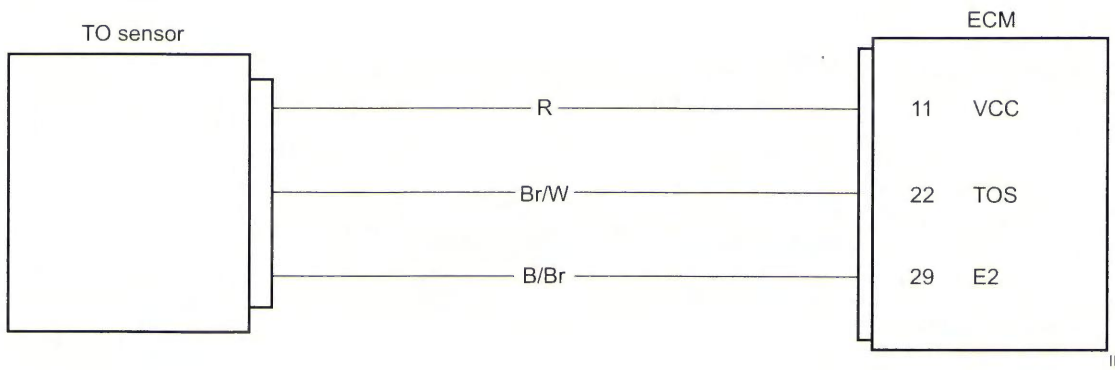
DTC "C23" (P1651-H/L): TO Sensor Circuit Malfunction

BENF08J11104017

Detected Condition and Possible Cause

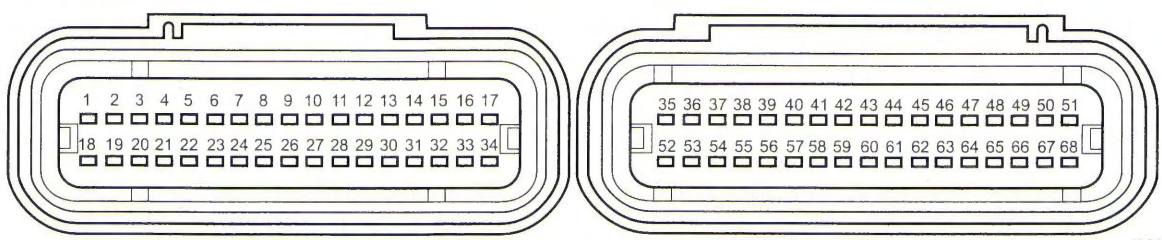
Detected Condition			Possible Cause
C23		The sensor voltage should be the following for 2 sec. and more, after ignition switch is turned ON. 0.2 V ≤ Sensor voltage < 4.8 V	• TO sensor circuit open or short. • TO sensor malfunction. • ECM malfunction.
P1651	H	Sensor voltage is higher than specified value.	• TO sensor signal circuit is open or ground circuit open.
	L	Sensor voltage is lower than specified value.	• TO sensor signal circuit is open or shorted to ground or VCC circuit open.

Wiring Diagram



IB08J1110074-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

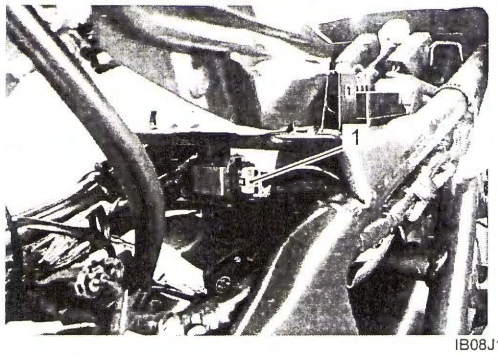
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

TO sensor power supply circuit check

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).
3) Remove the left frame cover. Refer to "Exterior Parts Removal and Installation" in Section 9D (Page 9D-6).
4) Disconnect the TO sensor coupler (1).



IB08J1110075-02

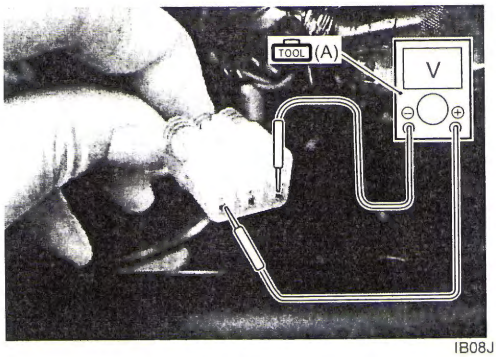
5) Check for proper terminal connection to the TO sensor coupler.
6) If connections are OK, turn the ignition switch ON.

7) Measure the voltage between the R wire and B/Br wire.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

TO sensor power supply voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: B/Br)



IB08J1110076-02

Is check result OK?

Yes Go to Step 3.

No Go to Step 2.

Step 2

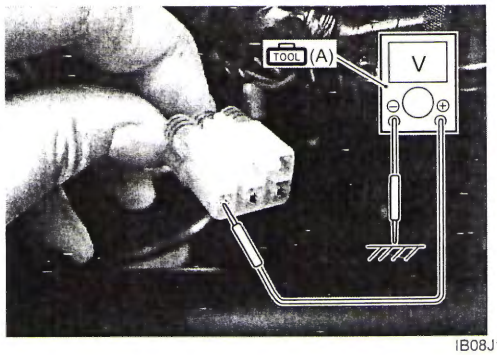
TO sensor ground circuit check

1) Measure the voltage between the R wire and ground.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

TO sensor power supply voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: ground)



IB08J1110077-02

Is check result OK?

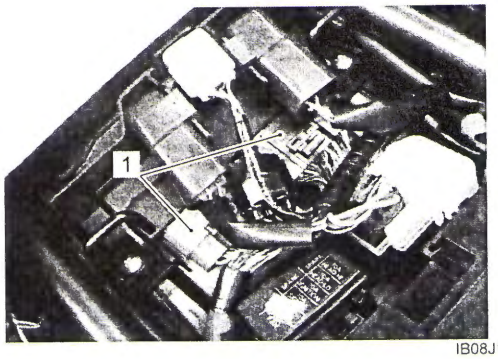
Yes Repair or replace the B/Br wire.

No Repair or replace the R wire.

Step 3

TO sensor signal circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



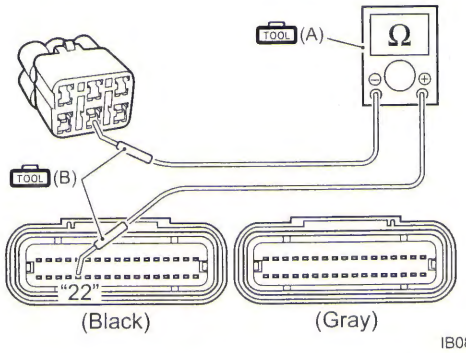
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

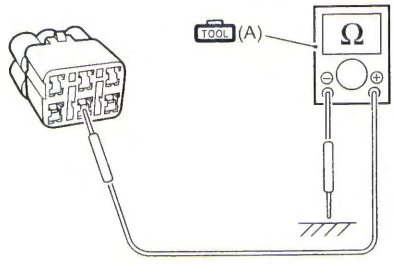
Tester knob indication
Resistance (Ω)

– Br/W wire: less than 1 Ω



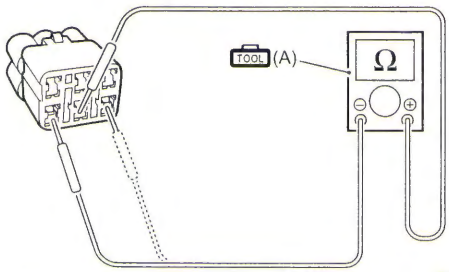
IB08J1110078-02

– Between Br/W wire and ground: infinity



IB08J1110079-02

– Between Br/W wire terminal and other terminal at TO sensor connector: infinity



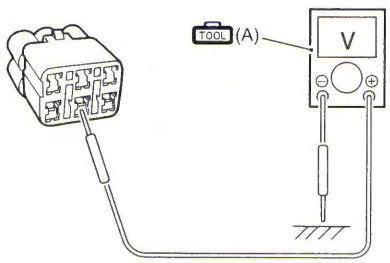
IB08J1110080-02

- Voltage

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– Br/W wire: approx. 0 V (When ignition switch is ON)



IB08J1110081-02

Is check result OK?

Yes — Go to Step 4.

No — Repair or replace the Br/W wire.

Step 4

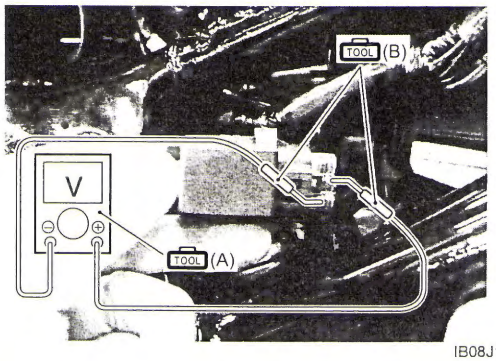
TO sensor check

1) Turn the ignition switch OFF.
2) Connect the ECM coupler and TO sensor coupler.
3) Insert the needle pointed probes to the lead wire coupler.
4) Measure the TO sensor output voltage between the Br/W wire and B/Br wire.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)
TOOL (B): 09900–25009 (Needle-point probe set)

Tester knob indication
Voltage (⎓)

TO sensor voltage (Normal)
0.4 – 1.4 V
((+) terminal: Br/W – (–) terminal: B/Br)

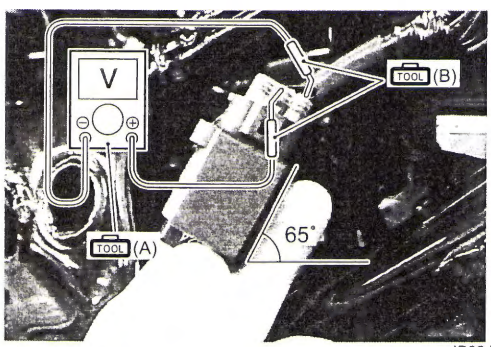


IB08J1110082-02

5) Dismount the TO sensor from its bracket and measure the voltage when it is leaned 65° and more, left and right, from the horizontal level. Refer to "TO Sensor Removal and Installation" in Section 1C (Page 1C-6).

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)
TOOL (B): 09900–25009 (Needle-point probe set)

TO sensor voltage (Leaning)
3.7 – 4.4 V
((+) terminal: Br/W – (–) terminal: B/Br)



IB08J1110083-02

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Replace the TO sensor with a new one. Refer to "TO Sensor Removal and Installation" in Section 1C (Page 1C-6).

DTC "C24" (P0351), "C25" (P0352), "C26" (P0353) or "C27" (P0354): Ignition System Malfunction

BENF08J11104018

NOTE

Refer to "No Spark or Poor Spark" in Section 1H (Page 1H-4) for details.

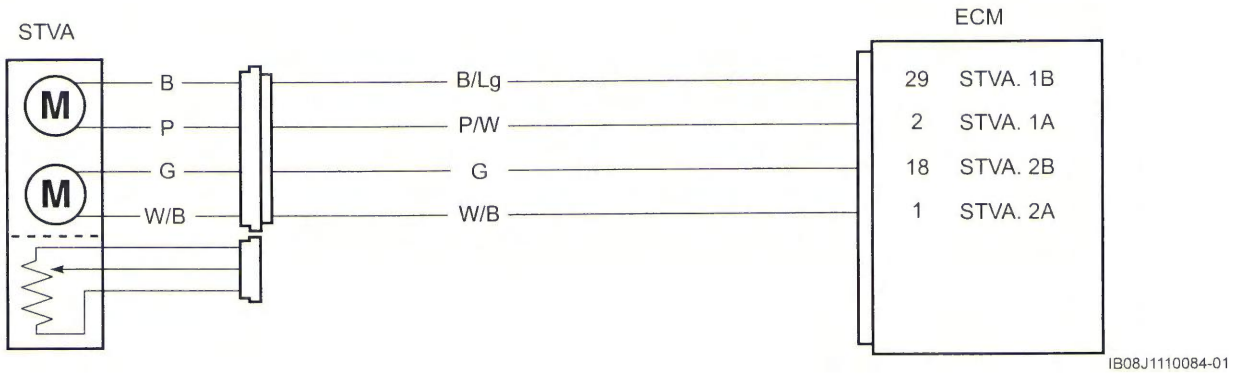
DTC "C28" (P1655): Secondary Throttle Valve Actuator (STVA) Malfunction

BENF08J11104019

Detected Condition and Possible Cause

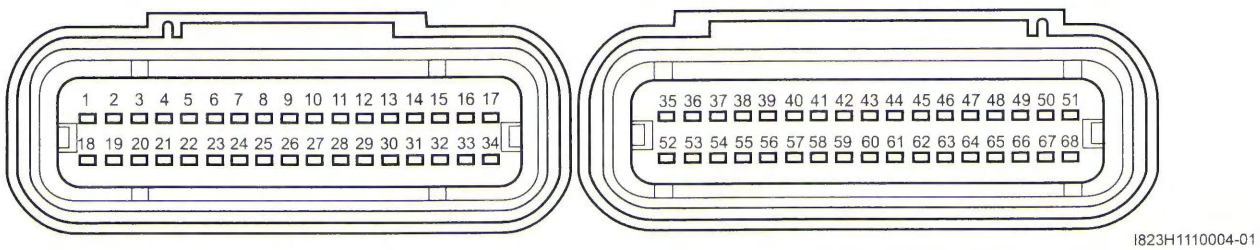
Detected Condition	Possible Cause
The operation voltage does not reach the STVA. ECM does not receive communication signal from the STVA. STVA can not operate properly or its motor locked.	• STVA malfunction. • STVA circuit open or short. • STVA motor malfunction.

Wiring Diagram



IB08J1110084-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

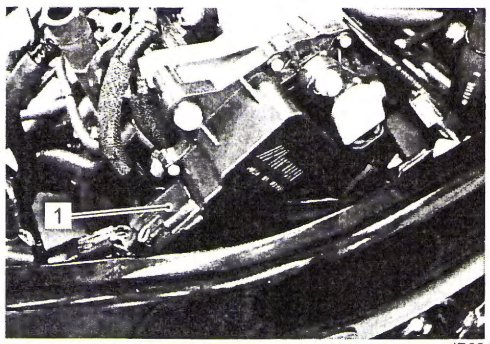
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

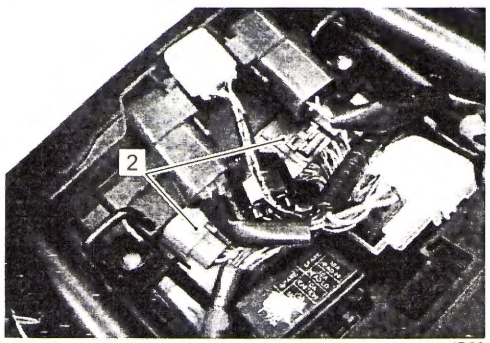
Step 1

STVA drive circuit check

1) Turn the ignition switch OFF.
2) Remove the air cleaner box. Refer to "Air Cleaner Box Removal and Installation" in Section 1D (Page 1D-7).
3) Disconnect the STVA (1) and ECM couplers (2).



IB08J1110085-02



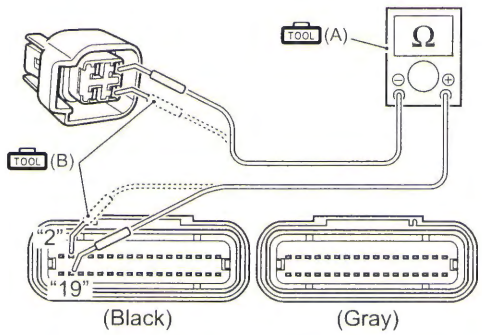
IB08J1110017-02

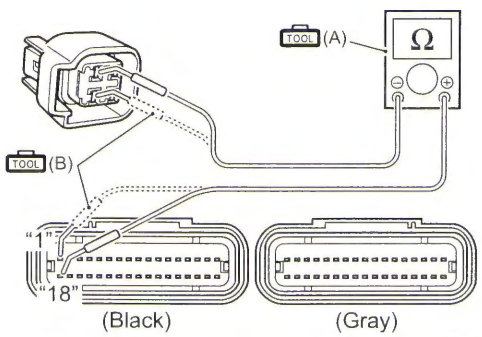
4) Check for proper terminal connection to the STVA coupler and ECM couplers.
5) If connections are OK, check the following points.
   - Resistance

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)
TOOL (B): 09900–25009 (Needle-point probe set)

Tester knob indication
Resistance (Ω)

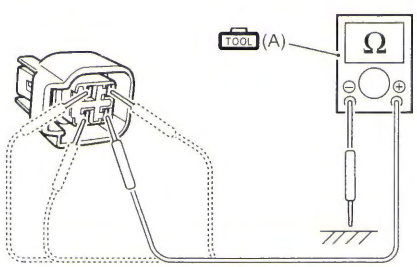
– B/Lg, P/W, G and W/B wire: less than 1 Ω





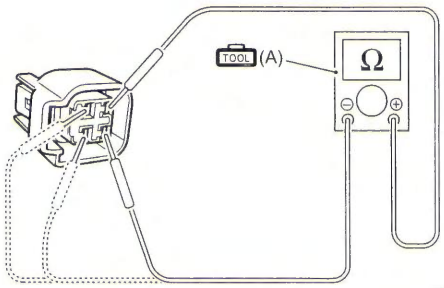
IB08J1110086-02

– Between each of B/Lg, P/W, G and W/B wire and ground: infinity



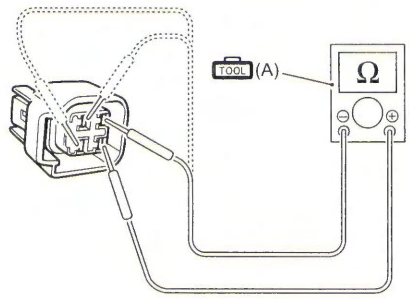
IB08J1110087-02

– Between B/Lg wire terminal and other terminal at STVA coupler: infinity



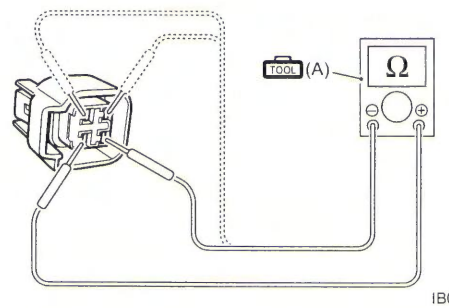
IB08J1110088-02

– Between P/W wire terminal and other terminal at STVA coupler: infinity



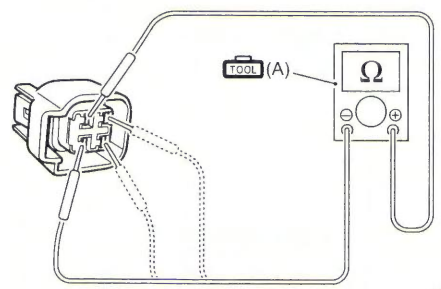
IB08J1110089-02

– Between G wire terminal and other terminal at STVA coupler: infinity



IB08J1110090-02

– Between W/B wire terminal and other terminal at STVA coupler: infinity



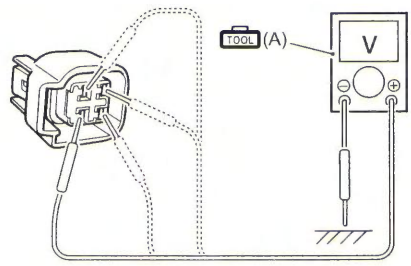
IB08J1110091-02

• Voltage

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)
TOOL (B): 09900–25009 (Needle-point probe set)

Tester knob indication
Voltage (⎓)

– B/Lg, P/W, G and W/B wire: approx. 0 V (When ignition switch is ON)



IB08J1110092-02

Is check result OK?

Yes	Go to Step 2.
No	Repair or replace the defective wire harness.

Step 2

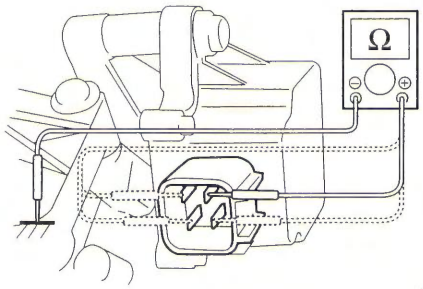
STVA check

1) Turn the ignition switch OFF.
2) Disconnect the STVA coupler.
3) Check the continuity between each terminal and ground.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Resistance (Ω)

STVA continuity
∞ Ω (Infinity)
(Terminal – Ground)

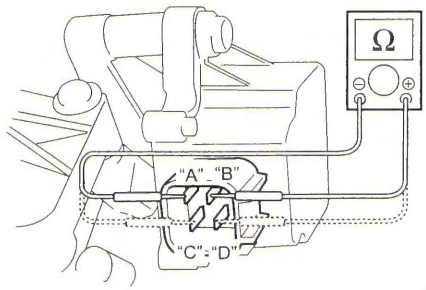


IB08J1110093-01

4) If OK, measure the STVA resistance (between the W/B wire "A" and G wire "B") and (between the B/Lg wire "C" and P/W wire "D").

Special tool
(A): 09900–25008 (Multi-circuit tester set)

STVA resistance
Approx. 7.8 Ω
(Terminal "A" – Terminal "B", Terminal "C" – Terminal "D")



IB08J1110094-01

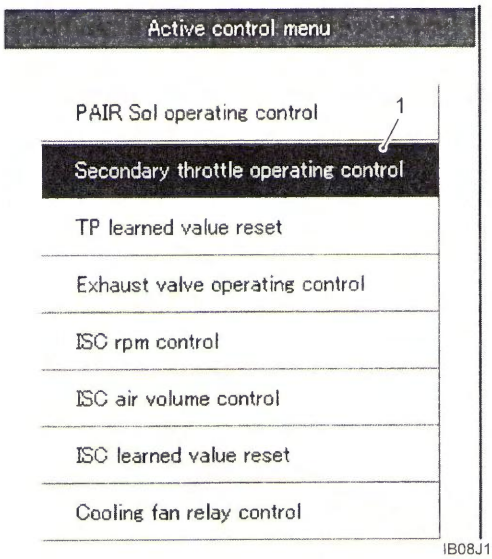
Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Replace the throttle body assembly with a new one. Refer to "Throttle Body Removal and Installation" in Section 1D (Page 1D-11).

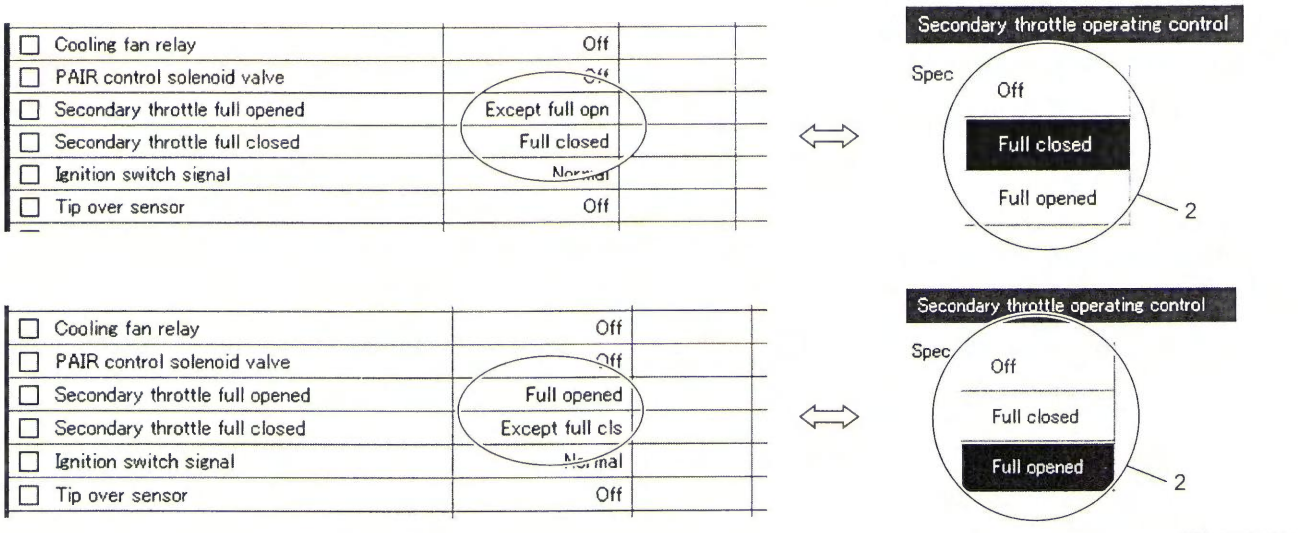
Active Control Inspection

1) Set up the SDS tool. (Refer to the SDS operation manual for further details.)
2) Turn the ignition switch ON.
3) Click "Secondary throttle operating control" (1).



IB08J1110095-02

4) Click each button (2).
At this time, if an operation sound is heard from the STVA, the function is normal.



IB08J1110096-04

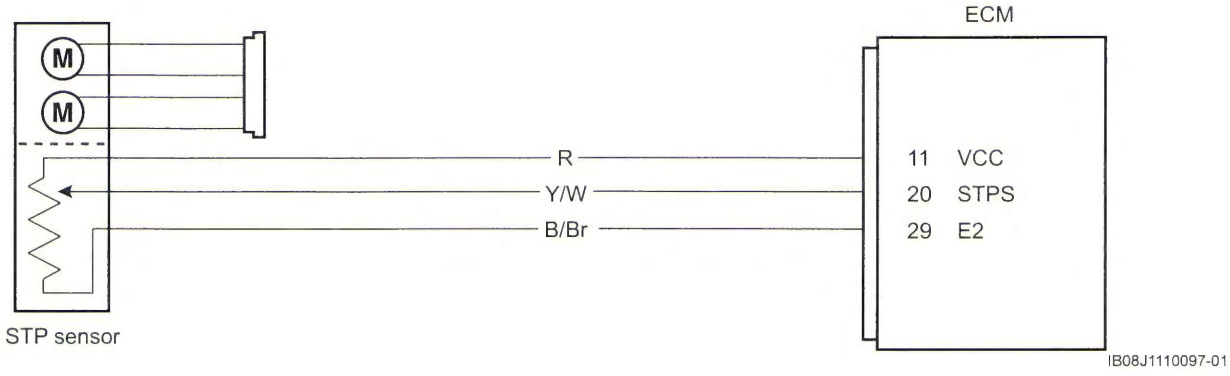
DTC "C29" (P1654-H/L): Secondary Throttle Position Sensor (STPS) Circuit Malfunction

BENF08J11104020

Detected Condition and Possible Cause

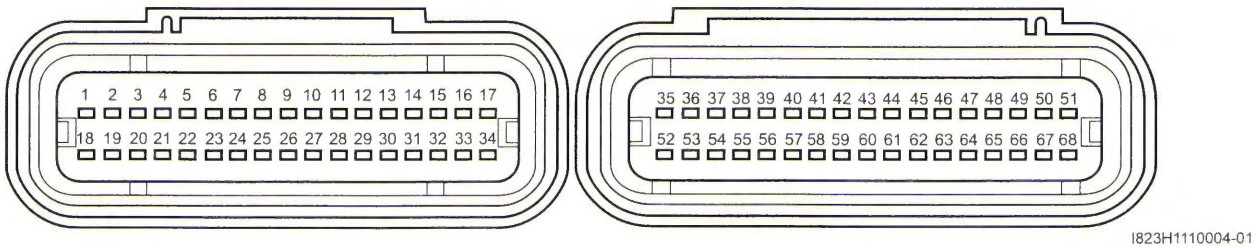
Detected Condition			Possible Cause
C29		Output voltage is not within the following range. 0.15 V ≤ Sensor voltage < 4.85 V	• STP sensor maladjusted. • STP sensor circuit open or short. • STP sensor malfunction. • ECM malfunction.
P1654	H	Sensor voltage is higher than specified value.	• STP sensor signal circuit shorted to VCC or ground circuit open.
	L	Sensor voltage is lower than specified value.	• STP sensor signal circuit open or shorted to ground or VCC circuit open.

Wiring Diagram



IB08J1110097-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

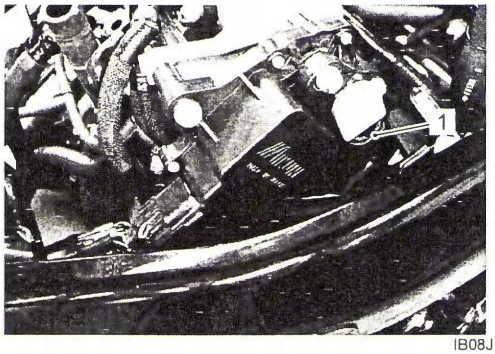
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

STP sensor power supply circuit check

1) Turn the ignition switch OFF.
2) Remove the air cleaner box. Refer to "Air Cleaner Box Removal and Installation" in Section 1D (Page 1D-7).
3) Disconnect the STP sensor coupler (1).



IB08J1110098-02

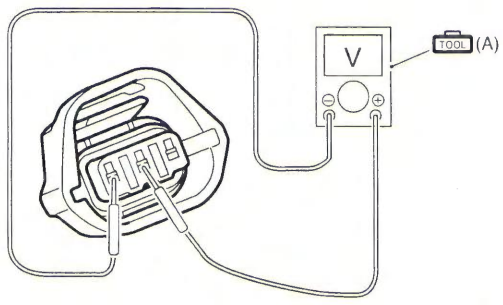
4) Check for proper terminal connection to the STP sensor coupler.

5) If connections are OK, turn the ignition switch ON.
6) Measure the voltage between the R wire and B/Br wire.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

STP sensor power supply voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: B/Br)



IB08J1110047-01

Is check result OK?

Yes Go to Step 3.

No Go to Step 2.

Step 2

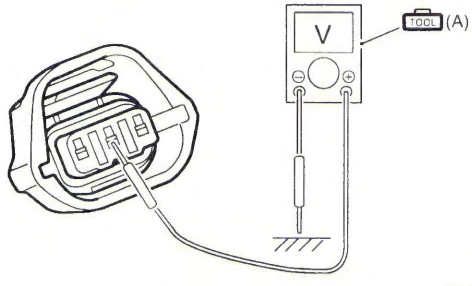
STP sensor ground circuit check

1) Measure the voltage between the R wire and ground.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

STP sensor power supply voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: Ground)



IB08J1110048-02

Is check result OK?

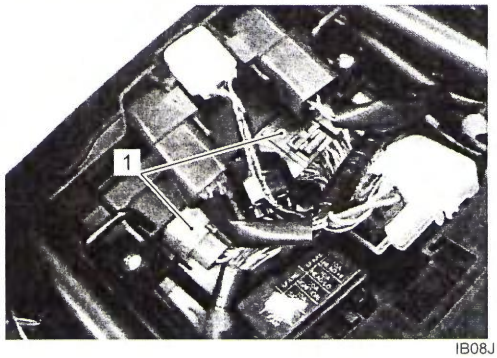
Yes Repair or replace the B/Br wire.

No Repair or replace the R wire.

Step 3

STP sensor signal circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



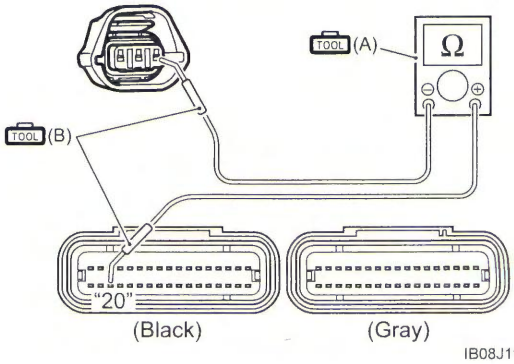
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)
TOOL (B): 09900–25009 (Needle-point probe set)

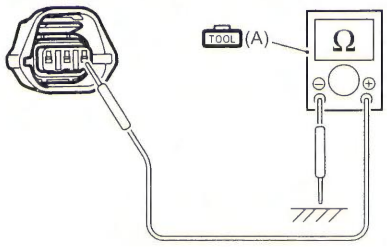
Tester knob indication
Resistance (Ω)

– Y/W wire: less than 1 Ω



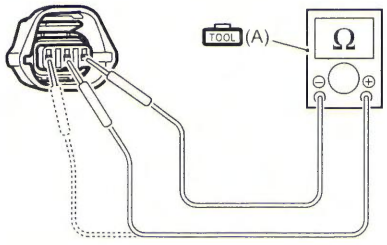
IB08J1110099-02

– Between Y/W wire and ground: infinity



IB08J1110100-02

– Between Y/W wire terminal and other terminal at STP sensor connector: infinity



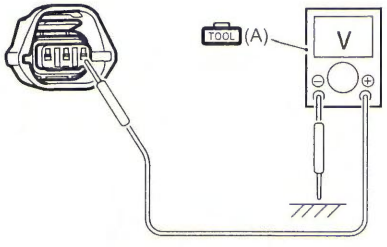
IB08J1110101-02

• Voltage

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– Y/W wire: approx. 0 V (When ignition switch is ON)



IB08J1110102-02

Is check result OK?

Yes Go to Step 4.

No Repair or replace the Y/W wire.

Step 4

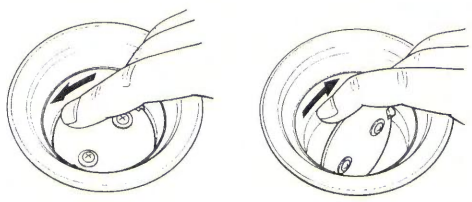
STP sensor check

1) Turn the ignition switch OFF.
2) Connect the special tool between the TP sensor and its coupler.
3) Turn the ignition switch ON.
4) Measure the STP sensor output voltage between the Y/W wire terminal (+) and B/Br wire terminal (–) by turning the secondary throttle valve (close and open) with your finger.

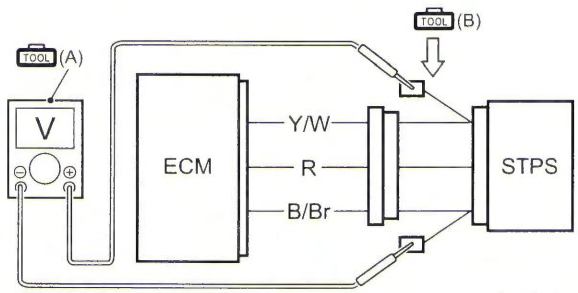
Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)
TOOL (B): 09900–28630 (TP Sensor test lead)

Tester knob indication
Voltage (⎓)

STP sensor output voltage
Throttle valve is closed: Approx. 0.6 V
Throttle valve is opened: Approx. 3.9 V
((+) terminal: Y/W – (–) terminal: B/Br)



I705H1110071-01



IB08J1110103-04

Is check result OK?

Yes Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No Replace STP sensor with a new one. Refer to "Throttle Body Disassembly and Assembly" in Section 1D (Page 1D-12).

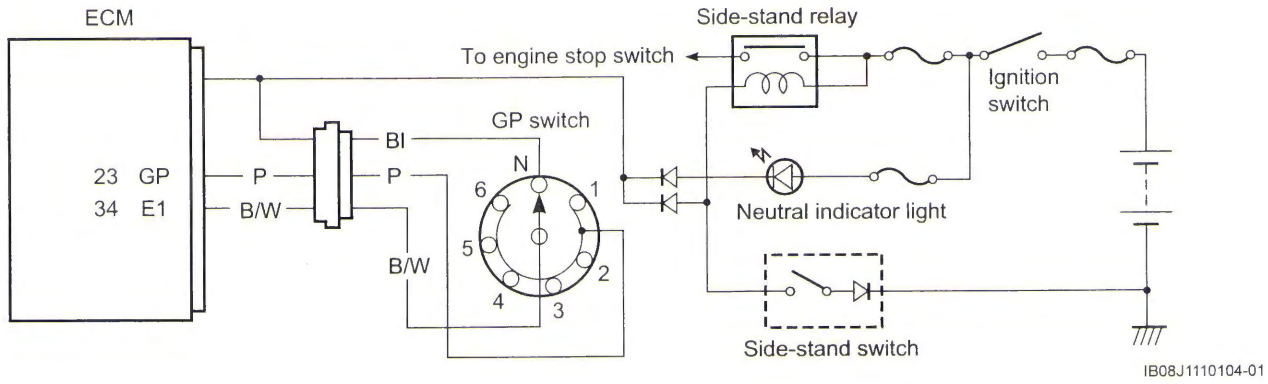
DTC "C31" (P0705): GP Switch Circuit Malfunction

BENF08J11104021

Detected Condition and Possible Cause

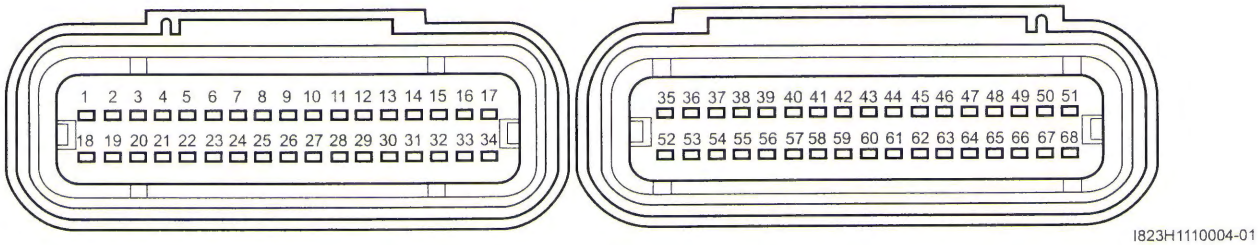
Detected Condition	Possible Cause
No GP switch voltage GP switch voltage is not within the following range. GP switch voltage > 0.6 V	• GP switch circuit open or short. • GP switch malfunction. • ECM malfunction.

Wiring Diagram



IB08J1110104-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

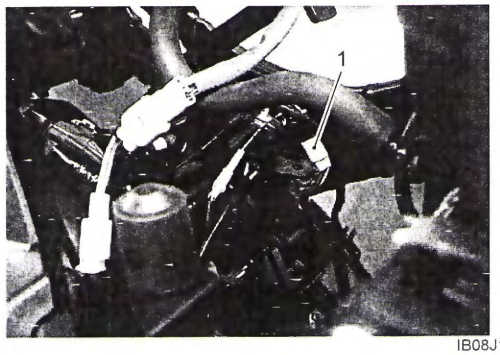
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

GP switch input voltage check

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).
3) Disconnect the GP switch coupler (1).



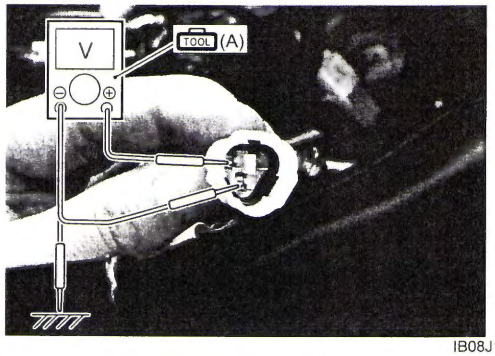
IB08J1110105-01

4) Check for proper terminal connection to the GP switch coupler.
5) If connections are OK, turn the ignition switch ON.
6) Measure the input voltage between the P wire and ground.
7) If OK, measure the input voltage between the P wire and B/W wire.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

GP switch input voltage
4.5 – 5.5 V
((+) terminal: P – (–) terminal: Ground, (+) terminal: P – (–) terminal: B/W)



IB08J1110106-01

Is check result OK?

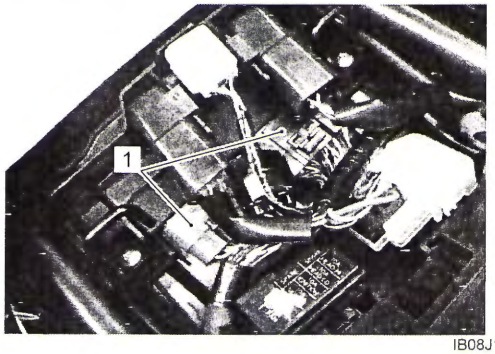
Yes Go to Step 3.

No Go to Step 2.

Step 2

GP switch circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



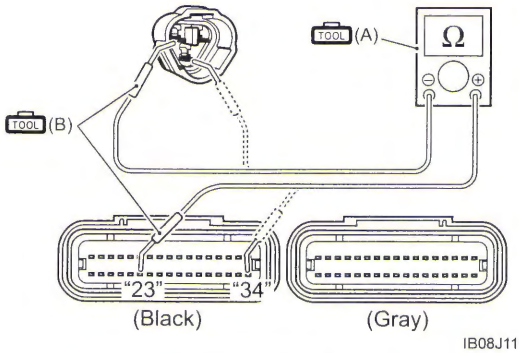
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

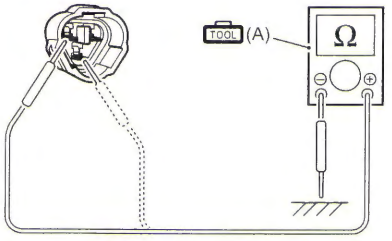
Tester knob indication
Resistance (Ω)

– P wire and B/W wire: less than 1 Ω



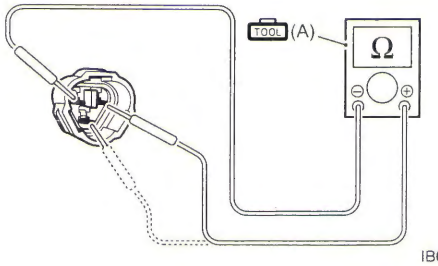
IB08J1110107-02

– Between each of P and B/W wire and ground: infinity



IB08J1110108-02

– Between P wire terminal and other terminal at GP switch coupler: infinity



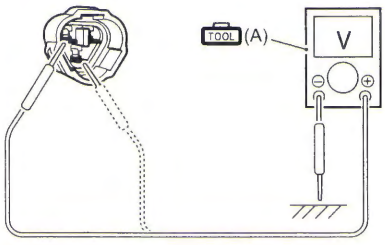
IB08J1110109-02

- Voltage

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– P wire and B/W wire: approx. 0 V (When ignition switch is ON)



IB08J1110110-02

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Repair or replace the defective wire harness.

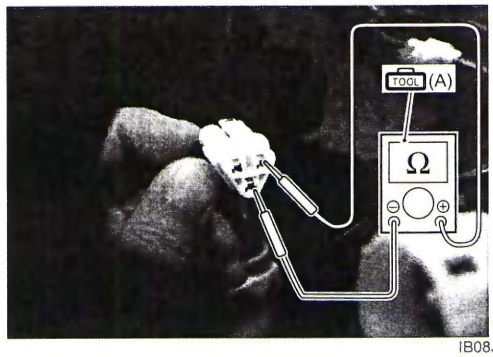
Step 3
GP switch check

1) Turn the ignition switch OFF.
2) Measure the resistance between the P wire and B/W wire, when shifting the gearshift lever from 1st to Top.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Resistance (Ω)

GP switch resistance
Approx. 500 Ω and more
((+) terminal: P – (–) terminal: B/W)



IB08J1110111-02

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Replace the GP switch with a new one. Refer to "GP Switch Removal and Installation" in Section 1C (Page 1C-9).

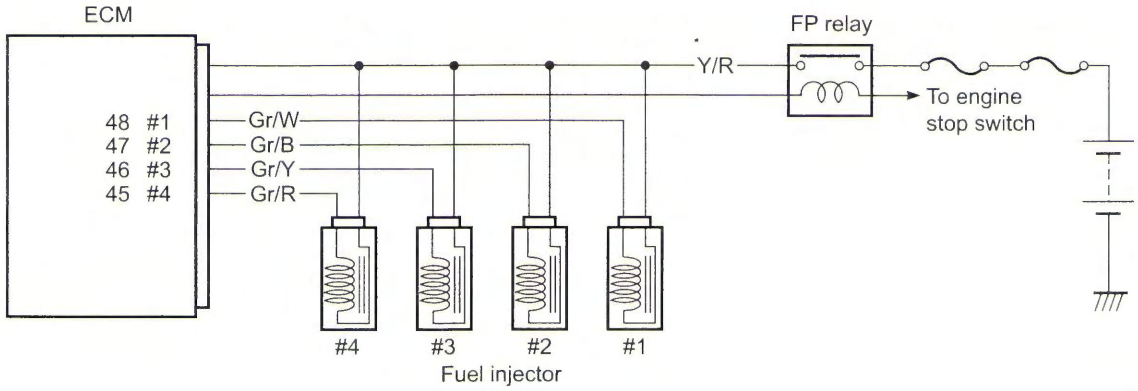
DTC "C32" (P0201), "C33" (P0202), "C34" (P0203) or "C35" (P0204): Fuel Injector Circuit Malfunction

BENF08J11104022

Detected Condition and Possible Cause

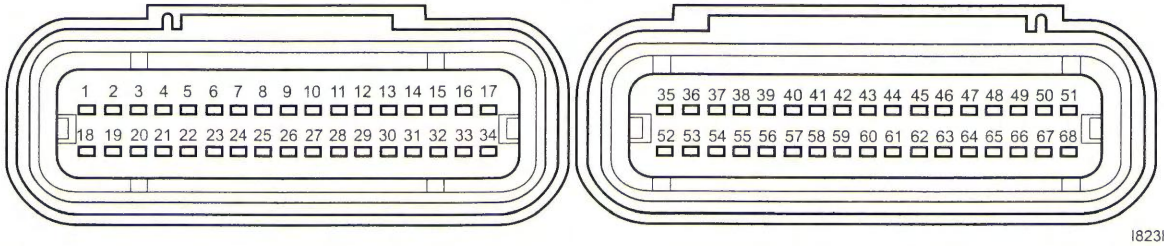
Detected Condition	Possible Cause
CKP signal is produced but fuel injector signal is interrupted by 4 times or more continuity.	• Injector circuit open or short. • Injector malfunction. • ECM malfunction.

Wiring Diagram



IB08J1110112-03

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

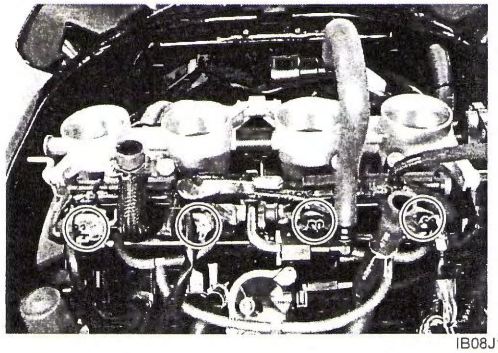
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

Injector power supply circuit check

1) Turn the ignition switch OFF.
2) Remove the air cleaner box. Refer to "Air Cleaner Box Removal and Installation" in Section 1D (Page 1D-7).
3) Disconnect the injector coupler related to DTC.



IB08J1110113-02

4) Check for proper terminal connection to the injector coupler.
5) If connections are OK, turn the ignition switch ON.
6) Measure the voltage between Y/R wire and ground.

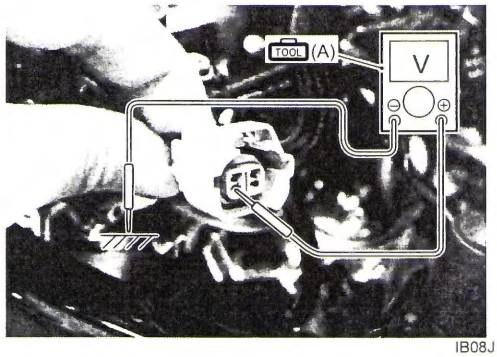
NOTE

Injector voltage can be detected only for 3 seconds after ignition switch is turned ON.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

Injector power supply voltage
Battery voltage
((+) terminal: Y/R – (–) terminal: Ground)



IB08J1110114-02

Is check result OK?

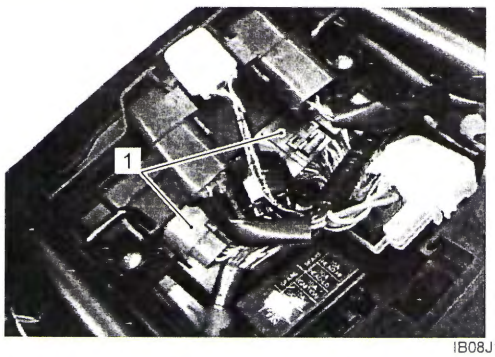
Yes — Go to Step 2.

No — Repair or replace the Y/R wire.

Step 2

Injector drive circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



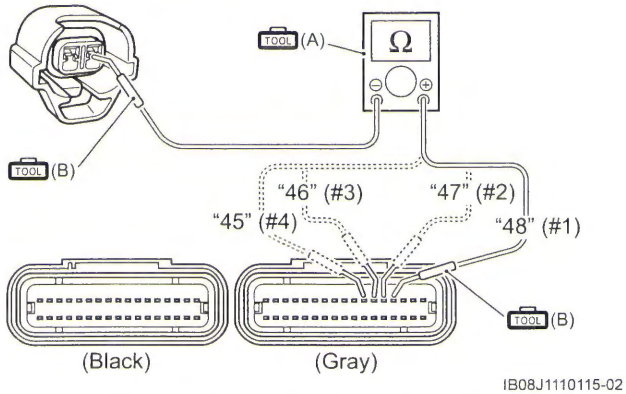
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

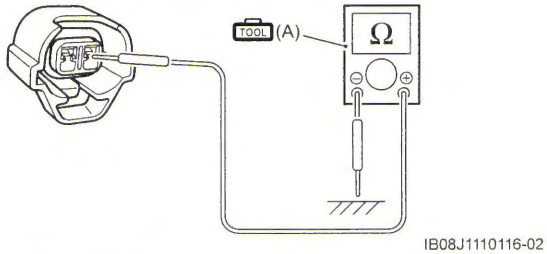
Tester knob indication
Resistance (Ω)

– Gr/W (#1), Gr/B (#2), Gr/Y (#3) or Gr/R (#4) wire: less than 1 Ω



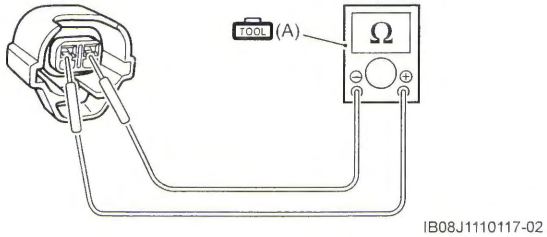
IB08J1110115-02

– Between Gr/W (#1), Gr/B (#2), Gr/Y (#3) or Gr/R (#4) wire and ground: infinity



IB08J1110116-02

– Between Gr/W (#1), Gr/B (#2), Gr/Y (#3) or Gr/R (#4) wire terminal and other terminal at injector coupler: infinity



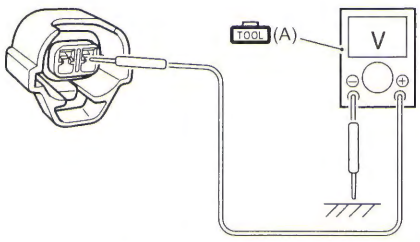
IB08J1110117-02

- Voltage

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– Gr/W (#1), Gr/B (#2), Gr/Y (#3) or Gr/R (#4) wire: approx. 0 V (When ignition switch is ON)



IB08J1110118-02

Is check result OK?

Yes — Go to Step 3.

No — Repair or replace the defective wire harness.

Step 3

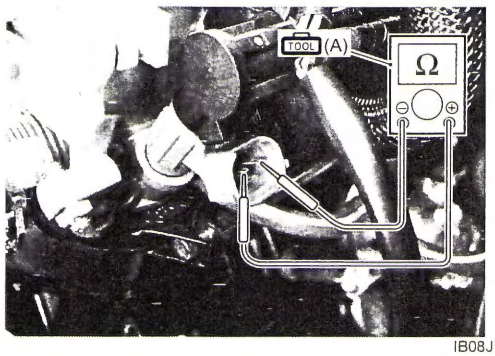
Injector resistance check

1) Turn the ignition switch OFF.
2) Measure the injector resistance between terminals.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Resistance (Ω)

Injector resistance
Battery voltage
Approx. 11.5 – 12.5 Ω at 20 °C (68 °F)
(Terminal – Terminal)

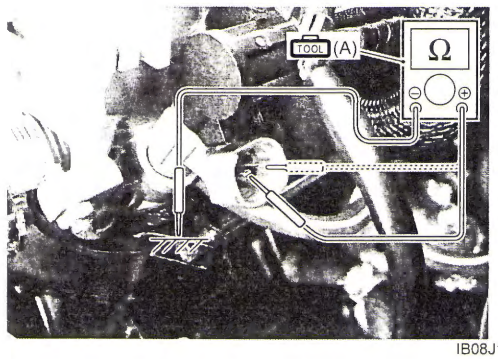


IB08J1110119-02

3) If OK, check the continuity between each terminal and ground.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Injector continuity
∞ Ω (Infinity)



IB08J1110120-02

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Replace the injector with a new one. Refer to "ECT Sensor Removal and Installation" in Section 1C (Page 1C-4).

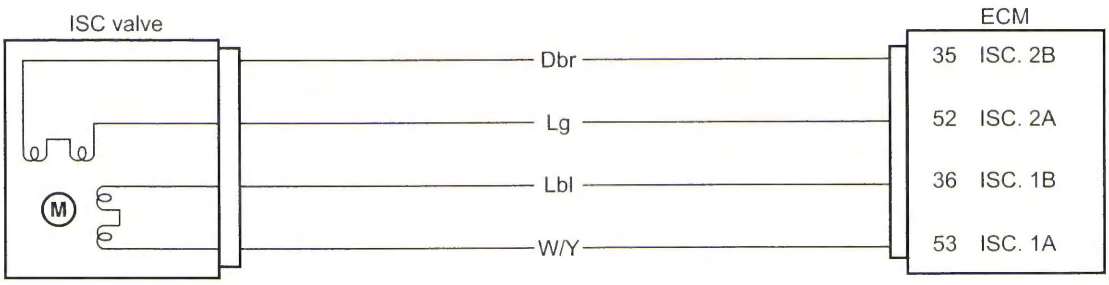
DTC "C40" (P0505): ISC Valve Circuit Malfunction

BENF08J11104023

Detected Condition and Possible Cause

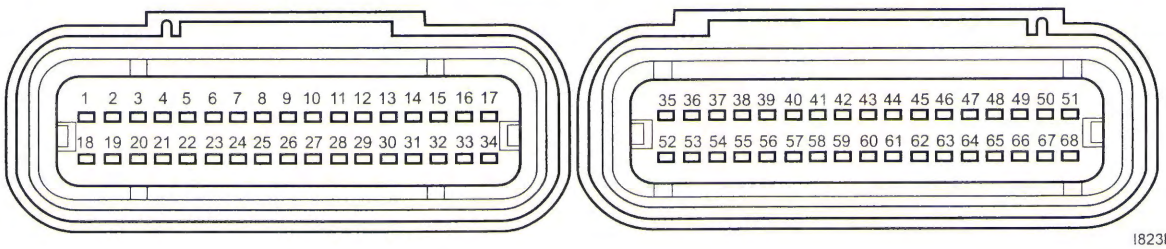
Detected Condition		Possible Cause
C40/P0505	The circuit voltage of motor drive is unusual.	• ISC valve circuit open or shorted to ground.

Wiring Diagram



IB08J1110121-02

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

- **Be careful not to disconnect the ISC valve coupler at least 5 seconds after ignition switch is turned to OFF.**
  If the ECM coupler is disconnected within 5 seconds after ignition switch is turned to OFF, there is a possibility of an unusual value being written in the ECM and causing an error of ISC valve operation.
- **When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.**

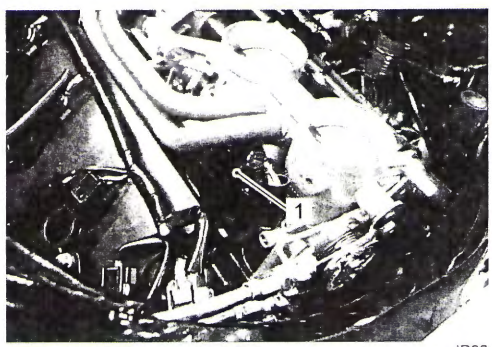
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

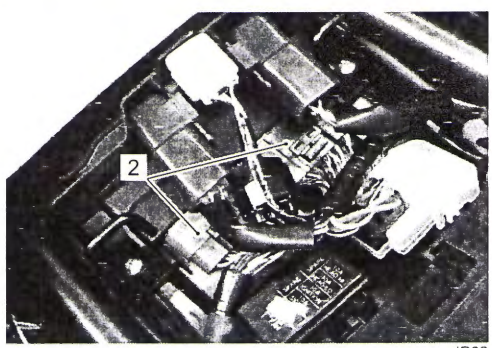
Step 1

ISC valve drive circuit check

1) Turn the ignition switch OFF.
2) Remove the air cleaner box. Refer to "Air Cleaner Box Removal and Installation" in Section 1D (Page 1D-7).
3) Disconnect the ISC valve coupler (1) and ECM couplers (2).



IB08J1110122-02



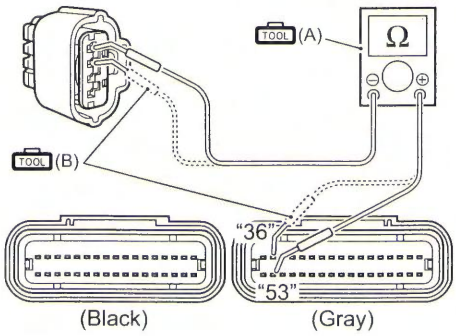
IB08J1110017-02

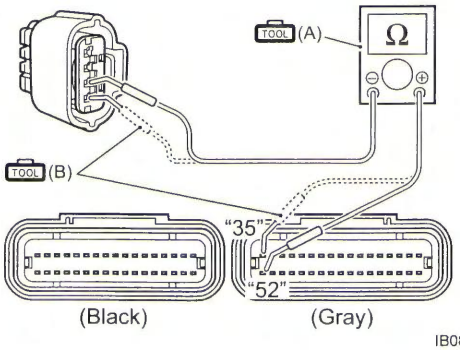
4) Check for proper terminal connection to the ISC valve coupler and ECM couplers.
5) If connections are OK, check the following points.
   - Resistance

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)
     (B): 09900–25009 (Needle-point probe set)

     Tester knob indication
     Resistance (Ω)

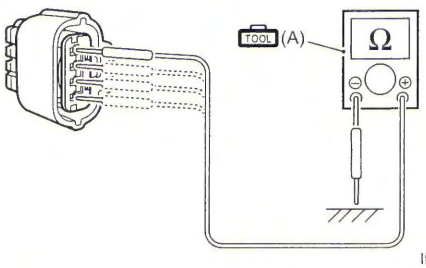
     – Dbr, Lg, Lbl and W/Y wires: less than 1 Ω





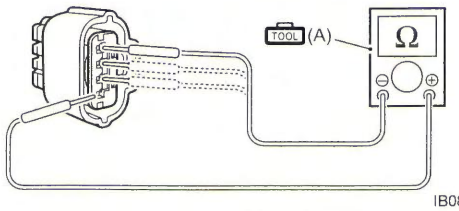
IB08J1110123-02

     – Between each of Dbr, Lg, Lbl and W/Y wire and ground: infinity



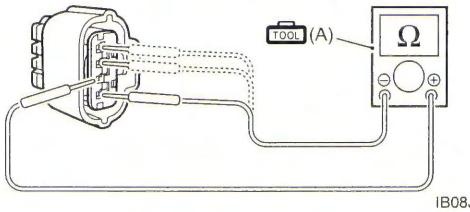
IB08J1110124-02

     – Between Dbr wire terminal and other terminal at ISC valve coupler: infinity



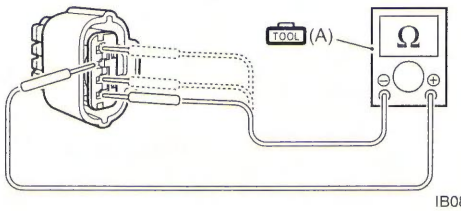
IB08J1110125-02

     – Between Lg wire terminal and other terminal at ISC valve coupler: infinity



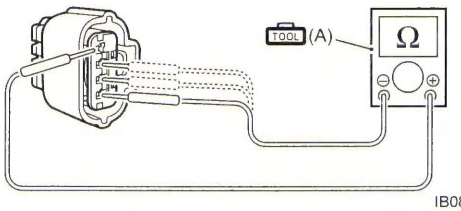
IB08J1110126-02

     – Between Lbl wire terminal and other terminal at ISC valve coupler: infinity



IB08J1110127-02

     – Between W/Y wire terminal and other terminal at ISC valve coupler: infinity



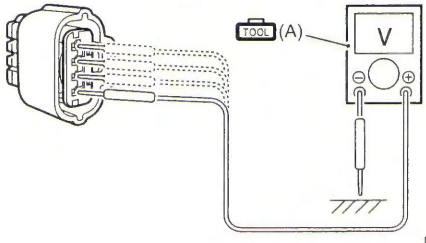
IB08J1110128-02

   - Voltage

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)

     Tester knob indication
     Voltage (⎓)

     – Dbr, Lg, Lbl and W/Y wires: approx. 0 V (When ignition switch is ON)



IB08J1110129-02

Is check result OK?

Yes	Go to Step 2.
No	Repair or replace the defective wire harness.

Step 2

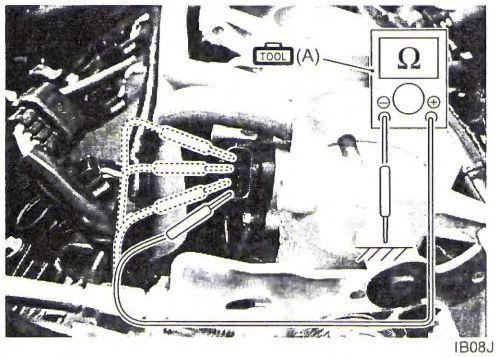
ISC valve check

1) Check the continuity between each ISC valve terminal and ground.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Resistance (Ω)

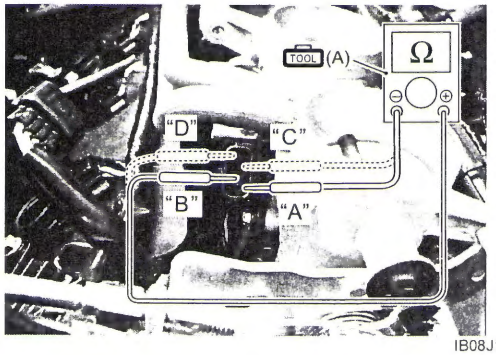
ISC valve continuity
∞ Ω (Infinity)
(Terminal – Ground)



IB08J1110130-04

2) If OK, measure the resistance (between the Dbr wire terminal "A" and Lg wire terminal "B") and (between the Lbl wire terminal "C" and W/Y wire terminal "D").

ISC valve resistance
Approx. 20 Ω at 20 °C (68 °F)
(Terminal: "A" – Terminal: "B", Terminal: "C" – Terminal: "D")



IB08J1110131-03

Is check result OK?

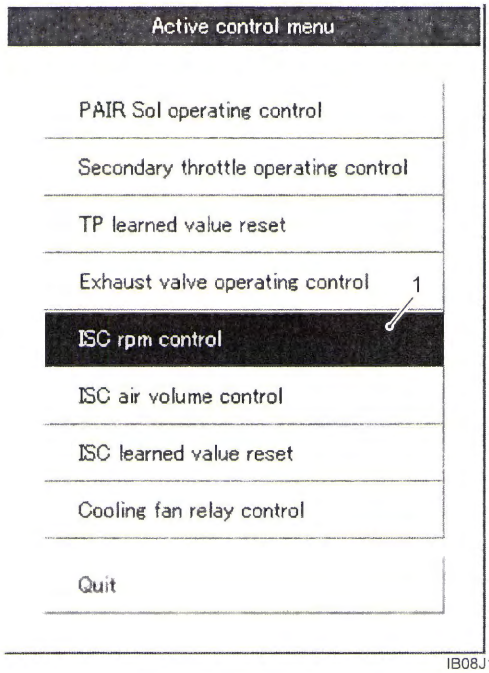
Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Replace the throttle body assembly with a new one. Refer to "Throttle Body Removal and Installation" in Section 1D (Page 1D-11).

ACTIVE CONTROL INSPECTION (ISC RPM CONTROL)

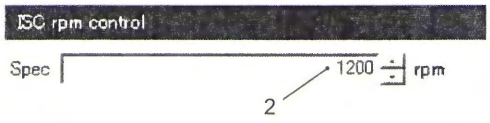
Check 1

1) Set up the SDS tool. (Refer to the SDS operation manual for further details.)
2) Check that the engine is running.
3) Click the "Active control".
4) Click the "ISC rpm control" (1).



IB08J1110132-02

5) Check that the "Spec" (2) is idle speed 1 200 ± 100 rpm.
6) Check that the "Desired idle speed" (3) is within the specified idle rpm.



I838H1110004-01

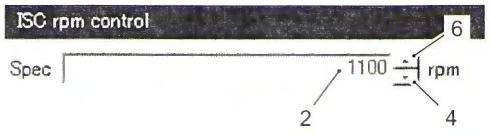
Engine coolant / oil temperature	94.9	°C
Desired idle speed	1205	rpm
Manifold absolute pressure 1	68.3	kPa
Vehicle speed	0.0	km/h
Throttle position	27.9	°
Intake air temperature	57.2	°C
Barometric pressure	101.6	kPa
Battery voltage	14.0	V
O2 sensor Bank1-Sensor1	1.1	V
Gear position	N	
ISC valve position	76	step
Secondary throttle actuator position sensor	4.7	%

3

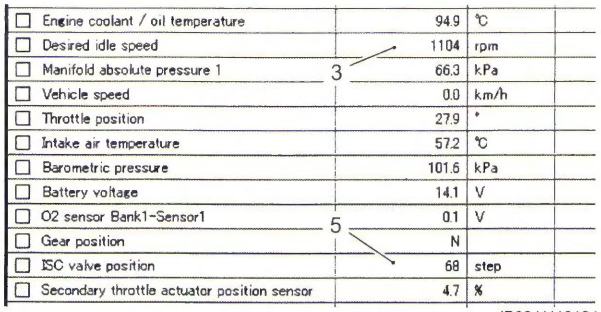
IB08J1110133-02

Check 2

1) Click the button (4) and decrease the "Spec" (2) to 1 100 rpm slowly.
2) Check that the "Desired idle speed" (3) is nearly equal to the "Spec" (2). At the same time, check that the number of steps (5) in the ISC valve position decreases.
3) Click the button (6) and increase the "Spec" (2) slowly.
4) Check that the "Desired idle speed" (3) is nearly equal to the "Spec" (2). Also, check that the number of steps (5) in the ISC valve position increases.



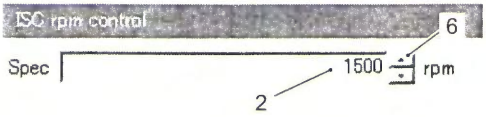
I837H1110082-01



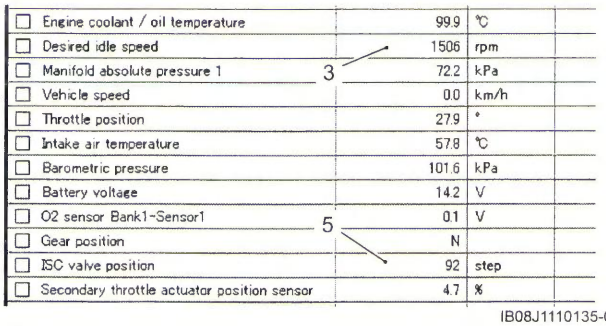
IB08J1110134-03

Check 3

1) Click the button (6) and increase the "Spec" (2) to 1 500 rpm slowly.
2) Check that the "Desired idle speed" (3) is nearly equal to the "Spec" (2). Also, check that the number of steps (5) in the ISC valve position increases.



I837H1110084-01



IB08J1110135-02

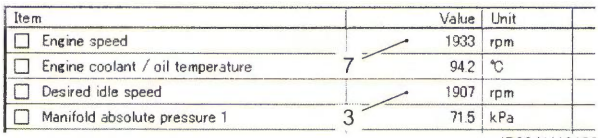
Check 4

1) Click the button (6) and increase the "Spec" (2) to 1 900 rpm.
2) Check that the "Desired idle speed" (3) is approx. 1 900 rpm.
3) Check that the "Engine speed" (7) is close to 1 900 rpm.

NOTE

Be careful not to increase the "Spec" to 2 000 rpm, or the "Engine speed" may reach the upper limit.

I837H1110086-01



IB08J1110136-02

If the ISC valve does not function properly, inspect the ISC valve. Refer to "ISC Valve Inspection" in Section 1C (Page 1C-8).

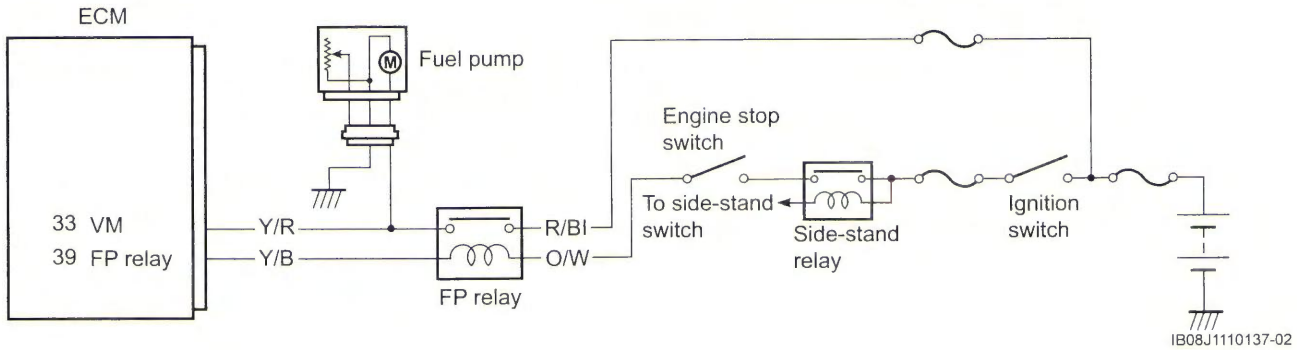
DTC "C41" (P0230-H/L): FP Relay Circuit Malfunction

BENF08J11104024

Detected Condition and Possible Cause

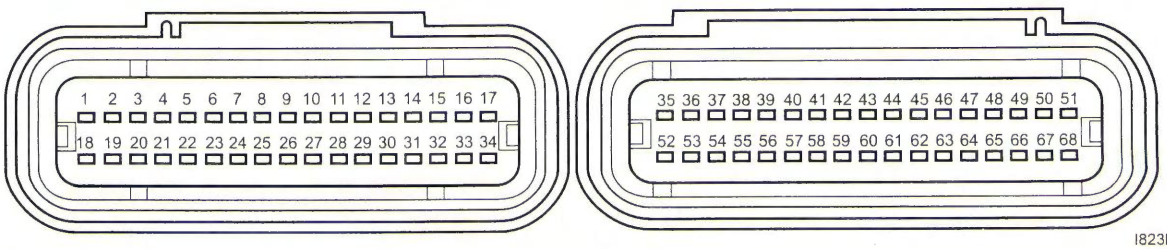
Detected Condition			Possible Cause
C41		No voltage is applied to fuel pump.	• FP relay circuit open or short. • FP relay malfunction.
P0230	H	Voltage is applied to fuel pump although FP relay is turned OFF.	• FP relay switch circuit is shorted to power source. • Faulty FP relay (switch side).
	L	No voltage is applied to fuel pump although FP relay is turned ON.	• FP relay coil circuit open or short. • Faulty FP relay (coil side).

Wiring Diagram



IB08J1110137-02

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

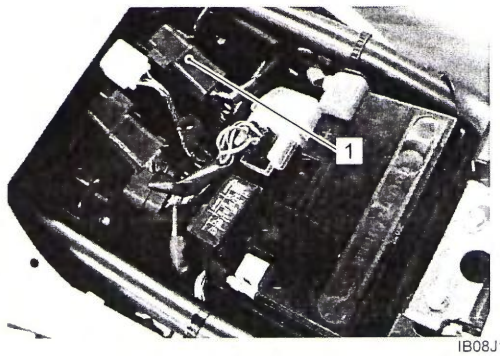
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

FP relay power supply circuit check

1) Turn the ignition switch OFF.
2) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D (Page 9D-6).
3) Disconnect the FP relay coupler (1).



IB08J1110138-01

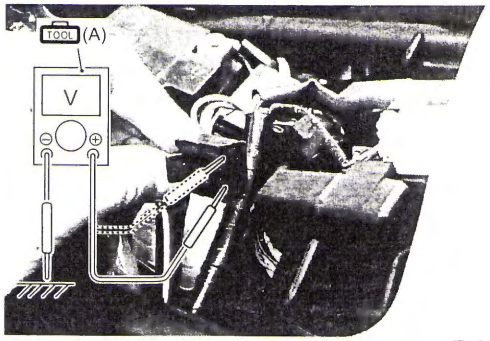
4) Check for proper terminal connection to the FP relay coupler.
5) If connections are OK, support the motorcycle with a jack.
6) Fold the side-stand to up position.
7) Turn the ignition switch ON.

8) Check the following points.
   - Voltage between O/W wire and ground is battery voltage.
   - Voltage between R/Bl wire and ground is battery voltage.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

FP relay power supply voltage
Battery voltage
((+) terminal: O/W – (–) terminal: Ground, (+) terminal: R/Bl – (–) terminal: Ground)



IB08J1110139-03

Is check result OK?

Yes	Go to Step 2.
No	Repair or replace the defective wire harness.

Step 2

FP relay check
Check the FP relay. Refer to "Fuel Pump Relay Inspection" in Section 1G (Page 1G-7).

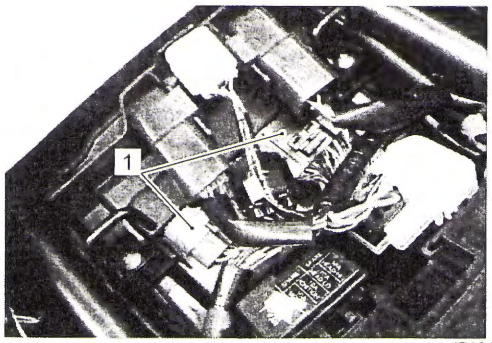
Is check result OK?

Yes	Go to Step 3.
No	Replace the FP relay.

Step 3

FP relay drive circuit and power supply circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



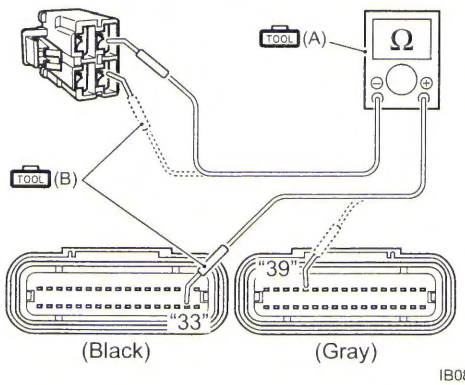
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

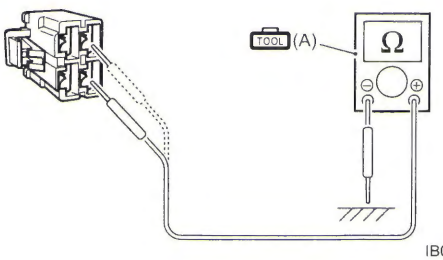
Tester knob indication
Resistance (Ω)

– Y/R wire and Y/B wire: less than 1 Ω



IB08J1110140-02

– Between each of Y/R and Y/B wire and ground: infinity



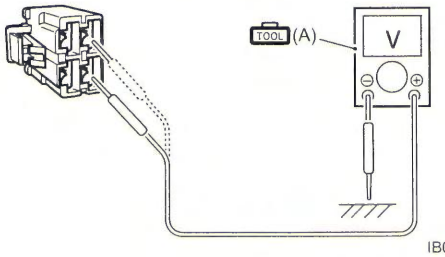
IB08J1110141-02

- Voltage

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– Y/R wire and Y/B wire: approx. 0 V (When ignition switch is ON)



IB08J1110142-02

Is check result OK?

Yes	Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).
No	Repair or replace the defective wire harness.

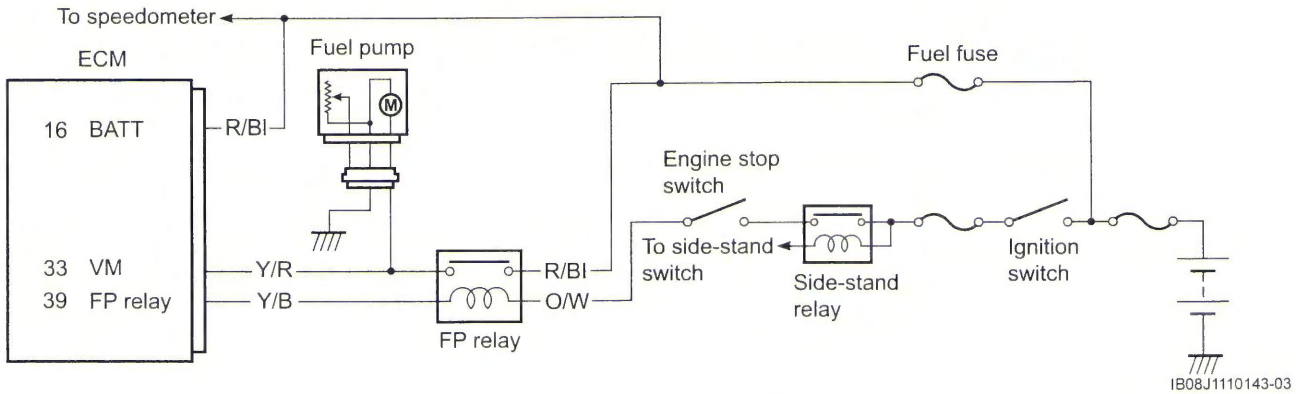
DTC "C41" (P2505): ECM Power Input Signal Malfunction

BENF08J11104025

Detected Condition and Possible Cause

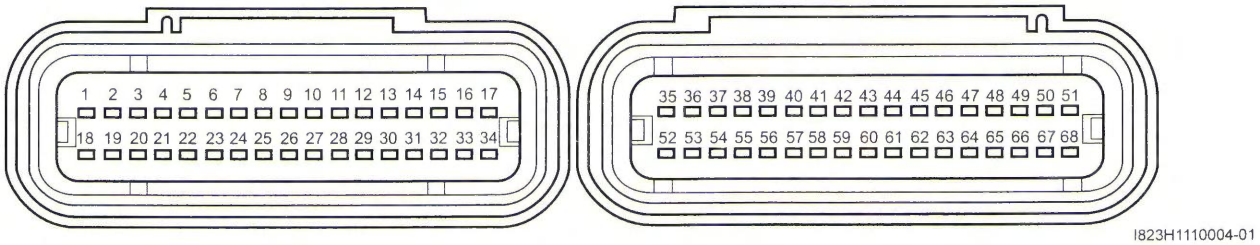
	Detected Condition	Possible Cause
C41/P2505	No voltage is applied to the ECM.	• Lead wire/coupler connection of ECM terminal to fuel fuse. • Fuel fuse.

Wiring Diagram



IB08J1110143-03

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

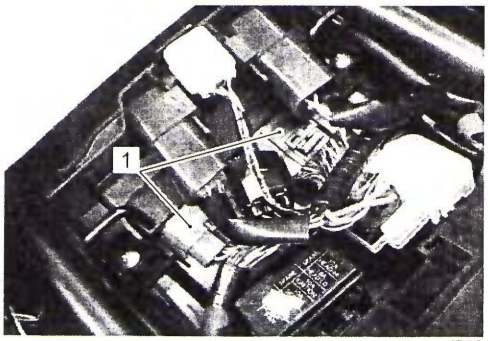
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

ECM power supply circuit check

1) Turn the ignition switch OFF.
2) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D (Page 9D-6).
3) Disconnect the ECM couplers (1).



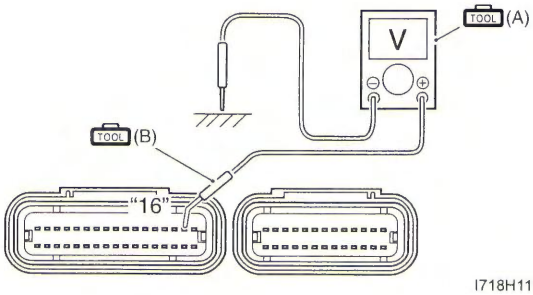
IB08J1110039-02

4) Check for proper terminal connection to the ECM couplers.
5) If connections are OK, Measure the voltage between R/Bl and ground.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

ECM input voltage
Battery voltage
((+) terminal: R/Bl – (–) terminal: Ground)



I718H1110250-01

Is check result OK?

Yes	Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).
No	Check FUEL fuse for blowout. If fuse is not blown, repair or replace the R/Bl wire.

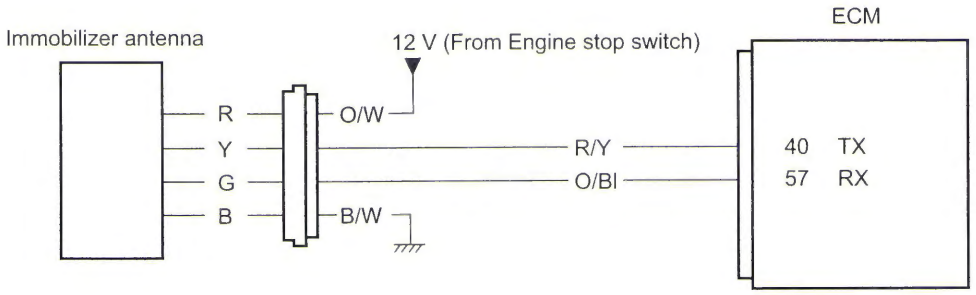
DTC "C42" (P1650): IG Switch Circuit Malfunction (If Equipped)

BENF08J11104026

Detected Condition and Possible Cause

Detected Condition	Possible Cause
When the ID agreement is not verified. ECM does not receive communication signal from the immobilizer antenna.	Immobilizer system malfunction.

Wiring Diagram



IB08J1110214-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

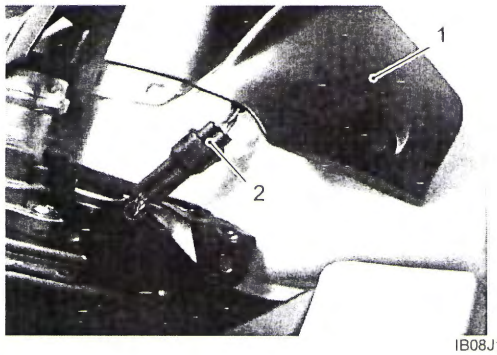
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

Immobilizer antenna power supply circuit check

1) Turn the ignition switch OFF.
2) Remove the ignition switch center cover (1) and disconnect the Immobilizer antenna coupler (2). Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).



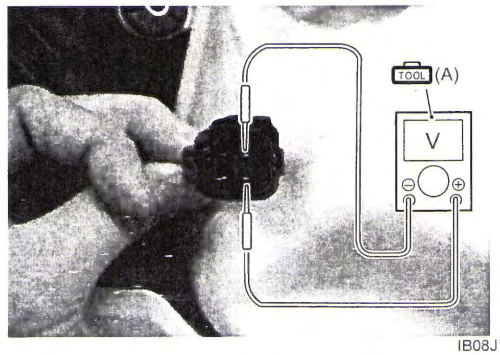
IB08J1110215-01

3) Check for proper terminal connection to Immobilizer antenna coupler.
4) If connections are OK, turn ignition switch ON.
5) Measure the voltage between O/W and B/W.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

Immobilizer antenna power supply voltage
Battery voltage
((+) terminal: O/W – (–) terminal: B/W)



IB08J1110216-01

Is check result OK?

Yes Go to Step 3.

No Go to Step 2.

Step 2

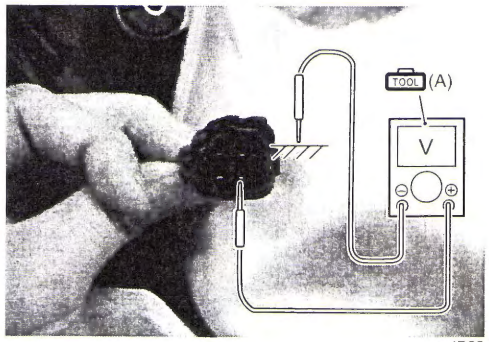
Immobilizer antenna ground circuit check

1) Measure the voltage between O/W and ground.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

Immobilizer antenna power supply voltage
Battery voltage
((+) terminal: O/W – (–) terminal: ground)



IB08J1110217-01

Is check result OK?

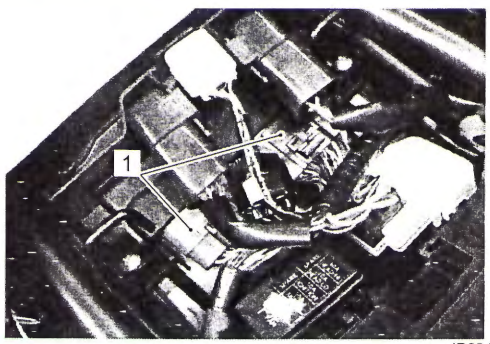
Yes — Repair or replace B/W wire.

No — Repair or replace O/W wire.

Step 3

Immobilizer antenna signal circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



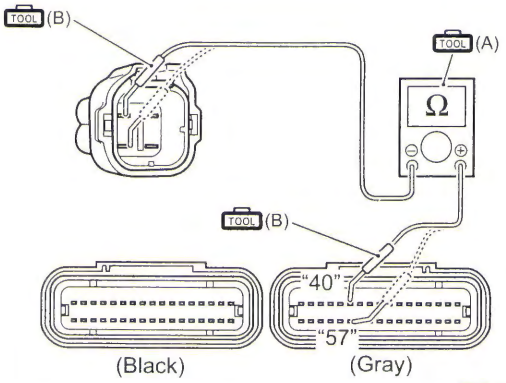
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

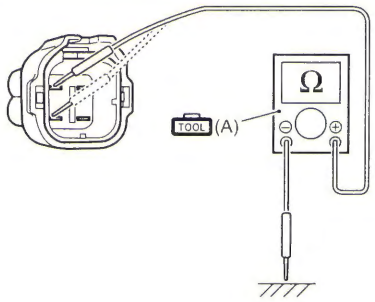
Tester knob indication
Resistance (Ω)

– R/Y wire and O/Bl wire: less than 1 Ω



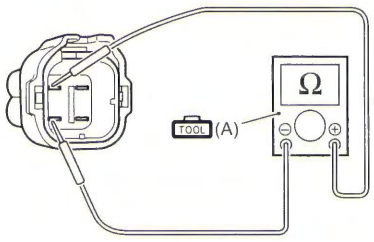
IB08J1110218-02

– Between each of R/Y and O/Bl wire and ground: infinity



IB08J1110219-02

– Between R/Y wire terminal and O/Bl wire terminal at immobilizer antenna coupler: infinity



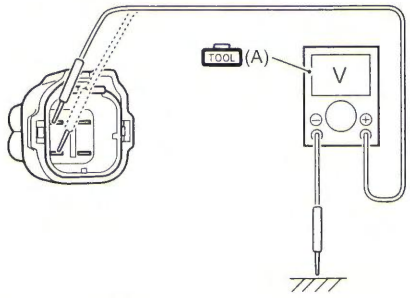
IB08J1110220-02

- Voltage

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– R/Y and O/Bl wires: approx. 0 V (When ignition switch is ON)



IB08J1110221-02

Is check result OK?

Yes	• Immobilizer antenna • Transponder • ECM
No	Repair or replace defective wire harness.

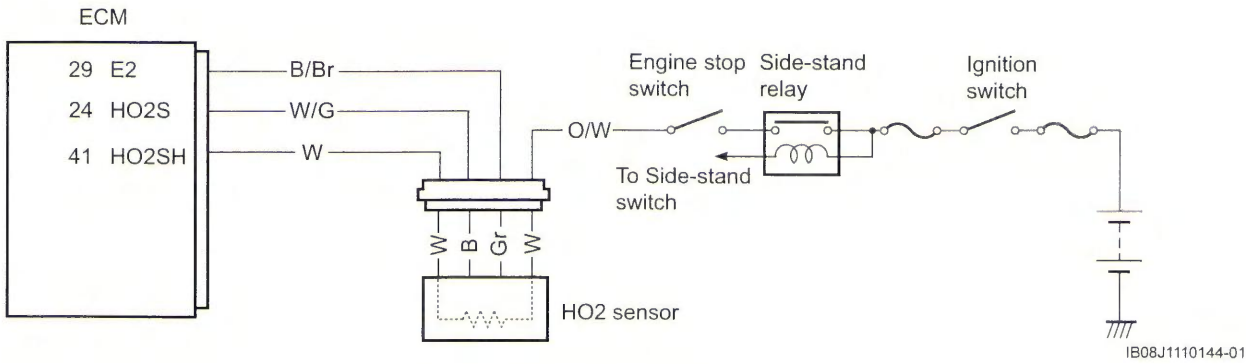
DTC "C44" (P0130/P0135): HO2 Sensor (HO2S) Circuit Malfunction

BENF08J11104027

Detected Condition and Possible Cause

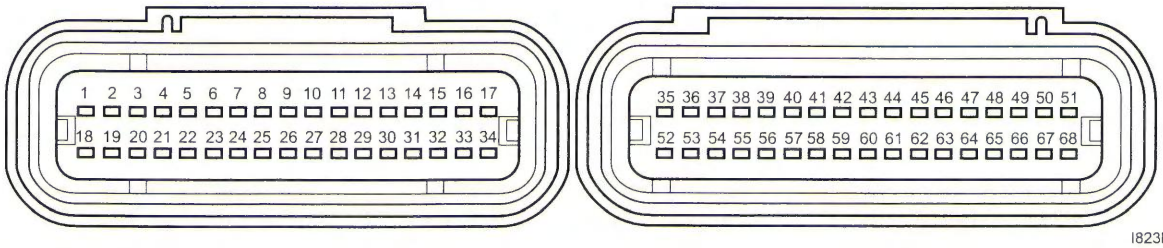
Detected Condition		Possible Cause
C44/P0130	HO2 sensor output voltage is not input to ECM specified running condition.	• Output state of HO2 sensor
C44/P0135	The heater can not operate so that heater operation voltage is not supplied to the HO2 sensor heater circuit.	• HO2 sensor heater circuit is open or shorted to ground. • Battery voltage is not supplied to the HO2 sensor.

Wiring Diagram



IB08J1110144-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

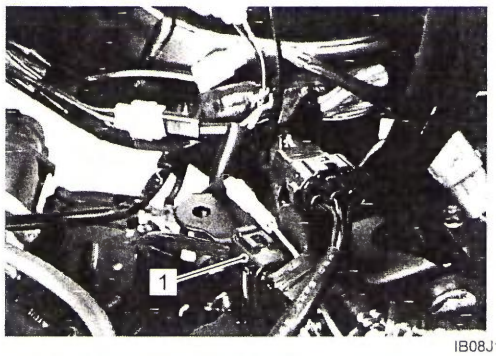
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

HO2 sensor heater power supply circuit check

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).
3) Disconnect the HO2 sensor coupler (1).



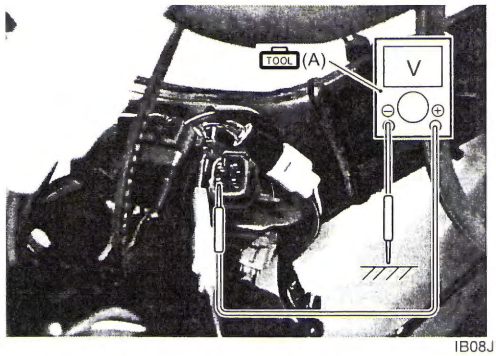
IB08J1110145-02

4) Check for proper terminal connection to the HO2 sensor coupler.
5) If connections are OK, support the motorcycle with a jack.
6) Fold the side-stand to up position.
7) Turn the ignition switch ON.
8) Measure the voltage between O/W wire and ground.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

HO2 sensor heater power supply voltage
Battery voltage
((+) terminal: O/W – (–) terminal: Ground)



IB08J1110146-02

Is check result OK?

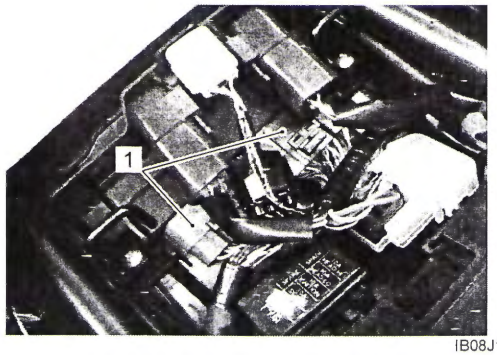
Yes Go to Step 2.

No Repair or replace the O/W wire.

Step 2

HO2 sensor circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



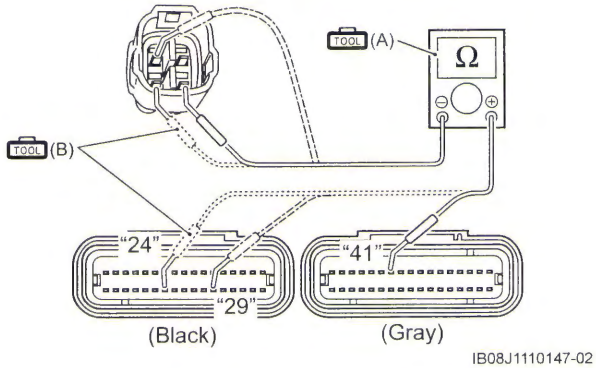
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

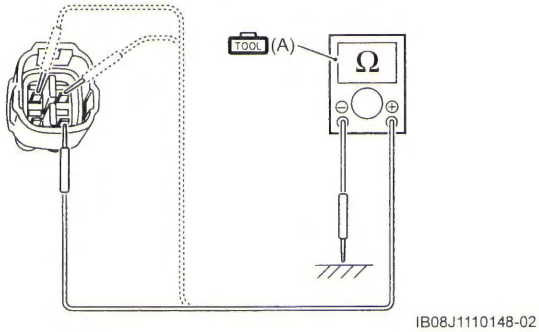
Tester knob indication
Resistance (Ω)

– W, W/G and B/Br wires: less than 1 Ω



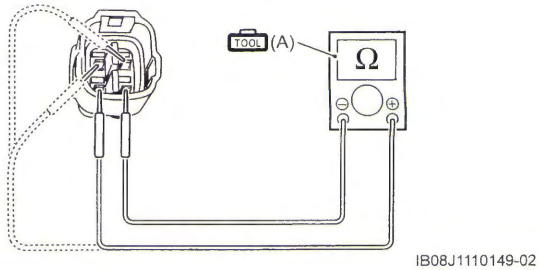
IB08J1110147-02

– Between each of W, W/G and B/Br wire and ground: infinity



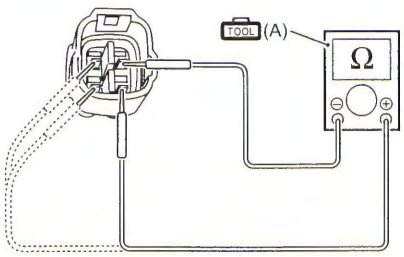
IB08J1110148-02

– Between W wire terminal and other terminal at HO2 sensor coupler: infinity



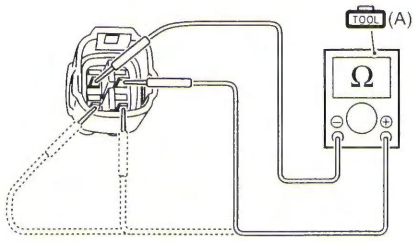
IB08J1110149-02

– Between W/G wire terminal and other terminal at HO2 sensor coupler: infinity



IB08J1110150-02

– Between B/Br wire terminal and other terminal at HO2 sensor coupler: infinity



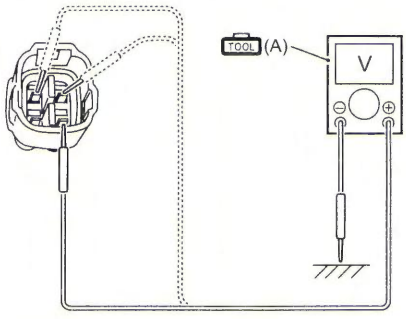
IB08J1110151-02

- Voltage

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– W, W/G and B/Br wires: approx. 0 V (When ignition switch is ON)



IB08J1110152-02

Is check result OK?

Yes — Go to Step 3.

No — Repair or replace the defective wire harness.

Step 3
HO2 sensor heater check

1) Measure the resistance between terminals.

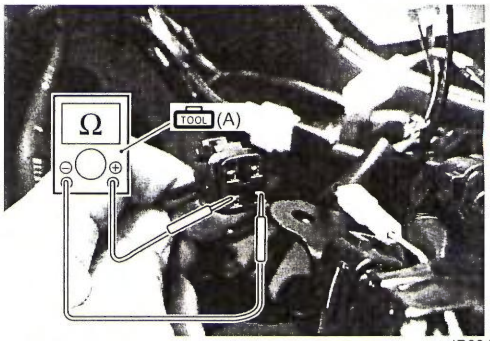
NOTE

- **Temperature of the HO2 sensor affects resistance value largely.**
- **Make sure that the HO2 sensor heater is in atmospheric temperature.**

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Resistance (Ω)

HO2 sensor heater resistance
6.7 – 9.5 Ω at 23 °C (73 °F)
(W – W)



IB08J1110153-02

Is check result OK?

Yes — Go to Step 4.

No — Replace the HO2 sensor with a new one. Refer to "HO2 Sensor Removal and Installation" in Section 1C (Page 1C-9).

Step 4

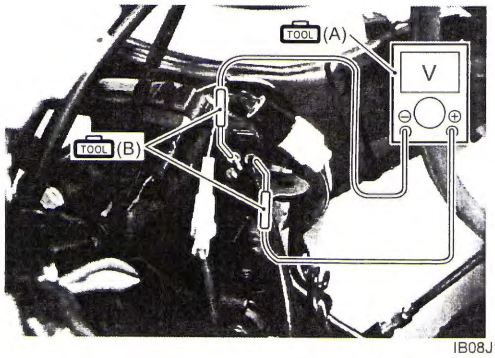
HO2 sensor output voltage check

1) Connect the ECM coupler and HO2 sensor coupler.
2) Warm up the engine enough.
3) Insert the needle pointed probes to the lead wire coupler.
4) Measure the HO2 sensor output voltage between the W/G wire and B/Br wire, in idling condition.

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

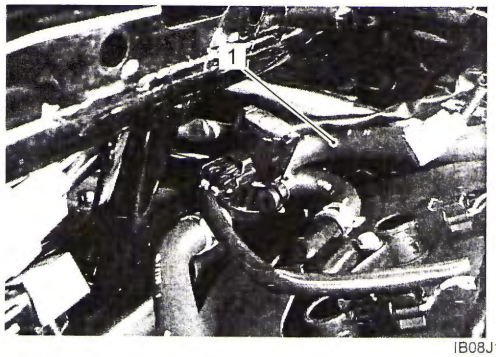
Tester knob indication
Voltage (⎓)

HO2 sensor output voltage at idle speed
0.4 V and less
((+) terminal: W/G – (–) terminal: B/Br)



IB08J1110154-03

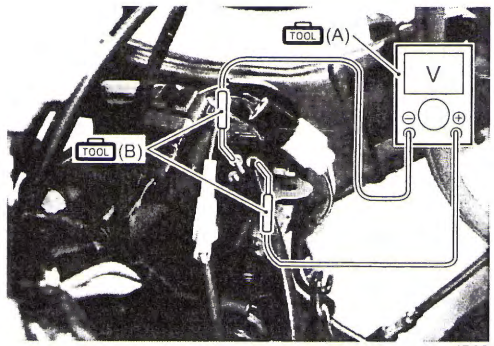
5) If OK, remove the air cleaner box and pinch the PAIR hose (1) with a proper hose clamp.



IB08J1110155-01

6) Measure the HO2 sensor output voltage while holding the engine speed at 5 000 r/min.

HO2 sensor output voltage at 5 000 r/min
0.6 V and more
((+) terminal: W/G – (–) terminal: B/Br)



IB08J1110154-03

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

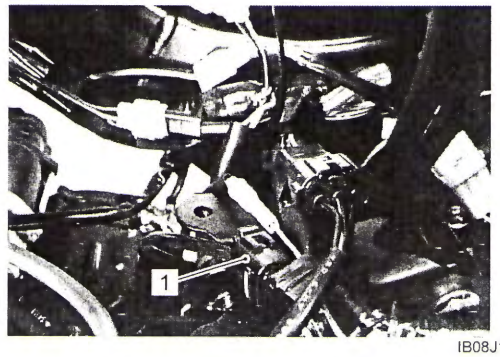
No — Replace the HO2 sensor with a new one. Refer to "HO2 Sensor Removal and Installation" in Section 1C (Page 1C-9).

P0130 for HO2 sensor (Use of SDS)

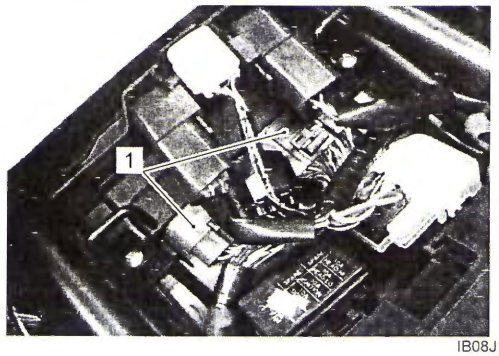
Step 1

HO2 sensor circuit check

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).
3) Disconnect the HO2 sensor coupler (1) and the ECM couplers (2).



IB08J1110145-02



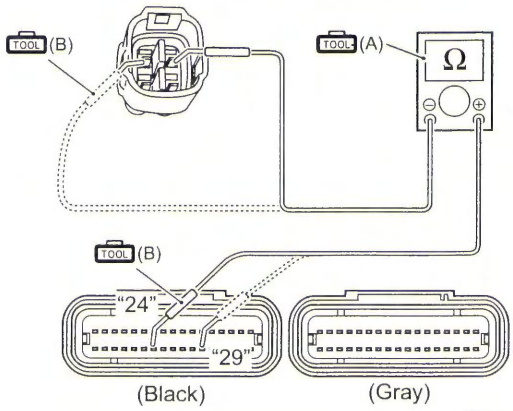
IB08J1110039-02

4) Check for proper terminal connection to the HO2 sensor coupler and the ECM couplers.
5) If connections are OK, check the following points.
   - Resistance

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)
     (B): 09900–25009 (Needle-point probe set)

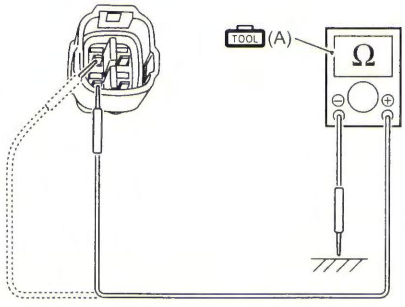
     Tester knob indication
     Resistance (Ω)

     – W/G wire and B/Br wire: less than 1 Ω



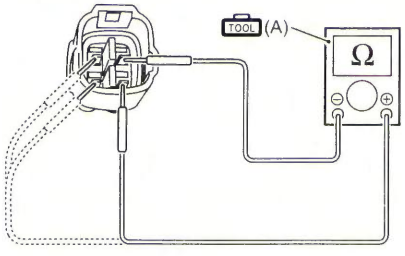
IB08J1110156-02

     – Between each of W/G and B/Br wire and ground: infinity



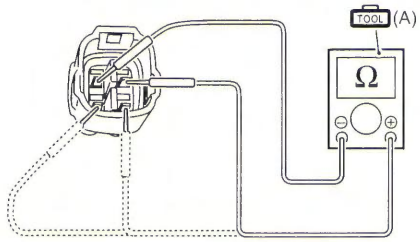
IB08J1110157-02

     – Between W/G wire terminal and other terminal at HO2 sensor coupler: infinity



IB08J1110150-02

     – Between B/Br wire terminal and other terminal at HO2 sensor coupler: infinity



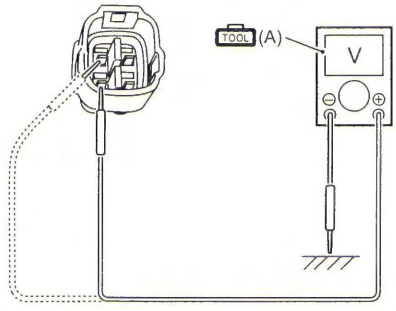
IB08J1110151-02

   - Voltage

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)

     Tester knob indication
     Voltage (⎓)

     – W/G wire and B/Br wire: approx. 0 V (When ignition switch is ON)



IB08J1110158-02

Is check result OK?

Yes	Go to Step 2.
No	Repair or replace the defective wire harness.

Step 2

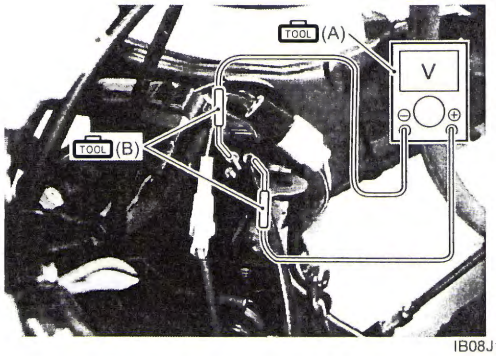
HO2 sensor output voltage check

1) Connect the ECM coupler and HO2 sensor coupler.
2) Warm up the engine enough.
3) Insert the needle pointed probes to the lead wire coupler.
4) Measure the HO2 sensor output voltage between the W/G wire and B/Br wire, in idling condition.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)
TOOL (B): 09900–25009 (Needle pointed probe set)

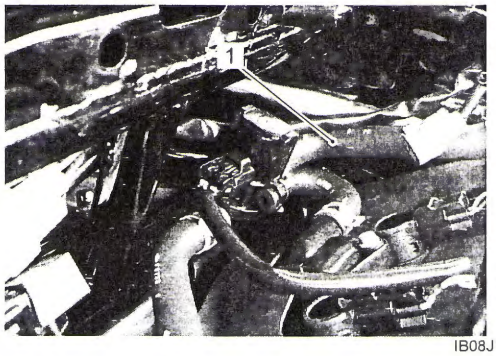
Tester knob indication
Voltage (⎓)

HO2 sensor output voltage at idle speed
0.4 V and less
((+) terminal: W/G – (–) terminal: B/Br)



IB08J1110154-03

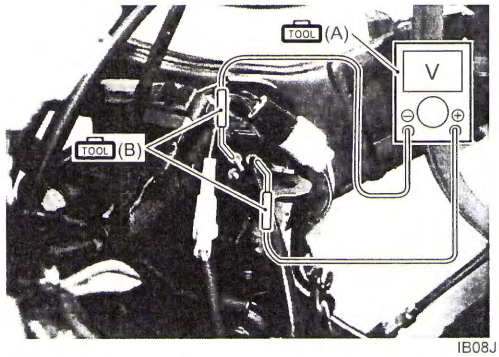
5) If OK, remove the air cleaner box and pinch the PAIR hose (1) with a proper hose clamp.



IB08J1110155-01

6) Measure the HO2 sensor output voltage while holding the engine speed at 5 000 r/min.

HO2 sensor output voltage at 5 000 r/min
0.6 V and more
((+) terminal: W/G – (–) terminal: B/Br)



IB08J1110154-03

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

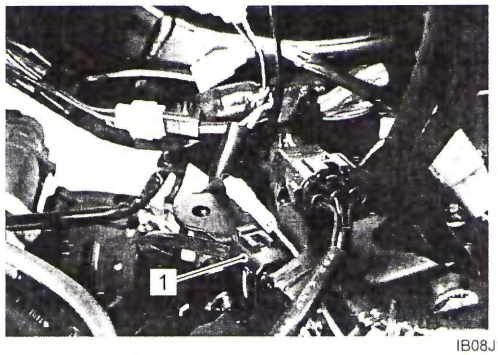
No — Replace the HO2 sensor with a new one. Refer to "HO2 Sensor Removal and Installation" in Section 1C (Page 1C-9).

P0135 for HO2 sensor (Use of SDS)

Step 1

HO2 sensor heater power supply circuit check

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).
3) Disconnect the HO2 sensor coupler (1).



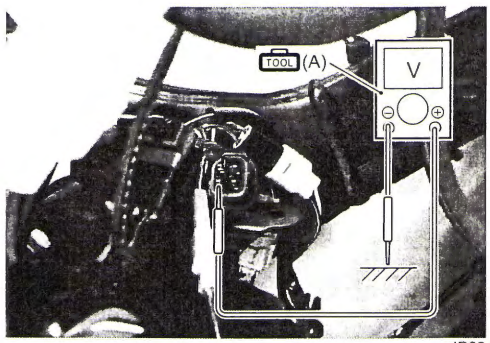
IB08J1110145-02

4) Check for proper terminal connection to the HO2 sensor coupler.
5) If connections are OK, support the motorcycle with a jack.
6) Fold the side-stand to up position.
7) Turn the ignition switch ON.
8) Measure the voltage between O/W and ground.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

HO2 sensor heater power supply voltage
Battery voltage
((+) terminal: O/W – (–) terminal: Ground)



IB08J1110146-02

Is check result OK?

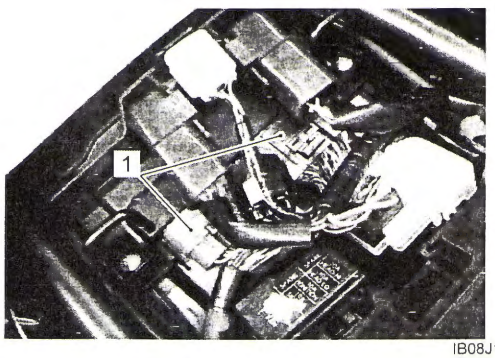
Yes Go to Step 2.

No Repair or replace the O/W wire.

Step 2

HO2 sensor heater drive circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



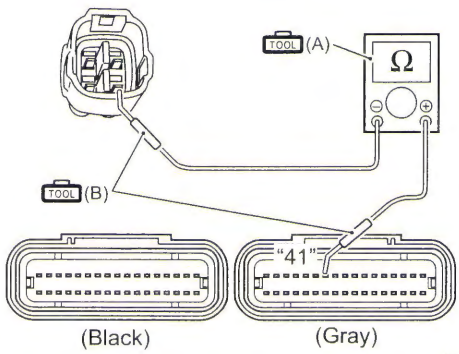
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

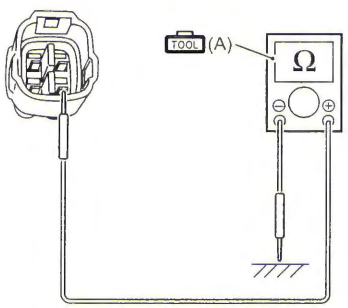
Tester knob indication
Resistance (Ω)

– W wire: less than 1 Ω



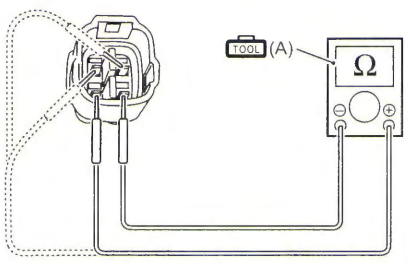
IB08J1110159-02

– Between W wire and ground: infinity



IB08J1110160-02

– Between W wire terminal and other terminal at HO2 sensor coupler: infinity



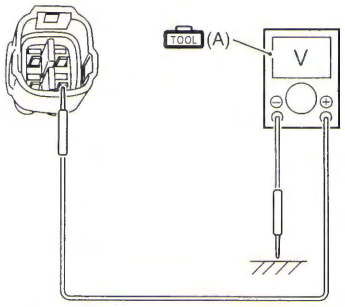
IB08J1110149-02

- Voltage

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– W wire: approx. 0 V (When ignition switch is ON)



IB08J1110161-02

Is check result OK?

Yes — Go to Step 3.

No — Repair or replace the W wire.

Step 3

HO2 sensor heater check

1) Measure the resistance between terminals.

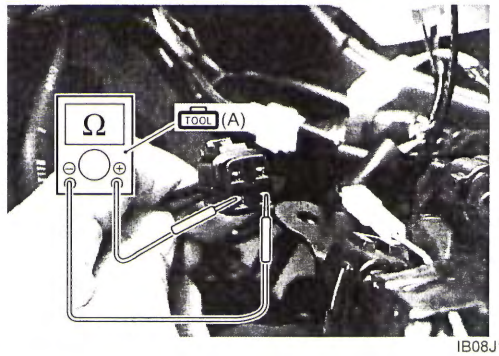
NOTE

- **Temperature of the HO2 sensor affects resistance value largely.**
- **Make sure that the HO2 sensor heater is in atmospheric temperature.**

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

Tester knob indication
Resistance (Ω)

HO2 sensor heater resistance
6.7 – 9.5 Ω at 23 °C (73 °F)
(W – W)



IB08J1110162-02

Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

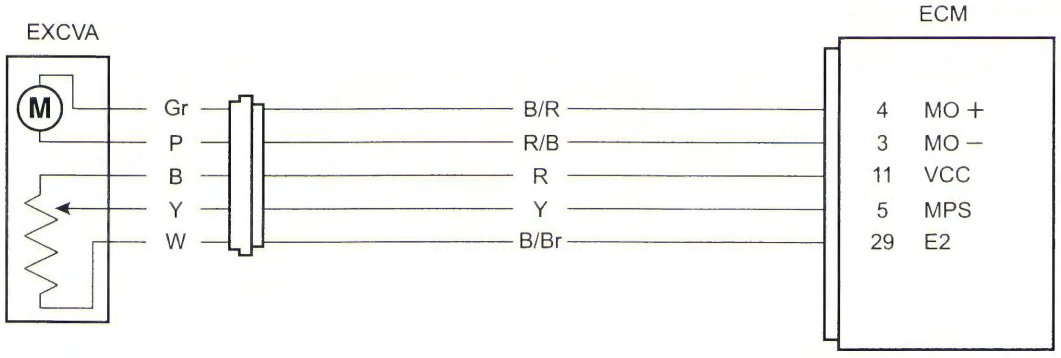
No — Replace the HO2 sensor with a new one. Refer to "HO2 Sensor Removal and Installation" in Section 1C (Page 1C-9).

DTC "C46" (P1657-H/L or P1658): EXCV Actuator Circuit Malfunction

BENF08J11104028

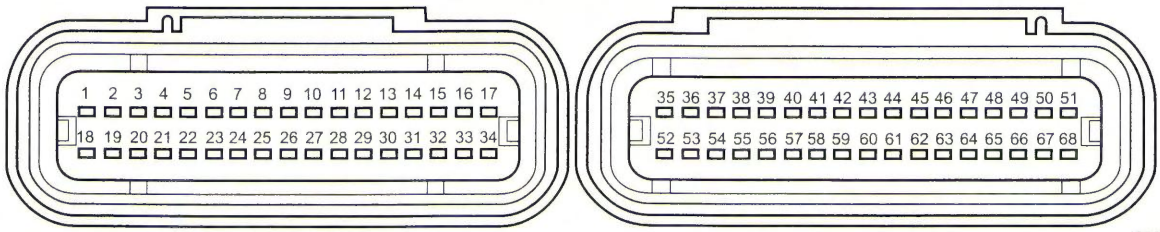
Detected Condition			Possible Cause
C46		The operation signal does not reach the EXCVA. EXCVA position sensor voltage is not within the following range. 0.1 V ≤ Sensor voltage < 4.9 V EXCVA can not operate properly.	• EXCVA maladjusted. • EXCVA circuit open or short. • EXCVA motor malfunction. • EXCVA position sensor malfunction.
P1657	H	Sensor voltage is higher than specified value.	• EXCVA position sensor signal circuit shorted to VCC or ground circuit open.
	L	Sensor voltage is lower than specified value.	• EXCVA position sensor signal circuit open or shorted to ground or VCC circuit open.
P1658		The operation signal does not reach the EXCVA motor. EXCVA can not operate properly.	• EXCVA motor circuit open or short. • EXCVA motor malfunction.

Wiring Diagram



IB08J1110163-02

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

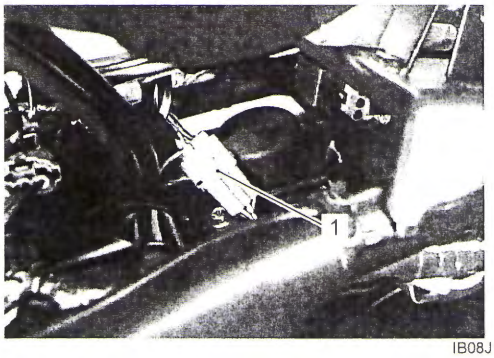
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

EXCVA position sensor power supply circuit check

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).
3) Disconnect the EXCVA coupler (1).



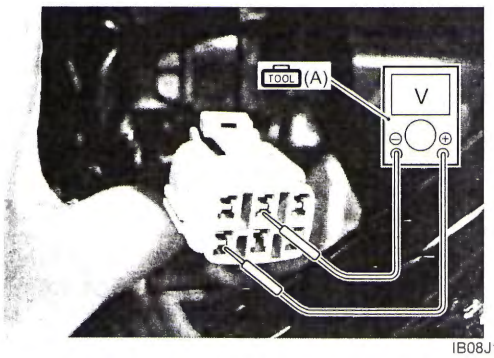
IB08J1110164-02

4) Check for proper terminal connection to the EXCVA coupler.
5) If connections are OK, turn the ignition switch ON.
6) Measure the voltage between the R wire and B/Br wire.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

EXCVA position sensor power supply voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: B/Br)



IB08J1110165-02

Is check result OK?

Yes Go to Step 3.

No Go to Step 2.

Step 2

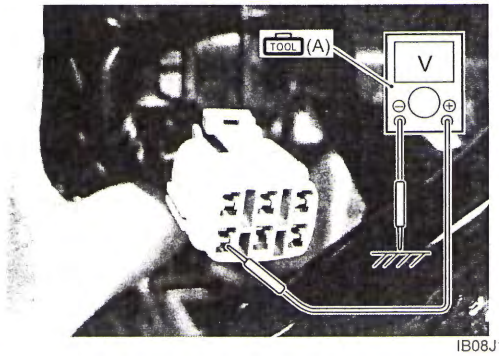
EXCVA position sensor ground circuit check

1) Measure the voltage between the R wire and ground.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

EXCVA position sensor power supply voltage
4.5 – 5.5 V
((+) terminal: R – (–) terminal: ground)



IB08J1110166-02

Is check result OK?

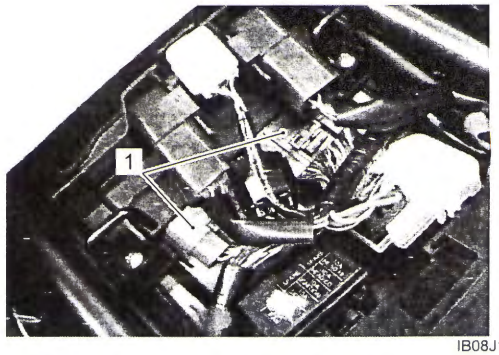
Yes Repair or replace the B/Br wire.

No Repair or replace the R wire.

Step 3

EXCVA position sensor signal circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



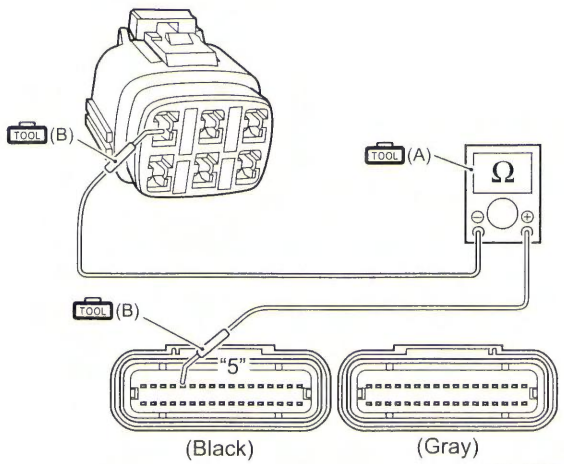
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)
     (B): 09900–25009 (Needle-point probe set)

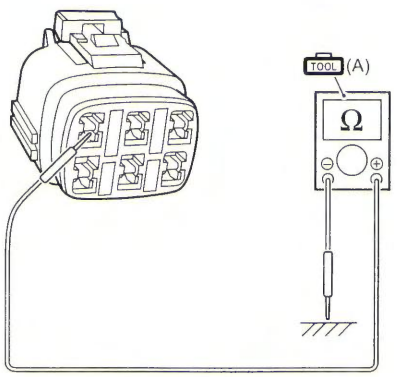
     Tester knob indication
     Resistance (Ω)

     – Y wire: less than 1 Ω



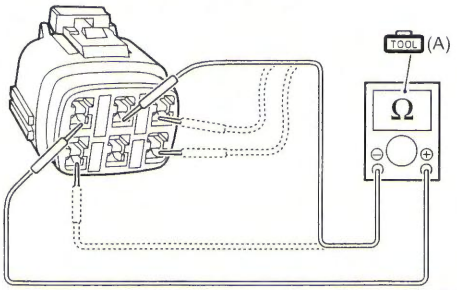
IB08J1110167-02

     – Between Y wire and ground: infinity



IB08J1110168-02

     – Between Y wire terminal and other terminal at EXCVA coupler: infinity



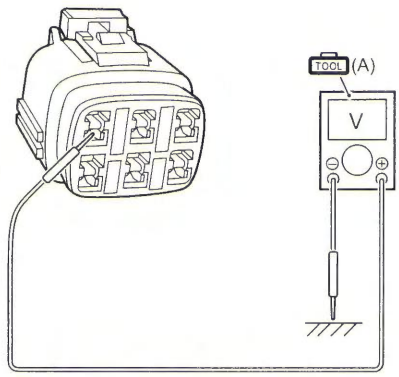
IB08J1110169-02

   - Voltage

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)

     Tester knob indication
     Voltage (⎓)

     – Y wire: approx. 0 V (When ignition switch is ON)



IB08J1110170-02

Is check result OK?

Yes	Go to Step 4.
No	Repair or replace the Y wire.

Step 4

EXCV cable check

1) Turn the ignition switch OFF.
2) Check the installation of EXCV cables. Refer to "EXCV Cable Removal and Installation" in Section 1K (Page 1K-6).
3) Recheck DTC.

Is check result OK?

Yes	Go to Step 5.
No	Adjust the EXCV cables. Refer to "EXCVA Adjustment" in Section 1K (Page 1K-10).

Step 5

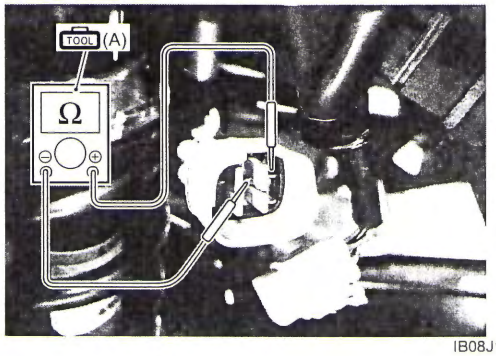
EXCVA position sensor resistance check

1) Connect the EXCVA coupler and set the EXCVA to adjustment position. Refer to "EXCV Cable Removal and Installation" in Section 1K (Page 1K-6).
2) Disconnect the EXCVA coupler and measure the resistance (between Y and W wires).

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Resistance (Ω)

EXCVA position sensor resistance at adjustment position
Approx. 3.1 kΩ
((+) Y – (–) W)



IB08J1110171-02

Is DTC still detected?

Yes — Go to Step 6.

No — Replace the EXCVA. Refer to "EXCVA Removal and Installation" in Section 1K (Page 1K-8).

Step 6

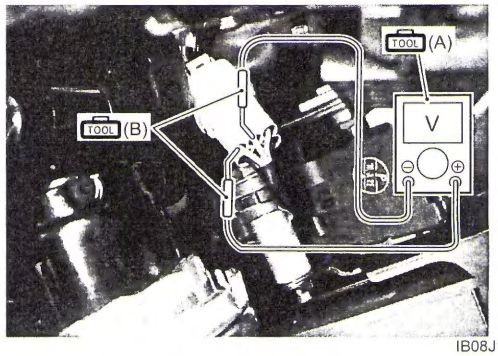
EXCVA position sensor output voltage check 1 (using SDS)

1) Turn the ignition switch OFF.
2) Connect the EXCVA and ECM couplers.
3) Set EXCV to the full closed position. Refer to "Active Control Inspection" (Page 1A-92).
4) Measure the EXCVA position sensor output voltage at EXCV fully closed position.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)
TOOL (B): 09900–25009 (Needle-point probe set)

Tester knob indication
Voltage (⎓)

EXCVA position sensor output voltage
EXCV is fully closed: 0.45 – 1.4 V
((+) Y – (–) W)



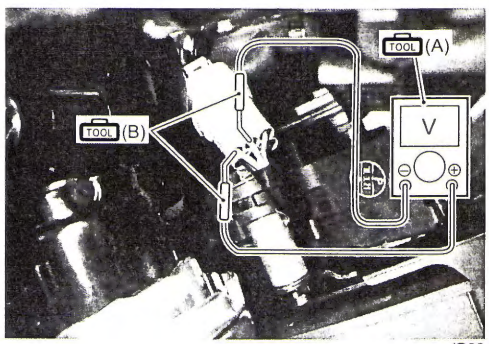
IB08J1110172-03

5) Set EXCV to the full opened position. Refer to "Active Control Inspection" (Page 1A-92).
6) Measure the EXCVA position sensor output voltage at EXCV fully opened position.

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

Tester knob indication
Voltage (⎓)

EXCVA position sensor output voltage
EXCV is fully opened: 3.6 – 4.55 V
((+) Y – (–) W)



IB08J1110172-03

Is check result OK?

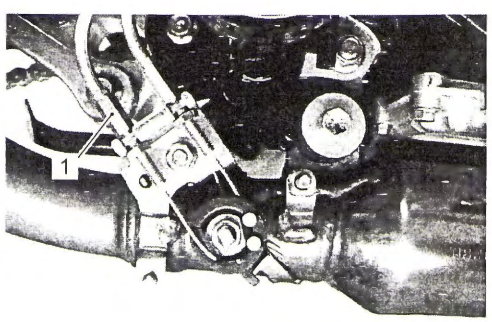
Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Go to Step 7.

Step 7

EXCVA position sensor output voltage check 2 (using SDS)

1) If the EXCVA position sensor output voltage is 0.5 V and less at EXCV fully closed position, adjust the output voltage to the specified value by turning out the No. 1 cable adjuster (1). Refer to "EXCV Cable Removal and Installation" in Section 1K (Page 1K-6).



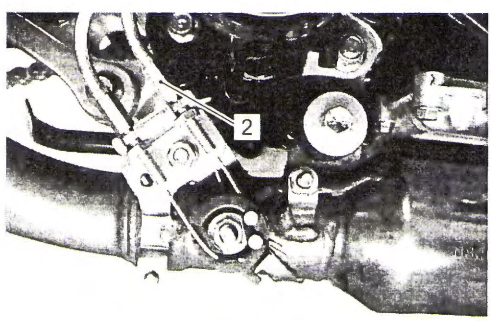
IB08J1110173-02

2) Repeat the procedure in Step 6 until the output voltage is set within the specified value. (If C46/P1657 code is indicated after adjusting the voltage, increase the voltage to 0.9 V).

NOTICE

- **Adjusting the cable with the EXCV fully opened or fully closed can damage the EXCVA. Be sure to adjust the cable with the EXCV set in the adjustment position. Refer to "EXCV Cable Removal and Installation" in Section 1K (Page 1K-6).**
- **Do not turn the EXCVA pulley using the wrench.**

3) If the EXCVA position sensor output voltage is 4.5 V and more at EXCV fully opened position, adjust the output voltage to the specified value by turning out the No. 2 cable adjuster (2). Refer to "EXCV Cable Removal and Installation" in Section 1K (Page 1K-6). Repeat the procedure in Step 6 until the output voltage is set within the specified value.



IB08J1110174-02

EXCVA position sensor output voltage
EXCV is fully closed: 0.45 ≤ Output voltage ≤ 1.4
EXCV is fully opened: 3.6 ≤ Output voltage ≤ 4.55

Is check result OK?

Yes — Go to Step 8.

No — Replace the EXCVA. Refer to "EXCVA Removal and Installation" in Section 1K (Page 1K-8).

Step 8

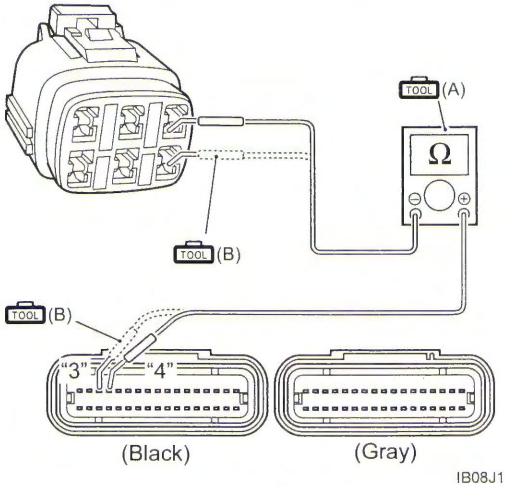
EXCVA drive circuit check

1) Turn the ignition switch OFF.
2) Disconnect the EXCVA and ECM couplers.
3) Check the following points.
   - Resistance

     Special tool
     TOOL (A): 09900–25008 (Multi-circuit tester set)
     TOOL (B): 09900–25009 (Needle-point probe set)

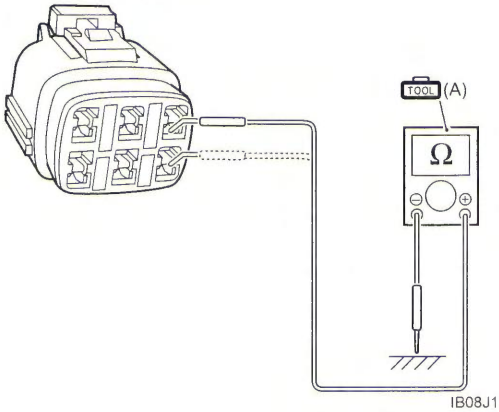
     Tester knob indication
     Resistance (Ω)

     – B/R wire and R/B wire: less than 1 Ω



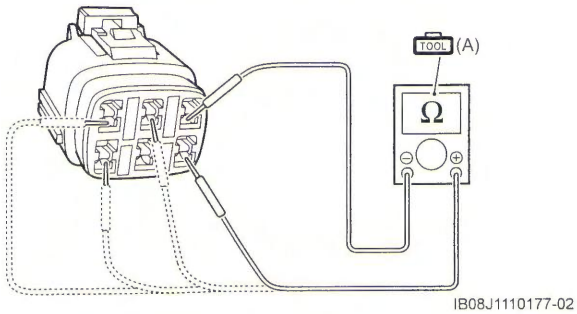
IB08J1110175-02

     – Between each of B/R and R/B wire and ground: infinity



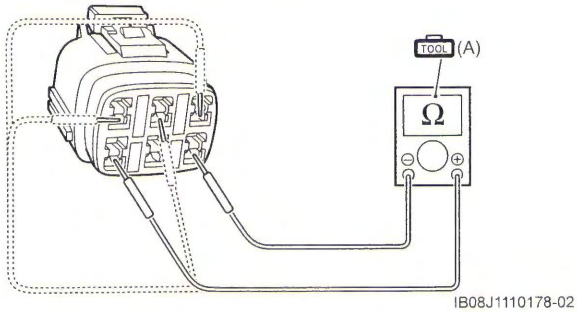
IB08J1110176-02

     – Between B/R wire terminal and other terminal at EXCVA coupler: infinity



IB08J1110177-02

     – Between R/B wire terminal and other terminal at EXCVA coupler: infinity



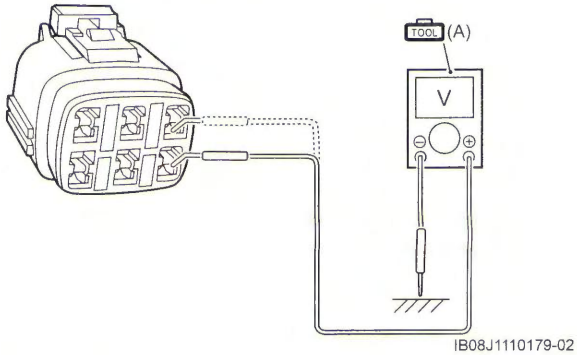
IB08J1110178-02

   - Voltage

     Special tool
     TOOL (A): 09900–25008 (Multi-circuit tester set)

     Tester knob indication
     Voltage (⎓)

     – B/R wire and R/B wire: approx. 0 V (When ignition switch is ON)



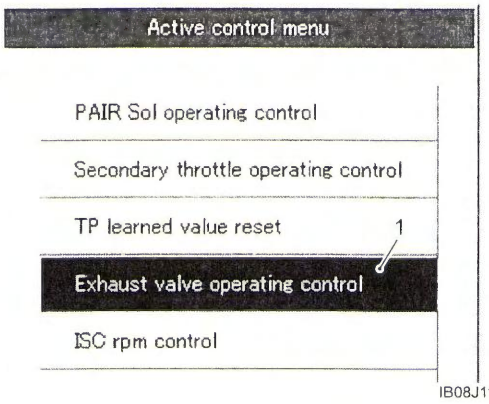
IB08J1110179-02

Is check result OK?

Yes	Replace the EXCVA. Refer to "EXCVA Removal and Installation" in Section 1K (Page 1K-8).
No	Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

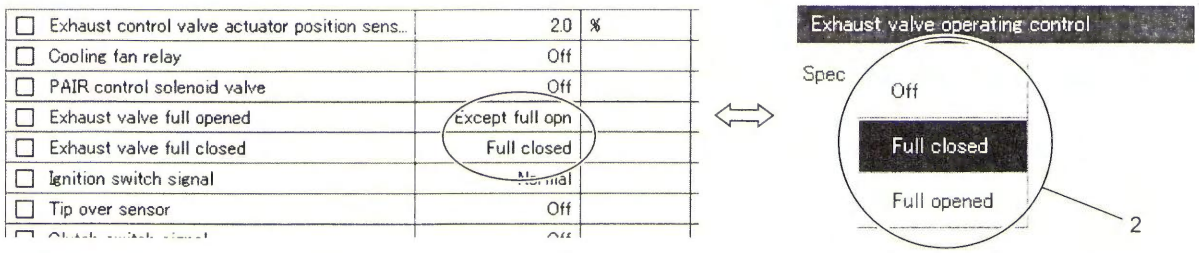
Active Control Inspection

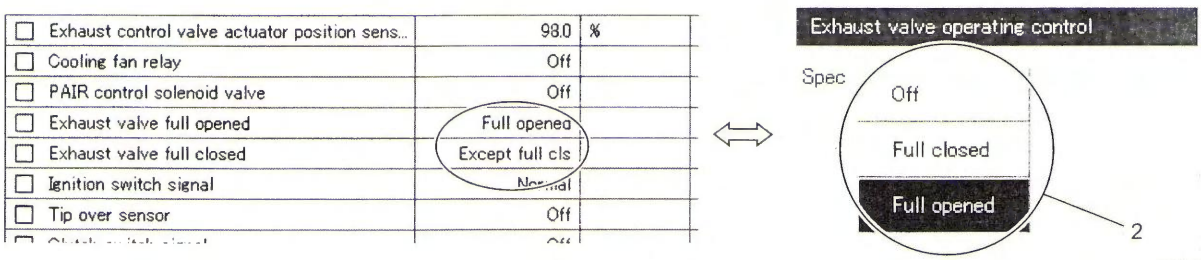
1) Set up the SDS tool. (Refer to the SDS operation manual for further details.)
2) Turn the ignition switch ON.
3) Click "Exhaust valve operating control" (1).



IB08J1110180-02

4) Click each button (2).
At this time, if an operation sound is heard from the EXCVA, the function is normal.





IB08J1110181-03

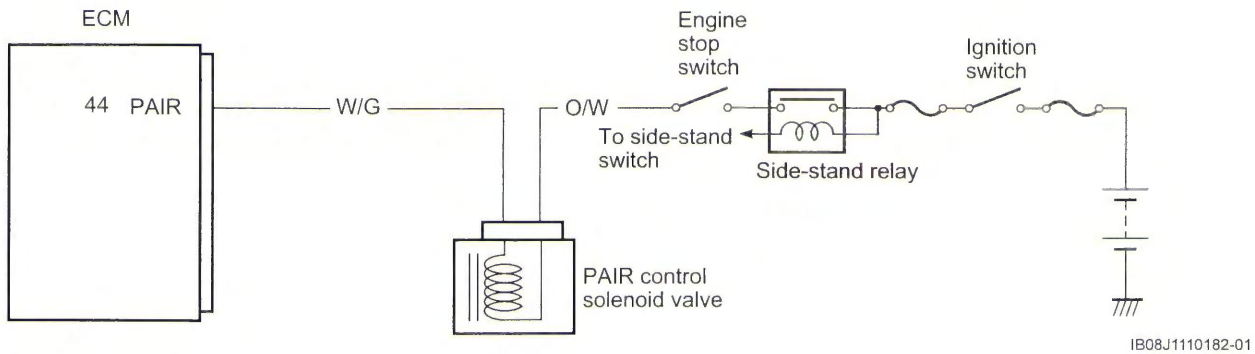
DTC "C49" (P1656): PAIR Control Solenoid Valve Circuit Malfunction

BENF08J11104029

Detected Condition and Possible Cause

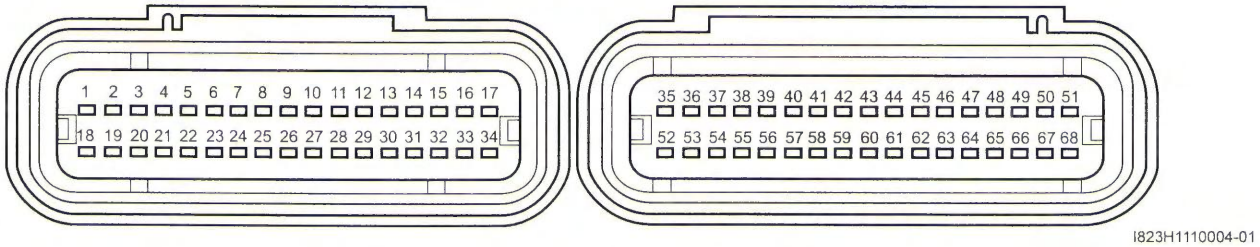
Detected Condition	Possible Cause
PAIR control solenoid valve voltage is not input to ECM.	• PAIR control solenoid valve circuit open or short. • PAIR control solenoid valve malfunction. • ECM malfunction.

Wiring Diagram



IB08J1110182-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

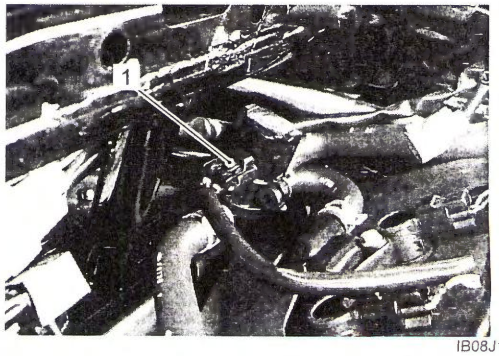
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

PAIR control solenoid valve power supply circuit check

1) Turn the ignition switch OFF.
2) Remove the air cleaner box. Refer to "Air Cleaner Box Removal and Installation" in Section 1D (Page 1D-7).
3) Disconnect the PAIR control solenoid valve coupler (1).



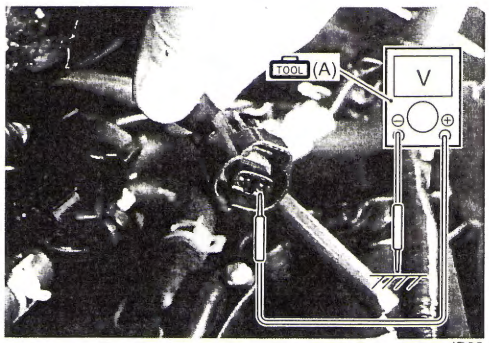
IB08J1110183-01

4) Check for proper terminal the PAIR control solenoid valve coupler.
5) If connections are OK, support the motorcycle with a jack.
6) Fold the side-stand to up position.
7) Turn the ignition switch ON.
8) Measure the voltage between O/W wire and ground.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

PAIR control solenoid valve power supply voltage
Battery voltage
((+) terminal: O/W – (–) terminal: Ground)



IB08J1110184-01

Is check result OK?

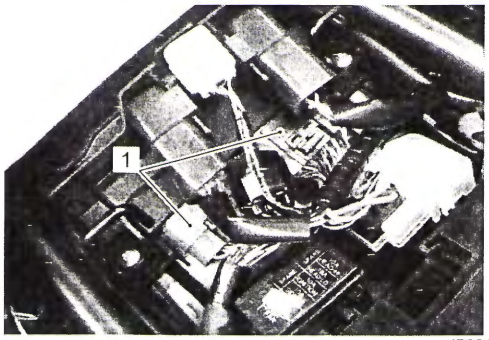
Yes Go to Step 2.

No Repair or replace the O/W wire.

Step 2

PAIR control solenoid valve drive circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



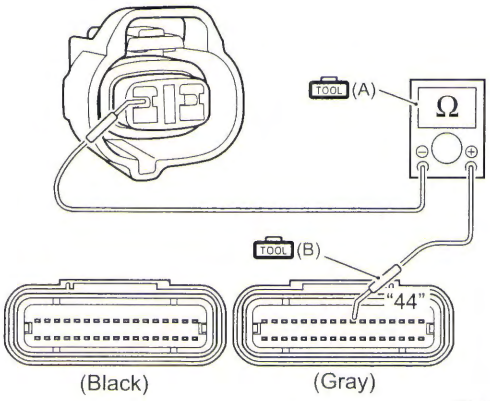
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
(A): 09900–25008 (Multi-circuit tester set)
(B): 09900–25009 (Needle-point probe set)

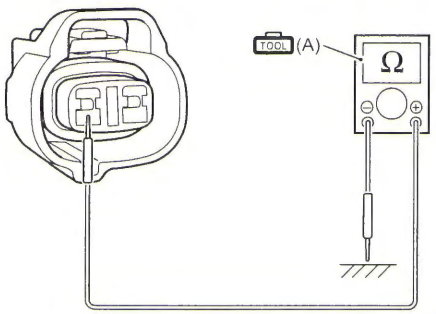
Tester knob indication
Resistance (Ω)

– W/G wire: less than 1 Ω



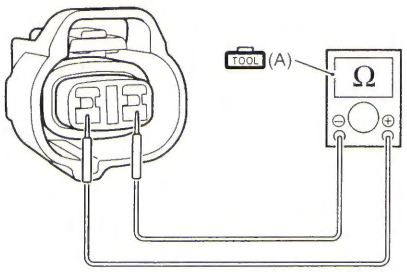
IB08J1110185-02

– Between W/G wire and ground: infinity



IB08J1110186-02

– Between W/G wire terminal and other terminal at PAIR control solenoid valve coupler: infinity



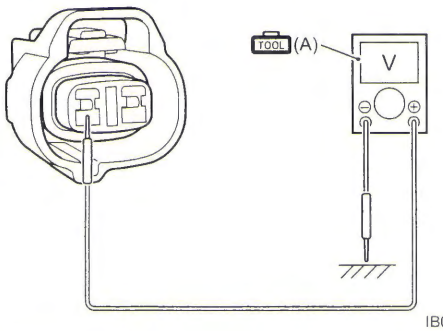
IB08J1110187-02

- Voltage

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– W/G wire: approx. 0 V (When ignition switch is ON)



IB08J1110188-02

Is check result OK?

Yes — Go to Step 3.

No — Repair or replace the defective wire harness.

Step 3

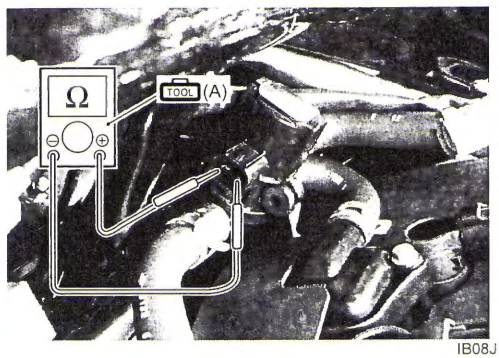
PAIR control solenoid valve check

1) Turn the ignition switch OFF.
2) Measure the PAIR control solenoid valve resistance between terminals.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Resistance (Ω)

PAIR control solenoid valve resistance
Approx. 20 – 24 Ω at 20 – 30 °C (68 – 86 °F) (Terminal – Terminal)



IB08J1110189-01

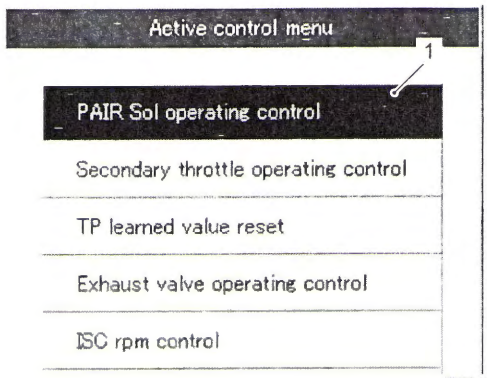
Is check result OK?

Yes — Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No — Replace the PAIR control solenoid valve with a new one. Refer to "PAIR Control Solenoid Valve Removal and Installation" in Section 1B (Page 1B-7).

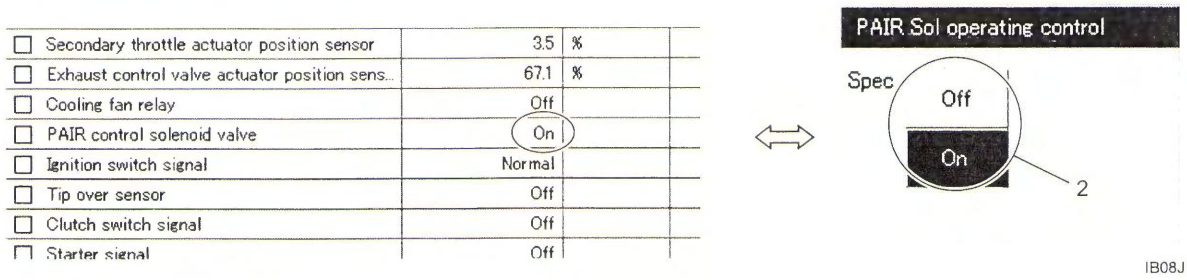
Active Control Inspection

1) Set up the SDS tool. (Refer to SDS operation manual for further details.)
2) Turn the ignition switch ON.
3) Click "PAIR Sol operating control" (1).



IB08J1110190-02

4) Click each button (2). At this time, if an operating sound is heard from the PAIR control solenoid valve, the function is normal.



IB08J1110191-02

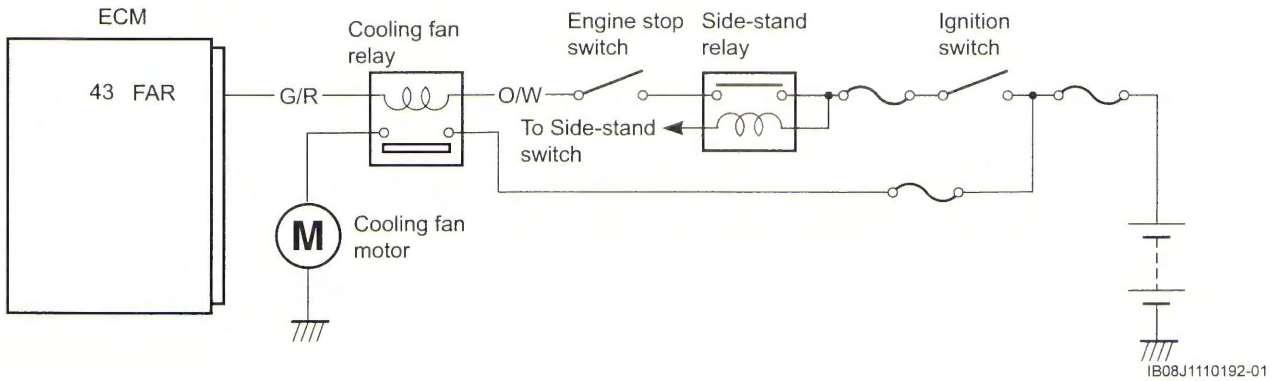
DTC "C60" (P0480): Cooling Fan Relay Circuit Malfunction

BENF08J11104030

Detected Condition and Possible Cause

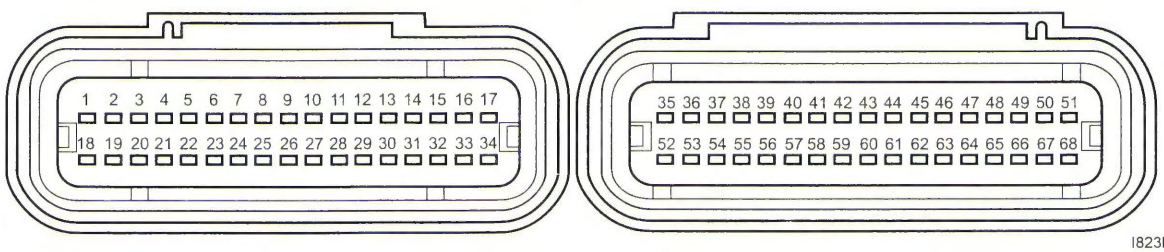
Detected Condition	Possible Cause
Cooling fan relay signal is not input to ECM.	• Cooling fan relay circuit open or short. • Cooling fan relay. • ECM malfunction.

Wiring Diagram



IB08J1110192-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

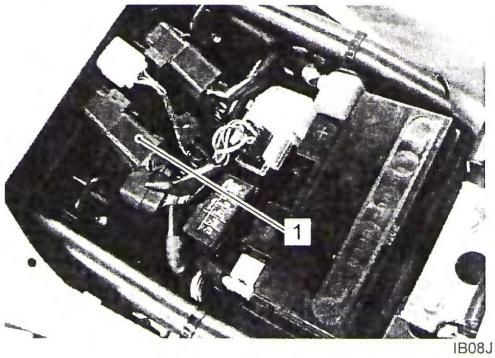
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

Cooling Fan relay power supply circuit check

1) Turn the ignition switch OFF.
2) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D (Page 9D-6).
3) Disconnect the cooling fan relay coupler (1).



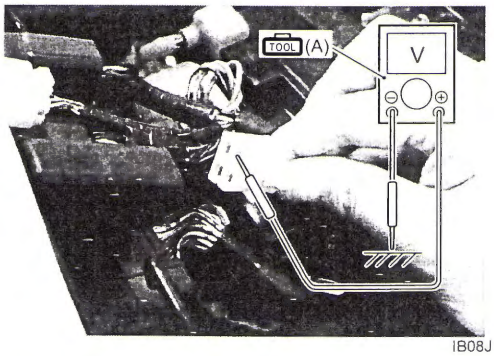
IB08J1110193-01

4) Check for proper terminal connection to the cooling fan relay coupler.
5) If connections are OK, support the motorcycle with a jack.
6) Fold the side-stand to up position.
7) Turn the ignition switch ON.
8) Measure the voltage between O/W wire and ground.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

Cooling fan relay power supply voltage
Battery voltage
((+) terminal: O/W – (–) terminal: Ground)



IB08J1110194-02

Is check result OK?

Yes — Go to Step 2.

No — Repair or replace the defective wire harness.

Step 2

Cooling Fan relay check

Check the cooling fan relay. Refer to "Cooling Fan Relay Inspection" in Section 1F (Page 1F-11).

Is check result OK?

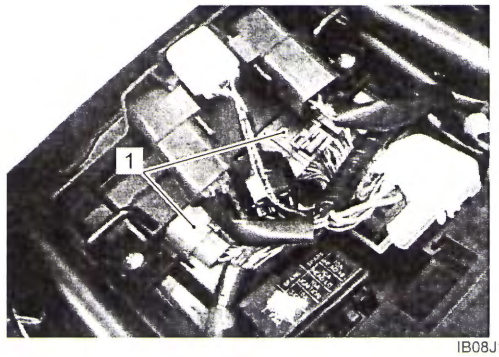
Yes — Go to Step 3.

No — Replace the cooling fan relay.

Step 3

Cooling Fan relay drive circuit check

1) Turn the ignition switch OFF.
2) Disconnect the ECM couplers (1).



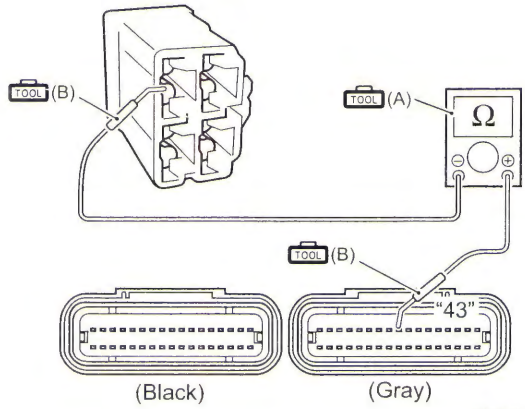
IB08J1110039-02

3) Check for proper terminal connection to the ECM couplers.
4) If connections are OK, check the following points.
   - Resistance

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)
TOOL (B): 09900–25009 (Needle-point probe set)

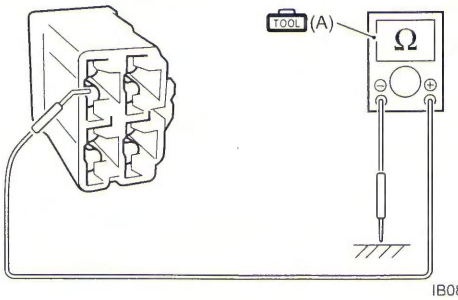
Tester knob indication
Resistance (Ω)

– G/R wire: less than 1 Ω



IB08J1110195-02

– Between G/R wire and ground: infinity



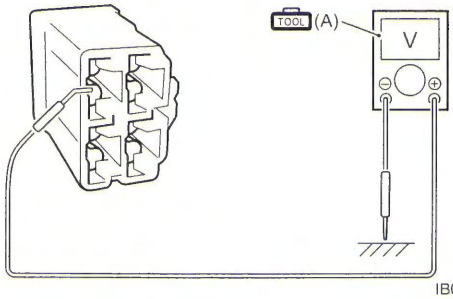
IB08J1110196-02

- Voltage

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

– G/R wire: approx. 0 V (When ignition switch is ON)



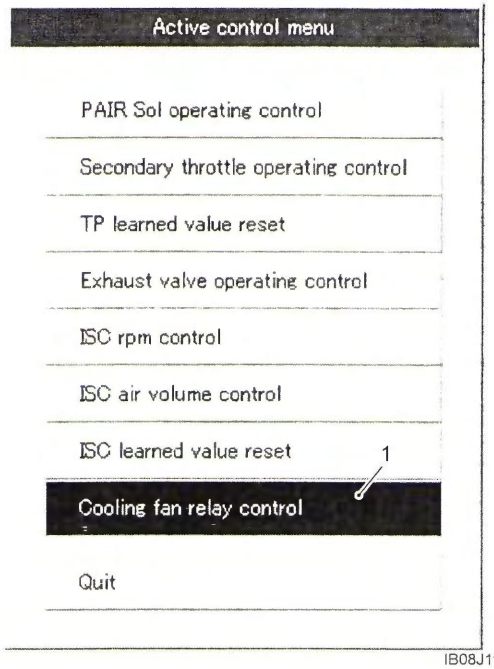
IB08J1110197-02

Is check result OK?

Yes	Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).
No	Repair or replace the G/R wire.

Active Control Inspection

1) Set up the SDS tool. (Refer to SDS operation manual for further details.)
2) Start the engine and run it in idling condition.
3) Click "Cooling fan relay control" (1).

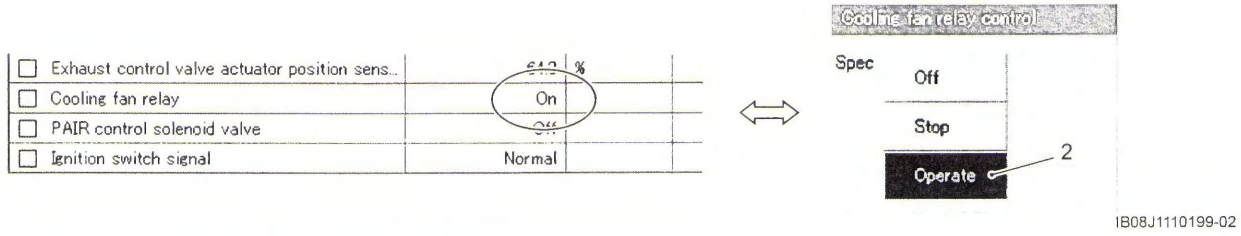


IB08J1110198-02

4) Click the "Operate" (2).
At this time, if an operation sound is heard from the cooling fan relay and cooling fan motors are operated, the function is normal.

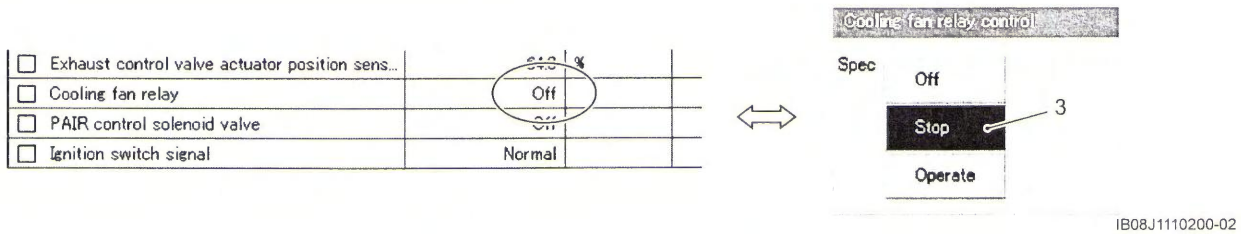
NOTE

The cooling fan relay and cooling fan motor inspection is operational at any engine coolant temperature until reaching 100 °C (212 °F).



IB08J1110199-02

5) Click the "Stop" (3) to check the operation properly.

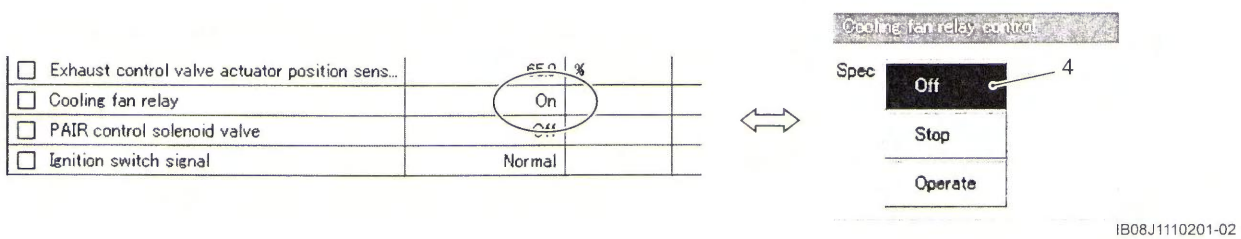


IB08J1110200-02

6) Click the "Off" (4) to check the cooling fan relay and cooling fan motor operation.

NOTE

- **This inspection should be begun from when the engine coolant temperature is below 50 °C (122 °F). Check that the cooling fan relay operates for a few seconds as the engine coolant temperature reaches each temp. of 50 °C (122 °F), 70 °C (158 °F) and 90 °C (194 °F)/above 4 000 r/min. It is cooling fan motor malfunction or its circuit failure when the motor would not run even if the relay turns ON.**
- **There is a tolerance of operating temperature of cooling fan relay.**



IB08J1110201-02

DTC "C65" (P0506 / P0507): Idle Speed Malfunction

BENF08J11104031

Detected Condition and Possible Cause

Detected Condition		Possible Cause
C65	Idle speed rose higher than or dropped lower than desired idle speed by more than specified range.	• Air passage clogged. • ISC valve is fixed. • Idle speed malfunction. • Air leakage.
P0506	Idle speed dropped lower than desired idle speed by more than specified range.	
P0507	Idle speed rose higher than desired idle speed by more than specified range.	

Troubleshooting

NOTICE

- **Be careful not to disconnect the ISC valve coupler at least 5 seconds after ignition switch is turned to OFF.**
  If the ECM coupler is disconnected within 5 seconds after ignition switch is turned to OFF, there is a possibility of an unusual value being written in the ECM and causing an error of ISC valve operation.
- **When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.**

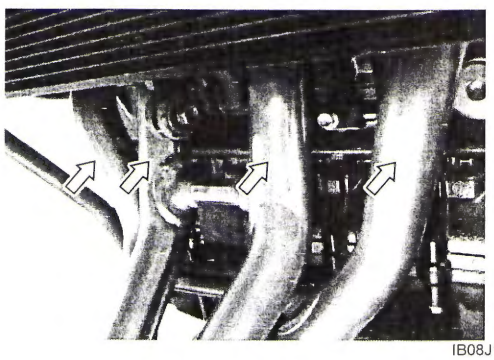
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

Engine combustion check

1) Run the engine at idle speed.
2) By spraying water to exhaust pipes from #1 to #4, check evaporation from each of them to make sure for equal combustion among cylinders.



IB08J1110222-01

Is check result OK?

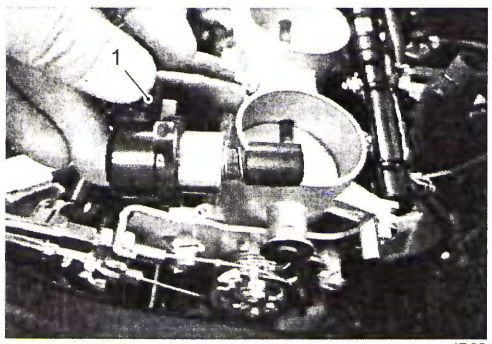
Yes — Go to Step 2.

No — Repair or replace defective parts.

Step 2

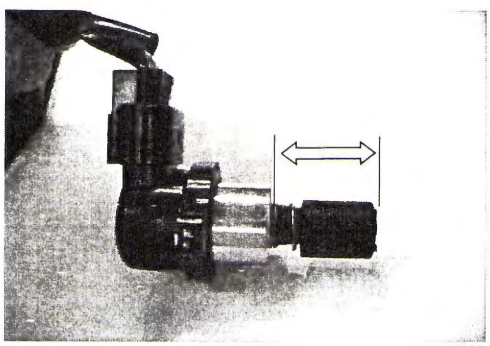
ISC valve initial check

1) Turn the ignition switch OFF.
2) Remove the ISC valve. Refer to "ISC Valve Removal and Installation" in Section 1C (Page 1C-8).
3) Connect the ISC valve coupler (1).



IB08J1110223-01

4) Turn the ignition switch ON and then OFF again.
5) While performing above step 4), check that the ISC valve moves from fully open position to fully closed position.



IB08J1110224-01

6) Execute ISC Valve Preset and Opening Initialization. Refer to "ISC Valve Preset and Opening Initialization" in Section 1C (Page 1C-9).

Is check result OK?

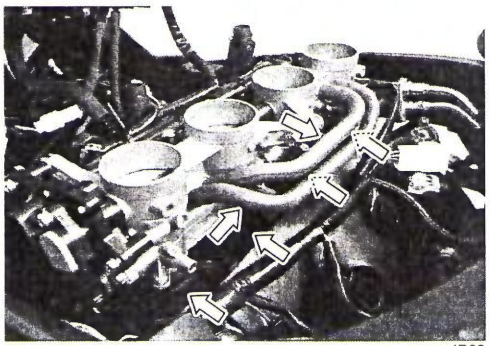
Yes — Go to Step 3.

No — Replace the ISC valve with a new one. Refer to "ISC Valve Removal and Installation" in Section 1C (Page 1C-8).

Step 3

Air intake system check

1) Check air intake system for clogging and leakage.



IB08J1110225-01

Is check result OK?

Yes Go to Step 4.

No Repair or replace defective parts.

Step 4

Engine mechanical systems check

1) Check the following points related to engine mechanical system.
   - Engine compression. Refer to "Compression Pressure Check" in Section 1D (Page 1D-3).
   - Fuel pressure. Refer to "Fuel Pressure Inspection" in Section 1G (Page 1G-5).

Is check result OK?

Yes Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No Repair or replace defective parts.

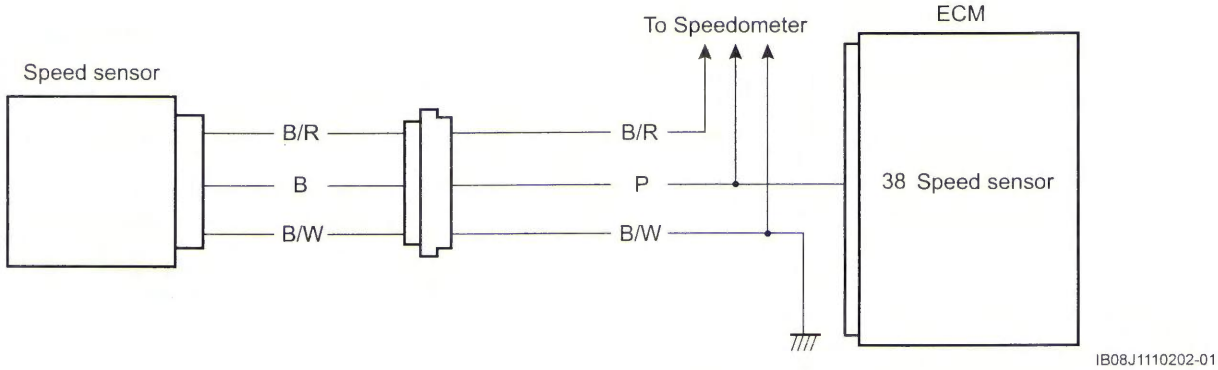
DTC "C91" (P0500): Vehicle Speed Sensor Circuit Malfunction

BENF08J11104032

Detected Condition and Possible Cause

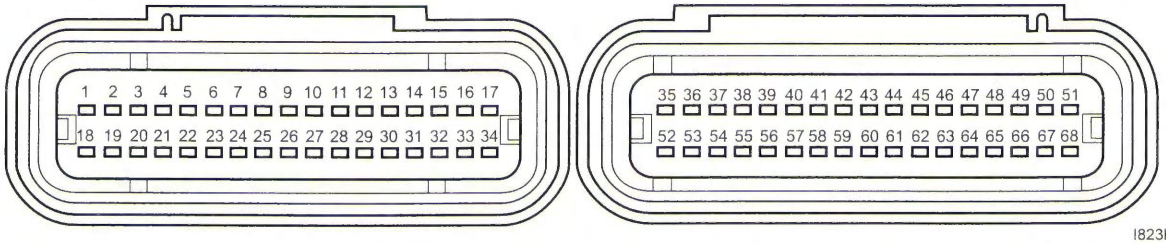
Detected Condition	Possible Cause
Speedometer does not receive signal from the vehicle speed sensor for more than 6 sec. when the motorcycle is running. ECM does not receive signal from the vehicle speed sensor for more than 6 sec. when the motorcycle is running. Failure in communication between ECM and speedometer with reference to vehicle speed.	• Speed sensor circuit open or short. • Speed sensor malfunction. • Speedometer malfunction. • ECM malfunction.

Wiring Diagram



IB08J1110202-01

ECM coupler (Harness side)



I823H1110004-01

Troubleshooting

NOTICE

When using the multi-circuit tester, do not strongly touch the terminal of the ECM coupler with a needle pointed tester probe to prevent terminal damage.

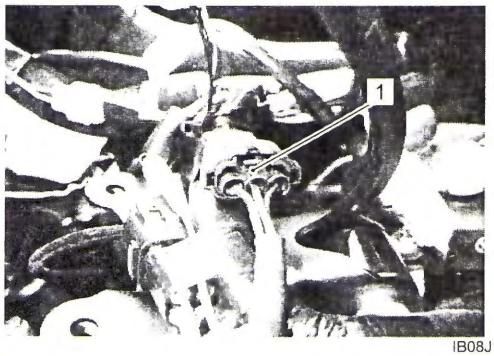
NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "Use of SDS Diagnosis Reset Procedures" (Page 1A-14).

Step 1

Speed sensor power supply circuit check

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-9).
3) Disconnect the speed sensor coupler (1).



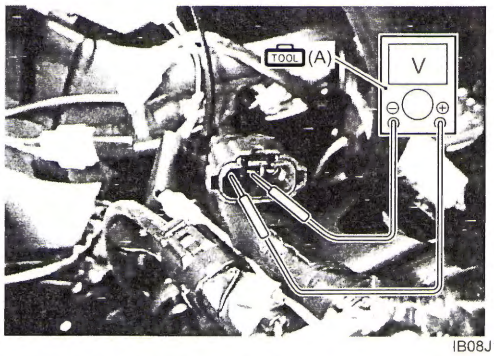
IB08J1110203-02

4) Check for proper terminal connection to the speed sensor coupler.
5) If connections are OK, turn the ignition switch ON.
6) Measure the voltage between B/R and B/W.

Special tool
TOOL : 09900–25008 (Multi-circuit tester set)

Tester knob indication
Voltage (⎓)

Speed sensor power supply voltage
Battery voltage
((+) terminal: B/R – (–) terminal: B/W)



IB08J1110204-02

Is check result OK?

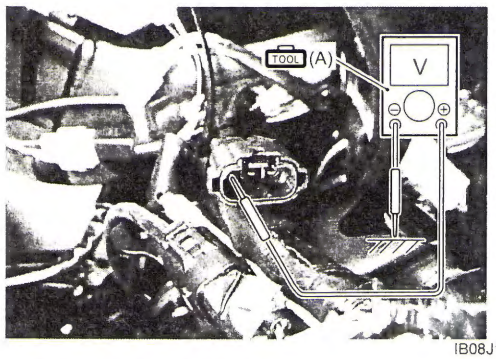
Yes Go to Step 3.

No Go to Step 2.

Step 2

Speed sensor ground circuit check

1) Measure the voltage between B/R and ground.



IB08J1110205-02

Is check result OK?

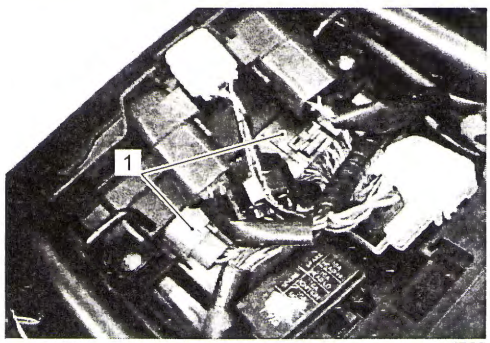
Yes Repair or replace the B/W wire.

No Repair or replace the B/R wire.

Step 3

Speed sensor signal circuit check

1) Turn the ignition switch OFF.
2) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D (Page 9D-6).
3) Disconnect the ECM couplers (1).



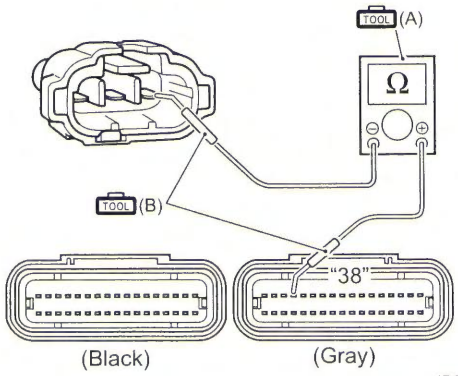
IB08J1110039-02

4) Check for proper terminal connection to the ECM couplers.
5) If connections are OK, check the following points.
   - Resistance

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)
     (B): 09900–25009 (Needle-point probe set)

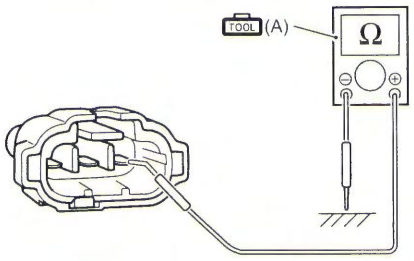
     Tester knob indication
     Resistance (Ω)

     – P wire: less than 1 Ω



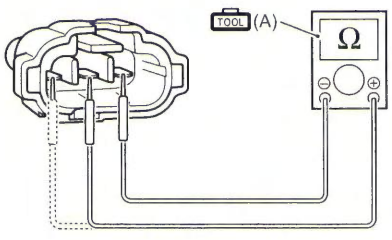
IB08J1110206-03

     – Between P wire and ground: infinity



IB08J1110207-02

     – Between P wire terminal and other terminal at vehicle speed sensor connector: infinity



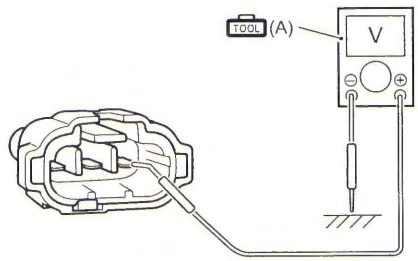
IB08J1110208-02

   - Voltage

     Special tool
     (A): 09900–25008 (Multi-circuit tester set)

     Tester knob indication
     Voltage (⎓)

     – P wire: approx. 0 V (When ignition switch is ON)



IB08J1110209-02

Is check result OK?

Yes	Go to Step 4.
No	Repair or replace the P wire.

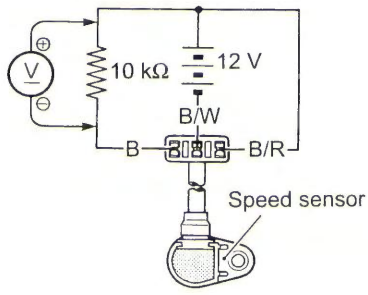
Step 4

Speed sensor check

1) Connect 12 V battery, 10 kΩ resistor and the multi-circuit tester as shown in the figure.

   Special tool
   (A): 09900–25008 (Multi-circuit tester set)

   Tester knob indication
   Voltage (⎓)

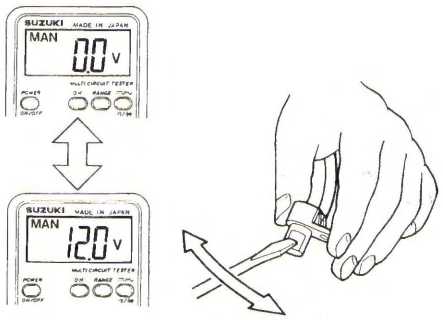


I837H1110118-01

2) Under this condition, if a suitable screwdriver touching the pick-up surface of the speed sensor is moved, the tester reading voltage changes (0 V → 12 V or 12 V → 0 V). If the tester reading voltage does not change, replace the speedometer sensor with a new one.

NOTE

While testing, the highest voltage reading should be the same as the battery voltage (12 V).



I837H1110119-01

Is check result OK?

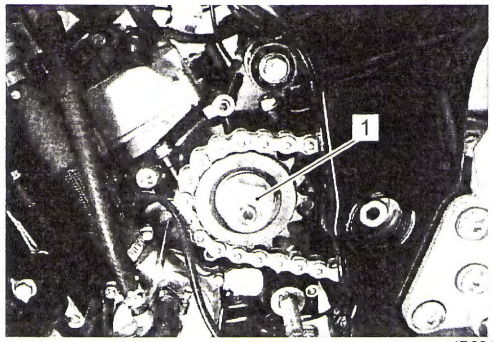
Yes Go to Step 5.

No Replace the speed sensor.

Step 5

Speed sensor rotor check

1) Remove the engine sprocket cover. Refer to "Engine Sprocket Removal and Installation" in Section 3A (Page 3A-2).
2) Check sensor rotor for crack and damage (1).



IB08J1110210-02

Is check result OK?

Yes Replace the ECM with a known good one, and inspect it again. Refer to "ECM Removal and Installation" in Section 1C (Page 1C-1).

No Replace the speed sensor rotor.

Specifications

Service Data

BENF08J11107001

Injector + Fuel Pump + Fuel Pressure Regulator

Item	Specification	Note
Injector resistance	11.5 – 12.5 Ω at 20 °C (68 °F)	

FI Sensors

Item	Standard/Specification		Note
CMP sensor resistance	0.9 k – 1.7 kΩ		
CMP sensor peak voltage	0.7 V and more		When cranking
CKP sensor resistance	142 – 194 Ω		
CKP sensor peak voltage	0.5 V and more		When cranking
IAP sensor input voltage	4.5 – 5.5 V		
IAP sensor output voltage	Approx. 2.7 V at idle speed		
TP sensor input voltage	4.5 – 5.5 V		
TP sensor output voltage	Closed	Approx. 1.1 V	
	Opened	Approx. 4.3 V	
ECT sensor input voltage	4.5 – 5.5 V		
ECT sensor output voltage	0.15 – 4.85 V		
ECT sensor resistance	Approx. 2.45 kΩ at 20 °C (68 °F)		
IAT sensor input voltage	4.5 – 5.5 V		
IAT sensor output voltage	0.15 – 4.85 V		
IAT sensor resistance	Approx. 2.58 kΩ at 20 °C (68 °F)		
AP sensor input voltage	4.5 – 5.5 V		
AP sensor output voltage	Approx. 3.6 V at 100 kPa (760 mmHg)		
TO sensor resistance	16.5 k – 22.3 kΩ		
TO sensor voltage	Normal	0.4 – 1.4 V	
	Leaning	3.7 – 4.4 V	When leaning 65°
GP switch voltage	0.6 V and more		From 1st to Top
Injector voltage	Battery voltage		
Ignition coil primary peak voltage	80 V and more		When cranking
HO2 sensor output voltage	0.4 V and less at idle speed		
	0.6 V and more at 5 000 r/min		
HO2 sensor heater resistance	6.7 – 9.5 Ω at 23 °C (73 °F)		
PAIR control solenoid valve resistance	20 – 24 Ω at 20 – 30 °C (68 – 86 °F)		
STP sensor input voltage	4.5 – 5.5 V		
STP sensor output voltage	Closed	Approx. 0.6 V	
	Opened	Approx. 3.9 V	
STVA resistance	Approx. 7.8 Ω		
EXCVA position sensor input voltage	4.5 – 5.5 V		
EXCVA position sensor output voltage	Closed	0.45 – 1.4 V	
	Opened	3.6 – 4.55 V	
EXCVA position sensor resistance	Approx. 3.1 kΩ		At adjustment position
ISC valve resistance	Approx. 20 Ω at 20 °C (68 °F)		

Special Tools and Equipment

Special Tool

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