

Component Inspection144

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Alphabetical & P No. Index for DTC ALPHABETICAL INDEX FOR DTC

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^{• *1:} These numbers are prescribed by SAE J2012.

- *2: When the fail-safe operation occurs, the MIL illuminates.
- *3: The MIL illuminates when both the "Revolution sensor signal" and the "Vehicle speed sensor signal" meet the fail-safe condition at the same time.

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^{• *1:} These numbers are prescribed by SAE J2012.

^{• *2:} When the fail-safe operation occurs, the MIL illuminates.

^{• *3:} The MIL illuminates when both the "Revolution sensor signal" and the "Vehicle speed sensor signal" meet the fail-safe condition at the same time.

[RE4F03B]

PRECAUTIONS PFP:00001

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

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

WARNING:

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

Precautions for On Board Diagnostic (OBD) System of A/T and Engine

CS005VW

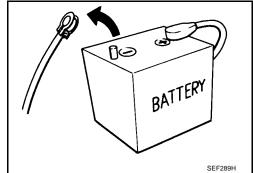
The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

CAUTION:

- Be sure to turn the ignition switch "OFF" and disconnect the negative battery terminal before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to light up.
- Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will
 cause the MIL to light up due to an open circuit. (Be sure the connector is free from water, grease,
 dirt, bent terminals, etc.)
- Be sure to route and secure the harnesses properly after work. Interference of the harness with a bracket, etc. may cause the MIL to light up due to a short circuit.
- Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube
 may cause the MIL to light up due to a malfunction of the EGR system or fuel injection system, etc.
- Be sure to erase the unnecessary malfunction information (repairs completed) from the TCM and ECM before returning the vehicle to the customer.

Precautions

 Before connecting or disconnecting the TCM harness connector, turn ignition switch OFF and disconnect negative battery terminal. Failure to do so may damage the TCM. Because battery voltage is applied to TCM even if ignition switch is turned off.



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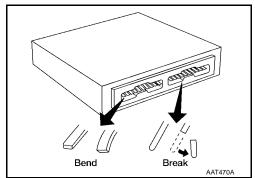
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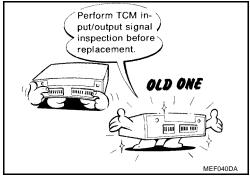
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 When connecting or disconnecting pin connectors into or from TCM, take care not to damage pin terminals (bend or break).

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

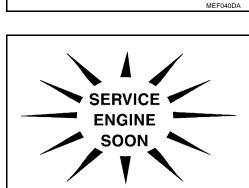


 Before replacing TCM, perform TCM input/output signal inspection and make sure whether TCM functions properly or not. See page <u>AT-109</u>.



- After performing each TROUBLE DIAGNOSIS, perform "DTC (Diagnostic Trouble Code) CONFIRMATION PROCE-DURE".
 - The DTC should not be displayed in the "DTC CONFIRMATION PROCEDURE" if the repair is completed.
- Before proceeding with disassembly, thoroughly clean the outside of the transaxle. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Disassembly should be done in a clean work area.
- Use lint-free cloth or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transaxle.
- Place disassembled parts in order for easier and proper assembly.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the transaxle is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced.
 Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Do not use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- Replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer. Refer to <u>AT-11</u>, "ATF COOLER SERVICE".
- After overhaul, refill the transaxle with new ATF.
- When the A/T drain plug is removed, only some of the fluid is drained. Old A/T fluid will remain in torque converter and ATF cooling system.
 Always follow the procedures under "Changing A/T Fluid" in the MA section when changing A/T fluid.

Refer to MA-31, "Changing A/T Fluid" .



SAT9641

PRECAUTIONS

[RE4F03B]

Service Notice or Precautions **FAIL-SAFE**

The TCM has an electronic Fail-Safe (limp home mode). This allows the vehicle to be driven even if a major electrical input/output device circuit is damaged.

Under Fail-Safe, the vehicle always runs in third gear, even with a shift lever position of "1", "2" or "D". The customer may complain of sluggish or poor acceleration.

When the ignition key is turned "ON" following Fail-Safe operation, O/D OFF indicator lamp blinks for about 8 seconds. [For "TCM Self-diagnostic Procedure (No Tools)", refer to AT-51, "TCM Self-diagnostic Procedure (No Tools)" .]

The blinking of the O/D OFF indicator lamp for about 8 seconds will appear only once and be cleared. The customer may resume normal driving conditions.

Always follow the "Work Flow". Refer to AT-60, "Work Flow".

The SELF-DIAGNOSIS results will be as follows:

- The first SELF-DIAGNOSIS will indicate damage to the vehicle speed sensor or the revolution sensor.
- During the next SELF-DIAGNOSIS, performed after checking the sensor, no damages will be indicated.

TORQUE CONVERTER SERVICE

The torque converter should be replaced under any of the following conditions:

- External leaks in the hub weld area.
- Converter hub is scored or damaged.
- Converter pilot is broken, damaged or fits poorly into crankshaft.
- Steel particles are found after flushing the cooler and cooler lines.
- Pump is damaged or steel particles are found in the converter.
- Vehicle has TCC shudder and/or no TCC apply. Replace only after all hydraulic and electrical diagnoses have been made. (Converter clutch material may be glazed.)
- Converter is contaminated with engine coolant containing antifreeze.
- Internal failure of stator roller clutch.
- Heavy clutch debris due to overheating (blue converter).
- Steel particles or clutch lining material found in fluid filter or on magnet when no internal parts in unit are worn or damaged — indicates that lining material came from converter.

The torque converter should not be replaced if:

- The fluid has an odor, is discolored, and there is no evidence of metal or clutch facing particles.
- The threads in one or more of the converter bolt holes are damaged.
- Transaxle failure did not display evidence of damaged or worn internal parts, steel particles or clutch plate lining material in unit and inside the fluid filter.
- Vehicle has been exposed to high mileage (only). The exception may be where the torque converter clutch dampener plate lining has seen excess wear by vehicles operated in heavy and/or constant traffic, such as taxi, delivery or police use.

ATF COOLER SERVICE

Replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer.

Replace radiator lower tank (which includes ATF cooler) with a new one and flush cooler line using cleaning solvent and compressed air.

Refer to CO-14, "RADIATOR".

OBD-II SELF-DIAGNOSIS

- A/T self-diagnosis is performed by the TCM in combination with the ECM. The results can be read through the blinking pattern of the O/D OFF indicator or the malfunction indicator lamp (MIL). Refer to the table on AT-54, "Judgement of Self-diagnosis Code" for the indicator used to display each self-diagnostic result.
- The self-diagnostic results indicated by the MIL are automatically stored in the ECM and TCM memories. Always perform the procedure "HOW TO ERASE DTC" on page AT-40 to complete the repair and avoid unnecessary blinking of the MIL.
- The following self-diagnostic items can be detected using ECM self-diagnostic results mode* only when the O/D OFF indicator lamp does not indicate any malfunctions.
- PNP switch

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^{*:} For details of OBD-II, refer to EC-51, "ON BOARD DIAGNOSTIC (OBD) SYSTEM".

PRECAUTIONS

[RE4F03B]

Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector.
 For description and how to disconnect, refer to <u>PG-48, "HARNESS CONNECTOR (SLIDE-LOCKING TYPE)"</u>.

Wiring Diagrams and Trouble Diagnosis

ECS005VZ

When you read wiring diagrams, refer to the following:

- GI-13, "How to Read Wiring Diagrams".
- PG-3, "POWER SUPPLY ROUTING".

When you perform trouble diagnosis, refer to the following:

- GI-10, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES".
- GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

PREPARATION

[RE4F03B]

		[KE4FU3D]	
PREPARATION		PFP:00002	
Special Service Tools		EC\$005W0	Α
-	may differ from those of special service tools	illustrated here.	
Tool number (Kent-Moore No.) Tool name		Description	В
(J-34301-C) Oil pressure gauge set 1 (J-34301-1) Oil pressure gauge		Measuring line pressure	AT
2 (J-34301-2) Hoses 3 (J-34298) Adapter 4 (J-34282)	2 (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c		D
4 (J-34262) Adapter 5 (790-301-1230-A) 60° Adapter 6 (J-34301-15)			E
Square socket			Г
KV31103000 (J-38982) Drift	a b	Installing differential oil seal (Use with ST35325000.) a: 59 mm (2.32 in) dia. b: 49 mm (1.93 in) dia.	G
			Н
	NT105		
ST35325000 (—) Drift	a	Installing differential oil seal (Use with KV31103000.) a: 215 mm (8.46 in) b: 25 mm (0.98 in) dia. c: M12 x 1.5P	J
	\\ NT417		
KV38107700 (J-39027)		Measuring turning torque of final drive as- sembly	K
Preload adapter		 Measuring clearance between side gear and differential case with washer 	L
		 Selecting differential side bearing adjusting shim 	
	NT087		M
KV31103200 (J-34285-A and J-34285-87) Clutch spring compressor	a a a distribution of the state	Removing and installing clutch return spring a: 320 mm (12.60 in) b: 174 mm (6.85 in)	

		[RE4F03B]
Tool number (Kent-Moore No.) Tool name		Description
ST23540000 (J-25689-A) Pin punch	a b NT442	Removing and installing parking rod plate, manual plate and differential pinion mate shaft retaining pins a: 2.3 mm (0.091 in) dia. b: 4 mm (0.16 in) dia.
KV32101000 (J-25689-A) Pin punch	a	Installing throttle lever and manual shaft retaining pins a: 4 mm (0.16 in) dia.
ST25710000 (—) Pin punch	NT410	Aligning groove of manual shaft and hole of transmission case a: 2 mm (0.08 in) dia.
ST3306S001 (J-22888-D) Differential side bearing puller set 1 ST33051001 (J-22888-D) Puller 2 ST33061000 (J-8107-2) Adapter	NT410 C D D NT745	Removing differential side bearing inner race a: 39 mm (1.54 in) dia. b: 29.5 mm (1.161 in) dia. c: 130 mm (5.12 in) d: 135 mm (5.31 in) e: 120 mm (4.72 in)
KV381054S0 (J-34286) Puller	a NT414	 Removing idler gear bearing outer race Removing differential side oil seals Removing differential side bearing outer race Removing needle bearing from bearing retainer a: 250 mm (9.84 in) b: 160 mm (6.30 in)
ST27180001 (J-25726-B) Puller	b NT424	• Removing idler gear a: 100 mm (3.94 in) b: 110 mm (4.33 in) c: M8 x 1.25P
ST30031000 (J-22912-O1) Puller	a b b NT411	Removing reduction gear bearing inner race a: 90 mm (3.54 in) dia. b: 50 mm (1.97 in) dia.

PREPARATION

[RE4F03B]

		[RE4F03B]
Tool number (Kent-Moore No.) Tool name		Description
ST35272000 (J-26092) Drift	a b	 Installing reduction gear bearing inner race Installing idler gear bearing inner race a: 72 mm (2.83 in) dia. b: 35.5 mm (1.398 in) dia.
ST37830000 (—) Drift	NT426	Installing idler gear bearing outer race a: 62 mm (2.44 in) dia. b: 39 mm (1.54 in) dia.
ST35321000 (—) Drift	NT427	Installing output shaft bearing a: 49 mm (1.93 in) dia. b: 41 mm (1.61 in) dia.
ST30633000 (—) Drift	NT073	Installing differential side bearing outer race a: 67 mm (2.64 in) dia. b: 49 mm (1.93 in) dia.
ST35271000 (J-26091) Drift	NT073	 Installing idler gear a: 72 mm (2.83 in) dia. b: 63 mm (2.48 in) dia.
ST33400001 (J-26082) Drift	NT115	 Installing oil pump housing oil seal a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.
KV38105710 (—)	NT115	Measuring clearance between side gear and differential case
	NT087	

Commercial Service Tools

ECS005W1

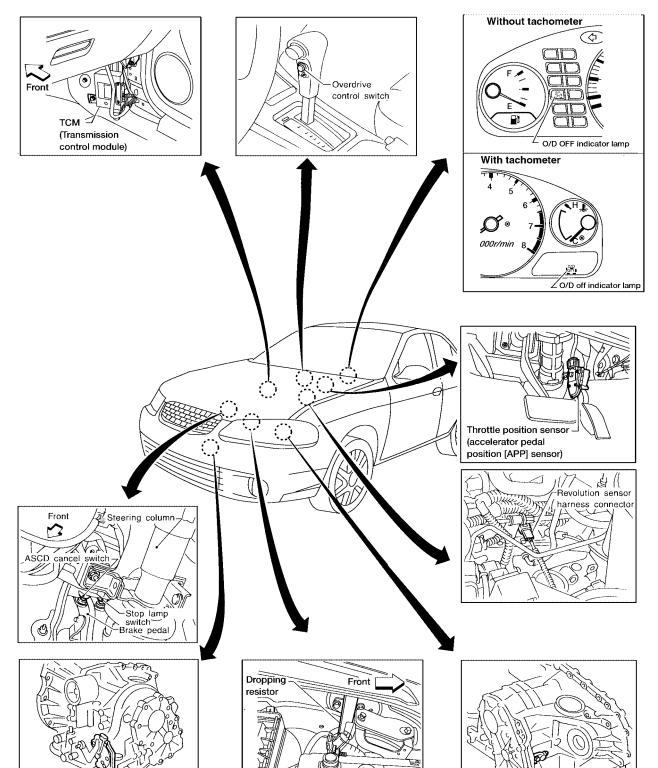
Tool name		Description
Puller		Removing idler gear bearing inner race Removing and installing band servo pistor snap ring
Drift	a NT077	Removing idler gear bearing inner race a: 34 mm (1.34 in) dia.
Drift	NT109	Installing differential left side bearing a: 86 mm (3.39 in) dia. b: 80 mm (3.15 in) dia.
Drift	NT115	Installing differential right side bearing a: 46 mm (1.81 in) dia. b: 40 mm (1.57 in) dia.
	a b NT115	a: 46 mm (1.81 in) dia. b: 40 mm (1.57 in) dia.

OVERALL SYSTEM A/T Electrical Parts Location

PNP switch

PFP:00000

ECS005W2



WCIA0162E

Revolution sensor

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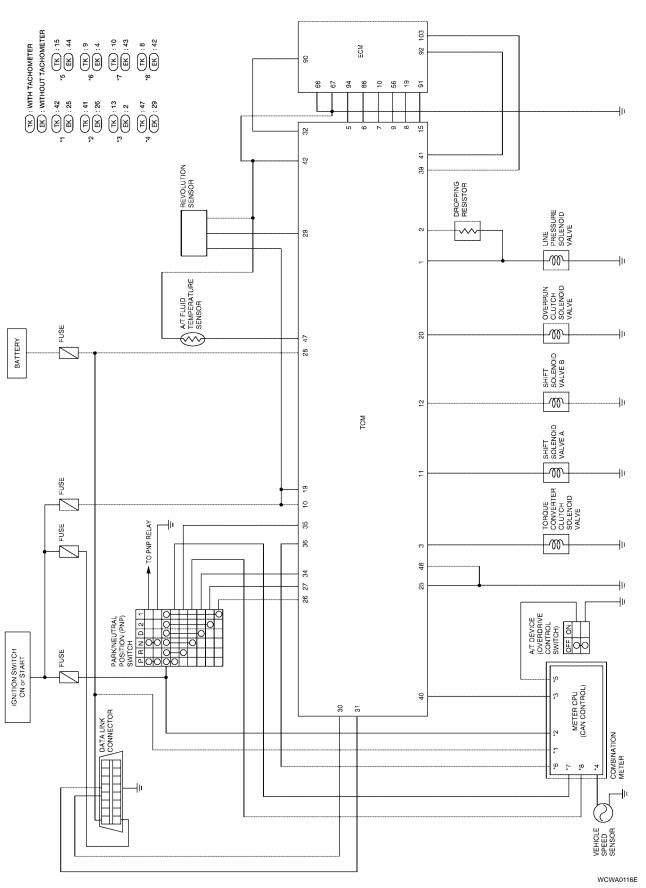
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Circuit Diagram



OVERALL SYSTEM

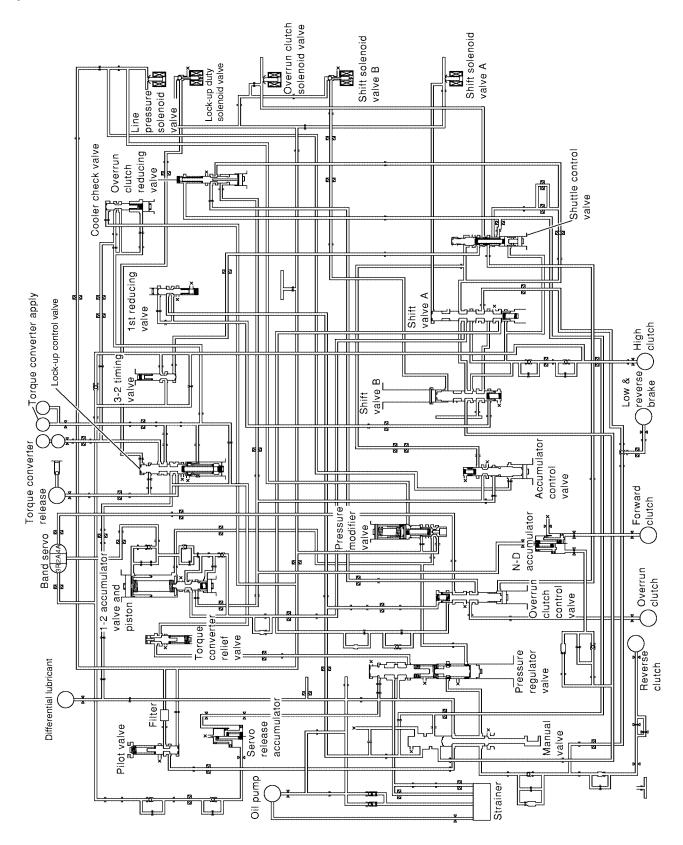
[RE4F03B]

Cross-sectional View Α В AT Band servo piston Reverse clutch drum Front planetary gear High clutch D Reverse clutch Low one-way clutch Oil pump Rear planetary gear Brake band Е Forward clutch Converter housing Overrun clutch Low & reverse brake Output gear Torque converter clutch piston Torque converter Н Side cover Input shaft Idler gear M Forward one-way clutch Reduction pinion gear Final gear Transmission cases Differential case

SAT842J

Hydraulic Control Circuit

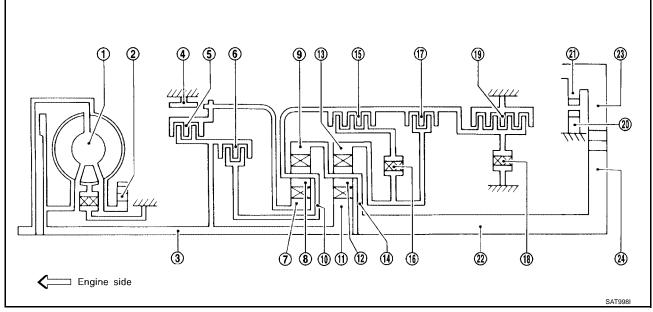
ECS005W5



WAT408

Shift Mechanism CONSTRUCTION





					C/13301
1.	Torque converter	2.	Oil pump	3.	Input shaft
4.	Brake band	5.	Reverse clutch	6.	High clutch
7.	Front sun gear	8.	Front pinion gear	9.	Front internal gear
10	Front planetary carrier	11	Rear sun gear	12	Rear pinion gear
13	Rear internal gear	14	Rear planetary carrier	15	Forward clutch
16	Forward one-way clutch	17	Overrun clutch	18	Low one-way clutch
19	Low & reverse brake	20	Parking pawl	21	Parking gear
22	Output shaft	23	Idle gear	24	Output gear

FUNCTION OF CLUTCH AND BRAKE

Clutch and brake components	Abbr.	Function
5 Reverse clutch	R/C	To transmit input power to front sun gear 7.
6 High clutch	H/C	To transmit input power to front planetary carrier 10.
15 Forward clutch	F/C	To connect front planetary carrier 10 with forward one-way clutch 16.
17 Overrun clutch	O/C	To connect front planetary carrier 10 with rear internal gear 13.
4 Brake band	B/B	To lock front sun gear 7.
16 Forward one-way clutch	F/O.C	When forward clutch 15 is engaged, to stop rear internal gear 13 from rotating in opposite direction against engine revolution.
18 Low one-way clutch	L/O.C	To stop front planetary carrier 10 from rotating in opposite direction against engine revolution.
19 Low & reverse brake	L & R/B	To lock front planetary carrier 10 .

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CLUTCH AND BAND CHART

		1		For-	Over-		Band serve)	Forward	Low	Low &			
		sition clutch	clutch clutch	n clutch clutch	ward clutch 15	run clutch 17	2nd apply	3rd release	4th apply	one-way clutch 16	one- way clutch 18	reverse brake 19	Lock- up	Remarks
	Р												PARK POSITION	
	R	0									0		REVERSE POSITION	
	N												NEUTRAL POSITION	
	1st			0	*1 D				В	В			Automatic shift 1 ⇔ 2 ⇔ 3 ⇔ 4	
D	2nd			0	*1 A	0			В					
*4	3rd		0	0	*1 A	*2 C	С		В			*1 0		
	4th		0	С		*3 C	С	0				0		
-	1st			0	0	*2 C			В	В			Automatic shift $1 \Leftrightarrow 2 \Leftarrow 3$ Locks (held stationary) in 1st speed $1 \Leftarrow 2 \Leftarrow 3$	
2	2nd			0	0	0			В					
	3rd			0	0	*2 C			В					
	1st			0	0				В		0			
1	2nd			0	0	0			В					
	3rd			0	0	*2 C			В					

- *1: Operates when overdrive control switch is set in "OFF" position.
- *2: Oil pressure is applied to both 2nd "apply" side and 3rd "release" side of band servo piston. However, brake band does not contract because oil pressure area on the "release" side is greater than that on the "apply" side.
- *3: Oil pressure is applied to 4th "apply" side in condition *2 above, and brake band contracts.
- *4: A/T will not shift to 4th when overdrive control switch is set in "OFF" position.
- O: Operates.
- A: Operates when throttle opening is less than 3/16, activating engine brake.
- B: Operates during "progressive" acceleration.
- C: Operates but does not affect power transmission.
- D: Operates when throttle opening is less than 3/16, but does not affect engine brake.

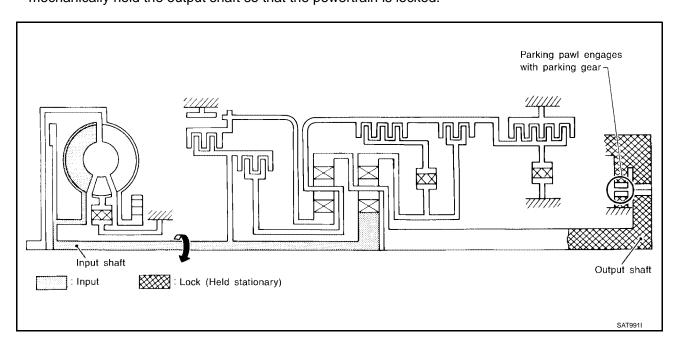
OVERALL SYSTEM

[RE4F03B]

POWER TRANSMISSION

"N" and "P" Positions

- "N" position
 - Power from the input shaft is not transmitted to the output shaft because the clutches do not operate.
- "P" position
 Similar to the "N" position, the clutches do not operate. The parking pawl engages with the parking gear to mechanically hold the output shaft so that the powertrain is locked.



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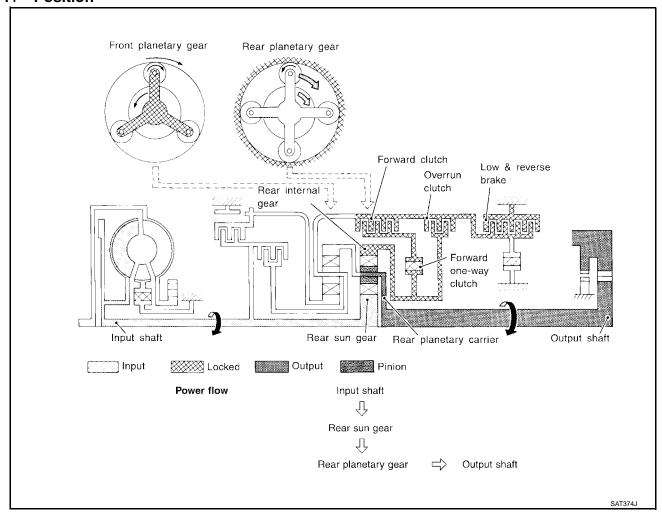
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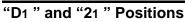
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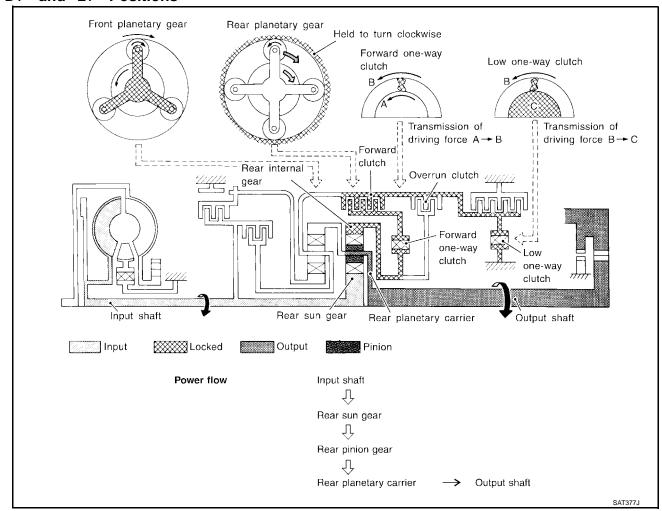
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"11" Position



 Forward clutch Forward one-way clutch Overrun clutch Low and reverse brake 	As overrun clutch engages, rear internal gear is locked by the operation of low and reverse brake. This is different from that of D1 and 21.
Engine brake	Overrun clutch always engages, therefore engine brake can be obtained when decelerating.





 Forward one-way clutch Forward clutch Low one-way clutch 	Rear internal gear is locked to rotate counterclockwise because of the functioning of these three clutches.
Overrun clutch engagement conditions (Engine brake)	D1: Overdrive control switch "OFF" and throttle opening is less than 3/16 21: Always engaged At D1 and 21 positions, engine brake is not activated due to free turning of low one-way clutch.

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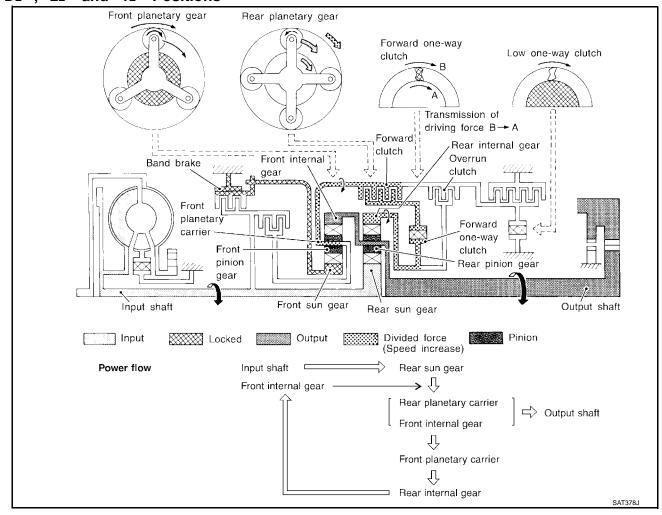
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"D2 ", "22 " and "12 " Positions



 Forward clutch 	Rear sun gear drives rear planetary carrier and combined front internal gear. Front internal gear now
Forward one-way	rotates around front sun gear accompanying front planetary carrier.
clutch	As front planetary carrier transfers the power to rear internal gear through forward clutch and forward one-
- Droke hand	way clutch, this rotation of rear internal gear increases the speed of rear planetary carrier compared with
Brake band	that of the 1st aread

that of the 1st speed.

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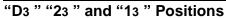
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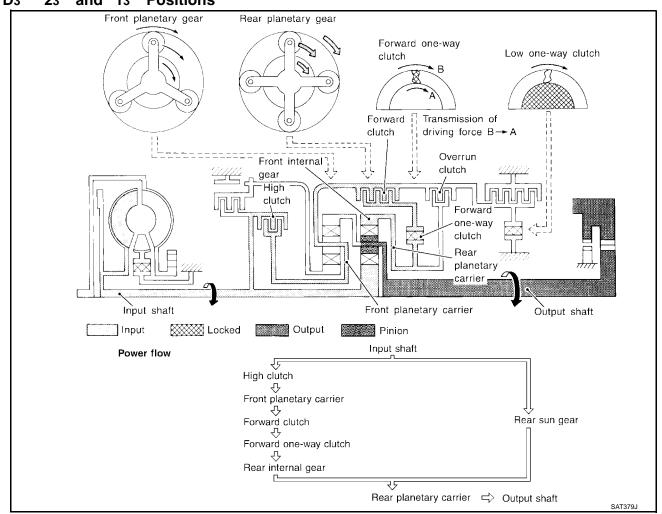
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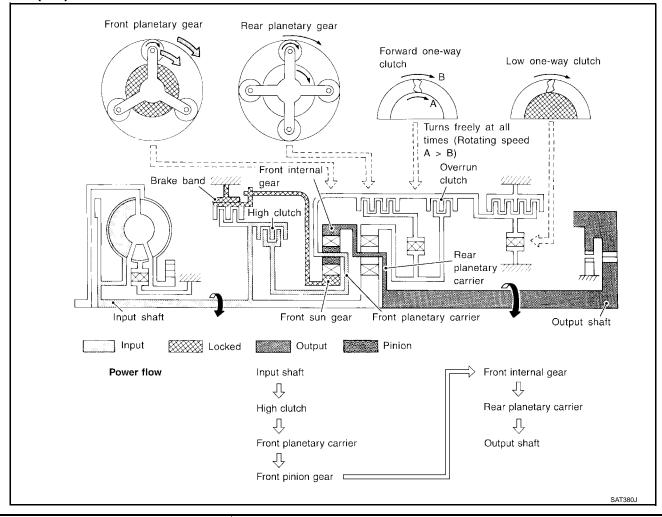


High clutchForward clutchForward one-way clutch	Input power is transmitted to front planetary carrier through high clutch. And front planetary carrier is connected to rear internal gear by operation of forward clutch and forward one-way clutch. This rear internal gear rotation and another input (the rear sun gear) accompany rear planetary carrier to turn at the same speed.
Overrun clutch engagement conditions	D3 : Overdrive control switch "OFF" and throttle opening is less than 3/16 23 and 13 : Always engaged

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"D4" (OD) Position



High clutch	Input power is transmitted to front carrier through high clutch.				
Brake band	This front carrier turns around the sun gear which is fixed by brake band and makes				
 Forward clutch (Does not affect power transmission) 	front internal gear (output) turn faster.				
Engine brake	At D4 position, there is no one-way clutch in the power transmission line and engine brake can be obtained when decelerating.				

OVERALL SYSTEM

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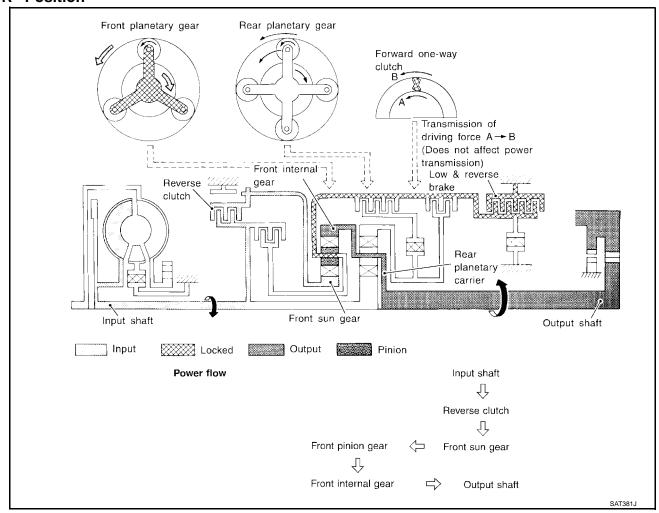
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"R" Position



Reverse clutchLow and reverse brake	Front planetary carrier is stationary because of the operation of low and reverse brake. Input power is transmitted to front sun gear through reverse clutch, which drives front internal gear in the opposite direction.		
Engine brake	As there is no one-way clutch in the power transmission line, engine brake can be obtained when decelerating.		

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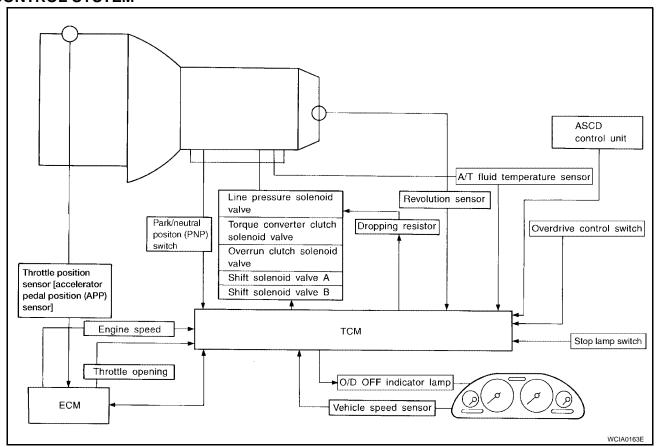
Control System OUTLINE

ECS005W7

The automatic transaxle senses vehicle operating conditions through various switches and sensors. It always controls the optimum shift position and reduces shifting and lock-up shocks.

SWITCHES & SENSORS	TCM	ACTUATORS
Park/neutral position (PNP) switch Throttle position sensor [accelerator pedal position (APP) sensor] Engine speed signal A/T fluid temperature sensor Revolution sensor Vehicle speed sensor Overdrive control switch ASCD control unit Stop lamp switch Turbine revolution sensor	Shift control Line pressure solenoid Lock-up control Overrun clutch control Timing control Fail-safe control Self-diagnosis CONSULT-II communication line control	Shift solenoid valve A Shift solenoid valve B Overrun clutch solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve O/D OFF indicator lamp

CONTROL SYSTEM



OVERALL SYSTEM

[RE4F03B]

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TCM FUNCTION

The function of the TCM is to:

- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids.

INPUT/OUTPUT SIGNAL OF TCM

	Sensors, switches and solenoid valves	Function			
	PNP switch	Detects select lever position and sends a signal to TCM.			
	Throttle position sensor [accelerator pedal position (APP) sensor]	Detects accelerator pedal position and requested throttle opening and sends a signal to TCM.			
	Engine speed signal	From ECM.			
	A/T fluid temperature sensor	Detects transmission fluid temperature and sends a signal to TCM.			
	Revolution sensor	Detects output shaft rpm and sends a signal to TCM.			
Input	Vehicle speed sensor	Used as an auxiliary vehicle speed sensor. Sends a signal when revolution sensor (installed on transmission) malfunctions.			
	Overdrive control switch	Sends a signal, which prohibits a shift to "D4" (overdrive) position, to the TCM.			
	ASCD control unit	Sends the cruise signal and "D4" (overdrive) cancellation signal from ASCD control unit to TCM.			
	Stop lamp switch	Releases lock-up system when depressing pedal in lock-up condition.			
	Shift solenoid valve A/B	Selects shifting point suited to driving conditions in relation to a signal sent from TCM.			
	Line pressure solenoid valve	Regulates (or decreases) line pressure suited to driving conditions in relation to a signal sent from TCM.			
Output	Torque converter clutch solenoid valve	Regulates (or decreases) lock-up pressure suited to driving conditions in relation to a signal sent from TCM.			
	Overrun clutch solenoid valve	Controls an "engine brake" effect suited to driving conditions in relation to a signal sent from TCM.			
	O/D OFF indicator lamp	Shows TCM faults, when A/T control components malfunction.			

CAN Communication SYSTEM DESCRIPTION

ECS006H7

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to LAN-4, "CAN Communication Unit".

Control Mechanism LINE PRESSURE CONTROL

ECS005W8

TCM has various line pressure control characteristics to match the driving conditions.

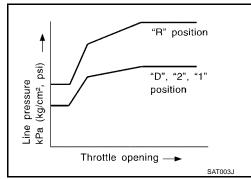
An ON-OFF duty signal is sent to the line pressure solenoid valve based on TCM characteristics.

Hydraulic pressure on the clutch and brake is electronically controlled through the line pressure solenoid valve to accommodate engine torque. This results in smooth shift operation.

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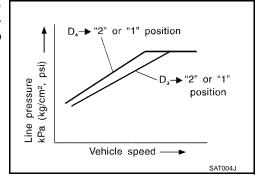
Normal Control

The line pressure to throttle opening characteristics is set for suitable clutch operation.



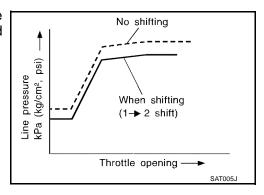
Back-up Control (Engine brake)

If the selector lever is shifted to "2" position while driving in D4 $\,$ (OD) or D3 , great driving force is applied to the clutch inside the transmission. Clutch operating pressure (line pressure) must be increased to deal with this driving force.



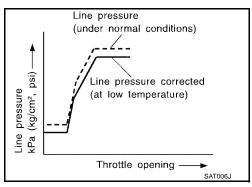
During Shift Change

The line pressure is temporarily reduced corresponding to a change in engine torque when shifting gears (that is, when the shift solenoid valve is switched for clutch operation) to reduce shifting shock.



At Low Fluid Temperature

- Fluid viscosity and frictional characteristics of the clutch facing change with fluid temperature. Clutch engaging or band-contacting pressure is compensated for, according to fluid temperature, to stabilize shifting quality.
- The line pressure is reduced below 60°C (140°F) to prevent shifting shock due to low viscosity of automatic transmission fluid when temperature is low.



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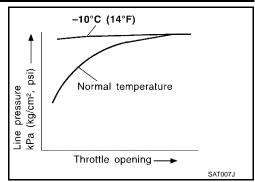
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Line pressure is increased to a maximum, irrespective of the throttle opening, when fluid temperature drops to −10°C (14°F). This pressure rise is adopted to prevent a delay in clutch and brake operation due to extreme drop of fluid viscosity at low temperature.

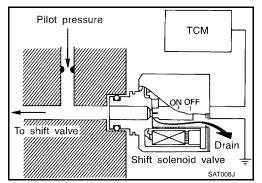


SHIFT CONTROL

The shift is regulated entirely by electronic control to accommodate vehicle speed and varying engine operations. This is accomplished by electrical signals transmitted by the revolution sensor and throttle position sensor [accelerator pedal position (APP) sensor]. This results in improved acceleration performance and fuel economy.

Control of Shift Solenoid Valves A and B

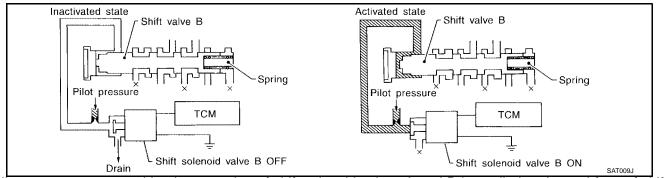
The TCM activates shift solenoid valves A and B according to signals from the throttle position sensor [accelerator pedal position (APP) sensor] and revolution sensor to select the optimum gear position on the basis of the shift schedule memorized in the TCM. The shift solenoid valve performs simple ON-OFF operation. When set to "ON", the drain circuit closes and pilot pressure is applied to the shift valve.



Relation Between Shift Solenoid Valves A and B and Gear Positions

Shift solenoid valve	Gear position					
Shift solehold valve	D1 , 21 , 11	D2 , 22 , 12	D3	D4 (OD)	N-P	
A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)	ON (Closed)	
В	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)	

Control of Shift Valves A and B



Pilot pressure generated by the operation of shift solenoid valves A and B is applied to the end face of shift valves A and B.

The drawing above shows the operation of shift valve B. When the shift solenoid valve is "ON", pilot pressure applied to the end face of the shift valve overcomes spring force, moving the valve upward.

LOCK-UP CONTROL

The torque converter clutch piston in the torque converter is locked to eliminate torque converter slip to increase power transmission efficiency. The solenoid valve is controlled by an ON-OFF duty signal sent from the TCM. The signal is converted to an oil pressure signal which controls the torque converter clutch piston.

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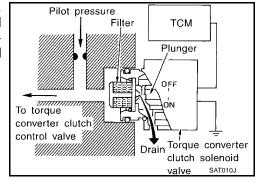
Conditions for Lock-up Operation

When vehicle is driven in 3rd and 4th gear position, vehicle speed and throttle opening are detected. If the detected values fall within the lock-up zone memorized in the TCM, lock-up is performed.

Overdrive control switch	ON	OFF
Selector lever	"D" position	
Gear position	D4	D3
Vehicle speed sensor	More than set value	
Throttle position sensor [accelerator pedal position (APP) sensor]	Less than set opening	
A/T fluid temperature sensor	More than 40°C (104°F)	

Torque Converter Clutch Solenoid Valve Control

The torque converter clutch solenoid valve is controlled by the TCM. The plunger closes the drain circuit during the "OFF" period, and opens the circuit during the "ON" period. If the percentage of OFF-time increases in one cycle, the pilot pressure drain time is reduced and pilot pressure remains high.



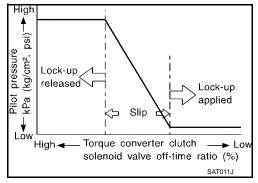
The torque converter clutch piston is designed to slip to adjust the ratio of ON-OFF, thereby reducing lock-up shock.

OFF-time INCREASING

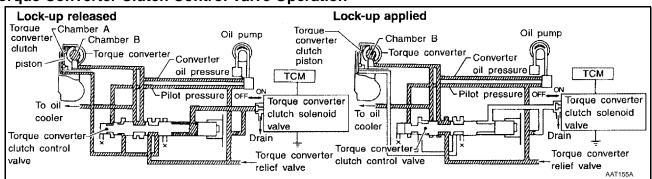
Amount of drain DECREASING

Pilot pressure HIGH

Lock-up RELEASING



Torque Converter Clutch Control Valve Operation



Lock-up released

The OFF-duration of the torque converter clutch solenoid valve is long, and pilot pressure is high. The pilot pressure pushes the end face of the torque converter clutch control valve in combination with spring force to move the valve to the left. As a result, converter pressure is applied to chamber A (torque converter clutch piston release side). Accordingly, the torque converter clutch piston remains unlocked.

Lock-up applied

When the OFF-duration of the torque converter clutch solenoid valve is short, pilot pressure drains and becomes low. Accordingly, the control valve moves to the right by the pilot pressure of the other circuit and

converter pressure. As a result, converter pressure is applied to chamber B, keeping the torque converter clutch piston applied.

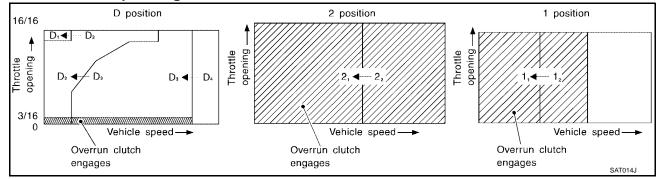
Also smooth lock-up is provided by transient application and release of the lock-up.

OVERRUN CLUTCH CONTROL (ENGINE BRAKE CONTROL)

Forward one-way clutch is used to reduce shifting shocks in downshifting operations. This clutch transmits engine torque to the wheels. However, drive force from the wheels is not transmitted to the engine because the one-way clutch rotates idle. This means the engine brake is not effective.

The overrun clutch operates when the engine brake is needed.

Overrun Clutch Operating Conditions



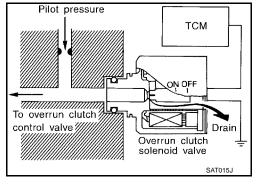
Selector lever position	Gear position	Throttle opening
"D" position	D1, D2, D3 gear position	Less than 3/16
"2" position	21, 22 gear position	
"1" position	11, 12 gear position	At any position

Overrun Clutch Solenoid Valve Control

The overrun clutch solenoid valve is operated by an ON-OFF signal transmitted by the TCM to provide overrun clutch control (engine brake control).

When this solenoid valve is "ON", the pilot pressure drain port closes. When it is "OFF", the drain port opens.

During the solenoid valve "ON", pilot pressure is applied to the end face of the overrun clutch control valve.



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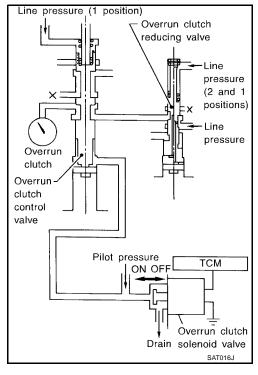
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Overrun Clutch Control Valve Operation

When the solenoid valve is "ON", pilot pressure is applied to the overrun clutch control valve. This pushes up the overrun clutch control valve. The line pressure is then shut off so that the clutch does not engage.

When the solenoid valve is "OFF", pilot pressure is not generated. At this point, the overrun clutch control valve moves downward by spring force. As a result, overrun clutch operation pressure is provided by the overrun clutch reducing valve. This causes the overrun clutch to engage.

In the 1 position, the overrun clutch control valve remains pushed down so that the overrun clutch is engaged at all times.



Control Valve FUNCTION OF CONTROL VALVES

ECS005W9

Valve name	Function	
Pressure regulator valve, plug and sleeve	Regulates oil discharged from the oil pump to provide optimum line pressure for all driving conditions.	
Pressure modifier valve and sleeve	Used as a signal supplementary valve to the pressure regulator valve. Regulates pressure-mod fier pressure (signal pressure) which controls optimum line pressure for all driving conditions.	
Pilot valve	Regulates line pressure to maintain a constant pilot pressure level which controls lock-up mech nism, overrun clutch, shift timing.	
Accumulator control valve	Regulates accumulator back-pressure to pressure suited to driving conditions.	
Manual valve	Directs line pressure to oil circuits corresponding to select positions. Hydraulic pressure drains when the shift lever is in Neutral.	
Shift valve A	Simultaneously switches four oil circuits using output pressure of shift solenoid valve A to meet driving conditions (vehicle speed, throttle opening, etc.). Provides automatic downshifting and up-shifting (1st \rightarrow 2nd \rightarrow 3rd \rightarrow 4th gears/4th \rightarrow 3rd \rightarrow 2nd \rightarrow 1st gears) in combination with shift valve B.	
Shift valve B	Simultaneously switches three oil circuits using output pressure of shift solenoid valve B in relation to driving conditions (vehicle speed, throttle opening, etc.). Provides automatic downshifting and up-shifting (1st → 2nd → 3rd → 4th gears/4th → 3rd → 2nd → 1st gears) in combination with shift valve A.	
Overrun clutch control valve	Switches hydraulic circuits to prevent engagement of the overrun clutch simultaneously with application of the brake band in D4 . (Interlocking occurs if the overrun clutch engages during D4 .)	
1st reducing valve	Reduces low & reverse brake pressure to dampen engine-brake shock when down-shifting from the "1" position 12 to 11.	
Overrun clutch reducing valve	Reduces oil pressure directed to the overrun clutch and prevents engine-brake shock. In "1" and "2" positions, line pressure acts on the overrun clutch reducing valve to increase the pressure-regulating point, with resultant engine brake capability.	
Torque converter relief valve	Prevents an excessive rise in torque converter pressure.	
Torque converter clutch control valve, plug and sleeve	Activates or inactivates the lock-up function. Also provides smooth lock-up through transient application and release of the lock-up system.	
1-2 accumulator valve and piston	Dampens the shock encountered when 2nd gear band servo contracts, and provides smooth shifting.	

OVERALL SYSTEM

[RE4F03B]

Valve name	Function
3-2 timing valve	Switches oil pressure with 3-2 timing valve according to throttle opening.
Shuttle control valve	Reduces shock when down-shifting from 3rd to 2nd and regulates overrun clutch.
Cooler check valve	Regulates oil pressure which causes lock-up when driving at low speeds.

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[RE4F03B]

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

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Introduction

The A/T system has two self-diagnostic systems.

The first is the emission-related on board diagnostic system (OBD-II) performed by the TCM in combination with the ECM. The malfunction is indicated by the MIL (malfunction indicator lamp) and is stored as a DTC in the ECM memory but not the TCM memory.

The second is the TCM original self-diagnosis indicated by the O/D OFF indicator lamp. The malfunction is stored in the TCM memory. The detected items are overlapped with OBD-II self-diagnostic items. For detail, refer to AT-43, "SELF-DIAGNOSTIC RESULT TEST MODE".

OBD-II Function for A/T System

ECS005WE

The ECM provides emission-related on board diagnostic (OBD-II) functions for the A/T system. One function is to receive a signal from the TCM used with OBD-related parts of the A/T system. The signal is sent to the ECM when a malfunction occurs in the corresponding OBD-related part. The other function is to indicate a diagnostic result by means of the MIL (malfunction indicator lamp) on the instrument panel. Sensors, switches and solenoid valves are used as sensing elements.

The MIL automatically illuminates in One or Two Trip Detection Logic when a malfunction is sensed in relation to A/T system parts.

One or Two Trip Detection Logic of OBD-II ONE TRIP DETECTION LOGIC

ECS005WC

If a malfunction is sensed during the first test drive, the MIL will illuminate and the malfunction will be stored in the ECM memory as a DTC. The TCM is not provided with such a memory function.

TWO TRIP DETECTION LOGIC

When a malfunction is sensed during the first test drive, it is stored in the ECM memory as a 1st trip DTC (diagnostic trouble code) or 1st trip freeze frame data. At this point, the MIL will not illuminate. — First Trip If the same malfunction as that experienced during the first test drive is sensed during the second test drive, the MIL will illuminate. — Second Trip

A/T-related parts for which the MIL illuminates during the first or second test drive are listed below.

Items	MIL		
Items	One trip detection	Two trip detection	
Shift solenoid valve A — DTC: P0750	X		
Shift solenoid valve B — DTC: P0755	X		
Throttle position sensor [accelerator pedal position (APP) sensor] or switch — DTC: P1705	Х		
Except above		Х	

The "trip" in the "One or Two Trip Detection Logic" means a driving mode in which self-diagnosis is performed during vehicle operation.

OBD-II Diagnostic Trouble Code (DTC) HOW TO READ DTC AND 1ST TRIP DTC

ECS005WD

DTC and 1st trip DTC can be read by the following methods.

with CONSULT-II or GST (Generic Scan Tool) Examples: P0705, P0710, P0720, P0725, etc.

These DTCs are prescribed by SAE J2012.

(CONSULT-II also displays the malfunctioning component or system.)

- 1st trip DTC No. is the same as DTC No.
- Output of the diagnostic trouble code indicates that the indicated circuit has a malfunction. However, in case of the Mode II and GST they do not indicate whether the malfunction is still occurring or occurred in the past and returned to normal.

CONSULT-II can identify them as shown below. Therefore, using CONSULT-II (if available) is recommended.

[RE4F03B]

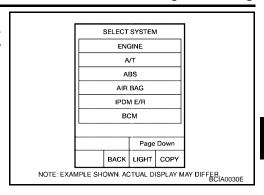
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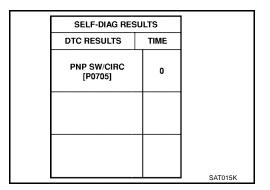
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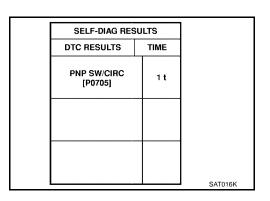
A sample of CONSULT-II display for DTC and 1st trip DTC is shown. DTC or 1st trip DTC of a malfunction is displayed in SELF DIAGNO-SIS mode for "ENGINE" with CONSULT-II. Time data indicates how many times the vehicle was driven after the last detection of a DTC.



If the DTC is being detected currently, the time data will be "0".



If a 1st trip DTC is stored in the ECM, the time data will be "1t".



Freeze Frame Data and 1st Trip Freeze Frame Data

The ECM has a memory function, which stores the driving condition such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed and vehicle speed at the moment the ECM detects a malfunction.

Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data, and the data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-II or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-II screen, not on the GST. For detail, refer to EC-56, "FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA".

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

The ECM has the following priorities to update the data.

Priority	Items	
1	Freeze frame data	Misfire — DTC: P0300 - P0304 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175
2		Except the above items (Includes A/T related items)
3	1st trip freeze frame data	

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

[RE4F03B]

HOW TO ERASE DTC

The diagnostic trouble code can be erased by CONSULT-II, GST or ECM DIAGNOSTIC TEST MODE as follows.

- If the battery terminal is disconnected, the diagnostic trouble code will be lost within 24 hours.
- When you erase the DTC, using CONSULT-II or GST is easier and quicker than switching the mode selector on the ECM.

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to EC-64, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION".

- Diagnostic trouble codes (DTC)
- 1st trip diagnostic trouble codes (1st trip DTC)
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values

(A) HOW TO ERASE DTC (WITH CONSULT-II)

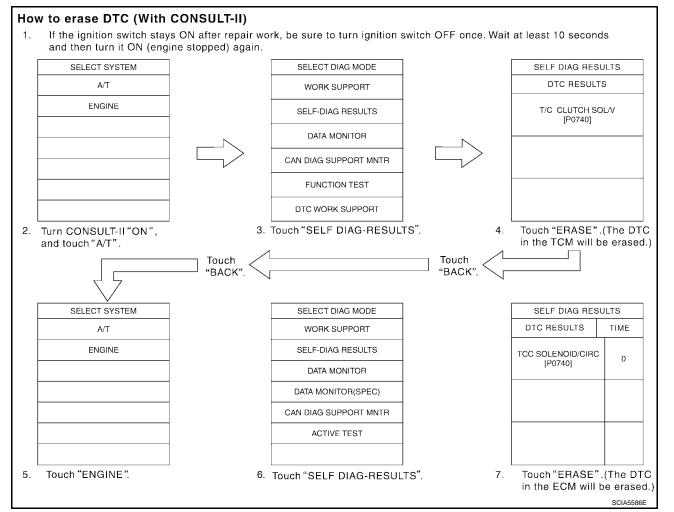
- If a DTC is displayed for both ECM and TCM, it needs to be erased for both ECM and TCM.
- 1. If the ignition switch stays "ON" after repair work, be sure to turn ignition switch "OFF" once. Wait at least 10 seconds and then turn it "ON" (engine stopped) again.
- 2. Turn CONSULT-II "ON" and touch "A/T".
- 3. Touch "SELF DIAGNOSIS".
- 4. Touch "ERASE". (The DTC in the TCM will be erased.) Then touch "BACK" twice.
- 5. Touch "ENGINE".
- 6. Touch "SELF DIAGNOSIS".
- 7. Touch "ERASE". (The DTC in the ECM will be erased.)

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- 1. If the ignition switch stays "ON" after repair work, be sure to turn ignition switch "OFF" once. Wait at least 5 seconds and then turn it "ON" (engine stopped) again.
- Perform TCM Self-diagnostic Procedure. Refer to <u>AT-51, "TCM Self-diagnostic Procedure (No Tools)"</u>. (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
- Select Mode 4 with Generic Scan Tool (GST). For details, refer to <u>EC-64, "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION"</u>.

HOW TO ERASE DTC (NO TOOLS)

- 1. If the ignition switch stays "ON" after repair work, be sure to turn ignition switch "OFF" once. Wait at least 5 seconds and then turn it "ON" (engine stopped) again.
- Perform TCM Self-diagnostic Procedure. Refer to <u>AT-51, "TCM Self-diagnostic Procedure (No Tools)"</u>.
 (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
- 3. Perform OBD-II Self-diagnostic Procedure. Refer to AT-51, "TCM Self-diagnostic Procedure (No Tools)".

[RE4F03B]

Malfunction Indicator Lamp (MIL)

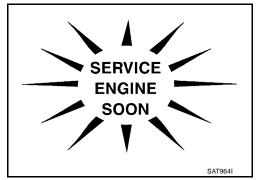
ECS005WE

- 1. The malfunction indicator lamp will light up when the ignition switch is turned ON without the engine running. This is for checking the lamp.
 - If the malfunction indicator lamp does not light up, refer to DI-27, "WARNING LAMPS"

(Or see MIL & CONSULT-II in EC section. Refer to $\underline{\text{EC-65}}$, "Malfunction Indicator Lamp (MIL)", and $\underline{\text{EC-133}}$, "CONSULT-II Function (ENGINE)".

When the engine is started, the malfunction indicator lamp should go off.

If the lamp remains on, the on board diagnostic system has detected an emission-related (OBD-II) malfunction. For detail, refer to $\underline{\text{EC-52}}$, "Emission-related Diagnostic Information".



CONSULT-II ECS005WI

After performing "SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)" (AT-43, "SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)"), place check marks for results on the "DIAGNOSTIC WORKSHEET", (AT-57, "DIAGNOSTIC WORKSHEET"). Reference pages are provided following the items.

NOTICE:

- 1. The CONSULT-II electrically displays shift timing and lock-up timing (that is, operation timing of each sole-noid).
 - Check for time difference between actual shift timing and the CONSULT-II display. If the difference is noticeable, mechanical parts (except solenoids, sensors, etc.) may be malfunctioning. Check mechanical parts using applicable diagnostic procedures.
- 2. Shift schedule (which implies gear position) displayed on CONSULT-II and that indicated in Service Manual may differ slightly. This occurs because of the following reasons:
- Actual shift schedule has more or less tolerance or allowance,
- Shift schedule indicated in Service Manual refers to the point where shifts start, and
- Gear position displayed on CONSULT-II indicates the point where shifts are completed.
- 3. Shift solenoid valve "A" or "B" is displayed on CONSULT-II at the start of shifting. Gear position is displayed upon completion of shifting (which is computed by TCM).
- 4. Additional CONSULT-II information can be found in the Operation Manual supplied with the CONSULT-II unit.

FUNCTION

Diagnostic test mode	Function	Reference page
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-II.	_
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	<u>AT-43</u>
Data monitor	Input/Output data in the ECM can be read.	<u>AT-45</u>
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.	_
Function test	Perform by CONSULT-II instead of a technican to determine whether each system is "OK" or "NG".	_
DTC work support	Select the operating condition to confirm Diagnostic Trouble Codes.	<u>AT-47</u>
TCM part number	TCM part number can be read.	_

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(A) SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)

 Turn on CONSULT-II and touch "ENGINE" for OBD-II detected items or touch "A/T" for TCM self-diagnosis.
 If A/T is not displayed, check TCM power supply and ground circuit. Refer to <u>AT-112</u>, "TROUBLE DIAGNOSIS FOR POWER <u>SUPPLY</u>". If result is NG, refer to <u>PG-3</u>, "POWER SUPPLY ROUTING".

SELECT SYSTEM

ENGINE

A/T

ABS

AIR BAG

IPDM E/R

BCM

Page Down

BACK LIGHT COPY

NOTE: EXAMPLE SHOWN. ACTUAL DISPLAY MAY DIFFER CANDONCE

REAL-TIME DIAG

REAL-TIME DIAG	
ENG SPEED SIG	
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2. Touch "SELF DIAG RESULTS".

Display shows malfunction experienced since the last erasing operation.

CONSULT-II performs "REAL TIME DIAG".

Also, any malfunction detected while in this mode will be displayed at real time.

SELF-DIAGNOSTIC RESULT TEST MODE

Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode) "A/T" "ENGINE"			TCM self-diagnosis	OBD-II (DTC)	
		Malfunction is detected when	Available by O/D OFF indicator lamp or "A/T" on CONSULT-II	Available by malfunction indicator lamp *2, "ENGINE" on CON-	
			OH GOINGGET II	SULT-II or GST	
PNP switch circuit		TCM does not receive the correct		D0705	
_	PNP SW/CIRC	voltage signal (based on the gear position) from the switch.	_	P0705	
Revolution sensor		TCM does not receive the proper voltage signal from the sensor.	Х	P0720	
VHCL SPEED SEN-A/T	VEH SPD SEN/CIR AT				
Vehicle speed sensor (Meter)		TCM does not receive the proper			
VHCL SPEED SEN·MTR	_	voltage signal from the sensor.	X	_	
A/T 1st gear function		A/T cannot be shifted to the 1st			
A/T 1ST GR FNCTN	A/T 1ST GR FNCTN	gear position even if electrical circuit is good.	_	P0731*1	
A/T 2nd gear function		A/T cannot be shifted to the 2nd			
A/T 2ND GR FNCTN	A/T 2ND GR FNCTN	gear position even if electrical circuit is good.	_	P0732*1	
A/T 3rd gear function		A/T cannot be shifted to the 3rd		D0700#4	
A/T 3RD GR FNCTN	A/T 3RD GR FNCTN	gear position even if electrical circuit is good.	_	P0733*1	
A/T 4th gear function		A/T cannot be shifted to the 4th			
A/T 4TH GR FNCTN	A/T 4TH GR FNCTN	gear position even if electrical circuit is good.	_	P0734*1	
A/T TCC S/V function (lock-up)		A/T cannot perform lock-up even if			
A/T TCC S/V FNCTN	A/T TCC S/V FNCTN	electrical circuit is good.	_	P0744*1	

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[RE4F03B]

				[KE4FU3D]	
Detected items			TCM self-diagnosis	OBD-II (DTC)	
(Screen terms for CO DIAGNOSIS" test mod		Malfunction is detected when	Available by O/D OFF	Available by malfunction indicator lamp *2, "ENGINE" on CONSULT-II or GST	
Shift solenoid valve A		TCM detects an improper voltage			
SHIFT SOLENOID/V A	SFT SOL A/CIRC	drop when it tries to operate the solenoid valve.	X	P0750	
Shift solenoid valve B		TCM detects an improper voltage			
SHIFT SOLENOID/V B	SFT SOL B/CIRC	drop when it tries to operate the solenoid valve.	X	P0755	
Overrun clutch solence	oid valve	TCM detects an improper voltage			
OVERRUN CLUTCH S/V	O/R CLUCH SOL/ CIRC	drop when it tries to operate the solenoid valve.	X	P1760	
T/C clutch solenoid va	alve	TCM detects an improper voltage			
T/C CLUTCH SOL/V	TCC SOLENOID/ CIRC	drop when it tries to operate the solenoid valve.	X	P0740	
Line pressure solenoi	d valve	TCM detects an improper voltage			
LINE PRESSURE S/ V	L/PRESS SOL/CIRC	drop when it tries to operate the solenoid valve.	X	P0745	
Throttle position sensor, Throttle position switch		TCM receives an excessively low or high voltage from the sensor.	X	P1705	
THROTTLE POSI SEN	TP SEN/CIRC A/T		^	1 17 00	
Engine speed signal		TCM does not receive the proper	X	P0725	
ENGINE SPEED SIG		voltage signal from the ECM.	,		
A/T fluid temperature	sensor	TCM receives an excessively low			
BATT/FLUID TEMP SEN	ATF TEMP SEN/ CIRC	or high voltage from the sensor.	X	P0710	
TCM (RAM)		TCM memory (RAM) is malfunc-			
CONTROL UNIT (RAM)	_	tioning.	_	_	
TCM (ROM)		TCM memory (ROM) is malfunc-			
CONTROL UNIT (ROM)	_	tioning.	_	_	
TCM (EEP ROM)		TCM memory (EEP ROM) is mal-			
CONT UNIT (EEP ROM)	_	functioning.	_	_	
Initial start		This is not a malfunction message			
INITIAL START	_	(Whenever shutting off a power supply to the TCM, this message appears on the screen.)	Х	_	
No failure (NO SELF DIAGNOS CATED FURTHER TE REQUIRED**)		No failure has been detected.	Х	Х	

X: Applicable

^{—:} Not applicable

^{*1:} These malfunctions cannot be displayed by MIL representation is assigned to MIL.

^{*2:} Refer to EC-65, "Malfunction Indicator Lamp (MIL)".

[RE4F03B]

DATA MONITOR MODE (A/T)

		Monit	or item			
ltem	Display	TCM input sig-	Main sig- nals	Description	Remarks	
Vehicle speed sensor 1 (A/T) (Revolution sensor)	VHCL/S SE-A/T [km/h] or [mph]	Х	_	Vehicle speed computed from signal of revolution sensor is displayed.	When racing engine in "N" or "P" position with vehicle stationary, CONSULT-II data may not indicate 0 km/h (0 mph).	
Vehicle speed sensor 2 (Meter)	VHCL/S SE·MTR [km/h] or [mph]	Х	_	Vehicle speed computed from signal of vehicle speed sensor is dis- played.	Vehicle speed display may not be accurate under approx. 10 km/h (6 mph). It may not indicate 0 km/h (0 mph) when vehicle is stationary.	-
Throttle position sensor [accelerator pedal position (APP) sensor]	THRTL POS SEN [V]	Х	_	Throttle position sensor [accelerator pedal position (APP) sensor] signal voltage is displayed.		
A/T fluid temperature sensor	FLUID TEMP SE [V]	x	_	 A/T fluid temperature sensor signal voltage is displayed. Signal voltage lowers as fluid temperature rises. 		
Battery voltage	BATTERY VOLT [V]	Х	_	Source voltage of TCM is displayed.		
Engine speed	ENGINE SPEED [rpm]	x	х	Engine speed, computed from engine speed signal, is displayed.	Engine speed display may not be accurate under approx. 800 rpm. It may not indicate 0 rpm even when engine is not running.	
Overdrive control switch	OVERDRIVE SW [ON/OFF]	Х	_	ON/OFF state computed from signal of overdrive control SW is displayed.		
PN position switch	PN POSI SW [ON/OFF]	Х	_	ON/OFF state computed from signal of PN position SW is displayed.		
R position switch	R POSITION SW [ON/OFF]	Х	_	ON/OFF state computed from signal of R position SW is displayed.		
D position switch	D POSITION SW [ON/OFF]	Х	_	ON/OFF state computed from signal of D position SW is displayed.		
2 position switch	2 POSITION SW [ON/OFF]	Х	_	ON/OFF status, computed from signal of 2 position SW, is displayed.		
1 position switch	1 POSITION SW [ON/OFF]	Х	_	ON/OFF status, computed from signal of 1 position SW, is displayed.		
ASCD cruise signal	ASCD CRUISE [ON/OFF]	x	_	Status of ASCD cruise signal is displayed. ON Cruising state OFF Normal running state	This is displayed even when no ASCD is mounted.	

[RE4F03B]

		Monit	or item		
ltem	Display	TCM input sig- nals	Main sig- nals	Description	Remarks
ASCD OD cut signal	ASCD OD CUT [ON/OFF]	Х	_	Status of ASCD OD release signal is displayed. ON OD released OFF OD not released	This is displayed even when no ASCD is mounted.
Kickdown switch	KICKDOWN SW [ON/OFF]	Х	_	ON/OFF status, computed from signal of kick-down SW, is displayed.	This is displayed even when no kickdown switch is equipped.
Gear position	GEAR	_	Х	Gear position data used for computation by TCM, is displayed.	
Selector lever position	SLCT LVR POSI	_	Х	Selector lever position data, used for computa- tion by TCM, is displayed.	 A specific value used for control is displayed if fail- safe is activated due to error.
Vehicle speed	VEHICLE SPEED [km/h] or [mph]	_	Х	Vehicle speed data, used for computation by TCM, is displayed.	
Stop lamp switch	BRAKE SW [ON/OFF]	Х	_	ON/OFF status are displayed. ON: Brake pedal is depressed. OFF: Brake pedal is released.	
Throttle position	THROTTLE POSI [/8]	_	Х	Throttle position data, used for computation by TCM, is displayed.	 A specific value used for control is displayed if fail- safe is activated due to error.
Line pressure duty	LINE PRES DTY [%]	_	Х	Control value of line pressure solenoid valve, computed by TCM from each input signal, is displayed.	
Torque converter clutch solenoid valve duty	TCC S/V DUTY [%]	_	х	Control value of torque converter clutch solenoid valve, computed by TCM from each input signal, is displayed.	
Shift solenoid valve A	SHIFT S/V A [ON/OFF]	_	Х	Control value of shift solenoid valve A, com- puted by TCM from each input signal, is displayed.	Control value of solenoid is displayed even if solenoid circuit is disconnected. The "OFF" signal is dis-
Shift solenoid valve B	SHIFT S/V B [ON/OFF]	_	Х	Control value of shift solenoid valve B, com- puted by TCM from each input signal, is displayed.	played if solenoid circuit is shorted.
Overrun clutch solenoid valve	OVERRUN/C S/ V [ON/OFF]	_	Х	Control value of overrun clutch solenoid valve computed by TCM from each input signal is dis- played.	
Self-diagnosis display lamp (O/D OFF indicator lamp)	SELF-D DP LMP [ON/OFF]	_	Х	Control status of O/D OFF indicator lamp is displayed.	

X: Applicable

—: Not applicable

[RE4F03B]

Α

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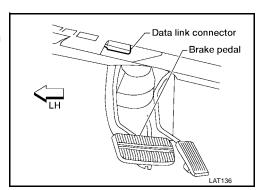
Е

Н

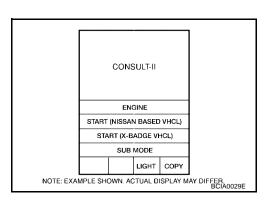
M

DTC WORK SUPPORT MODE WITH CONSULT-II CONSULT-II Setting Procedure

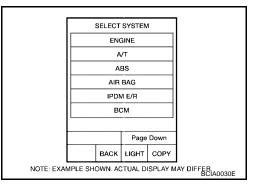
- Turn ignition switch "OFF".
- 2. Connect CONSULT-II to Data link connector which is located in left side lower dash panel.



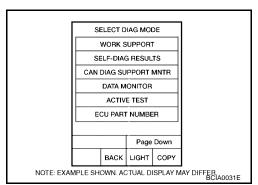
- 3. Turn ignition switch "ON".
- 4. Touch "START (NISSAN BASED VHCL)".



5. Touch "A/T".



6. Touch "DTC WORK SUPPORT".

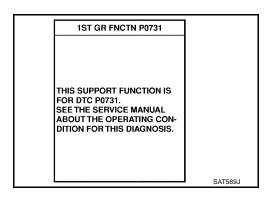


[RE4F03B]

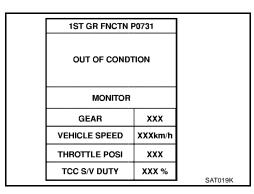
7. Touch select item menu (1ST, 2ND, etc.).

SELECT WORK ITEM	
1ST GR FNCTN P0731	
2ND GR FNCTN P0732	
3RD GR FNCTN P0733	
4TH GRFNCTN P0734	
TCC S/V FNCTN P0744	
	SAT018K

8. Touch "START".



9. Perform driving test according to "DTC CONFIRMATION PROCEDURE" in "TROUBLE DIAGNOSIS FOR DTC".



• When testing conditions are satisfied, CONSULT-II screen changes from "OUT OF CONDITION" to "TESTING".

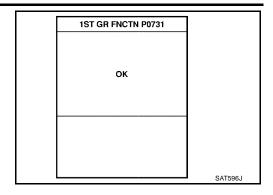
1ST GR FNCTN		
TESTING		
MONITOR		
GEAR	xxx	
VEHICLE SPEED	XXXkm/h	
THROTTLE POSI	xxx	
TCC S/V DUTY	XXX %	
<u></u>		SAT591J

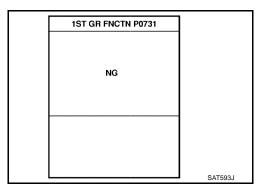
[RE4F03B]

SAT595J

10. Stop vehicle. If "NG" appears on the screen, malfunction may 1ST GR FNCTN P0731 exist. Go to "DIAGNOSTIC PROCEDURE". Α STOP VEHICLE В ΑT SAT592J D 1ST GR FNCTN P0731 Е NG SAT593J 11. Perform test drive to check gear shift feeling in accordance with 1ST GR FNCTN P0731 Н instructions displayed. DRIVE VHCL IN D RANGE SHIFTING 1→2→3→4 UNDER NORMAL ACCELERATION. DOES A/T SHFT NORMAL CHECK FOR PROPER SHF TIMING AND SHFT SHOCK SAT594J 12. Touch "YES" or "NO". 1ST GR FNCTN P0731 DRIVE VHCL IN D RANGE SHIFTING 1→2→3→4 UNDER M NORMAL ACCELERATION. DOES A/T SHFT NORMAL CHECK FOR PROPER SHF TIMING AND SHFT SHOCK

13. CONSULT-II procedure ended.





If "NG" appears on the screen, a malfunction may exist. Go to "DIAGNOSTIC PROCEDURE".

DTC WORK SUPPORT MODE

DTC work support item	Description	Check items (Possible cause)
1ST GR FNCTN P0731	Following items for "A/T 1st gear function (P0731)" can be confirmed. Self-diagnosis status (whether the diagnosis is being conducted or not) Self-diagnosis result (OK or NG)	 Shift solenoid valve A Shift solenoid valve B Each clutch Hydraulic control circuit
2ND GR FNCTN P0732	Following items for "A/T 2nd gear function (P0732)" can be confirmed. Self-diagnosis status (whether the diagnosis is being conducted or not) Self-diagnosis result (OK or NG)	Shift solenoid valve BEach clutchHydraulic control circuit
3RD GR FNCTN P0733	Following items for "A/T 3rd gear function (P0733)" can be confirmed. Self-diagnosis status (whether the diagnosis is being conducted or not) Self-diagnosis result (OK or NG)	Shift solenoid valve AEach clutchHydraulic control circuit
4TH GR FNCTN P0734	Following items for "A/T 4th gear function (P0734)" can be confirmed. Self-diagnosis status (whether the diagnosis is being conducted or not) Self-diagnosis result (OK or NG)	 Shift solenoid valve A Shift solenoid valve B Line pressure solenoid valve Each clutch Hydraulic control circuit
TCC S/V FNCTN P0744	Following items for "A/T TCC S/V function (lock-up) (P0744)" can be confirmed. Self-diagnosis status (whether the diagnosis is being conducted or not) Self-diagnosis result (OK or NG)	 Torque converter clutch sole- noid valve Each clutch Hydraulic control circuit

DIAGNOSTIC PROCEDURE WITHOUT CONSULT-II

OBD-II Self-diagnostic Procedure (With GST)

Refer to EC-145, "Generic Scan Tool (GST) Function".

[RE4F03B]

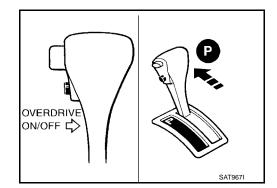
OBD-II Self-diagnostic Procedure (No Tools)

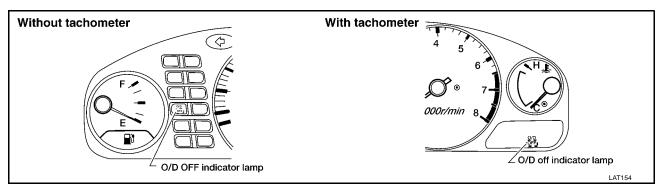
Refer to EC-65, "Malfunction Indicator Lamp (MIL)".

TCM Self-diagnostic Procedure (No Tools)

1. CHECK O/D OFF INDICATOR LAMP

- Move A/T selector lever to "P" position.
 Start the engine.
 Warm engine to normal operating temperature.
- 2. Turn ignition switch to "OFF" position.
- 3. Wait 5 seconds.
- 4. Turn ignition switch to "ON" position. (Do not start engine.)
- 5. Does O/D OFF indicator lamp come on for about 2 seconds?





Yes or No

Yes >> GO TO 2.

No >> GO TO AT-220, "1. O/D OFF Indicator Lamp Does Not Come On".

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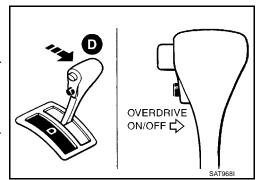
J

K

M

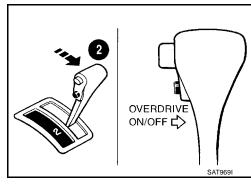
2. JUDGEMENT PROCEDURE STEP 1

- 1. Turn ignition switch to "OFF" position.
- 2. Turn ignition switch to "ACC" position.
- Move A/T selector lever from "P" to "D" position.
- 4. Turn ignition switch to "ON" position. (Do not start engine.)
- 5. Depress and hold overdrive control switch (the O/D OFF indicator lamp will be "ON") until directed to release the switch.
 - If O/D OFF indicator lamp does not come on, go to <u>AT-249</u>, "21. TCM Self-diagnosis Does Not Activate {Park/neutral Position (PNP), Overdrive Control and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor] Switches Circuit Checks}".
- 6. Turn ignition switch to "OFF" position.
- 7. Turn ignition switch to "ON" position. (Do not start engine.)
- 8. Release the overdrive control switch (the O/D OFF indicator lamp will be "OFF").
- 9. Wait 2 seconds.
- 10. Move A/T selector lever to "2" position.
- 11. Depress and release the overdrive control switch (the O/D OFF indicator lamp will be "ON").



12. Depress and hold the overdrive control switch (the O/D OFF indicator lamp will be "OFF") until directed to release the switch.

>> GO TO 3.



[RE4F03B]

Α

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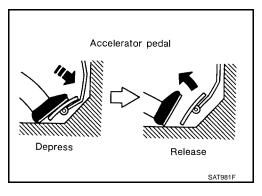
3. JUDGEMENT PROCEDURE STEP 2

- 1. Move A/T selector lever to "1" position.
- 2. Release the overdrive control switch.
- 3. Depress and release the overdrive control switch (the O/D OFF indicator lamp will be "ON").
- 4. Depress and release the overdrive control switch (the O/D OFF indicator lamp will be "OFF").
- 5. Depress and hold the overdrive control switch (the O/D OFF indicator lamp will be "ON") until directed to release the switch.



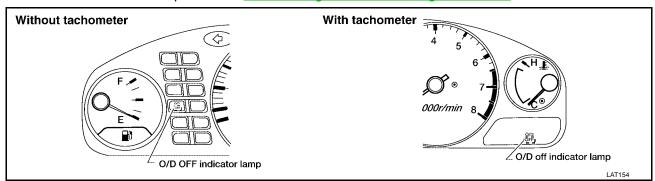
- 6. Depress accelerator pedal fully and release.
- 7. Release the overdrive control switch (the O/D OFF indicator lamp will begin to flash "ON" and "OFF").

>> GO TO 4.



4. CHECK SELF-DIAGNOSIS CODE

Check O/D OFF indicator lamp. Refer to AT-54, "Judgement of Self-diagnosis Code" .



>> DIAGNOSIS END

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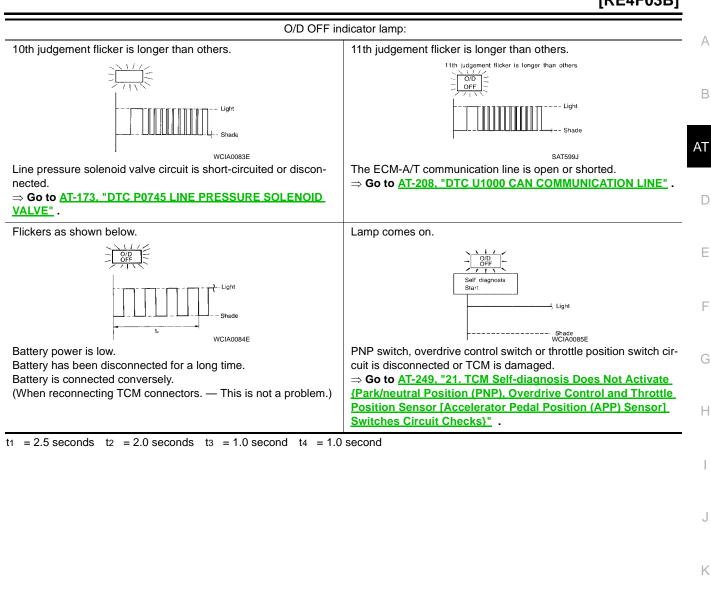
[RE4F03B]

Judgement of Self-diagnosis Code

O/D OFF indicator lamp: All judgement flickers are the same. 1st judgement flicker is longer than others. ta WCIA0073E WCIA0074F All circuits that can be confirmed by self-diagnosis are OK. Revolution sensor circuit is short-circuited or disconnected. ⇒ Go to AT-126, "DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR)". 2nd judgement flicker is longer than others. 3rd judgement flicker is longer than others. WCIA0076F Vehicle speed sensor circuit is short-circuited or disconnected. Throttle position sensor [accelerator pedal position (APP) sensor] ⇒ Go to AT-203, "DTC VHCL SPEED SEN-MTR VEHICLE circuit is short-circuited or disconnected. SPEED SENSOR-MTR". ⇒ Go to AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" . 4th judgement flicker is longer than others. 5th judgement flicker is longer than others. WCIA0077E Shift solenoid valve A circuit is short-circuited or disconnected. Shift solenoid valve B circuit is short-circuited or disconnected. ⇒ Go to AT-179. "DTC P0750 SHIFT SOLENOID VALVE A". ⇒ Go to AT-183. "DTC P0755 SHIFT SOLENOID VALVE B" . 6th judgement flicker is longer than others. 7th judgement flicker is longer than others. WCIA0080E Overrun clutch solenoid valve circuit is short-circuited or discon-Torque converter clutch solenoid valve circuit is short-circuited or nected. disconnected. ⇒ Go to AT-193. "DTC P1760 OVERRUN CLUTCH SOLENOID ⇒ Go to AT-159. "DTC P0740 TORQUE CONVERTER CLUTCH **SOLENOID VALVE".** VALVE". 8th judgement flicker is longer than others. 9th judgement flicker is longer than others. A/T fluid temperature sensor is disconnected or TCM power Engine speed signal circuit is short-circuited or disconnected. ⇒ Go to AT-131, "DTC P0725 ENGINE SPEED SIGNAL" . source circuit is damaged. ⇒ Go to AT-197, "DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)".

[RE4F03B]

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PFP:00000

ECS005WG

Introduction

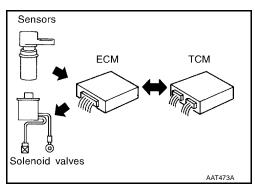
The TCM receives a signal from the vehicle speed sensor, throttle position sensor [accelerator pedal position (APP) sensor] or PNP switch and provides shift control or lock-up control via A/T solenoid valves.

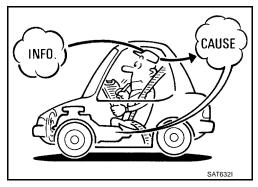
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.

Input and output signals must always be correct and stable in the operation of the A/T system. The A/T system must be in good operating condition and be free of valve seizure, solenoid valve malfunction, etc.

It is much more difficult to diagnose a problem that occurs intermittently rather than continuously. Most intermittent problems are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.

A visual check only may not find the cause of the problems. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the "Work Flow". Refer to AT-60, "Work Flow".

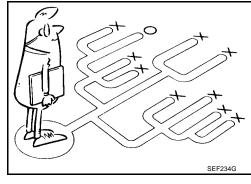




Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such problems, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A "Diagnostic Worksheet" like the example (AT-58, "Diagnostic Worksheet") should be used.

Start your diagnosis by looking for "conventional" problems first. This will help troubleshoot driveability problems on an electronically controlled engine vehicle.

Also check related Service bulletins for information.



M

			[RE4F03B]
IAGNOSTIC WORKSHE			
nformation from Custon	ner		
EY POINTS			
WHAT Vehicle & A/T			
WHEN Date, Frequer			
WHERE Road condit			
HOW Operating cond	litions, Symptoms		
Customer name MR/MS	Model & Year	VIN	
Trans. model	Engine	Mileage	
ncident Date	Manuf. Date	In Service Date	
requency	☐ Continuous ☐ Intermittent (times a day)	
Symptoms	☐ Vehicle does not move. (☐ A	Any position 🚨 Particular position)	
	\square No up-shift (\square 1st \rightarrow 2nd	\square 2nd \rightarrow 3rd \square 3rd \rightarrow O/D)	
	\square No down-shift (\square O/D \rightarrow 3rd		
	□ Lockup malfunction		
	☐ Shift point too high or too low.		
	\square Shift shock or slip (\square N \rightarrow D	☐ Lockup ☐ Any drive position)	
	☐ Noise or vibration		·
	☐ No kickdown		·
	☐ No pattern select		·
	☐ Others		
	()	
D/D OFF indicator lamp	Blinks for about 8 seconds.		
	☐ Continuously lit	□ Not lit	
	□ Continuously lit	□ Not lit	

AT-57 Revision: July 2004 2005 Sentra

[RE4F03B]

Diagr	ostic W	orksheet					
1.	□ Read the "FAIL-SAFE" and listen to customer complaints.						
2.	□ CHEC	HECK A/T FLUID Leakage (Follow specified procedure) Fluid condition Fluid level					
3.	□ Perfo	□ Perform STALL TEST and LINE PRESSURE TEST.					
		☐ Stall test — Mark possible damaged components/others.	Test", AT-67, "Line Pres-				
		☐ Torque converter one-way clutch ☐ Reverse clutch ☐ Forward clutch ☐ Overrun clutch ☐ Forward one-way clutch ☐ Forward one-way clutch ☐ Clutches and brakes except high clutch and brake band are OK	sure Test"				
		☐ Line Pressure test — Suspected parts:					
4.	☐ Perfo	rm all ROAD TEST and mark required procedures.	AT-68, "Road Test"				
	4-1.	Check before engine is started.	AT-70, "1.				
		□ SELF-DIAGNOSTIC PROCEDURE — Mark detected items.	CHECK BEFORE				
		□ PNP switch, AT-115. "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH". □ A/T fluid temperature sensor, AT-120. "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT". □ Vehicle speed sensor·A/T (Revolution sensor), AT-126. "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)". □ Engine speed signal, AT-131. "DTC P0725 ENGINE SPEED SIGNAL". □ Torque converter clutch solenoid valve, □ Line pressure solenoid valve, AT-173. "DTC P0745 LINE PRESSURE SOLENOID VALVE". □ Shift solenoid valve A, AT-179. "DTC P0750 SHIFT SOLENOID VALVE A". □ Shift solenoid valve B, AT-183. "DTC P0755 SHIFT SOLENOID VALVE B". □ Throttle position sensor [accelerator pedal position (APP) sensor], AT-187. "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]". □ Overrun clutch solenoid valve, AT-193. "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE". □ PNP, overdrive control and throttle position sensor [accelerator pedal position (APP) sensor], AT-249. "21. TCM Self-diagnosis Does Not Activate (Park/neutral Position (PNP). Overdrive Control and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor]. Switches Circuit Checks)". □ A/T fluid temperature sensor and TCM power source, AT-197. "DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)". □ Vehicle speed sensor·MTR, AT-203. "DTC VHCL SPEED SEN.MTR VEHICLE SPEED SENSOR·MTR". □ Control unit (RAM), control unit (ROM), AT-211. "DTC CONTROL UNIT (RAM). CONTROL UNIT (RAM). CONTROL UNIT (RAM). CONTROL UNIT (REP ROM)".					
	4-2. Check at idle □ 1. O/D OFF Indicator Lamp Does Not Come On, AT-220, "1. O/D OFF Indicator Lamp Does Not Come On". □ 2. Engine Cannot Be Started In "P" And "N" Position, AT-222, "2. Engine Cannot Be Started In "P" and "N" Position". □ 3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed, AT-223, "3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed". □ 4. In "N" Position, Vehicle Moves, AT-224, "4. In "N" Position, Vehicle Moves". □ 5. Large Shock. "N" → "R" Position, AT-225, "5. Large Shock. "N" → "R" Position". □ 6. Vehicle Does Not Creep Backward In "R" Position, AT-226, "6. Vehicle Does Not Creep Backward In "R" Position". □ 7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position, AT-228, "7. Vehicle Does Not						

[RE4F03B]

			[RE4F03B]	
4.	4-3	Cruise test	AT-73, "3.	
(cont'd)	(cont'd)	Part-1	CRUISE TEST"	Α
		□ 8. Vehicle Cannot Be Started From D1 , AT-230, "8. Vehicle Cannot Be Started From D1" . □ 9. A/T Does Not Shift: D1 \rightarrow D2 Or Does Not Kickdown: D4 \rightarrow D2 , AT-233, "9. A/T Does Not Shift: D1 \rightarrow D2 Or Does Not Kickdown: D4 \rightarrow D2" . □ 10. A/T Does Not Shift: D2 \rightarrow D3 , AT-235, "10. A/T Does Not Shift: D2 \rightarrow D3" . □ 11. A/T Does Not Shift: D3 \rightarrow D4 , AT-237, "11. A/T Does Not Shift: D3 \rightarrow D4" .	AT-77. "Cruise Test — Part 1"	В
		□ 12. A/T Does Not Perform Lock-up, <u>AT-239</u> , "12. A/T <u>Does Not Perform Lock-up"</u> . □ 13. A/T Does Not Hold Lock-up Condition, <u>AT-240</u> , "13. A/T <u>Does Not Hold Lock-up Condition"</u> . □ 14. Lock-up Is Not Released, <u>AT-242</u> , "14. <u>Lock-up Is Not Released"</u> .		AT
		□ 15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3), AT-243, "15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3)". Part-2	AT-80,	D
		□ 16. Vehicle Does Not Start From D1 , <u>AT-244, "16. Vehicle Does Not Start From D1"</u> . □ 9. A/T Does Not Shift: D1 \rightarrow D2 Or Does Not Kickdown: D4 \rightarrow D2 , <u>AT-233, "9. A/T Does Not Shift: D1 \rightarrow D2 Or Does Not Kickdown: D4 \rightarrow D2" . □ 10. A/T Does Not Shift: D2 \rightarrow D3 , <u>AT-235, "10. A/T Does Not Shift: D2 \rightarrow D3" .</u></u>	"Cruise Test — Part 2"	Е
		□ 11. A/T Does Not Shift: D ₃ →D ₄ , <u>AT-237, "11. A/T Does Not Shift: D₃ → D₄"</u> .		F
4. (cont'd)	4-3 . (cont'd)	Part-3 □ 17. A/T Does Not Shift: D4 →D3 When Overdrive Control Switch "ON" → "OFF", AT-246, "17. A/T Does Not Shift: D4 → D3 When Overdrive Control Switch "ON" → "OFF", AT-246, "17.	AT-82, "Cruise Test — Part 3"	
		A/T Does Not Shift: D4 → D3, When Overdrive Control Switch "ON" → "OFF" . □ 15. Engine Speed Does Not Return To Idle (Engine Brake In D3), AT-243, "15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3)". □ 18. A/T Does Not Shift: D3 → 22, When Selector Lever "D" → "2" Position, AT-247, "18. A/T		G
		Does Not Shift: D ₃ → 2 ₂ , When Selector Lever "D" → "2" Position". □ 15. Engine Speed Does Not Return To Idle (Light Braking D ₄ → D ₂), AT-243, "15. Engine Speed Does Not Return To Idle (Light Braking D ₄ → D ₃)". □ 19. A/T Does Not Shift: 2 ₂ → 1 ₁ , When Selector Lever "2" → "1" Position, AT-248, "19. A/T		Н
		Does Not Shift: 22 → 11, When Selector Lever "2" → "1" Position". □ 20. Vehicle Does Not Decelerate By Engine Brake, AT-249, "20. Vehicle Does Not Decelerate By Engine Brake". □ SELF-DIAGNOSTIC PROCEDURE — Mark detected items.		I
		□ PNP switch, AT-115, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH".		J
		☐ A/T fluid temperature sensor, <u>AT-120, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT"</u> .		
		□ Vehicle speed sensor·A/T (Revolution sensor), AT-126, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)". □ Engine speed signal, AT-131, "DTC P0725 ENGINE SPEED SIGNAL".		K
		☐ Torque converter clutch solenoid valve, AT-159, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE".		L
		□ Line pressure solenoid valve, <u>AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</u> . □ Shift solenoid valve A, <u>AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"</u> .		
		□ Shift solenoid valve B, AT-183, "DTC P0755 SHIFT SOLENOID VALVE B". □ Throttle position sensor [accelerator pedal position (APP) sensor], AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]". □ Overrun clutch solenoid valve, AT-193, "DTC P1760 OVERRUN CLUTCH SOLENOID		M
		VALVE". □ PNP, overdrive control and throttle position sensor [accelerator pedal position (APP) sensor], AT-249. "21. TCM Self-diagnosis Does Not Activate {Park/neutral Position (PNP), Overdrive Control and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor]		
		Switches Circuit Checks}" □ A/T fluid temperature sensor and TCM power source, AT-197, "DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"		
		□ Vehicle speed sensor·MTR, AT-203, "DTC VHCL SPEED SEN·MTR VEHICLE SPEED SENSOR·MTR". □ Control unit (RAM), control unit (ROM), AT-211, "DTC CONTROL UNIT (RAM), CONTROL UNIT (ROM)".		
		☐ Control unit (EEP ROM), AT-213, "DTC CONTROL UNIT (EEP ROM)" . ☐ Battery ☐ Others		

[RE4F03B]

5.	☐ For self-diagnosis NG items, inspect each component. Repair or replace the damaged parts.	AT-43. "SELF-DIAG- NOSTIC RESULT TEST MODE"			
6.	□ Perform all ROAD TEST and re-mark required procedures.				
7.	□ Perform DTC CONFIRMATION PROCEDURE for following MIL indicating items and check out NG items. Refer to EC-143, "DTC & SRT CONFIRMATION MODE".				
	□ DTC (P0731), AT-135, "DTC P0731 A/T 1ST GEAR FUNCTION". □ DTC (P0732), AT-140, "DTC P0732 A/T 2ND GEAR FUNCTION". □ DTC (P0733), AT-145, "DTC P0733 A/T 3RD GEAR FUNCTION". □ DTC (P0734), AT-150, "DTC P0734 A/T 4TH GEAR FUNCTION". □ DTC (P0744), AT-163, "DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)".				
8.	□ Perform the Diagnostic Procedures for all remaining items marked NG. Repair or replace the damaged parts. Refer to the Symptom Chart when you perform the procedures. (The chart also shows some other possible symptoms and the component inspection orders.)	AT-43, "SELF-DIAG- NOSTIC RESULT TEST MODE" AT-84, "Symptom Chart"			
9.	☐ Erase DTC from TCM and ECM memories.	AT-40, "HOW TO ERASE DTC"			

Work Flow HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

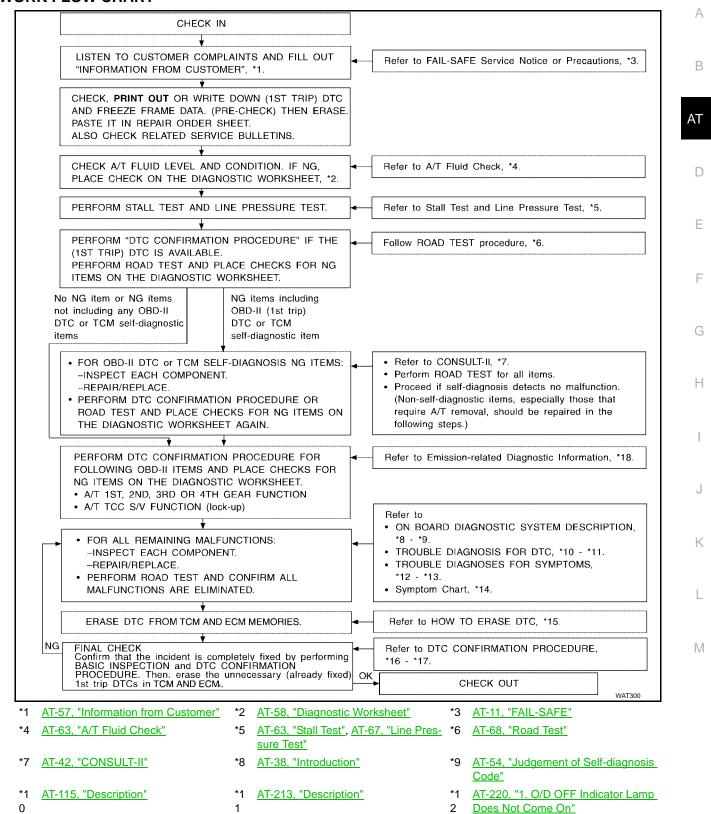
ECS005WH

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate. In general, each customer feels differently about a problem. It is important to fully understand the symptoms or conditions for a customer complaint.

Make good use of the two sheets provided, "Information from Customer" (AT-57, "Information from Customer") and "Diagnostic Worksheet" (AT-58, "Diagnostic Worksheet"), to perform the best troubleshooting possible.

[RE4F03B]

WORK FLOW CHART



[RE4F03B]

*1	AT-249, "21. TCM Self-diagnosis	*1	AT-84, "Symptom Chart"	*1	AT-40, "HOW TO ERASE DTC"
3	Does Not Activate {Park/neutral	4		5	
	Position (PNP), Overdrive Control				
	and Throttle Position Sensor [Accel-				
	erator Pedal Position (APP) Sensor]				
	Switches Circuit Checks}"				
*1	AT-115, "DIAGNOSTIC TROUBLE	*1	AT-213, "DIAGNOSTIC TROUBLE	*1	EC-52, "EMISSION-RELATED
6	CODE (DTC) CONFIRMATION	7	CODE (DTC) CONFIRMATION	8	DIAGNOSTIC INFORMATION
	PROCEDURE"		PROCEDURE"		<u>ITEMS"</u> .

TROUBLE DIAGNOSIS — BASIC INSPECTION

[RE4F03B]

TROUBLE DIAGNOSIS — BASIC INSPECTION

PFP:00000

A/T Fluid Check **FLUID LEAKAGE CHECK**

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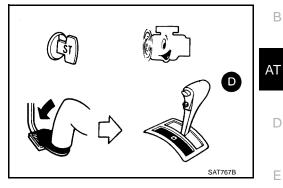
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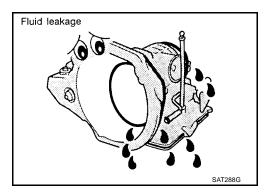
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- Clean area suspected of leaking, for example, mating surface of converter housing and transmission case.
- Start engine, apply foot brake, place selector lever in "D" posi-2. tion and wait a few minutes.
- Stop engine.



4. Check for fresh leakage.



FLUID CONDITION CHECK

Fluid color	Suspected problem
Dark or black with burned odor	Wear of frictional material
Milky pink	Water contamination — Road water entering through filler tube or breather
Varnished fluid, light to dark brown and tacky	Oxidation — Over or under filling, — Overheating



FLUID LEVEL CHECK

Refer to MA-31, "Checking A/T Fluid".

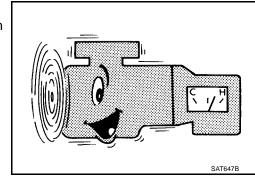
Stall Test STALL TEST PROCEDURE

ECS005W.I

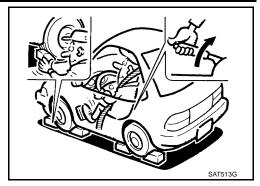
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- Check A/T fluid and engine oil levels. If necessary, add.
- Drive vehicle for approx. 10 minutes or until fluid and oil reach operating temperature.

ATF operating tempera- : 50 - 80°C (122 - 176°F) ture



- Set parking brake and block wheels.
- 4. Install a tachometer where it can be seen by driver during test.
 - It is good practice to mark the point of specified engine rpm on indicator.

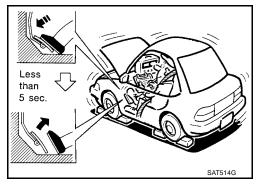


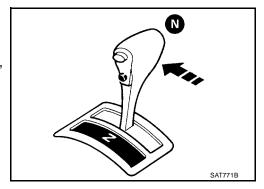
- 5. Start engine, apply foot brake, and place selector lever in "D" position.
- Accelerate to wide open throttle gradually while applying foot brake.
- 7. Quickly note the engine stall revolution and immediately release throttle.
 - During test, never hold throttle wide open for more than 5 seconds.

Stall revolution

QG18DE : 2,350 - 2,800 rpm

- 8. Move selector lever to "N" position.
- 9. Cool off ATF.
 - Run engine at idle for at least one minute.
- Repeat steps 5 through 9 with selector lever in "2", "1" and "R" positions.





JUDGEMENT OF STALL TEST

The test result and possible damaged components relating to each result are shown in the illustrations that follow.

In order to pinpoint the possible damaged components, follow the "Work Flow" shown in <u>AT-60, "Work Flow"</u> . **NOTE:**

Stall revolution is too high in "D", "2" or "1" position:

- Slippage occurs in 1st gear but not in 2nd and 3rd gears..... Low one-way clutch slippage
- Slippage occurs in the following gears:
 - 1st through 3rd gears in "D" position and engine brake functions with overdrive control switch set to "OFF".

1st and 2nd gears in "2" position and engine brake functions with accelerator pedal released (fully closed throttle)...... Forward clutch or forward one-way clutch slippage

Stall revolution is too high in R position:

- Engine brake does not function in "1" position..... Low & reverse brake slippage
- Engine brake functions in "1" position..... Reverse clutch slippage

Stall revolution within specifications:

 Vehicle does not achieve speed of more than 80 km/h (50 MPH)..... One-way clutch seizure in torque converter housing

CAUTION:

Be careful since automatic fluid temperature increases abnormally.

Slippage occurs in 3rd and 4th gears in "D" position...... High clutch slippage

TROUBLE DIAGNOSIS — BASIC INSPECTION

[RE4F03B]

- Slippage occurs in 2nd and 4th gear in "D" position..... Brake band slippage
- Engine brake does not function in 2nd and 3rd gears in "D" position, 2nd gear in "2" position, and 1st gear in "1" position with overdrive control switch set to "OFF"...... Overrun clutch slippage

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Stall revolution less than specifications:

Poor acceleration during starts..... One-way clutch slippage in torque converter

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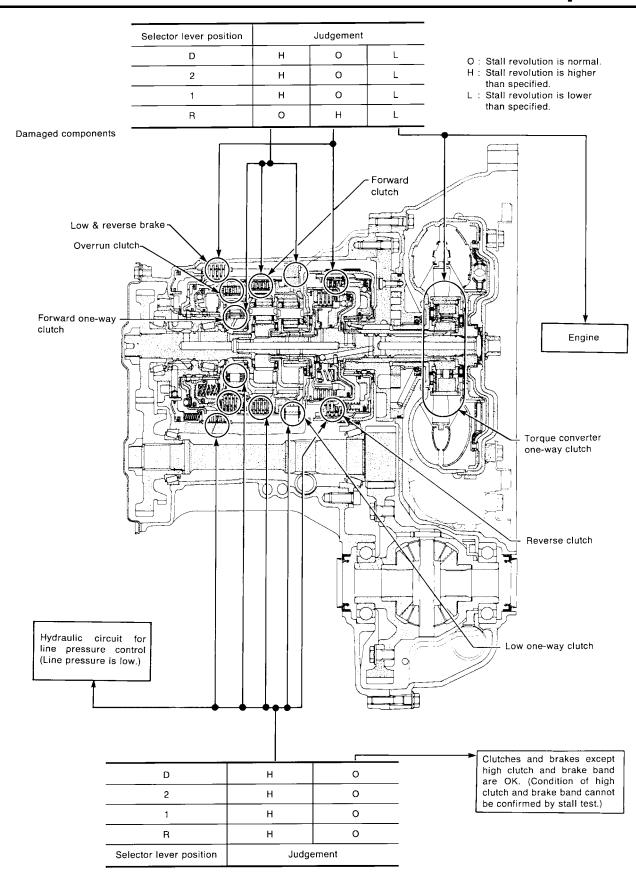
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TROUBLE DIAGNOSIS — BASIC INSPECTION

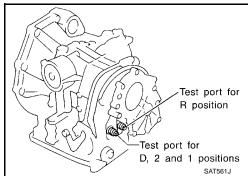
[RE4F03B]

ECS005WK

Line Pressure Test LINE PRESSURE TEST PORTS

Location of line pressure test ports are shown in the illustration.

 Always replace pressure plugs as they are self-sealing bolts.



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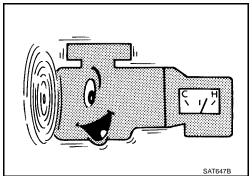
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LINE PRESSURE TEST PROCEDURE

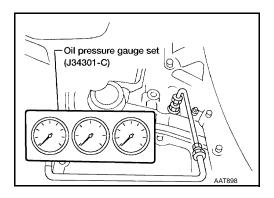
- Check A/T fluid and engine oil levels. If necessary, add fluid or oil.
- 2. Drive vehicle for approx. 10 minutes or until engine oil and ATF reach operating temperature.

ATF operating tempera- : 50 - 80°C (122 - 176°F) ture

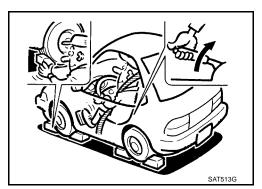


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3. Install pressure gauge to corresponding line pressure port.



- 4. Set parking brake and block wheels.
 - Continue to depress brake pedal fully while line pressure test is being performed at stall speed.



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- 5. Start engine and measure line pressure at idle and stall speed.
 - When measuring line pressure at stall speed, follow the stall test procedure.

Refer to AT-67, "Line Pressure Test".



JUDGEMENT OF LINE PRESSURE TEST

Judgement		Suspected parts		
At idle	Line pressure is low in particular position. Line pressure is low in particular position. Line pressure is high.	 Oil pump wear Control piston damage Pressure regulator valve or plug sticking Spring for pressure regulator valve damaged Fluid pressure leakage between oil strainer and pressure regulator valve Clogged strainer Fluid pressure leakage between manual valve and particular clutch For example, line pressure is: Low in "R" and "1" positions, but Normal in "D" and "2" positions. Therefore, fluid leakage exists at or around low and reverse brake circuit. Refer to AT-22, "CLUTCH AND BAND CHART" Maladjustment of throttle position sensor [accelerator pedal position (APP) sensor] A/T fluid temperature sensor damaged Line pressure solenoid valve sticking Short circuit of line pressure solenoid valve circuit Pressure modifier valve sticking Pressure regulator valve or plug sticking Open in dropping resistor circuit 		
At stall speed	Line pressure is low.	 Maladjustment of throttle position sensor [accelerator pedal position (APP) sensor] Line pressure solenoid valve sticking Short circuit of line pressure solenoid valve circuit Pressure regulator valve or plug sticking Pressure modifier valve sticking Pilot valve sticking 		

Road Test DESCRIPTION

ECS005WL

- The purpose of the test is to determine overall performance of the transmission and analyze causes of problems.
- The road test consists of the following three parts:
- 1. Check before engine is started
- 2. Check at idle

ROAD TEST PROCEDURE	
1. Check before engine is started.	
\Box	
2. Check at idle.	
\Box	
3. Cruise test.	
SAT78	36A

TROUBLE DIAGNOSIS — BASIC INSPECTION

[RE4F03B]

3. Cruise test

- Before road test, familiarize yourself with all test procedures and items to check.
- Conduct tests on all items until specified symptom is found. Troubleshoot items which check out No Good after road test. Refer to <u>AT-38</u>, "<u>ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION</u>" and <u>AT-215</u>, "TROUBLE DIAGNOSES FOR SYMPTOMS".



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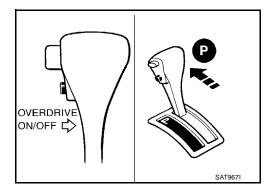
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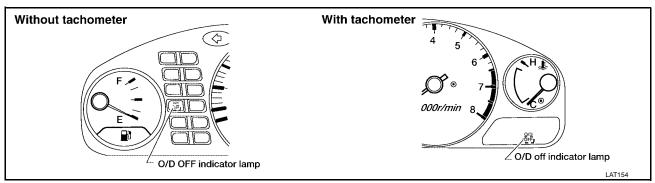
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1. CHECK BEFORE ENGINE IS STARTED

1. CHECK O/D OFF INDICATOR LAMP

- 1. Park vehicle on flat surface.
- 2. Move A/T selector lever to "P" position.
- 3. Turn ignition switch to "OFF" position. Wait at least 5 seconds.
- 4. Turn ignition switch to "ON" position. (Do not start engine.)
- 5. Does O/D OFF indicator lamp come on for about 2 seconds?





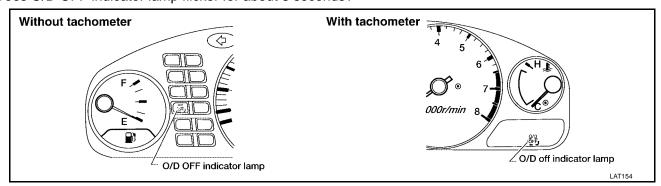
Yes or No

Yes >> GO TO 2.

No >> Stop ROAD TEST. Go to AT-220, "1. O/D OFF Indicator Lamp Does Not Come On".

2. CHECK O/D OFF INDICATOR LAMP

Does O/D OFF indicator lamp flicker for about 8 seconds?



Yes or No

Yes >> TCM is in fail-safe mode. Perform self-diagnosis and check NG items on the <u>AT-58, "Diagnostic Worksheet"</u>. Refer to <u>AT-51, "TCM Self-diagnostic Procedure (No Tools)"</u>.

No >> 1. Turn ignition switch to "OFF" position.

- 2. Perform self-diagnosis and note NG items. Refer to AT-51, "TCM Self-diagnostic Procedure (No Tools)" .
- 3. Go to AT-71, "2. CHECK AT IDLE".

TROUBLE DIAGNOSIS — BASIC INSPECTION

[RE4F03B]

2. CHECK AT IDLE

1. CHECK ENGINE START

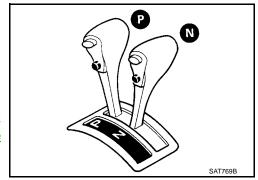
- 1. Park vehicle on flat surface.
- 2. Move A/T selector lever to "P" position.
- 3. Turn ignition switch to "OFF" position.
- 4. Turn ignition switch to "START" position.
- 5. Is engine started?

Yes or No

>> GO TO 2. Yes

No

>> Stop ROAD TEST. Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-222, "2. Engine Cannot Be Started In "P" and "N" Position".



2. CHECK ENGINE START

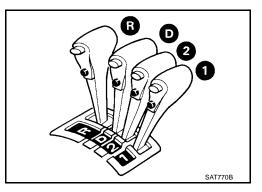
- Turn ignition switch to "ACC" position.
- 2. Move A/T selector lever to "D", "1", "2" or "R" position.
- Turn ignition switch to "START" position.
- 4. Is engine started?

Yes or No

Yes

>> Stop ROAD TEST. Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-222, "2. Engine Cannot Be Started In "P" and "N" Position".

>> GO TO 3. No



3. CHECK VEHICLE MOVE

- 1. Move A/T selector lever to "P" position.
- 2. Turn ignition switch to "OFF" position.
- 3. Release parking brake.

>> GO TO 4.



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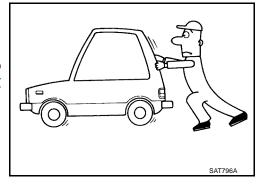
4. CHECK VEHICLE MOVE

- 1. Push vehicle forward or backward.
- 2. Does vehicle move when it is pushed forward or backward?
- 3. Apply parking brake.

Yes or No

Yes >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-223, "3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed" . Continue ROAD TEST.

No >> GO TO 5.



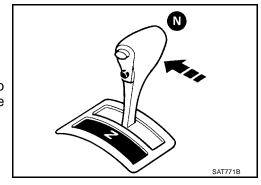
5. CHECK VEHICLE MOVE

- 1. Start engine.
- 2. Move A/T selector lever to "N" position.
- 3. Release parking brake.
- 4. Does vehicle move forward or backward?

Yes or No

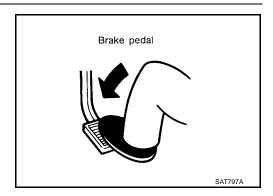
Yes >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-224, "4. In "N" Position, Vehicle Moves" . Continue ROAD TEST.

No >> GO TO 6.



6. CHECK SHIFT SHOCK

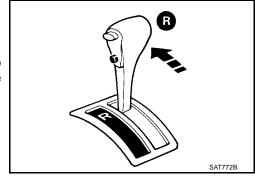
1. Apply foot brake.



- 2. Move A/T selector lever to "R" position.
- 3. Is there large shock when changing from "N" to "R" position? Yes or No

Yes >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-225, "5. Large Shock. "N" \rightarrow "R" Position" . Continue ROAD TEST.

No >> GO TO 7.



[RE4F03B]

7. CHECK VEHICLE MOVE

- Release foot brake for several seconds.
- 2. Does vehicle creep backward when foot brake is released?

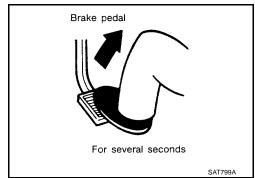
Yes or No

Yes :

>> GO TO 8.

No

>> Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-226, "6. Vehicle Does Not Creep Backward In "R" Position". Continue ROAD TEST.



8. CHECK VEHICLE MOVE

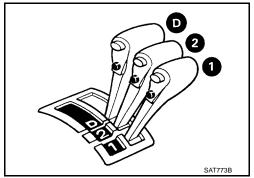
- 1. Move A/T selector lever to "D", "2" and "1" positions and check if vehicle creeps forward.
- 2. Does vehicle creep forward in all three positions?

Yes or No

Yes >> Go to AT-73, "3. CRUISE TEST"

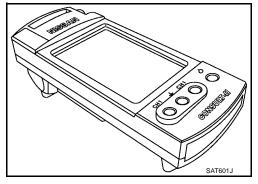
No

>> Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-228, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position". Continue ROAD TEST.



3. CRUISE TEST

 Check all items listed in Parts 1 through 3 of Diagnostic Worksheet.



(II) With CONSULT-II

- Using CONSULT-II, conduct a cruise test and record the result.
- Print the result and ensure that shifts and lock-ups take place as per Shift Schedule.

CONSULT-II Setting Procedure

CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carries out CAN communication.

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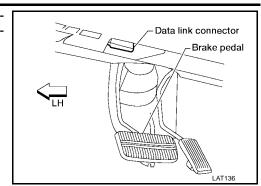
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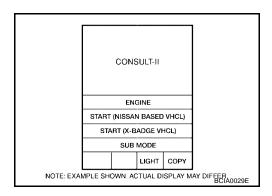
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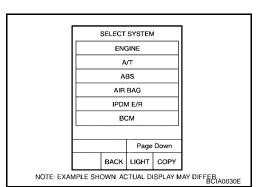
 With the ignition switch OFF, connect CONSULT-II and CON-SULT-II CONVERTER to the data link connector, then turn ignition switch ON.



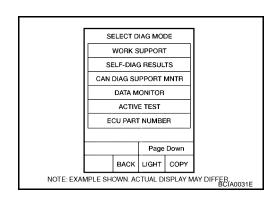
2. Touch "START (NISSAN BASED VHCL)".



3. Touch "A/T".



Touch "DATA MONITOR".



[RE4F03B]

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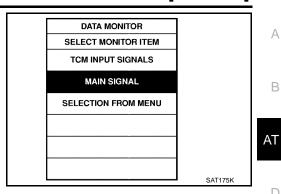
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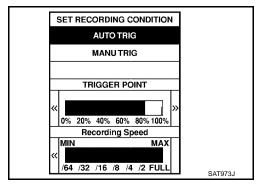
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- Touch "MAIN SIGNALS" or "TCM INPUT SIGNALS".
- See "Numerical Display", "Barchart Display" or "Line Graph Display".

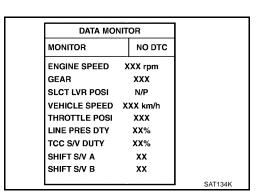


Touch "SETTING" to recording condition ("AUTO TRIG" or "MANU TRIG") and touch "BACK".

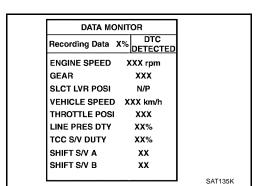
8. Touch "START".



9. When performing cruise test, touch "RECORD".

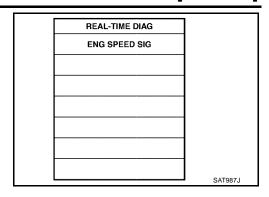


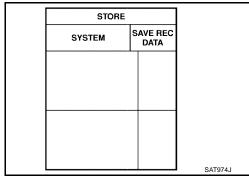
10. After finishing cruise test part 1, touch "STOP".



[RE4F03B]

11. Touch "STORE" and touch "BACK".



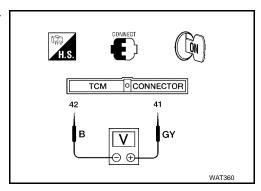


Trigger VHCL S/SEN S/SEN POSI SEN Km/h Km/h V

- 12. Touch "DISPLAY".
- 13. Touch "PRINT".
- 14. Check the monitor data printed out.
- 15. Continue cruise test part 2 and 3.

⊗ Without CONSULT-II

 Throttle position sensor can be checked by voltage across terminals 41 and 42 of TCM.



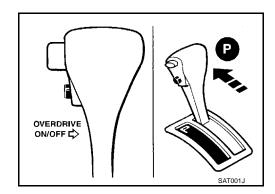
Cruise Test — Part 1

1. CHECK STARTING GEAR (D1) POSITION

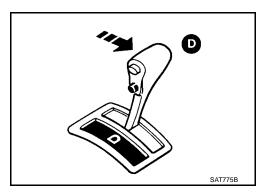
1. Drive vehicle for approx. 10 minutes to warm engine oil and ATF up to operating temperature.

ATF operating tempera- : 50 - 80°C (122 - 176°F) ture

- 2. Park vehicle on flat surface.
- 3. Set overdrive control switch to "ON" position.
- 4. Move A/T selector lever to "P" position.
- 5. Start engine.



6. Move A/T selector lever to "D" position.

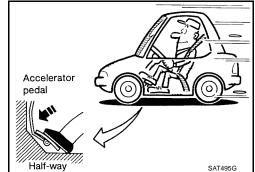


- 7. Accelerate vehicle by constantly depressing accelerator pedal halfway.
- 8. Does vehicle start from D1?
 - Read gear position.

Yes or No

Yes >> GO TO 2.

>> Go to AT-230, "8. Vehicle Cannot Be Started From D1" No Continue ROAD TEST.



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2. CHECK SHIFT UP (D1 TO D2)

Does A/T shift from D₁ to D₂ at the specified speed?

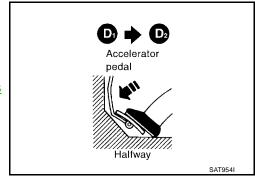
Read gear position, throttle opening and vehicle speed.

Specified speed when : Refer to AT-385, "Shift shifting from D1 to D2 Schedule".

Yes or No

Yes >> GO TO 3.

No >> Go to <u>AT-233</u>, "9. <u>A/T Does Not Shift: D1 \rightarrow D2 Or Does Not Kickdown: D4 \rightarrow D2" . Continue ROAD TEST.</u>



3. CHECK SHIFT UP (D2 TO D3)

Does A/T shift from D₂ to D₃ at the specified speed?

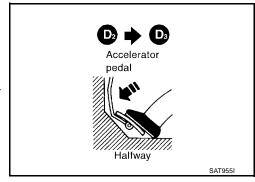
Read gear position, throttle position and vehicle speed.

Specified speed when : Refer to <u>AT-385, "Shift</u> shifting from D2 to D3 <u>Schedule"</u>.

Yes or No

Yes >> GO TO 4.

No >> Go to AT-235, "10. A/T Does Not Shift: $D_2 \rightarrow D_3$ " . Continue ROAD TEST.



4. CHECK SHIFT UP (D₃ TO D₄)

Does A/T shift from D₃ to D₄ at the specified speed?

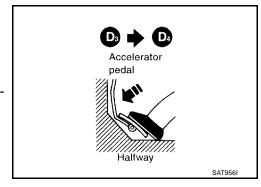
(III) Read gear position, throttle position and vehicle speed.

Specified speed when : Refer to <u>AT-385, "Shift</u> shifting from D3 to D4 : Schedule".

Yes or No

Yes >> GO TO 5.

No >> Go to <u>AT-237, "11. A/T Does Not Shift: D3 \rightarrow D4" . Continue ROAD TEST.</u>



[RE4F03B]

5. CHECK LOCK-UP (D4 TO D4 L/U)

Does A/T perform lock-up at the specified speed?

Read vehicle speed, throttle position when lock-up duty becomes 94%.

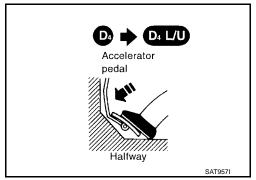
Specified speed when lock-up occurs

: Refer to AT-385, "Shift Schedule".

Yes or No

Yes >> GO TO 6.

Nο >> Go to AT-239, "12. A/T Does Not Perform Lock-up" . Continue ROAD TEST.



6. CHECK HOLD LOCK-UP

Does A/T hold lock-up condition for more than 30 seconds?

Yes or No

Yes >> GO TO 7.

No >> Go to AT-240, "13. A/T Does Not Hold Lock-up Condition" .

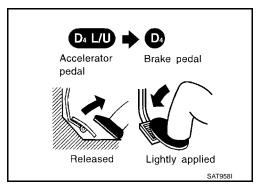
7. CHECK SHIFT DOWN (D4 L/U TO D4)

- 1. Release accelerator pedal.
- 2. Is lock-up released when accelerator pedal is released?

Yes or No

Yes >> GO TO 8.

>> Go to AT-242, "14. Lock-up Is Not Released" . Continue No ROAD TEST.



8. CHECK SHIFT DOWN (D4 TO D3)

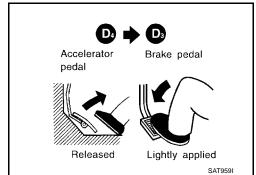
- 1. Decelerate vehicle by applying foot brake lightly.
- Does engine speed return to idle smoothly when A/T is shifted from D4 to D3? 2.
- Read gear position and engine speed.

Yes or No

Yes >> 1. Stop vehicle.

Go to AT-80, "Cruise Test — Part 2".

>> Go to AT-243, "15. Engine Speed Does Not Return To No Idle (Light Braking $D_4 \rightarrow D_3$)". Continue ROAD TEST.



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Cruise Test — Part 2

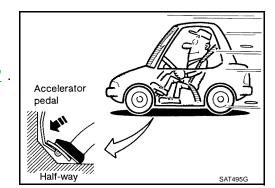
1. CHECK STARTING GEAR (D1) POSITION

- 1. Confirm overdrive control switch is in "ON" position.
- 2. Confirm A/T selector lever is in "D" position.
- 3. Accelerate vehicle by half throttle again.
- 4. Does vehicle start from D1?
- ® Read gear position.

Yes or No

Yes >> GO TO 2.

No >> Go to <u>AT-244, "16. Vehicle Does Not Start From D1"</u>. Continue ROAD TEST.



$2. \ \text{CHECK SHIFT UP AND SHIFT DOWN (D3 TO D4 TO D2)}\\$

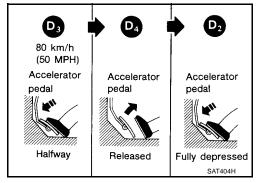
- 1. Accelerate vehicle to 80 km/h (50 MPH) as shown in illustration.
- 2. Release accelerator pedal and then quickly depress it fully.
- 3. Does A/T shift from D4 to D2 as soon as accelerator pedal is depressed fully?
- Read gear position and throttle position.

Yes or No

No

Yes >> GO TO 3.

>> Go to AT-233, "9. A/T Does Not Shift: D1 \rightarrow D2 Or Does Not Kickdown: D4 \rightarrow D2" . Continue ROAD TEST.



3. CHECK SHIFT UP (D2 TO D3)

Does A/T shift from D2 to D3 at the specified speed?

Read gear position, throttle position and vehicle speed.

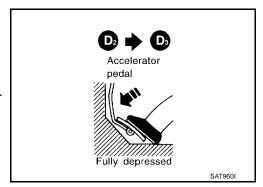
Specified speed when : Refer to AT-385, "Shift shifting from D2 to D3 Schedule".

Yes or No

No

Yes >> GO TO 4.

>> Go to AT-235, "10. A/T Does Not Shift: $D2 \rightarrow D3$ " . Continue ROAD TEST.



[RE4F03B]

4. CHECK SHIFT UP (D $_3$ TO D $_4$) AND ENGINE BRAKE

Release accelerator pedal after shifting from D2 to D3.

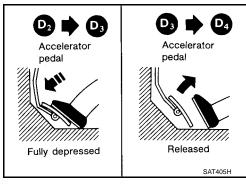
Does A/T shift from D₃ to D₄ and does vehicle decelerate by engine brake?

Read gear position, throttle position and vehicle speed. Yes or No

Yes >> 1. Stop vehicle.

2. Go to AT-82, "Cruise Test — Part 3".

No >> Go to AT-237, "11. A/T Does Not Shift: D3 \rightarrow D4" . Continue ROAD TEST.



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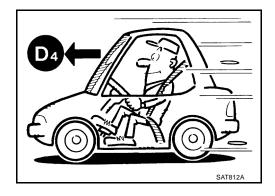
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Cruise Test — Part 3

1. VEHICLE SPEED D4 POSITION

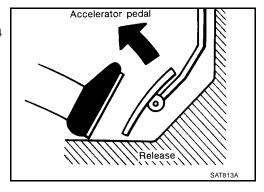
- 1. Confirm overdrive control switch is in "ON" position.
- 2. Confirm selector lever is in "D" position.
- 3. Accelerate vehicle using half-throttle to D4.

>> GO TO 2.



2. CHECK SHIFT DOWN (D4 TO D3)

- 1. Release accelerator pedal.
- 2. Set overdrive control switch to "OFF" position while driving in D4
- 3. Does A/T shift from D4 to D3 (O/D OFF)?



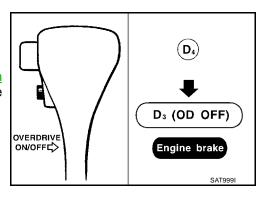
Read gear position and vehicle speed.

Yes or No

Yes >> GO TO 3.

No >> Go to AT-246, "17. A/T Does Not Shift: D4 \rightarrow D3 , When Overdrive Control Switch "ON" \rightarrow "OFF" . Continue

ROAD TEST.



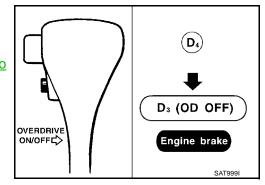
3. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

Yes >> GO TO 4.

No >> Go to AT-243, "15. Engine Speed Does Not Return To Idle (Light Braking $D_4 \rightarrow D_3$)". Continue ROAD TEST.



[RE4F03B]

4. CHECK SHIFT DOWN (D3 TO D2)

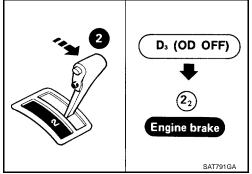
- 1. Move A/T selector lever from "D" to "2" position while driving in D3 (O/D OFF).
- 2. Does A/T shift from D3 (O/D OFF) to D2?
- Read gear position.

Yes or No

Yes >> GO TO 5.

No

>> Go to AT-247, "18. A/T Does Not Shift: D3 \to 22 , When Selector Lever "D" \to "2" Position" . Continue ROAD TEST.



5. CHECK ENGINE BRAKE

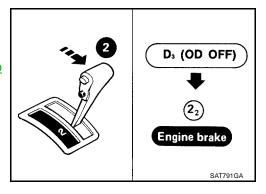
Does vehicle decelerate by engine brake?

Yes or No

Yes >> GO TO 6.

No >> Go to A

>> Go to AT-243, "15. Engine Speed Does Not Return To Idle (Light Braking D4 \rightarrow D3)" . Continue ROAD TEST.



6. CHECK SHIFT DOWN

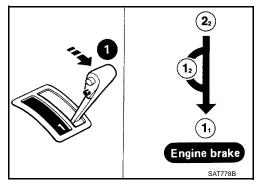
- 1. Move A/T selector lever from "2" to "1" position while driving in 22.
- 2. Does A/T shift from 22 to 11 position?
- Read gear position.

Yes or No

Yes >> GO TO 7.

No

>> Go to AT-248, "19. A/T Does Not Shift: $22 \to 11$, When Selector Lever "2" \to "1" Position" . Continue ROAD TEST.



7. CHECK ENGINE BRAKE

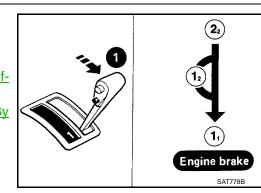
Does vehicle decelerate by engine brake?

Yes or No

Yes >> 1. Stop vehicle.

2. Perform self-diagnosis. Refer to <u>AT-51, "TCM Self-diagnostic Procedure (No Tools)"</u>.

No >> Go to AT-249, "20. Vehicle Does Not Decelerate By Engine Brake" . Continue ROAD TEST.



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[RE4F03B]

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION Symptom Chart

PFP:00000

ECS005WM

Numbers are arranged in order of inspection.

Perform inspections starting with number one and work up.

				Reference	Page
Items	Symptom	Condition	Diagnostic Item	QG18DE (SULEV)	QG18DE (ULEV)
	Engine cannot start in "P" and "N" positions.		Ignition switch and starter	PG-3, "POWI PLY ROUTII SC-9, "START TEM	NG" and ING SYS-
	AT-222, "2. Engine Cannot Be Started In "P" and "N"	ON vehicle	2. Control cable adjustment	AT-262, "Cont Adjustm	
Not Used	Position"		3. PNP switch adjustment	AT-262, "Parl Position (PNF Adjustm	P) Switch
	Engine starts in position other than "N" and "P" posi-		Control cable adjustment	AT-262, "Cont Adjustm	
	tions. AT-222, "2. Engine Cannot Be Started In "P" and "N" Position"	ON vehicle	2. PNP switch adjustment	AT-262, "Part Position (PNF Adjustm	P) Switch
	Transaxle noise in "P" and "N" positions.	ON vehicle	1. Fluid level	AT-63, "FLUII CHEC	
			2. Line pressure test	AT-67, "Line Test	
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DT(THROTTLE P SENSOR [AC TOR PEDAI TION (APP) S	CELERA- L POSI-
Not Used			4. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-126. "DTU VEHICLE SPE SOR-A/T (RI TION SENSO 203. "DTC SPEED SE VEHICLE SPE SOR-M	EED SEN- EVOLU- DR)", AT- VHCL N-MTR EED SEN-
		OFF vehicle	5. Oil pump	AT-292, "Com	nponents"
		3.1 VOINOIO	6. Torque converter	AT-272, "Disa	ssembly"

[RE4F03B]

				[112-11-00
				Reference Page
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
	Vehicle moves when changing into "P" position,	ON vehicle	Control cable adjustment	AT-262, "Control Cable Adjustment"
	or parking gear does not disengage when shifted out of "P" position. AT-223, "3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed"	OFF vehicle	2. Parking components	AT-267, "Components"
lot Used		ON vehicle	Control cable adjustment	AT-262, "Control Cable Adjustment"
	Vehicle moves in "N" position.		2. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
	AT-224, "4. In "N" Position, Vehicle Moves"	OFF vehicle	3. Reverse clutch	AT-313, "REVERSE CLUTCH"
			4. Overrun clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
		ON vehicle	Control cable adjustment	AT-262, "Control Cable Adjustment"
			2. Stall test	AT-63, "Stall Test"
			3. Line pressure test	AT-67, "Line Pressure Test"
			Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"
	Vehicle will not run in "R" position (but runs in "D", "2" and "1" positions). Clutch		5. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
Slips/Will Not Engage	slips. Very poor acceleration.		6. Reverse clutch	AT-313, "REVERSE CLUTCH"
	AT-226, "6. Vehicle Does Not Creep Backward In "R" Position"		7. High clutch	AT-318, "HIGH CLUTCH"
		OFF vehicle	8. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			9. Overrun clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			10. Low & reverse brake	AT-332, "LOW & REVERSE BRAKE"

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				Reference Page
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			2. Line pressure test	AT-67, "Line Pressure Test"
		ON vehicle	3. Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"
Not Used	Vehicle braked when shift-		4. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
Not Osed	ing into "R" position.		5. High clutch	AT-318, "HIGH CLUTCH"
			6. Brake band	AT-348, "Components"
		OFF vehicle	7. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			8. Overrun clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
	Sharp shock in shifting from "N" to "D" position.		Engine idling rpm	EC-79, "Idle Speed and Ignition Timing Check" and EC-80, "Idle Mixture Ratio Adjustment"
			2.Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
			3. Line pressure test	AT-67, "Line Pressure Test"
Shift Shock		ON vehicle	4. A/T fluid temperature sensor	AT-120, "DTC P0710 A/ T FLUID TEMPERA- TURE SENSOR CIR- CUIT"
			5. Engine speed signal	AT-131, "DTC P0725 ENGINE SPEED SIG- NAL"
			6. Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"
			7. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
			8. Accumulator N-D	AT-297, "Components"
		OFF vehicle	9. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
	Not Used	Not Used Vehicle braked when shifting into "R" position.	Not Used Vehicle braked when shifting into "R" position. OFF vehicle Shift Shock Sharp shock in shifting from "N" to "D" position. ON vehicle	Not Used Vehicle braked when shifting into "R" position. Vehicle braked when shifting into "R" position. OFF vehicle Shift Shock Sharp shock in shifting from "N" to "D" position. Shift Shock Shift Shock Shift Shock Sharp shock in shifting from "N" to "D" position. ON vehicle 1. Fluid level 2. Line pressure solenoid valve 4. Control valve assembly 5. High clutch 6. Brake band 7. Forward clutch 1. Engine idling rpm 2. Throttle position sensor [accelerator pedal position (APP) sensor] 3. Line pressure test 4. A/T fluid temperature sensor 5. Engine speed signal 6. Line pressure solenoid valve 7. Control valve assembly 8. Accumulator N-D

[RE4F03B]

				Reference Page
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
	Vehicle will not run in "D" and "2" positions (but runs	ON vehicle	Control cable adjustment	AT-262, "Control Cable Adjustment"
	in "1" and "R" positions).	OFF vehicle	2. Low one-way clutch	AT-267, "Components"
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			2. Stall test	AT-63, "Stall Test"
	Vehicle will not run in "D", "1", "2" positions (but runs in "R" position). Clutch slips. Very poor accelera- tion.	ON vehicle	3. Line pressure test	AT-67, "Line Pressure Test"
Slips/Will Not			Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"
Engage			5. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
			6. Accumulator N-D	AT-297, "Components"
			7. Reverse clutch	AT-313, "REVERSE CLUTCH"
			8. High clutch	AT-318, "HIGH CLUTCH"
		OFF vehicle	9. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			10. Forward one-way clutch	AT-337, "Components"
			11. Low one-way clutch	AT-267, "Components"

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				Reference Page
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			2. Control cable adjustment	AT-262, "Control Cable Adjustment"
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187. "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
			4. Line pressure test	AT-67, "Line Pressure Test"
			5. Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"
	Clutches or brakes slip somewhat in starting.	ON vehicle	6. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
			7. Accumulator N-D	AT-297, "Components"
Slips/Will Not			8. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
Engage			9. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"
			10. Overrun clutch solenoid	AT-193, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"
			11. Torque converter clutch solenoid valve	AT-159, "DTC P0740 TORQUE CON- VERTER CLUTCH SOLENOID VALVE"
			12. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
		OFF vehicle	13. Reverse clutch	AT-313, "REVERSE CLUTCH"
			14. Low & reverse brake	AT-332, "LOW & REVERSE BRAKE"
			15. Oil pump	AT-292, "OIL PUMP"
			16. Torque converter	AT-267, "Components"
Not Used	Excessive creep.	ON vehicle	Engine idling rpm	EC-79, "Idle Speed and Ignition Timing Check" and EC-80, "Idle Mixture Ratio Adjustment"

[RE4F03B]

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	Items	Symptom	Condition	Diagnostic Item	Reference Page QG18DE QG18DE (SULEV) (ULEV)
				1. Fluid level	AT-63, "FLUID LEVEL CHECK"
		No creep at all. AT-226, "6. Vehicle Does	ON vehicle	2. Line pressure test	AT-67, "Line Pressure Test"
	Slips/Will Not Engage	Not Creep Backward In "R" Position", AT-228, "7. Vehi-		3. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
	Engage	cle Does Not Creep Forward In "D", "2" Or "1" Position"	OFF vehicle	4. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
				5. Oil pump	AT-292, "OIL PUMP"
				6. Torque converter	AT-267, "Components"
		No Up Shift Failure to change gear from "D1 " to "D2 ".	ON vehicle	Control cable adjustment	AT-262, "Control Cable Adjustment"
				2. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
				3. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
	No Up Shift			4. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-126, "DTC P0720 VEHICLE SPEED SEN- SOR-A/T (REVOLU- TION SENSOR)", AT- 203, "DTC VHCL SPEED SEN-MTR VEHICLE SPEED SEN- SOR-MTR"
				5. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187. "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
			OFF vehicle	6. Brake band	AT-348, "Components"

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					Reference Page
	Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
				Control cable adjustment	AT-262, "Control Cable Adjustment"
				2. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"
				3. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
٨	No Up Shift	Failure to change gear from "D2" to "D3".	ON vehicle OFF vehicle	4. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-126. "DTC P0720 VEHICLE SPEED SEN- SOR·A/T (REVOLU- TION SENSOR)", AT- 203. "DTC VHCL SPEED SEN-MTR VEHICLE SPEED SEN- SOR·MTR"
				5. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
				6. High clutch	AT-318, "HIGH CLUTCH"
			7. Brake band	AT-348, "Components"	

[RE4F03B]

				Referen	ce Page
Items	Symptom	Condition	Diagnostic Item	QG18DE (SULEV)	QG18DE (ULEV)
			PNP switch adjustment	Position (P	ark/Neutral NP) Switch tment"
		ON vehicle	2. Overdrive control switch	diagnosis Activate {P Position (P drive Contro tle Positio [Accelerator tion (APF Switche	. TCM Self- Does Not Park/neutral PNP), Over- ol and Throt- on Sensor Pedal Posi- P) Sensor] es Circuit cks}"
			3. Shift solenoid valve A	SHIFT SO	OTC P0750 OLENOID /E A"
No Up Shift	Failure to change gear from "D3" to "D4".		4. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	VEHICLE S SOR-A/T I TION SEN 203, "DT SPEED S VEHICLE S	PEED SEN- (REVOLU- SOR)", AT- IC VHCL SEN-MTR PEED SEN- MTR"
			5. A/T fluid temperature sensor	T FLUID T	TC P0710 A/ TEMPERA- NSOR CIR- UIT"
			Throttle position sensor [accelerator pedal position (APP) sensor]	THROTTLE SENSOR [A TOR PED	POSITION ACCELERA- DAL POSI-) SENSOR!"
		OFF vehicle	7. Brake band	AT-348, "Co	omponents"

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				Reference Page
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
	Too high a goor change		Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
Improper Shift Timing	Too high a gear change point from "D1 " to "D2 ", from "D2 " to "D3 ", from "D3 " to "D4 ". AT-233, "9. A/T Does Not Shift: D1 → D2 Or Does Not Kickdown: D4 → D2", AT-235, "10. A/T Does Not Shift: D2 → D3", AT-237,	ON vehicle	2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-203, "DTC VHCL SPEED SEN-MTR VEHICLE SPEED SEN- SOR-MTR" or AT-126, "DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SEN- SOR)"
Ü	"11. A/T Does Not Shift: D3 → D4"		3. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
			4. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"
	Gear change directly from "D1" to "D3" occurs.	ON vehicle	1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			2. Accumulator servo release	AT-297, "Components"
		OFF vehicle	3. Brake band	AT-348, "Components"
		ON vehicle	Engine idling rpm	EC-79, "Idle Speed and Ignition Timing Check" and EC-80, "Idle Mixture Ratio Adjustment"
	Engine stops when shifting		2. Fluid level	AT-63, "FLUID LEVEL CHECK"
Not Used	lever into "R", "D", "2" and "1".		Torque converter clutch solenoid valve	AT-159, "DTC P0740 TORQUE CON- VERTER CLUTCH SOLENOID VALVE"
			4. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
		OFF vehicle	5. Torque converter	AT-267, "Components"
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
		ONL	2. Line pressure test	AT-67, "Line Pressure Test"
Shift Shock	Too sharp a shock in change from "D1" to "D2".	ON vehicle	3. Accumulator servo release	AT-297, "Components"
	cnange from "D1 " to "D2 ".		4. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
			5. A/T fluid temperature sensor	AT-120, "DTC P0710 A/ T FLUID TEMPERA- TURE SENSOR CIR- CUIT"
	1			AT-348, "Components"

[RE4F03B]

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					Reference Page
	Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
				Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
			ON vehicle	2. Line pressure test	AT-67, "Line Pressure Test"
	Shift Shock	Too sharp a shock in change from "D2" to "D3".		3. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
				A/T fluid temperature sensor	AT-120, "DTC P0710 A/ T FLUID TEMPERA- TURE SENSOR CIR- CUIT"
			OFF vehicle	5. High clutch	AT-318, "HIGH CLUTCH"
				6. Brake band	AT-348, "Components"
				Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
			ON vehicle	2. Line pressure test	AT-67, "Line Pressure Test"
	01.77.01	Too sharp a shock in		3. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
	Shift Shock	change from "D3" to "D4".		4. A/T fluid temperature sensor	AT-120, "DTC P0710 A/ T FLUID TEMPERA- TURE SENSOR CIR- CUIT"
				5. Brake band	AT-348, "Components"
				6. Forward one-way clutch	AT-324, "Components"
			OFF vehicle	7. Overrun clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"

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				Reference Page
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"
	Almost no shock or	ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
	clutches slipping in change from "D1" to "D2".		3. Line pressure test	AT-67, "Line Pressure Test"
			4. Accumulator servo release	AT-297, "Components"
			5. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
Slips/Will Not		OFF vehicle	6. Brake band	AT-348, "Components"
Engage	Almost no shock or slipping in change from "D2" to "D3".		1. Fluid level	AT-63, "FLUID LEVEL CHECK"
		ON vehicle OFF vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
			3. Line pressure test	AT-67, "Line Pressure Test"
			4. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
			5. High clutch	AT-318, "HIGH CLUTCH"
			6. Brake band	AT-348, "Components"
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"
Slips/Will Not Engage	Almost no shock or slipping in change from "D3" to "D4	ON vehicle	2.Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
—∵g∽g⊄	".		3. Line pressure test	AT-67, "Line Pressure Test"
			4. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
		OFF vehicle	5. Brake band	AT-348, "Components"

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				Reference Page
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
		ON vehicle	1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			2. Reverse clutch	AT-313, "REVERSE CLUTCH"
	Vehicle braked by gear change from "D1 " to "D2 ".	OFF vehicle	3. Low & reverse brake	AT-332, "LOW & REVERSE BRAKE"
			4. High clutch	AT-318, "HIGH CLUTCH"
			5. Low one-way clutch	AT-267, "Components"
Not Used	Vehicle braked by gear change from "D2" to "D3".	ON vehicle	1. Fluid level	AT-63, "FLUID LEVEL CHECK"
	change noin bz to bs .	OFF vehicle	2. Brake band	AT-348, "Components"
		ON vehicle	1. Fluid level	AT-63, "FLUID LEVEL CHECK"
	Vehicle braked by gear change from "D3" to "D4".	<u></u>	2. Overrun clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
		OFF vehicle	3. Forward one-way clutch	AT-337, "Components"
			4. Reverse clutch	AT-313, "REVERSE CLUTCH"

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					Reference Page
	Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
				1. Fluid level	AT-63, "FLUID LEVEL CHECK"
				2. PNP switch adjustment	AT-262, "Park/Neutral Position (PNP) Switch Adjustment"
				3. Overdrive control switch	AT-249, "21. TCM Self-diagnosis Does Not Activate {Park/neutral Position (PNP), Over-drive Control and Throt-tle Position Sensor [Accelerator Pedal Position (APP) Sensor Switches Circuit Checks}"
			ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
	Not Used	Maximum speed not attained. Acceleration poor.		5. Vehicle speed sensor · A/T (revolution sensor) and vehicle speed sensor · MTR	AT-126. "DTC P0720 VEHICLE SPEED SEN- SOR-A/T (REVOLU- TION SENSOR)"
				6. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
				7. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"
				8. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
		9. Reverse clutch	AT-313, "REVERSE CLUTCH"		
			10. High clutch	AT-318, "HIGH CLUTCH"	
			OFF vehicle	11. Brake band	AT-348, "Components"
				12. Low & reverse brake	AT-332, "LOW & REVERSE BRAKE"
				13. Oil pump	AT-292, "OIL PUMP"
				14. Torque converter	AT-267, "Components"

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				Reference Page
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV) (ULEV)
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			2.Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
		ON vehicle	Overrun clutch solenoid valve	AT-193, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"
	Failure to change gear from "D4" to "D3".		4. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
			5. Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"
			6. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
		OFF vehicle	7. Brake band	AT-348, "Components"
No Down Shift			8. Overrun clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
	Failure to change gear from "D3" to "D2" or from	ON vehicle	3. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
	"D4" to "D2".		4. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"
			5. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
		OFF vehicle	6. High clutch	AT-318, "HIGH CLUTCH"
			7. Brake band	AT-348, "Components"

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•					Reference Page
	Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
•				1. Fluid level	AT-63, "FLUID LEVEL CHECK"
				Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
	No Down	Failure to change gear from "D2" to "D1" or from	ON vehicle	3. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
	Shift	"D3 " to "D1 ".		4. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"
				5. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
				6. Low one-way clutch	AT-267, "Components"
			OFF vehicle	7. High clutch	AT-318, "HIGH CLUTCH"
				8. Brake band	AT-348, "Components"
		Gear change shock felt during deceleration by releasing accelerator pedal.	ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
	Shift Shock			2. Line pressure test	AT-67, "Line Pressure Test"
				Overrun clutch solenoid valve	AT-193, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"
				4. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
•		Too high a change point		Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
	Improper Shift Timing	from "D4" to "D3", from "D3" to "D2", from "D2" to "D1".	ON vehicle	2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-126. "DTC P0720 VEHICLE SPEED SEN- SOR-A/T (REVOLU- TION SENSOR)", AT- 203. "DTC VHCL SPEED SEN-MTR VEHICLE SPEED SEN- SOR-MTR"

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					Reference Page
	Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
				Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
	Kickdown does not operate when depressing pedal in "D4" within kickdown vehicle speed.	ON vehicle	Revolution sensor and vehicle speed sensor	AT-126, "DTC P0720 VEHICLE SPEED SEN- SOR-A/T (REVOLU- TION SENSOR)", AT- 203, "DTC VHCL SPEED SEN-MTR VEHICLE SPEED SEN- SOR-MTR"	
				3. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
	Improper Shift Timing 1. Vehicle (Revolution cle speed) Kickdown operates or engine overruns when depressing pedal in "D4" beyond kickdown vehicle 2. Throttle [acceleral]	4. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"		
		Kiekdown operator or		Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-126, "DTC P0720 VEHICLE SPEED SEN- SOR-A/T (REVOLU- TION SENSOR)", AT- 203. "DTC VHCL SPEED SEN-MTR VEHICLE SPEED SEN- SOR-MTR"
		ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"	
				3. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
				4. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"

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				Reference Page
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV) (ULEV)
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
		ON vehicle	3. Line pressure test	AT-67, "Line Pressure Test"
	Races extremely fast or slips in changing from "D4" to "D3" when depressing pedal.		Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"
	pedai.		5. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
			6. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
		OFF vehicle	7. Brake band	AT-348, "Components"
			8. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
Clina (M/III Not		ON vehicle	1. Fluid level	AT-63, "FLUID LEVEL CHECK"
Slips/Will Not Engage			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
			3. Line pressure test	AT-67, "Line Pressure Test"
			Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"
	Races extremely fast or slips in changing from "D4" to "D2" when depressing pedal.		5. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
		6. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"	
			7. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
			8. Brake band	AT-348, "Components"
		OFF vehicle	9. High clutch	AT-318, "HIGH CLUTCH"
			10. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"

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				Reference Page			
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)			
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"			
				Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA TOR PEDAL POSI- TION (APP) SENSOR]		
		ON vehicle	3. Line pressure test	AT-67, "Line Pressure Test"			
	Races extremely fast or slips in changing from "D3" to "D2" when depressing pedal.		4. Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"			
			5. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"			
			6. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"			
		OFF vehicle	7. Brake band	AT-348, "Components"			
			8. High clutch	AT-318, "HIGH CLUTCH"			
AACH NI	Races extremely fast or	ON vehicle	1. Fluid level	AT-63, "FLUID LEVEL CHECK"			
ips/Will Not ngage			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA TOR PEDAL POSI- TION (APP) SENSOR]			
			3. Line pressure test	AT-67, "Line Pressure Test"			
			ON vehicle	ON vehicle	ON vehicle	ON vehicle	4. Line pressure solenoid valve
	slips in changing from "D4" or "D3" to "D1" when depressing pedal.					5. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
			6. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"			
			7. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"			
		OFF vehicle	8. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"			
		OTT VOITIONS	9. Forward one-way clutch	AT-337, "Components"			
			10. Low one-way clutch	AT-267, "Components"			

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Items	Symptom	Condition	Diagnostic Item	Reference Page QG18DE QG18DE (SULEV) (ULEV)
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			2. Control cable adjustment	AT-262, "Control Cable Adjustment"
		ON vehicle	3. Line pressure test	AT-67, "Line Pressure Test"
Slips/Will Not	Vehicle will not run in any		4. Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"
Engage	position.		5. Oil pump	AT-292, "OIL PUMP"
			6. High clutch	AT-318, "HIGH CLUTCH"
		055 1:1	7. Brake band	AT-348, "Components"
		OFF vehicle	8. Low & reverse brake	AT-332, "LOW & REVERSE BRAKE"
			9. Torque converter	AT-267, "Components"
			10. Parking components	AT-267, "Components"
Not Used	Transmission noise in "D", "2", "1" and "R" positions.	ON vehicle	1. Fluid level	AT-63, "FLUID LEVEL CHECK"
		OFF vehicle	2. Torque converter	AT-267, "Components"
	Failure to change from "D3	OFF vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
No Down Shift	" to "22" when changing lever into "2" position. AT-247, "18. A/T Does Not Shift: D3 → 22, When		2. Shift solenoid valve B	AT-183, "DTC P0755 SHIFT SOLENOID VALVE B"
	Selector Lever "D" → "2" Position"		3. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
			4. Control cable adjustment	AT-262, "Control Cable Adjustment"
			5. Brake band	AT-348, "Components"
Improper Shift Timing	Gear change from "22" to	ON vehicle	PNP switch adjustment	AT-262, "Park/Neutral Position (PNP) Switch Adjustment"
	"23" in "2" position.		2. Control cable adjustment	AT-262, "Control Cable Adjustment"

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				Reference Page
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
			PNP switch adjustment	AT-262, "Park/Neutral Position (PNP) Switch Adjustment"
	Engine brake does not		2. Control cable adjustment	AT-262, "Control Cable Adjustment"
Not Used	operate in "1" position. AT-248, "19. A/T Does Not Shift: 22 → 11, When Selector Lever "2" → "1" Position" ON vehicle 3. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR ON vehicle 3. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-126, "DTC P0720 VEHICLE SPEED SEN- SOR·A/T (REVOLU- TION SENSOR)", AT- 203, "DTC VHCL SPEED SEN·MTR VEHICLE SPEED SEN- SOR·MTR"		
			4. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
	Not Used Engine brake does not operate in "1" position. AT-248, "19. A/T Does Not Shift: $22 \rightarrow 11$, When Selector Lever "2" \rightarrow "1" Position"	ON vehicle	5. Overrun clutch solenoid valve	AT-193, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"
Not Used		OFF vehicle	6. Overrun clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			7. Low & reverse brake	AT-332, "LOW & REVERSE BRAKE"
Improper Shift Timing	Gear change from "11" to "12" in "1" position.	ON vehicle	PNP switch adjustment	AT-262, "Park/Neutral Position (PNP) Switch Adjustment"
Tilling	12 III i position.		2. Control cable adjustment	AT-262, "Control Cable Adjustment"
		ON vehicle	Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-126, "DTC P0720 VEHICLE SPEED SEN- SOR-A/T (REVOLU- TION SENSOR)", AT- 203, "DTC VHCL SPEED SEN-MTR VEHICLE SPEED SEN- SOR-MTR"
No Down Shift	Does not change from "12" to "11" in "1" position.		2. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
			3. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
			4. Low one-way clutch	AT-267, "Components"
		OFF vehicle	5. Brake band	AT-348, "Components"
			6. Low & reverse brake	AT-332, "LOW & REVERSE BRAKE"
Shift Shock	Large shock changing from	ON vehicle	1. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
Shift Shock	"12" to "11" in "1" position.	OFF vehicle	2. Low & reverse brake	AT-332, "LOW &

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				Reference Page
Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			2. Engine idling rpm	EC-79, "Idle Speed and Ignition Timing Check" and EC-80, "Idle Mixture Ratio Adjustment"
		ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
			4. Line pressure test	AT-67, "Line Pressure Test"
			5. Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"
Not used	Transaxle overheats.		6. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
			7. Oil pump	AT-292, "OIL PUMP"
			8. Reverse clutch	AT-313, "REVERSE CLUTCH"
			9. High clutch	AT-318, "HIGH CLUTCH"
			10. Brake band	AT-348, "Components"
		OFF vehicle	11. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			12. Overrun clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			13. Low & reverse brake	AT-332, "LOW & REVERSE BRAKE"
			14. Torque converter	AT-267, "Components"

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Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)
		ON vehicle	1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			2. Reverse clutch	AT-313, "REVERSE CLUTCH"
			3. High clutch	AT-318, "HIGH CLUTCH"
	ATF shoots out during operation. White smoke		4. Brake band	AT-348, "Components"
	emitted from exhaust pipe during operation.	OFF vehicle	5. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			6. Overrun clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			7. Low & reverse brake	AT-332, "LOW & REVERSE BRAKE"
Not Used		ON vehicle	1. Fluid level	AT-63, "FLUID LEVEL CHECK"
			2. Torque converter	AT-267, "Components"
			3. Oil pump	AT-292, "OIL PUMP"
			4. Reverse clutch	AT-313, "REVERSE CLUTCH"
	Offensive smell at fluid		5. High clutch	AT-318, "HIGH CLUTCH"
	charging pipe.	OFF vohicle	6. Brake band	AT-348, "Components"
		OFF vehicle	7. Forward clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			8. Overrun clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"
			9. Low & reverse brake	AT-332, "LOW & REVERSE BRAKE"

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Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)			
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"			
			2. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-126, "DTC P0720 VEHICLE SPEED SEN- SOR·A/T (REVOLU- TION SENSOR)", AT- 203, "DTC VHCL SPEED SEN·MTR VEHICLE SPEED SEN- SOR·MTR"			
No Lockup Engagement/ TCC Inopera-	Torque converter is not locked up.	ON vehicle	3. Engine speed signal	AT-131, "DTC P0725 ENGINE SPEED SIG- NAL"			
tive						4. A/T fluid temperature sensor	AT-120, "DTC P0710 A/ T FLUID TEMPERA- TURE SENSOR CIR- CUIT"
			5. Line pressure test	AT-67, "Line Pressure Test"			
			Torque converter clutch solenoid valve	AT-159, "DTC P0740 TORQUE CON- VERTER CLUTCH SOLENOID VALVE"			
			7. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"			
		OFF vehicle	8. Torque converter	AT-267, "Components"			

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Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV)			
			1. Fluid level	AT-63, "FLUID LEVEL CHECK"			
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"			
		ONbisls	3. Line pressure test	AT-67, "Line Pressure Test"			
	Torque converter clutch piston slip.	ON vehicle	ON vehicle	ON vehicle	ON vehicle	Torque converter clutch solenoid valve	AT-159, "DTC P0740 TORQUE CON- VERTER CLUTCH SOLENOID VALVE"
			5. Line pressure solenoid valve	AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE"			
No Lockup			6. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"			
ingagement/ CC Inopera-		OFF vehicle	7. Torque converter	AT-267, "Components"			
ive	Lock-up point is extremely	ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"			
			2. Vehicle speed sensor·A/T (Revolution sensor) and vehi-	AT-126, "DTC P0720 VEHICLE SPEED SEN- SOR-A/T (REVOLU- TION SENSOR)", AT- 203, "DTC VHCL			
			cle speed sensor-MTR	SPEED SEN-MTR VEHICLE SPEED SEN- SOR-MTR"			
			Torque converter clutch solenoid valve	AT-159, "DTC P0740 TORQUE CON- VERTER CLUTCH SOLENOID VALVE"			
			4. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"			

AT-107 Revision: July 2004 2005 Sentra

ı					Reference Page
	Items	Symptom	Condition	Diagnostic Item	QG18DE QG18DE (SULEV) (ULEV)
	No Up Shift	A/T does not shift to "D4" when driving with overdrive control switch "ON".	ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-187, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERA- TOR PEDAL POSI- TION (APP) SENSOR]"
				2. PNP switch adjustment	AT-262, "Park/Neutral Position (PNP) Switch Adjustment"
				3. Overdrive control switch	AT-249. "21. TCM Self-diagnosis Does Not Activate {Park/neutral Position (PNP), Over-drive Control and Throt-tle Position Sensor [Accelerator Pedal Position (APP) Sensor] Switches Circuit Checks}"
				4. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-126, "DTC P0720 VEHICLE SPEED SEN- SOR-A/T (REVOLU- TION SENSOR)", AT- 203, "DTC VHCL SPEED SEN-MTR VEHICLE SPEED SEN- SOR-MTR"
				5. Shift solenoid valve A	AT-179, "DTC P0750 SHIFT SOLENOID VALVE A"
				Overrun clutch solenoid valve	AT-193, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"
				7. Control valve assembly	AT-297, "CONTROL VALVE ASSEMBLY"
				8. A/T fluid temperature sensor	AT-120, "DTC P0710 A/ T FLUID TEMPERA- TURE SENSOR CIR- CUIT"
				9. Line pressure test	AT-67, "Line Pressure Test"
			OFF vehicle	10. Brake band	AT-348, "Components"
				11. Overrun clutch	AT-324, "FORWARD CLUTCH AND OVER- RUN CLUTCH"

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[RE4F03B]

TCM Terminals and Reference Value PREPARATION

ECS005WN

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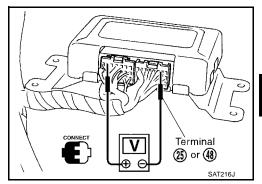
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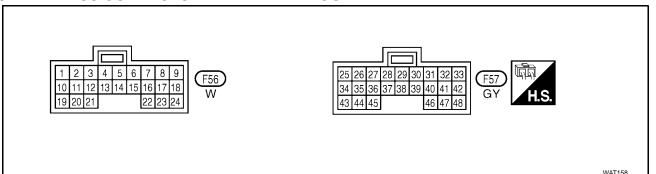
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 Measure voltage between each terminal and terminal 25 or 48 by following "TCM INSPECTION TABLE".



TCM HARNESS CONNECTOR TERMINAL LAYOUT



TCM INSPECTION TABLE

(Data are reference values.)

Termi- nal No.	Wire color	Item	Condition		Judgement stan- dard (Approx.)
1	R/W	Line pressure		When releasing accelerator pedal after warming up engine.	1.5 - 3.0V
'	IV/VV	solenoid valve	((Con))	When depressing accelerator pedal fully after warming up engine.	0V
2	D/D	Line pressure solenoid valve	857	When releasing accelerator pedal after warming up engine.	4 - 14V
2	P/B (with dropping resistor)	When depressing accelerator pedal fully after warming up engine.	0V		
				When A/T performs lock-up.	8 - 15V
3	Y/G	Torque converter clutch solenoid valve		When A/T does not perform lock-up.	ov
5	L	CAN-H	@n	_	_
6	Y	CAN-L	((Lon))	_	_
			- ()	When turning ignition switch to "ON".	Battery voltage
10	BR/R	Power source		When turning ignition switch to "OFF".	oV

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[RE4F03B]

					[KE4FU3D]
Termi- nal No.	Wire color	Item	Co	ondition	Judgement stan- dard (Approx.)
44	1 00/	Shift solenoid	:	When shift solenoid valve A operates. (When driving in "D1 " or "D4 ".)	Battery voltage
11	L/W	valve A		When shift solenoid valve A does not operate. (When driving in "D2" or "D3".)	OV
12	L/Y	Shift solenoid		When shift solenoid valve B operates. (When driving in "D1 " or "D2 ".)	Battery voltage
		valve B		When shift solenoid valve B does not operate. (When driving in "D3" or "D4".)	OV
			CON	When turning ignition switch to "ON".	Battery voltage
19	PU	OBD-II		When turning ignition switch to "OFF".	ov
				When overrun clutch solenoid valve operates.	Battery voltage
20	L/B	Overrun clutch solenoid valve		When overrun clutch solenoid valve does not operate.	0V
25	В	Ground		_	0V
		PNP switch "1"		When setting selector lever to "1" position.	Battery voltage
26	BR/Y	position		When setting selector lever to other positions.	0V
27	B/R	PNP switch "2"	AL C.	When setting selector lever to "2" position.	Battery voltage
21	D/IX	position		When setting selector lever to other positions.	0V
			// ~ \	When turning ignition switch to "OFF".	Battery voltage
28	R/B	Power source (Memory back-up)	or COFF)	When turning ignition switch to "ON".	Battery voltage
29	W	Revolution sensor		When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item.	150Hz
			,	When vehicle parks.	Under 1.3V or over 4.5V

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[RE4F03B]

					[RE4F03B]	
Termi- nal No.	Wire color	ltem		Condition	Judgement stan- dard (Approx.)	А
30 **	G/B	Data link connector Data link connector		_	_	В
31 **	GY/L	tor		_	_	
00	-	Throttle position		When turning ignition switch to "ON".	4.5 - 5.5V	AT
32	R	sensor (Power source)	A 5	When turning ignition switch to "OFF".	OV	
34	W/G	PNP switch "D"	(Con)	When setting selector lever to "D" position.	Battery voltage	D
04	W/G	position	% 3 1	When setting selector lever to other positions.	0V	Е
35	G/Y	PNP switch "R"		When setting selector lever to "R" position.	Battery voltage	
33	G/T	position		When setting selector lever to other positions.	OV	F
	1.0	PNP switch "N" or		When setting selector lever to "N" or "P" position.	Battery voltage	G
36	LG	"P" position		When setting selector lever to other positions.	OV	
39 *	L/OR	Engine speed signal		Refer to <u>EC-125</u> , <u>"ECM INSPEC-TION TABLE"</u> .	_	H
40	PU/R	Vehicle speed sensor		When moving vehicle at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more.	Voltage varies between less than 1V and more than 4.5V	J K
41 *	GY	Throttle position sensor		When depressing accelerator pedal slowly after warming up engine. (Voltage rises gradually in response to throttle position.)	Fully-closed throttle: 0.5 - 0.7V Fully-open throt- tle: 4V	L
42	B/W	Throttle position sensor (Ground)		_	0V	
47	BR	A/T fluid tempera-		When ATF temperature is 20°C (68°F).	1.5V	
		ture sensor		When ATF temperature is 80°C (176°F).	0.5V	
48	В	Ground		_	0V	

^{*:} This terminal is connected to the ECM.

^{**:} These terminals are connected to the Data link connector.

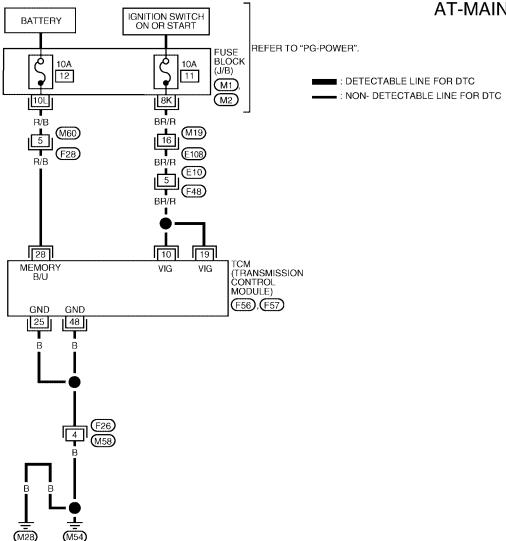
TROUBLE DIAGNOSIS FOR POWER SUPPLY

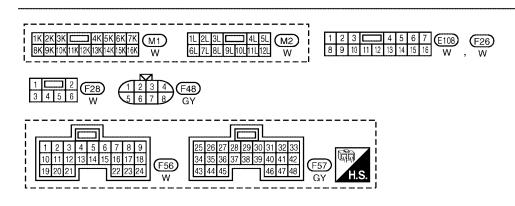
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ECS005WO

Wiring Diagram — AT — MAIN

AT-MAIN-01





TROUBLE DIAGNOSIS FOR POWER SUPPLY

[RE4F03B]

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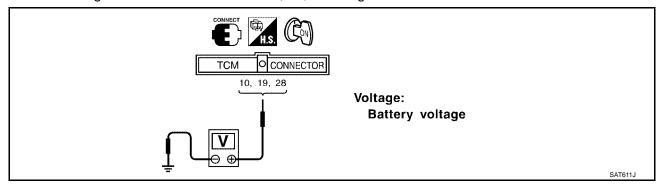
TERMINALS	AND REFI	ERENCE VALUE FOR TRANSMI	SSION CONTROL MODULE	_
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC) (Approx.)
10	BR/R	POWER SOURCE	WHEN TURNING IGNITION SWITCH TO "ON"	BATTERY VOLTAGE
10	DR/K	FOWER SOURCE	WHEN TURNING IGNITION SWITCH TO "OFF"	0V
19	BR/R	POWER SOURCE	WHEN TURNING IGNITION SWITCH TO "ON"	BATTERY VOLTAGE
19	DIVIC	FOWER SOURCE	WHEN TURNING IGNITION SWITCH TO "OFF"	0V
25	В	GROUND	_	0V
28	R/B	POWER SOURCE (MEMORY	WHEN TURNING IGNITION SWITCH TO "OFF"	BATTERY VOLTAGE
20	N/D	BACKUP)	WHEN TURNING IGNITION SWITCH TO "ON"	BATTERY VOLTAGE
48	В	GROUND		0V

Diagnostic Procedure

ECS005WP

1. CHECK TCM POWER SOURCE STEP 1

- 1. Turn ignition switch to ON position. (Do not start engine.)
- 2. Check voltage between TCM terminals 10, 19, 28 and ground.

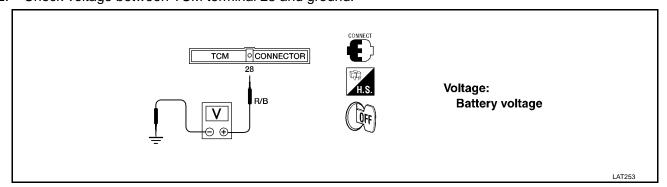


OK or NG

OK >> GO TO 2. NG >> GO TO 3.

2. CHECK TCM POWER SOURCE STEP 2

- Turn ignition switch to OFF position.
- 2. Check voltage between TCM terminal 28 and ground.



OK or NG

OK >> GO TO 4. NG >> GO TO 3.

TROUBLE DIAGNOSIS FOR POWER SUPPLY

[RE4F03B]

3. detect malfunctioning item

- Check the following items:
- Harness for short or open between ignition switch and TCM terminals 10, 19 and 28 (Main harness)
- Fuse
- Ignition switch

Refer to PG-3, "POWER SUPPLY ROUTING".

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. CHECK TCM GROUND CIRCUIT

- 1. Turn ignition switch to OFF position.
- 2. Disconnect TCM harness connector.
- 3. Check continuity between TCM terminals 25, 48 and ground. Refer to <u>AT-112, "Wiring Diagram AT MAIN"</u> .

Continuity should exist.

If OK, check harness for short to ground and short to power.

OK or NG

OK >> INSPECTION END

NG >> Repair open circuit or short to ground or short to power in harness connectors.

DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

[RE4F03B]

DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

Description

PFP:32006

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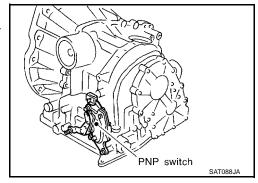
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ECS005WQ

- The PNP switch assembly includes a transmission range switch.
- The transmission range switch detects the selector lever position and sends a signal to the TCM.



ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)
① : PNP SW/CIRC ③ : P0705	TCM does not receive the correct voltage signal from the switch based on the gear position.	 Harness or connectors (The PNP switch circuit is open or shorted.) PNP switch

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

- With CONSULT-II
- 1. Turn ignition switch "ON".
- 2. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- 3. Start engine and maintain the following conditions for at least 5 consecutive seconds.

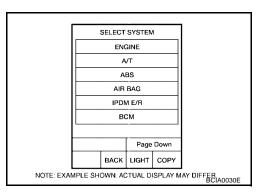
VHCL SPEED SE: 10 km/h (6 MPH) or more

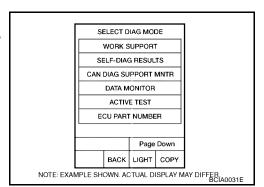
THRTL POS SEN: More than 1.3V

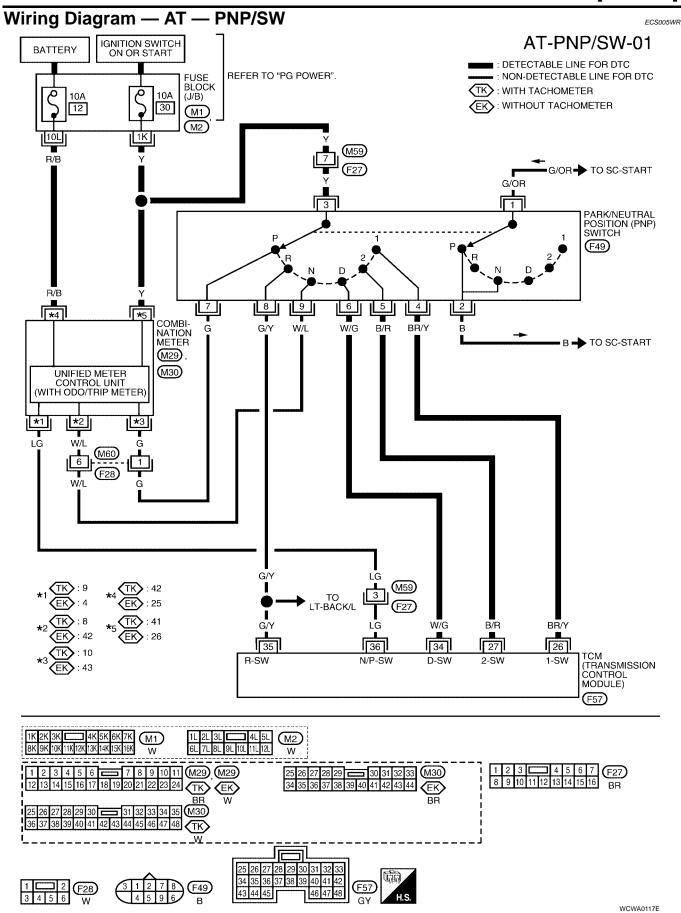
Selector lever: D position (OD "ON" or "OFF")

With GST

Follow the procedure "With CONSULT-II".







DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

[RE4F03B]

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ECS005WS

TCM TERMIN	NALS AND REFE	RENCE VALUE MEASURED BET	WEEN EACH TERMINAL AND GRO	UND
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
26	BR/Y	PNP SWITCH "1" POSITION	WHEN SETTING SELECTOR LEVER TO "1" POSITION	BATTERY VOLTAGE
20	DIV I	FINE SWITCH I FOSITION	WHEN SETTING SELECTOR LEVER TO OTHER POSITIONS	0V
27	B/R	PNP SWITCH "2" POSITION	WHEN SETTING SELECTOR LEVER TO "2" POSITION	BATTERY VOLTAGE
21	D/IX	FINE SWITCH 2 FOSITION	WHEN SETTING SELECTOR LEVER TO OTHER POSITIONS	0V
34	W/G	PNP SWITCH "D" POSITION	WHEN SETTING SELECTOR LEVER TO "D" POSITION	BATTERY VOLTAGE
J4	W/G	THI SWITCH B TOSITION	WHEN SETTING SELECTOR LEVER TO OTHER POSITIONS	0V
35	G/Y	PNP SWITCH "R" POSITION	WHEN SETTING SELECTOR LEVER TO "R" POSITION	BATTERY VOLTAGE
33	G/1	FINE SWITCH IN FOSITION	WHEN SETTING SELECTOR LEVER TO OTHER POSITIONS	0V
36	LG	PNP SWITCH "N" OR "P"	WHEN SETTING SELECTOR LEVER TO "N" OR "P" POSITION	BATTERY VOLTAGE
30	LG	POSITION	WHEN SETTING SELECTOR LEVER TO OTHER POSITIONS	oV

Diagnostic Procedure

1. CHECK PNP SWITCH CIRCUIT (WITH CONSULT-II)

(II) With CONSULT-II

- Turn ignition switch to "ON" position. (Do not start engine.)
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out "P/N", "R", "D", "2" and "1" position switches moving selector lever to each position. Check the signal of the selector lever position is indicated properly.

OK or NG

OK >> GO TO 3.

NG >> Check the following items:

- PNP switch Refer to AT-119, "Component Inspection".
- Harness for short or open between ignition switch and PNP switch (Main harness)
- Harness for short or open between PNP switch and TCM (Main harness)
- Ignition switch and fuse Refer to <u>PG-3</u>, "<u>POWER SUPPLY ROUTING</u>".

DATA MONITOR

MONITORING

PN POSI SW OFF

R POSITION SW OFF

D POSITION SW OFF

2 POSITION SW ON

1 POSITION SW OFF

SAT701J

2. CHECK PNP SWITCH CIRCUIT (WITHOUT CONSULT-II)

Without CONSULT-II

 Turn ignition switch to "ON" position. (Do not start engine.)

2. Check voltage between TCM terminals 26, 27, 34, 35, 36 and ground while moving selector lever through each position.

Lever position			Terminal No).	
	36	35	34	27	26
P, N	В	0	0	0	0
R	0	В	0	0	0
D	0	0	В	0	0
2	0	0	0	В	0
1	0	0	0	0	В

Voltage

B : Battery voltage

0 : 0V

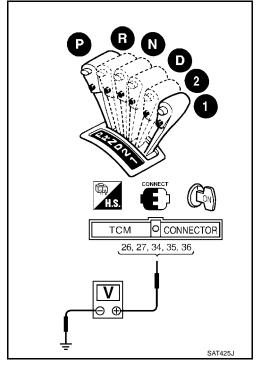
OK or NG

OK >> GO TO 3.

NG >> Check the following items:

 PNP switch Refer to <u>AT-119</u>, "Component Inspection".

- Harness for short or open between ignition switch and PNP switch (Main harness)
- Harness for short or open between PNP switch and TCM (Main harness)
- Ignition switch and fuse Refer to <u>PG-3</u>, "<u>POWER SUPPLY ROUTING</u>".



3. СНЕСК ОТС

Perform AT-115, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE".

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

[RE4F03B]

ECS005WT

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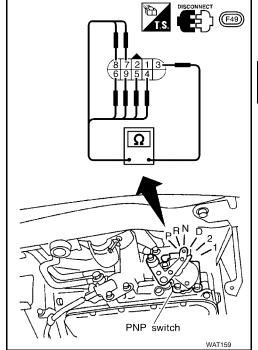
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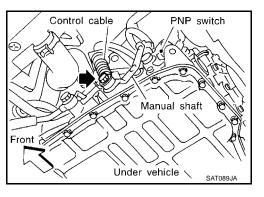
Component Inspection PARK/NEUTRAL POSITION SWITCH

1. Check continuity between terminals 1 and 2 and between terminals 3 and 4, 5, 6, 7, 8, 9 while moving manual shaft through each position.

Lever position	Termi	nal No.
Р	3 — 7	1 — 2
R	3 — 8	
N	3 — 9	1 — 2
D	3 — 6	
2	3 — 5	
1	3 — 4	



- 2. If NG, check again with control cable disconnected from manual shaft of A/T assembly. Refer to step 1.
- 3. If OK on step 2, adjust control cable. Refer to AT-262, "Control Cable Adjustment".
- 4. If NG on step 2, remove PNP switch from A/T and check continuity of PNP switch terminals. Refer to step 1.
- 5. If OK on step 4, adjust PNP switch. Refer to <u>AT-262, "Park/Neutral Position (PNP) Switch Adjustment"</u>.
- 6. If NG on step 4, replace PNP switch.



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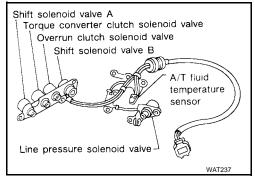
DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

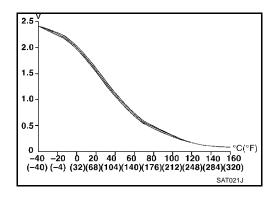
PFP:31940

Description

ECS005WU

The A/T fluid temperature sensor detects the A/T fluid temperature and sends a signal to the TCM.





CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	•	fication prox.)
A/T fluid temperature sensor	Cold [20°C (68°F)]	1.5V	2.5 kΩ
	↓	↓	↓
	Hot [80°C (176°F)]	0.5V	0.3 kΩ

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)	
(E): ATF TEMP SEN/CIRC	TCM receives an excessively low or high	Harness or connectors (The sensor circuit is open or shorted.)	
᠍ : P0710	voltage from the sensor.	A/T fluid temperature sensor	

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

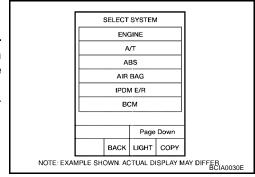
CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.



DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

[RE4F03B]

With CONSULT-II

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.

2. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)

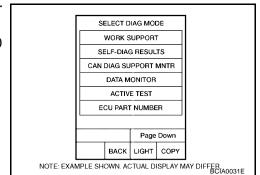
CMPS-RPM (REF): 450 rpm or more

VHCL SPEED SE: 10 km/h (6 MPH) or more

THRTL POS SEN: More than 1.2V Selector lever: D position (OD "ON")

With GST

Follow the procedure "With CONSULT-II".



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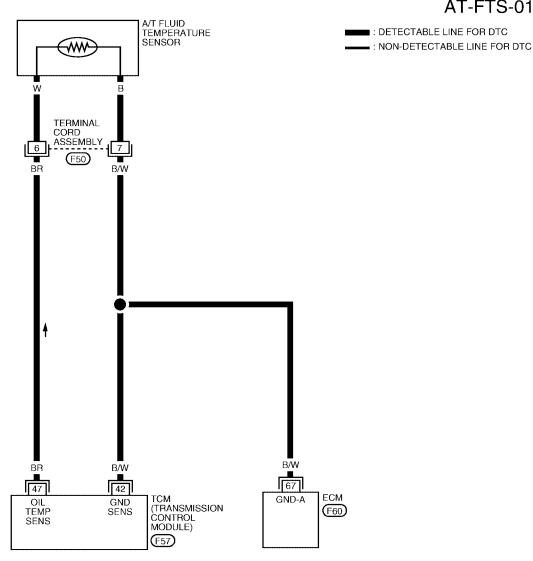
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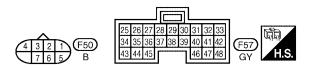
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Wiring Diagram — AT — FTS

ECS005WV

AT-FTS-01





REFER TO THE FOLLOWING. (F60) - ELECTRICAL UNITS

BCWA0245E

DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

[RE4F03B]

TERMINALS	AND REFEREN	CE VALUE MEASURED BETV	VEEN EACH TERMINAL	
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
42	B/W	SENSOR (GROUND)	_	0V
47	BR	A/T FLUID TEMPERATURE	WHEN ATF TEMPERATURE IS 20°C (68°F)	1.5V
47	BK	SENSOR	WHEN ATF TEMPERATURE IS 80°C (176°F)	0.5V

Diagnostic Procedure

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1. INSPECTION START

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 2.

No >> GO TO 3.

2. CHECK INPUT SIGNAL OF A/T FLUID TEMPERATURE SENSOR (WITH CONSULT-II)

(I) With CONSULT-II

- 1. Start engine.
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out the value of "FLUID TEMP SE".

DATA MONITOR	
MONITORING	
VHCL/S SE-A/T XXX km/h	
VHCL/S SE-MTR XXX km/h	
THRTL POS SEN XXX V	
FLUIDTEMP SE XXX V	
BATTERY VOLT XXX V	
	SAT

Voltage

Cold [20°C (68°F)] \rightarrow : Approximately 1.5V \rightarrow Hot [80°C (176°F)] 0.5V

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OK or NG

OK >> GO TO 4.

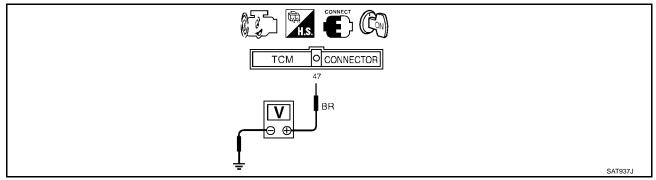
NG >> GO TO 5.

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$3.\,$ check input signal of a/t fluid temperature sensor (without consult-ii)

Without CONSULT-II

- 1. Start engine.
- 2. Check voltage between TCM terminal 47 and ground while warming up A/T.



Voltage

Cold [20°C (68°F)] \rightarrow : Approximately 1.5V \rightarrow Hot [80°C (176°F)] 0.5V

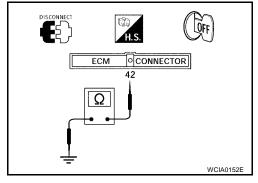
- 3. Turn ignition switch to "OFF" position.
- Disconnect TCM harness connector.
- 5. Check continuity between TCM harness connector F57 terminal 42 (B/W) and ground.

Continuity should exist.

If OK, check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4. NG >> GO TO 5.



4. CHECK DTC

Perform AT-120, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" .

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

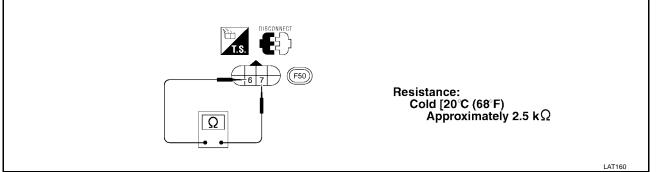
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

[RE4F03B]

5. CHECK A/T FLUID TEMPERATURE SENSOR WITH TERMINAL CORD ASSEMBLY

- 1. Turn ignition switch to "OFF" position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- 3. Check resistance between terminals 6 and 7 when A/T is cold.



4. Reinstall any part removed.

OK or NG

OK (With CONSULT-II)>> GO TO 2. OK (Without CONSULT-II)>> GO TO 3.

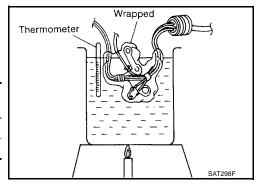
NG >> 1. Remove oil pan.

- 2. Check the following items:
- A/T fluid temperature sensor
 Refer to <u>AT-125, "Component Inspection"</u>.
- Harness of terminal cord assembly for short or open

Component Inspection A/T FLUID TEMPERATURE SENSOR

- For removal, refer to <u>AT-259</u>, "Control Valve Assembly and <u>Accumulators"</u>.
- Check resistance between two terminals while changing temperature as shown at left.

Temperature °C (°F)	Resistance (Approx.)
20 (68)	2.5 kΩ
80 (176)	0.3 kΩ



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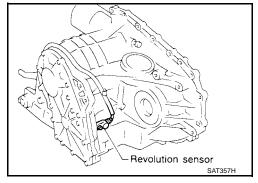
DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR)

PFP:32702

Description

ECS005WY

The revolution sensor detects the revolution of the idler gear parking pawl lock gear and emits a pulse signal. The pulse signal is sent to the TCM which converts it into vehicle speed.



ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)
(I): VEH SPD SEN/CIR AT	TCM does not receive the proper voltage signal from the sensor.	Harness or connectors (The sensor circuit is open or shorted.)
		Revolution sensor

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

- Always drive vehicle at a safe speed.
- Be careful not to rev engine into the red zone on the tachometer.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

- With CONSULT-II
- Turn ignition switch "ON" and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Drive vehicle and check for an increase of "VHCL/S SE-MTR" value increase.

If the check result is NG, go to <u>AT-126, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE"</u>.

If the check result is OK, go to following step.

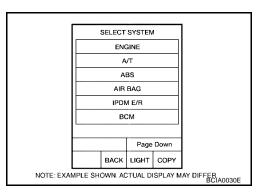
- Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- 4. Start engine and maintain the following conditions for at least 5 consecutive seconds.

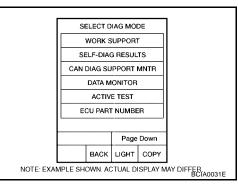
VHCL SPEED SE: 30 km/h (19 MPH) or more

THRTL POS SEN: More than 1.2V Selector lever: D position (OD "ON")

Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

If the check result is NG, go to AT-129, "Diagnostic Procedure".





DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR) [RE4F03B]

If the check result is OK, go to following step.

Maintain the following conditions for at least 5 consecutive seconds.

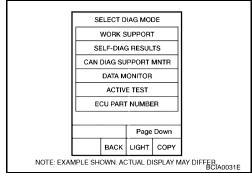
CMPS-RPM (REF): 3,500 rpm or more THRTL POS SEN: More than 1.2V Selector lever: D position (OD "ON")

Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions

required for this test.

With GST

Follow the procedure "With CONSULT-II".



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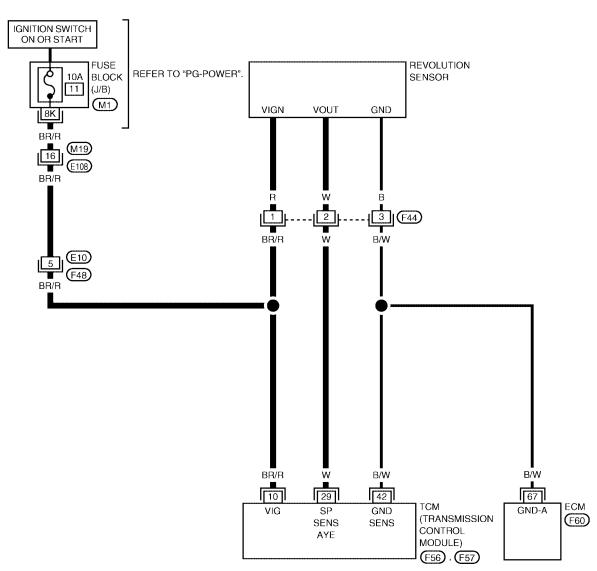
ı

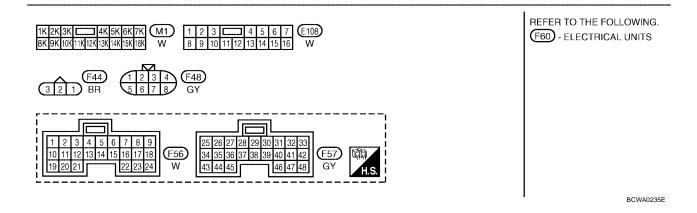
Wiring Diagram — AT — VSSA/T

ECS005WZ

AT-VSSA/T-01

: DETECTABLE LINE FOR DTC
: NON- DETECTABLE LINE FOR DTC





DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR) [RE4F03B]

TERMINALS	TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND GROUND					
TERMINAL	TERMINAL WIRE COLOR ITEM		CONDITION	DATA (DC)		
10	BR/R	POWER SOURCE	WHEN TURNING IGNITION SWITCH TO "ON"	BATTERY VOLTAGE		
10	DK/K	R/R POWER SOURCE	WHEN TURNING IGNITION SWITCH TO "OFF"	0V		
29	W	REVOLUTION SENSOR	WHEN MOVING AT 20 KM/H (12 MPH). USE CONSULT-II PULSE FREQUENCY MEASURING FUNCTION	150 Hz		
42 B/M		THROTTLE POSITION SENSOR (GROUND)	_	0V		

Diagnostic Procedure

ECS005X0

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1. CHECK INPUT SIGNAL (WITH CONSULT-II)

With CONSULT-II

- 1. Start engine.
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out the value of "VHCL/S SE-A/T" while driving. Check the value changes according to driving speed.

DAT	DATA MONITOR	
MONITO	1G	
VHCL/S SE-	Γ	XXX km/h
VHCL/S SE-	îR	XXX km/h
THRTL POS	ΞN	xxx v
FLUIDTEM	E	xxx v
BATTERY V	Г	xxx v

OK or NG

OK >> GO TO 3. NG >> GO TO 2.

2. CHECK REVOLUTION SENSOR (WITH CONSULT-II)

- (II) With CONSULT-II
- Start engine.

Condition	Judgement standard (Approx.)	
When moving at 20 km/h (12 MPH, use the CONSULT-II pulse frequency measuring function. *1 CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item.	150 Hz	
When vehicle is not moving	Under 1.3V or over 4.5V	
		WAT402

- Check harness for short or open between TCM, ECM and revolution sensor. Refer to <u>AT-128, "Wiring Diagram AT VSSA/T"</u>.
- Check harness for short or open between ignition switch and revolution sensor.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

Revision: July 2004 AT-129 2005 Sentra

DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR) [RE4F03B]

3. CHECK DTC

Perform AT-126, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE" .

OK or NG

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

DTC P0725 ENGINE SPEED SIGNAL

[RE4F03B]

DTC P0725 ENGINE SPEED SIGNAL

PFP:24825

Description

ECS005X1

The engine speed signal is sent from the ECM to the TCM.

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check item (Possible cause)
(E): ENGINE SPEED SIG	TCM does not receive the proper voltage	Harness or connectors
	signal from ECM.	(The sensor circuit is open or shorted.)

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

With CONSULT-II

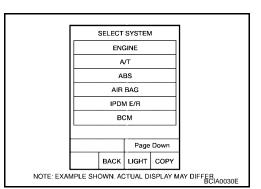
- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- 2. Start engine and maintain the following conditions for at least 10 consecutive seconds.

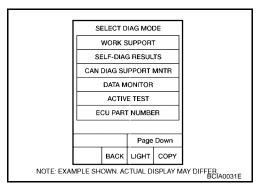
VHCL SPEED SE: 10 km/h (6 MPH) or more

THRTL POS SEN: More than 1.2V Selector lever: D position (OD "ON")

With GST

Follow the procedure "With CONSULT-II".





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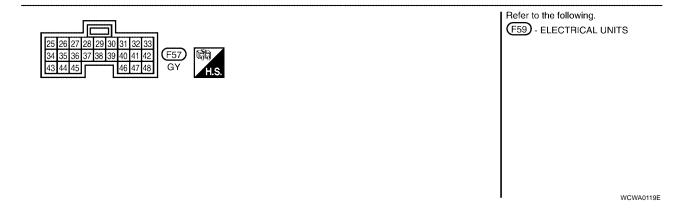
Wiring Diagram — AT — ENGSS

ECS005X2

AT-ENGSS-01







DTC P0725 ENGINE SPEED SIGNAL

[RE4F03B]

TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL					
TERMINAL WIRE COLOR ITEM CONDITION DATA (DC)					
39	L/OR	ENGINE SPEED SIGNAL	REFER TO ECM TABLE	_	

Diagnostic Procedure

ECS005X3

1. CHECK DTC WITH ECM

Perform diagnostic test mode II (self-diagnostic results) for engine control. Check ignition signal circuit condition.

OK or NG

OK (With CONSULT-II)>> GO TO 2.

OK (Without CONSULT-II)>> GO TO 3.

NG >> Check ignition signal circuit for engine control. Refer to <u>EC-30, "INPUT/OUTPUT SIGNAL CHART"</u>.

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

(III) With CONSULT-II

- 1. Start engine.
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out the value of "ENGINE SPEED".

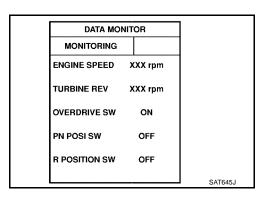
 Check engine speed changes according to throttle position.

OK or NG

OK >> GO TO 4.

NG

- >> Check the following items:
 - Harness for short or open between TCM and ECM
 - Resistor and ignition coil Refer to <u>EC-30</u>, "SYSTEM DESCRIPTION" .



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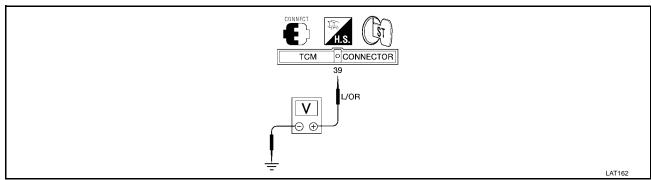
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3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

Without CONSULT-II

- Start engine.
- 2. Check voltage between TCM terminal 39 and ground.



Voltage (Idle speed)

: Refer to <u>AT-109, "TCM</u> <u>Terminals and Reference</u> <u>Value"</u>.

OK or NG

OK >> GO TO 4.

NG >> Check the following items:

- Harness for short or open between TCM and ECM
- Resistor and ignition coil
 Refer to <u>EC-30</u>, "SYSTEM DESCRIPTION"

4. CHECK DTC

Perform AT-131, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE" . OK or NG $\,$

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

[RE4F03B]

DTC P0731 A/T 1ST GEAR FUNCTION

PFP:31940

Description ECS005X4

This malfunction will not be detected while the O/D OFF indicator lamp is indicating another self-diagnosis malfunction.

This malfunction is detected when the A/T does not shift into first gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

ON BOARD DIAGNOSTIC LOGIC

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:

Torque converter slip ratio = $A \times C/B$

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

If the actual gear position is higher than the position (1st) supposed by TCM, the slip ratio will be more than normal. In case the ratio exceeds the specified value, TCM judges this diagnosis malfunction.

This malfunction will be caused when either shift solenoid valve A is stuck open or shift solenoid valve B is stuck open.

Gear position supposed by TCM	1	2	3	4
In case of gear position with no malfunctions	1	2	3	4
In case of gear position with shift solenoid valve A stuck open	2*	2	3	3
In case of gear position with shift solenoid valve B stuck open	4*	3	3	4

^{*:} P0731 is detected.

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)
: A/T 1ST GR FNCTN		Shift solenoid valve A
	A/T cannot be shifted to the 1st gear posi-	Shift solenoid valve B
['] : P0731	tion even if electrical circuit is good.	Each clutch
		Hydraulic control circuit

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

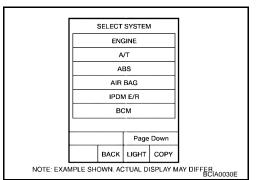
- Always drive vehicle at a safe speed.
- Be careful not to rev engine into the red zone on the tachometer.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

TESTING CONDITION:

Always drive vehicle on a level road to improve the accuracy of test.



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[RE4F03B]

After the repair, perform the following procedure to confirm the malfunction is eliminated.

- With CONSULT-II
- Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.

FLUID TEMP SEN: 0.4 - 1.5V

If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).



- Accelerate vehicle to 20 to 25 km/h (12 to 16 MPH) under the following condition and release the accelerator pedal completely.
 - THROTTLE POSI: Less than 1.0/8 (at all times during step 4) Selector lever: D position (OD "ON")
- Check that "GEAR" shows "2" after releasing pedal.
- Depress accelerator pedal to WOT (more than 7.0/8 of "THROT-TLE POSI") quickly from a speed of 20 to 25 km/h (12 to 16 MPH) until "TESTING" changes to "STOP VEHICLE" or "COM-PLETED". (It will take approximately 3 seconds.)

If the check result NG appears on CONSULT-II screen, go to <u>AT-138, "Diagnostic Procedure"</u>. If "STOP VEHICLE" appears on CONSULT-II screen, go to the following step.



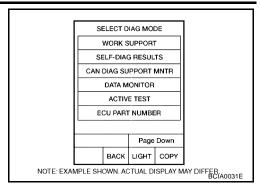
- If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAGNOSIS" for "ENGINE". In case a 1st trip DTC other than P0731 is shown, refer to applicable "TROUBLE DIAG-NOSIS FOR DTC".
- 6. Stop vehicle.
- 7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)

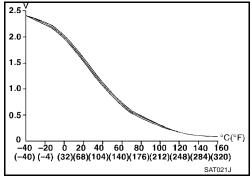
Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 \rightarrow 2 \rightarrow 3 \rightarrow 4
No malfunction exists	$1 \rightarrow 2 \rightarrow 3 \rightarrow 4$
Malfunction for P0731	$2 \rightarrow 2 \rightarrow 3 \rightarrow 3$
exists.	$4 \rightarrow 3 \rightarrow 3 \rightarrow 4$

Make sure that "OK" is displayed. (If "NG" is displayed, refer to "Diagnostic Procedure".)
 Refer to <u>AT-138, "Diagnostic Procedure"</u>.
 Refer to <u>AT-385, "Shift Schedule"</u>.

With GST

Follow the procedure "With CONSULT-II".



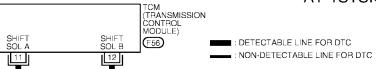


[RE4F03B]

Wiring Diagram — AT — 1ST

ECS005X5

AT-1STSIG-01



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TERMINAL CORD ASSEMBLY SHIFT SOLENOID VALVE A SHIFT SOLENOID VALVE B



TRANSMISSION CONTROL MODULE TERMINALS AND REFERENCE VALUE

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC) (Approx.)
11	L/W	SHIFT SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A OPERATES	BATTERY VOLTAGE
1.1	L/VV	SHIFT SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A DOES NOT OPERATE	OV
10		CHIET COLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B OPERATES	BATTERY VOLTAGE
12	12 L/Y SHIFT SOLENOID VALVE B		WHEN SHIFT SOLENOID VALVE B DOES NOT OPERATE	ov

WAT343

Diagnostic Procedure

CS005X6

1. CHECK SHIFT SOLENOID VALVE

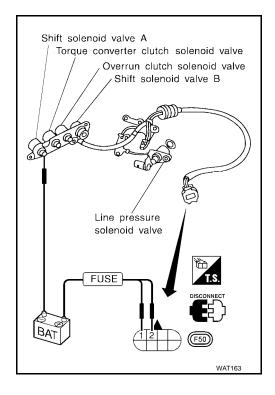
- Remove control valve assembly. Refer to <u>AT-259, "REMOVAL"</u>.
- 2. Check shift solenoid valve operation.
- Shift solenoid valve A
- Shift solenoid valve B

Refer to AT-139, "Component Inspection".

OK or NG

OK >> GO TO 2.

NG >> Repair or replace shift solenoid valve assembly.



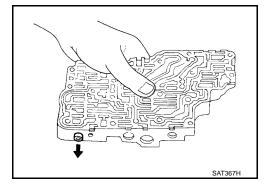
2. CHECK CONTROL VALVE

- 1. Disassemble control valve assembly. Refer to AT-298, "Disassembly".
- 2. Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.

OK or NG

OK >> GO TO 3.

NG >> Repair control valve assembly.



3. CHECK DTC

Perform AT-135, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE" .

OK or NG

OK >> INSPECTION END

NG >> Check transaxle internal components (clutch, brake, etc.).

Revision: July 2004 AT-138 2005 Sentra

[RE4F03B]

Component Inspection SHIFT SOLENOID VALVE A AND B

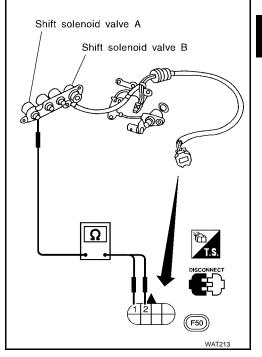
ECS005X7

Refer to AT-259, "Control Valve Assembly and Accumulators".

Resistance Check

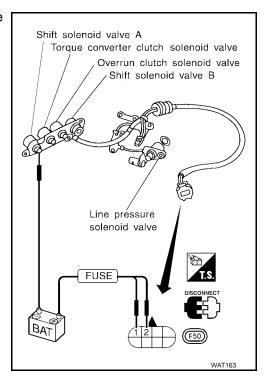
• Check resistance between two terminals.

Solenoid valve	Termi	Resistance (Approx.)	
Shift solenoid valve A	2	Ground	20 - 30Ω
Shift solenoid valve B	1	Ground	5 - 20Ω



Operation Check

 Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



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DTC P0732 A/T 2ND GEAR FUNCTION

PFP:31940

Description

ECS005X8

- This malfunction will not be detected while the O/D OFF indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into second gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

ON BOARD DIAGNOSTIC LOGIC

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:

Torque converter slip ratio = $A \times C/B$

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

If the actual gear position is higher than the position (2nd) supposed by TCM, the slip ratio will be more than normal. In case the ratio exceeds the specified value, TCM judges this diagnosis malfunction.

This malfunction will be caused when shift solenoid valve B is stuck open.

Gear position supposed by TCM	1	2	3	4
In case of gear position with no malfunctions	1	2	3	4
In case of gear position with shift solenoid valve B stuck open	4	3*	3	4

^{*:} P0732 is detected.

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)
(II): A/T 2ND GR FNCTN	A/T cannot be shifted to the 2nd gear position even if electrical circuit is good.	Shift solenoid valve B Each clutch
᠍ : P0732		Hydraulic control circuit

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

- Always drive vehicle at a safe speed.
- Be careful not to rev engine into the red zone on the tachometer.

NOTE

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

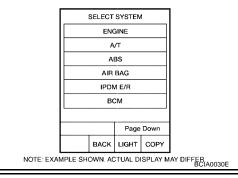
TESTING CONDITION:

Always drive vehicle on a level road to improve the accuracy of test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

- With CONSULT-II
- Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.

FLUID TEMP SEN: 0.4 - 1.5V



DTC P0732 A/T 2ND GEAR FUNCTION

[RE4F03B]

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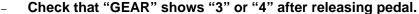
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If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).

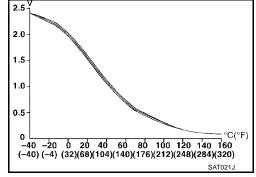
3. Select "2ND GR FNCTN P0732" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".

 Accelerate vehicle to 50 to 55 km/h (31 to 34 MPH) under the following condition and release the accelerator pedal completely.

THROTTLE POSI: Less than 1.0/8 (at all times during step 4)
Selector lever: D position (OD "ON")



 Depress accelerator pedal to WOT (more than 7.0/8 of "THROT-TLE POSI") quickly from a speed of 50 to 55 km/h (31 to 34 MPH) until "TESTING" changes to "STOP VEHICLE" or "COM-PLETED". (It will take approximately 3 seconds.)



If the check result NG appears on CONSULT-II screen, go to <u>AT-143, "Diagnostic Procedure"</u>. If "STOP VEHICLE" appears on CONSULT-II screen, go to following step.

- Check that "GEAR" shows "2" when depressing accelerator pedal to WOT.
- If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAGNOSIS" for "ENGINE". In case a 1st trip DTC other than P0732 is shown, refer to applicable "TROUBLE DIAG-NOSIS FOR DTC".
- 6. Stop vehicle.

7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)

Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 \rightarrow 2 \rightarrow 3 \rightarrow 4
No malfunction exists	$1 \to 2 \to 3 \to 4$
Malfunction for P0732 exists.	$4 \rightarrow 3 \rightarrow 3 \rightarrow 4$

Make sure that "OK" is displayed. (If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE".)
 Refer to <u>AT-143, "Diagnostic Procedure"</u>.
 Refer to <u>AT-385, "Shift Schedule"</u>.

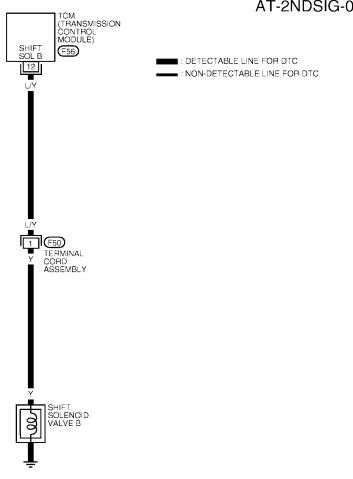
With GST

Follow the procedure "With CONSULT-II".

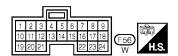
Wiring Diagram — AT — 2ND

ECS005X9

AT-2NDSIG-01







WAT119

TRANSMISSION CONTROL MODULE TERMINALS AND REFERENCE VALUE BETWEEN TERMINAL AND GROUND

TERMINA	L WIRE COLOR	ITEM	CONDITION	DATA (DC) (Approx.)
10	10	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B OPERATES	BATTERY VOLTAGE
12 L/Y	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B DOES NOT OPERATE	ov	

WAT344

[RE4F03B]

Diagnostic Procedure

1. CHECK SHIFT SOLENOID VALVE

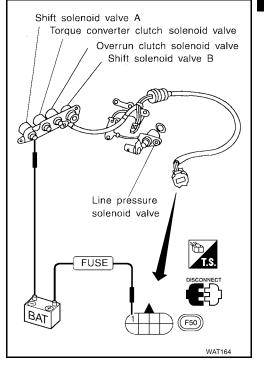
- 1. Remove control valve assembly. Refer to AT-259, "REMOVAL".
- 2. Check shift solenoid valve operation.
- Shift solenoid valve B

Refer to AT-144, "Component Inspection".

OK or NG

OK >> GO TO 2.

NG >> Repair or replace shift solenoid valve assembly.



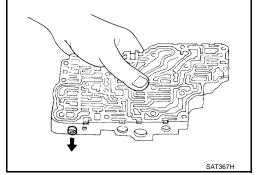
2. CHECK CONTROL VALVE

- 1. Disassemble control valve assembly. Refer to AT-298, "Disassembly".
- 2. Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.

OK or NG

OK >> GO TO 3.

NG >> Repair control valve assembly.



3. CHECK DTC

Perform AT-140, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE".

OK or NG

OK >> INSPECTION END

>> Check transaxle internal components (clutch, brake, etc.). NG

AT-143 2005 Sentra Revision: July 2004

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Component Inspection SHIFT SOLENOID VALVE B

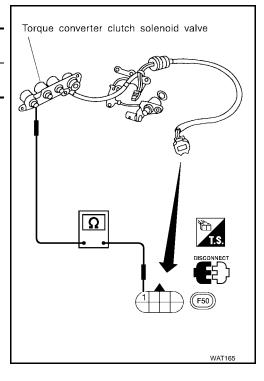
ECS005XB

Refer to AT-259, "Control Valve Assembly and Accumulators".

Resistance Check

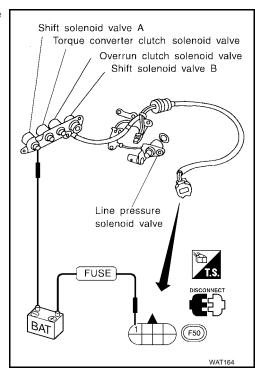
• Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Shift solenoid valve B	1	Ground	5 - 20Ω



Operation Check

 Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



[RE4F03B]

DTC P0733 A/T 3RD GEAR FUNCTION

PFP:31940

ECS005XC

Description

 This malfunction will not be detected while the O/D OFF indicator lamp is indicating another self-diagnosis malfunction.

malfunction.
 This malfunction is detected when the A/T does not shift into third gear position as instructed by the TCM.
 This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such

as control valve stick etc.		\	, ,	piston or brake band,
Gear position	1	2	3	4

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

ON BOARD DIAGNOSTIC LOGIC

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:

Torque converter slip ratio = $A \times C/B$

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

If the actual gear position is higher than the position (3rd) supposed by TCM, the slip ratio will be more than normal. In case the ratio exceeds the specified value, TCM judges this diagnosis malfunction.

This malfunction will be caused when shift solenoid valve A is stuck closed.

Gear position supposed by TCM	1	2	3	4
In case of gear position with no malfunctions	1	2	3	4
In case of gear position with shift solenoid valve A stuck closed	1	1	4*	4

^{*:} P0733 is detected.

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)
: A/T 3RD GR FNCTN	A/T	Shift solenoid valve A
	A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.	Each clutch
⁽²⁾ : P0733	tion even il electrical circuit is good.	Hydraulic control circuit

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

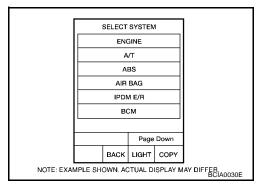
- Always drive vehicle at a safe speed.
- Be careful not to rev engine into the red zone on the tachometer.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

TESTING CONDITION:

Always drive vehicle on a level road to improve the accuracy of test.



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2005 Sentra

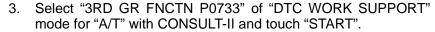
[RE4F03B]

After the repair, perform the following procedure to confirm the malfunction is eliminated.

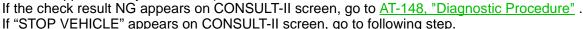
- With CONSULT-II
- Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Make sure that output voltage of A/T fluid temperature sensor is within the range below.

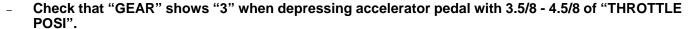
FLUID TEMP SEN: 0.4 - 1.5V

If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).



- Accelerate vehicle to 70 to 85 km/h (43 to 53 MPH) under the following condition and release the accelerator pedal completely.
 - THROTTLE POSI: Less than 1.0/8 (at all times during step 4) Selector lever: D position (OD "ON")
- Check that "GEAR" shows "4" after releasing pedal.
- 5. Depress accelerator pedal steadily with 3.5/8 4.5/8 of "THROT-TLE POSI" from a speed of 70 to 85 km/h (43 to 53 MPH) until "TESTING" changes to "STOP VEHICLE" or "COMPLETED". (It will take approximately 3 seconds.)



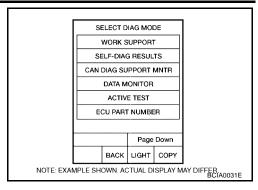


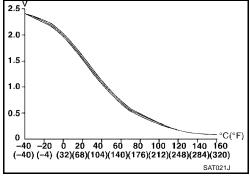
- If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAGNOSIS" for "ENGINE". In case a 1st trip DTC other than P0733 is shown, refer to applicable "TROUBLE DIAG-NOSIS FOR DTC".
- Stop vehicle.
- 7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)

Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 \rightarrow 2 \rightarrow 3 \rightarrow 4
No malfunction exists.	$1 \to 2 \to 3 \to 4$
Malfunction for P0733 exists.	$1 \rightarrow 1 \rightarrow 4 \rightarrow 4$

- Make sure that "OK" is displayed. (If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE".)
 Refer to <u>AT-148, "Diagnostic Procedure"</u>.
 Refer to <u>AT-385, "Shift Schedule"</u>.
- With GST

Follow the procedure "With CONSULT-II".





[RE4F03B]

Wiring Diagram — AT — 3RD

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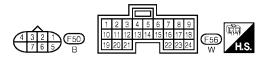
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WAT120

AT-3RDSIG-01 TCM (TRANSMISSION CONTROL MODULE) : DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC 111 L/W TERMINAL CORD ASSEMBLY



TRANSMISSION CONTROL MODULE TERMINALS AND REFERENCE VALUE BETWEEN TERMINAL AND GROUND

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC) (Approx.)
11	L∕W	SHIFT SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A OPERATES	BATTERY VOLTAGE
	""	SIII I SOLLINOID VALVE A	WHEN SHIFT SOLENOID VALVE A DOES NOT OPERATE	ov

WAT345

Diagnostic Procedure

CS005XF

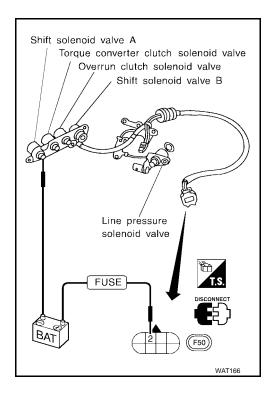
1. CHECK SHIFT SOLENOID VALVE

- 1. Remove control valve assembly. Refer to AT-259, "REMOVAL".
- 2. Check shift solenoid valve operation.
- Shift solenoid valve A Refer to "Component Inspection".

OK or NG

OK >> GO TO 2.

NG >> Repair or replace shift solenoid valve assembly.



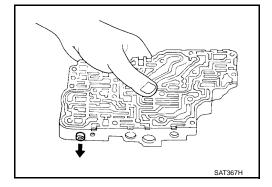
2. CHECK CONTROL VALVE

- 1. Disassemble control valve assembly. Refer to AT-298, "Disassembly".
- 2. Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.

OK or NG

OK >> GO TO 3.

NG >> Repair control valve assembly.



3. снеск отс

Perform AT-145, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE".

OK or NG

OK >> INSPECTION END

NG >> Check transaxle internal components (clutch, brake, etc.).

[RE4F03B]

ECS005XF

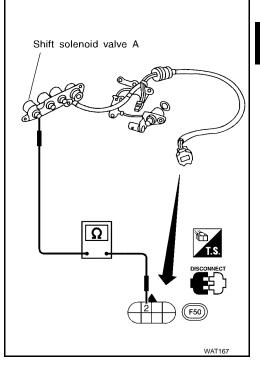
Component Inspection SHIFT SOLENOID VALVE A

Refer to <u>AT-259</u>, "<u>REMOVAL</u>".

Resistance Check

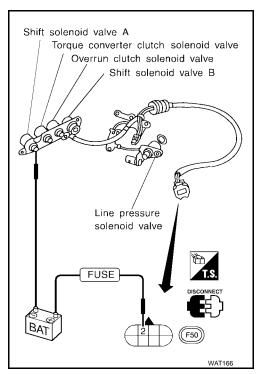
• Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Shift solenoid valve A	2	Ground	20 - 30Ω



Operation Check

 Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



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[RE4F03B]

DTC P0734 A/T 4TH GEAR FUNCTION

PFP:31940

Description

ECS005XG

- This malfunction will not be detected while the O/D OFF indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into fourth gear position or when the line pressure is low. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning oil pump or torque converter clutch, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification (Approx.)
Line pressure solenoid valve duty	Small throttle opening (Low line pressure) ↓ Large throttle opening (High line pressure)	24% ↓ 95%

ON BOARD DIAGNOSTIC LOGIC

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:

Torque converter slip ratio = $A \times C/B$

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

If the actual gear position is much lower than the position (4th) supposed by TCM, the slip ratio will be much less than normal. In case the ratio does not reach the specified value, TCM judges this diagnosis malfunction. This malfunction will be caused when shift solenoid valve B is stuck closed.

Gear position supposed by TCM	1	2	3	4
In case of gear position with no malfunctions	1	2	3	4
In case of gear position with shift solenoid valve B stuck closed	1	2	2	1*

^{*:} P0734 is detected.

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)	
(E): A/T 4TH GR FNCTN		Shift solenoid valve A	
⑤ : P0734	A/T	Shift solenoid valve B	
	A/T cannot be shifted to the 4th gear position even if electrical circuit is good.	 Line pressure solenoid valve 	
	tion even in electrical en ear le geea.	Each clutch	
		Hydraulic control circuit	

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DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

- Always drive vehicle at a safe speed.
- If conducting this "DTC CONFIRMATION PROCEDURE" again, always turn ignition switch "OFF" and wait at least 5 seconds before continuing.
- Be careful not to rev engine into the red zone on the tachometer.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

TESTING CONDITION:

Always drive vehicle on a level road to improve the accuracy of test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

With CONSULT-II

- Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.

FLUID TEMP SEN: 0.4 - 1.5V

If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).

- 3. Select "4TH GR FNCTN P0734" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".
- 4. Accelerate vehicle to 45 to 55 km/h (28 to 34 MPH) under the following condition and release the accelerator pedal completely.

THROTTLE POSI: Less than 5.5/8 (at all times during step 4) Selector lever: D position (OD "ON")

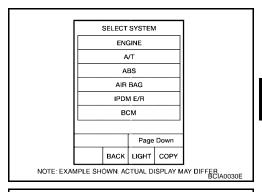
- Check that "GEAR" shows "3" after releasing pedal.
- Depress accelerator pedal steadily with 1.0/8 2.0/8 of "THROTTLE POSI" from a speed of 45 to 55 km/h (28 to 34 MPH) until "TESTING" has turned to "STOP VEHICLE" or "COMPLETED". (It will take approximately 3 seconds.)

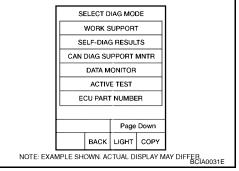
If the check result NG appears on CONSULT-II screen, go to <u>AT-154, "Diagnostic Procedure"</u>. If "STOP VEHICLE" appears on CONSULT-II screen, go to following step.

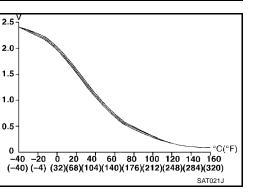
- Check that "GEAR" shows "4" when depressing accelerator pedal with 1.0/8 2.0/8 of "THROTTLE POSI".
- If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAGNOSIS" for "ENGINE". In case a 1st trip DTC other than P0734 is shown, refer to applicable "TROUBLE DIAG-NOSIS FOR DTC".
- Stop vehicle.
- 7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)

Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 \rightarrow 2 \rightarrow 3 \rightarrow 4
No malfunction exists	$1 \rightarrow 2 \rightarrow 3 \rightarrow 4$
Malfunction for P0734 exists.	$1 \to 2 \to 2 \to 1$

Make sure that "OK" is displayed. (If "NG" is displayed, refer to "Diagnostic Procedure".)
Refer to <u>AT-154, "Diagnostic Procedure"</u>.
Refer to AT-385, "Shift Schedule".







[RE4F03B]

With GST

Follow the procedure "With CONSULT-II".

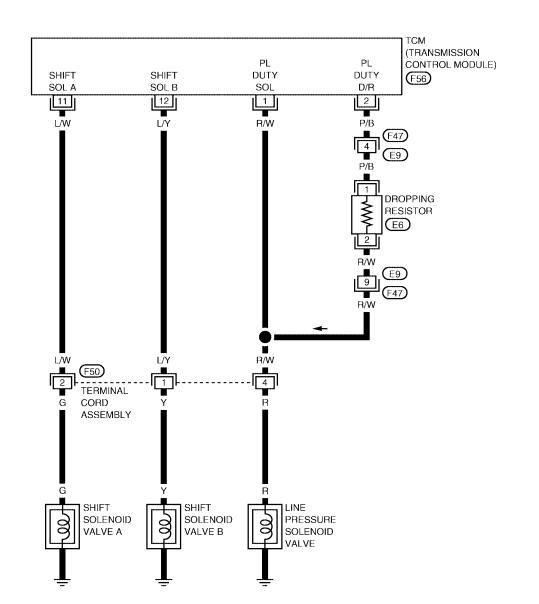
[RE4F03B]

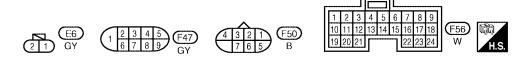
Wiring Diagram — AT — 4TH

ECS005XH

AT-4THSIG-01

: DETECTABLE LINE FOR DTC -: NON- DETECTABLE LINE FOR DTC





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[RE4F03B]

TERMINALS	AND REFEREN	CE VALUE MEASURED BETWE	EN EACH TERMINAL	
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
1	R/W	LINE PRESSURE	WHEN RELEASING ACCELERATOR PEDAL (ENGINE WARM)	1.5 - 2.5V
ı	10,00	SOLENOID VALVE	WHEN DEPRESSING ACCELERATOR PEDAL (ENGINE WARM)	0V
2	P/B	LINE PRESSURE SOLENOID VALVE (WITH DROPPING	WHEN RELEASING ACCELERATOR PEDAL (ENGINE WARM)	5 - 14V
۷	175	RESISTOR)	WHEN DEPRESSING ACCELERATOR PEDAL (ENGINE WARM)	0.5V OR LESS
11	L/W	L/W SHIFT SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A OPERATES	BATTERY VOLTAGE
11	L) VV	STIII T SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A DOES NOT OPERATES	0V
12	L/Y	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B OPERATES	BATTERY VOLTAGE
12	U I	STILL TOOLLINGID VALVE B	WHEN SHIFT SOLENOID VALVE B DOES NOT OPERATES	0V

Diagnostic Procedure

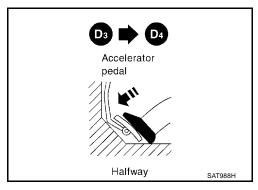
ECS005XI

1. CHECK SHIFT UP (D3 TO D4)

During "Cruise Test – Part 1" (AT-77, "Cruise Test — Part 1"), does A/T shift from D3 to D4 at the specified speed?

Yes or No

Yes >> GO TO 9. No >> GO TO 2.



2. CHECK LINE PRESSURE

Perform line pressure test.

Refer to AT-67, "Line Pressure Test".

Engine apped ram	Line pressure kPa (kg/cm², psi)	
Engine speed rpm	D, 2 and 1 positions	R position
ldle	500 (5.1, 73)	778 (7.9, 113)
Stall	1,167 (11.9, 169)	1,816 (18.5, 263)

OK or NG

OK >> GO TO 3. NG >> GO TO 6.

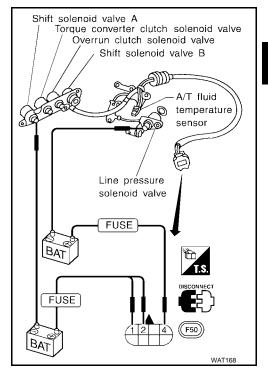
3. CHECK SOLENOID VALVES

- Remove control valve assembly. Refer to <u>AT-259</u>, "<u>REMOVAL</u>".
- 2. Refer to AT-158, "SOLENOID VALVES".

OK or NG

OK >> GO TO 4.

NG >> Replace solenoid valve assembly.



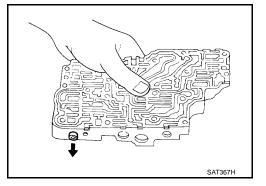
4. CHECK CONTROL VALVE

- 1. Disassemble control valve assembly. Refer to AT-298, "Disassembly".
- 2. Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.

OK or NG

OK >> GO TO 5.

NG >> Repair control valve.



5. CHECK SHIFT UP (D3 TO D4)

Does A/T shift from D₃ to D₄ at the specified speed?

OK or NG

OK >> GO TO 9.

NG >> Check transaxle internal components (clutch, brake, etc.).

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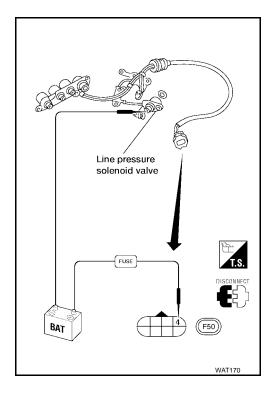
6. CHECK LINE PRESSURE SOLENOID VALVE

- Remove control valve assembly. Refer to <u>AT-259</u>, "<u>REMOVAL</u>".
- Refer to <u>AT-158, "Component Inspection"</u>.

OK or NG

OK >> GO TO 7.

NG >> Replace solenoid valve assembly.



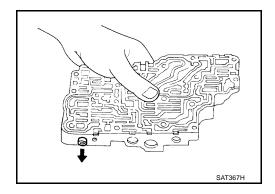
7. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to <u>AT-298, "Disassembly"</u>.
- 2. Check line pressure circuit valves for sticking.
- Pressure regulator valve
- Pilot valve
- Pressure modifier valve

OK or NG

OK >> GO TO 8.

NG >> Repair control valve.



8. CHECK SHIFT UP (D₃ TO D₄)

Does A/T shift from D₃ to D₄ at the specified speed?

Yes or No

Yes >> GO TO 9.

No >> Check transaxle internal components (clutch, brake, etc.).

[RE4F03B]

9. снеск отс

Perform AT-151, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE" .

OK or NG

OK >> INSPECTION END

NG >> Perform "Cruise Test — Part 1" (AT-77, "Cruise Test — Part 1") again and return to the start point of this test group.

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Component Inspection SOLENOID VALVES

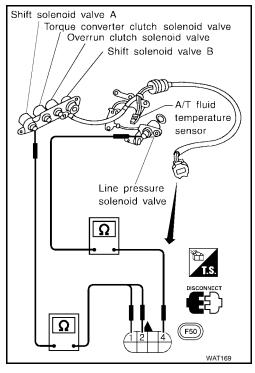
ECS005XJ

Refer to <u>AT-259</u>, "<u>REMOVAL</u>".

Resistance Check

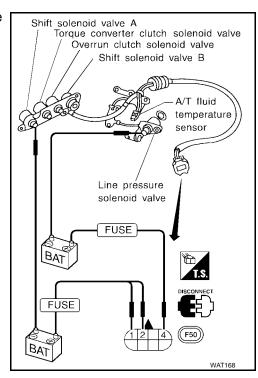
Check resistance between two terminals.

Solenoid valve	Termi	nal No.	Resistance (Approx.)
Shift solenoid valve A	2		20 - 30Ω
Shift solenoid valve B	1	Ground	5 - 20Ω
Line pressure solenoid valve	4		2.5 - 5Ω



Operation Check

 Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[RE4F03B]

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

ECS005XK

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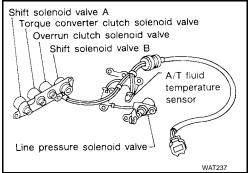
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Description

The torque converter clutch solenoid valve is activated, with the gear in "D4", by the TCM in response to signals sent from the vehicle speed sensor and throttle position sensor [accelerator pedal position]

(APP) sensor]s. Lock-up piston operation will then be controlled. Lock-up operation, however, is prohibited when A/T fluid temperature is too low.

When the accelerator pedal is depressed (less than 2/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification (Approx.)
Torque converter clutch solenoid valve duty	Lock-up "OFF" ↓ Lock-up "ON"	4% ↓ 94%

ON BOARD DIAGNOSIS LOGIC

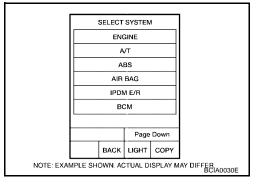
Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)
: TCC SOLENOID/CIRC : P0740	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	 Harness or connectors (The solenoid circuit is open or shorted.) T/C clutch solenoid valve

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

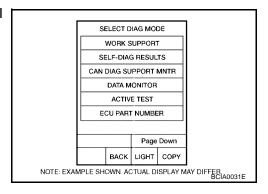
After the repair, perform the following procedure to confirm the malfunction is eliminated.

- With CONSULT-II
- 1. Turn ignition switch "ON".



- Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II and wait at least 1 second.
- With GST

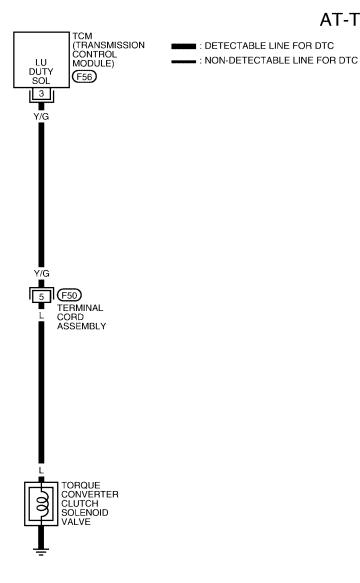
Follow the procedure "With CONSULT-II".

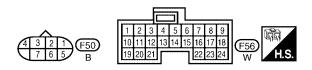


Wiring Diagram — AT — TCV

ECS005XL

AT-TCV-01





WCWA0066E

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

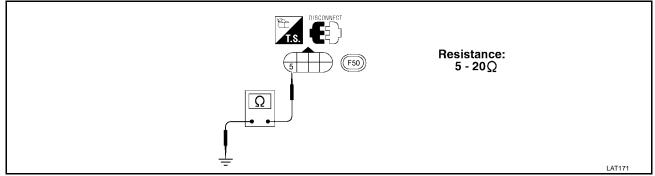
[RE4F03B]

TCM TERMIN	NALS AND REFE	RENCE VALUE MEASURED BET	WEEN EACH TERMINAL AND GRO	UND
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
3	Y/G	TORQUE CONVERTER	WHEN A/T PERFORMS LOCK- UP	8 - 15V
3	170	CLUTCH SOLENOID VALVE	WHEN A/T DOES NOT PER- FORM LOCK-UP	OV

Diagnostic Procedure

1. CHECK VALVE RESISTANCE

- Turn ignition switch to "OFF" position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- 3. Check resistance between terminal 5 and ground.



OK or NG

OK >> GO TO 2.

NG >> 1. Remove oil pan. Refer to AT-259, "REMOVAL".

- 2. Check the following items:
- Torque converter clutch solenoid valve Refer to AT-162, "TORQUE CONVERTER CLUTCH SOLENOID VALVE".
- Harness of terminal cord assembly for short or open

2. CHECK POWER SOURCE CIRCUIT

- 1. Turn ignition switch to "OFF" position.
- Disconnect TCM harness connector F56.
- 3. Check continuity between terminal cord assembly F50 terminal 5 (Y/G) and TCM harness connector terminal 3 (Y/G).

Continuity should exist.

If OK, check harness for short to ground and short to power.

4. Reinstall any part removed.

OK or NG

OK >> GO TO 3.

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

Terminal cord assembly OCONNECTOR TCM WCIA0086F

3. check dtc

Perform AT-159, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE".

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

AT-161 2005 Sentra Revision: July 2004

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DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[RE4F03B]

Component Inspection TORQUE CONVERTER CLUTCH SOLENOID VALVE

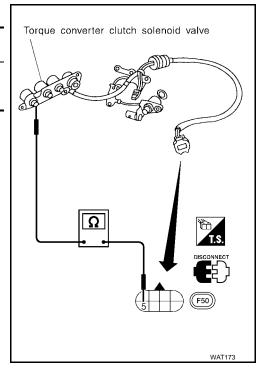
ECS005XN

Refer to <u>AT-259</u>, "<u>REMOVAL</u>".

Resistance Check

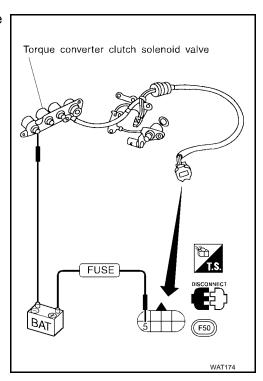
• Check resistance between two terminals.

Solenoid valve	Termi	nal No.	Resistance (Approx.)
Torque converter clutch solenoid valve	5	Ground	5 - 20Ω



Operation Check

 Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



[RE4F03B]

DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)

PFP:31940

Description

ECS005XO

- This is an OBD-II self-diagnostic item and not available in TCM self-diagnosis.
- This malfunction will not be detected while the O/D OFF indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into fourth gear position or the torque converter clutch does not lock up as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning oil pump or torque converter clutch, etc.

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CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification (Approx.)
Torque converter clutch solenoid valve duty	Lock-up "OFF" ↓ Lock-up "ON"	4% ↓ 94%

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[RE4F03B]

ON BOARD DIAGNOSTIC LOGIC

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:

Torque converter slip ratio = $A \times C/B$

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

If the actual gear position is much lower than the position (4th) supposed by TCM, the slip ratio will be much less than normal. In case the ratio does not reach the specified value, TCM judges this diagnosis malfunction. This malfunction will be caused when shift solenoid valve B is stuck closed.

Gear position supposed by TCM	1	2	3	4
In case of gear position with no malfunctions	1	2	3	4
In case of gear position with shift solenoid valve B stuck closed	1	2	2	1*

^{*:} P0744 is detected.

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)
: A/T TCC S/V FNCTN : P0744	A/T cannot perform lock-up even if electrical circuit is good.	 Torque converter clutch solenoid valve Line pressure solenoid valve Each clutch Hydraulic control circuit

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

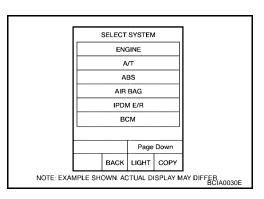
After the repair, perform the following procedure to confirm the malfunction is eliminated.

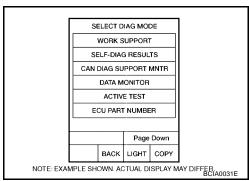
- With CONSULT-II
- Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Make sure that output voltage of A/T fluid temperature sensor is within the range below.

FLUID TEMP SEN: 0.4 - 1.5V

If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).

3. Select "TCC S/V FNCTN P0744" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".





[RE4F03B]

 Accelerate vehicle to more than 80 km/h (50 MPH) and maintain the following condition continuously until "TESTING" has turned to "COMPLETE". (It will take approximately 30 seconds after "TESTING" shows.)

THROTTLE POSI: 1.0/8 - 2.0/8 (at all times during step 4)

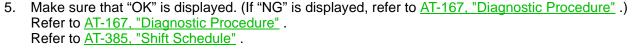
Selector lever: D position (OD "ON")

TCC S/V DUTY: More than 94%

VHCL/S SE-A/T: Constant speed of more than 80 km/h (50

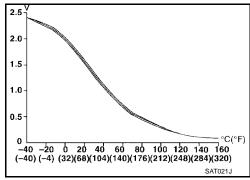
MPH)

- Check that "GEAR" shows "4".
- If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAGNOSIS". In case a 1st trip DTC other than P0744 is shown, refer to applicable "TROUBLE DIAGNOSIS FOR DTC".





Follow the procedure "With CONSULT-II".



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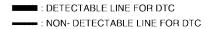
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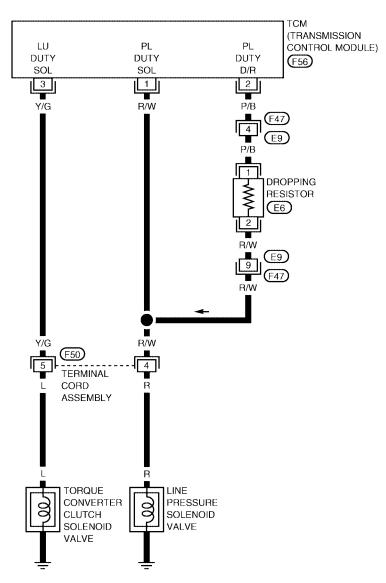
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Wiring Diagram — AT — TCCSIG

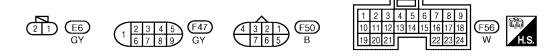
ECS005XP

AT-TCCSIG-01









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[RE4F03B]

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TCM TERMIN	ALS AND REFER	RENCE VALUE MEASURED BET	WEEN EACH TERMINAL AND GRO	JND	
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)	
1	R/W	LINE PRESSURE SOLENOID	WHEN RELEASING ACCELERA- TOR PEDAL (ENGINE WARM)	1.5 - 2.5V	
ľ	10,00	VALVE	WHEN DEPRESSING ACCELER- ATOR PEDAL (ENGINE WARM)	0.5V OR LESS	
2	P/B	LINE PRESSURE SOLENOID VALVE (WITH DROPPING	WHEN RELEASING ACCELERA- TOR PEDAL (ENGINE WARM)	5 - 14V	
2	F/B	RESISTOR)	WHEN DEPRESSING ACCELER- ATOR PEDAL (ENGINE WARM)	0.5V OR LESS	
3	Y/G	TORQUE CONVERTER	WHEN A/T PERFORMS LOCK- UP	8 - 14V	
3	176	CLUTCH SOLENOID VALVE	WHEN A/T DOES NOT PER- FORM LOCK-UP	oV	

Diagnostic Procedure

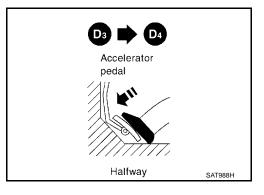
ECS005XQ

1. CHECK SHIFT UP (D3 TO D4)

During "Cruise Test – Part 1" ($\underline{\text{AT-77}}$, "Cruise Test — Part 1"), does A/T shift from D3 to D4 at the specified speed?

Yes or No

Yes >> GO TO 10. No >> GO TO 2.



2. CHECK LINE PRESSURE

Perform line pressure test.

Refer to AT-67, "Line Pressure Test" .

	Line pressure kf	Pa (kg/cm², psi)	
Engine speed rpm	D, 2 and 1 positions	R position	_
ldle	500 (5.1, 73)	778 (7.9, 113)	_
Stall	1,167 (11.9, 169)	1,816 (18.5, 263)	

OK or NG

OK >> GO TO 3. NG >> GO TO 6.

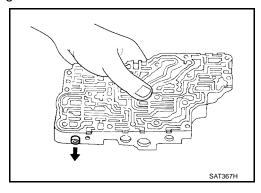
3. CHECK CONTROL VALVE

- 1. Disassemble control valve assembly. Refer to <u>AT-298, "Disassembly"</u>.
- 2. Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.

OK or NG

OK >> GO TO 4.

NG >> Repair control valve.



4. CHECK SHIFT UP (D₃ TO D₄)

Does A/T shift from D₃ to D₄ at the specified speed?

Yes or No

Yes >> GO TO 5.

No >> Check transaxle internal components (clutch, brake, etc.).

5. CHECK DTC

Perform AT-164, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE".

OK or NG

OK >> INSPECTION END

NG >> GO TO 10. Check lock-up condition.

[RE4F03B]

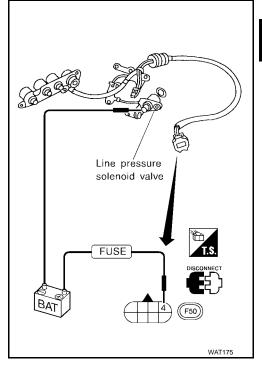
6. CHECK LINE PRESSURE SOLENOID VALVE

- Remove control valve assembly. Refer to <u>AT-259</u>, "<u>REMOVAL</u>".
- 2. Check line pressure solenoid valve operation. Refer to <u>AT-177</u>, "Component Inspection".

OK or NG

OK >> GO TO 7.

NG >> Replace solenoid valve assembly.



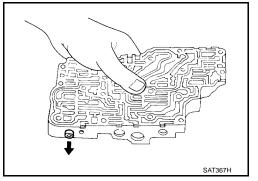
7. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to <u>AT-298</u>, "<u>Disassembly</u>".
- 2. Check line pressure circuit valves for sticking.
- Pressure regulator valve
- Pilot valve
- Pressure modifier valve

OK or NG

OK >> GO TO 8.

NG >> Repair control valve.



8. CHECK SHIFT UP (D3 TO D4)

Does A/T shift from D₃ to D₄ at the specified speed?

Yes or No

Yes >> GO TO 9.

No >> Check transaxle internal components (clutch, brake, etc.).

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9. CHECK DTC

Perform AT-164, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE" .

OK or NG

OK >> INSPECTION END

NG >> GO TO 10. Check for proper lock-up.

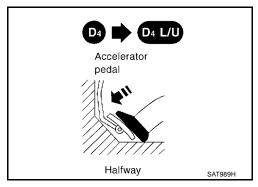
10. CHECK LOCK-UP CONDITION

During "Cruise Test – Part 1" (AT-77, "Cruise Test — Part 1"), does A/T perform lock-up at the specified speed?

Yes or No

Yes >> Perform "Cruise Test - Part 1" (<u>AT-77, "Cruise Test - Part 1"</u>) again and return to the start point of this test group.

No >> GO TO 11.



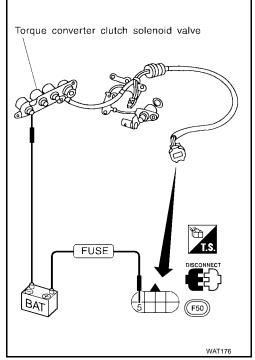
11. CHECK TORQUE CONVERTER CLUTCH SOLENOID VALVE

- Remove control valve assembly. Refer to AT-259, "REMOVAL".
- 2. Check torque converter clutch solenoid valve operation. Refer to AT-162, "TORQUE CONVERTER CLUTCH SOLENOID VALVE"

OK or NG

OK >> GO TO 12.

NG >> Replace solenoid valve assembly.



[RE4F03B]

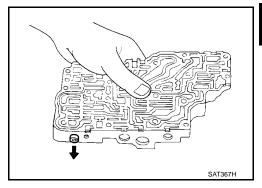
12. CHECK CONTROL VALVE

- 1. Disassemble control valve assembly. Refer to <u>AT-298, "Disassembly"</u>.
- 2. Check control valves for sticking.
- Torque converter clutch control valve
- Torque converter clutch relief valve

OK or NG

OK >> GO TO 13.

NG >> Repair control valve.



13. CHECK LOCK-UP CONDITION

Does A/T perform lock-up at the specified speed?

Yes or No

Yes >> GO TO 14.

No >> Check transaxle internal components (clutch, brake, etc.).

14. снеск отс

Perform AT-164, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE" .

OK or NG

OK >> INSPECTION END

NG >> Perform "Cruise Test — Part 1" (<u>AT-77, "Cruise Test — Part 1"</u>) again and return to the start point of this test group.

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Component Inspection SOLENOID VALVES

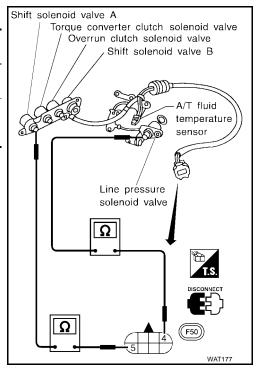
ECS005XR

Refer to <u>AT-259</u>, "<u>REMOVAL</u>".

Resistance Check

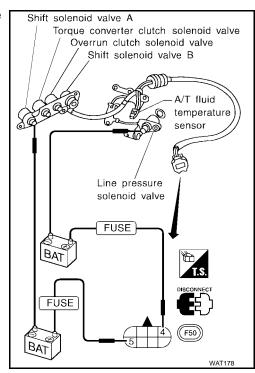
Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Line pressure solenoid valve	4		2.5 - 5Ω
Torque converter clutch solenoid valve	5	Ground	5 - 20Ω



Operation Check

 Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



[RE4F03B]

DTC P0745 LINE PRESSURE SOLENOID VALVE

PFP:31940

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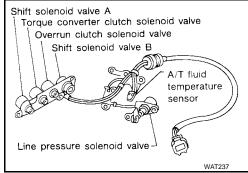
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Description

The line pressure solenoid valve regulates the oil pump discharge pressure to suit the driving condition in response to a signal sent from the TCM.

The line pressure duty cycle value is not consistent when the closed throttle position switch is "ON". To confirm the line pressure duty cycle at low pressure, the accelerator (throttle) should be open until the closed throttle position switch is "OFF".



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification (Approx.)
Line pressure solenoid valve duty	Small throttle opening (Low line pressure) Large throttle opening (High line pressure)	24% ↓ 95%

NOTE:

The line pressure duty cycle value is not consistent when the closed throttle position switch is "ON". To confirm the line pressure duty cycle at low pressure, the accelerator (throttle) should be open until the closed throttle position switch is "OFF".

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)
: L/PRESS SOL/CIRC	TCM detects an improper voltage drop	Harness or connectors (The solenoid circuit is open or shorted.)
᠑ : P0745	when it tries to operate the solenoid valve.	Line pressure solenoid valve

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

- With CONSULT-II
- Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- SELECT SYSTEM

 ENGINE

 A/T

 ABS

 AIR BAG

 IPDM E/R

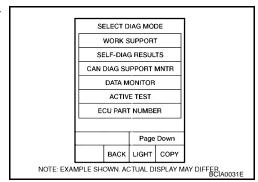
 BCM

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 NOTE: EXAMPLE SHOWN ACTUAL DISPLAY MAY DIFFEB BIA0030E
- Depress accelerator pedal completely and wait at least 5 seconds.
- With GST

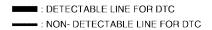
Follow the procedure "With CONSULT-II".

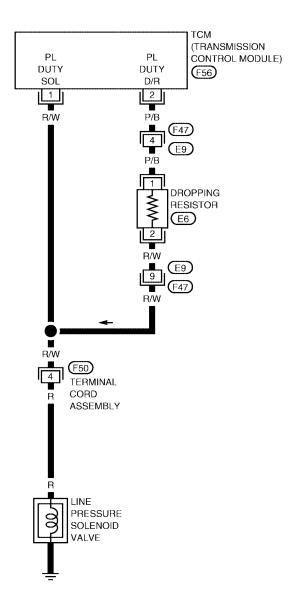


Wiring Diagram — AT — LPSV

ECS005XT

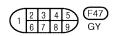
AT-LPSV-01

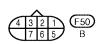
















BCWA0238E

DTC P0745 LINE PRESSURE SOLENOID VALVE

[RE4F03B]

TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
1	1 R/W	LINE PRESSURE SOLENOID VALVE	WHEN RELEASING ACCELERATOR PEDAL (ENGINE WARM)	1.5 - 3.0V
ı			WHEN DEPRESSING ACCELERATOR PEDAL (ENGINE WARM)	0.5V OR LESS
2 P/B	LINE PRESSURE SOLENOID VALVE (WITH DROPPING RESISTOR)	WHEN RELEASING ACCELERATOR PEDAL (ENGINE WARM)	5 - 14v	
		WHEN DEPRESSING ACCELERATOR PEDAL (ENGINE WARM)	0.5V OR LESS	

Diagnostic Procedure

ECS005XU

1. CHECK VALVE RESISTANCE

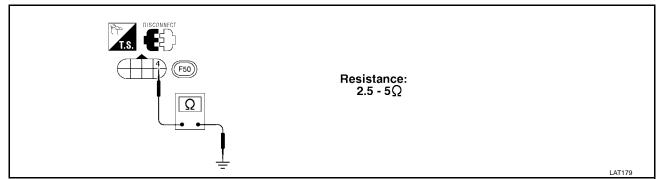
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- 1. Turn ignition switch to "OFF" position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- 3. Check resistance between terminal 4 and ground.



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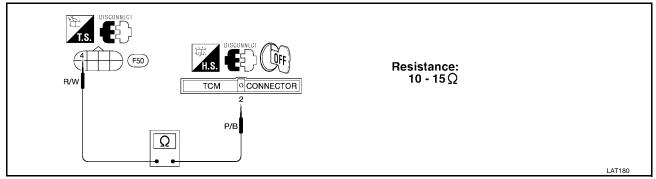
OK >> GO TO 2. NG >> 1. Remove

- >> 1. Remove control valve assembly. Refer to AT-259, "REMOVAL".
 - 2. Check the following items:

- Line pressure solenoid valve
 Refer to <u>AT-177, "Component Inspection"</u>.
- Harness of terminal cord assembly for short or open

2. CHECK POWER SOURCE CIRCUIT

- 1. Turn ignition switch to "OFF" position.
- 2. Disconnect TCM harness connector.
- 3. Check resistance between terminal 4 and TCM harness connector terminal 2.



OK or NG

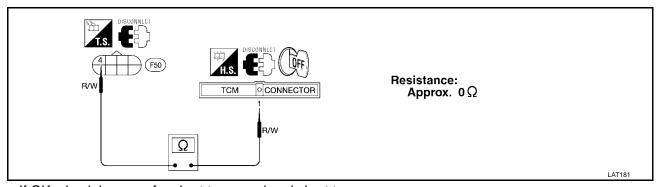
OK >> GO TO 3.

NG >> Check the following items:

- Dropping resistor
 Refer to <u>AT-178, "DROPPING RESISTOR"</u>.
- Harness for short or open between TCM terminal 2 and terminal cord assembly (Main harness)

3. CHECK POWER SOURCE CIRCUIT

- 1. Turn ignition switch to "OFF" position.
- 2. Check resistance between terminal 4 and TCM harness connector terminal 1.



If OK, check harness for short to ground and short to power.

Reinstall any part removed.

OK or NG

OK >> GO TO 4.

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK DTC

Perform AT-173, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE".

OK or NG

NG

OK >> INSPECTION END

>> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

DTC P0745 LINE PRESSURE SOLENOID VALVE

[RE4F03B]

Component Inspection LINE PRESSURE SOLENOID VALVE

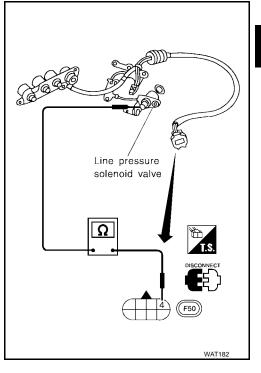
Refer to <u>AT-259</u>, "<u>REMOVAL</u>".

Resistance Check

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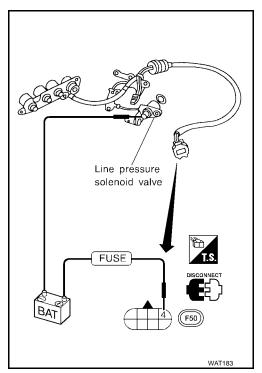
Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Line pressure solenoid valve	4	Ground	2.5 - 5Ω



Operation Check

 Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



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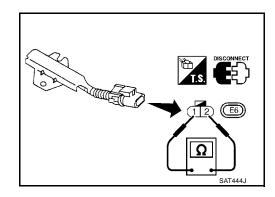
DTC P0745 LINE PRESSURE SOLENOID VALVE

[RE4F03B]

DROPPING RESISTOR

• Check resistance between two terminals.

Resistance : $10 - 15\Omega$



DTC P0750 SHIFT SOLENOID VALVE A

PFP:31940 ECS005XW

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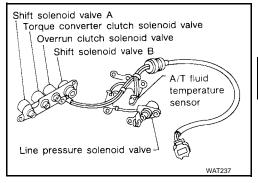
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Description

Shift solenoid valves A and B are turned "ON" or "OFF" by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and throttle position sensor [accelerator pedal position (APP) sensor]. Gears will then be shifted to the optimum position.



Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)	
: SFT SOL A/CIRC	TCM detects an improper voltage drop	Harness or connectors (The solenoid circuit is open or shorted.)	
③ : P0750	when it tries to operate the solenoid valve.	Shift solenoid valve A	

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

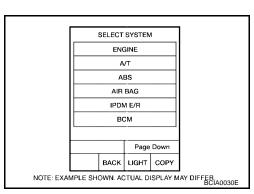
NOTE:

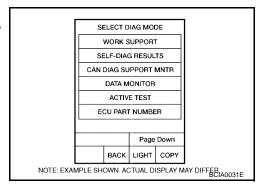
If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

- With CONSULT-II
- Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- 2. Start engine.
- Drive vehicle in D position and allow the transmission to shift "1" \rightarrow "2" ("GEAR").
- With GST

Follow the procedure "With CONSULT-II".



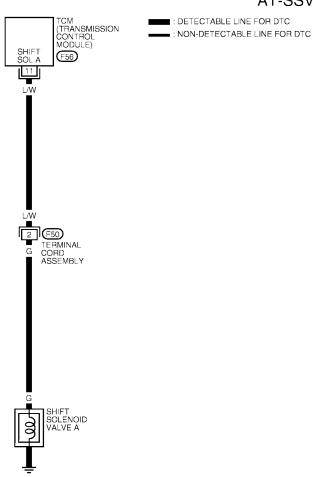


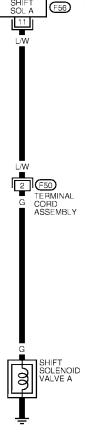
AT-179 Revision: July 2004 2005 Sentra

Wiring Diagram — AT — SSV/A

ECS005XX

AT-SSV/A-01





WAT125

TRANSMISSION CONTROL MODULE TERMINALS AND REFERENCE VALUE BETWEEN TERMINAL AND GROUND

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC) (Approx.)
11 L/W	W ISHIET SOLENOID VALVE A ⊢	WHEN SHIFT SOLENOID VALVE A OPERATES	BATTERY VOLTAGE	
		WHEN SHIFT SOLENOID VALVE A DOES NOT OPERATE	ov	

WAT345

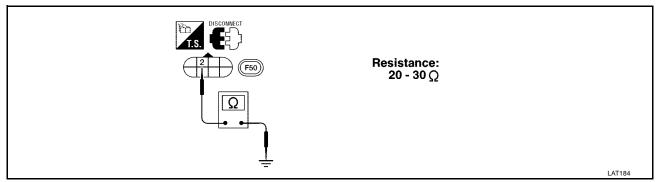
DTC P0750 SHIFT SOLENOID VALVE A

[RE4F03B]

Diagnostic Procedure

1. CHECK VALVE RESISTANCE

- Turn ignition switch to "OFF" position. 1.
- Disconnect terminal cord assembly connector in engine compartment. 2.
- Check resistance between terminal 2 and ground.



OK or NG

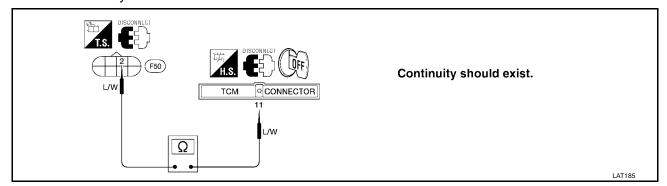
OK >> GO TO 2.

NG >> 1. Remove control valve assembly. Refer to AT-259, "REMOVAL".

- 2. Check the following items:
- Shift solenoid valve A Refer to AT-182, "Component Inspection".
- Harness of terminal cord assembly for short or open

2. CHECK POWER SOURCE CIRCUIT

- Turn ignition switch to "OFF" position. 1.
- 2. Disconnect TCM harness connector.
- Check continuity between terminal 2 and TCM harness connector terminal 11.



If OK, check harness for short to ground and short to power.

4. Reinstall any part removed.

OK or NG

OK >> GO TO 3.

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Perform AT-179, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE".

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

AT-181 2005 Sentra Revision: July 2004

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Component Inspection SHIFT SOLENOID VALVE A

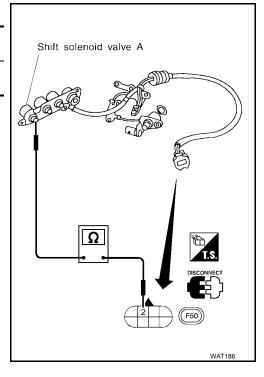
ECS005XZ

Refer to AT-182, "Component Inspection".

Resistance Check

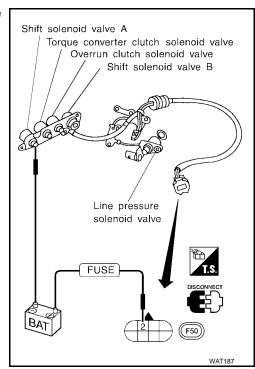
• Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Shift solenoid valve A	2	Ground	20 - 30Ω



Operation Check

 Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



DTC P0755 SHIFT SOLENOID VALVE B

PFP:31940

ECS005Y0

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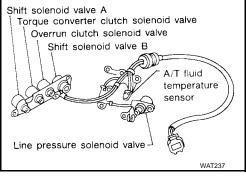
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Description

Shift solenoid valves A and B are turned "ON" or "OFF" by the TCM

in response to signals sent from the PNP switch, vehicle speed and

throttle position sensors. Gears will then be shifted to the optimum position.



Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)
: SFT SOL B/CIRC	TCM detects an improper voltage drop	Harness or connectors (The solenoid circuit is open or shorted.)
: P0755	when it tries to operate the solenoid valve.	Shift solenoid valve B

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

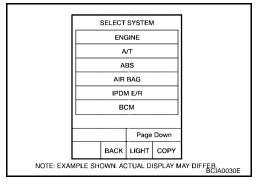
CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

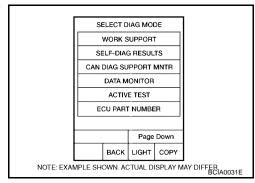
After the repair, perform the following procedure to confirm the malfunction is eliminated.



With CONSULT-II

- Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- 2. Start engine.
- 3. Drive vehicle in D position and allow the transmission to shift 1 \rightarrow 2 \rightarrow 3 ("GEAR").
- With GST

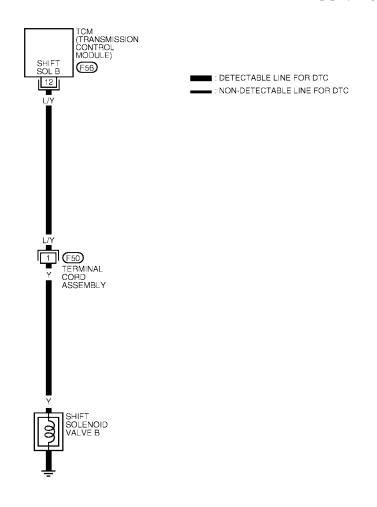
Follow the procedure "With CONSULT-II".



Wiring Diagram — AT — SSV/B

ECS005Y1

AT-SSV/B-01







WAT126

TRANSMISSION CONTROL MODULE TERMINALS AND REFERENCE VALUE BETWEEN TERMINAL AND GROUND

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC) (Approx.)
10	10 10	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B OPERATES	BATTERY VOLTAGE
12	L/Y	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B DOES NOT OPERATE	ov

WAT344

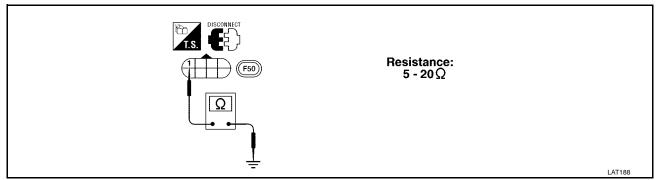
[RE4F03B]

Diagnostic Procedure

SUUENS

1. CHECK VALVE RESISTANCE

- 1. Turn ignition switch to "OFF" position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- 3. Check resistance between terminal 1 and ground.



OK or NG

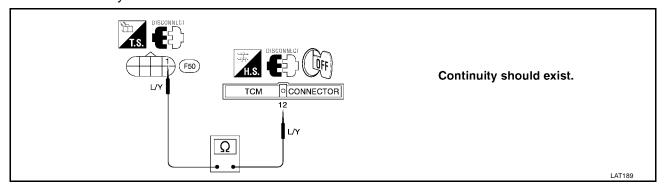
OK >> GO TO 2.

NG >> 1. Remove control valve assembly. Refer to <u>AT-259</u>, "REMOVAL".

- 2. Check the following items:
- Shift solenoid valve B
 Refer to <u>AT-186</u>, "Component Inspection".
- Harness of terminal cord assembly for short or open

2. CHECK POWER SOURCE CIRCUIT

- 1. Turn ignition switch to "OFF" position.
- 2. Disconnect TCM harness connector.
- Check continuity between terminal 1 and TCM harness connector terminal 12.



If OK, check harness for short to ground and short to power.

4. Reinstall any part removed.

OK or NG

OK >> GO TO 3.

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Perform AT-183, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE".

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

Revision: July 2004 AT-185 2005 Sentra

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Component Inspection SHIFT SOLENOID VALVE B

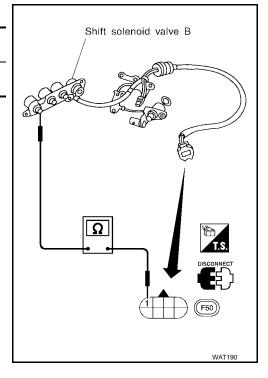
ECS005Y3

Refer to <u>AT-259</u>, "<u>REMOVAL</u>".

Resistance Check

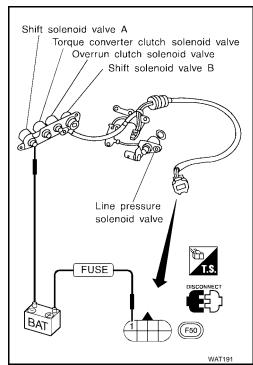
• Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Shift solenoid valve B	1	Ground	5 - 20Ω



Operation Check

 Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



[RE4F03B]

DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Description ECS006GS

The throttle position sensor [accelerator pedal position (APP) sensor] is part of the system that controls throttle position. This system also uses an electric throttle control actuator which consists of a throttle control motor and throttle position sensors. Accelerator pedal position signal is sent to the ECM.

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Throttle position sensor	Fully-closed throttle	Approximately 0.5V
[accelerator pedal position (APP) sensor]	Fully-open throttle	Approximately 4V

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[RE4F03B]

On Board Diagnosis Logic

FCS006G

Diagnostic trouble code TP SEN/CIRC A/T with CONSULT-II or P1705 without CONSULT-II is detected when TCM receives an excessively low or high voltage from the ECM.

Possible Cause

Check the following items.

 Harness or connectors (The sensor circuit is open or shorted.)

Diagnostic Trouble Code (DTC) Confirmation Procedure

FCS006GV

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

 Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.

Accelerator pedal condition	THRTL POS SEN	CLOSED THL/SW	W/O THRL/P-SW
Fully released	Less than 4.7V	ON	OFF
Partially depressed	0.1 - 4.6V	OFF	OFF
Fully depressed	1.9 - 4.6V	OFF	ON

If the check result is NG, go to $\underline{\text{AT-191, "Diagnostic Procedure"}}$. If the check result is OK, go to following step.

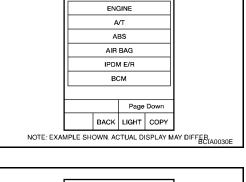
- Turn ignition switch ON and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- Start engine and maintain the following conditions for at least 3 consecutive seconds. Then release accelerator pedal completely.

VHCL SPEED SE: 10 km/h (6 MPH) or more THRTL POS SEN: Approximately 3V or less

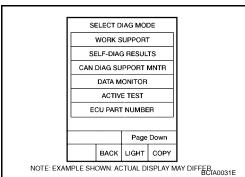
Selector lever: D position (O/D ON)

If the check result is NG, go to AT-191, "Diagnostic Procedure" .

If the check result is OK, go to following step.

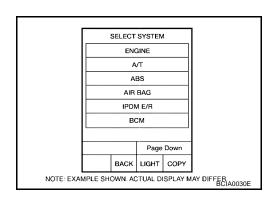


SELECT SYSTEM



 Maintain the following conditions for at least 3 consecutive seconds. Then release accelerator pedal completely.

VHCL SPEED SE: 10 km/h (6 MPH) or more Accelerator pedal: Wide open throttle Selector lever: D position (O/D ON)



[RE4F03B]

	SE	LECT D	IAG MOI	DE	
	WORK SUPPORT				
	SELF-DIAG RESULTS				
	CAN	DIAG SU	PPORT I	MNTR	
		DATA M	ONITOR		
		ACTIV	E TEST		
	EC	CU PAR1	NUMBE	:R	
	L			J	
			Page	Down	
		BACK	LIGHT	COPY	
NOTE: EXAM	/IPLE SHO	OA .NWC	TUAL DI	SPLAY M	IAY DIFFER BCIA0031E

WITH GST

Follow the procedure "With CONSULT-II".

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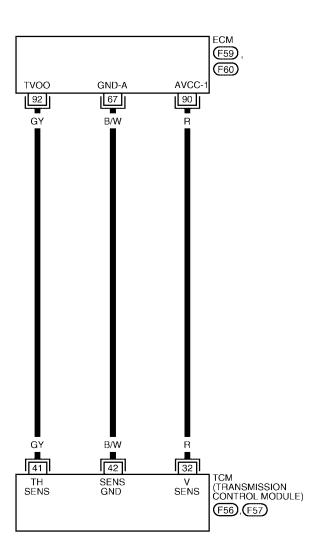
[RE4F03B]

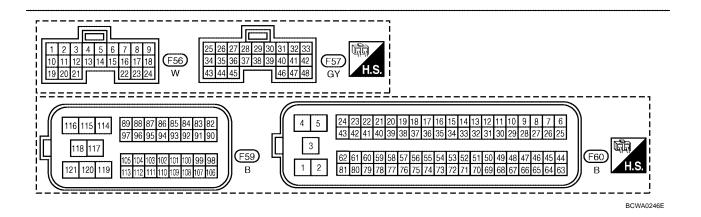
Wiring Diagram — AT — TPS

ECS006GW

AT-TPS-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





[RE4F03B]

TERMINALS	TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)					
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)		
32	R	SENSOR POWER	IGNITION SWITCH ON	4.5 - 5.5V		
32	K	SENSON FOWER	IGNITION SWITCH OFF	OV		
41	GY	THROTTLE POSITION SEN- GY SOR [ACCELERATOR PEDAL	IGNITION ON AND ACCELERA- TOR PEDAL IS DEPRESSED	FULLY CLOSED THROTTLE: 0.5V		
		POSITION (APP) SENSOR]	SLOWLY AFTER WARMING UP ENGINE	WIDE OPEN THROTTLE: 4.0V		
42	B/W	SENSOR GROUND	_	_		

Diagnostic Procedure

ECS006GX

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1. CHECK DTC WITH ECM

Check P code with CONSULT-II "ENGINE".
 Turn ignition switch ON and select "SELF DIAGNOSTIC RESULTS" mode for "ENGINE" with CONSULT-II.

Refer to EC-65, "Malfunction Indicator Lamp (MIL)".

OK or NG

OK (with CONSULT-II)>>GO TO 2.

OK (without CONSULT-II)>>GO TO 3.

NG

>> Check throttle position sensor [accelerator pedal position (APP) sensor] circuit for engine control. Refer to EC-264, "DTC P0222, P0223 TP SENSOR" and EC-572, "DTC P2122, P2123 APP SENSOR".

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

With CONSULT-II

- 1. Turn ignition switch to ON position. (Do not start engine.)
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out the value of "THRTL POS SEN".

DATA MONITOR

MONITORING

VHCL/S SE-A/T XXX km/h

VHCL/S SE-MTR XXX km/h

THRTL POS SEN XXX V

FLUID TEMP SE XXX V

BATTERY VOLT XXX V

Voltage:

Fully-closed throttle :Approximately 0.5V
Fully-open throttle :Approximately 4V

OK or NG

OK >> GO TO 4.

NG >> Check harness for short or open between ECM and TCM regarding throttle position sensor [accelerator pedal position (APP) sensor] circuit. (Main harness)

[RE4F03B]

3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

Without CONSULT-II

1. Turn ignition switch to ON position. (Do not start engine.)

2. Check voltage between TCM terminals 41 (GY) and 42 (B/W) while accelerator pedal is depressed slowly.

Voltage:

Fully-closed throttle :Approximately 0.5V

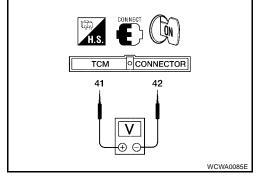
valve

Fully-open throttle :Approximately 4V

valve

(Voltage rises gradually in response to throttle posi-

tion.)



OK or NG

OK >> GO TO 4.

NG >> Check harness for short or open between ECM and TCM regarding throttle position sensor [accelerator pedal position (APP) sensor] circuit. (Main harness)

4. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

[RE4F03B]

DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

Description

ECS005Y8

PFP:31940

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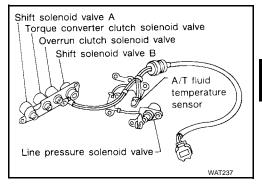
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The overrun clutch solenoid valve is activated by the TCM in response to signals sent from the inhibitor switch, overdrive control switch, vehicle speed and throttle position sensors. The overrun clutch operation will then be controlled.



ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)
①: O/R CLTCH SOL/CIRC ②: P1760	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	 Harness or connectors (The solenoid circuit is open or shorted.) Overrun clutch solenoid valve

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

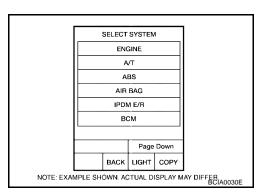
TESTING CONDITION:

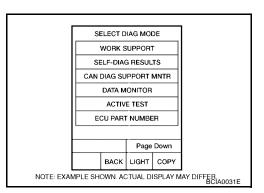
Always drive vehicle on a level road to improve accuracy of test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

- With CONSULT-II
- Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- 2. Start engine.
- 3. Accelerate vehicle to a speed of more than 10 km/h (6 MPH) with "D" position (OD "ON").
- Release accelerator pedal completely with "D" position (OD "OFF").
- With GST

Follow the procedure "With CONSULT-II".

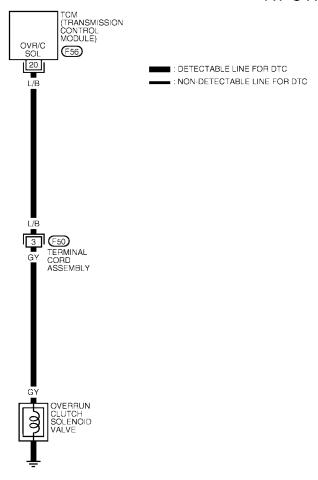




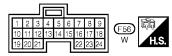
Wiring Diagram — AT — OVRCSV

ECS005Y9

AT-OVRCSV-01







WAT128

TRANSMISSION CONTROL MODULE TERMINALS AND REFERENCE VALUE BETWEEN TERMINAL AND GROUND

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC) (Approx.
20	1/0	OVERRUN CLUTCH	WHEN OVERRUN CLUTCH SOLENOID VALVE OPERATES	BATTERY VOLTAGE
20	Ь	SOLENOID VALVE	WHEN OVERRUN CLUTCH SOLENOID VALVE DOES NOT OPERATE	0V

WAT351

DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

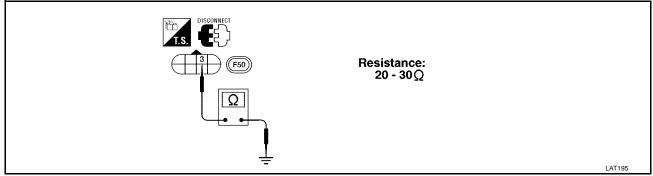
[RE4F03B]

Diagnostic Procedure

200574

1. CHECK VALVE RESISTANCE

- 1. Turn ignition switch to "OFF" position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- 3. Check resistance between terminal 3 and ground.



OK or NG

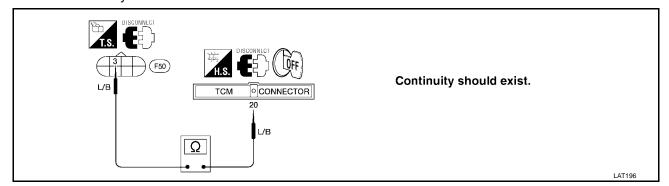
OK >> GO TO 2.

NG >> 1. Remove control valve assembly. Refer to <u>AT-259, "REMOVAL"</u>.

- 2. Check the following items:
- Overrun clutch solenoid valve
 Refer to <u>AT-196</u>, "Component Inspection".
- Harness of terminal cord assembly for short or open

2. CHECK POWER SOURCE CIRCUIT

- 1. Turn ignition switch to "OFF" position.
- 2. Disconnect TCM harness connector.
- Check continuity between terminal 3 and TCM harness connector terminal 20.



If OK, check harness for short to ground and short to power.

4. Reinstall any part removed.

OK or NG

OK >> GO TO 3.

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Perform AT-193, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE".

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

Revision: July 2004 AT-195 2005 Sentra

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DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

[RE4F03B]

Component Inspection OVERRUN CLUTCH SOLENOID VALVE

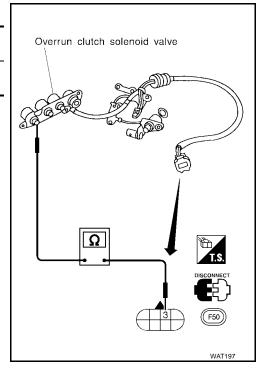
ECS005YB

• Refer to AT-196, "Component Inspection".

Resistance Check

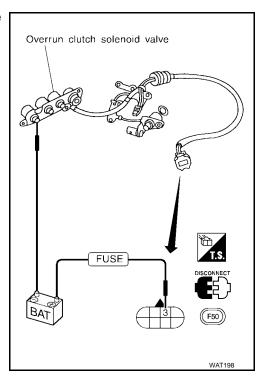
• Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Overrun clutch solenoid valve	3	Ground	20 - 30Ω



Operation Check

 Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



[RE4F03B]

DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM **POWER SOURCE)**

ECS005YC

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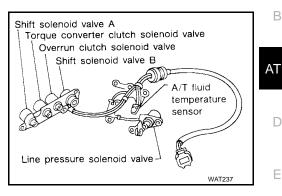
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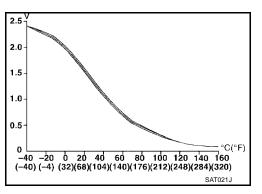
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Description

The A/T fluid temperature sensor detects the A/T fluid temperature and sends a signal to the TCM.





CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values

Monitor item	Condition	•	Specification (Approx.)	
A/T fluid temperature sensor	Cold [20°C (68°F)]	1.5V	2.5 kΩ	
	↓	↓	↓	
	Hot [80°C (176°F)]	0.5V	0.3 kΩ	

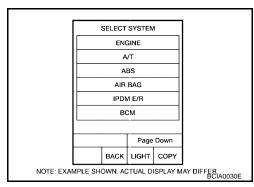
ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)	
: BATT/FLUID TEMP SEN	TCM receives an excessively low or high	 Harness or connectors (The sensor circuit is open or shorted.) A/T fluid temperature sensor 	
🔊 : 8th judgement flicker	voltage from the sensor.		

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

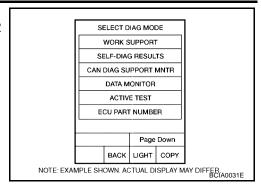
After the repair, perform the following procedure to confirm the malfunction is eliminated.

- With CONSULT-II
- Start engine. 1.
- Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Drive vehicle under the following conditions: Selector lever in "D", vehicle speed higher than 20 km/h (12 MPH).
- Without CONSULT-II
- Start engine.



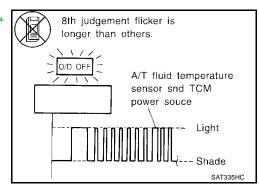
[RE4F03B]

 Drive vehicle under the following conditions: Selector lever in "D", vehicle speed higher than 20 km/h (12 MPH).



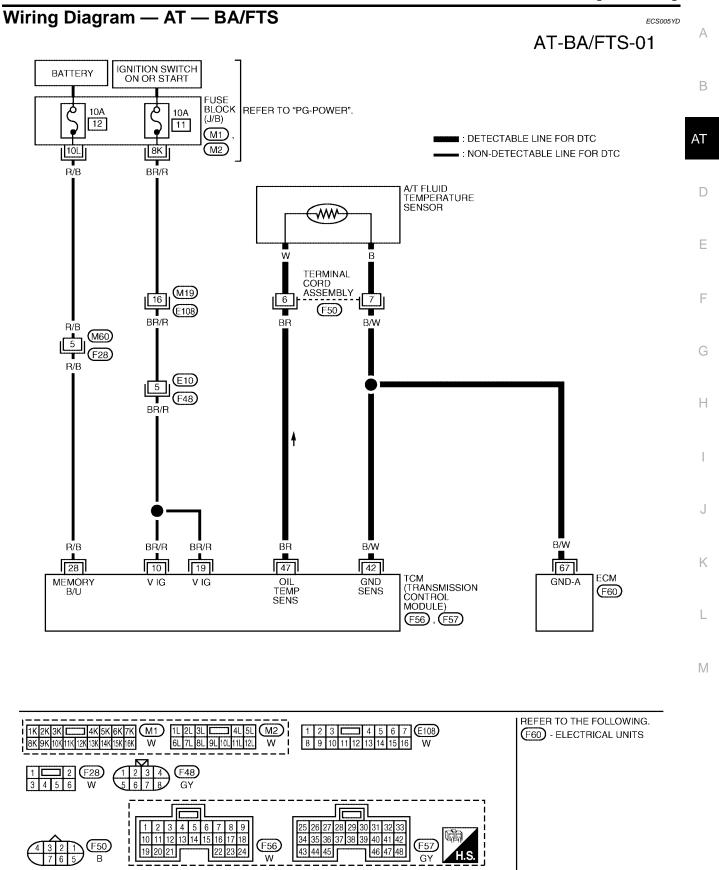
3. Perform self-diagnosis.

Refer to TCM Self-diagnostic Procedure (No Tools), <u>AT-51</u>, <u>"TCM Self-diagnostic Procedure (No Tools)"</u>.



[RE4F03B]

BCWA0239E



[RE4F03B]

TERMINALS	TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND GROUND					
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)		
10	10 BR/R	POWER SOURCE	WHEN TURNING IGNITION SWITCH TO "ON"	BATTERY VOLTAGE		
10	DIVIC		WHEN TURNING IGNITION SWITCH TO "OFF"	OV		
19	BR/R	BR/R POWER SOURCE	WHEN TURNING IGNITION SWITCH TO "ON"	BATTERY VOLTAGE		
19 DK/K	FOWER SOURCE	WHEN TURNING IGNITION SWITCH TO "OFF"	0V			
28	28 R/B	POWER SOURCE	WHEN TURNING IGNITION SWITCH TO "OFF"	BATTERY VOLTAGE		
20 100	(MEMORY BACK UP)	WHEN TURNING IGNITION SWITCH TO "ON"	BATTERY VOLTAGE			
42	B/W	GROUND (A/T FLUID TEMPERATURE SENSOR)	_	0V		
47 BR	R.P.		WHEN ATF TEMPERATURE IS 20°C (68°F)	APPROX. 1.5V		
	DK.		WHEN ATF TEMPERATURE IS 80°C (176°F)	APPROX. 0.5V		

Diagnostic Procedure

ECS005YE

1. CHECK TCM POWER SOURCE

- Turn ignition switch to "ON" position. (Do not start engine.)
- 2. Check voltage between TCM terminals 10, 19, 28 and ground.

Voltage : Battery voltage

- 3. Turn ignition switch to "OFF" position.
- 4. Check voltage between TCM terminal 28 and ground.

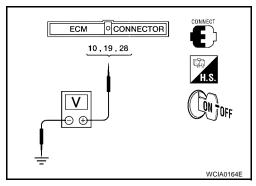
Voltage : Battery voltage

OK or NG

OK >> GO TO 2.

NG >> Check the following items:

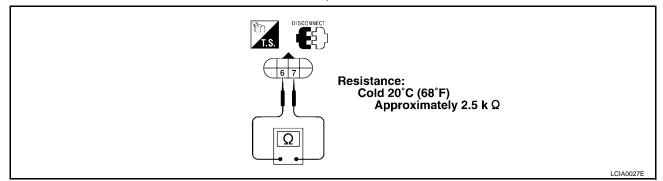
- Harness for short or open between ignition switch and TCM (Main harness)
- Harness for short or open between battery and TCM (Main harness)
- Ignition switch and fuse Refer to <u>PG-3</u>, "<u>POWER SUPPLY ROUTING</u>".



[RE4F03B]

$2.\,$ check a/t fluid temperature sensor with terminal cord assembly

- 1. Turn ignition switch to "OFF" position.
- 2. Disconnect terminal cord assembly connector F50 in engine compartment.
- Check resistance between terminal cord assembly F50 terminals 6 and 7 when A/T is cold.



Reinstall any part removed.

OK or NG

OK (With CONSULT-II)>> GO TO 3. OK (Without CONSULT-II)>> GO TO 4.

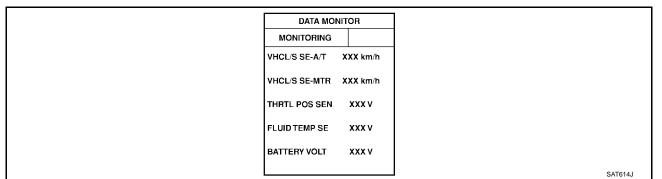
NG >> 1. Remove oil pan.

- 2. Check the following items:
- A/T fluid temperature sensor Refer to AT-202, "Component Inspection".
- Harness of terminal cord assembly for short or open

$3.\,$ check input signal of a/t fluid temperature sensor (with consult-ii)

With CONSULT-II

- Start engine. 1.
- Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Read out the value of "FLUID TEMP SE".



Voltage

Cold [20°C (68°F)] \rightarrow : Approximately 1.5V → Hot [80°C (176°F)] 0.5V

OK or NG

OK >> GO TO 5.

NG >> Check the following items:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM Refer to EC-164, "Wiring Diagram".

AT-201 Revision: July 2004 2005 Sentra

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[RE4F03B]

4. CHECK INPUT SIGNAL OF A/T FLUID TEMPERATURE SENSOR (WITHOUT CONSULT-II)

Without CONSULT-II

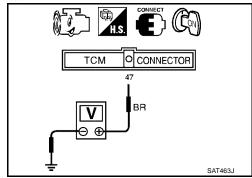
Start engine.

2. Check voltage between TCM terminal 47 and ground while warming up A/T.

Voltage

Cold [20°C (68°F)] \rightarrow : Approximately 1.5V \rightarrow Hot [80°C (176°F)] 0.5V

- Turn ignition switch to "OFF" position.
- 4. Disconnect TCM harness connector.



5. Check resistance between terminal 42 (B/W) and ground.

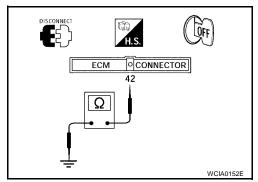
Continuity should exist.

OK or NG

OK >> GO TO 5.

NG >> Check the following items:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM Refer to EC-164, "Wiring Diagram".



5. CHECK DTC

Perform <u>AT-197, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE"</u> . OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

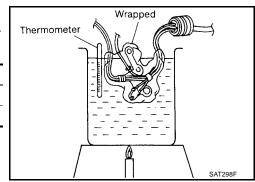
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

Component Inspection A/T FLUID TEMPERATURE SENSOR

ECS005YF

- Refer to AT-259, "REMOVAL".
- Check resistance between two terminals while changing temperature as shown.

Temperature °C (°F)	Resistance (approx.)	
20 (68)	2.5 kΩ	
80 (176)	0.3 kΩ	



DTC VHCL SPEED SEN.MTR VEHICLE SPEED SENSOR.MTR

[RE4F03B]

DTC VHCL SPEED SEN.MTR VEHICLE SPEED SENSOR.MTR

PFP:24814

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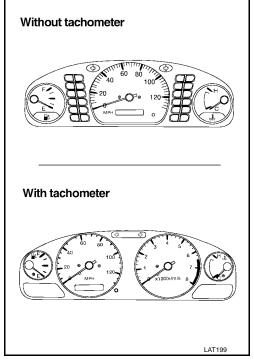
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Description

The vehicle speed sensor MTR is built into the speedometer assembly. The sensor functions as an auxiliary device to the revolution sensor when it is malfunctioning. The TCM will then use a signal sent from the vehicle speed sensor MTR.



ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)	
: VHCL SPEED SEN-MTR	TCM does not receive the proper voltage	 Harness or connectors (The sensor circuit is open or shorted.) 	
🗴 : 2nd judgement flicker	signal from the sensor.	Vehicle speed sensor	

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

- Always drive vehicle at a safe speed.
- If conducting this "DTC CONFIRMATION PROCEDURE" again, always turn ignition switch "OFF" and wait at least 5 seconds before continuing.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

- (II) With CONSULT-II
- 1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- SELECT SYSTEM

 ENGINE

 A/T

 ABS

 AIR BAG

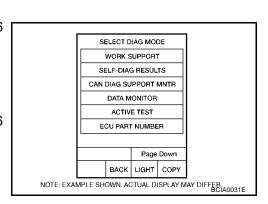
 IPDM E/R

 BCM

 Page Down

 BACK LIGHT COPY

 NOTE: EXAMPLE SHOWN ACTUAL DISPLAY MAY DIFFER BCIA0030E
- Start engine and accelerate vehicle from 0 to 25 km/h (0 to 16 MPH).
- Without CONSULT-II
- 1. Start engine.
- Drive vehicle under the following conditions: Selector lever in "D" and vehicle speed higher than 25 km/h (16 MPH).

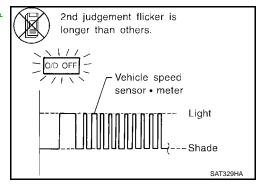


DTC VHCL SPEED SEN.MTR VEHICLE SPEED SENSOR.MTR

[RE4F03B]

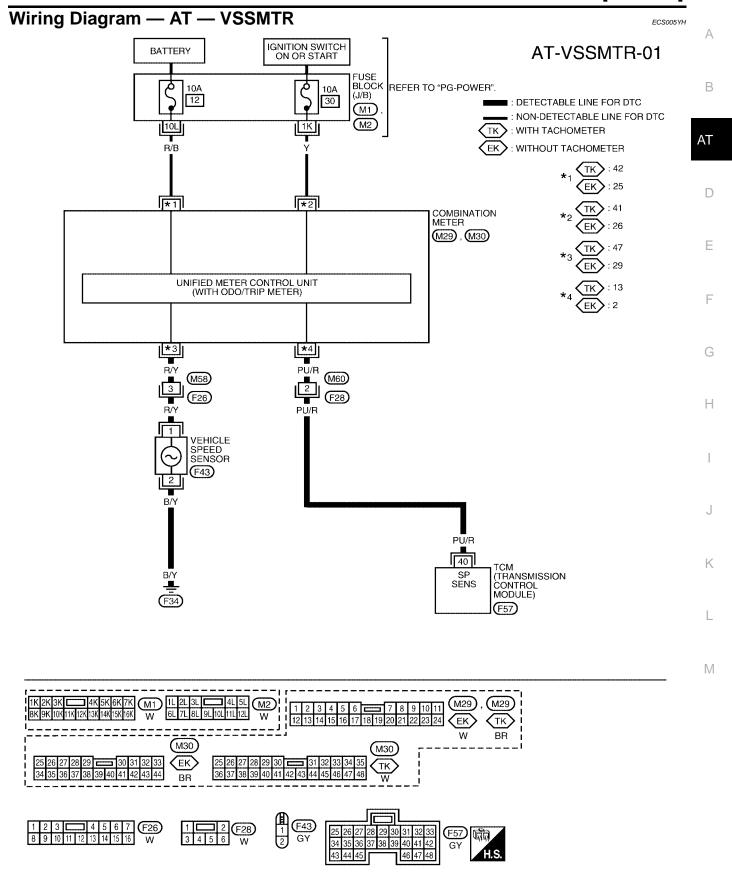
3. Perform self-diagnosis.

Refer to "TCM Self-diagnostic Procedure (No Tools)", <u>AT-51</u>. "TCM Self-diagnostic Procedure (No Tools)".



DTC VHCL SPEED SEN-MTR VEHICLE SPEED SENSOR-MTR

[RE4F03B]



WCWA0122E

DTC VHCL SPEED SEN-MTR VEHICLE SPEED SENSOR-MTR

[RE4F03B]

TERMINALS	TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL					
TERMINAL WIRE COLOR ITEM CONDITION DATA (DC)						
40	PU/R	VEHICLE SPEED SENSOR	WHEN MOVING VEHICLE AT 2 TO 3 KM/H (1 TO 2 MPH) FOR 1 m (3ft) OR MORE	VOLTAGE VARIES FROM GREATER THAN 1V TO LESS THAN 4.5 V		

Diagnostic Procedure

ECS005YI

1. CHECK INPUT SIGNAL

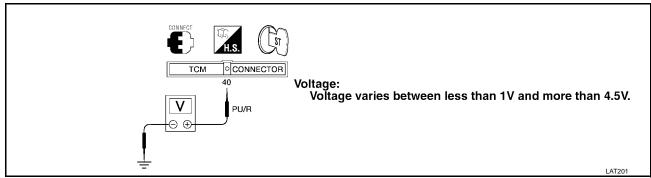
(III) With CONSULT-II

- 1. Start engine.
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Read out the value of "VHCL/S SE-MTR" while driving. Check the value changes according to driving speed.

DATA	DATA MONITOR	
MONITOR	G	
VHCL/S SE-A		XXX km/h
VHCL/S SE-N	R	XXX km/h
THRTL POS	ΞN	xxx v
FLUIDTEMP	Ē	xxx v
BATTERY VO	ī	xxx v

Without CONSULT-II

- 1. Start engine.
- 2. Check voltage between TCM terminal 40 and ground while driving at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more.



OK or NG

OK >> GO TO 2.

NG >> Check the following items:

- Vehicle speed sensor and ground circuit for vehicle speed sensor Refer to <u>DI-26, "VEHICLE SPEED SENSOR SIGNAL CHECK"</u>.
- Harness for short or open between TCM and vehicle speed sensor (Main harness)

DTC VHCL SPEED SEN·MTR VEHICLE SPEED SENSOR·MTR

[RE4F03B]

$\overline{2}$. CHECK DTC

Perform AT-203, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE" .

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

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DTC U1000 CAN COMMUNICATION LINE

[RE4F03B]

DTC U1000 CAN COMMUNICATION LINE

PFP:23710

Description

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

On Board Diagnosis Logic

ECS006GN

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "CAN COMM CIRCUIT" with CONSULT-II or U1000 without CONSULT-II is detected when TCM cannot communicate to other control unit.

Possible Cause

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

DTC Confirmation Procedure

ECS006GP

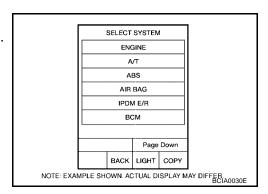
NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

(P) WITH CONSULT-II

- 1. Turn ignition switch to ON position. (Do not start engine.)
- Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- 3. Start engine and wait for at least 6 seconds.
- 4. If DTC is detected, go to AT-210, "Diagnostic Procedure".



WITH GST

Follow the procedure "WITH CONSULT-II".

DTC U1000 CAN COMMUNICATION LINE

CAN-L

86

CAN-H

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(F59)

[RE4F03B]

Wiring Diagram — AT — CAN

AT-CAN-01

: DETECTABLE LINE FOR DTC : NON-DETECTABLE LINE FOR DTC

: DATA LINE

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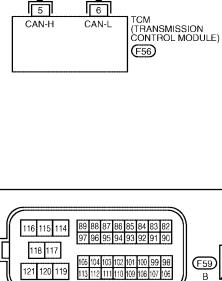
AT

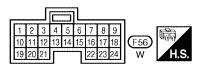
D

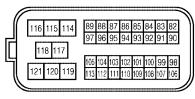
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DTC U1000 CAN COMMUNICATION LINE

[RE4F03B]

Diagnostic Procedure

1. CHECK CAN COMMUNICATION CIRCUIT

ECS006GR

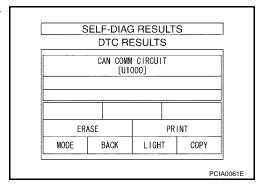
(With CONSULT-II

- 1. Turn ignition switch "ON" and start engine.
- Select "SELF-DIAG RESULTS" mode for "A/T" with CONSULT-II.

Is any malfunction of the "CAN COMM CIRCUIT" indicated?

Yes >> Print out CONSULT-II screen, GO TO LAN section. Refer to LAN - <u>LAN-4, "CAN Communication Unit"</u>

No >> INSPECTION END.



DTC CONTROL UNIT (RAM), CONTROL UNIT (ROM)

[RE4F03B]

PFP:31036

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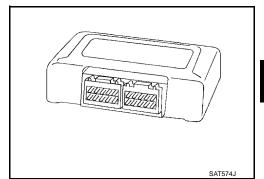
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DTC CONTROL UNIT (RAM), CONTROL UNIT (ROM)

Description

The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The unit controls the A/T.



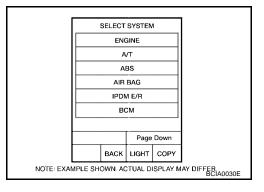
ON BOARD DIAGNOSIS LOGIC

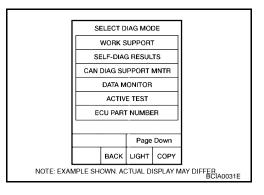
Diagnostic Trouble Code No.	Malfunction is detected when	Check Item (Possible Cause)
(CONTROL UNIT (RAM), CONTROL UNIT (ROM)	TCM memory (RAM) or (ROM) is malfunctioning.	• TCM

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

- (II) With CONSULT-II
- Turn ignition switch "ON" and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 2. Start engine.
- 3. Run engine for at least 2 seconds at idle speed.





Diagnostic Procedure

ECS005YK

1. INSPECTION START (WITH CONSULT-II)

- With CONSULT-II
- 1. Turn ignition switch "ON" and select "SELF DIAGNOSIS" mode for A/T with CONSULT-II.
- 2. Touch "ERASE".

>> GO TO 2.

DTC CONTROL UNIT (RAM), CONTROL UNIT (ROM)

[RE4F03B]

$\overline{2}$. CHECK DTC

Perform AT-211, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE" .

>> GO TO 3.

3. CHECK DTC AGAIN

Is the "CONTROL UNIT (RAM)" or "CONTROL UNIT (ROM)" displayed again? Yes or No

Yes >> Replace TCM.

No >> INSPECTION END

DTC CONTROL UNIT (EEP ROM)

[RE4F03B]

DTC CONTROL UNIT (EEP ROM)

PFP:31036

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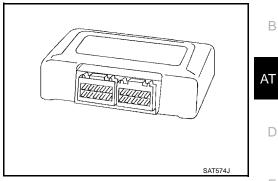
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Description

The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The unit controls the A/T.



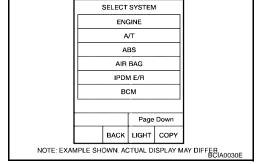
ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check item (Possible cause)	
: CONT UNIT (EEP ROM)	TCM memory (EEP ROM) is malfunctioning.	• TCM	

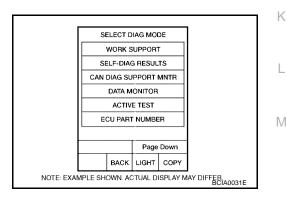
DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

- With CONSULT-II
- Turn ignition switch "ON" and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 2. Start engine.



Run engine for at least 2 seconds at idle speed.



AT-213 2005 Sentra Revision: July 2004

DTC CONTROL UNIT (EEP ROM)

[RE4F03B]

Diagnostic Procedure

ECS005YM

1. CHECK DTC

(III) With CONSULT-II

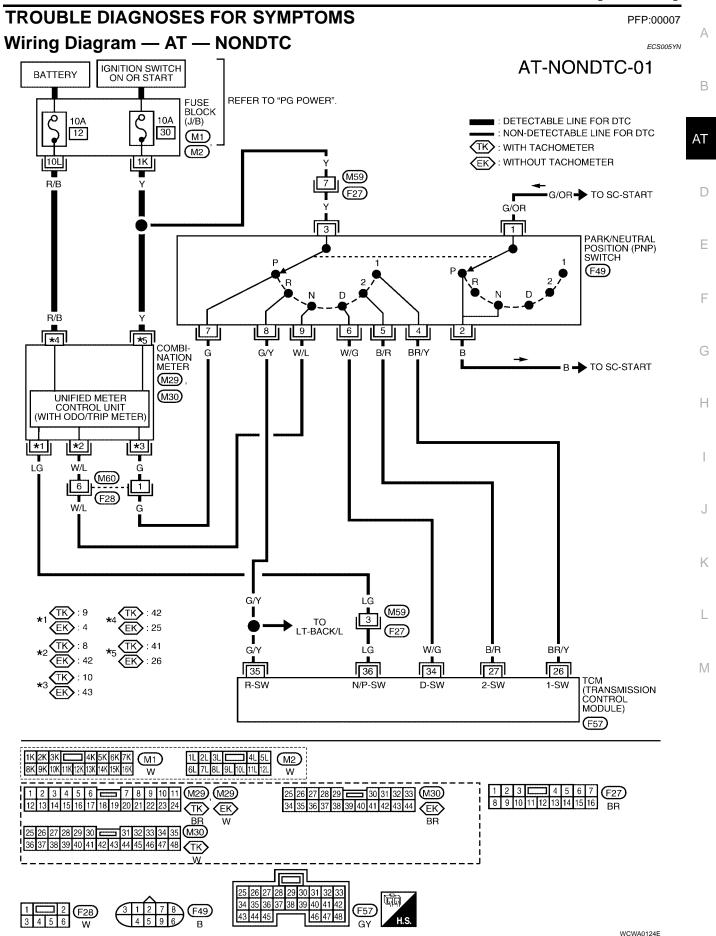
- 1. Turn ignition switch "ON" and select "SELF DIAGNOSIS" mode for A/T with CONSULT-II.
- 2. Move selector lever to "R" position.
- 3. Depress accelerator pedal (Full throttle position).
- 4. Touch "ERASE".
- 5. Turn ignition switch "OFF" position for 10 seconds.

Perform AT-213, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE".

Is the "CONT UNIT (EEP ROM)" displayed again?

Yes >> Replace TCM.

No >> INSPECTION END

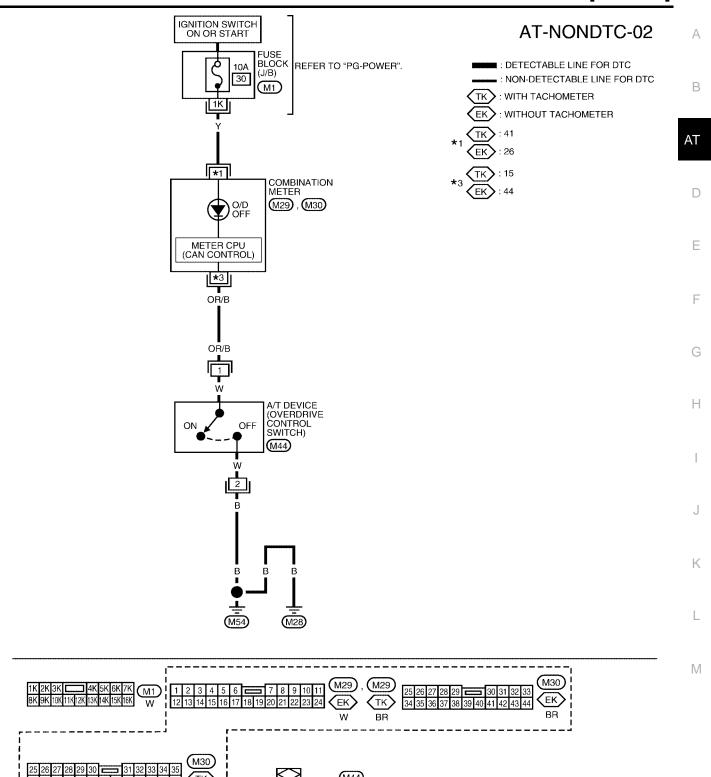


TROUBLE DIAGNOSES FOR SYMPTOMS

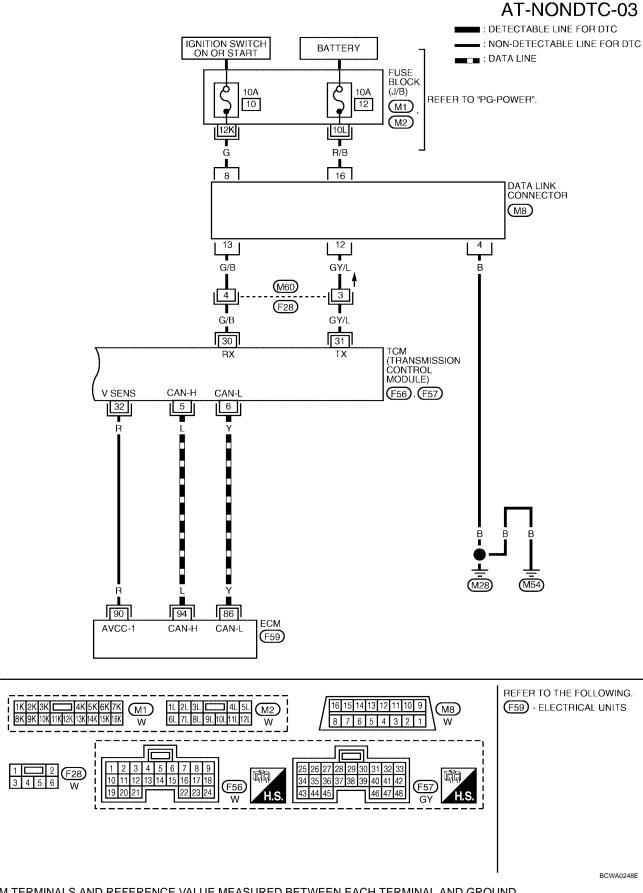
[RE4F03B]

[
TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND GROUND					
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)	
26	BR/Y	PNP SWITCH "1" POSITION	WHEN SETTING SELECTOR LEVER TO "1" POSITION	BATTERY VOLTAGE	
20	20 DR/1	PNP SWITCH I POSITION	WHEN SETTING SELECTOR LEVER TO OTHER POSITIONS	OV	
27	27 B/R	PNP SWITCH "2" POSITION	WHEN SETTING SELECTOR LEVER TO "2" POSITION	BATTERY VOLTAGE	
21 D/K	D/IX		WHEN SETTING SELECTOR LEVER TO OTHER POSITIONS	0V	
34	W/G	W/G PNP SWITCH "D" POSITION	WHEN SETTING SELECTOR LEVER TO "D" POSITION	BATTERY VOLTAGE	
34 W/G	FINE SWITCH D FOSITION	WHEN SETTING SELECTOR LEVER TO OTHER POSITIONS	0V		
35 G/Y	G/V	G/Y PNP SWITCH "R" POSITION -	WHEN SETTING SELECTOR LEVER TO "R" POSITION	BATTERY VOLTAGE	
	G/1		WHEN SETTING SELECTOR LEVER TO OTHER POSITIONS	OV	
36 L	I.G.	LG PNP SWITCH "N" OR "P" POSITION	WHEN SETTING SELECTOR LEVER TO "N" OR "P" POSITION	BATTERY VOLTAGE	
			WHEN SETTING SELECTOR LEVER TO OTHER POSITIONS	OV	

[RE4F03B]



WCWA0074E



[RE4F03B]

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
5	L	CAN-H	_	_
6	Υ	CAN-L	_	_
30	G/B	DATA LINK CONNECTOR (RX)	_	_
31	GY/L	DATA LINK CONNECTOR (TX)	_	_
32	R	SENSOR POWER	IGNITION SWITCH ON	APPROX. 4.5 - 5.5V
			IGNITION SWITCH OFF	APPROX. 0V

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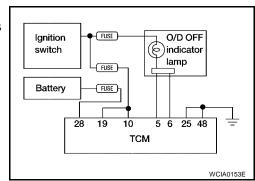
SAT467J

FCS005YO

1. O/D OFF Indicator Lamp Does Not Come On

SYMPTOM:

O/D OFF indicator lamp does not come on for about 2 seconds when turning ignition switch to "ON".



1. CHECK TCM POWER SOURCE

- Turn ignition switch to "ON" position. (Do not start engine.)
- 2. Check voltage between TCM terminals 10, 19, 28 and ground.

Voltage : Battery voltage

- 3. Turn ignition switch to "OFF" position.
- 4. Check voltage between TCM terminal 28 and ground.

Voltage : Battery voltage

OK or NG

OK >> GO TO 2.

NG >> Check the following items:

- Harness for short or open between ignition switch and TCM (Main harness). Refer to <u>AT-112, "Wiring Diagram — AT — MAIN"</u>.
- Harness for short or open between battery and TCM (Main harness) Refer to <u>AT-112, "Wiring Diagram AT MAIN"</u>.
- Ignition switch and fuse. Refer to <u>PG-3, "POWER SUPPLY ROUTING"</u>.

2. CHECK TCM GROUND CIRCUIT

- 1. Turn ignition switch to "OFF" position.
- 2. Disconnect TCM harness connector.
- 3. Check continuity between TCM terminals 25, 48 and ground.

Continuity should exist.

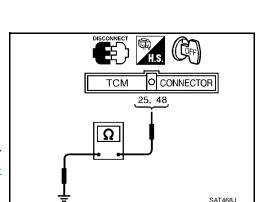
If OK, check harness for short to ground and short to power.

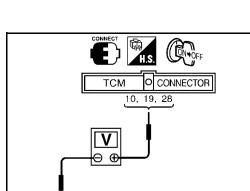
OK or NG

OK >> GO TO 3.

NG >> Repair of

>> Repair open circuit or short to ground or short to power in harness or connectors. Refer to AT-112, "Wiring Diagram — AT — MAIN".





[RE4F03B]

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[RE4F03B]				
3. CHECK SELF-DIAGNOSIS RESULTS	А			
With CONSULT-II Does "SELECTION FORM MENU" in "DATA MONITOR" show damage to O/D OFF indicator lamp (SELF D DP LMP) signal circuit?				
No Tools Execute the self-diagnosis. Is a malfunction in the CAN communication indicated in the results? YES or NO YES >> Check the CAN communication line. Refer to AT-208, "DTC U1000 CAN COMMUNICATION"	АТ			
NO >> GO TO 4.	D			
4. CHECK O/D OFF INDICATOR LAMP CIRCUIT				
 Turn ignition switch to "OFF" position. Check the combination meter. Refer to DI-7, "Combination Meter" 	Е			
OK or NG OK >> GO TO 5.	F			
NG >> Replace the combination meter. 5. CHECK SYMPTOM	G			
Check again. OK or NG	Н			
OK >> INSPECTION END NG >> 1. Perform TCM input/output signal inspection. 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.	I			
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Revision: July 2004 AT-221 2005 Sentra

[RE4F03B]

2. Engine Cannot Be Started In "P" and "N" Position

ECS005YE

SYMPTOM:

- Engine cannot be started with selector lever in "P" or "N" position.
- Engine can be started with selector lever in "D", "2", "1" or "R" position.

1. CHECK PNP SWITCH CIRCUIT

(II) With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

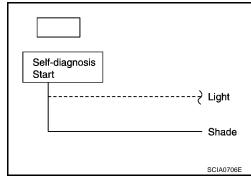
Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to <u>AT-115, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH"</u>.

No >> GO TO 2.



2. CHECK PNP SWITCH INSPECTION

Check for short or open of PNP switch harness connector terminals 1 and 2. Refer to <u>AT-117</u>, "Diagnostic Procedure".

OK or NG

NG

OK >> GO TO 3.

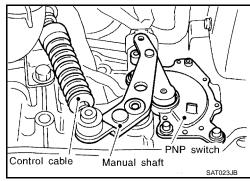
NG >> Repair or replace PNP switch.

3. CHECK CONTROL CABLE

Check control cable. Refer to <u>AT-262, "Control Cable Adjustment"</u> <u>OK or NG</u>

OK >> GO TO 4.

>> Adjust control cable. Refer to <u>AT-262, "Control Cable</u> Adjustment".



4. CHECK STARTING SYSTEM

Check starting system. Refer to <u>SC-9, "STARTING SYSTEM"</u> . OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

[RE4F03B]

3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed

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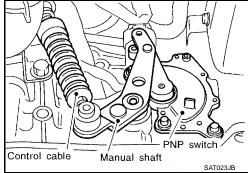
Vehicle moves when it is pushed forward or backward with selector lever in "P" position.

1. CHECK CONTROL CABLE

Check control cable. Refer to <u>AT-262, "Control Cable Adjustment"</u> OK or NG

OK >> GO TO 2.

NG >> Adjust control cable. Refer to <u>AT-262, "Control Cable Adjustment"</u>.

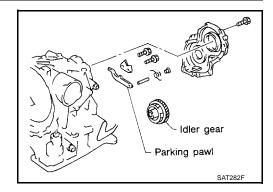


2. CHECK PARKING COMPONENTS

Check parking components. Refer to $\underline{\text{AT-267, "Components"}}$. OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.



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4. In "N" Position, Vehicle Moves

SYMPTOM:

Vehicle moves forward or backward when selecting "N" position.

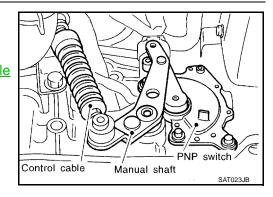
1. CHECK CONTROL CABLE

Check control cable. Refer to $\underline{\text{AT-262, "Control Cable Adjustment"}}$. OK or NG

OK >> GO TO 2.

NG >> Adjust control cable. Refer to AT-262, "Control Cable

Adjustment".



2. CHECK A/T FLUID LEVEL

Check A/T fluid level again.

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.



3. CHECK A/T FLUID CONDITION

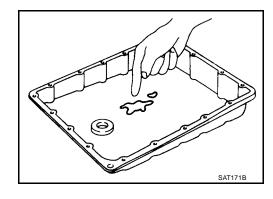
- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 4.

NG >> 1. Disassemble A/T.

- 2. Check the following items:
- Forward clutch assembly
- Overrun clutch assembly
- Reverse clutch assembly



4. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

[RE4F03B]

5. Large Shock. "N" → "R" Position

ECS005YS

SYMPTOM:

There is large shock when changing from "N" to "R" position.

1. CHECK SELF-DIAGNOSTIC RESULTS

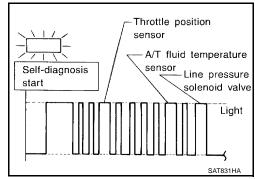
Does self-diagnosis show damage to A/T fluid temperature sensor, line pressure solenoid valve or throttle position sensor [accelerator pedal position (APP) sensor] circuit?

Yes or No

Yes

>> Check damaged circuit. Refer to AT-120, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT", AT-173, "DTC P0745 LINE PRESSURE SOLENOID VALVE" or AT-187, "DTC P1705 THROTTLE POSI-TION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]".

>> GO TO 2. No



2. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "D" position. Refer to AT-67, "Line Pressure Test".

OK or NG

OK

>> GO TO 3.

NG

- >> 1. Remove control valve assembly. Refer to AT-259, "REMOVAL".
 - 2. Check the following items:
 - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
 - Line pressure solenoid valve
 - Oil pump assembly

SAT4940

3. CHECK SYMPTOM

Check again.

OK or NG

OK NG >> INSPECTION END

>> 1. Perform TCM input/output signal inspection.

If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

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6. Vehicle Does Not Creep Backward In "R" Position

SYMPTOM:

Vehicle does not creep backward when selecting "R" position.

1. CHECK A/T FLUID LEVEL

Check A/T fluid level again.

OK or NG

OK >> GO TO 2. NG >> Refill ATF.



2. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "R" position. Refer to <u>AT-67, "Line Pressure Test"</u> .

OK or NG

OK >> GO TO 3.

NG >> 1. Remo

- >> 1. Remove control valve assembly. Refer to $\underline{\text{AT-259}}$ $\underline{\text{"REMOVAL"}}$.
 - 2. Check the following items:
 - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
 - Line pressure solenoid valve
 - 3. Disassemble A/T.
 - 4. Check the following item:
 - Oil pump assembly

3. CHECK STALL TEST

Check stall revolution with selector lever in "1" and "R" positions.

OK or NG

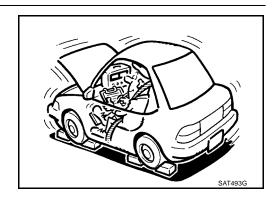
OK >> GO TO 4.

OK in "1" position, NG in "R" position>>1. Disassemble A/T.

- 2. Check the following items:
- Reverse clutch assembly

NG in both "1" and "R" positions>> GO TO 6.





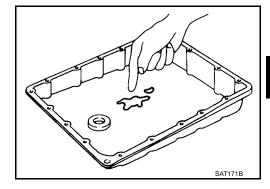
[RE4F03B]

4. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 5. NG >> GO TO 6.



5. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

6. DETECT MALFUNCTIONING ITEM

- 1. Disassemble A/T.
- 2. Check the following items:
- Reverse clutch assembly
- High clutch assembly
- Low & reverse brake assembly
- Forward clutch assembly
- Overrun clutch assembly

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

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7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position

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SYMPTOM:

Vehicle does not creep forward when selecting "D", "2" or "1" position.

1. CHECK A/T FLUID LEVEL

Check A/T fluid level again.

OK or NG

OK >> GO TO 2. NG >> Refill ATF.



2. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "D" position. Refer to <u>AT-67, "Line Pressure Test"</u> .

OK or NG

OK >> GO TO 3.

NG

- >> 1. Remove control valve assembly. Refer to <u>AT-259,</u> "<u>REMOVAL"</u>.
 - 2. Check the following items:
 - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
 - Oil pump assembly

ter) Line pressure solenoid valve 3. Disassemble A/T. 4. Check the following item:



3. CHECK STALL TEST

Check stall revolution with selector lever in "D" position. Refer to $\underline{\text{AT-}}$ 63, "Stall Test" .

OK or NG

OK >> GO TO 4. NG >> GO TO 6.



[RE4F03B]

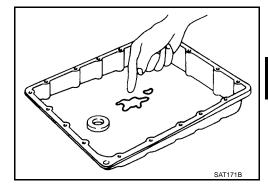
4. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

>> GO TO 5. OK

NG >> GO TO 6.



5. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

6. DETECT MALFUNCTIONING ITEM

- 1. Disassemble A/T.
- 2. Check the following items:
- Forward clutch assembly
- Forward one-way clutch
- Low one-way clutch
- Reverse clutch assembly
- High clutch assembly

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts. D

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8. Vehicle Cannot Be Started From D1

ECS005YV

SYMPTOM:

Vehicle cannot be started from D₁ on Cruise Test — Part 1.

1. CHECK SYMPTOM

Is "6. Vehicle Does Not Creep Backward In R Position" OK?

Yes or No

Yes >> GO TO 2.

No >> Go to AT-226, "6. Vehicle Does Not Creep Backward In "R" Position".

2. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to vehicle speed sensor-A/T (revolution sensor), overrun clutch solenoid valve, torque converter clutch solenoid valve, shift solenoid valve A, B or vehicle speed sensor-MTR after cruise test?

Yes or No

Yes >> Check damaged circuit. Refer to AT-126, "DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR)", AT-159, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE", AT-179, "DTC P0750 SHIFT SOLENOID VALVE A", AT-183, "DTC P0755 SHIFT SOLENOID VALVE B", AT-193, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE" or AT-203,

"DTC VHCL SPEED SEN:MTR VEHICLE SPEED SENSOR:MTR".

No >> GO TO 3.

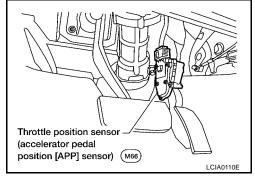
3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to $\underline{\text{EC-212}}$, $\underline{\text{"DTC P0122}}$, $\underline{\text{P0123 TP SENSOR"}}$.

OK or NG

OK >> GO TO 4.

NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



Vehicle speed sensor•A/T (revolution sensor)

711

Self-diagnosis

start

Vehicle speed sensor•MTR | Shift solenoid valve A

Overrun clutch

solenoid valve

Shift solenoid valve B

Torque converter

clutch solenoid valve

- Light

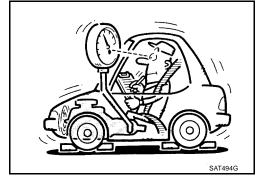
- Shade

4. CHECK LINE PRESSURE

Check line pressure at stall point with selector lever in "D" position. Refer to $\underline{\text{AT-67}}$, "Line Pressure Test".

OK or NG

OK >> GO TO 5. NG >> GO TO 8.



[RE4F03B]

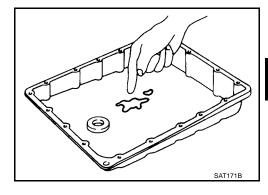
5. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

>> GO TO 6. OK

NG >> GO TO 8.



6. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-259, "REMOVAL" .
- 2. Check the following items:
- Shift valve A
- Shift valve B
- Shift solenoid valve A
- Shift solenoid valve B
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

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[RE4F03B]

8. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-259, "REMOVAL".
- 2. Check the following items:
- Shift valve A
- Shift valve B
- Shift solenoid valve A
- Shift solenoid valve B
- Pilot valve
- Pilot filter
- 3. Disassemble A/T.
- 4. Check the following items:
- High clutch assembly
- Torque converter
- Oil pump assembly
- Reverse clutch assembly
- Low and reverse brake assembly

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

[RE4F03B]

9. A/T Does Not Shift: D1 \rightarrow D2 Or Does Not Kickdown: D4 \rightarrow D2

ECS005YW

SYMPTOM:

A/T does not shift from D₁ to D₂ at the specified speed.

A/T does not shift from D4 to D2 when depressing accelerator pedal fully at the specified speed.

1. CHECK SYMPTOM

Are "7. Vehicle Does Not Creep Forward In D, 2 Or 1 Position" and "8. Vehicle Cannot Be Started From D1 OK?

Yes or No

Yes >> GO TO 2.

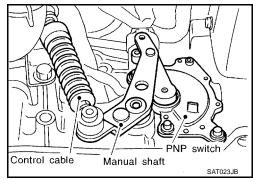
No >> Go to AT-228, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position", AT-230, "8. Vehicle Cannot Be Started From D1".

2. CHECK CONTROL CABLE

Check control cable. Refer to <u>AT-262, "Control Cable Adjustment"</u> <u>OK or NG</u>

OK >> GO TO 3.

NG >> Adjust control cable. Refer to <u>AT-262, "Control Cable Adjustment"</u>.



3. CHECK VEHICLE SPEED SENSOR-A/T AND CHECK VEHICLE SPEED SENSOR-MTR CIRCUIT

Check vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuit. Refer to AT-126, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)", AT-203, "DTC VHCL SPEED SENSOR·MTR".

OK or NG

OK >> GO TO 4.

NG >> Repair or replace vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuits.

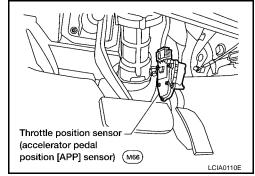
4. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to $\underline{\text{CC-212}}$, $\underline{\text{"DTC P0122}}$, $\underline{\text{P0123 TP SENSOR"}}$.

OK or NG

OK >> GO TO 5.

NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



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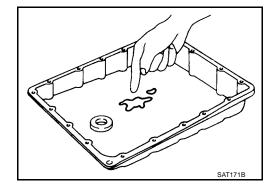
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5. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 6. NG >> GO TO 8.



6. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve. Refer to AT-259, "REMOVAL".
- 2. Check the following items:
- Shift valve A
- Shift valve B
- Shift solenoid valve A
- Shift solenoid valve B
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

8. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve. Refer to AT-259, "REMOVAL".
- 2. Check the following items:
- Shift valve A
- Shift valve B
- Shift solenoid valve A
- Shift solenoid valve B
- Pilot valve
- Pilot filter
- 3. Disassemble A/T.
- 4. Check the following items:
- Servo piston assembly
- Brake band

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

[RE4F03B]

10. A/T Does Not Shift: D2 \rightarrow D3

SYMPTOM:

A/T does not shift from D2 to D3 at the specified speed.

1. CHECK SYMPTOM

Are "7. Vehicle Does Not Creep Forward In D, 2 Or 1 Position" and "8. Vehicle Cannot Be Started From D1" OK?

Yes or No

Yes >> GO TO 2.

>> Go to AT-228, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position", AT-230, "8. Vehicle No Cannot Be Started From D1".

2. CHECK PNP SWITCH CIRCUIT

(III) With CONSULT-II

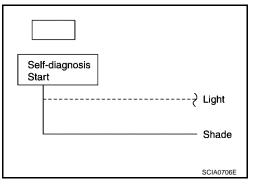
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit? Yes or No

Yes >> Check PNP switch circuit. Refer to AT-115, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH".

>> GO TO 3. No



3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

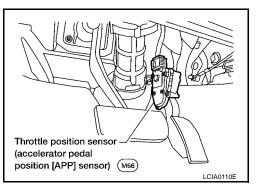
Check throttle position sensor [accelerator pedal position (APP) sensorl. Refer to EC-212, "DTC P0122, P0123 TP SENSOR".

OK or NG

OK >> GO TO 4.

NG

>> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



AT-235 2005 Sentra Revision: July 2004

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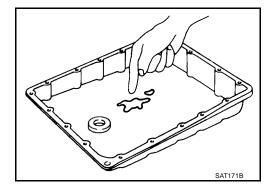
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4. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 5. NG >> GO TO 7.



5. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-259, "REMOVAL" .
- 2. Check the following items:
- Shift valve B
- Shift solenoid valve B
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

6. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

7. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-259, "REMOVAL".
- 2. Check the following items:
- Shift valve B
- Shift solenoid valve B
- Pilot valve
- Pilot filter
- 3. Disassemble A/T.
- 4. Check the following items:
- Servo piston assembly
- High clutch assembly
- Brake band

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

[RE4F03B]

11. A/T Does Not Shift: D₃ → D₄

S005YY

SYMPTOM:

- A/T does not shift from D₃ to D₄ at the specified speed.
- A/T must be warm before D₃ to D₄ shift will occur.

1. CHECK SYMPTOM

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Are "7. Vehicle Does Not Creep Forward In D, 2 Or 1 Position" and "8. Vehicle Cannot Be Started From D1 " OK?

Yes or No

D

Yes >> GO TO 2.

No

>> Go to AT-228, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position", AT-230, "8. Vehicle Cannot Be Started From D1".

2. CHECK SELF-DIAGNOSTIC RESULTS

(III) With CONSULT-II

Does self-diagnosis, after cruise test, show damage to any of the following circuits?

- PNP switch
- Overdrive control switch
- A/T fluid temperature sensor
- Vehicle speed sensor-A/T (revolution sensor)
- Shift solenoid valve A or B
- Vehicle speed sensor·MTR

Yes or No

Yes

>>> Check damaged circuit. Refer to AT-115, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH", AT-120, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT", AT-126, "DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR)", AT-179, "DTC P0750 SHIFT SOLENOID VALVE A", AT-183, "DTC P0755 SHIFT SOLENOID VALVE B", AT-203, "DTC VHCL SPEED SEN-MTR VEHICLE SPEED SEN-SOR-MTR".

No >> GO TO 3.

3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to <u>EC-212</u>, "<u>DTC P0122</u>, <u>P0123 TP SENSOR</u>" .

OK or NG

OK >> GO TO 4.

NG

>> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

Throttle position sensor (accelerator pedal position [APP] sensor) M66

LCIA0110E

Vehicle speed sensor•A/T

sensor

Vehicle speed sensor•MTR

Shift solenoid valve A

Shift solenoid valve B / A/T fluid temperature

Light

Light

(revolution sensor)

Self-diagnosis

start

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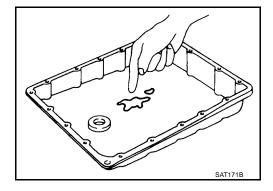
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4. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 5. NG >> GO TO 7.



5. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-259, "REMOVAL" .
- 2. Check the following items:
- Shift valve A
- Overrun clutch control valve
- Shift solenoid valve A
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

6. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

7. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-259, "REMOVAL".
- 2. Check the following items:
- Shift valve A
- Overrun clutch control valve
- Shift solenoid valve A
- Pilot valve
- Pilot filter
- 3. Disassemble A/T.
- 4. Check the following items:
- Servo piston assembly
- Brake band

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

[RE4F03B]

12. A/T Does Not Perform Lock-up

SYMPTOM:

A/T does not perform lock-up at the specified speed.

1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to A/T fluid temperature sensor, vehicle speed sensor.A/T (revolution sensor), engine speed signal, torque converter clutch solenoid valve, or vehicle speed sensor MTR circuit after cruise test?

Yes or No

Yes

>> Check torque converter clutch solenoid valve circuit. Refer to AT-120, "DTC P0710 A/T FLUID TEMPERA-TURE SENSOR CIRCUIT", AT-126, "DTC P0720 VEHI-CLE SPEED SENSOR-A/T (REVOLUTION SENSOR)", AT-131, "DTC P0725 ENGINE SPEED SIGNAL", AT-159, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE", and AT-203, "DTC VHCL SPEED SEN-MTR VEHICLE SPEED SENSOR-MTR".

Vehicle speed sensor•A/T (revolution sensor) Vehicle speed sensor•MTR Torque converter clutch solenoid valve A/T fluid temperature 717 Self-diagnosis Engine speed signal start - Light -Shade

No >> GO TO 2.

$2.\,$ check throttle position sensor [accelerator pedal position (app) sensor]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to EC-212, "DTC P0122, P0123 TP SENSOR".

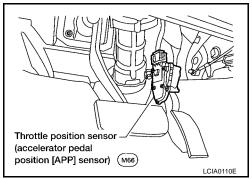
OK or NG

OK

>> GO TO 3.

NG

>> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



3. DETECT MALFUNCTIONING ITEM

- Remove control valve. Refer to AT-259, "REMOVAL" . 1.
- 2. Check the following items:
- Torque converter clutch control valve
- Torque converter relief valve
- Pilot valve
- Pilot filter
- Remove A/T.
- Check torque converter.

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

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Revision: July 2004

13. A/T Does Not Hold Lock-up Condition

ECS005Z0

SYMPTOM:

A/T does not hold lock-up condition for more than 30 seconds.

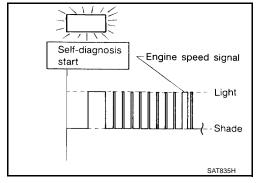
1. CHECK DIAGNOSTIC RESULTS

Does self-diagnosis show damage to engine speed signal circuit after cruise test?

Yes or No

Yes >> Check engine speed signal circuit. Refer to <u>AT-131</u>, "DTC P0725 ENGINE SPEED SIGNAL" .

No >> GO TO 2.

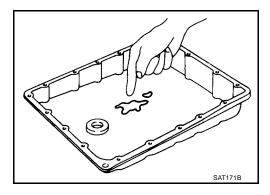


2. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 3. NG >> GO TO 5.



3. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-259, "REMOVAL".
- 2. Check the following items:
- Torque converter clutch control valve
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

[RE4F03B]

5. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-259, "REMOVAL" .
- 2. Check the following items:
- Torque converter clutch control valve
- Pilot valve
- Pilot filter
- 3. Disassemble A/T.
- 4. Check torque converter and oil pump assembly.

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

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[RE4F03B]

14. Lock-up Is Not Released

SYMPTOM:

Lock-up is not released when accelerator pedal is released.

1. CHECK THROTTLE POSITION SWITCH CIRCUIT

(III) With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to closed throttle position switch circuit?

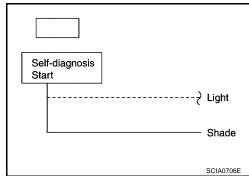
Without CONSULT-II

Does self-diagnosis show damage to closed throttle position switch circuit?

Yes or No

Yes >> Check closed throttle position switch circuit. Refer to <u>AT-115, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH"</u>.

No >> GO TO 2.



2. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

[RE4F03B]

15. Engine Speed Does Not Return To Idle (Light Braking D4 $\, ightarrow$ D3) SYMPTOM:

- Engine speed does not smoothly return to idle when A/T shifts from D4 to D3.
- Vehicle does not decelerate by engine brake when turning overdrive control switch OFF.
- Vehicle does not decelerate by engine brake when shifting A/T from "D" to "2" position.

1. CHECK SELF-DIAGNOSTIC RESULTS

ΑT

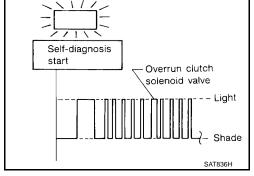
Does self-diagnosis show damage to overrun clutch solenoid valve circuit after cruise test?

Yes or No

Yes

>> Check overrun clutch solenoid valve circuit. Refer to AT-193, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE".

>> GO TO 2. No



2. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to EC-212, "DTC P0122, P0123 TP SENSOR".

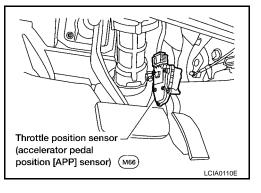
OK or NG

OK

>> GO TO 3.

NG

>> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



3. check a/t fluid condition

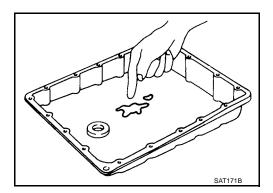
- Remove oil pan. 1.
- 2. Check A/T fluid condition.

OK or NG

OK

>> GO TO 4.

NG >> GO TO 6.



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4. detect malfunctioning item

- 1. Remove control valve assembly. Refer to AT-259, "REMOVAL".
- 2. Check the following items:
- Overrun clutch control valve
- Overrun clutch reducing valve
- Overrun clutch solenoid valve

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

6. DETECT MALFUNCTIONING ITEM

- Remove control valve assembly. Refer to <u>AT-259, "REMOVAL"</u>.
- 2. Check the following items:
- Overrun clutch control valve
- Overrun clutch reducing valve
- Overrun clutch solenoid valve
- Disassemble A/T.
- 4. Check the following items:
- Overrun clutch assembly

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

16. Vehicle Does Not Start From D1

SYMPTOM:

Vehicle does not start from D1 on Cruise test — Part 2.

1. CHECK SELF-DIAGNOSTIC RESULTS

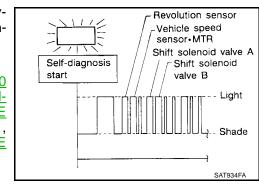
Does self-diagnosis show damage to vehicle speed sensor-A/T (revolution sensor), shift solenoid valve A, B or vehicle speed sensor-MTR after cruise test?

Yes or No

Yes

>> Check damaged circuit. Refer to AT-126, "DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR)", AT-179, "DTC P0750 SHIFT SOLENOID VALVE A", AT-183, "DTC P0755 SHIFT SOLENOID VALVE B", AT-203, "DTC VHCL SPEED SEN-MTR VEHICLE SPEED SENSOR-MTR".

No >> GO TO 2.



[RE4F03B]

$\overline{2}$. CHECK SYMPTOM

Check again.

OK or NG

OK >> Go to AT-230, "8. Vehicle Cannot Be Started From D1".

NG >> 1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

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[RE4F03B]

17. A/T Does Not Shift: D4 $\,\rightarrow$ D3 , When Overdrive Control Switch "ON" $\,\rightarrow$ "OFF"

ECS005Z4

SYMPTOM:

A/T does not shift from D4 to D3 when changing overdrive control switch to "OFF" position.

1. CHECK OVERDRIVE CONTROL SWITCH CIRCUIT

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to overdrive control switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to overdrive control switch circuit?

Yes or No

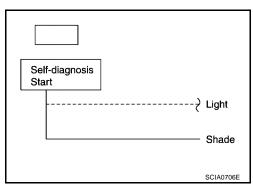
Yes

>> Check overdrive control switch circuit. Refer to AT-249,

"21. TCM Self-diagnosis Does Not Activate {Park/neutral Position (PNP), Overdrive Control and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor]
Switches Circuit Checks}".

No

>> Go to AT-235, "10. A/T Does Not Shift: $D_2 \rightarrow D_3$ ".



[RE4F03B]

18. A/T Does Not Shift: D3 ightarrow 22 , When Selector Lever "D" ightarrow "2" Position ECSSOGES

A/T does not shift from D₃ to 2₂ when changing selector lever from "D" to "2" position.

1. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

Without CONSULT-II

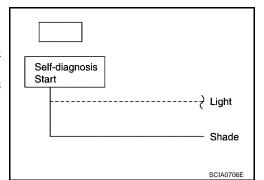
Does self-diagnosis show damage to PNP switch circuit?

Yes or No

SYMPTOM:

Yes >> Check PNP switch circuit. Refer to AT-115, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH"

No >> Go to AT-233, "9. A/T Does Not Shift: $D_1 \rightarrow D_2$ Or Does Not Kickdown: $D_4 \rightarrow D_2$ ".



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[RE4F03B]

19. A/T Does Not Shift: 22 \rightarrow 11 , When Selector Lever "2" \rightarrow "1" Position SYMPTOM:

A/T does not shift from 22 to 11 when changing selector lever from "2" to "1" position.

1. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

Without CONSULT-II

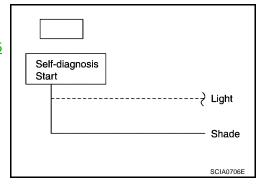
Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes

>> Check PNP switch circuit. Refer to <u>AT-115, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH"</u>.

No >> GO TO 2.



2. CHECK SYMPTOM

Check again.

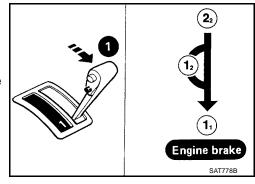
OK or NG

OK

>> INSPECTION END

NG

- >> 1. Perform TCM input/output signal inspection.
 - 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.



[RE4F03B]

20. Vehicle Does Not Decelerate By Engine Brake

CS005Z7

SYMPTOM:

Vehicle does not decelerate by engine brake when shifting from 22 (12) to 11.

1. CHECK SYMPTOM

Is "6. Vehicle Does Not Creep Backward In R Position" OK?

Yes or No

Yes \rightarrow Go to AT-243, "15. Engine Speed Does Not Return To Idle (Light Braking D4 \rightarrow D3)".

No >> Go to AT-226, "6. Vehicle Does Not Creep Backward In "R" Position".

21. TCM Self-diagnosis Does Not Activate {Park/neutral Position (PNP), Over-drive Control and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor] Switches Circuit Checks}

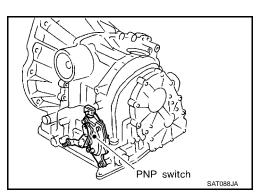
ECS006GY

SYMPTOM:

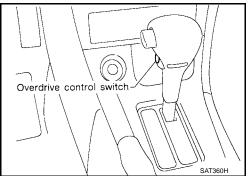
O/D OFF indicator lamp does not come on in TCM self-diagnostic procedure even if the lamp circuit is good.

DESCRIPTION

Park/neutral position (PNP) switch
 The park/neutral (PNP) switch assembly includes a transmission range switch. The transmission range switch detects the selector lever position and sends a signal to the TCM.

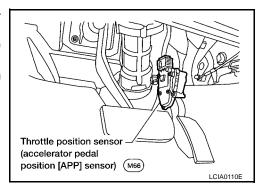


Overdrive control switch
 Detects the overdrive control switch position (ON or OFF) and sends a signal to the TCM.



Throttle position sensor [accelerator pedal position (APP) sensor]

The throttle position sensor [accelerator pedal position (APP) sensor] is part of the system that controls the throttle position. This system also uses an electric throttle control actuator, which consists of a throttle control motor and throttle position sensors. Accelerator pedal position signal is sent to the ECM.



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DIAGNOSTIC PROCEDURE

NOTE:

The diagnostic procedure includes inspections for the overdrive control switch circuits.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITH CONSULT-II)

With CONSULT-II

- Turn ignition switch to ON position. (Do not start engine.)
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Read out P/N, R, D, 2 and 1 position switches moving selector lever to each position.
 Check that the signal of the selector lever position is indicated

properly.

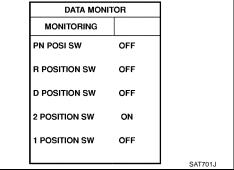
OK or NG

NG

OK >> GO TO 2.

>> Check the following items:

- PNP switch (Refer to <u>AT-115, "DTC P0705 PARK/</u> <u>NEUTRAL POSITION (PNP) SWITCH"</u>
- Harness for short or open between ignition switch and PNP switch
- Harness for short or open between PNP switch and TCM



2. CHECK OVERDRIVE CONTROL SWITCH CIRCUIT (WITH CONSULT-II)

With CONSULT-II

- Turn ignition switch to ON position. (Do not start engine.)
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Read out "OVERDRIVE SW".
 Check the signal of the overdrive control switch is indicated properly.
 (Overdrive control switch "ON" displayed on CONSULT-II means overdrive "OFF".)

OK or NG

OK >> GO TO 3.

NG

- >> Check the following items:
 - Overdrive control switch (Refer to <u>AT-251, "Overdrive</u> Control Switch"
 - Harness for short or open between TCM and overdrive control switch
 - Harness of ground for overdrive control switch for short or open

DATA MONITOR MONITORING ENGINE SPEED XXX rpm TURBINE REV XXX rpm OVERDRIVE SW ON PN POSI SW OFF R POSITION SW OFF

3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Perform throttle position sensor [accelerator pedal position (APP) sensor] inspection. Refer to <u>AT-187</u>,
 "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]".

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

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4. CHECK TCM INSPECTION

1. Perform AT-250, "DIAGNOSTIC PROCEDURE"

OK or NG

OK >> INSPECTION END.

NG >> ● Perform TCM input/output signal inspection.

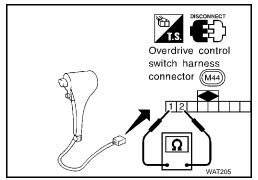
If NG, recheck TCM pin terminals for damage or loose connections with harness connector.

COMPONENT INSPECTION

Overdrive Control Switch

Check continuity between terminals 1 and 2.

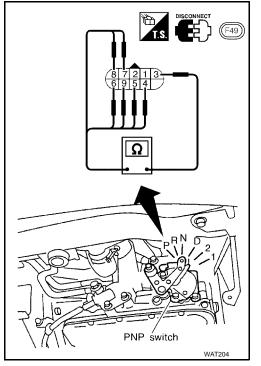
Switch position	Continuity	
RELEASED	No	
DEPRESSED	Yes	



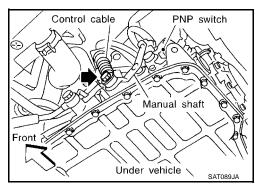
PNP Switch

1. Check continuity between terminals 1 and 2 and between terminals 3 and 4, 5, 6, 7, 8, 9 while moving manual shaft through each position.

Lever position	Terminal No.		
Р	3 — 7	1 — 2	
R	3 — 8		
N	3 — 9	1 — 2	
D	3 — 6		
2	3 — 5		
1	3 — 4		



- 2. If NG, check again with manual control cable disconnected from manual shaft of A/T assembly. Refer to step 1.
- 3. If OK on step 2, adjust manual control cable. Refer to <u>AT-262, "Control Cable Adjustment"</u>.
- 4. If NG on step 2, remove PNP switch from A/T and check continuity of PNP switch terminals. Refer to step 1.
- 5. If OK on step 4, adjust PNP switch. Refer to <u>AT-262, "Park/Neutral Position (PNP) Switch Adjustment"</u>.
- 6. If NG on step 4, replace PNP switch.



A/T SHIFT LOCK SYSTEM

PFP:34950

ECS006H0

Description

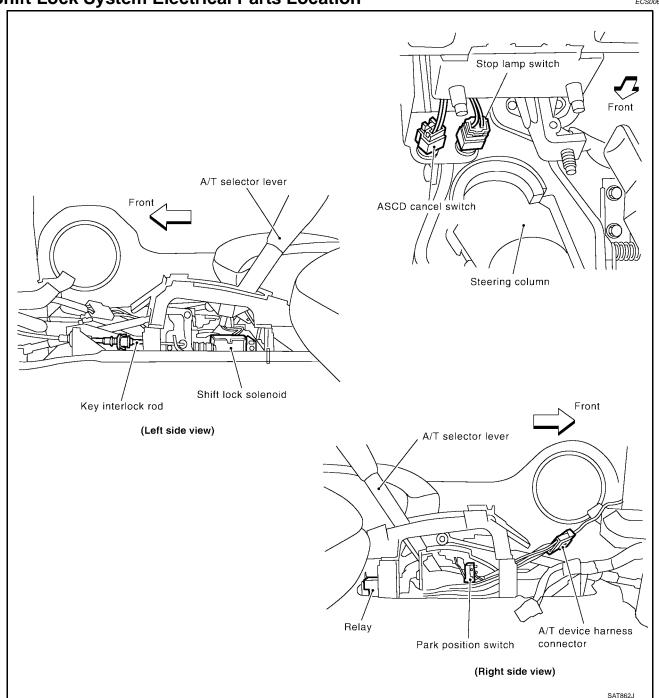
The mechanical key interlock mechanism also operates as a shift lock:

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- With the key switch turned to ON, the selector lever cannot be shifted from "P" (parking) to any other position unless the brake pedal is depressed.
- With the key removed, the selector lever cannot be shifted from "P" to any other position.
- The key cannot be removed unless the selector lever is placed in "P".
- The shift lock and key interlock mechanisms are controlled by the ON-OFF operation of the shift lock solenoid and by the operation of the rotator and slider located inside the key cylinder.

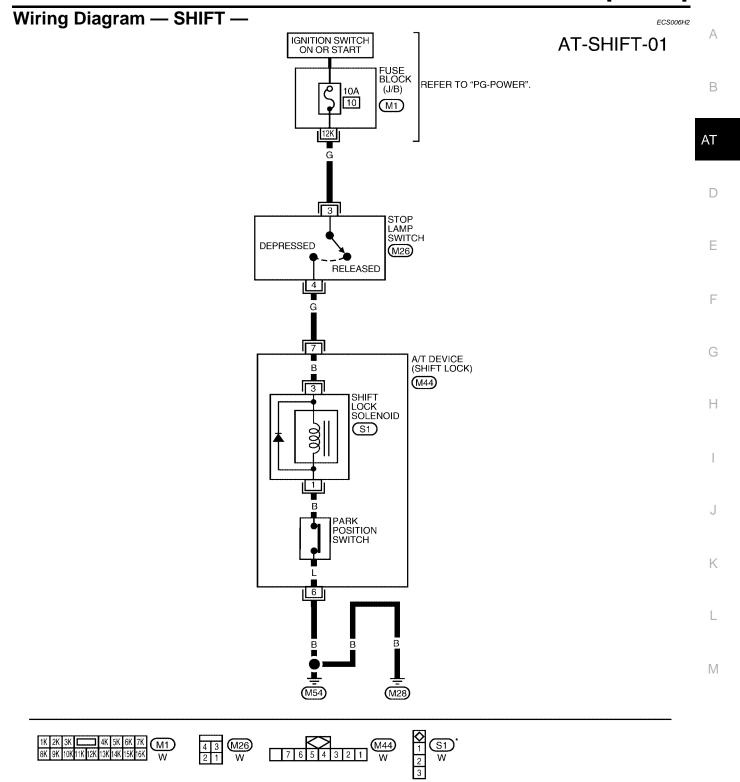
Shift Lock System Electrical Parts Location





A/T SHIFT LOCK SYSTEM

[RE4F03B]



*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

WCWA0126E

Diagnostic Procedure

ECS006H3

SYMPTOM 1:

- Selector lever cannot be moved from "P" position with key in ON position and brake pedal applied.
- Selector lever can be moved from "P" position with key in ON position and brake pedal released.
- Selector lever can be moved from "P" position when key is removed from key cylinder.

SYMPTOM 2:

Ignition key cannot be removed when selector lever is set to "P" position. It can be removed when selector lever is set to any position except "P".

1. CHECK KEY INTERLOCK CABLE

Check key interlock cable for damage.

OK or NG

OK >> GO TO 2.

NG >> Repair key interlock cable. Refer to <u>AT-637, "Components"</u>.

2. CHECK SELECTOR LEVER POSITION

Check selector lever position for damage.

OK or NG

OK >> GO TO 3.

NG >> Check selector lever. Refer to AT-642, "Control Cable Adjustment".

3. CHECK POWER SOURCE

Turn ignition switch to "ON" position. (Do not start engine.)

Check voltage between A/T device harness connector M44 terminal 7 (G) and ground.

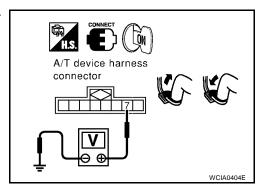
Voltage:

Brake pedal depressed: Battery voltage

Brake pedal released: 0V

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



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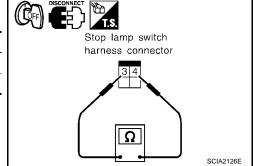
4. DETECT MALFUNCTIONING ITEM

Check the following items.

- 1. Harness for open or short between fuse block (J/B) connector M1 terminal 12K and stop lamp switch harness connector M26 terminal 3.
- 2. Harness for open or short stop lamp switch harness connector M26 terminal 4 and A/T device harness connector M44 terminal 7 (G).
- 3. 10A fuse [10, located in the fuse block (J/B)].
- 4. Check continuity between stop lamp switch harness connector M26 terminals 3 (G) and 4 (G).

Condition	Continuity
When brake pedal is depressed	Yes
When brake pedal is released	No

Check stop lamp switch after adjusting brake pedal —refer to BR-12, "STOP LAMP SWITCH AND ASCD CANCEL SWITCH **CLEARANCE**"



OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK GROUND CIRCUIT

- Turn ignition switch to "OFF" position. 1.
- Disconnect A/T device harness connector. 2.
- Check continuity between A/T device harness M44 terminal 6 (B) and ground. 3.

Continuity should exist

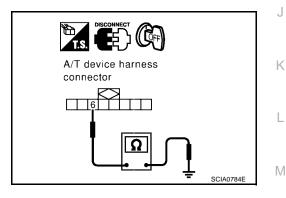
Continuity should exist.

If OK, check harness for short to power.

OK or NG

OK >> GO TO 6.

NG >> Repair open circuit in harness.



6. CHECK PARK POSITION SWITCH

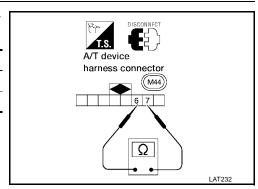
Check continuity between A/T device harness connector M44 terminals 6 (B) and 7 (G).

Selector lever position	Continuity
"P" position	Yes
Other position	No

OK or NG

OK >> GO TO 7.

NG >> Replace park position switch.



AT-255 Revision: July 2004 2005 Sentra

7. CHECK SHIFT LOCK SOLENOID

- 1. Connect A/T device harness connector.
- 2. Turn ignition switch to "ON" position.
- 3. Check operation sound.

Condition	Brake pedal	Operation sound
When ignition switch is turned to "ON" position and	Depressed	Yes
selector lever is in the "P" position.	Released	No

OK or NG

OK >> GO TO 8.

NG >> Replace shift lock solenoid.

8. CHECK SHIFT LOCK OPERATION

- 1. Reconnect shift lock harness connector.
- 2. Turn ignition switch from "OFF" to "ON" position. (Do not start engine.)
- 3. Recheck shift lock operation.

OK or NG

OK >> INSPECTION END

NG >> GO TO .9

9. CHECK A/T DEVICE INSPECTION

- 1. Perform A/T device input/output signal inspection test.
- 2. If NG, recheck harness connector connection.

OK or NG

OK >> INSPECTION END

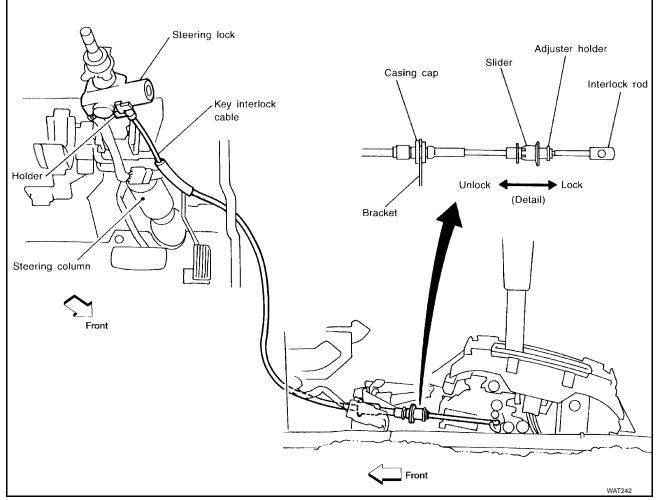
NG >> Repair or replace damaged parts.

KEY INTERLOCK CABLE

PFP:34908

Components

ECS005ZD

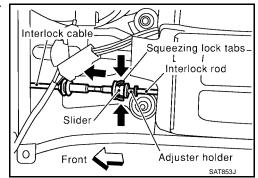


CAUTION:

- Install key interlock cable in such a way that it will not be damaged by sharp bends, twists or interference with adjacent parts.
- After installing key interlock cable to control device, make sure that casing cap and bracket are firmly secured in their positions.

Removal

 Unlock slider by squeezing lock tabs on slider from adjuster holder and remove interlock rod from cable.



Revision: July 2004 AT-257 2005 Sentra

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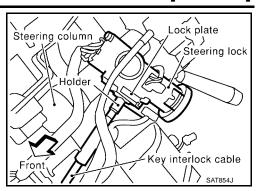
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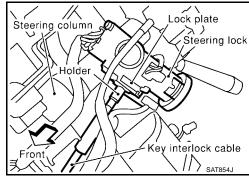
2. Remove lock plate from steering lock assembly and remove key interlock cable.



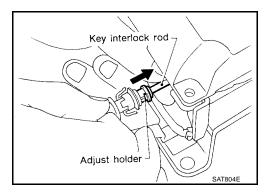
Installation

ECS005ZF

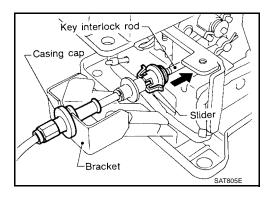
- 1. Turn ignition key to lock position.
- 2. Set A/T selector lever to "P" position.
- 3. Set key interlock cable to steering lock assembly and install lock plate.
- 4. Clamp cable to steering column and attach to control cable with band.



5. Insert interlock rod into adjuster holder.



- 6. Install casing cap to bracket.
- 7. Move slider in order to connect adjuster holder to interlock rod.



ON-VEHICLE SERVICE

[RE4F03B]

ON-VEHICLE SERVICE

PFP:00000

Control Valve Assembly and Accumulators REMOVAL

ECS005ZG

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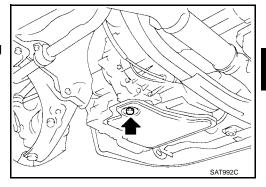
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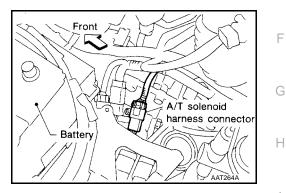
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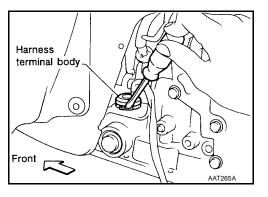
- 1. Drain ATF from transaxle.
- 2. Remove oil pan and gasket.
 - Always replace oil pan bolts as they are self-sealing bolts.



3. Disconnect A/T solenoid valve harness connector.



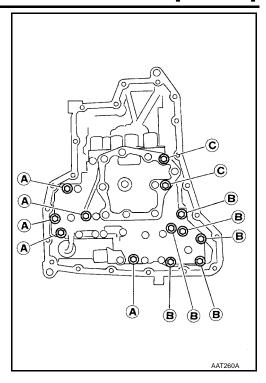
- 4. Remove stopper ring from A/T solenoid harness terminal body.
- 5. Remove A/T solenoid harness by pushing terminal body into transmission case.



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Revision: July 2004 AT-259 2005 Sentra

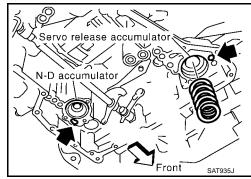
6. Remove control valve assembly mounting bolts A, B and C.



Bolt length, number and location:

Bolt symbol	А	В	С
Bolt length "I"	40.0 mm (1.575 in)	33.0 mm (1.299 in)	43.5 mm (1.713 in)
Number of bolts	5	6	2

- Be careful not to drop manual valve and servo release accumulator return springs.
- 7. Disassemble and inspect control valve assembly if necessary. Refer to AT-297, "Components".
- 8. Remove servo release and N-D accumulators by applying compressed air if necessary.
 - Hold each piston with a clean, lint-free towel.

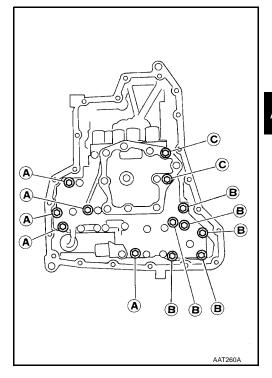


INSTALLATION

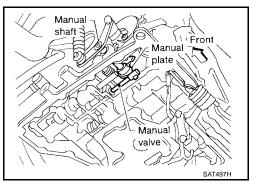
• Tighten mounting bolts A, B and C to specification.



: 7 - 9 N·m (0.7 - 0.9 kg-m, 61 - 78 in-lb)



- Set manual shaft in Neutral position, then align manual plate with groove in manual valve.
- After installing control valve assembly to transmission case, make sure that selector lever can be moved to all positions.



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Control Cable Adjustment

Move selector lever from the "P" position to the "1" position. You should be able to feel the detents in each position. If the detents cannot be felt or if the pointer indicating the position is improperly aligned, the control cable needs adjustment.

- 1. Place selector lever in "P" position.
- 2. Loosen control cable lock nut and place manual shaft in "P" position.
- 3. Push control cable, by specified force, in the direction of the arrow shown in the illustration.

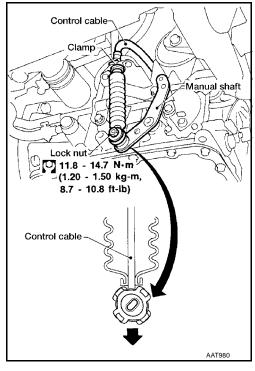
Specified force : 9.8 N (1.0 kg, 2.2 lb)

- 4. Release control cable in the opposite direction of the arrow for 1.0 mm (0.039 in).
- 5. Tighten control cable lock nut by hand.
- 6. Tighten control cable lock nut.

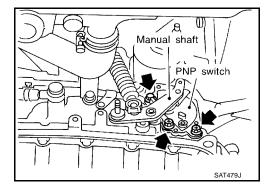
- 7. Move selector lever from "P" to "1" position again. Make sure that selector lever moves smoothly.
- 8. Apply grease to contacting areas of selector lever and control cable. Install any part removed.

Park/Neutral Position (PNP) Switch Adjustment

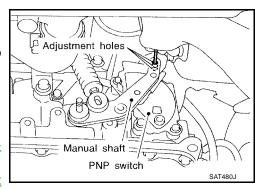
- 1. Remove control cable end from manual shaft.
- Set manual shaft in "N" position.
- 3. Loosen PNP switch fixing bolts.



ECS005ZI



- 4. Use a 4 mm (0.157 in) pin for this adjustment.
- a. Insert the pin straight into the manual shaft adjustment hole.
- b. Rotate PNP switch until the pin can also be inserted straight into hole in PNP switch.
- 5. Tighten PNP switch fixing bolts.
- 6. Remove pin from adjustment hole after adjusting PNP switch.
- 7. Reinstall any part removed.
- 8. Adjust control cable. Refer to AT-262, "Control Cable Adjustment".
- 9. Check continuity of PNP switch. Refer to <u>AT-119, "Component Inspection"</u>.



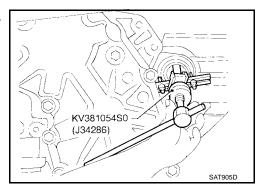
ON-VEHICLE SERVICE

[RE4F03B]

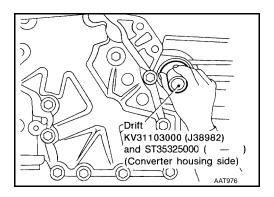
Differential Side Oil Seal Replacement

 Remove drive shaft assemblies using Tool. Refer to <u>FAX-14</u>, "Removal".

2. Remove oil seals.



- 3. Install oil seals using Tool.
 - Apply ATF to oil seal surface before installing.

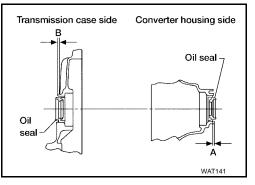


• Install oil seals so that dimensions "A" and "B" are within specifications.

Unit: mm (in)

A	В
5.5 - 6.5 (0.217 - 0.256)	-0.5 to 0.5 (-0.020 to 0.020)

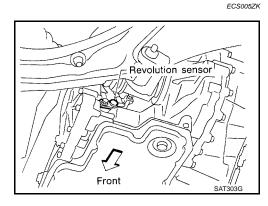
4. Reinstall any part removed.



Revolution Sensor Replacement

- 1. Disconnect revolution sensor harness connector.
- 2. Remove harness bracket from A/T.
- 3. Remove revolution sensor from A/T.
- 4. Reinstall any part removed.

Always use new sealing parts.



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REMOVAL AND INSTALLATION

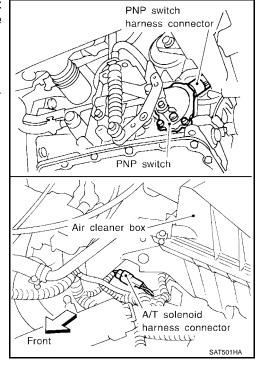
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Removal

CAUTION:

Before separating transaxle from engine, remove the crankshaft position sensor (OBD) from transaxle. Be careful not to damage sensor.

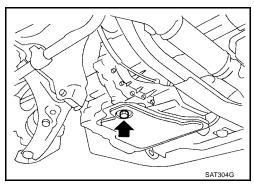
- Remove battery and bracket.
- 2. Remove air duct between throttle body and air cleaner.
- Disconnect terminal cord assembly, PNP switch harness connector and revolution sensor harness connector.

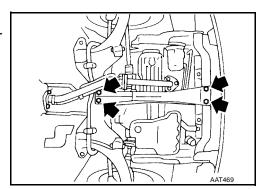


- 4. Drain ATF from transaxle.
- 5. Disconnect control cable from transaxle.
- 6. Disconnect oil cooler hoses.
- 7. Remove drive shafts. Refer to FAX-14, "Removal".
- 8. Remove the intake manifold support bracket. Refer to <u>EM-15</u>, <u>"Removal and Installation"</u>.
- 9. Remove starter motor from transaxle.

Tighten bolts to specified torque.

- 10. Remove upper bolts fixing transaxle to engine.
- 11. Support transaxle with a jack.
- 12. Remove center member.
 - Tighten center member fixing bolts to specified torque, Refer to <u>EM-68, "INSTALLATION"</u>.



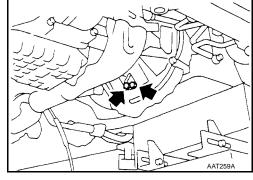


REMOVAL AND INSTALLATION

[RE4F03B]

- 13. Remove rear plate cover.
- 14. Remove torque converter bolts.

 Rotate crankshaft to gain access to securing bolts.
- 15. Remove rear transaxle to engine bracket. Refer to <u>EM-66</u>, <u>"REMOVAL"</u>.
- 16. Support engine with a jack.
- 17. Remove rear transaxle mount. Refer to EM-65.
- 18. Remove lower bolts fixing transaxle to engine.
- 19. Lower transaxle while supporting it with a jack.

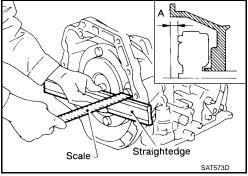


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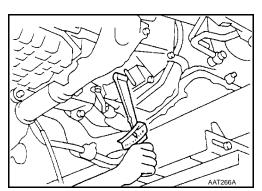
Installation

1. When connecting torque converter to transaxle, measure distance "A" to be certain that they are correctly assembled.

Distance "A" : 21.1 mm (0.831 in)

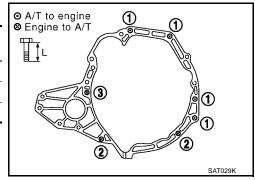


- 2. Install torque converter to drive plate.
 - With converter installed, rotate crankshaft several turns to check that transaxle rotates freely without binding.



3. Tighten bolts fixing transaxle.

Bolt No.	Tightening torque N-m (kg-m, ft-lb)	Bolt length "I " mm (in)
1	30 - 40 (3.1 - 4.1, 23 - 29)	50 (1.97)
2	16 - 20 (1.6 - 2.1, 12 - 15)	25 (0.98)
3	31 - 40 (3.1 - 4.1, 23 - 29)	30 (1.18)



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REMOVAL AND INSTALLATION

[RE4F03B]

- 4. Reinstall any part removed.
- Adjust control cable. Refer to <u>AT-262, "Control Cable Adjust-ment"</u>.
- 6. Check continuity of PNP switch. Refer to <u>AT-119, "PARK/NEU-TRAL POSITION SWITCH"</u>.
- 7. Refill transaxle with ATF and check fluid level.
- 8. Move selector lever through all positions to be sure that transaxle operates correctly. With parking brake applied, idle engine. Move selector lever through "N" to "D", to "2", to "1" and "R" positions. A slight shock should be felt through the hand gripping the selector each time the transaxle is shifted.
- 9. Perform road test. Refer to AT-68, "Road Test".



OVERHAUL PFP:00000

Components

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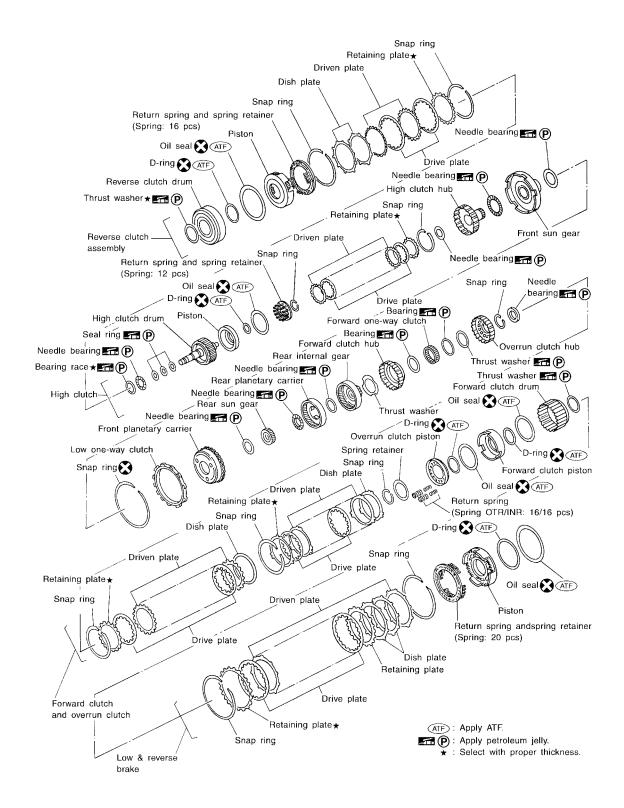
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SEC. 311•313•327•381

ΑT D 113 - 127 (11.5 - 13.0, 83 - 94) Е Differential side Pinion mate thrust washer bearing adjusting shim * Pinion mate gear Lock pin 💢 Pinion mate shaft Side gear **O** Differential side bearing Side gear thrust washer * Final gear Speedometer drive gear -Differential side bearing (ATF) Н Differential case 7 - 11 (0.7 - 1.1, 62 - 97) Gasket 18 - 21 (1.8 - 2.1, 13 - 15) -Seal ring 4.9 - 6.8 **€ ■ P** 4.9 - 6.8 (0.5 - 0.7, 43 - 61) (0.5 - 0.7, 43 - 61) -Speedometer pinion 8 00 Inner gear O-ring Outer gear M O-ring ATF Rama R Oil pump housing 26 - 30 Oil pump assembly Oil seal Seal lip (2.7 - 3.1, 20 - 22) Input shaft O-ring Clip (kg-m, in-lb) Differential lubricant tube : N•m (kg-m, ft-lb) Converter housing Differential side oil seal (ATF): Apply ATF. (ATF) (P) : Apply petroleum jelly. Torque converter ★ : Select with proper thickness. **(44 - 59 (4.5 - 6.0, 33 - 43)**

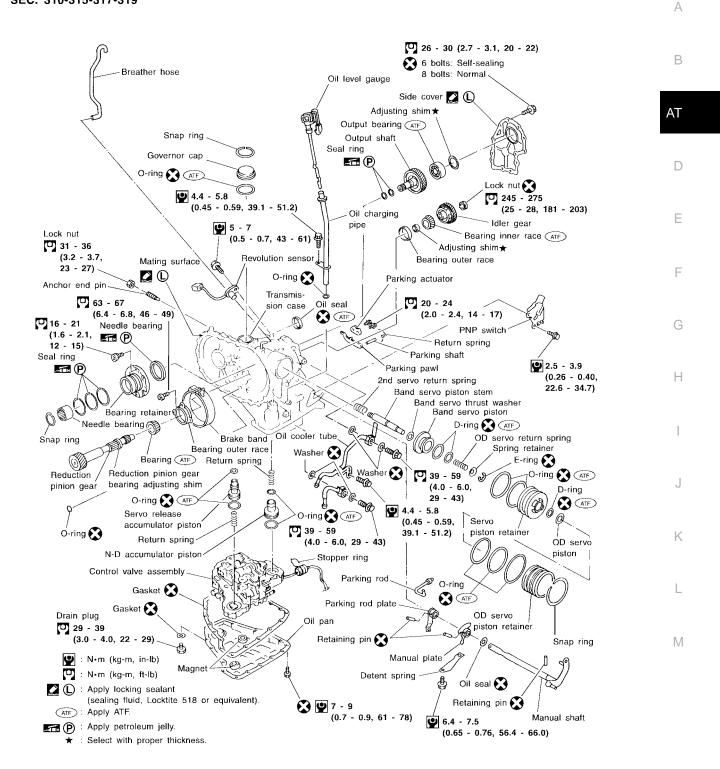
WAT404

SEC. 315



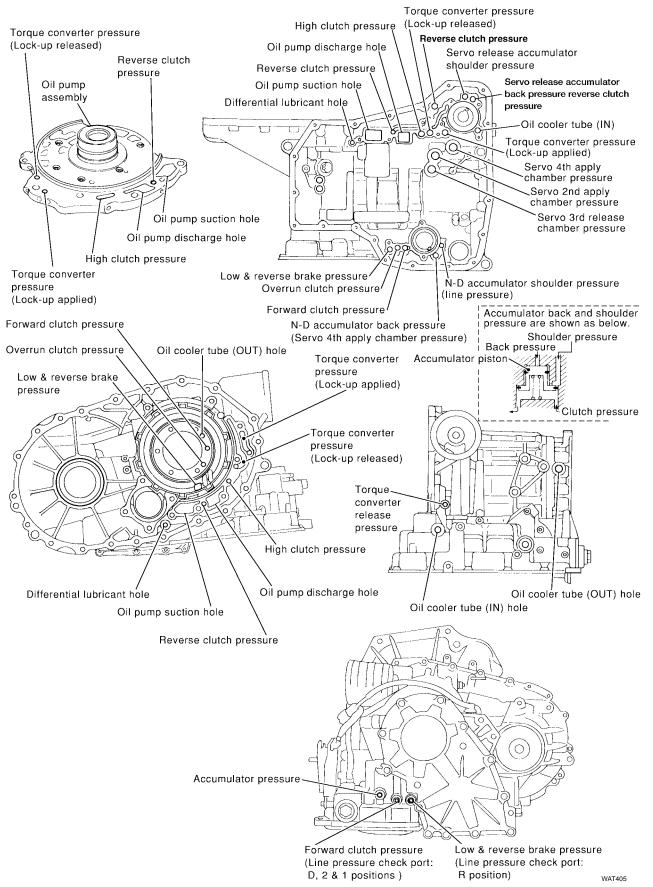
WCIA0218E

SEC. 310-315-317-319



WCIA0219E

Oil Channel ECS005ZO



Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

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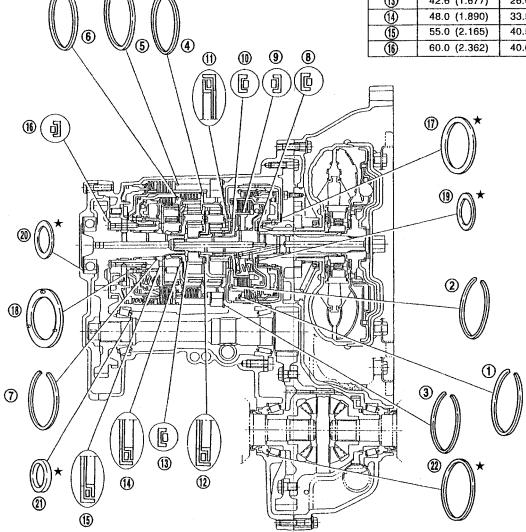
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Outer diam	eter and color of th	rust washers
ltem number	Outer diameter mm (in)	Color
17	72.0 (2.835)	Black
(18)	78.5 (3.091)	Diack

Outer and Inner diameter of needle bearings Item Outer diameter Inner diameter

Outer diameter	inner diameter
mm (in)	mm (in)
47.0 (1.850)	32.0 (1.260)
35.0 (1.378)	20.1 (0.791)
60.0 (2.362)	42.0 (1.657)
60.0 (2.362)	45.0 (1.772)
47.0 (1.850)	30.0 (1.181)
42.6 (1.677)	26.0 (1.024)
48.0 (1.890)	33.5 (1.319)
55.0 (2.165)	40.5 (1.594)
60.0 (2.362)	40.0 (1.579)
	mm (in) 47.0 (1.850) 35.0 (1.378) 60.0 (2.362) 60.0 (2.362) 47.0 (1.850) 42.6 (1.677) 48.0 (1.890) 55.0 (2.165)



* : Select proper thickness.

Outer and inner diameter of bearing race and adjusting shims

and adjusting simils		
Item number	Outer diameter mm (in)	Inner diameter mm (in)
19	48.0 (1.890)	33.0 (1.299)
20	72.0 (2.835)	61.0 (2.402)
(1)	34.5 (1.358)	26.1 (1.028)
22	68.0 (2.677)	60.0 (2.362)

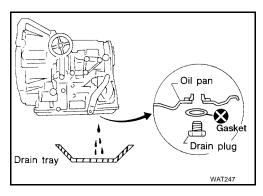
Outer diameter of snap rings

<u> </u>		
Outer diameter		
mm (in)		
142.0 (5.59)		
113.0 (4.45)		
162.4 (6.39)		
135.4 (5.33)		
162.3 (6.39)		
126.0 (4.96)		
40.5 (1.594)		

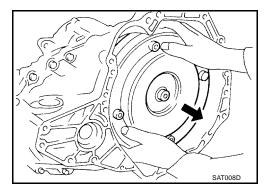
WAT246

Disassembly

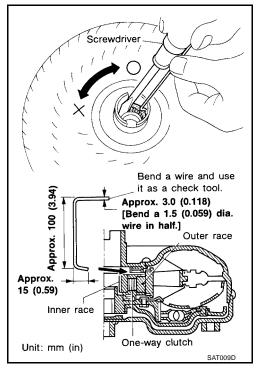
1. Drain ATF through drain plug.



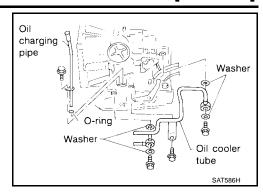
2. Remove torque converter.



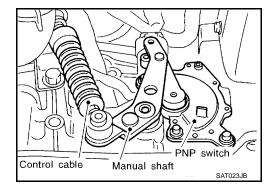
- 3. Check torque converter one-way clutch using check tool as shown.
- Insert check tool into the groove of bearing support built into one-way clutch outer race.
- b. While fixing bearing support with check tool, rotate one-way clutch spline using flat-bladed screwdriver.
- Check to make sure the inner race rotates clockwise only. If not, replace torque converter assembly.



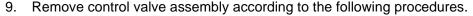
4. Remove oil charging pipe and oil cooler tube.

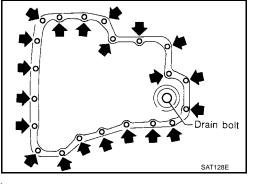


- 5. Set manual shaft to "P" position.
- Remove PNP switch.



- 7. Remove oil pan and oil pan gasket.
 - Always replace oil pan bolts as they are self-sealing bolts.
- 8. Check foreign materials in oil pan to help determine cause of malfunction. If the fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and may inhibit pump pressure.
 - If frictional material is detected, replace radiator after repair of A/T. Refer to <u>CO-14</u>, "<u>Removal and Installation</u>".





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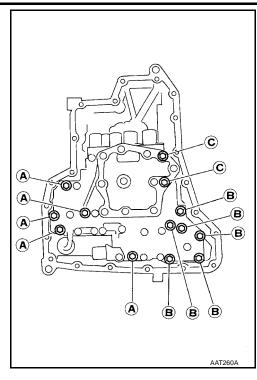
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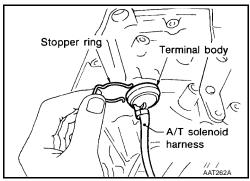
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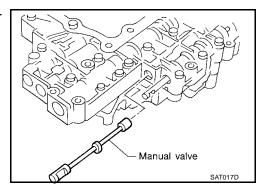
a. Remove control valve assembly mounting bolts A, B and C.



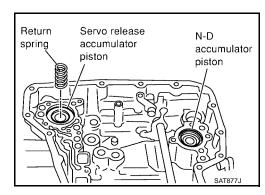
- b. Remove stopper ring from terminal body.
- c. Push terminal body into transmission case and draw out solenoid harness.



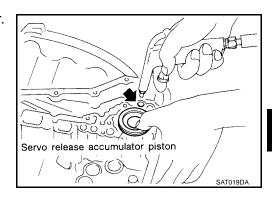
10. Remove manual valve from control valve assembly as a precaution.



11. Remove return spring from servo release accumulator piston.



- 12. Remove servo release accumulator piston with compressed air.
- 13. Remove O-rings from servo release accumulator piston.



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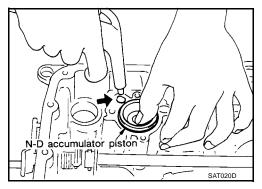
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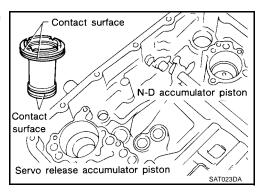
- 14. Remove N-D accumulator piston and return spring with compressed air.
- 15. Remove O-rings from N-D accumulator piston.



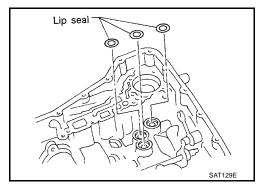
16. Check accumulator pistons and contact surface of transmission case for damage.

17. Check accumulator return springs for damage and free length.

Return springs : Refer to <u>AT-393, "RETURN SPRING"</u>

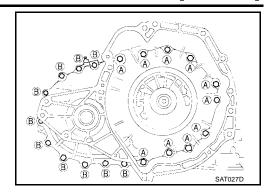


Remove lip seals from band servo oil port.

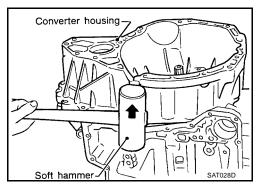


19. Remove converter housing according to the following procedures.

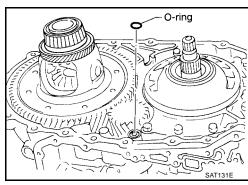
a. Remove converter housing mounting bolts A and B.



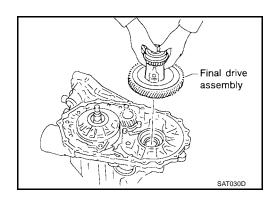
b. Remove converter housing.



c. Remove O-ring from differential oil port.



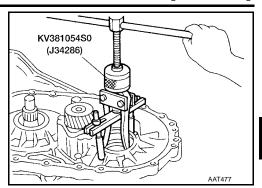
20. Remove final drive assembly from transmission case.



OVERHAUL

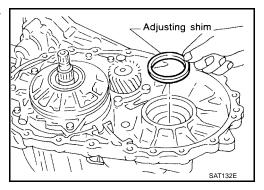
[RE4F03B]

21. Remove differential side bearing outer race from transmission case using Tool.

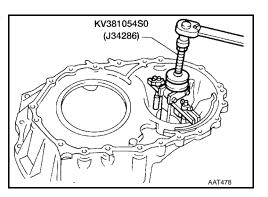


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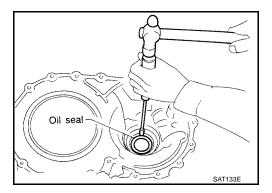
22. Remove differential side bearing adjusting shim from transmission case.



23. Remove differential side bearing outer race from converter housing using Tool.



- 24. Remove oil seal from converter housing using a screwdriver.
 - Be careful not to damage case.



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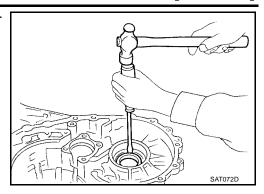
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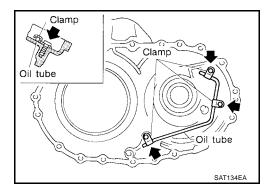
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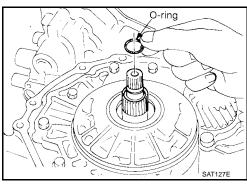
25. Remove side oil seal from transmission case using a screw-driver.



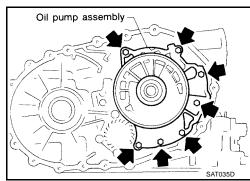
26. Remove oil tube from converter housing.



- 27. Remove oil pump according to the following procedures.
- a. Remove O-ring from input shaft.



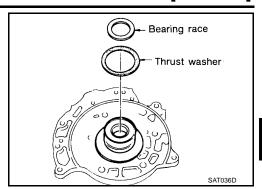
Remove oil pump assembly from transmission case.



OVERHAUL

[RE4F03B]

Remove thrust washer and bearing race from oil pump assembly.



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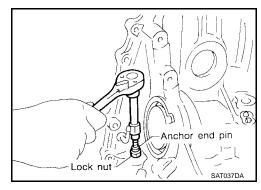
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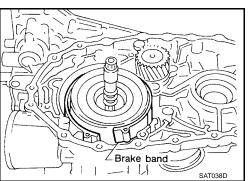
В

28. Remove brake band according to the following procedures.

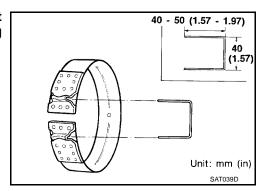
- a. Loosen lock nut, then back off anchor end pin.
 - Do not reuse anchor end pin.



b. Remove brake band from transmission case.

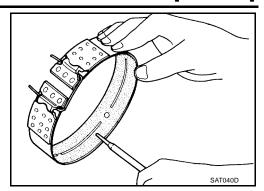


 To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown.
 Leave the clip in position after removing the brake band.

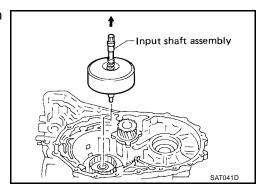


2005 Sentra

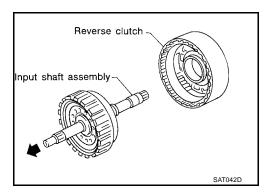
c. Check brake band facing for damage, cracks, wear or burns.



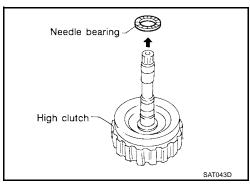
29. Remove input shaft assembly (high clutch) and reverse clutch according to the following procedures.



- a. Remove input shaft assembly (high clutch) with reverse clutch.
- b. Remove input shaft assembly (high clutch) from reverse clutch.



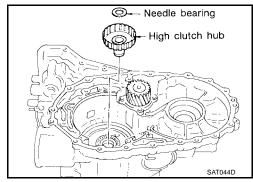
- c. Remove needle bearing from high clutch drum.
- d. Check input shaft assembly and needle bearing for damage or wear.



OVERHAUL

[RE4F03B]

- 30. Remove high clutch hub and needle bearing from transmission case.
- 31. Check high clutch hub and needle bearing for damage or wear.



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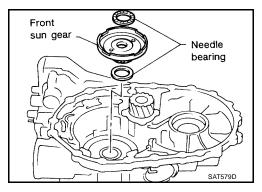
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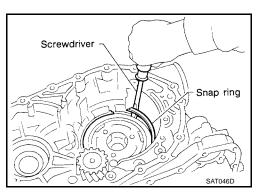
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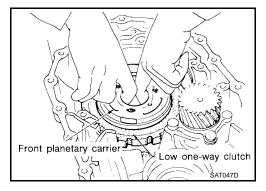
- 32. Remove front sun gear and needle bearings from transmission case.
- 33. Check front sun gear and needle bearings for damage or wear.



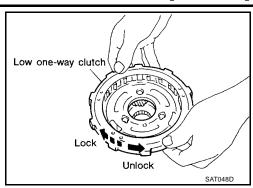
- 34. Remove front planetary carrier assembly and low one-way clutch according to the following procedures.
- a. Remove snap ring using a screwdriver.
 - Do not expand snap ring excessively.



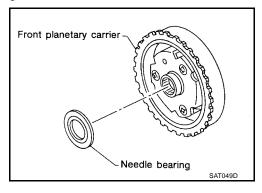
Remove front planetary carrier with low one-way clutch.



c. Check that low one-way clutch rotates in the direction of the arrow and locks in the opposite direction.



- d. Remove low one-way clutch from front planetary carrier by rotating it in the direction of unlock.
- e. Remove needle bearing from front planetary carrier.

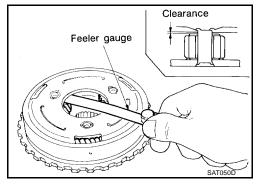


- f. Check front planetary carrier, low one-way clutch and needle bearing for damage or wear.
- g. Check clearance between pinion washer and planetary carrier using feeler gauge.

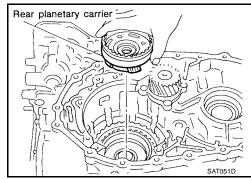
Standard clearance : 0.15 - 0.70 mm (0.0059 - 0.0276 in)

Allowable limit : 0.80 mm (0.0315 in)

Replace front planetary carrier if the clearance exceeds allowable limit.



35. Remove rear planetary carrier assembly and rear sun gear according to the following procedures.



a. Remove rear planetary carrier assembly from transmission case.

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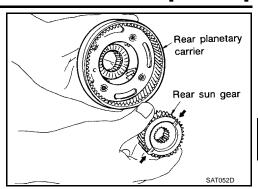
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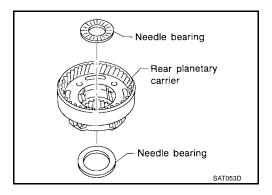
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b. Remove rear sun gear from rear planetary carrier.



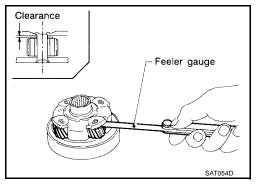
c. Remove needle bearings from rear planetary carrier assembly.



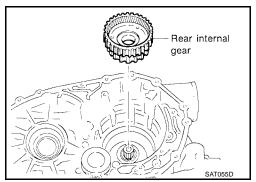
- d. Check rear planetary carrier, rear sun gear and needle bearings for damage or wear.
- e. Check clearance between pinion washer and rear planetary carrier using feeler gauge.

Standard clearance : 0.15 - 0.70 mm (0.0059 - 0.0276 in)
Allowable limit : 0.80 mm (0.0315 in)

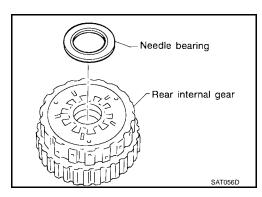
Replace rear planetary carrier if the clearance exceeds allowable limit.



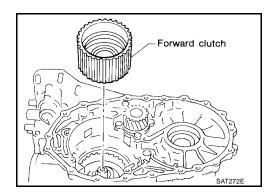
36. Remove rear internal gear from transmission case.



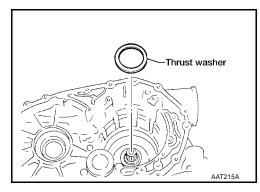
- 37. Remove needle bearing from rear internal gear.
 - Check needle bearing for damage or wear.



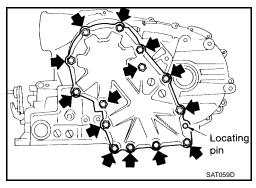
38. Remove forward clutch assembly from transmission case.



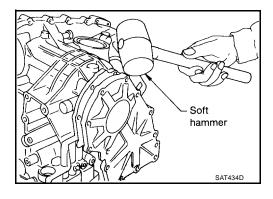
39. Remove thrust washer from transmission case.



40. Remove output shaft assembly according to the following procedures.

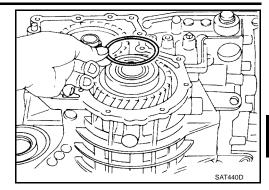


- a. Remove side cover bolts.
- b. Remove side cover by lightly tapping it with a soft hammer.



• Be careful not to drop output shaft assembly. It might come out when removing side cover.

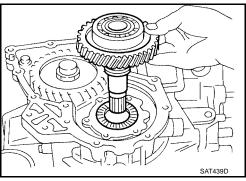
Remove adjusting shim.



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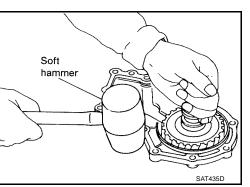
Remove output shaft assembly.



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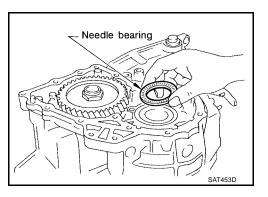
• If output shaft assembly came off with side cover, tap cover with a soft hammer to separate.



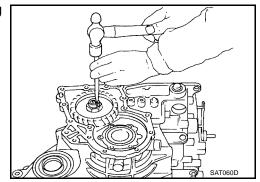
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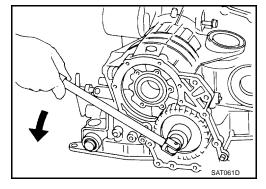
Remove needle bearing.



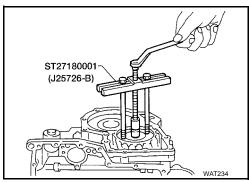
41. Disassemble reduction pinion gear according to the following procedures.



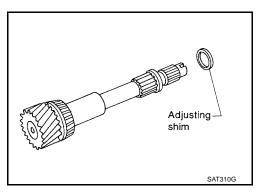
- a. Set manual shaft to position "P" to fix idler gear.
- b. Unlock idler gear lock nut using a pin punch.
- c. Remove idler gear lock nut.
 - Do not reuse idler gear lock nut.



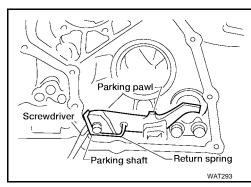
d. Remove idler gear with puller using Tool.



- e. Remove reduction pinion gear.
- f. Remove adjusting shim from reduction pinion gear.



42. Remove return spring from parking shaft using a screwdriver.



OVERHAUL

[RE4F03B]

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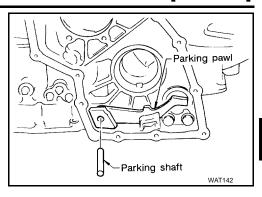
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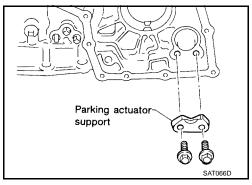
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- 43. Draw out parking shaft and remove parking pawl from transmission case.
- 44. Check parking pawl and shaft for damage or wear.

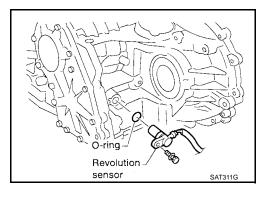


45. Remove parking actuator support from transmission case.

• Check parking actuator support for damage or wear.



46. Remove revolution sensor from transmission case.

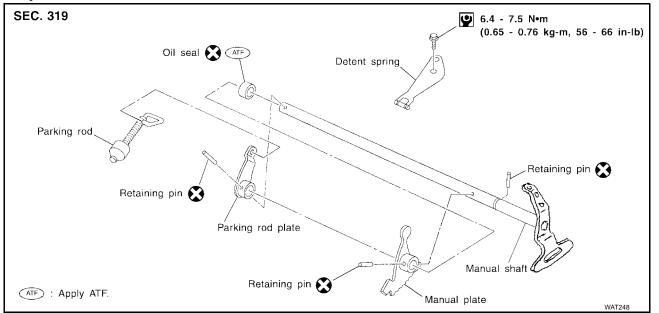


2005 Sentra

MANUAL SHAFT
PFP:31920

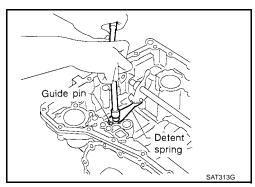
Components

ECS005ZR

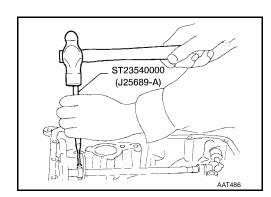


Removal

1. Remove detent spring from transmission case.



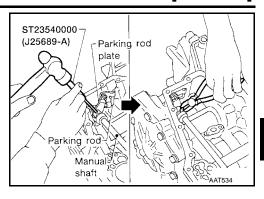
2. Drive out manual plate retaining pin using Tool.



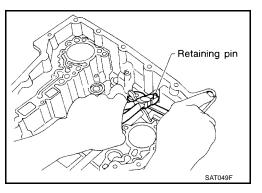
MANUAL SHAFT

[RE4F03B]

- 3. Drive and pull out parking rod plate retaining pin using Tool.
- 4. Remove parking rod plate from manual shaft.
- Draw out parking rod from transmission case. 5.

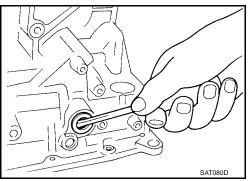


Pull out manual shaft retaining pin.



- Remove manual shaft and manual plate from transmission case. 7.
- Remove manual shaft oil seal.

Installation

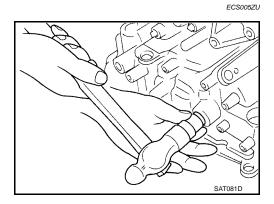


Inspection ECS005ZT

Check component parts for wear or damage. Replace if necessary.

1. Install manual shaft oil seal using a suitable tool.

Apply ATF to outer surface of oil seal.



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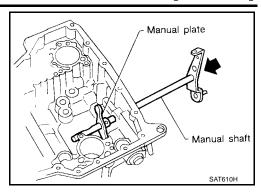
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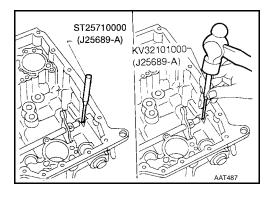
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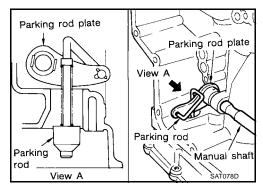
2. Install manual shaft and manual plate.



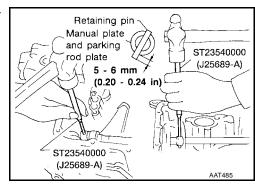
- 3. Align groove of manual shaft and hole of transmission case.
- 4. Install manual shaft retaining pin using Tool.



- 5. Install parking rod to parking rod plate.
- 6. Set parking rod assembly onto manual shaft.



7. Drive in manual plate retaining pin and parking rod plate retaining pin using Tool.



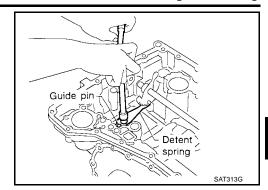
MANUAL SHAFT

[RE4F03B]

8. Install detent spring.



: 6.4 - 7.5 N·m (0.65 - 0.76 kg-m, 56.4 - 66.0 in-lb)



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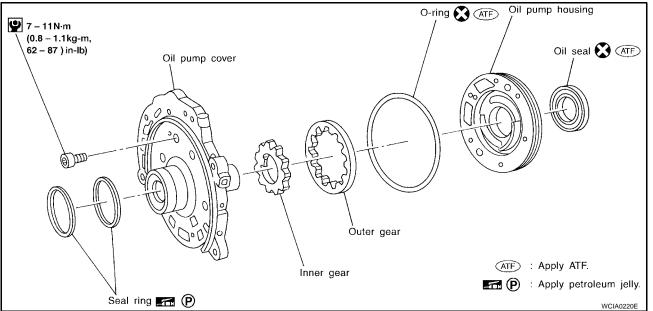
L

OIL PUMP

PFP:15010

Components

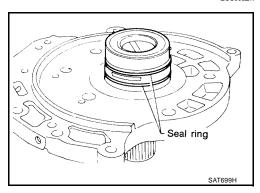
ECS005ZV



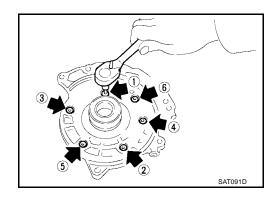
Disassembly

Remove seal rings.

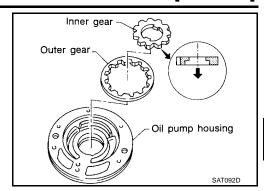
ECS005ZW



2. Loosen bolts in numerical order and remove oil pump cover.



3. Remove inner and outer gear from oil pump housing.



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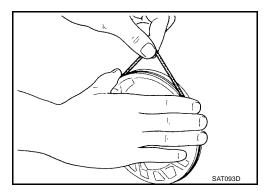
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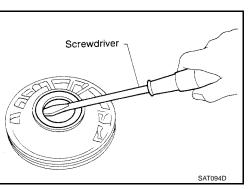
4. Remove O-ring from oil pump housing.



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5. Remove oil pump housing oil seal.



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Inspection OIL PUMP COVER, INNER GEAR AND OUTER GEAR

ECS005ZX

Check for wear or damage.

SIDE CLEARANCES

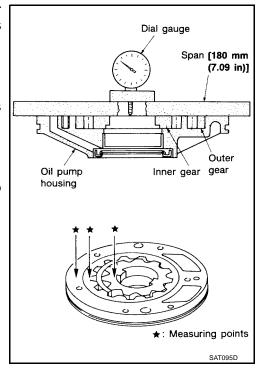
 Measure side clearance of inner and outer gears in at least four places around each outside edge. Maximum measured values should be within specified range.

Standard clearance : 0.02 - 0.04 mm (0.0008 - 0.0016 in)

• If clearance is less than standard, select inner and outer gear as a set so that clearance is within specifications.

Inner and outer gear : Refer to <u>AT-294, "SIDE CLEARANCES"</u>.

• If clearance is more than standard, replace whole oil pump assembly except oil pump cover.



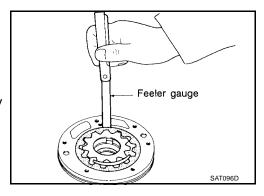
Measure clearance between outer gear and oil pump housing.

Standard clearance : 0.08 - 0.15 mm (0.0031 - 0.0059

in)

Allowable limit : 0.15 mm (0.0059 in)

 If not within allowable limit, replace whole oil pump assembly except oil pump cover.



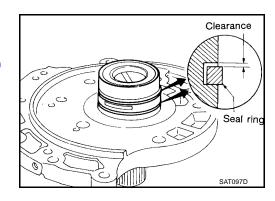
SIDE RING CLEARANCE

- Install new seal rings onto oil pump cover.
- Measure clearance between seal ring and ring groove.

Standard clearance : 0.1 - 0.25 mm (0.0039 - 0.0098 in)

Allowable limit : 0.25 mm (0.0098 in)

If not within allowable limit, replace oil pump cover assembly.



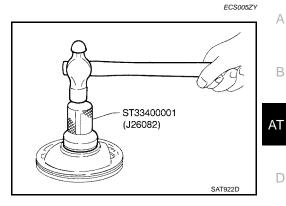
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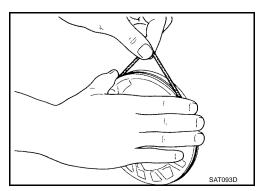
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Assembly

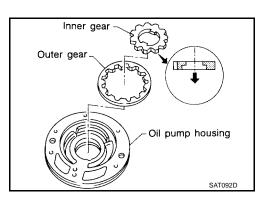
1. Install oil seal on oil pump housing using Tool.



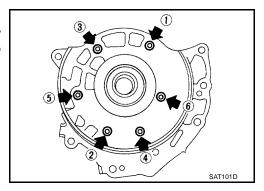
- 2. Install O-ring on oil pump housing.
 - Apply ATF to O-ring.



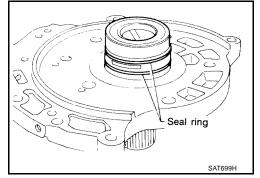
- 3. Install inner and outer gears on oil pump housing.
 - Take care with the direction of the inner gear.



- 4. Install oil pump cover on oil pump housing.
- a. Wrap masking tape around splines of oil pump cover assembly to protect seal. Position oil pump cover assembly on oil pump housing assembly, then remove masking tape.
- b. Tighten bolts in numerical order.



- 5. Install new seal rings carefully after packing ring groove with petroleum jelly.
 - Do not spread gap of seal ring excessively while installing. It may deform the ring.



CONTROL VALVE ASSEMBLY

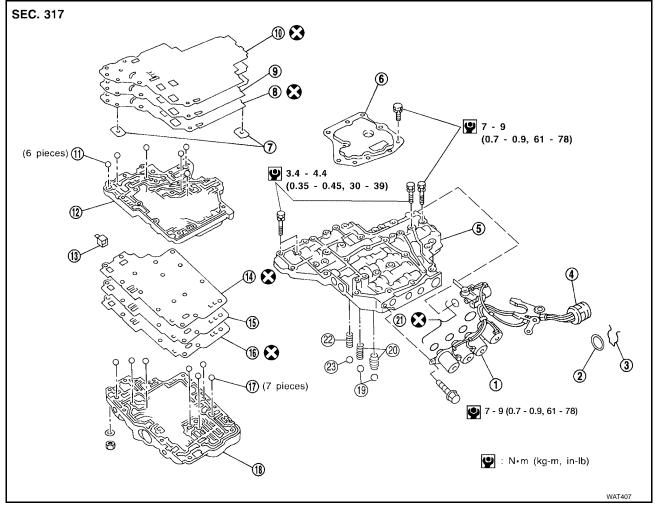
[RE4F03B]

CONTROL VALVE ASSEMBLY

PFP:31705

Components

ECS005ZZ



- 1. Solenoid valve assembly
- 4. Terminal body
- 7. Support plate
- 10. Lower separating gasket
- 13. Pilot filter
- 16. Upper separating gasket
- 19. Check ball
- 22. T/C pressure holding spring

- 2. O-ring
- 5. Control valve lower body
- 8. Lower inter separating gasket
- 11. Steel ball
- 14. Upper inter separating gasket
- 17. Steel ball
- 20. Oil cooler relief valve spring
- 23. Check ball

- 3. Stopper ring
- 6. Oil strainer
- 9. Separating plate
- 12. Control valve inter body
- 15. Separating plate
- 18. Control valve upper body
- 21. O-ring

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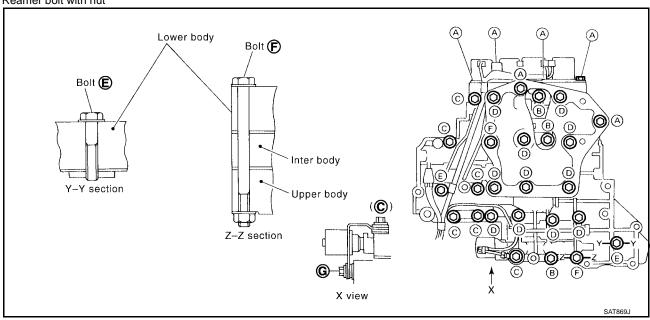
Disassembly

Disassemble upper, inter and lower bodies.

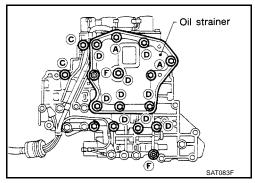
Bolt length, number and location:

Bolt symbol	А	В	С	D	Е	F	G
Bolt length "I"	13.5 mm (0.531 in)	58.0 mm (2.283 in)	40.0 mm (1.575 in)	66.0 mm (2.598 in)	33.0 mm (1.299 in)	78.0 mm (3.071 in)	18.0 mm (0.709 in)
Number of bolts	6	3	6	11	2	2	1

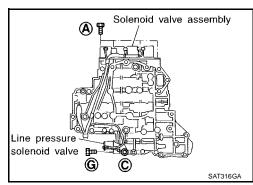
F: Reamer bolt with nut



1. Remove bolts A, D and F, and remove oil strainer from control valve assembly.



- 2. Remove solenoid valve assembly and line pressure solenoid valve from control valve assembly.
 - Be careful not to lose the line pressure solenoid valve spring.



CONTROL VALVE ASSEMBLY

[RE4F03B]

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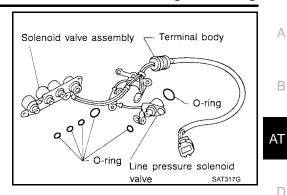
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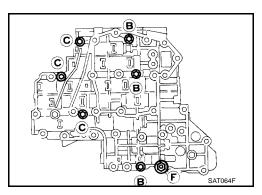
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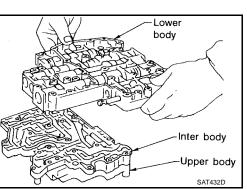
Remove O-rings from solenoid valves and terminal body.



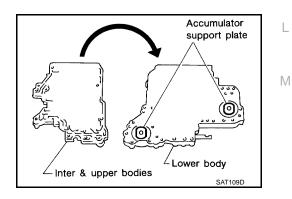
Place upper body face down, and remove bolts B, C and F.



Remove lower body from inter body.

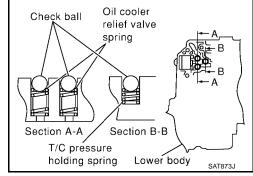


Turn over lower body, and accumulator support plates.

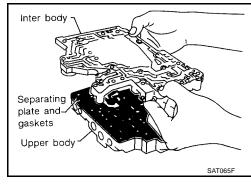


AT-299 Revision: July 2004 2005 Sentra

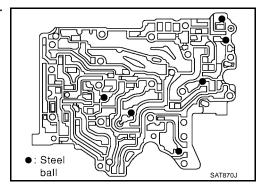
- 7. Remove bolts E, separating plate and separating gaskets from lower body.
- 8. Remove check balls, oil cooler relief valve springs and T/C pressure holding spring from lower body.
 - Be careful not to lose steel balls and relief valve springs.



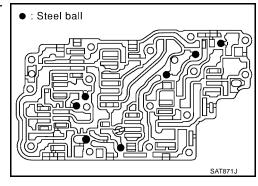
- 9. Remove inter body from upper body.
- 10. Remove pilot filter, separating plate and gaskets from upper body.



- 11. Check to see that steel balls are properly positioned in inter body and then remove them.
 - Be careful not to lose steel balls.



- 12. Check to see that steel balls are properly positioned in upper body and then remove them.
 - Be careful not to lose steel balls.



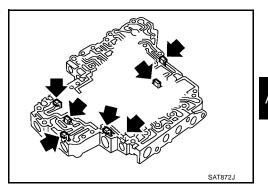
CONTROL VALVE ASSEMBLY

[RE4F03B]

Inspection LOWER AND UPPER BODIES

ECS00601

 Check to see that retainer plates are properly positioned in lower body.



ΑT

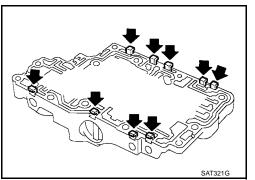
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 Check to see that retainer plates are properly positioned in upper body.



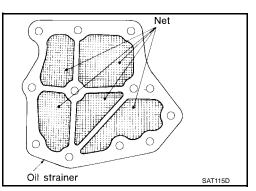
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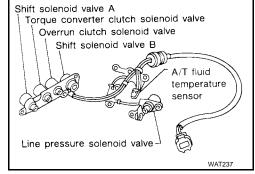
OIL STRAINER

Check wire netting of oil strainer for damage.



SHIFT SOLENOID VALVES A AND B, LINE PRESSURE SOLENOID VALVE, TORQUE CONVERTER CLUTCH SOLENOID VALVE AND OVERRUN CLUTCH SOLENOID VALVE

Refer to AT-182, "SHIFT SOLENOID VALVE A", AT-186, "SHIFT SOLENOID VALVE B", AT-177, "LINE PRESSURE SOLENOID VALVE", AT-177, "LINE PRESSURE SOLENOID VALVE" and AT-196, "OVERRUN CLUTCH SOLENOID VALVE"

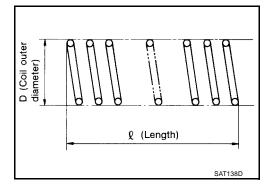


Revision: July 2004 AT-301 2005 Sentra

OIL COOLER RELIEF VALVE SPRING

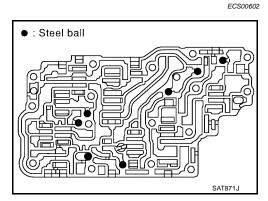
- Check springs for damage or deformation.
- Measure free length and outer diameter.

Inspection standard : Refer to <u>AT-388, "Clutch and Brake Return Springs"</u>

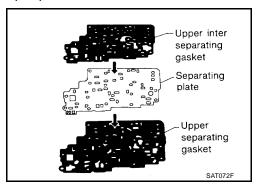


Assembly

1. Install upper, inter and lower body.

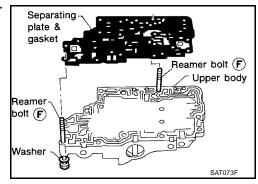


- a. Place oil circuit of upper body face up. Install steel balls in their proper positions.
- b. Install upper separating gasket, upper inter separating gasket and upper separating plate in order shown in illustration.



Always use new gaskets.

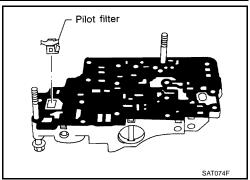
c. Install reamer bolts **F** from bottom of upper body. Using reamer bolts as guides, install separating plate and gaskets as a set.



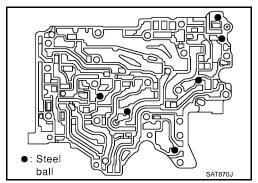
CONTROL VALVE ASSEMBLY

[RE4F03B]

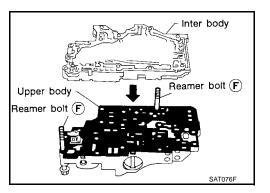
d. Install pilot filter.



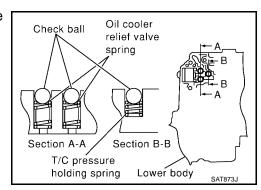
Place inter body as shown in the illustration. Install steel balls in their proper positions.



f. Install inter body on upper body using reamer bolts **F** as guides.



- Be careful not to dislocate or drop steel balls.
- Install steel balls, oil cooler relief valve springs and T/C pressure g. holding spring in their proper positions in lower body.



Α

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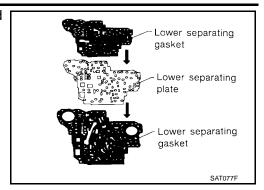
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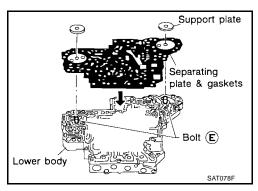
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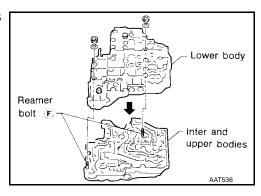
h. Install lower separating gasket, inter separating gasket and lower separating plate in order shown in the illustration.



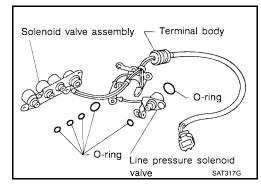
i. Install bolts **E** from bottom of lower body. Using bolts **E** as guides, install separating plate and gaskets as a set.



- j. Install support plates on lower body.
- k. Install lower body on inter body using reamer bolts **F** as guides and tighten reamer bolts **F** slightly.



- 2. Install O-rings to solenoid valves and terminal body.
 - Apply ATF to O-rings.
- 3. Install and tighten bolts.



CONTROL VALVE ASSEMBLY

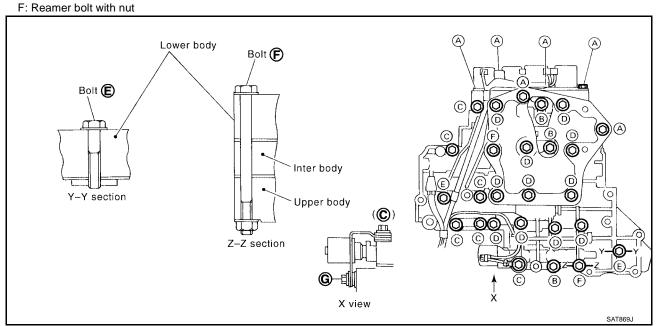
[RE4F03B]

Bolt length, number and location:

Bolt symbol	Α	В	С	D	E	F	G
Bolt length "I"	13.5 mm (0.531 in)	58.0 mm (2.283 in)	44.0 mm (1.732 in)	66.0 mm (2.598 in)	33.0 mm (1.299 in)	78.0 mm (3.071 in)	18.0 mm (0.709 in)
Number of bolts	6	3	6	11	2	2	1

В

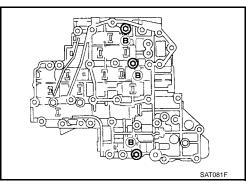
Α



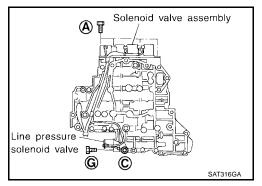
a. Install and tighten bolts **B** to specified torque.



: 7 - 9 N·m (0.7 - 0.9 kg-m, 61 - 78 in-lb)



b. Install solenoid valve assembly and line pressure solenoid valve to lower body.



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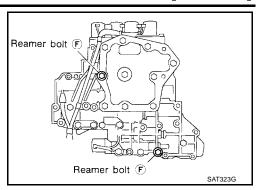
K

L

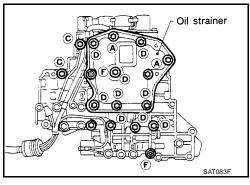
CONTROL VALVE ASSEMBLY

[RE4F03B]

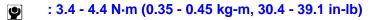
 Remove reamer bolts F and set oil strainer on control valve assembly.

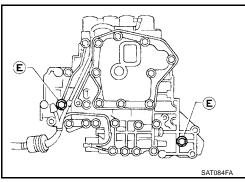


- d. Reinstall reamer bolts **F** from lower body side.
- e. Tighten bolts A, C, D and F to specified torque.
 - : 7 9 N·m (0.7 0.9 kg-m, 61 78 in-lb)



f. Tighten bolts **E** to specified torque.





CONTROL VALVE UPPER BODY

PFP:31711

Components

ECS00603

В

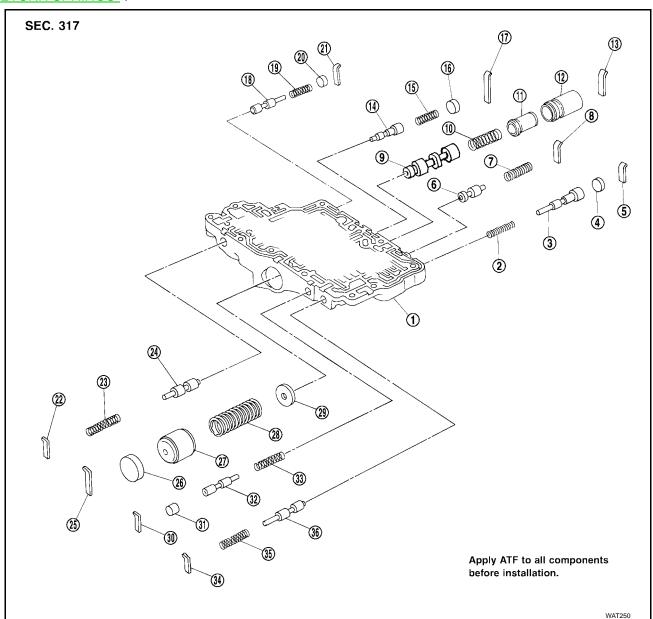
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Numbers preceding valve springs correspond with those shown in $\underline{\text{AT-386}}$, "CONTROL VALVE AND PLUG RETURN SPRINGS".



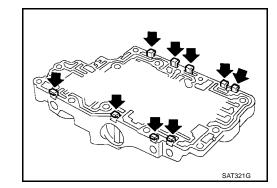
Disassembly

ECS00604

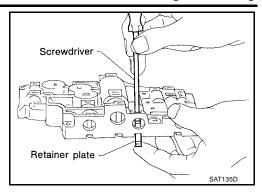
M

1. Remove valves at retainer plates.

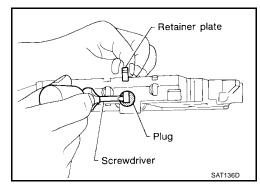
• Do not use a magnetic "hand".



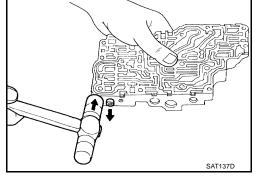
Use a screwdriver to remove retainer plates.



o. Remove retainer plates while holding spring, plugs or sleeves.



- Remove plugs slowly to prevent internal parts from jumping out.
- c. Place mating surface of valve body face down, and remove internal parts.
 - If a valve is hard to remove, place valve body face down and lightly tap it with a soft hammer.
 - Be careful not to drop or damage valves and sleeves.



Inspection VALVE SPRING

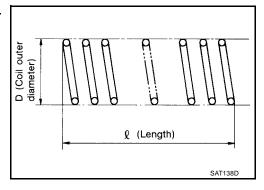
ECS00605

Measure free length and outer diameter of each valve spring.
 Also check for damage or deformation.

Inspection standard

: Refer to AT-386, "CON-TROL VALVE AND PLUG RETURN SPRINGS".

Replace valve springs if deformed or fatigued.



CONTROL VALVES

Check sliding surfaces of valves, sleeves and plugs.

CONTROL VALVE UPPER BODY

[RE4F03B]

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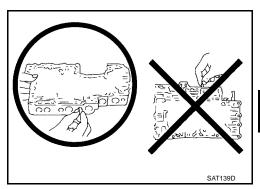
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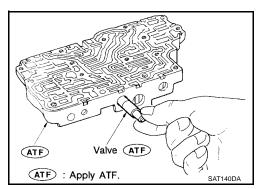
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Assembly

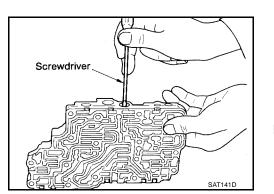
 Lay control valve body down when installing valves. Do not stand the control valve body upright.



1. Lubricate the control valve body and all valves with ATF. Install control valves by sliding them carefully into their bores.

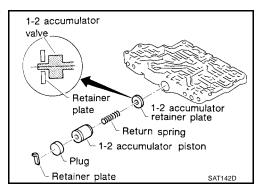


- Be careful not to scratch or damage valve body.
- Wrap a small screwdriver with vinyl tape and use it to insert the valves into their proper positions.



1-2 ACCUMULATOR VALVE

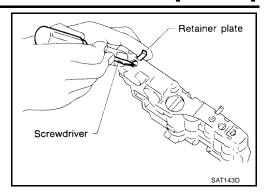
- Install 1-2 accumulator valve. Align 1-2 accumulator retainer plate from opposite side of control valve body.
- Install return spring, 1-2 accumulator piston and plug.



CONTROL VALVE UPPER BODY

[RE4F03B]

- Install retainer plates.
 - Install retainer plate while pushing plug or return spring.

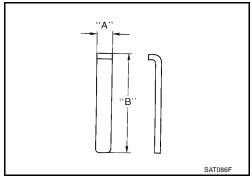


RETAINER PLATE (FOR CONTROL VALVE UPPER BODY)

Refer to AT-307, "CONTROL VALVE UPPER BODY" .

Unit: mm (in)

			` ,	
Name of valve and piston	No.	Width A	Length B	
Pilot valve	22		21.5 (0.846)	
1-2 accumulator valve	17		40 F (4 F04)	
1-2 accumulator piston	25		40.5 (1.594)	
1st reducing valve	30		21.5 (0.846)	
Overrun clutch reducing valve	5	6.0 (0.236)	24.0 (0.945)	
Torque converter relief valve	8		21.5 (0.846)	
Torque converter clutch control valve	13		28.0 (1.102)	
3-2 timing valve	34		21.5 (0.846)	
Cooler check valve	21		24.0 (0.945)	



Install proper retainer plates.

CONTROL VALVE LOWER BODY

PFP:31713

Components

ECS00607

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Numbers preceding valve springs correspond with those shown in $\underline{\text{AT-386}}$, "CONTROL VALVE AND PLUG RETURN SPRINGS".

SEC. 317 (11) Apply ATF to all components before installation. WAT251

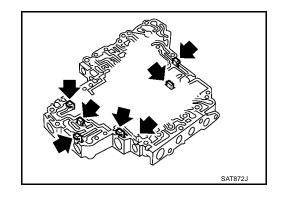
Disassembly

ECS00608

M

Remove valves at retainer plate.

For removal procedures, refer to AT-311, "Disassembly".



CONTROL VALVE LOWER BODY

[RE4F03B]

Inspection VALVE SPRINGS

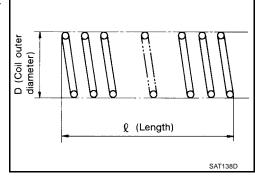
ECS00609

• Check each valve spring for damage or deformation. Also measure free length and outer diameter.

Inspection standard

: Refer to AT-386, "CON-TROL VALVE AND PLUG RETURN SPRINGS".

Replace valve springs if deformed or fatigued.

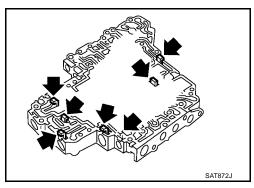


CONTROL VALVES

Check sliding surfaces of control valves, sleeves and plugs for damage.

Assembly

Install control valves.
 For installation procedures, refer to <u>AT-312, "Assembly"</u>.

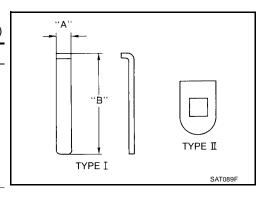


RETAINER PLATE (FOR CONTROL VALVE LOWER BODY)

Refer to AT-311, "CONTROL VALVE LOWER BODY".

Unit: mm (in)

Name of control valve	No.	Width A	Length B	Type
Pressure regulator valve	14	6.0 (0.236)	28.0 (1.102)	I
Accumulator control valve	24			
Shift valve A	28			
Overrun clutch control valve	20			
Pressure modifier valve	12			
Shuttle control valve	31			
Shift valve B	5	_		II



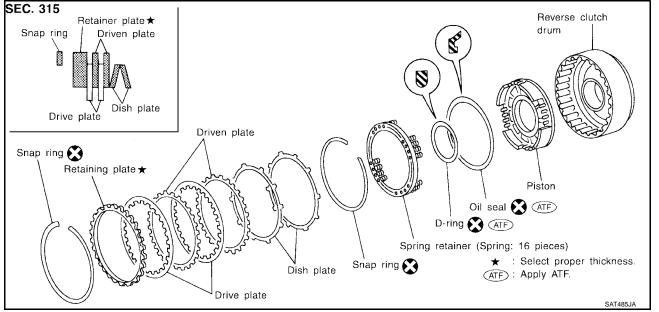
Install proper retainer plates.

REVERSE CLUTCH

PFP:31510

Components

ECS0060B

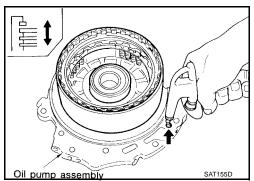


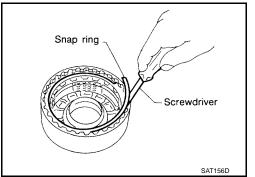
Disassembly

Check operation of reverse clutch.

 Install seal ring onto drum support of oil pump cover and install reverse clutch assembly. Apply compressed air to oil hole.

- b. Check to see that retaining plate moves to snap ring.
- c. If retaining plate does not contact snap ring:
 - D-ring might be damaged.
 - Oil seal might be damaged.
 - Fluid might be leaking past piston check ball.
- 2. Remove snap ring.
 - Do not expand snap ring excessively.
- Remove drive plates, driven plates, retaining plate, and dish plates.





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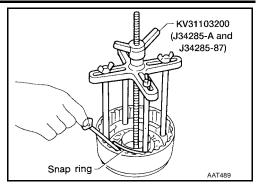
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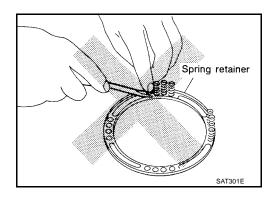
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ECS0060C

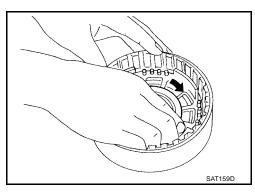
- 4. Set Tool on spring retainer and remove snap ring from reverse clutch drum while compressing return springs.
 - Set Tool directly above springs.
 - Do not expand snap ring excessively.



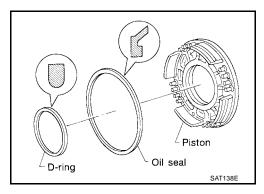
- 5. Remove spring retainer and return springs.
 - Do not remove return springs from spring retainer.



6. Remove piston from reverse clutch drum by turning it.



7. Remove D-ring and oil seal from piston.



Inspection REVERSE CLUTCH SNAP RING, SPRING RETAINER AND RETURN SPRINGS

ECS0060D

- Check for deformation, fatigue or damage.
- Replace if necessary.
- When replacing spring retainer and return springs, replace them as a set.

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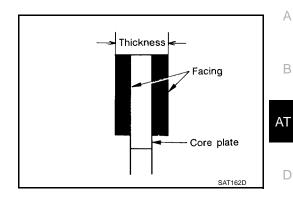
REVERSE CLUTCH DRIVE PLATES

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate

Standard value : 2.0 mm (0.079 in) Wear limit : 1.8 mm (0.071 in)

If not within wear limit, replace.

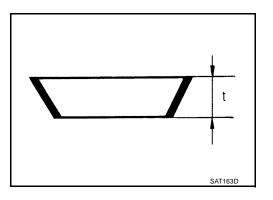


REVERSE CLUTCH DISH PLATES

- Check for deformation or damage.
- Measure thickness of dish plate.

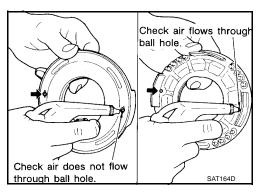
Thickness of dish plate : 2.8 mm (0.110 in)

If deformed or fatigued, replace.



REVERSE CLUTCH PISTON

- Make sure check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure that there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure air leaks past ball.

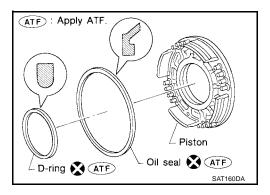


ECS0060E

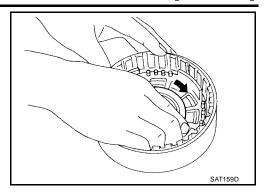
M

Assembly

- 1. Install D-ring and oil seal on piston.
 - Take care with the direction of the oil seal.
 - Apply ATF to both parts.



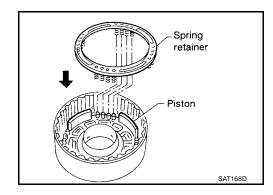
- 2. Install piston assembly by turning it slowly.
 - Apply ATF to inner surface of drum.



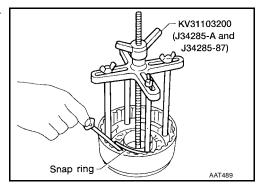
3. Install return springs and spring retainer on piston.

Return spring

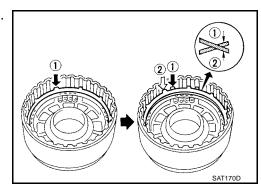
: Refer to AT-388, "Clutch and Brake Return Springs".



- 4. Set Tool on spring retainer and install snap ring while compressing return springs.
 - Set Tool directly above return springs.



- 5. Install drive plates, driven plates, retaining plate and dish plates.
 - Do not align the projections of any two dish plates.
 - Take care with the order and direction of plates.



REVERSE CLUTCH

[RE4F03B]

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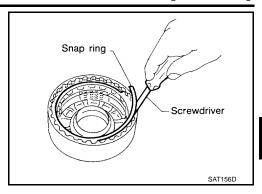
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- 6. Install snap ring.
 - Do not expand snap ring excessively.



7. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate.

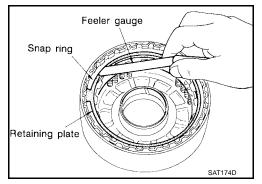
Specified clearance

Standard : 0.5 - 0.8 mm (0.020 - 0.031 in)

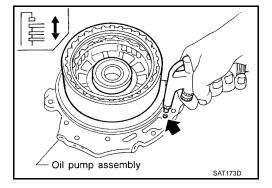
Allowable limit : 1.2 mm (0.047 in)

Retaining plate : Refer to <u>AT-386, "REVERSE</u>

CLUTCH"



8. Check operation of reverse clutch. Refer to AT-313, "Components".

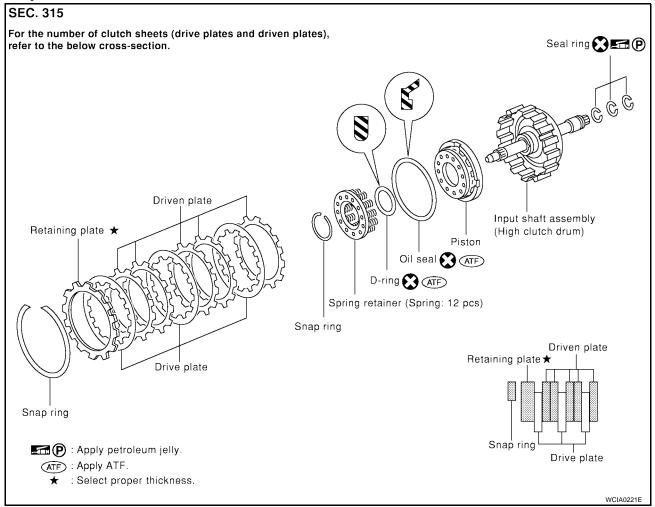


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HIGH CLUTCH PFP:31410

Components

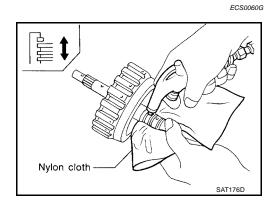


Disassembly

. Check operation of high clutch.

a. Apply compressed air to oil hole of input shaft.

- Stop up a hole on opposite side of input shaft.
- b. Check to see that retaining plate moves to snap ring.
- c. If retaining plate does not contact snap ring:
 - D-ring might be damaged.
 - Oil seal might be damaged.
 - Fluid might be leaking past piston check ball.



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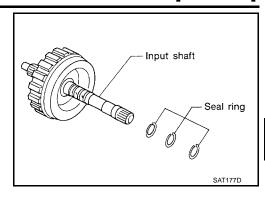
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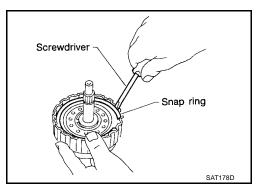
2. Remove seal rings from input shaft.



Remove snap ring.

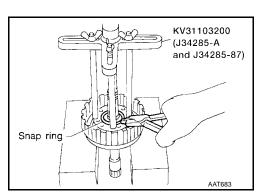
• Do not expand snap ring excessively.

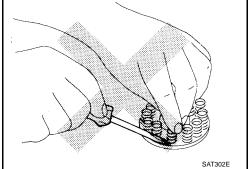
4. Remove drive plates, driven plates and retaining plate.



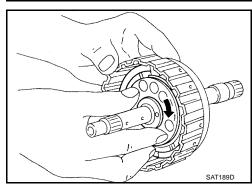
5. Set Tool on spring retainer and remove snap ring from high clutch drum while compressing return springs.

- Set Tool directly above springs.
- Do not expand snap ring excessively.
- 6. Remove spring retainer and return springs.
 - Do not remove return spring from spring retainer.





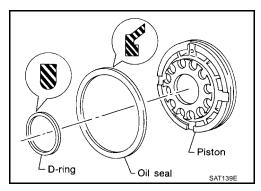
7. Remove piston from high clutch drum by turning it.



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ECS0060H

8. Remove D-ring and oil seal from piston.



Inspection REVERSE CLUTCH SNAP RING, SPRING RETAINER AND RETURN SPRINGS

- Check for deformation, fatigue or damage.
- Replace if necessary.
- When replacing spring retainer and return springs, replace them as a set.

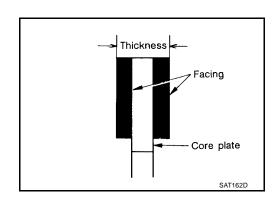
HIGH CLUTCH DRIVE PLATES

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate

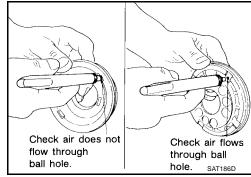
Standard value : 2.0 mm (0.079 in)
Wear limit : 1.8 mm (0.071 in)

If not within wear limit, replace.



HIGH CLUTCH PISTON

- Make sure check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure air leaks past ball.



SEAL RING CLEARANCE

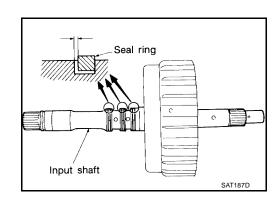
- Install new seal rings onto input shaft.
- Measure clearance between seal ring and ring groove.

Standard clearance : 0.08 - 0.23 mm (0.0031 - 0.0091

in)

Allowable limit : 0.23 mm (0.0091 in)

If not within wear limit, replace input shaft assembly.



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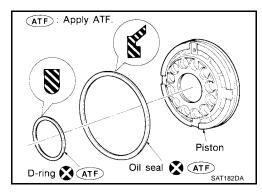
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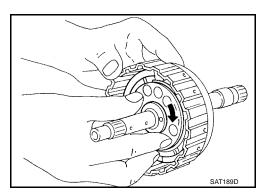
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Assembly

- 1. Install D-ring and oil seal on piston.
 - Take care with the direction of the oil seal.
 - Apply ATF to both parts.

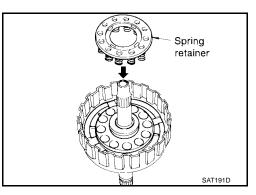


- 2. Install piston assembly by turning it slowly.
 - Apply ATF to inner surface of drum.

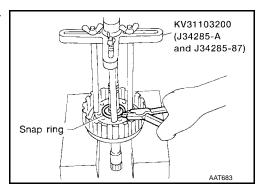


3. Install return springs and spring retainer on piston.

Return spring : Refer to <u>AT-388, "Clutch and Brake Return Springs"</u>.

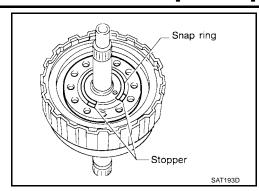


- 4. Set Tool on spring retainer and install snap ring while compressing return springs.
 - Set Tool directly above return springs.
 - Do not expand snap ring excessively.

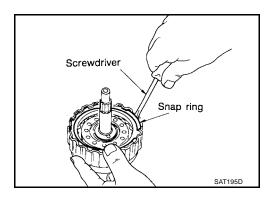


Revision: July 2004 AT-321 2005 Sentra

• Do not align snap ring gap with spring retainer stopper.



- 5. Install drive plates, driven plates and retaining plate. **Take care with the order and direction of plates.**
- 6. Install snap ring.
 - Do not expand snap ring excessively.



7. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate.

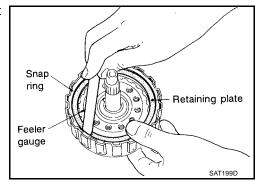
Specified clearance

Standard : 1.4 - 1.8 mm (0.055 - 0.071 in)

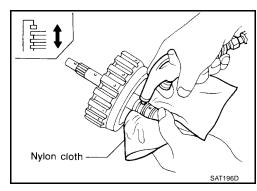
Allowable limit : 2.4 mm (0.094 in)

Retaining plate : Refer to <u>AT-387, "HIGH</u>

CLUTCH".



8. Check operation of high clutch. Refer to <u>AT-318, "HIGH CLUTCH"</u>.



HIGH CLUTCH

AT-323

[RE4F03B]

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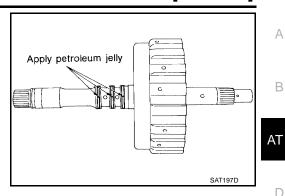
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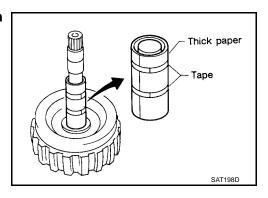
Install seal rings to input shaft. 9.

Revision: July 2004

• Apply petroleum jelly to seal rings.



• Roll paper around seal rings to prevent seal rings from spreading.

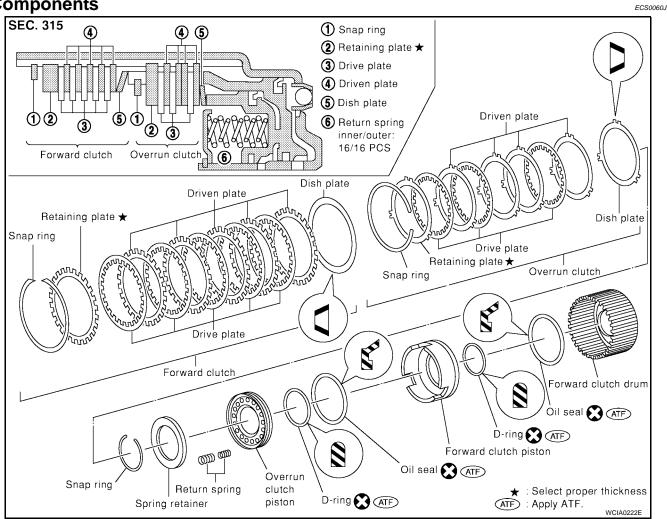


2005 Sentra

FORWARD CLUTCH AND OVERRUN CLUTCH

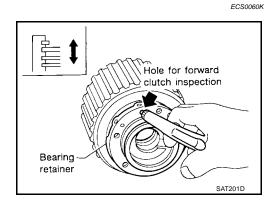
PFP:31570

Components



Disassembly

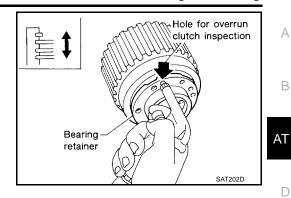
Check operation of forward clutch and overrun clutch.



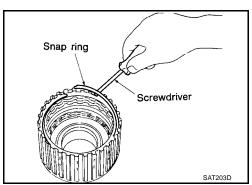
- Install bearing retainer on forward clutch drum. a.
- Apply compressed air to oil hole of forward clutch drum. b.
- Check to see that retaining plate moves to snap ring.

[RE4F03B]

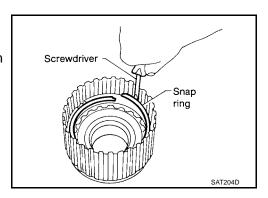
- If retaining plate does not contact snap ring:
 - D-ring might be damaged.
 - Oil seal might be damaged.
 - Fluid might be leaking past piston check ball.



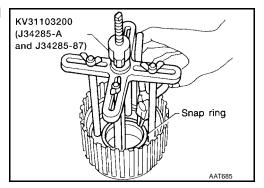
- 2. Remove snap ring for forward clutch.
 - Do not expand snap ring excessively.
- 3. Remove drive plates, driven plates, retaining plate and dish plate for forward clutch.



- 4. Remove snap ring for overrun clutch.
 - Do not expand snap ring excessively.
- 5. Remove drive plates, driven plates, retaining plate and dish plate for overrun clutch.



- 6. Set Tool on spring retainer and remove snap ring from forward clutch drum while compressing return springs.
 - Set Tool directly above return springs.
 - Do not expand snap ring excessively.
- 7. Remove spring retainer and return springs.



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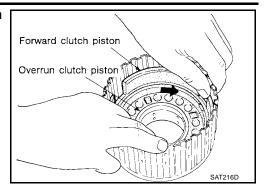
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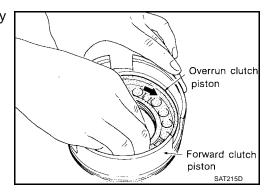
AT-325 2005 Sentra Revision: July 2004

[RE4F03B]

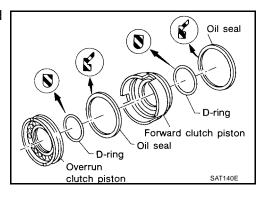
8. Remove forward clutch piston with overrun clutch piston from forward clutch drum by turning it.



Remove overrun clutch piston from forward clutch piston by turning it.



10. Remove D-rings and oil seals from forward clutch piston and overrun clutch piston.



ECS0060L

Inspection SNAP RINGS AND SPRING RETAINER

Check for deformation, fatigue or damage.

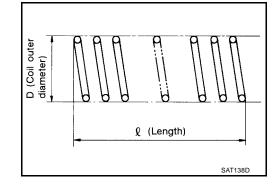
FORWARD CLUTCH AND OVERRUN CLUTCH RETURN SPRINGS

- Check for deformation or damage.
- Measure free length and outer diameter.

Inspection standard : Refer to <u>AT-388, "Clutch</u> and Brake Return

Springs".

Replace if deformed or fatigued.



[RE4F03B]

FORWARD CLUTCH AND OVERRUN CLUTCH DRIVE PLATES

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate

Forward clutch

Standard value : 1.8 mm (0.071 in) Wear limit : 1.6 mm (0.063 in)

Overrun clutch

Standard value : 1.6 mm (0.063 in) **Wear limit** : 1.4 mm (0.055 in)

If not within wear limit, replace.

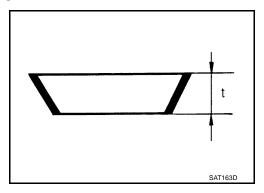
FORWARD CLUTCH AND OVERRUN CLUTCH DISH PLATES

- Check for deformation or damage.
- Measure thickness of dish plate.

Thickness of dish plate "t"

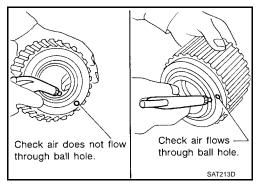
Forward clutch : 2.5 mm (0.098 in) : 2.15 mm (0.0846 in) Overrun clutch

If deformed or fatigued, replace.



FORWARD CLUTCH DRUM

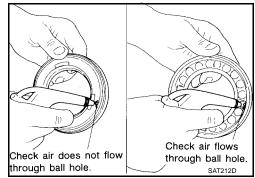
- Make sure check balls are not fixed.
- Apply compressed air to check ball oil hole from outside of forward clutch drum. Make sure air leaks past ball.
- Apply compressed air to oil hole from inside of forward clutch drum. Make sure there is no air leakage.



OVERRUN CLUTCH PISTON

Revision: July 2004

- Make sure check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side. Make sure air leaks past ball.



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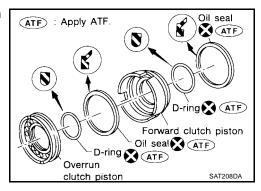
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2005 Sentra

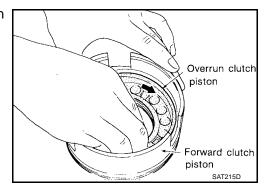
Assembly

1. Install D-rings and oil seals on forward clutch piston and overrun clutch piston.

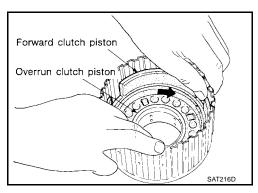
- Take care with direction of oil seal.
- Apply ATF to both parts.



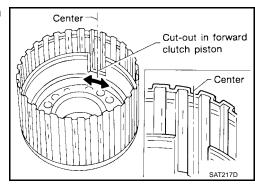
- 2. Install overrun clutch piston assembly on forward clutch piston while turning it slowly.
 - Apply ATF to inner surface of forward clutch piston.



- 3. Install forward clutch piston assembly on forward clutch drum while turning it slowly.
 - Apply ATF to inner surface of drum.



4. Align notch in forward clutch piston with groove in forward clutch drum.



[RE4F03B]

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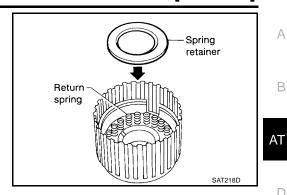
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- Install return spring on piston.
- 6. Install spring retainer on return springs.

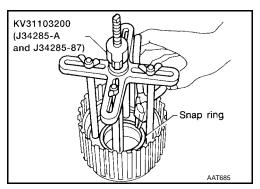
Return spring : Refer to AT-388, "Clutch

and Brake Return

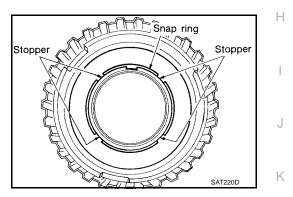
Springs".



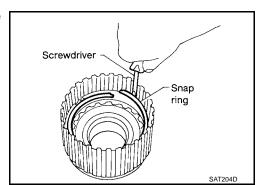
- 7. Set Tool on spring retainer and install snap ring while compressing return springs.
 - Set Tool directly above return springs.
 - Do not expand snap ring excessively.



• Do not align snap ring gap with spring retainer stopper.



- 8. Install drive plates, driven plates, retaining plate and dish plate for overrun clutch.
- Install snap ring for overrun clutch.
 - Do not expand snap ring excessively.



AT-329 Revision: July 2004 2005 Sentra

[RE4F03B]

10. Measure clearance between overrun clutch retaining plate and snap ring.

If not within allowable limit, select proper retaining plate.

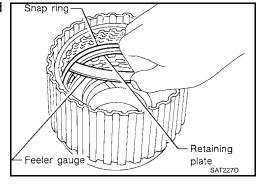
Specified clearance

Standard : 1.0 - 1.4 mm (0.039 - 0.055 in)

Allowable limit : 2.0 mm (0.079 in)

Overrun clutch retain- : Refer to AT-387, "OVERRUN

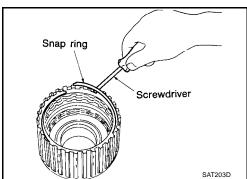
ing plate <u>CLUTCH"</u>.



11. Install drive plates, driven plates, retaining plate and dish plate for forward clutch.

Take care with the order and direction of plates.

- 12. Install snap ring for forward clutch.
 - Do not expand snap ring excessively.



13. Measure clearance between forward clutch retaining plate and snap ring.

If not within allowable limit, select proper retaining plate.

Specified clearance

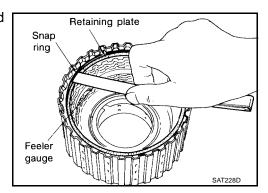
Standard : 0.45 - 0.85 mm (0.0177 - 0.0335

in)

Allowable limit : 1.85 mm (0.0728 in)

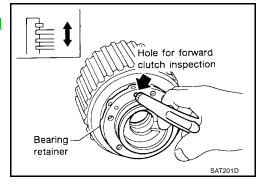
Forward clutch : Refer to AT-387, "FORWARD

retaining plate <u>CLUTCH"</u>



14. Check operation of forward clutch.

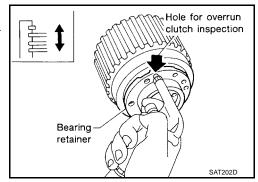
Refer to AT-324, "FORWARD CLUTCH AND OVERRUN CLUTCH"



[RE4F03B]

15. Check operation of overrun clutch.

Refer to AT-324, "FORWARD CLUTCH AND OVERRUN CLUTCH".



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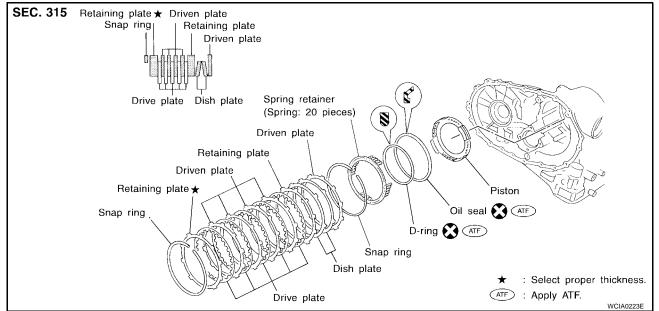
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LOW & REVERSE BRAKE

PFP:31645

ECS0060N

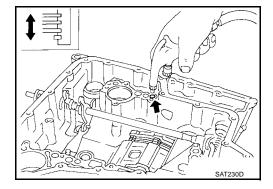
Components



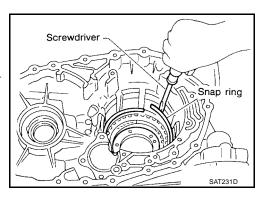
Disassembly

ECS00600

- 1. Check operation of low & reverse brake.
- a. Apply compressed air to oil hole of transmission case.
- b. Check to see that retaining plate moves to snap ring.
- c. If retaining plate does not contact snap ring:
 - D-ring might be damaged.
 - Oil seal might be damaged.
 - Fluid might be leaking past piston check ball.



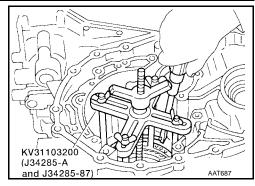
- 2. Stand transmission case.
- 3. Remove snap ring.
 - Do not expand snap ring excessively.
- Remove drive plates, driven plates, retaining plate from transmission case.



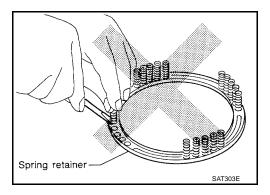
LOW & REVERSE BRAKE

[RE4F03B]

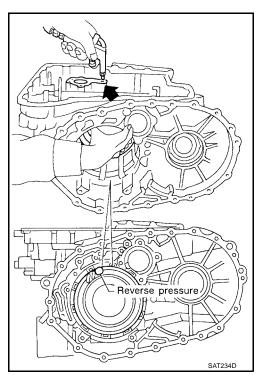
- 5. Set Tool on spring retainer and remove snap ring while compressing return springs.
 - Set Tool directly above return springs.
 - Do not expand snap ring excessively.
- 6. Remove spring retainer and return springs.



• Do not remove return springs from spring retainer.



- 7. Apply compressed air to oil hole of transmission case while holding piston.
- 8. Remove piston from transmission case by turning it.



Revision: July 2004 AT-333 2005 Sentra

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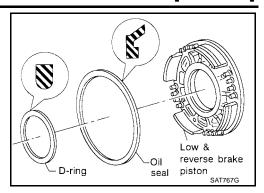
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9. Remove D-ring and oil seal from piston.



Inspection

LOW & REVERSE CLUTCH SNAP RING, SPRING RETAINER AND RETURN SPRINGS

- Check for deformation, fatigue or damage.
- Replace if necessary.
- When replacing spring retainer and return springs, replace them as a set.

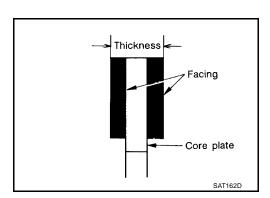
LOW & REVERSE BRAKE DRIVE PLATES

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate

Standard value : 2.0 mm (0.079 in)
Wear limit : 1.8 mm (0.071 in)

If not within wear limit, replace.

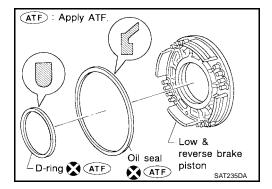


ECS0060Q

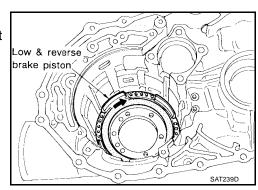
ECS0060F

Assembly

- 1. Install D-ring and oil seal on piston.
 - Take care with the direction of the oil seal.
 - Apply ATF to both parts.



- 2. Stand transmission case.
- 3. Install piston assembly on transmission case while turning it slowly.
 - Apply ATF to inner surface of transmission case.



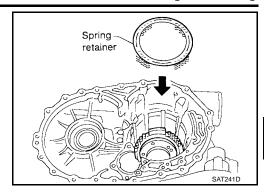
LOW & REVERSE BRAKE

[RE4F03B]

Install return springs and spring retainer on piston.

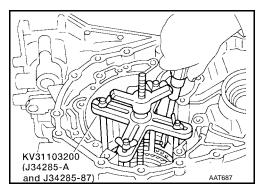
Return spring

:Refer to AT-388, "Clutch and Brake Return Springs".



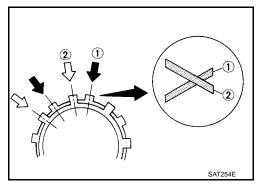
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- 5. Install snap ring while compressing return springs.
 - Set Tool directly above return springs.

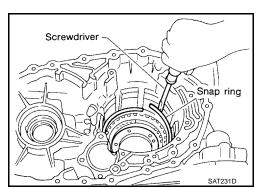


6. Install drive plates, driven plates, retaining plates and dished plates.

- Do not align the projections on the two dished plates.
- Make sure to put the plates in the correct order and direction.



- 7. Install snap ring.
 - Do not expand snap ring excessively.



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LOW & REVERSE BRAKE

[RE4F03B]

8. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate (front side).

Specified clearance

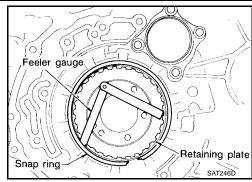
Standard : 1.4 - 1.8 mm (0.055 - 0.071 in)

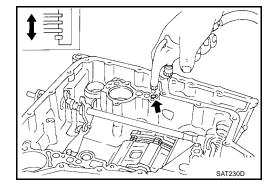
Allowable limit : 2.8 mm (0.110 in)

Retaining plate : Refer to <u>AT-387, "LOW & </u>

REVERSE BRAKE".

9. Check operation of low and reverse brake. Refer to <u>AT-332</u>, "LOW & REVERSE BRAKE".



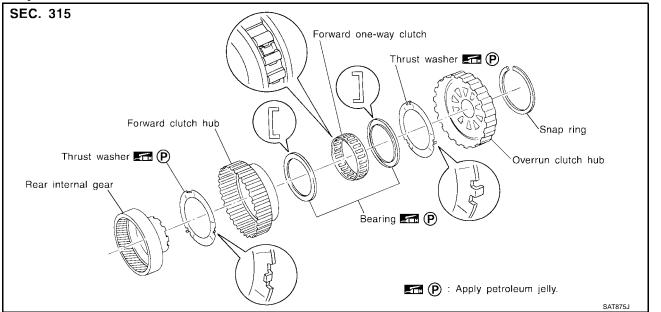


[RE4F03B]

FCS0060R

REAR INTERNAL GEAR, FORWARD CLUTCH HUB AND OVERRUN CLUTCH HUB PFP:31450

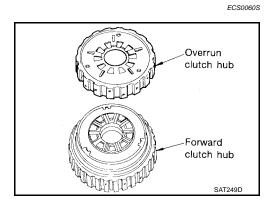
Components



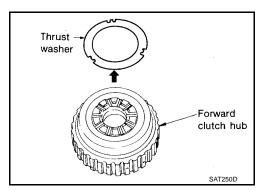
Disassembly

1. Remove snap ring from overrun clutch hub.

2. Remove overrun clutch hub from forward clutch hub.



3. Remove thrust washer from forward clutch hub.



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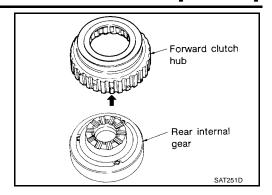
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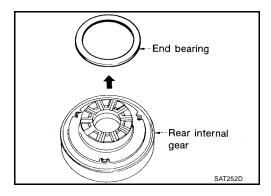
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[RE4F03B]

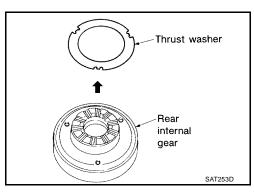
4. Remove forward clutch hub from rear internal gear.



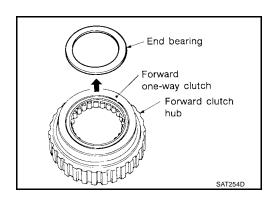
5. Remove end bearing from rear internal gear.



6. Remove thrust washer from rear internal gear.

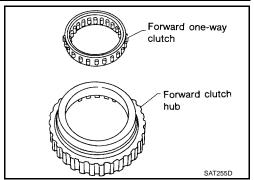


7. Remove end bearing from forward one-way clutch.



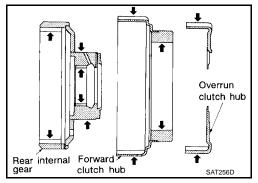
[RE4F03B]

Remove one-way clutch from forward clutch hub.



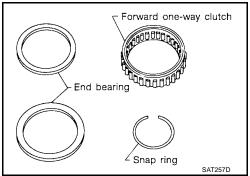
Inspection
REAR INTERNAL GEAR, FORWARD CLUTCH HUB AND OVERRUN CLUTCH HUB

Check rubbing surfaces for wear or damage.



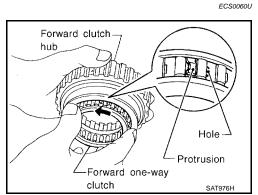
SNAP RING, END BEARINGS AND FORWARD ONE-WAY CLUTCH

- Check snap ring and end bearings for deformation and damage.
- Check forward one-way clutch for wear and damage.



Assembly

- 1. Install forward one-way clutch on forward clutch.
 - Take care with the direction of forward one-way clutch.



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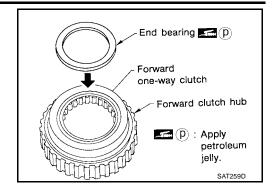
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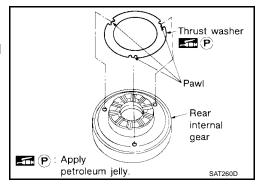
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[RE4F03B]

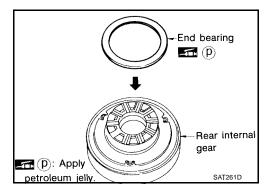
- 2. Install end bearing on forward one-way clutch.
 - Apply petroleum jelly to end bearing.



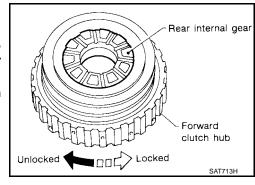
- 3. Install thrust washer on rear internal gear.
 - Apply petroleum jelly to thrust washer.
 - Align pawls of thrust washer with holes of rear internal gear.



- 4. Install end bearing on rear internal gear.
 - Apply petroleum jelly to end bearing.



- 5. Install forward clutch hub on rear internal gear.
 - Check operation of forward one-way clutch.
 Hold rear internal gear and turn forward clutch hub.
 Check forward clutch hub for correct locking and unlocking directions.
 - If not as shown in illustration, check installation direction of forward one-way clutch.



[RE4F03B]

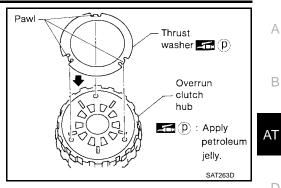
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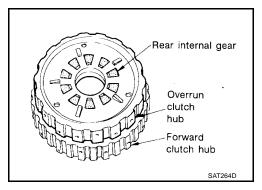
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- Install thrust washer and overrun clutch hub.
 - Apply petroleum jelly to thrust washer.
 - Align pawls of thrust washer with holes of overrun clutch

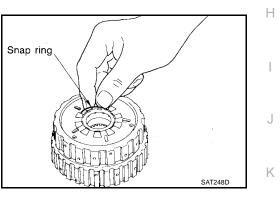


7. Install overrun clutch hub on rear internal gear.

. Align projections of rear internal gear with holes of overrun clutch hub.



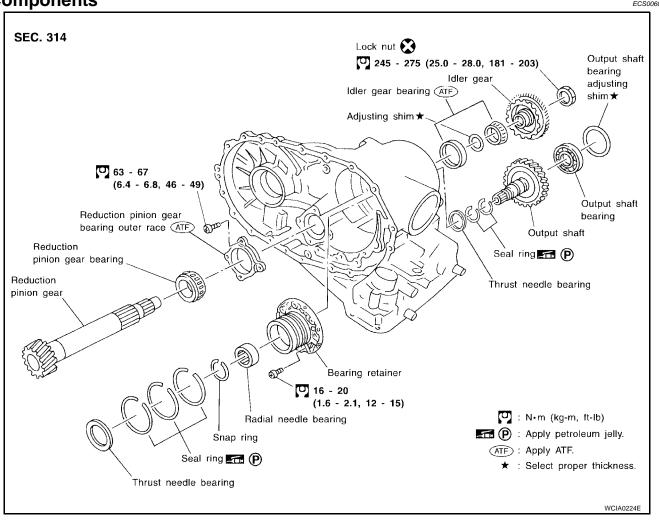
Install snap ring to groove of rear internal gear.



[RE4F03B]

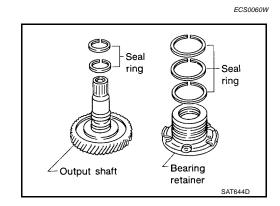
OUTPUT SHAFT, IDLER GEAR, REDUCTION PINION GEAR AND BEARING RETAINER PFP:31480

Components FCS0060V



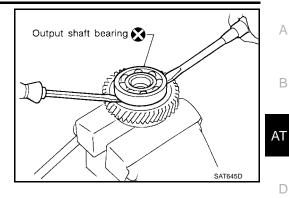
Disassembly

Remove seal rings from output shaft and bearing retainer.



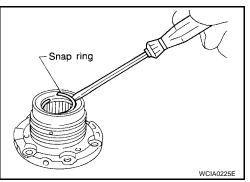
[RE4F03B]

- Remove output shaft bearing with screwdrivers.
 - Always replace bearing with a new one when removed.
 - Do not damage output shaft.

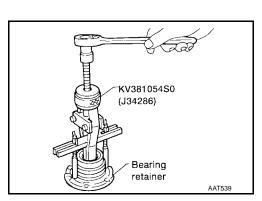


3. Remove snap ring from bearing retainer.

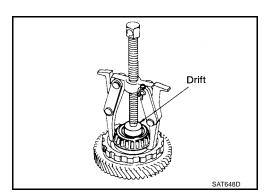
• Do not expand snap ring excessively.



Remove needle bearing from bearing retainer.



Remove idler gear bearing inner race from idler gear.



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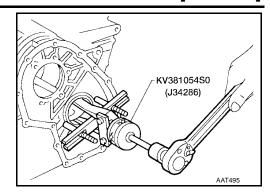
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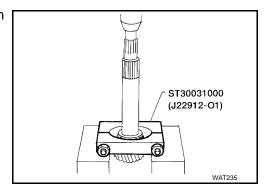
K

[RE4F03B]

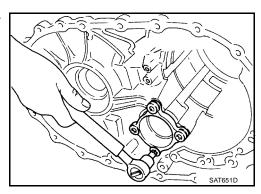
6. Remove idler gear bearing outer race from transmission case.



7. Press out reduction pinion gear bearing from reduction pinion gear.



8. Remove reduction pinion gear bearing outer race from transmission case.



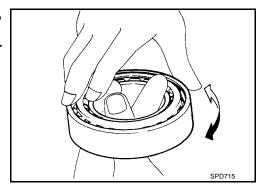
Inspection OUTPUT SHAFT, IDLER GEAR AND REDUCTION PINION GEAR

ECS0060X

- Check shafts for cracks, wear or bending.
- Check gears for wear, chips and cracks.

BEARING

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- When replacing taper roller bearing, replace outer and inner race as a set.



[RE4F03B]

SEAL RING CLEARANCE

Install new seal rings to output shaft.

 Measure clearance between seal ring and ring groove of output shaft.

Standard clearance : 0.10 - 0.25 mm (0.0039 - 0.0098 in)

Allowable limit : 0.25 mm (0.0098 in)

- If not within allowable limit, replace output shaft.
- Install new seal rings to bearing retainer.
- Measure clearance between seal ring and ring groove of bearing retainer.

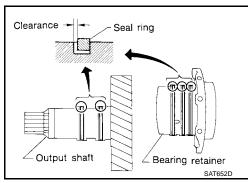
Standard clearance : 0.10 - 0.25 mm (0.0039 - 0.0098 in)

Allowable limit : 0.25 mm (0.0098 in)

If not within allowable limit, replace bearing retainer.

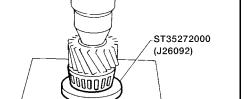


1. Press reduction pinion gear bearing on reduction pinion gear.



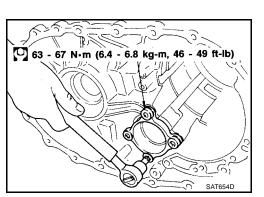
ECS0060Y

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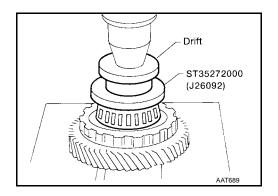


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Install reduction pinion gear bearing outer race on transmission case.



3. Press idler gear bearing inner race on idler gear.



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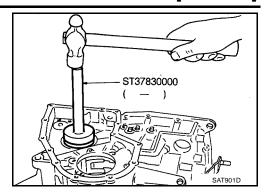
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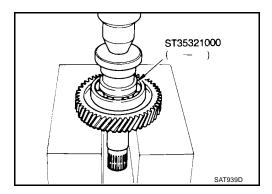
L

[RE4F03B]

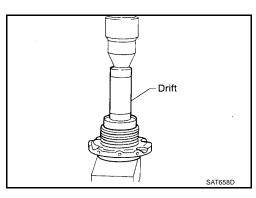
4. Install idler gear bearing outer race on transmission case.



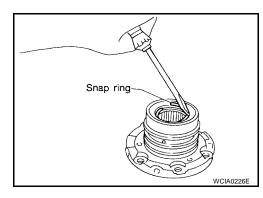
5. Press output shaft bearing on output shaft.



6. Press needle bearing on bearing retainer.



7. Install snap ring to bearing retainer.

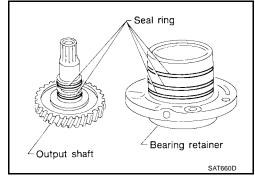


[RE4F03B]

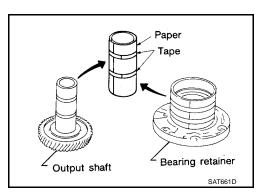
8. After packing ring grooves with petroleum jelly, carefully install new seal rings on output shaft and bearing retainer.

NOTE:

Do not align gaps in seal rings.



 Roll paper around seal rings to prevent seal rings from spreading.



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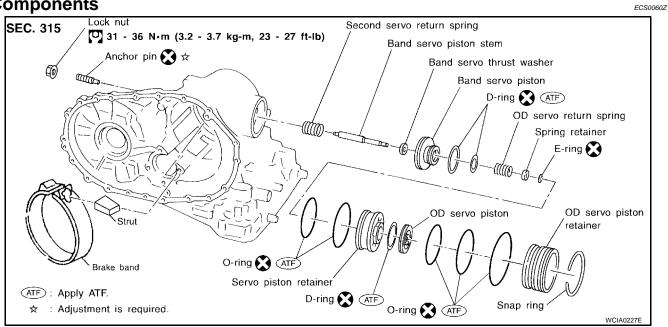
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BAND SERVO PISTON ASSEMBLY

PFP:31615

Components

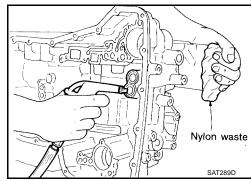


Disassembly

ECS00610 Remove band servo piston snap ring.

Screwdriver SAT288D

- 2. Apply compressed air to oil hole in transmission case to remove OD servo piston retainer and band servo piston assembly.
 - Hold band servo piston assembly with a rag or nylon waste.



BAND SERVO PISTON ASSEMBLY

[RE4F03B]

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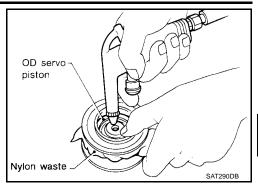
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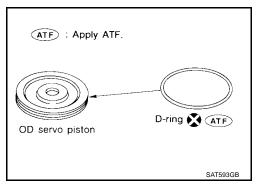
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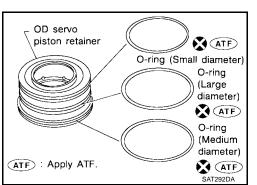
- 3. Apply compressed air to oil hole in OD servo piston retainer to remove OD servo piston from retainer.
 - Hold OD servo piston while applying compressed air.



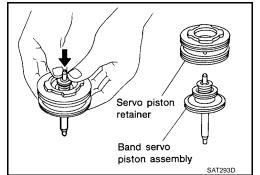
4. Remove D-ring from OD servo piston.



5. Remove O-rings from OD servo piston retainer.

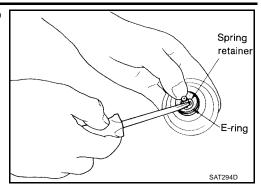


6. Remove band servo piston assembly from servo piston retainer by pushing it forward.

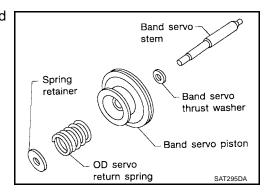


Revision: July 2004 AT-349 2005 Sentra

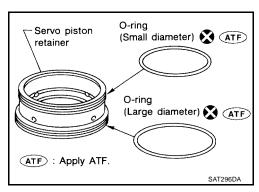
7. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, remove E-ring.



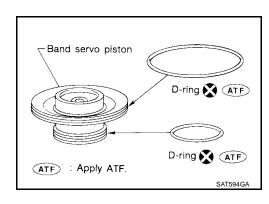
8. Remove OD servo return spring, band servo thrust washer and band servo piston stem from band servo piston.



9. Remove O-rings from servo piston retainer.



10. Remove D-rings from band servo piston.



BAND SERVO PISTON ASSEMBLY

[RE4F03B]

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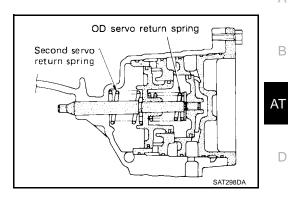
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Inspection PISTONS, RETAINERS AND PISTON STEM

Check frictional surfaces for abnormal wear or damage.

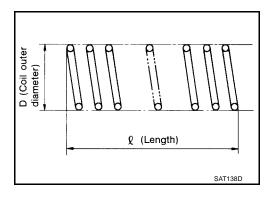


RETURN SPRINGS

- Check for deformation or damage.
- Measure free length and outer diameter.

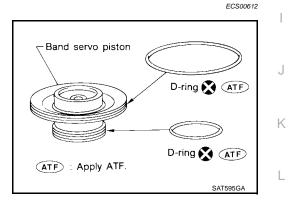
Band servo inspection standard

: Refer to **AT-393**, "RETURN SPRING".

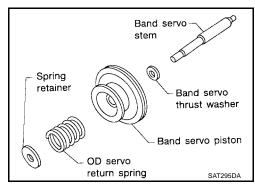


Assembly

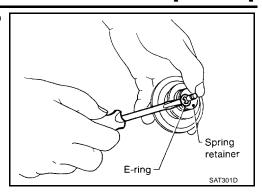
- 1. Install D-rings to band servo piston retainer.
 - Apply ATF to D-rings.
 - Pay attention to position of each D-ring.



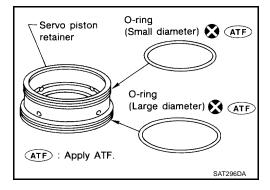
Install band servo piston stem, band servo thrust washer, OD servo return spring and spring retainer to band servo piston.



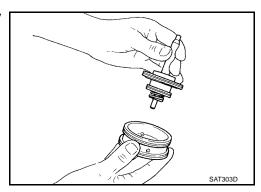
AT-351 Revision: July 2004 2005 Sentra 3. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, install E-ring.



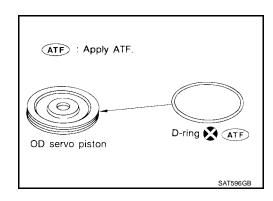
- 4. Install O-rings to servo piston retainer.
 - Apply ATF to O-rings.
 - Pay attention to the positions of the O-rings.



5. Install band servo piston assembly to servo piston retainer by pushing it inward.



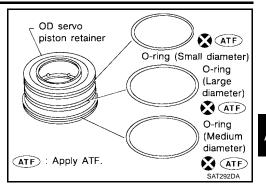
- 6. Install D-ring to OD servo piston.
 - Apply ATF to D-ring.



BAND SERVO PISTON ASSEMBLY

[RE4F03B]

- 7. Install O-rings to OD servo piston retainer.
 - Apply ATF to O-rings.
 - Pay attention to the positions of the O-rings.



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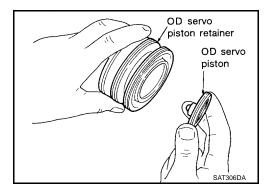
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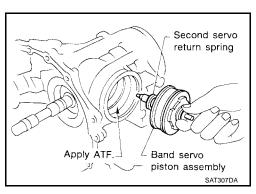
8. Install OD servo piston to OD servo piston retainer.



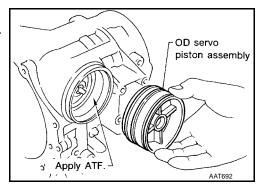
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- 9. Install band servo piston assembly and 2nd servo return spring to transmission case.
 - Apply ATF to O-ring of band servo piston and transmission case.



- 10. Install OD servo piston assembly to transmission case.
 - Apply ATF to O-ring of band servo piston and transmission case.



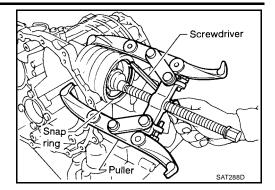
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BAND SERVO PISTON ASSEMBLY

[RE4F03B]

11. Install band servo piston snap ring to transmission case.



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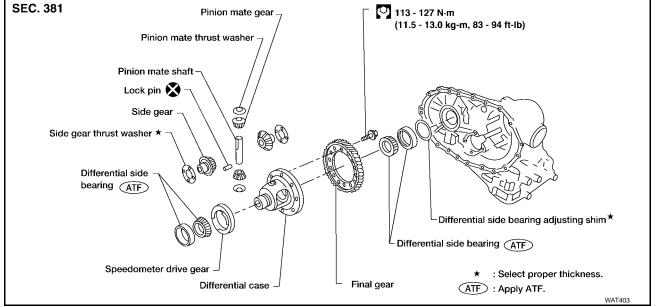
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FINAL DRIVE PFP:38411

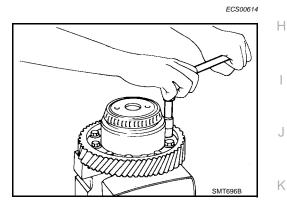
Components

ECS00613 113 - 127 N·m (11.5 - 13.0 kg-m, 83 - 94 ft-lb)

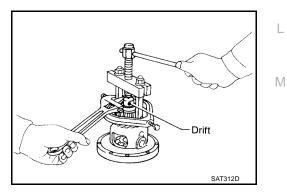


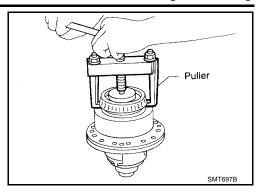
Disassembly

1. Remove final gear.

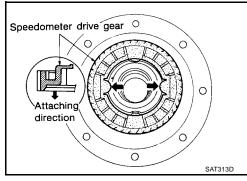


Press out differential side bearings.

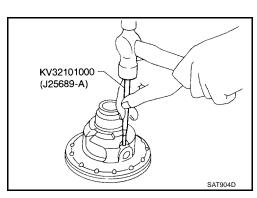




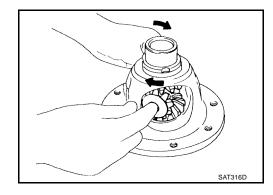
3. Remove speedometer drive gear.



4. Drive out pinion mate shaft lock pin.



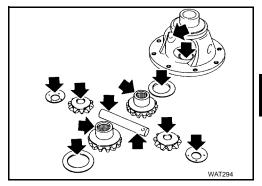
- 5. Draw out pinion mate shaft from differential case.
- 6. Remove pinion mate gears and side gears.



Inspection GEAR, WASHER, SHAFT AND CASE

ECS00615

- Check mating surfaces of differential case, side gears and pinion mate gears.
- Check washers for wear.



BEARINGS

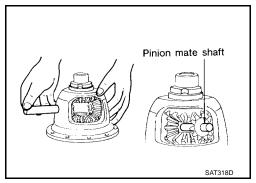
- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- When replacing taper roller bearing, replace outer and inner race as a set.



Assembly

1. Install side gear and thrust washers in differential case.

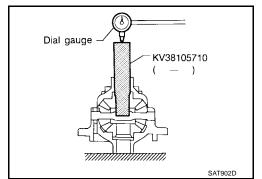
- 2. Install pinion mate gears and thrust washers in differential case while rotating them.
 - When inserting, be careful not to damage pinion mate gear washers.
 - Apply ATF to any parts.



- 3. Measure clearance between side gear and differential case with washers using the following procedure.
- a. Set Tool and dial indicator on side gear.
- b. Move side gear up and down to measure dial indicator deflection. Always measure indicator deflection on both side gears.

Clearance between side gear and differential case with washers

: 0.1 - 0.2 mm (0.004 - 0.008 in)



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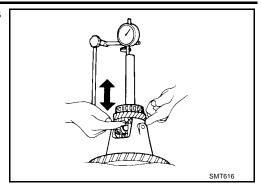
ECS00616

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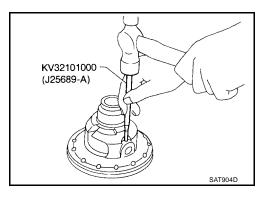
 If not within specification adjust clearance by changing thickness of side gear thrust washers.

Side gear thrust washer

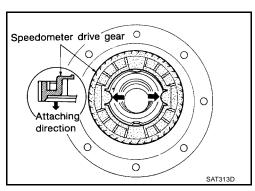
: Refer to AT-389, "DIF-FERENTIAL SIDE GEAR THRUST WASHERS".



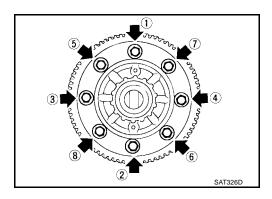
- 4. Install lock pin.
 - Make sure that lock pin is flush with case.



- 5. Install speedometer drive gear on differential case.
 - Align the projection of speedometer drive gear with the groove of differential case.



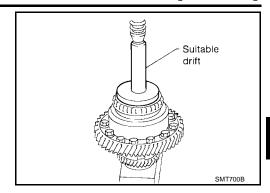
- 6. Install final gear and tighten fixing bolts in numerical order.
 - : 113 127 N-m (11.5 13.0 kg-m, 83 94 ft-lb)



FINAL DRIVE

[RE4F03B]

7. Press on differential side bearings.



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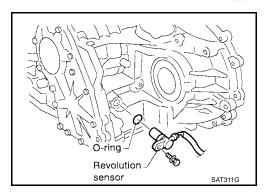
ASSEMBLY PFP:00000

Assembly (1)

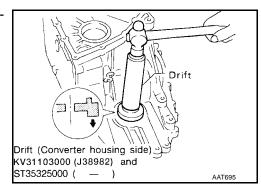
ECS00617

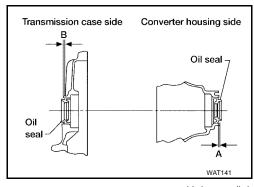
1. Install revolution sensor onto transmission case.

Always use new sealing parts.



2. Install differential side oil seals on transmission case and converter housing, so that "A" and "B" are within specifications.

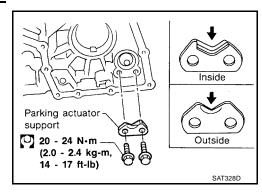




Unit: mm (in)

A	В
5.5 - 6.5 (0.217 - 0.256)	-0.5 to 0.5 (-0.020 to 0.020)

- 3. Install parking actuator support to transmission case.
 - Pay attention to direction of parking actuator support.



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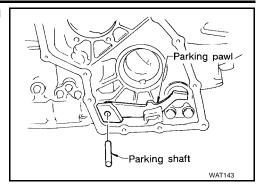
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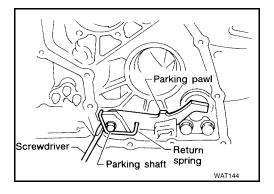
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ECS00618

4. Install parking pawl on transmission case and fix it with parking shaft.

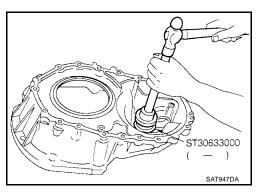


Install return spring.

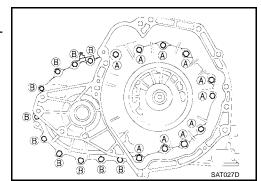


Adjustment (1) DIFFERENTIAL SIDE BEARING PRELOAD

- Install differential side bearing outer race without adjusting shim on transmission case.
- 2. Install differential side bearing outer race on converter housing.



- 3. Place final drive assembly on transmission case.
- 4. Install transmission case on converter housing. Tighten transmission case fixing bolts **A** and **B** to the specified torque.



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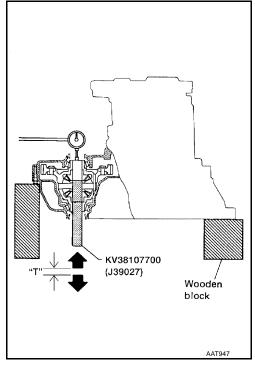
- Attach dial indicator on differential case at transmission case side.
- 6. Insert Tool into differential side gear from converter housing.
- 7. Move Tool up and down and measure dial indicator deflection.

Differential side : 0.04 - 0.09 mm (0.0016 - 0.0035 in) bearing preload "T"

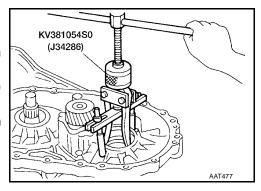
8. Select proper thickness of differential side bearing adjusting shim(s) using SDS table as a guide.

Differential side bearing adjusting shim

: Refer to AT-389, "DIF-FERENTIAL SIDE BEAR-ING ADJUSTING SHIMS".



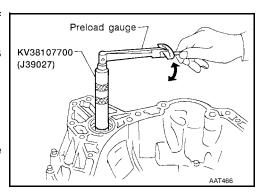
- 9. Remove converter housing from transmission case.
- 10. Remove final drive assembly from transmission case.
- Remove differential side bearing outer race from transmission case.
- 12. Reinstall differential side bearing outer race and shim(s) selected from SDS table on transmission case.
- 13. Reinstall converter housing on transmission case and tighten transmission case fixing bolts to the specified torque.



- 14. Insert Tool into differential case and measure turning torque of final drive assembly.
 - Turn final drive assembly in both directions several times to seat bearing rollers correctly.

Turning torque of : 0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, final drive assembly (New bearing) : 0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, final drive assembly (8.3 - 9.5 in-lb)

- When old bearing is used again, turning torque will be slightly less than the above.
- Make sure torque is within the specified range.

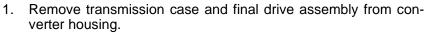


REDUCTION PINION GEAR BEARING PRELOAD

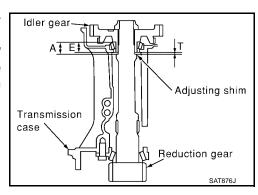
- Be sure to remove final drive assembly before doing this procedure.
- Using caliper and straightedge, calculate a dimension "T" (adjuster shim thickness) using the following formula. Adjust the inspection standard for preload (rotating slide torque) as shown below.

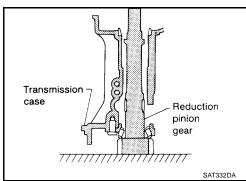
$$T = A - E$$

Inspection standard :0.1 - 0.69 N·m (1.1 - 7.0 kg-cm, for preload 0.95 - 6.08 in-lb)



- 2. Select proper thickness of reduction pinion gear bearing adjusting shim using the following procedures.
- a. Place reduction pinion gear on transmission case as shown.

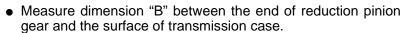




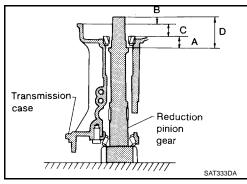
- b. Place idler gear bearing on transmission case.
- c. Measure dimensions "B", "C" and "D" and calculate dimension "A".

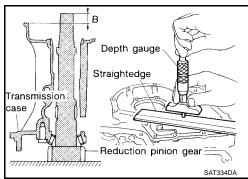
$$A = D - (B + C)$$
"A"

: Distance between the surface of idler gear bearing inner race and the adjusting shim mating surface of reduction pinion gear.









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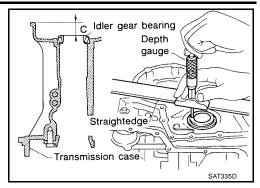
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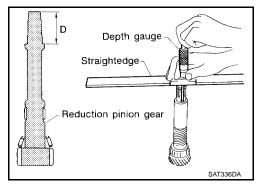
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- Measure dimension "C" between the surface of idler gear bearing inner race and the surface of transmission case.
- Measure dimension "C" in at least two places.



- Measure dimension "D" between the end of reduction pinion gear and the adjusting shim mating surface of reduction pinion gear.
- Measure dimension "D" in at least two places.
- Calculate dimension "A".

$$A = D - (B + C)$$

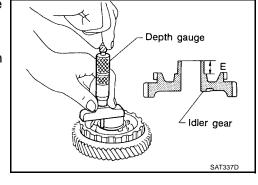


- d. Measure dimension "E" between the end of idler gear and the idler gear bearing inner race mating surface of idler gear.
 - Measure dimension "E" in at least two places.
- e. Calculate "T" and select proper thickness of reduction pinion gear bearing adjusting shim using SDS table as a guide.

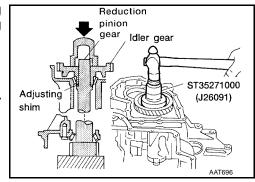
$$T = A - E - 0.05 \text{ mm } (0.0020 \text{ in})^*$$

Reduction pinion gear bearing adjusting shim

: Refer to AT-391, "REDUCTION PINION GEAR BEARING ADJUST-ING SHIMS".



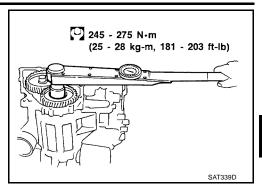
- *: Bearing preload
- Install reduction pinion gear and reduction pinion gear bearing adjusting shim selected in step 2-e on transmission case using Tool.
- 4. Press idler gear bearing inner race on idler gear.
- 5. Press idler gear on reduction pinion gear.
 - Press idler gear so that idler gear can be locked by parking pawl.



ASSEMBLY

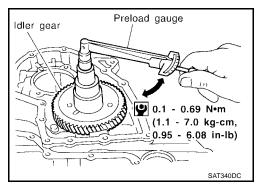
[RE4F03B]

- 6. Tighten idler gear lock nut to the specified torque.
 - Lock idler gear with parking pawl when tightening lock nut.



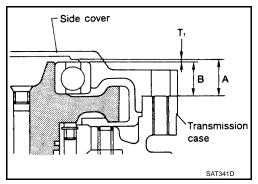
- 7. Measure turning torque of reduction pinion gear.
 - When measuring turning torque, turn reduction pinion gear in both directions several times to seat bearing rollers correctly.

Turning torque of : 0.1 - 0.69 N·m (1.1 - 7.0 kg-cm, reduction pinion 0.95 - 6.08 in-lb) gear

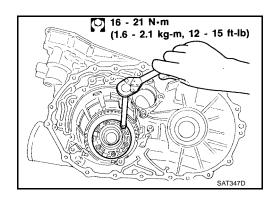


OUTPUT SHAFT END PLAY

- Measure clearance between side cover and the end of the output shaft bearing.
- Select proper thickness of adjusting shim so that clearance is within specifications.



1. Install bearing retainer for output shaft.



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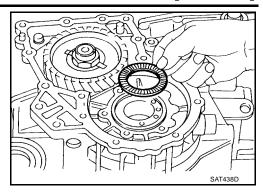
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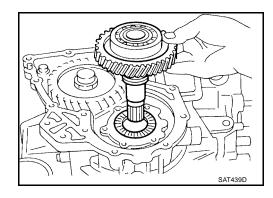
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2. Install output shaft thrust needle bearing on bearing retainer.



3. Install output shaft on transmission case.

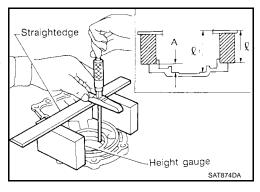


- 4. Measure dimensions "l1" and "l2" at side cover and then calculate dimension "A".
 - Measure dimension "l1" and "l2" in at least two places "A": Distance between transmission case fitting surface and adjusting shim mating surface

$$A = I_1 - I_2$$

$$I_2$$

: Height of gauge



5. Measure dimensions "l2" and "l3" and then calculate dimension "B".

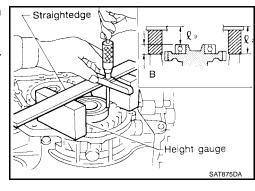
Measure "l2" and "l3" in at least two places.

"B": Distance between the end of output shaft bearing outer race and the side cover fitting surface of transmission case

$$B = I_2 - I_3$$

12

: Height of gauge



ASSEMBLY

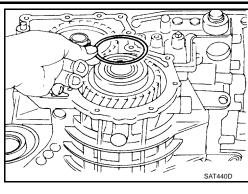
[RE4F03B]

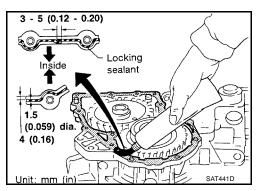
Select proper thickness of adjusting shim so that output shaft end play (clearance between side cover and output shaft bearing) is within specifications.

> Output shaft end play (A - B) : 0 - 0.5 mm (0 - 0.020 in)Output shaft end play adjust- : Refer to AT-392, "OUTing shim

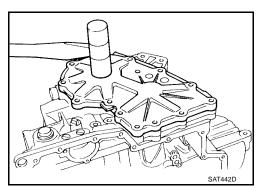
PUT SHAFT END PLAY ADJUSTING SHIMS".

- Install adjusting shim on output shaft bearing.
- Apply locking sealant (Loctite 5/8 or equivalent) to transmission case as shown in illustration.

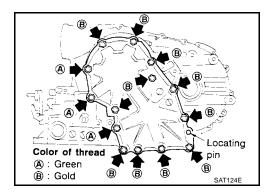




- Install side cover on transmission case.
 - Apply locking sealant to the mating surface of transmission case.



- 10. Tighten side cover fixing bolts to specified torque.
 - : 26 30 N·m (2.7 3.1 kg-m, 20 22 ft-lb)
 - Do not mix bolts A and B.
 - Always replace bolts A as they are self-sealing bolts.



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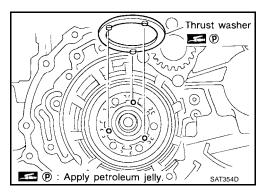
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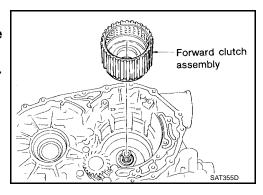
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Assembly (2)

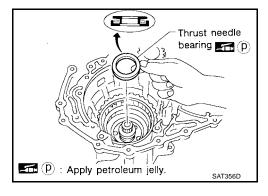
- 1. Remove paper rolled around bearing retainer.
- 2. Install thrust washer on bearing retainer.
 - Apply petroleum jelly to thrust washer.



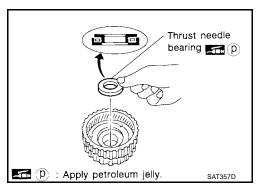
- 3. Install forward clutch assembly.
 - Align teeth of low & reverse brake drive plates before installing.
 - Make sure that bearing retainer seal rings are not spread.



- 4. Install thrust needle bearing on bearing retainer.
 - Apply petroleum jelly to thrust bearing.
 - Pay attention to direction of thrust needle bearing.



- 5. Install thrust needle bearing on rear internal gear.
 - Apply petroleum jelly to thrust needle bearing.
 - Pay attention to direction of thrust needle bearing.



ASSEMBLY

[RE4F03B]

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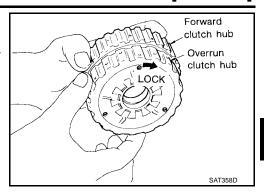
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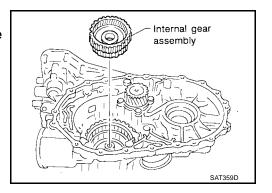
- 6. Hold forward clutch hub and turn overrun clutch hub.

 Check overrun clutch hub for directions of lock and unlock.
 - If not as shown in illustration, check installed direction of forward one-way clutch.

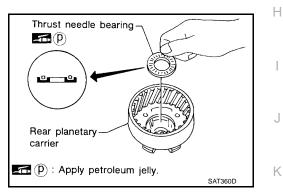


7. Install rear internal gear assembly.

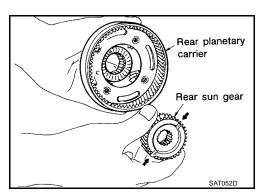
 Align teeth of forward clutch and overrun clutch drive plate.



- 8. Install needle bearing on rear planetary carrier.
 - Apply petroleum jelly to needle bearing.
 - Pay attention to direction of needle bearing.

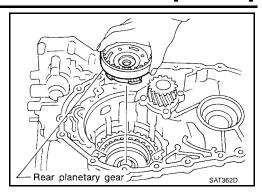


- 9. Install rear sun gear on rear planetary carrier.
 - Pay attention to direction of rear sun gear.

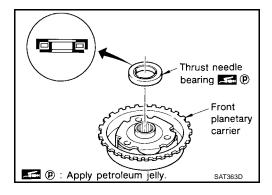


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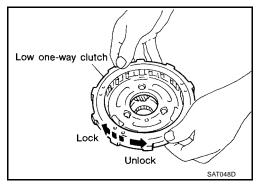
10. Install rear planetary carrier on transmission case.



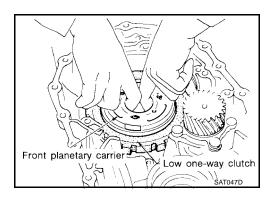
- 11. Install thrust needle bearing on front planetary carrier.
 - Apply petroleum jelly to thrust needle bearing.
 - Pay attention to direction of thrust needle bearing.



- 12. Install low one-way clutch to front planetary carrier by turning it in the direction of the arrow as shown.
- 13. While holding front planetary carrier, turn low one-way clutch. Check low one-way clutch for correct directions of lock and unlock.



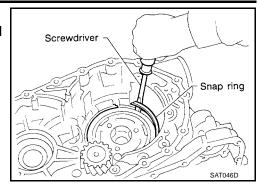
14. Install front planetary carrier assembly on transmission case.



ASSEMBLY

[RE4F03B]

- 15. Install snap ring with screwdriver.
 - Forward clutch and bearings must be correctly installed for snap ring to fit groove of transmission case.



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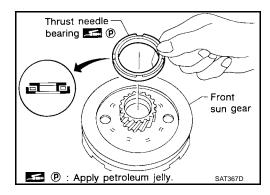
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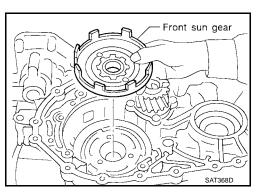
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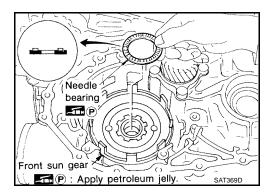
- 16. Install needle bearing on front sun gear.
 - Apply petroleum jelly to needle bearing.
 - Pay attention to direction of needle bearing.



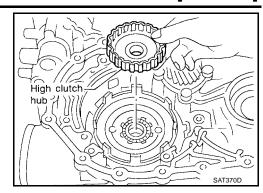
17. Install front sun gear on front planetary carrier.



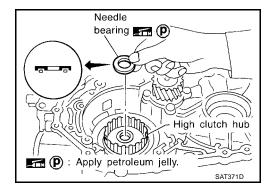
- 18. Install needle bearing on front sun gear.
 - Apply petroleum jelly to needle bearing.
 - Pay attention to direction of needle bearing.



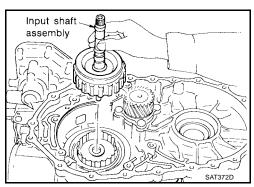
19. Install high clutch hub on front sun gear.



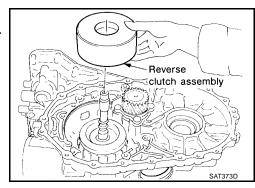
- 20. Install needle bearing on high clutch hub.
 - Apply petroleum jelly to needle bearing.
 - Pay attention to direction of needle bearing.



- 21. Remove paper rolled around input shaft.
- 22. Install input shaft assembly.
 - Align teeth of high clutch drive plates before installing.



- 23. Install reverse clutch assembly.
 - Align teeth of reverse clutch drive plates before installing.



Adjustment (2)

ECS0061A

When any parts listed below are replaced, adjust total end play and reverse clutch end play.

Part name	Total end play	Reverse clutch end play	
Transmission case	•	•	
Overrun clutch hub	•	•	
Rear internal gear	•	•	
Rear planetary carrier	•	•	

ASSEMBLY

[RE4F03B]

Part name	Total end play	Reverse clutch end play
Rear sun gear	•	•
Front planetary carrier	•	•
Front sun gear	•	•
High clutch hub	•	•
High clutch drum	•	•
Oil pump cover	•	•
Reverse clutch drum	_	•

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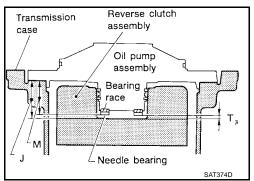
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TOTAL END PLAY

- Measure clearance between reverse clutch drum and needle bearing for oil pump cover.
- Select proper thickness of bearing race so that end play is within specifications.

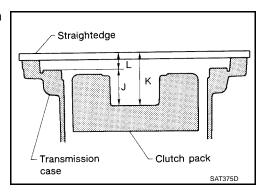


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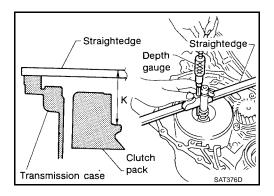
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Measure dimensions "K" and "L" and then calculate dimension "J".

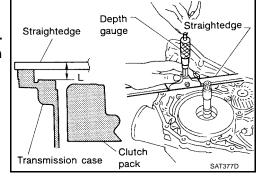


Measure dimension "K".

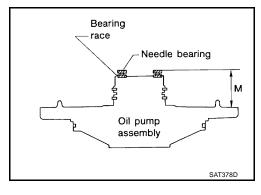


- b. Measure dimension "L".
- c. Calculate dimension "J".
 - "J": Distance between oil pump fitting surface of transmission case and needle bearing mating surface of high clutch drum

$$J = K - L$$



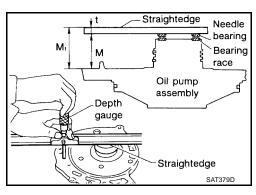
2. Measure dimension "M".



- a. Place bearing race and needle bearing on oil pump assembly.
- b. Measure dimension "M".

"M": Distance between transmission case fitting surface and needle bearing on oil pump cover

"M1": Indication of gauge



Measure thickness of straightedge "t".

$$M = M1 - t$$

Adjust total end play "T3".

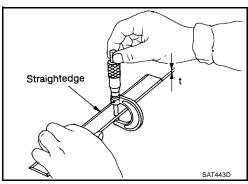
$$T_3 = J - M$$

Total end play "T3 : 0.25 - 0.55 mm (0.0098 - 0.0217 in)

• Select proper thickness of bearing race so that total end play is within specifications.

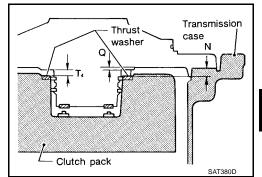


: Refer to AT-393, "BEAR-ING RACE FOR ADJUST-ING TOTAL END PLAY"

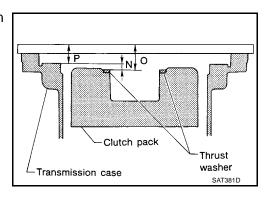


REVERSE CLUTCH END PLAY

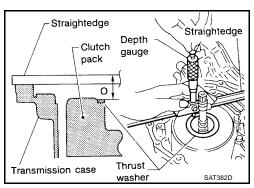
- Measure clearance between oil pump cover and thrust washer for reverse clutch drum.
- Select proper thickness of thrust washer so that end play is within specifications.



1. Measure dimensions "O" and "P" and then calculate dimension "N".



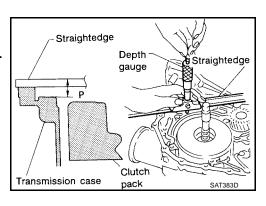
a. Place thrust washer on reverse clutch drum.



- b. Measure dimension "O".
- c. Measure dimension "P".
- d. Calculate dimension "N".

"N": Distance between oil pump fitting surface of transmission case and thrust washer on reverse clutch drum

$$N = O - P$$



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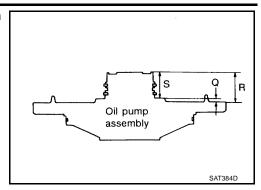
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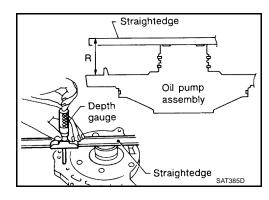
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Measure dimensions "R" and "S" and then calculate dimension "Q".



a. Measure dimension "R".



- b. Measure dimension "S".
- c. Calculate dimension "Q".

"Q": Distance between transmission case fitting surface and thrust washer mating surface

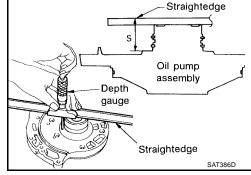
$$Q = R - S$$

3. Adjust reverse clutch end play "T4".

$$T4 = N - Q$$

Reverse clutch end : 0.65 - 1.00 mm (0.0256 - 0.0394

play in)



• Select proper thickness of thrust washer so that reverse clutch end play is within specifications.

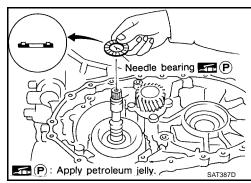
Thrust washer : Refer to AT-393,

"THRUST WASHERS FOR ADJUSTING REVERSE CLUTCH END PLAY"

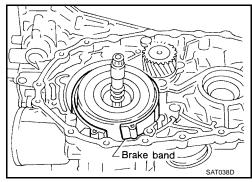
Assembly (3)

ECS0061B

- 1. Remove reverse clutch assembly and install needle bearing on high clutch assembly.
 - Pay attention to direction of needle bearing.
- 2. Install reverse clutch assembly.



- 3. Install anchor end pin and lock nut on transmission case.
- Place brake band on outside of reverse clutch drum. Tighten anchor end pin just enough so that brake band is evenly fitted on reverse clutch drum.



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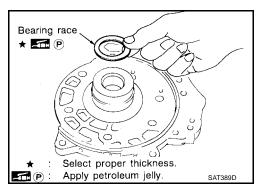
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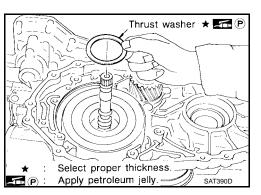
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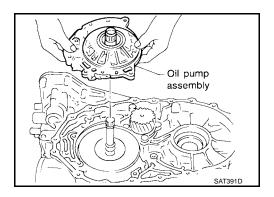
- 5. Place bearing race selected in total end play adjustment step on oil pump cover.
 - Apply petroleum jelly to bearing race.



- 6. Place thrust washer selected in reverse clutch end play step on reverse clutch drum.
 - Apply petroleum jelly to thrust washer.

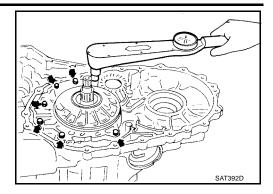


7. Install oil pump assembly on transmission case.

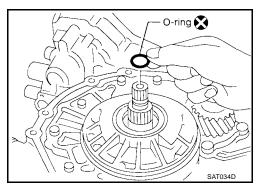


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8. Tighten oil pump fixing bolts to specified torque.

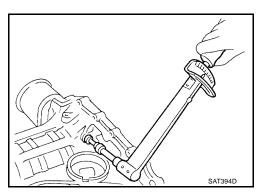


- 9. Install O-ring to input shaft.
 - Apply ATF to O-ring.

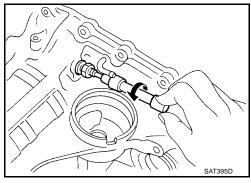


- 10. Adjust brake band.
- a. Tighten anchor end pin to specified torque.

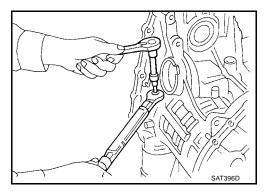
Anchor end : 3.9 - 5.9 N·m (0.4 - 0.6 kg-m, 35 - 52 inpin lb)



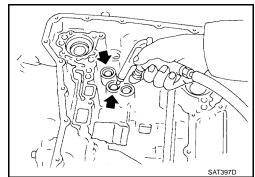
b. Back off anchor end pin two and a half turns.



c. While holding anchor end pin, tighten lock nut.



11. Apply compressed air to oil holes of transmission case and check operation of brake band.



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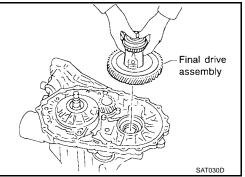
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Assembly (4)

1. Install final drive assembly on transmission case.



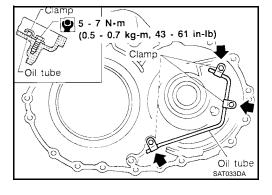
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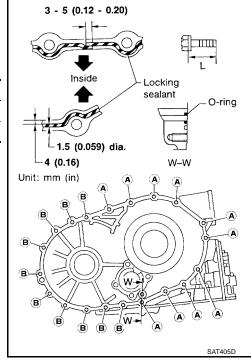
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2. Install oil tube on converter housing.

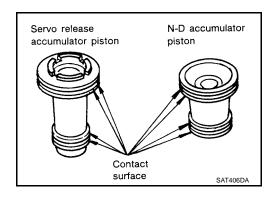


- 3. Install O-ring on differential oil port of transmission case.
- 4. Install converter housing on transmission case.
 - Apply locking sealant to mating surface of converter housing.

Bolt	Length mm (in)		
Α	32.8 (1.291)		
В	40 (1.57)		

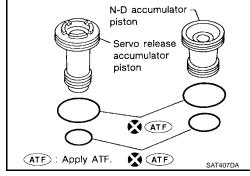


- 5. Install accumulator piston.
- a. Check contact surface of accumulator piston for damage.



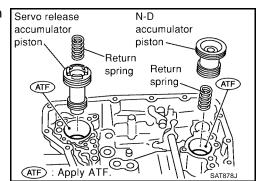
- b. Install O-rings on accumulator piston.
 - Apply ATF to O-rings.

Accumulator piston O: Refer to <u>AT-393, "Orings RING"</u>.

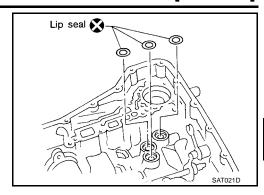


- Install accumulator pistons and return springs on transmission case.
 - Apply ATF to inner surface of transmission case.

Return springs : Refer to <u>AT-393,</u> "<u>RETURN SPRING</u>".



6. Install lip seals for band servo oil holes on transmission case.



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Snap ring removers
Oil filter
SAT022D

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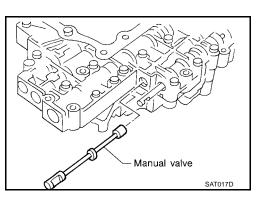
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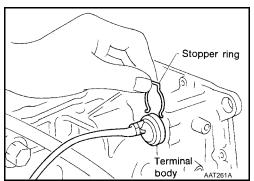
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- Apply petroleum jelly to lip seals.
- 7. Install control valve assembly.
- a. Insert manual valve into control valve assembly.
 - Apply ATF to manual valve.



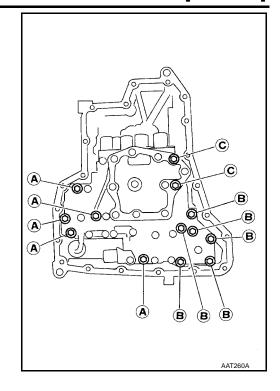
- b. Pass solenoid harness through transmission case and install terminal body on transmission case by pushing it.
- c. Install stopper ring to terminal body.



d. Tighten bolts A , B and C .



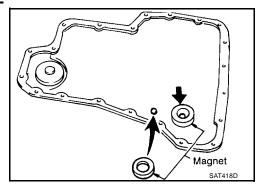
: 7 - 9 N·m (0.7 - 0.9 kg-m, 61 - 78 in-lb)



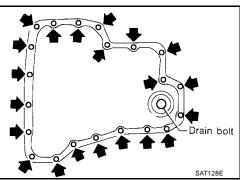
Bolt length, number and location

Bolt symbol	Α	В	С
Bolt length "I"	40.0 mm (1.575 in)	33.0 mm (1.299 in)	43.5 mm (1.713 in)
Number of bolts	5	6	2

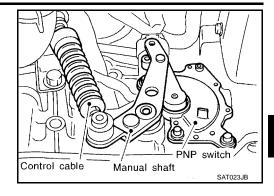
- 8. Install oil pan.
- a. Attach magnet to oil pan.



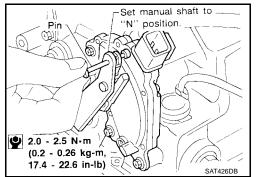
- b. Install new oil pan gasket on transmission case.
- c. Install oil pan on transmission case.
 - Always replace oil pan bolts as they are self-sealing bolts.
 - Tighten the bolts in a criss-cross pattern to prevent dislocation of gasket.
- d. Tighten drain plug to specified torque.



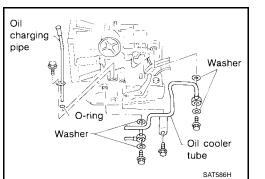
- 9. Install PNP switch.
- a. Set manual shaft in "P" position.
- b. Temporarily install PNP switch on manual shaft.
- c. Move selector lever to "N" position.



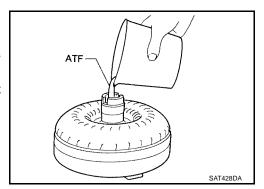
- d. Use a 4 mm (0.157 in) pin for this adjustment.
 - 1. Insert the pin straight into the manual shaft adjustment hole.
 - 2. Rotate PNP switch until the pin can also be inserted straight into hole in PNP switch.
- e. Tighten PNP switch fixing bolts.
- f. Remove pin from adjustment hole after adjusting PNP switch.



10. Install oil charging pipe and oil cooler tube to transmission case.



- 11. Install torque converter.
- a. Pour ATF into torque converter.
 - Approximately 1 liter (1-1/8 US qt, 7/8 lmp qt) of fluid is required for a new torque converter.
 - When reusing old torque converter, add the same amount of fluid as was drained.



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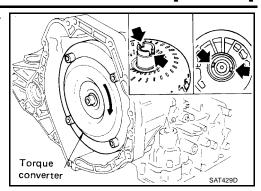
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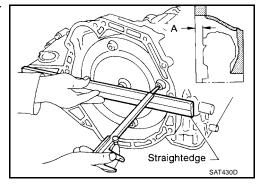
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b. Install torque converter while aligning notches of torque converter with notches of oil pump.



 Measure distance "A" to check that torque converter is in proper position.

Distance "A" : 21.1 mm (0.831 in)



[RE4F03B]

SERVICE DATA AND SPECIFICATIONS (SDS)

Constant Considerations

PFP:00030

ECS0061D

General Specifications

Automatic transaxle model		QG18DE
		RE4F03B
Automatic transaxle assembly Model code number		3AX60
	1st	2.861
-	2nd	1.562
	3rd	1.000
Transaxle gear ratio	4th	0.698
	Reverse	2.230
Final drive		3.827
Recommended fluid		Nissan Matic "D" (Continental U.S. and Alaska) or Genuine Nissan Automatic Transmission Fluid (Canada)*1
Fluid capacity		7.0l (7-3/8 US qt, 6-1/8 lmp qt)

^{*1:} Refer to MA-13, "Fluids and Lubricants" .

Shift Schedule VEHICLE SPEED WHEN SHIFTING GEARS

QG18DE (Calif. CA Model)

Throttle position	Shift pat-		Vehicle speed km/h (MPH)					
Throttle position	tern	D1 → D2	D2 → D3	D3 → D4	D4 → D3	D3 → D2	$D2 \rightarrow D1$	12 → 11
Full throttle	Comfort	54 - 62 (34 - 39)	103 - 111 (64 - 69)	163 - 171 (101 - 106)	159 - 167 (99 - 104)	93 - 101 (58 - 63)	41 - 49 (25 - 30)	54 - 62 (34 - 39)
Half throttle	Comfort	32 - 40 (20 - 25)	60 - 68 (37 - 42)	124 - 132 (77 - 82)	70 - 78 (43 - 48)	35 - 43 (22 - 27)	25 - 33 (16 - 21)	54 - 62 (34 - 39)

QG18DE (Except Calif. CA Model)

Throttle position	Shift pat-		Vehicle speed km/h (MPH)					
tern		D1 → D2	D2 → D3	D3 → D4	$D4 \rightarrow D3$	D3 → D2	$D2 \rightarrow D1$	12 → 11
Full throttle	Comfort	52 - 60 (32 - 37)	100 - 108 (62 - 67)	158 - 166 (98 - 103)	154 - 162 (96 - 101)	70 - 98 (56 - 61)	41 - 49 (25 - 30)	52 - 60 (32 - 37)
Half throttle	Comfort	31 - 39 (19 - 24)	58 - 66 (36 - 41)	119 - 127 (74 - 79)	68 - 76 (42 - 47)	34 - 42 (21 - 26)	24 - 32 (15 - 20)	52 - 60 (32 - 37)

VEHICLE SPEED WHEN PERFORMING LOCK-UP QG18DE (Calif. CA Model)

Throttle opening	OD switch	Shift pattern	Vehicle speed km/h (MPH)		
Throttle opening	Throttle opening OD switch Chill pattern		Lock-up ON	Lock-up OFF	
2/8	ON (D4)	Comfort	97 - 105 (60 - 65)	63 - 71 (39 - 44)	
	OFF (D ₃)	Comfort	86 - 94 (53 - 58)	83 - 91 (52 - 57)	

QG18DE (Except Calif. CA Model)

Throttle opening	OD switch	Shift pattern	Vehicle speed km/h (MPH)		
	OD SWITCH	Onlin pattern	Lock-up ON	Lock-up OFF	
2/8	ON (D4)	Comfort	94 - 102 (58 - 63)	61 - 69 (38 - 43)	
	OFF (D ₃)	Comfort	86 - 94 (53 - 58)	83 - 91 (52 - 57)	

Stall Revolution ECS0061F

Engine model	Stall revolution rpm	
QG18DE	2,350 - 2,800	

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[RE4F03B]

Line Pressure				ECS0061G
Engine speed		Line pressure k	:Pa (kg/cm² , psi)	
rpm	R position	D position	2 position	1 position
Idle	778 (7.9, 113)	500 (5.1, 73)	500 (5.1, 73)	500 (5.1, 73)

1,167 (11.9, 169)

1,167 (11.9, 169)

Control Valves CONTROL VALVE AND PLUG RETURN SPRINGS

1,816 (18.5, 263)

Stall

ECS0061H

Unit: mm (in)

1,167 (11.9, 169)

					Unit: mm (i
	No	Parts	Part No.*	Free length	Outer diameter
	35	3-2 timing valve spring	31736-01X00	23.29 (0.917)	6.65 (0.2618)
	19	Cooler check valve spring	31742-3AX05	28.04 (1.1039)	7.15 (0.2815)
Upper body	23	Pilot valve spring	31742-3AX03	38.98 (1.5346)	8.9 (0.350)
Refer to	15	1-2 accumulator valve spring	31742-3AX00	20.5 (0.807)	6.95 (0.2736)
<u>AT-307.</u> "CON-	28	1-2 accumulator piston spring	31742-3AX09	55.66 (2.1913)	19.5 (0.7677)
TROL	33	1st reducing valve spring	31742-80X05	27.0 (1.063)	7.0 (0.276)
<u>VALVE</u> <u>UPPER</u>	2	Overrun clutch reducing valve spring	31742-80X06	37.5 (1.476)	7.0 (0.276)
BODY"	7	Torque converter relief valve spring	31742-3AX04	33.3 (1.3110)	9.0 (0.354)
	10	Torque converter clutch control valve spring	31742-3AX02	53.01 (2.0870)	6.5 (0.256)
	34	Shuttle control valve spring	31762-41X04	51.0 (2.0079)	5.65 (0.2224)
	18	Pressure regulator valve spring	31742-80X13	45.0 (1.772)	15.0 (0.591)
Lower body	23	Overrun clutch control valve spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
Refer to	27	Accumulator control valve spring	31742-80X02	22.0 (0.866)	6.5 (0.256)
AT-311,	29	Shift valve A spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
<u>"CON-</u> TROL	2	Shift valve B spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
<u>VALVE</u>	11	Pressure modifier valve spring	31742-41X15	30.5 (1.201)	9.8 (0.386)
LOWER BODY".	7	Pressure modifier valve spring	31742-80X16	32.0 (1.260)	6.9 (0.272)
		Oil cooler relief valve spring	31872-31X00	17.02 (0.6701)	8.0 (0.315)
	_	T/C pressure spring	31742-3AX11	9.0 (0.354)	7.3 (0.287)

^{*:} Always check with the Parts Department for the latest parts information.

Clutch, Brake and Brake Band REVERSE CLUTCH

ECS00611

Number of drive plates		2	
Number of driven plates		2	
Drive plate thickness mm (in)	Standard	2.0 (0.07	79)
brive plate thickness thiri (iii)	Allowable limit	1.8 (0.07	71)
Clearance mm (in)	Standard	0.5 - 0.8 (0.020	0 - 0.031)
Clearance min (iii)	Allowable limit	1.2 (0.04	47)
		Thickness mm (in) Part number*	
Thickness of retaining plates		4.4 (0.173) 31537-31X00 4.6 (0.181) 31537-31X01	
		4.8 (0.189) 31537-31X02 5.0 (0.197) 31537-31X03 5.2 (0.205) 31537-31X04	

^{*:} Always check with the Parts Department for the latest parts information.

[RE4F03B]

Number of drive plates		3	
Number of driven plates		5	
Dais a milata this in a same (in)	Standard	2.0 (0.0	079)
Drive plate thickness mm (in)	Allowable limit	1.8 (0.0	071)
Clasrones mm (in)	Standard	1.4 - 1.8 (0.05	55 - 0.071)
Clearance mm (in)	Allowable limit	2.4 (0.0	094)
		Thickness mm (in)	Part number*
Thickness of retaining plates		4.8 (0.189) 5.0 (0.197) 5.2 (0.205) 5.4 (0.213) 5.6 (0.220) 5.8 (0.228) 6.0 (0.236)	31537-32X05 31537-32X06 31537-32X07 31537-32X08 31537-32X09 31537-32X10 31537-32X11
Always check with the Parts D	epartment for the latest parts i	information.	
ORWARD CLUTCH			
Number of drive plates		5	
Number of driven plates	Oten dend	5	274)
Drive plate thickness mm (in)	Standard	1.8 (0.0	· · · · · · · · · · · · · · · · · · ·
	Allowable limit Standard	0.45 - 0.85 (0.0	,
Clearance mm (in)	Allowable limit	,	·
	Allowable liffiit	1.85 (0.0	Part number*
Thickness of retaining plate		3.6 (0.142) 3.8 (0.150) 4.0 (0.157) 4.2 (0.165) 4.4 (0.173) 4.6 (0.181)	31537-31X60 31537-31X61 31537-31X62 31537-31X63 31537-31X64 31537-31X65
Always check with the Parts D	epartment for the latest parts i		
VERRUN CLUTCH			
Number of drive plates		3	
Number of driven plates		4	
	Standard	1.6 (0.0	063)
Orivo ploto thioks and man (in)	<u> </u>		755)
Drive plate thickness mm (in)	Allowable limit	1.4 (0.0	000)
	Allowable limit Standard	1.4 (0.0 1.0 - 1.4 (0.0	,
Drive plate thickness mm (in) Clearance mm (in)		,	39 - 0.055)
	Standard	1.0 - 1.4 (0.03	39 - 0.055)
	Standard	1.0 - 1.4 (0.03 2.0 (0.0	39 - 0.055) 079)
Clearance mm (in)	Standard Allowable limit	1.0 - 1.4 (0.03 2.0 (0.0 Thickness mm (in) 3.6 (0.142) 3.8 (0.150) 4.0 (0.157) 4.2 (0.165) 4.4 (0.173)	99 - 0.055) Part number* 31567-31X79 31567-31X80 31567-31X81 31567-31X82
Clearance mm (in) Thickness of retaining plate	Standard Allowable limit epartment for the latest parts in	1.0 - 1.4 (0.03 2.0 (0.0 Thickness mm (in) 3.6 (0.142) 3.8 (0.150) 4.0 (0.157) 4.2 (0.165) 4.4 (0.173)	39 - 0.055) Part number* 31567-31X79 31567-31X80 31567-31X81 31567-31X82
Clearance mm (in) Thickness of retaining plate Always check with the Parts D	Standard Allowable limit epartment for the latest parts in	1.0 - 1.4 (0.03 2.0 (0.0 Thickness mm (in) 3.6 (0.142) 3.8 (0.150) 4.0 (0.157) 4.2 (0.165) 4.4 (0.173)	99 - 0.055) Part number* 31567-31X79 31567-31X80 31567-31X81 31567-31X82

Drive plate thickness mm (in)	Standard	2.0 (0.	079)
Drive plate thickness mm (in)	Allowable limit	1.8 (0.	071)
Clearence man (in)	Standard	1.4 - 1.8 (0.0	55 - 0.071)
Clearance mm (in)	Allowable limit	2.8 (0.	110)
		Thickness mm (in)	Part number*
		3.6 (0.142)	31667-31X16
		3.8 (0.150)	31667-31X17
Thickness of retaining plate		4.0 (0.157)	31667-31X18
		4.2 (0.165)	31667-31X19
		4.4 (0.173)	31667-31X20
		4.6 (0.181)	31667-31X21

^{*:} Always check with the Parts Department for the latest parts information.

BRAKE BAND

Anchor end pin tightening torque	3.5 - 5.9 N-m (0.35 - 0.6 kg-m, 31 - 52 in-lb)
Number of returning revolutions for anchor end pin	2.5±0.125
Lock nut tightening torque	31 - 36 N-m (3.2 - 3.7 kg-m, 23 - 27 ft-lb)

Clutch and Brake Return Springs

ECS0061J

Unit: mm (in)

Parts		Free length	Outer diameter	Part number*
Forward alutab (Overrup alutab)	Outer (16 pcs)	26.6 (1.047)	10.6 (0.417)	31505-31X02
Forward clutch (Overrun clutch)	Inner (16 pcs)	26.3 (1.035)	7.7 (0.303)	31505-31X03
Reverse clutch (16 pcs)		18.6 (0.732)	8.0 (0.315)	31505-31X00
High clutch (12 pcs)		19.7 (0.776)	11.1 (0.437)	31505-31X01
Low reverse brake (20 pcs)		25.1 (0.988)	7.6 (0.299)	31505-31X04

^{*:} Always check with the Parts Department for the latest parts information.

Oil Pump

Oil pump side clearance mm (in)		0.02 - 0.04 (0.000)	8 - 0.0016)
		Inner gea	ar
		Thickness mm (in)	Part number*
This land of the second of the		9.99 - 10.00 (0.3933 - 0.3937) 9.98 - 9.99 (0.3929 - 0.3933) 9.97 - 9.98 (0.3925 - 0.3929)	31346-31X00 31346-31X01 31346-31X02
Thickness of inner gears and ou	ter gears	Outer gea	ar
		Thickness mm (in)	Part number*
		9.99 - 10.00 (0.3933 - 0.3937) 9.98 - 9.99 (0.3929 - 0.3933) 9.97 - 9.98 (0.3925 - 0.3929)	31347-31X00 31347-31X01 31347-31X02
Clearance between oil pump	Standard	0.08 - 0.15 (0.003	1 - 0.0059)
housing and outer gear mm (in)	Allowable limit	0.15 (0.00	59)
Oil pump cover seal ring clear-	Standard	0.1 - 0.25 (0.0039	- 0.0098)
ance mm (in)	Allowable limit	0.25 (0.009	98)

^{*:} Always check with the Parts Department for the latest parts information.

Input Shaft

ECS0061L

Unit: mm (in)

Input shaft seal ring clearance	Standard	0.08 - 0.23 (0.0031 - 0.0091)
Input shart scarning clearance	Allowable limit	0.23 (0.0091)

[RE4F03B]

Planetary Carrier		Ecs Unit: mm	ร _ั (in)
Clearance between planetary carrier and	Standard	0.15 - 0.70 (0.0059 - 0.0276)	
pinion washer	Allowable limit	0.80 (0.0315)	
Final Drive DIFFERENTIAL SIDE GEAR CL	.EARANCE	EC	S0061N
Clearance between side gear and differenti	al case with washer	0.1 - 0.2 mm (0.004 - 0.008 in)	
DIFFERENTIAL SIDE GEAR TH	RUST WASHERS		
Thickness mm (in)		Part number*	
0.75 - 0.80 (0.0295 - 0.03	315)	38424-D2111	
0.80 - 0.85 (0.0315 - 0.03	,	38424-D2112	
0.85 - 0.90 (0.0335 - 0.03	354)	38424-D2113	
0.90 - 0.95 (0.0354 - 0.03	,	38424-D2114	
0.95 - 1.00 (0.0374 - 0.03	394)	38424-D2115	
*: Always check with the Parts Department for	or the latest parts information	1.	
BEARING PRELOAD			
BEARING PRELOAD Differential side bearing preload "T"		0.04 - 0.09 mm (0.0016 - 0.0035 in)	
		0.04 - 0.09 mm (0.0016 - 0.0035 in)	
Differential side bearing preload "T"		0.04 - 0.09 mm (0.0016 - 0.0035 in) 0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb)	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb)	
Differential side bearing preload "T" TURNING TORQUE	S ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb)	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb)	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) S Part number*	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157)	S ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157) 0.44 (0.0173)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07 31499-21X08	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157) 0.44 (0.0173) 0.48 (0.0189)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07 31499-21X08 31499-21X09	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157) 0.44 (0.0173) 0.48 (0.0189) 0.52 (0.0205)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07 31499-21X08 31499-21X09 31499-21X10	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157) 0.44 (0.0173) 0.48 (0.0189) 0.52 (0.0205) 0.56 (0.0220)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07 31499-21X08 31499-21X09 31499-21X10 31499-21X11	_
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157) 0.44 (0.0173) 0.48 (0.0189) 0.52 (0.0205) 0.56 (0.0220) 0.60 (0.0236)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07 31499-21X08 31499-21X09 31499-21X10 31499-21X11 31499-21X11	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157) 0.44 (0.0173) 0.48 (0.0189) 0.52 (0.0205) 0.56 (0.0220) 0.60 (0.0236) 0.64 (0.0252)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07 31499-21X08 31499-21X09 31499-21X10 31499-21X11 31499-21X12 31499-21X12	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157) 0.44 (0.0173) 0.48 (0.0189) 0.52 (0.0205) 0.56 (0.0220) 0.60 (0.0236) 0.64 (0.0252) 0.68 (0.0268)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07 31499-21X08 31499-21X09 31499-21X10 31499-21X11 31499-21X12 31499-21X12 31499-21X13 31499-21X14	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157) 0.44 (0.0173) 0.48 (0.0189) 0.52 (0.0205) 0.56 (0.0220) 0.60 (0.0236) 0.64 (0.0252) 0.68 (0.0268) 0.72 (0.0283)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07 31499-21X08 31499-21X09 31499-21X10 31499-21X10 31499-21X11 31499-21X12 31499-21X12 31499-21X13 31499-21X14 31499-21X15	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157) 0.44 (0.0173) 0.48 (0.0189) 0.52 (0.0205) 0.56 (0.0220) 0.60 (0.0236) 0.64 (0.0252) 0.68 (0.0268) 0.72 (0.0283) 0.76 (0.0299)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07 31499-21X08 31499-21X09 31499-21X10 31499-21X10 31499-21X11 31499-21X12 31499-21X13 31499-21X14 31499-21X15 31499-21X15 31499-21X16	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157) 0.44 (0.0173) 0.48 (0.0189) 0.52 (0.0205) 0.56 (0.0220) 0.60 (0.0236) 0.64 (0.0252) 0.68 (0.0268) 0.72 (0.0283) 0.76 (0.0299) 0.80 (0.0315)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07 31499-21X08 31499-21X09 31499-21X10 31499-21X10 31499-21X11 31499-21X12 31499-21X13 31499-21X15 31499-21X15 31499-21X16 31499-21X17	
Differential side bearing preload "T" TURNING TORQUE Turning torque of final drive assembly DIFFERENTIAL SIDE BEARING Thickness mm (in) 0.40 (0.0157) 0.44 (0.0173) 0.48 (0.0189) 0.52 (0.0205) 0.56 (0.0220) 0.60 (0.0236) 0.64 (0.0252) 0.68 (0.0268) 0.72 (0.0283) 0.76 (0.0299) 0.80 (0.0315) 0.84 (0.0331)	ADJUSTING SHIMS	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb) Part number* 31499-21X07 31499-21X08 31499-21X09 31499-21X10 31499-21X11 31499-21X12 31499-21X12 31499-21X15 31499-21X15 31499-21X16 31499-21X17 31499-21X17	

[RE4F03B]

TABLE FOR SELECTING DIFFERENTIAL SIDE BEARING ADJUSTING SHIMS

Unit: mm (in)

Dial indicator deflection	Suitable shim(s)
0.31 - 0.35 (0.0122 - 0.0138)	0.40 (0.0157)
0.35 - 0.39 (0.0138 - 0.0154)	0.44 (0.0173)
0.39 - 0.43 (0.0154 - 0.0169)	0.48 (0.0189)
0.43 - 0.47 (0.0169 - 0.0185)	0.52 (0.0205)
0.47 - 0.51 (0.0185 - 0.0201)	0.56 (0.0220)
0.51 - 0.55 (0.0201 - 0.0217)	0.60 (0.0236)
0.55 - 0.59 (0.0217 - 0.0232)	0.64 (0.0252)
0.59 - 0.63 (0.0232 - 0.0248)	0.68 (0.0268)
0.63 - 0.67 (0.0248 - 0.0264)	0.72 (0.0283)
0.67 - 0.71 (0.0264 - 0.0280)	0.76 (0.0299)
0.71 - 0.75 (0.0280 - 0.0295)	0.80 (0.0315)
0.75 - 0.79 (0.0295 - 0.0311)	0.84 (0.0331)
0.79 - 0.83 (0.0311 - 0.0327)	0.88 (0.0346)
0.83 - 0.87 (0.0327 - 0.0343)	0.92 (0.0362)
0.87 - 0.91 (0.0343 - 0.0358)	0.48 (0.0189) + 0.48 (0.0189)
0.91 - 0.95 (0.0358 - 0.0374)	0.48 (0.0189) + 0.52 (0.0205)
0.95 - 0.99 (0.0374 - 0.0390)	0.52 (0.0205) + 0.52 (0.0205)
0.99 - 1.03 (0.0390 - 0.0406)	0.52 (0.0205) + 0.56 (0.0220)
1.03 - 1.07 (0.0406 - 0.0421)	0.56(0.0220) + 0.56(0.0220)
1.07 - 1.11 (0.0421 - 0.0437)	0.56 (0.0220) + 0.60 (0.0236)
1.11 - 1.15 (0.0437 - 0.0453)	0.60 (0.0236) + 0.60 (0.0236)
1.15 - 1.19 (0.0453 - 0.0469)	0.60 (0.0236) + 0.64 (0.0252)
1.19 - 1.23 (0.0469 - 0.0484)	0.64 (0.0252) + 0.64 (0.0252)
1.23 - 1.27 (0.0484 - 0.0500)	0.64 (0.0252) + 0.68 (0.0268)
1.27 - 1.31 (0.0500 - 0.0516)	0.68 (0.0268) + 0.68 (0.0268)
1.31 - 1.35 (0.0516 - 0.0531)	0.68 (0.0268) + 0.72 (0.0283)
1.35 - 1.39 (0.0531 - 0.0547)	1.44 (0.0567)
1.39 - 1.43 (0.0547 - 0.0563)	0.72 (0.0283) + 0.76 (0.0299)
1.43 - 1.47 (0.0563 - 0.0579)	0.76 (0.0299) + 0.76 (0.0299)
1.47 - 1.51 (0.0579 - 0.0594)	0.76 (0.0299) + 0.80 (0.0315)
1.51 - 1.55 (0.0594 - 0.0610)	0.80 (0.0315) + 0.80 (0.0315)
1.55 - 1.59 (0.0610 - 0.0626)	0.80 (0.0315) + 0.84 (0.0331)
1.59 - 1.63 (0.0626 - 0.0642)	0.84(0.0331) + 0.84(0.0331)
1.63 - 1.67 (0.0642 - 0.0657)	0.84 (0.0331) + 0.88 (0.0346)
1.67 - 1.71 (0.0657 - 0.0673)	0.88 (0.0346) + 0.88 (0.0346)
1.71 - 1.75 (0.0673 - 0.0689)	0.88 (0.0346) + 0.92 (0.0362)
1.75 - 1.79 (0.0689 - 0.0705)	0.92(0.0362) + 0.92(0.0362)
1.79 - 1.83 (0.0705 - 0.0720)	0.92 (0.0362) + 0.96 (0.0378)
1.83 - 1.87 (0.0720 - 0.0736)	0.96 (0.0378) + 0.96 (0.0378)
1.87 - 1.91 (0.0736 - 0.0752)	0.52 (0.0205) + 1.44 (0.0567)
,	0.56 (0.0220) + 1.44 (0.0567)

Reduction pinion gear bearing preload	0.05 mm (0.0020 in)
TURNING TORQUE	
Turning torque of reduction pinion gear	0.1 - 0.69 N-m (1.1 - 7.0 kg-cm, 0.95 - 6.08 in-lb)

[RE4F03B]

A	Part number*	Thickness mm (in)
	31438-31X16	1.74 (0.0685)
	31438-31X17	1.78 (0.0701)
В	31438-31X18	1.82 (0.0717)
	31438-31X19	1.86 (0.0732)
	31438-31X20	1.90 (0.0748)
Λ.Τ.	31439-31X60	1.92 (0.0756)
AT	31438-31X21	1.94 (0.0764)
	31439-31X61	1.96 (0.0772)
	31438-31X22	1.98 (0.0780)
D	31439-31X62	2.00 (0.0787)
D	31438-31X23	2.02 (0.0795)
	31439-31X63	2.04 (0.0803)
	31438-31X24	2.06 (0.0811)
Е	31439-31X64	2.08 (0.0819)
	31438-31X60	2.10 (0.0827)
	31439-31X65	2.12 (0.0835)
	31438-31X61	2.14 (0.0843)
F	31439-31X66	2.16 (0.0850)
	31438-31X62	2.18 (0.0858)
	31439-31X67	2.20 (0.0866)
	31438-31X63	2.22 (0.0874)
G	31439-31X68	2.24 (0.0882)
	31438-31X64	2.26 (0.0890)
	31439-31X69	2.28 (0.0898)
Н	31438-31X65	2.30 (0.0906)
П	31438-31X66	2.34 (0.0921)
	31438-31X67	2.38 (0.0937)
	31438-31X68	2.42 (0.0953)
1	31438-31X69	2.46 (0.0969)
1	31438-31X70	2.50 (0.0984)
	31438-31X71	2.54 (0.1000)
	31438-31X72	2.58 (0.1016)
J	31438-31X73	2.62 (0.1031)
	31438-31X74	2.66 (0.1047)

^{*:} Always check with the Parts Department for the latest parts information.

[RE4F03B]

TABLE FOR SELECTING REDUCTION PINION GEAR BEARING ADJUSTING SHIM

Unit: mm (in)

	Onit: mm (ii
Dimension "T"	Suitable shim(s)
1.77 - 1.81 (0.0697 - 0.0713)	1.74 (0.0685)
1.81 - 1.85 (0.0713 - 0.0728)	1.78 (0.0701)
1.85 - 1.89 (0.0728 - 0.0744)	1.82 (0.0717)
1.89 - 1.93 (0.0744 - 0.0760)	1.86 (0.0732)
1.93 - 1.96 (0.0760 - 0.0772)	1.90 (0.0748)
1.96 - 1.98 (0.0772 - 0.0780)	1.92 (0.0756)
1.98 - 2.00 (0.0780 - 0.0787)	1.94 (0.0764)
2.00 - 2.02 (0.0787 - 0.0795)	1.96 (0.0772)
2.02 - 2.04 (0.0795 - 0.0803)	1.98 (0.0780)
2.04 - 2.06 (0.0803 - 0.0811)	2.00 (0.0787)
2.06 - 2.08 (0.0811 - 0.0819)	2.02 (0.0795)
2.08 - 2.10 (0.0819 - 0.0827)	2.04 (0.0803)
2.10 - 2.12 (0.0827 - 0.0835)	2.06 (0.0811)
2.12 - 2.14 (0.0835 - 0.0843)	2.08 (0.0819)
2.14 - 2.16 (0.0843 - 0.0850)	2.10 (0.0827)
2.16 - 2.18 (0.0850 - 0.0858)	2.12 (0.0835)
2.18 - 2.20 (0.0858 - 0.0866)	2.14 (0.0843)
2.20 - 2.22 (0.0866 - 0.0874)	2.16 (0.0850)
2.22 - 2.24 (0.0874 - 0.0888)	2.18 (0.0858)
2.24 - 2.26 (0.0882 - 0.0890)	2.20 (0.0866)
2.26 - 2.28 (0.0890 - 0.0898)	2.22 (0.0874)
2.28 - 2.30 (0.0898 - 0.0906)	2.24 (0.0882)
2.30 - 2.32 (0.0906 - 0.0913)	2.26 (0.0890)
2.32 - 2.34 (0.0913 - 0.0921)	2.28 (0.0898)
2.34 - 2.37 (0.0921 - 0.0933)	2.30 (0.0906)
2.37 - 2.41 (0.0933 - 0.0949)	2.34 (0.0921)
2.41 - 2.45 (0.0949 - 0.0965)	2.38 (0.0937)
2.45 - 2.49 (0.0965 - 0.0980)	2.42 (0.0953)
2.49 - 2.53 (0.0980 - 0.0996)	2.46 (0.0969)
2.53 - 2.57 (0.0996 - 0.1012)	2.50 (0.0984)
2.57 - 2.61 (0.1012 - 0.1028)	2.54 (0.1000)
2.61 - 2.65 (0.1028 - 0.1043)	2.58 (0.1016)
2.65 - 2.69 (0.1043 - 0.1059)	2.62 (0.1031)
2.69 - 2.73 (0.1059 - 0.1075)	2.66 (0.1047)

Output Shaft SEAL RING CLEARANCE

ECS0061P

Unit: mm (in)

Output shaft seel ring elegrance		0.10 - 0.25 (0.0039 - 0.0098)
Output shaft seal ring clearance Allowable limit		0.25 (0.0098)
END PLAY		
Output shaft end play 0 - 0.5 mm (0 - 0.020 in)		
OUTPUT SHAFT END PLAY ADJUSTING SHIMS		

Thickness mm (in)	Part number*
0.56 (0.0220)	31438-31X46
0.96 (0.0378)	31438-31X47
1.36 (0.0535)	31438-31X48

^{*:} Always check with the Parts Department for the latest parts information.

Bearing Retainer SEAL RING CLEARANCE

ECS0061Q

Unit: mm (in)

Bearing retainer seal ring clearance	Standard	0.10 - 0.25 (0.0039 - 0.0098)
	Allowable limit	0.25 (0.0098)

[RE4F03B]

otal end play "T3 "			0.25 - 0.55 mm (0.0098 - 0	0.0217 in)
BEARING RACE FOR	ADJUSTING TOTA	AL END PLAY		
Thickn	ess mm (in)		Part number*	
0.8 1.0 1.2 1.4 1.6	6 (0.024) 8 (0.031) 9 (0.039) 2 (0.047) 6 (0.055) 6 (0.063)		31435-31X01 31435-31X02 31435-31X03 31435-31X04 31435-31X05 31435-31X06	
	3 (0.071) 0 (0.079)		31435-31X07 31435-31X08	
*: Always check with the Parts I	,	parts information.	0110001700	
•				
Reverse Clutch En	u Flay			ECS0061
Reverse clutch end play "T4"			0.65 - 1.00 mm (0.0256 - 0	0.0394 in)
THRUST WASHERS F	OR ADJUSTING R	EVERSE CLUTC	H END PLAY	
	OR ADJUSTING R	REVERSE CLUTC	Part number*	
Thickn 0.65 0.80 0.95 1.10 1.25		EVERSE CLUTC		
Thickn 0.65 0.80 0.95 1.10 1.25 1.40	ess mm (in) 6 (0.0256) 9 (0.0315) 6 (0.0374) 9 (0.0433) 6 (0.0492) 9 (0.0551)		Part number* 31508-31X10 31508-31X11 31508-31X12 31508-31X13 31508-31X14	
Thickn 0.65 0.80 0.95 1.10 1.25	ess mm (in) 6 (0.0256) 9 (0.0315) 6 (0.0374) 9 (0.0433) 6 (0.0492) 9 (0.0551)		Part number* 31508-31X10 31508-31X11 31508-31X12 31508-31X13 31508-31X14	ECS0061
Thickn 0.65 0.80 0.95 1.10 1.25 1.40 *: Always check with the Parts I Accumulator O-RING	ess mm (in) 6 (0.0256) 9 (0.0315) 6 (0.0374) 9 (0.0433) 6 (0.0492) 9 (0.0551) Department for the latest p	parts information.	Part number* 31508-31X10 31508-31X11 31508-31X12 31508-31X13 31508-31X14 31508-31X15	Unit: mm (in
Thickn 0.65 0.80 0.95 1.10 1.25 1.40 *: Always check with the Parts I Accumulator O-RING Accumulator	Diameter (Small)	parts information. Part number*	Part number* 31508-31X10 31508-31X11 31508-31X12 31508-31X13 31508-31X14 31508-31X15	Unit: mm (in Part number*
Thickn 0.65 0.80 0.95 1.10 1.25 1.40 *: Always check with the Parts I Accumulator O-RING	ess mm (in) 6 (0.0256) 9 (0.0315) 6 (0.0374) 9 (0.0433) 6 (0.0492) 9 (0.0551) Department for the latest p	parts information.	Part number* 31508-31X10 31508-31X11 31508-31X12 31508-31X13 31508-31X14 31508-31X15	Unit: mm (in

RETURN SPRING

Unit: mm (in)

Accumulator	Free length	Outer diameter	Part number*
Servo release accumulator spring	52.5 (2.067)	20.1 (0.791)	31605-80X00
N-D accumulator spring	45.0 (1.772)	27.6 (1.087)	31605-33X01

^{*:} Always check with the Parts Department for the latest parts information.

Band Servo RETURN SPRING

ECS0061U

M

Unit: mm (in)

Return spring	Free length	Outer diameter	Part number*
2nd servo return spring	32.5 (1.280)	25.9 (1.020)	31605-31X20
OD servo return spring	38.52 (1.5165)	22.0 (0.866)	31605-31X21

^{*:} Always check with the Parts Department for the latest parts information.

Removal and Installation

ECS0061V

Unit: mm (in)

Distance between end of converter housing and torque converter 21.1 (0.831)

		, ,	[RE4F03B]
Shift Solenoid Valves			ECS0061V
Gear	Solenoid A	Sole	noid B
1st	ON	(ON
2nd	OFF	(ON
3rd	OFF	C	FF
4th	ON	C	FF
Solenoid Valve			ECS0061.
Solenoid valve	Resistance (Approx.)	Termina	al number
Shift solenoid A	20 - 30Ω	2	
Shift solenoid B	5 - 20Ω		1
Ovr. clutch sol.	20 - 30Ω	3	
Line pres. sol.	2.5 - 5Ω	4	
T/conv. clutch sol.	5 - 20Ω		5
A/T Fluid Temperature Sens	or	,	ECS0061
Monitor Item	Condition		fication prox.)
	Cold [20°C (68°F)]	1.5V	2.5 kΩ
A/T fluid temperature sensor	↓ Hot [80°C (176°F)]	↓ 0.5V	↓ 0.3 kΩ
Revolution Sensor			ECS0061.
Condition		Judgement standard	
When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function. *1			
CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item.		Approximately 150 Hz	
When vehicle not moving.		Under 1.3V or o	ver 4.5V
Dropping Resistor			ECS00620
		40. 450	

 $10 - 15\Omega$

Resistance

TROUBLE DIAGNOSIS - INDEX

[RE4F04B]

TROUBLE DIAGNOSIS - INDEX

PFP:00000

Alphabetical & P No. Index for DTC ALPHABETICAL INDEX FOR DTC

ECS00621

Α

В

D

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Н

ltama	DTC	
Items (CONSULT-II screen terms)	CONSULT-II GST*1	Reference page
A/T 1ST GR FNCTN	P0731	<u>AT-508</u>
A/T 2ND GR FNCTN	P0732	<u>AT-513</u>
A/T 3RD GR FNCTN	P0733	<u>AT-518</u>
A/T 4TH GR FNCTN	P0734	<u>AT-523</u>
A/T TCC S/V FNCTN	P0744	<u>AT-535</u>
ATF TEMP SEN/CIRC	P0710	<u>AT-493</u>
ENGINE SPEED SIG	P0725	<u>AT-504</u>
L/PRESS SOL/CIRC	P0745	<u>AT-543</u>
O/R CLTCH SOL/CIRC	P1760	<u>AT-564</u>
PNP SW/CIRC	P0705	<u>AT-487</u>
SFT SOL A/CIRC*2	P0750	<u>AT-549</u>
SFT SOL B/CIRC*2	P0755	<u>AT-554</u>
TCC SOLENOID/CIRC	P0740	<u>AT-530</u>
TP SEN/CIRC A/T*2	P1705	<u>AT-559</u>
VEH SPD SEN/CIR AT*3	P0720	<u>AT-499</u>
CAN COMM CIRCUIT	U1000	<u>AT-586</u>

^{*1:} These numbers are prescribed by SAE J2012.

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^{*2:} When the fail-safe operation occurs, the MIL illuminates.

^{*3:} The MIL illuminates when both the "Revolution sensor signal" and the "Vehicle speed sensor signal" meet the fail-safe condition at the same time.

TROUBLE DIAGNOSIS - INDEX

[RE4F04B]

P NO. INDEX FOR DTC

DTC	Items	
CONSULT-II GST*1	(CONSULT-II screen terms)	Reference page
P0705	PNP SW/CIRC	AT-487
P0710	ATF TEMP SEN/CIRC	<u>AT-493</u>
P0720	VEH SPD SEN/CIR AT*3	<u>AT-499</u>
P0725	ENGINE SPEED SIG	<u>AT-504</u>
P0731	A/T 1ST GR FNCTN	<u>AT-508</u>
P0732	A/T 2ND GR FNCTN	<u>AT-513</u>
P0733	A/T 3RD GR FNCTN	<u>AT-518</u>
P0734	A/T 4TH GR FNCTN	<u>AT-523</u>
P0740	TCC SOLENOID/CIRC	<u>AT-530</u>
P0744	A/T TCC S/V FNCTN	<u>AT-535</u>
P0745	L/PRESS SOL/CIRC	<u>AT-543</u>
P0750	SFT SOL A/CIRC*2	<u>AT-549</u>
P0755	SFT SOL B/CIRC*2	<u>AT-554</u>
P1705	TP SEN/CIRC A/T*2	<u>AT-559</u>
P1760	O/R CLTCH SOL/CIRC	<u>AT-564</u>
U1000	CAN COMM CIRCUIT	<u>AT-586</u>

^{*1:} These numbers are prescribed by SAE J2012.

^{*2:} When the fail-safe operation occurs, the MIL illuminates.

^{*3:} The MIL illuminates when both the "Revolution sensor signal" and the "Vehicle speed sensor signal" meet the fail-safe condition at the same time.

PRECAUTIONS

[RE4F04B]

PRECAUTIONS PFP:00001

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

CS00622

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

WARNING:

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

Precautions for On Board Diagnostic (OBD) System of A/T and Engine

CS0062

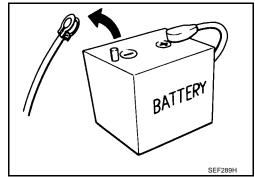
The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

CAUTION:

- Be sure to turn the ignition switch OFF and disconnect the negative battery terminal before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to light up.
- Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will
 cause the MIL to light up due to an open circuit. (Be sure the connector is free from water, grease,
 dirt, bent terminals, etc.)
- Be sure to route and secure the harnesses properly after work. Interference of the harness with a bracket, etc. may cause the MIL to light up due to a short circuit.
- Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube
 may cause the MIL to light up due to a malfunction of the EGR system or fuel injection system, etc.
- Be sure to erase the unnecessary malfunction information (repairs completed) from the TCM or ECM before returning the vehicle to the customer.

Precautions ECS00624

Before connecting or disconnecting the TCM harness connector, turn ignition switch OFF and disconnect negative battery terminal. Failure to do so may damage the TCM, because battery voltage is applied to TCM even if ignition switch is turned off.



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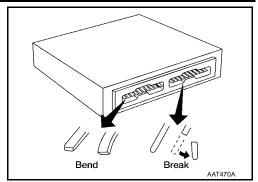
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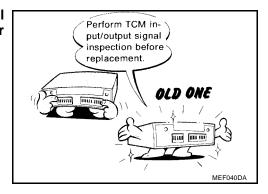
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 When connecting or disconnecting pin connectors into or from TCM, take care not to damage pin terminals (bend or break).

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



 Before replacing TCM, perform TCM input/output signal inspection and verify whether TCM functions properly or not. Refer to <u>AT-419</u>, "INPUT/OUTPUT SIGNAL OF TCM".



- After performing each TROUBLE DIAGNOSIS, perform "DTC (Diagnostic Trouble Code) CONFIRMATION PROCE-DURE".
 - The DTC should not be displayed in the "DTC CONFIRMATION PROCEDURE" if the repair is completed.
- Before proceeding with disassembly, thoroughly clean the outside of the transaxle. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Disassembly should be done in a clean work area.
- Use lint-free cloth or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transaxle.
- Place disassembled parts in order for easier and proper assembly.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the transaxle is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced.
 Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Do not use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- Replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer. Refer to AT-399, "ATF COOLER SERVICE".
- After overhaul, refill the transaxle with new ATF.
- When the A/T drain plug is removed, only some of the fluid is drained. Old A/T fluid will remain in torque converter and ATF cooling system.
 Always follow the procedures when changing A/T fluid. Refer to MA-31, "Changing A/T Fluid".



PRECAUTIONS

[RE4F04B]

Service Notice or Precautions **FAIL-SAFE**

The TCM has an electronic Fail-Safe (limp home mode). This allows the vehicle to be driven even if a major electrical input/output device circuit is damaged.

Under Fail-Safe, the vehicle always runs in third gear, even with a shift lever position of 1, 2 or D. The customer may complain of sluggish or poor acceleration.

When the ignition key is turned ON following Fail-Safe operation, O/D OFF indicator lamp blinks for about 8 seconds. [Or, refer to AT-439, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)"].

The blinking of the O/D OFF indicator lamp for about 8 seconds will appear only once and be cleared. The customer may resume normal driving conditions.

Always follow the "Work Flow". Refer to AT-447, "Work Flow".

The SELF-DIAGNOSIS results will be as follows:

- The first SELF-DIAGNOSIS will indicate damage to the vehicle speed sensor or the revolution sensor.
- During the next SELF-DIAGNOSIS, performed after checking the sensor, no damages will be indicated.

TORQUE CONVERTER SERVICE

The torque converter should be replaced under any of the following conditions:

- External leaks in the hub weld area.
- Converter hub is scored or damaged.
- Converter pilot is broken, damaged or fits poorly into crankshaft.
- Steel particles are found after flushing the cooler and cooler lines.
- Pump is damaged or steel particles are found in the converter.
- Vehicle has TCC shudder and/or no TCC apply. Replace only after all hydraulic and electrical diagnoses have been made. (Converter clutch material may be glazed.)
- Converter is contaminated with engine coolant containing antifreeze.
- Internal failure of stator roller clutch.
- Heavy clutch debris due to overheating (blue converter).
- Steel particles or clutch lining material found in fluid filter or on magnet when no internal parts in unit are worn or damaged — indicates that lining material came from converter. The torque converter should not be replaced if:
- The fluid has an odor, is discolored, and there is no evidence of metal or clutch facing particles.
- The threads in one or more of the converter bolt holes are damaged.
- Transaxle failure did not display evidence of damaged or worn internal parts, steel particles or clutch plate lining material in unit and inside the fluid filter.
- Vehicle has been exposed to high mileage (only). The exception may be where the torque converter clutch dampener plate lining has seen excess wear by vehicles operated in heavy and/or constant traffic. such as taxi, delivery or police use.

ATF COOLER SERVICE

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If A/T fluid contains frictional material (clutches, bands, etc.), replace radiator and flush cooler line using cleaning solvent and compressed air after repair of A/T. Refer to CO-32, "RADIATOR".

OBD-II SELF-DIAGNOSIS

- A/T self-diagnosis is performed by the TCM in combination with the ECM. The results can be read through the blinking pattern of the O/D OFF indicator or the malfunction indicator lamp (MIL). Refer to the table on AT-431 for the indicator used to display each self-diagnostic result.
- The self-diagnostic results indicated by the MIL are automatically stored in both the ECM and TCM memories.
 - Always perform the procedure "HOW TO ERASE DTC" on AT-428 to complete the repair and avoid unnecessary blinking of the MIL.
- The following self-diagnostic items can be detected using ECM self-diagnostic results mode* only when the O/D OFF indicator lamp does not indicate any malfunctions.
- park/neutral position (PNP) switch
 - *: For details of OBD-II, refer to EC-696, "ON BOARD DIAGNOSTIC (OBD) SYSTEM".
- Certain systems and components, especially those related to OBD, may use a new style slidelocking type harness connector.

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PRECAUTIONS

[RE4F04B]

For description and how to disconnect, refer to GI-23, "How to Check Terminal".

Wiring Diagrams and Trouble Diagnosis

ECS00626

When you read wiring diagrams, refer to the following:

- GI-13, "How to Read Wiring Diagrams"
- PG-3, "POWER SUPPLY ROUTING" for power distribution circuit

When you perform trouble diagnosis, refer to the following:

- GI-10, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"
- GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident"

PREPARATION

REPARATION		PFP:00002
pecial Service Tools		ECS00627
	may differ from those of special service too	
Tool number (Kent-Moore No.) Tool name		Description
KV381054S0	~~~	Removing differential side oil seals
(J-34286) Puller		 Removing differential side bearing outer race
	a NT414	 Removing idler gear bearing outer race a: 250 mm (9.84 in) b: 160 mm (6.30 in)
ST33400001 (J-26082)		Installing differential side oil seal F04B and F04W (RH side)
Orift		Installing oil seal on oil pump housing
	a b	a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.
J-34301-C)	NT086	Measuring line pressure
Dil pressure gauge set (J-34301-1) Dil pressure gauge 2 (J-34301-2)		
Hoses 8 (J-34298) Adapter I (J-34282-2) Adapter 5 (790-301-1230-A) 50° Adapter 6 (J-34301-15) Square socket	2 1 8 6 6 AAT896	
ST27180001		Removing idler gear
J-25726-A) Puller	b NT424	a: 100 mm (3.94 in) b: 110 mm (4.33 in) c: M8 x 1.25P
ST23540000		Removing and installing parking rod plate
J-25689-A) Pin punch	a	and manual plate pins a: 2.3 mm (0.091 in) dia. b: 4 mm (0.16 in) dia.
ST25710000	NT442	Aligning groove of manual shaft and hole of
J-25689-A) Pin punch	a	transmission case a: 2 mm (0.08 in) dia.
	NT410	

		[RE4F04B]
Tool number (Kent-Moore No.) Tool name		Description
KV32101000 (J-25689-A) Pin punch	a	 Removing and installing manual shaft retaining pin Removing and installing pinion mate shaft lock pin a: 4 mm (0.16 in) dia.
KV31102400 (J-34285 and J-34285-87) Clutch spring compressor	NT410	 Removing and installing clutch return springs Installing low and reverse brake piston a: 320 mm (12.60 in) b: 174 mm (6.85 in)
KV40100630 (J-26092) Drift	a b c c	 Installing reduction gear bearing inner race Installing idler gear bearing inner race a: 67.5 mm (2.657 in) dia. b: 44 mm (1.73 in) dia. c: 38.5 mm (1.516 in) dia.
ST30720000 (J-25405 and J-34331) Bearing installer	NT107	 Installing idler gear bearing outer race a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.
ST35321000 (—) Drift	NT115	 Installing output shaft bearing a: 49 mm (1.93 in) dia. b: 41 mm (1.61 in) dia.
 (J-34291-A) Shim setting gauge set	PARAFA PARAFA	 Selecting oil pump cover bearing race and oil pump thrust washer Selecting side gear thrust washer
ST33230000 (J25805-01) Drift	NT101	 Installing differential side bearing inner race (RH side) a: 51 mm (2.01 in) dia. b: 28.5 mm (1.122 in) dia.

PREPARATION

		[RE4F04B]
Tool number (Kent-Moore No.) Tool name		Description
(J-34290) Shim selecting tool set	NT080	Selecting differential side bearing adjusting shim
ST3306S001 (J-22888-D) Differential side bearing puller set 1 ST33051001 (J-22888-D) Puller 2 ST33061000 (J-8107-2) Adapter	AMT153	 Removing differential side bearing inner race a: 38 mm (1.50 in) dia. b: 28.5 mm (1.122 in) dia. c: 130 mm (5.12 in) d: 135 mm (5.31 in) e: 100 mm (3.94 in)
ST3127S000 (J-25765-A) Preload gauge 1 GG91030000 (J-25765-A) Torque wrench 2 HT62940000 (—) Socket adapter 3 HT62900000 (—) Socket adapter	1 2 3 NT124	Checking differential side bearing preload
ST35271000 J-26091) Drift	a b	Installing idler gear a: 72 mm (2.83 in) dia. b: 63 mm (2.48 in) dia.
 J-39713) Preload adapter	NT115	 Selecting differential side bearing adjusting shim Checking differential side bearing preload
 J-45816 E20 TORX socket	NT087	Removing flex plate bolts on vehicles equipped with QR25DE engines

PREPARATION

Tool name		Description
Puller		 Removing idler gear bearing inner race Removing and installing band servo piston snap ring
Puller	NT077	 Removing reduction gear bearing inner race a: 60 mm (2.36 in) dia. b: 35 mm (1.38 in) dia.
Drift	a	 Installing needle bearing on bearing retainer a: 36 mm (1.42 in) dia.
Drift	NT083	 Removing needle bearing from bearing retainer a: 33.5 mm (1.319 in) dia.
Drift	NT083	 Installing differential side bearing outer race (RH side) a: 75 mm (2.95 in) dia.

OVERALL SYSTEM A/T Electrical Parts Location

PFP:00000

ECS00629

В Accelerator pedal position (APP) sensor AT Overdrive control switch 000r/min O/D off indicator lamp Е Data link connector Brake pedal Front (Transmission control module) ASCD cancel switch Stop lamp switch Brake pedal 41 Revolution sensor harness connector Dropping resistor PNP switch

WCIA0131E

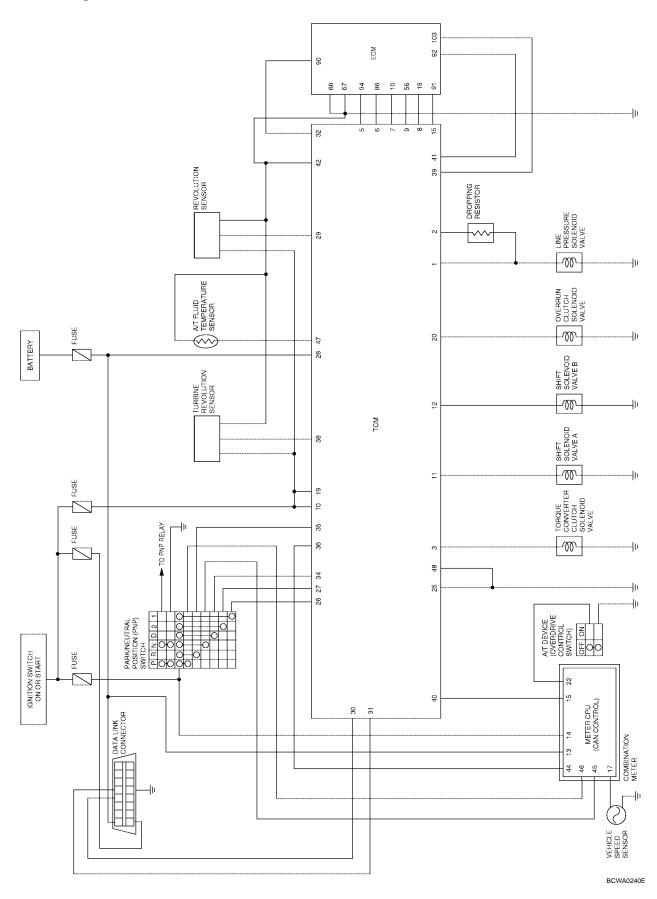
Revolution sensor

assembly

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Circuit Diagram



Cross-sectional View

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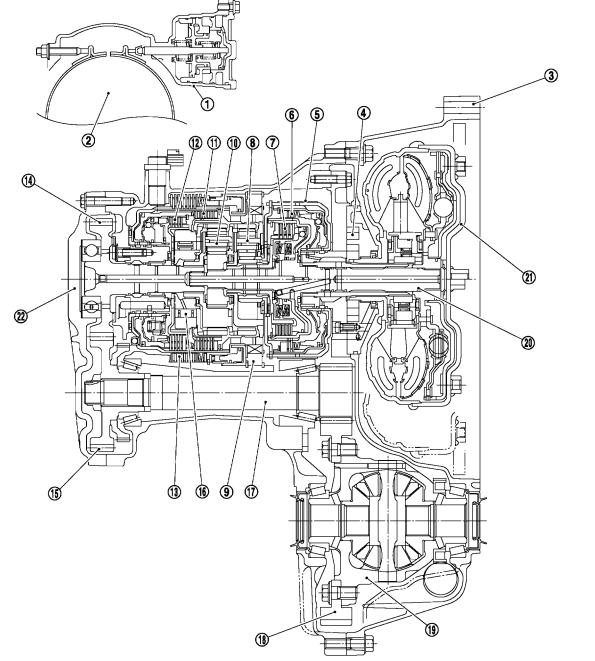
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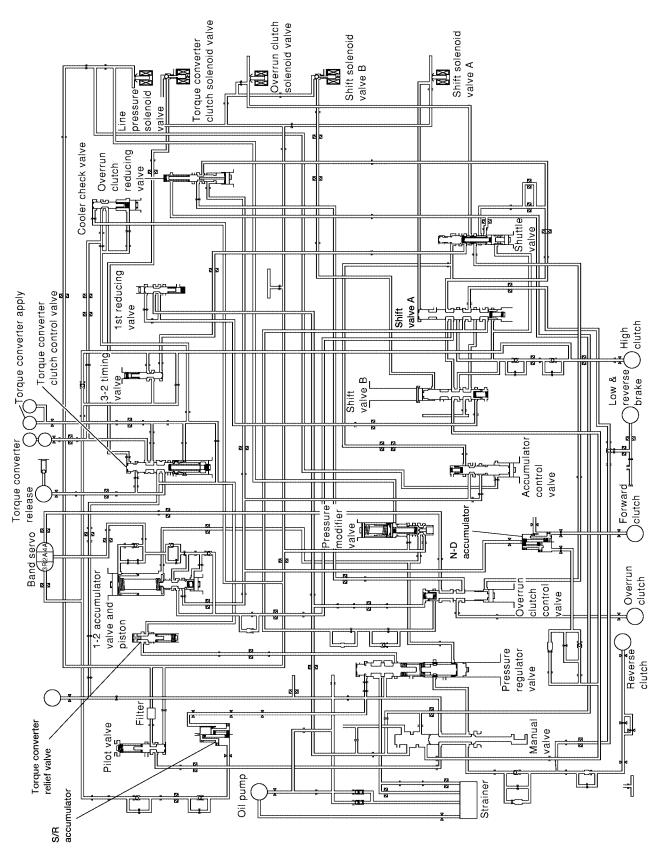
- 1. Band servo piston
- 4. Oil pump
- 7. High clutch
- 10. Rear planetary gear
- 13. Low & reverse brake
- 16. Forward one-way clutch
- 19. Differential case
- 22. Side cover

- 2. Reverse clutch drum
- 5. Brake band
- 8. Front planetary gear
- 11. Forward clutch
- 14. Output gear
- 17. Pinion reduction gear
- 20. Input shaft

- B. Converter housing
- 6. Reverse clutch
- 9. Low one-way clutch
- 12. Overrun clutch
- 15. Idler gear
- 18. Final gear
- 21. Torque converter

Hydraulic Control Circuit

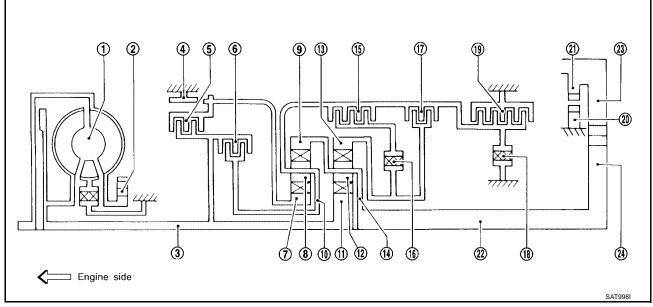
ECS0062C



LCIA0040E

Shift Mechanism CONSTRUCTION

ECS0062D



					2A1998I
1.	Torque converter	2.	Oil pump	3.	Input shaft
4.	Brake band	5.	Reverse clutch	6.	High clutch
7.	Front sun gear	8.	Front pinion gear	9.	Front internal gear
10	Front planetary carrier	11	Rear sun gear	12	Rear pinion gear
13	Rear internal gear	14	Rear planetary carrier	15	Forward clutch
16	Forward one-way clutch	17	Overrun clutch	18	Low one-way clutch
19	Low & reverse brake	20	Parking pawl	21	Parking gear
22	Output shaft	23	Idle gear	24	Output gear

FUNCTION OF CLUTCH AND BRAKE

Clutch and brake components	Abbr.	Function
Reverse clutch 5	R/C	To transmit input power to front sun gear 7.
High clutch 6	H/C	To transmit input power to front planetary carrier 10.
Forward clutch 15	F/C	To connect front planetary carrier 10 with forward one-way clutch 16.
Overrun clutch 17	O/C	To connect front planetary carrier 10 with rear internal gear 13.
Brake band 4	B/B	To lock front sun gear 7.
Forward one-way clutch 16	F/O.C	When forward clutch 15 is engaged, to stop rear internal gear 13 from rotating in opposite direction against engine revolution.
Low one-way clutch 18	L/O.C	To stop front planetary carrier 10 from rotating in opposite direction against engine revolution.
Low & reverse brake 19	L & R/B	To lock front planetary carrier 10.

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CLUTCH AND BAND CHART

				_			Band serv	0	For-	Low			
Shift p	osition	Reverse clutch 5	High clutch 6	For- ward clutch 15	Over- run clutch 17	2nd apply	3rd release	4th apply	ward one- way clutch 16	one- way clutch 18	Low & reverse brake 19	Lock- up	Remarks
ı	Р												PARK POSITION
ı	R	0									0		REVERSE POSITION
ı	N												NEUTRAL POSITION
	1st			0	*1 D				В	В			Automatic
D*4	2nd			0	*1 A	0			В				shift $1 \Leftrightarrow 2 \Leftrightarrow 3$
D 4	3rd		0	0	*1 A	*2 C	С		В			*4 O	
	4th		0	С		*3 C	С	0	В			0	⇔ 4
	1st			0	0				В	В			Automatic
2	2nd			0	0	0			В				shift $1 \Leftrightarrow 2 \Leftarrow 3$
	3rd			0	0				В				
	1st			0	0				В		0		Locks (held
1	2nd			0	0	0			В				stationary) in 1st
·	3rd			0	0	*2 C			В				speed $1 \leftarrow 2 \leftarrow 3$

^{*1:} Operates when overdrive control switch is set in OFF position.

^{*2:} Oil pressure is applied to both 2nd "apply" side and 3rd "release" side of band servo piston. However, brake band does not contract because oil pressure area on the "release" side is greater than that on the "apply" side.

^{*3:} Oil pressure is applied to 4th "apply" side in condition *2 above, and brake band contracts.

^{*4:} A/T will not shift to 4th when overdrive control switch is set in OFF position.

O: Operates

A: Operates when throttle opening is less than 3/16, activating engine brake.

B: Operates during "progressive" acceleration.

C: Operates but does not affect power transmission.

D: Operates when throttle opening is less than 3/16, but does not affect engine brake.

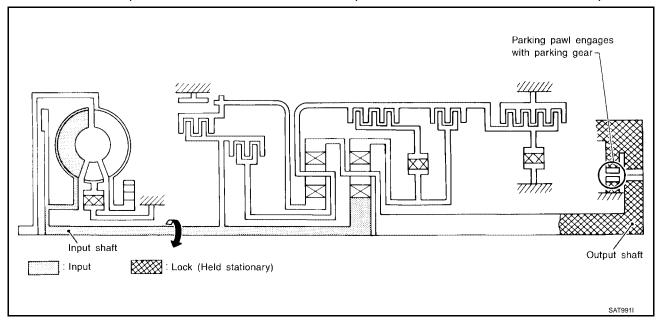
OVERALL SYSTEM

[RE4F04B]

POWER TRANSMISSION

P and N Positions

- P position
 - Similar to the N position, the clutches do not operate. The parking pawl engages with the parking gear to mechanically hold the output shaft so that the powertrain is locked.
- N position
 Power from the input shaft is not transmitted to the output shaft because the clutches do not operate.



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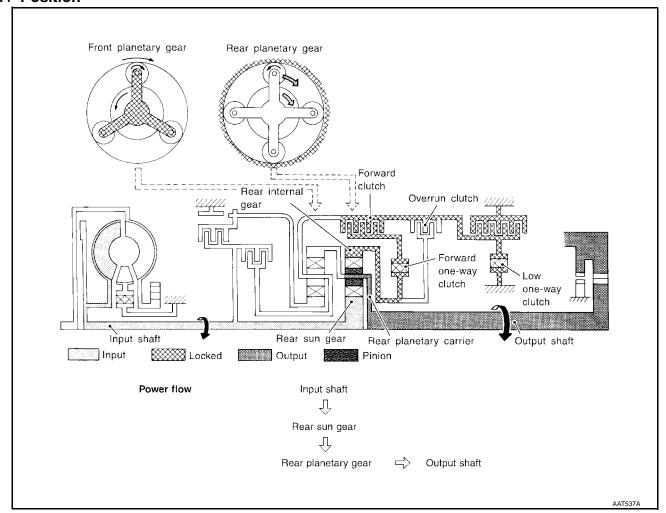
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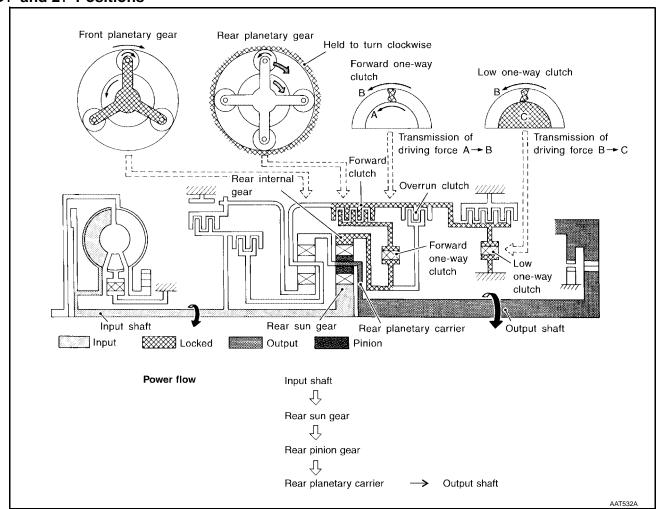
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11 Position



 Forward clutch Forward one-way clutch Overrun clutch Low and reverse brake 	As overrun clutch engages, rear internal gear is locked by the operation of low and reverse brake. This is different from that of D1 and 21.
Engine brake	Overrun clutch always engages, therefore engine brake can be obtained when decelerating.

D₁ and ₂₁ Positions



Forward one-way clutchForward clutchLow one-way clutch	Rear internal gear is locked to rotate counterclockwise because of the functioning of these three clutches.
Overrun clutch engagement conditions (Engine brake)	D1 : Overdrive control switch OFF and throttle opening is less than 3/16 21 : Always engaged At D1 and 21 positions, engine brake is not activated due to free turning of low one-way clutch.

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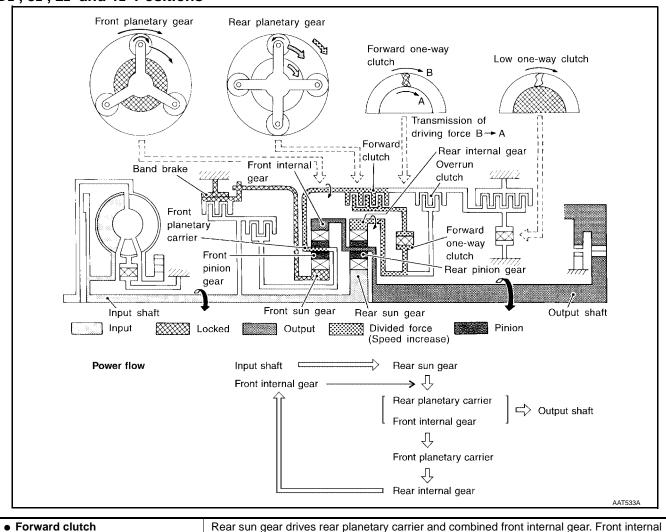
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D2, 32, 22 and 12 Positions



Forward clutchForward one-way clutchBrake band	Rear sun gear drives rear planetary carrier and combined front internal gear. Front internal gear now rotates around front sun gear accompanying front planetary carrier. As front planetary carrier transfers the power to rear internal gear through forward clutch and forward one-way clutch, this rotation of rear internal gear increases the speed of rear planetary carrier compared with that of the 1st speed.
Overrun clutch engagement conditions	D2 : Overdrive control switch OFF and throttle opening is less than 3/16 22 and 12 : Always engaged

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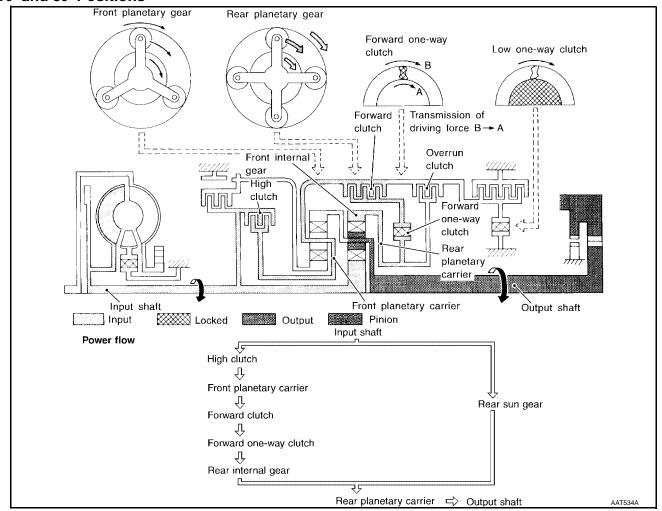
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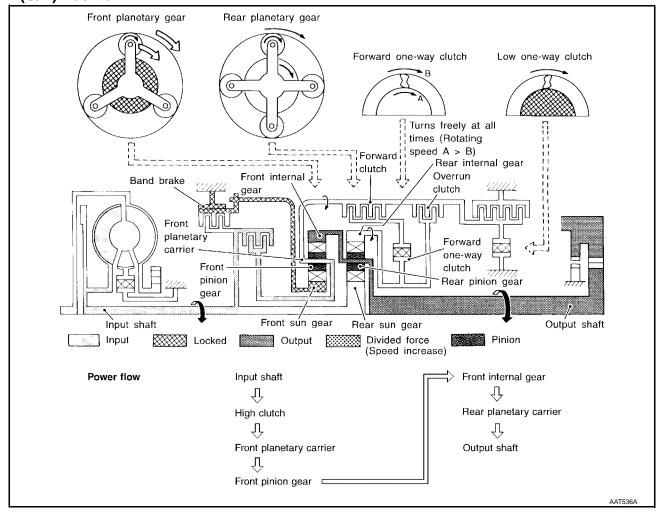
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D₃ and ₃₃ Positions



High clutchForward clutchForward one-way clutch	Input power is transmitted to front planetary carrier through high clutch. And front planetary carrier is connected to rear internal gear by operation of forward clutch and forward one-way clutch. This rear internal gear rotation and another input (the rear sun gear) accompany rear planetary carrier to turn at the same speed.
Overrun clutch engagement conditions	D3 : Overdrive control switch OFF and throttle opening is less than 3/16

D₄ (O/D) Position



 High clutch Brake band Forward clutch (Does not affect power transmission) 	Input power is transmitted to front carrier through high clutch. This front carrier turns around the sun gear which is fixed by brake band and makes front internal gear (output) turn faster.
Engine brake	At D4 position, there is no one-way clutch in the power transmission line and engine brake can be obtained when decelerating.

OVERALL SYSTEM

[RE4F04B]

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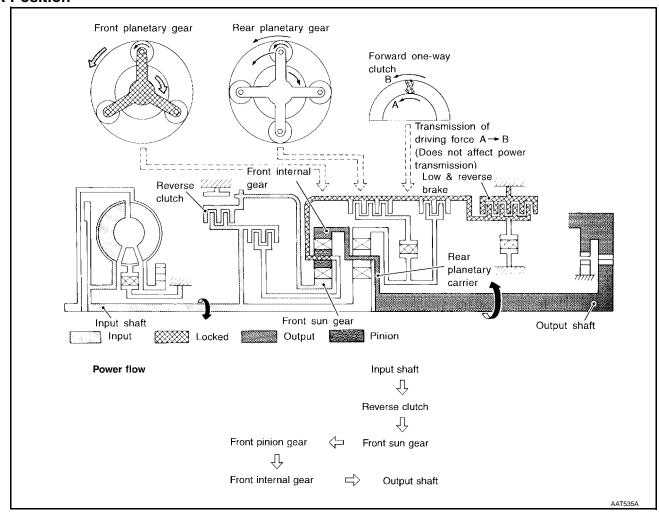
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R Position



Reverse clutchLow and reverse brake	Front planetary carrier is stationary because of the operation of low and reverse brake. Input power is transmitted to front sun gear through reverse clutch, which drives front internal gear in the opposite direction.
Engine brake	As there is no one-way clutch in the power transmission line, engine brake can be obtained when decelerating.

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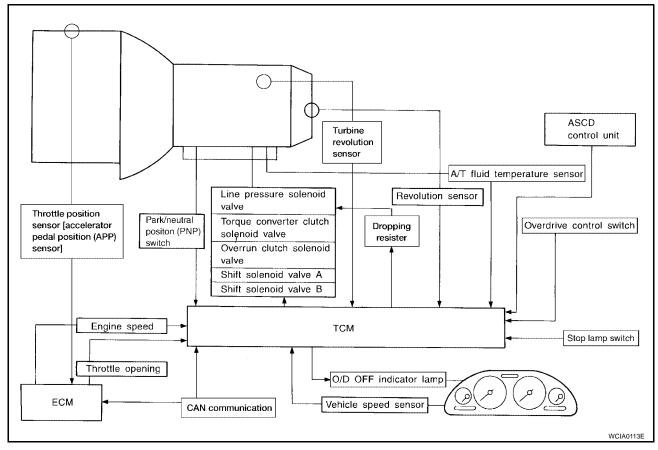
Control System OUTLINE

FCS0062F

The automatic transaxle senses vehicle operating conditions through various sensors. It always controls the optimum shift position and reduces shifting and lock-up shocks.

SENSORS	TCM	ACTUATORS
Park/neutral position (PNP) switch Throttle position sensor [accelerator pedal position (APP) sensor] Engine speed signal A/T fluid temperature sensor Revolution sensor Vehicle speed sensor Overdrive control switch ASCD control unit Stop lamp switch Turbine revolution sensor	Shift control Line pressure control Lock-up control Overrun clutch control Timing control Fail-safe control Self-diagnosis CONSULT-II communication line control	Shift solenoid valve A Shift solenoid valve B Overrun clutch solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve O/D OFF indicator lamp

CONTROL SYSTEM



OVERALL SYSTEM

[RE4F04B]

Α

В

TCM FUNCTION

The function of the TCM is to:

- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids.

INPUT/OUTPUT SIGNAL OF TCM

	Sensors and solenoid valves	Function	ΑT
	Park/neutral position (PNP) switch	Detects select lever position and sends a signal to TCM.	•
	Throttle position sensor [accelerator pedal position (APP) sensor]	Detects accelerator pedal position and requested throttle opening and sends a signal to TCM.	[
	Engine speed signal	Receives signal from ECM and controls lock-up control solenoid valve.	•
	A/T fluid temperature sensor	Detects transmission fluid temperature and sends a signal to TCM.	F
	Revolution sensor	Detects output shaft rpm and sends a signal to TCM.	
Input	Vehicle speed sensor	Used as an auxiliary vehicle speed sensor. Sends a signal which is used if revolution sensor (installed on transmission) malfunctions.	-
	Overdrive control switch	Sends a signal to the TCM which prohibits a shift to D4 (overdrive) position.	
	ASCD control unit	Sends the cruise signal and D4 (overdrive) cancellation signal from ASCD control unit to TCM.	
	Stop lamp switch	Send the lock-up release signal to the TCM at time of D4 (lock-up).	
	CAN communication	Control units are connected to two communication lines (CAN H and CAN L) allowing a high rate of information transmission.	-
	Shift solenoid valve A/B	Selects shifting point suited to driving conditions in relation to a signal sent from TCM.	•
	Line pressure solenoid valve	Regulates line pressure suited to driving conditions in relation to a signal sent from TCM.	•
Output	Torque converter clutch solenoid valve	Regulates lock-up pressure suited to driving conditions in relation to a signal sent from TCM.	
·	Overrun clutch solenoid valve	Controls an "engine brake" effect suited to driving conditions in relation to a signal sent from TCM.	
	O/D OFF indicator lamp	Shows TCM faults, when A/T control components malfunction.	-
	CAN communication	Control units are connected to two communication lines (CAN H and CAN L) allowing a high rate of information transmission.	

CAN Communication SYSTEM DESCRIPTION

ECS006H8

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to LAN-4, "CAN Communication Unit".

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Control Mechanism LINE PRESSURE CONTROL

ECS0062F

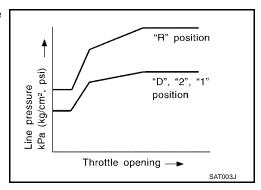
TCM has various line pressure control characteristics to meet the driving conditions.

An ON-OFF duty signal is sent to the line pressure solenoid valve based on TCM characteristics.

Hydraulic pressure on the clutch and brake is electronically controlled through the line pressure solenoid valve to accommodate engine torque. This results in smooth shift operation.

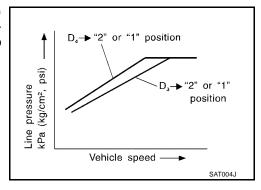
Normal Control

The line pressure to throttle opening characteristics is set for suitable clutch operation.



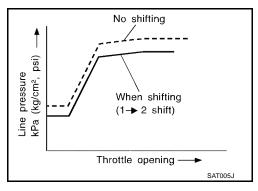
Back-up Control (Engine brake)

If the selector lever is shifted to 2 position while driving in D4 (O/D) or D3, great driving force is applied to the clutch inside the transmission. Clutch operating pressure (line pressure) must be increased to deal with this driving force.



During Shift Change

The line pressure is temporarily reduced corresponding to a change in engine torque when shifting gears (that is, when the shift solenoid valve is switched for clutch operation) to reduce shifting shock.



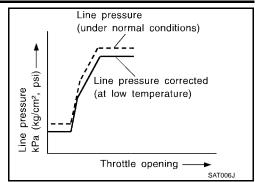
At Low Fluid Temperature

Fluid viscosity and frictional characteristics of the clutch facing change with fluid temperature. Clutch
engaging or band-contacting pressure is compensated for, according to fluid temperature, to stabilize
shifting quality.

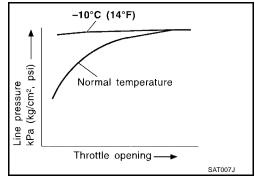
OVERALL SYSTEM

[RE4F04B]

 The line pressure is reduced below 60°C (140°F) to prevent shifting shock due to low viscosity of automatic transmission fluid when temperature is low.



Line pressure is increased to a maximum irrespective of the throttle opening when fluid temperature drops to −10°C (14°F). This pressure rise is adopted to prevent a delay in clutch and brake operation due to extreme drop of fluid viscosity at low temperature.



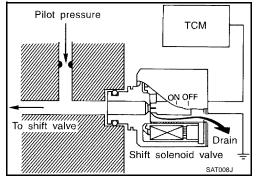
SHIFT CONTROL

The shift is regulated entirely by electronic control to accommodate vehicle speed and varying engine operations. This is accomplished by electrical signals transmitted by the revolution sensor and the ECM (throttle opening). This results in improved acceleration performance and fuel economy.

Control of Shift Solenoid Valves A and B

The TCM activates shift solenoid valves A and B according to signals from the ECM (throttle opening) and revolution sensor to select the optimum gear position on the basis of the shift schedule memorized in the TCM.

The shift solenoid valve performs simple ON-OFF operation. When set to ON, the drain circuit closes and pilot pressure is applied to the shift valve.



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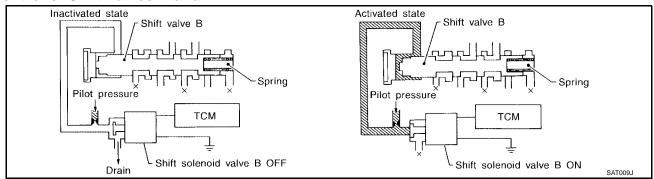
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Relation between shift solenoid valves A and B and gear positions

Shift solenoid valve	Gear position				
Shirt solehold valve	D1 , 21 , 11	D2 , 22 , 12	D3	D4 (O/D)	N-P
A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)	ON (Closed)
В	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)

Control of Shift Valves A and B



Pilot pressure generated by the operation of shift solenoid valves A and B is applied to the end face of shift valves A and B.

The drawing above shows the operation of shift valve B. When the shift solenoid valve is ON, pilot pressure applied to the end face of the shift valve overcomes spring force, moving the valve upward.

LOCK-UP CONTROL

The torque converter clutch piston in the torque converter is locked to eliminate torque converter slip to increase power transmission efficiency. The solenoid valve is controlled by an ON-OFF duty signal sent from the TCM. The signal is converted to an oil pressure signal which controls the lock-up piston.

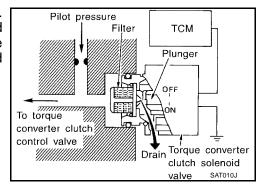
Conditions for Lock-up Operation

When vehicle is driven in 3rd and 4th gear position, vehicle speed and throttle opening are detected. If the detected values fall within the lock-up zone memorized in the TCM, lock-up occurs.

Overdrive control switch	ON	OFF
Selector lever	D position	
Gear position	D4 D3	
Vehicle speed sensor	More than set value	
ECM (throttle opening)	Less than set opening	
A/T fluid temperature sensor	More than 40°C (104°F)	

Torque Converter Clutch Solenoid Valve Control

The torque converter clutch solenoid valve is controlled by the TCM. The plunger closes the drain circuit during the OFF period, and opens the circuit during the ON period. If the percentage of OFF-time increases in one cycle, the pilot pressure drain time is reduced and pilot pressure remains high.



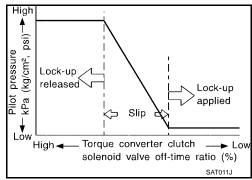
The torque converter clutch piston is designed to slip to adjust the ratio of ON-OFF, thereby reducing lock-up shock.

OFF-time INCREASING

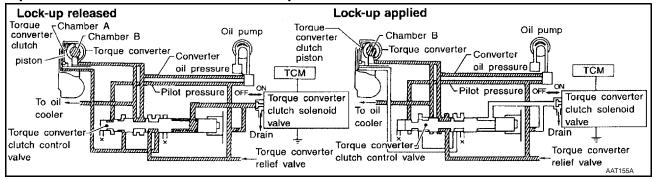
Amount of drain DECREASING

Pilot pressure HIGH

Lock-up RELEASING



Torque Converter Clutch Control Valve Operation



Lock-up released

The OFF-duration of the torque converter clutch solenoid valve is long, and pilot pressure is high. The pilot pressure pushes the end face of the torque converter clutch control valve in combination with spring force to move the valve to the left. As a result, converter pressure is applied to chamber A (torque converter clutch piston release side). Accordingly, the torque converter clutch piston remains unlocked.

Lock-up applied

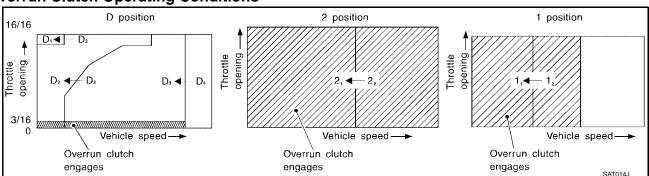
When the OFF-duration of the torque converter clutch solenoid valve is short, pilot pressure drains and becomes low. Accordingly, the control valve moves to the right by the pilot pressure of the other circuit and converter pressure. As a result, converter pressure is applied to chamber B, keeping the torque converter clutch piston applied.

Also smooth lock-up is provided by transient application and release of the lock-up.

OVERRUN CLUTCH CONTROL (ENGINE BRAKE CONTROL)

Forward one-way clutch is used to reduce shifting shocks in downshifting operations. This clutch transmits engine torque to the wheels. However, drive force from the wheels is not transmitted to the engine because the one-way clutch rotates idle. This means the engine brake is not effective. The overrun clutch operates when the engine brake is needed.

Overrun Clutch Operating Conditions



	Gear position	Throttle opening
D position	D1, D2, D3 gear position	Less than 3/16
2 position	21, 22 gear position	Less than 3/10
1 position	11 , 12 gear position	At any position

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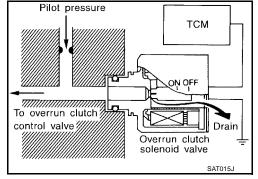
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Overrun Clutch Solenoid Valve Control

The overrun clutch solenoid valve is operated by an ON-OFF signal transmitted by the TCM to provide overrun clutch control (engine brake control).

When this solenoid valve is ON, the pilot pressure drain port closes. When it is OFF, the drain port opens.

During the solenoid valve ON pilot pressure is applied to the end face of the overrun clutch control valve.

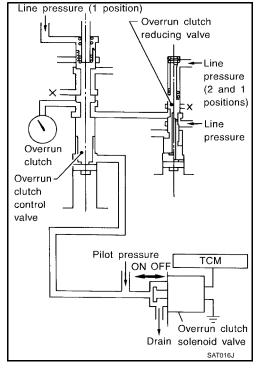


Overrun Clutch Control Valve Operation

When the solenoid valve is ON, pilot pressure is applied to the overrun clutch control valve. This pushes up the overrun clutch control valve. The line pressure is then shut off so that the clutch does not engage.

When the solenoid valve is OFF, pilot pressure is not generated. At this point, the overrun clutch control valve moves downward by spring force. As a result, overrun clutch operation pressure is provided by the overrun clutch reducing valve. This causes the overrun clutch to engage.

In the 1 position, the overrun clutch control valve remains pushed down so that the overrun clutch is engaged at all times.



Control Valve FUNCTION OF CONTROL VALVES

ECS0062G

Valve name	Function		
Pressure regulator valve, plug and sleeve plug	Regulates oil discharged from the oil pump to provide optimum line pressure for all driving conditions.		
Pressure modifier valve and sleeve	Used as a signal supplementary valve to the pressure regulator valve. Regulates pressure-modifier pressure (signal pressure) which controls optimum line pressure for all driving conditions.		
Pilot valve	Regulates line pressure to maintain a constant pilot pressure level which controls lock-up mechanism, overrun clutch, shift timing.		
Accumulator control valve	Regulates accumulator back-pressure to pressure suited to driving conditions.		
Manual valve	Directs line pressure to oil circuits corresponding to select positions. Hydraulic pressure drains when the shift lever is in Neutral.		
Shift valve A	Simultaneously switches three oil circuits using output pressure of shift solenoid valve A to meet driving conditions (vehicle speed, throttle opening, etc.). Provides automatic downshifting and up-shifting (1st \rightarrow 2nd \rightarrow 3rd \rightarrow 4th gears/4th \rightarrow 3rd \rightarrow 2nd \rightarrow 1st gears) in combination with shift valve B.		

OVERALL SYSTEM

[RE4F04B]

Valve name	Function		
Shift valve B	Simultaneously switches two oil circuits using output pressure of shift solenoid valve B in relation to driving conditions (vehicle speed, throttle opening, etc.). Provides automatic downshifting and up-shifting (1st \rightarrow 2nd \rightarrow 3rd \rightarrow 4th gears/4th \rightarrow 3rd \rightarrow 2nd \rightarrow 1st gears) in combination with shift valve A.		
Overrun clutch control valve	Switches hydraulic circuits to prevent engagement of the overrun clutch simultaneously with application of the brake band in D4 . (Interlocking occurs if the overrun clutch engages during D4 .)		
"1" reducing valve	Reduces low & reverse brake pressure to dampen engine-brake shock when down-shifting from the 1 position 12 to 11.		
Overrun clutch reducing valve	Reduces oil pressure directed to the overrun clutch and prevents engine-brake In 1 and 2 positions, line pressure acts on the overrun clutch reducing valve to i the pressure-regulating point, with resultant engine brake capability.		
Torque converter relief valve	Prevents an excessive rise in torque converter pressure.		
Torque converter clutch control valve, plug and sleeve	Activates or inactivates the lock-up function. Also provides smooth lock-up through transient application and release of the lock-up system.		
1-2 accumulator valve and piston	Dampens the shock encountered when 2nd gear band servo contracts, and provides smooth shifting.		
3-2 timing valve	Switches the pace that oil pressure is released depending on vehicle speed; maximizes the high clutch release timing, and allows for soft down shifting.		
Shuttle valve	Determines if the overrun clutch solenoid valve should control the 3-2 timing valve or the overrun clutch control valve and switches between the two.		
Cooler check valve	At low speeds and with a small load when little heat is generated, saves the volume cooler flow, and stores the oil pressure for lock up.		

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[RE4F04B]

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

PFP:00000

Introduction ECS0062H

The A/T system has two self-diagnostic systems.

The first is the emission-related on board diagnostic system (OBD-II) performed by the TCM (transmission control module) in combination with the ECM. The malfunction is indicated by the MIL (malfunction indicator lamp) and is stored as a DTC in the ECM memory but not the TCM memory.

The second is the TCM original self-diagnosis indicated by the O/D OFF indicator lamp. The malfunction is stored in the TCM memory. The detected items are overlapped with OBD-II self-diagnostic items. For details, refer to AT-426, "OBD-II Function for A/T System".

OBD-II Function for A/T System

ECS00621

The ECM provides emission-related on board diagnostic (OBD-II) functions for the A/T system. One function is to receive a signal from the TCM used with OBD-related parts of the A/T system. The signal is sent to the ECM when a malfunction occurs in the corresponding OBD-related part. The other function is to indicate a diagnostic result by means of the MIL (malfunction indicator lamp) on the instrument panel. Sensors, switches and solenoid valves are used as sensing elements.

The MIL automatically illuminates in One or Two Trip Detection Logic when a malfunction is sensed in relation to A/T system parts.

One or Two Trip Detection Logic of OBD-II ONE TRIP DETECTION LOGIC

ECS0062J

If a malfunction is sensed during the first test drive, the MIL will illuminate and the malfunction will be stored in the ECM memory as a DTC. The TCM is not provided with such a memory function.

TWO TRIP DETECTION LOGIC

When a malfunction is sensed during the first test drive, it is stored in the ECM memory as a 1st trip DTC (diagnostic trouble code) or 1st trip freeze frame data. At this point, the MIL will not illuminate. — First Trip If the same malfunction as that experienced during the first test drive is sensed during the second test drive, the MIL will illuminate. — Second Trip

A/T-related parts for which the MIL illuminates during the first or second test drive are listed below.

Items	MIL		
пень	One trip detection	Two trip detection	
Shift solenoid valve A — DTC: P0750	X		
Shift solenoid valve B — DTC: P0755	X		
Throttle position sensor [accelerator pedal position (APP) sensor] — DTC: P1705	X		
Except above		X	

The "trip" in the "One or Two Trip Detection Logic" means a driving mode in which self-diagnosis is performed during vehicle operation.

OBD-II Diagnostic Trouble Code (DTC) HOW TO READ DTC AND 1ST TRIP DTC

ECS0062K

DTC and 1st trip DTC can be read by the following methods.

(With CONSULT-II or ST (Generic Scan Tool) Examples: P0705, P0710, P0720, P0725, etc.

These DTCs are prescribed by SAE J2012.

(CONSULT-II also displays the malfunctioning component or system.)

- 1st trip DTC No. is the same as DTC No.
- Output of the diagnostic trouble code indicates that the indicated circuit has a malfunction. However, in case of the Mode II and GST they do not indicate whether the malfunction is still occurring or occurred in the past and returned to normal.

CONSULT-II can identify them as shown below. Therefore, using CONSULT-II (if available) is recommended.

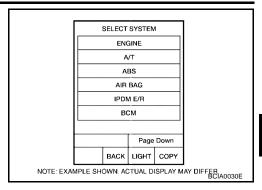
[RE4F04B]

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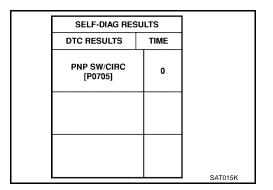
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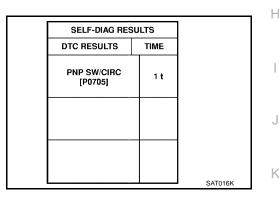
A sample of CONSULT-II display for DTC and 1st trip DTC is shown in the following page. DTC or 1st trip DTC of a malfunction is displayed in "SELF DIAGNOSIS" mode for "ENGINE" with CONSULT-II. Time data indicates how many times the vehicle was driven after the last detection of a DTC.



If the DTC is being detected currently, the time data will be "0".



If a 1st trip DTC is stored in the ECM, the time data will be "1t".



Freeze Frame Data and 1st Trip Freeze Frame Data

The ECM has a memory function, which stores the driving condition such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed and vehicle speed at the moment the ECM detects a malfunction.

Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data, and the data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-II or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-II screen, not on the GST. For detail, refer to EC-701, "FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA".

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

Priority	Items		
1	Freeze frame data	Misfire — DTC: P0300 - P0304 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175	
2		Except the above items (Includes A/T related items)	
3	1st trip freeze frame o	lata	

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

[RE4F04B]

HOW TO ERASE DTC

The diagnostic trouble code can be erased by CONSULT-II, GST or ECM DIAGNOSTIC TEST MODE as described in the following.

- If the battery terminal is disconnected, the diagnostic trouble code will be lost within 24 hours.
- When you erase the DTC, using CONSULT-II or GST is easier and quicker than switching the mode selector on the ECM.

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to EC-697, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS"

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- Diagnostic trouble codes (DTC)
- 1st trip diagnostic trouble codes (1st trip DTC)
- Freeze frame data
- 1st trip freeze frame data
- System readiness test (SRT) codes
- Test values

(A) HOW TO ERASE DTC (WITH CONSULT-II)

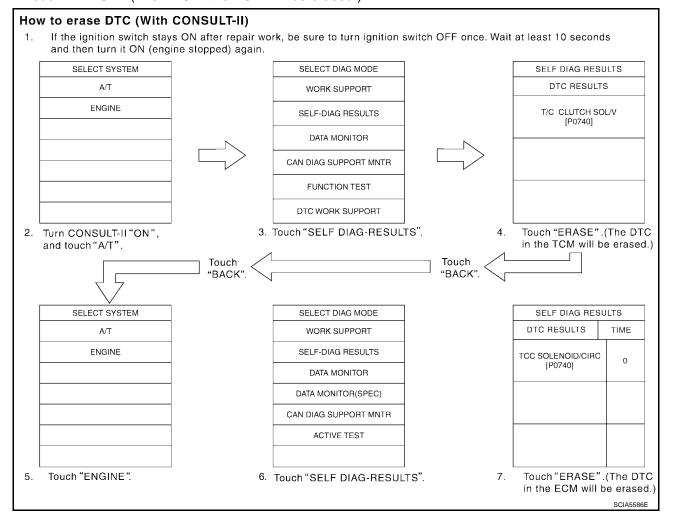
- If a DTC is displayed for both ECM and TCM, it needs to be erased for both ECM and TCM.
- 1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
- 2. Turn CONSULT-II "ON" and touch "A/T".
- 3. Touch "SELF-DIAG RESULTS".
- 4. Touch "ERASE". (The DTC in the TCM will be erased.) Then touch "BACK" twice.
- 5. Touch "ENGINE".
- 6. Touch "SELF DIAGNOSIS".

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7. Touch "ERASE". (The DTC in the ECM will be erased.)



MATERIAL PROPERTY OF THE CONTRACT OF THE CONT

- 1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
- Perform TCM self-diagnostic procedure. Refer to <u>AT-439, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)"</u>. (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
- 3. Select Mode 4 with Generic Scan Tool (GST). For details, refer to EC-711, "How to Erase DTC" .

HOW TO ERASE DTC (NO TOOLS)

- 1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
- Perform TCM self-diagnostic procedure. Refer to <u>AT-439, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)"</u>. (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
- Perform OBD-II self-diagnostic procedure. Refer to <u>AT-439, "OBD-II SELF-DIAGNOSTIC PROCEDURE</u> (<u>NO TOOLS)"</u>. (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)

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[RE4F04B]

Malfunction Indicator Lamp (MIL)

ECS0062L

- The malfunction indicator lamp will light up when the ignition switch is turned ON without the engine running. This is for checking the lamp.
 - If the malfunction indicator lamp does not light up, refer to <u>DI-27, "WARNING LAMPS"</u>.

(Or see AT-430, "Malfunction Indicator Lamp (MIL)".)

2. When the engine is started, the malfunction indicator lamp should go off.

If the lamp remains on, the on board diagnostic system has detected an emission-related (OBD-II) malfunction. For details, refer to <u>AT-426, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"</u>.



CONSULT-II ECS0062M

After performing <u>AT-431</u>, "SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)", place check marks for results on the <u>AT-444</u>, "DIAGNOSTIC WORKSHEET". Reference pages are provided following the items.

NOTICE:

- 1. The CONSULT-II electrically displays shift timing and lock-up timing (that is, operation timing of each sole-noid).
 - Check for time difference between actual shift timing and the CONSULT-II display. If the difference is noticeable, mechanical parts (except solenoids, sensors, etc.) may be malfunctioning. Check mechanical parts using applicable diagnostic procedures.
- 2. Shift schedule (which implies gear position) displayed on CONSULT-II and that indicated in Service Manual may differ slightly. This occurs because of the following reasons:
- Actual shift schedule has more or less tolerance or allowance,
- Shift schedule indicated in Service Manual refers to the point where shifts start, and
- Gear position displayed on CONSULT-II indicates the point where shifts are completed.
- 3. Shift solenoid valve "A" or "B" is displayed on CONSULT-II at the start of shifting. Gear position is displayed upon completion of shifting (which is computed by TCM).
- Additional CONSULT-II information can be found in the Operation Manual supplied with the CONSULT-II
 unit.

FUNCTION

Diagnostic test mode	Function	Reference page
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-II.	_
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	<u>AT-431</u>
Data monitor	Input/Output data in the ECM can be read.	<u>AT-433</u>
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.	_
Function test	Performed by CONSULT-II instead of a technician to determine whether each system is "OK" or "NG".	_
DTC work support	Select the operating condition to confirm Diagnostic Trouble Codes.	<u>AT-435</u>
TCM part number	TCM part number can be read.	_

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(A) SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)

 Turn on CONSULT-II and touch "ENGINE" for OBD-II detected items or touch "A/T" for TCM self-diagnosis.
 If A/T is not displayed, check TCM power supply and ground circuit. Refer to <u>AT-484, "TROUBLE DIAGNOSIS FOR POWER SUPPLY"</u>. If result is NG, refer to <u>PG-3, "POWER SUPPLY</u> ROUTING".

	SELECT	SYSTEM	1	
	ENGINE			
	,	V T		
	F	BS		
	AIR BAG			
	IPDM E/R			
	ВСМ			
	,			
		Page	Down	
	BACK	1	COPY	
NOTE: EXA	MPLE SHOWN. A	CTUAL D	ISPLAY M	IAY DIFFER BCIA0030E

2. Touch "SELF DIAGNOSIS".

Display shows malfunction experienced since the last erasing operation.

CONSULT-II performs "Real Time Diagnosis".

Also, any malfunction detected while in this mode will be displayed at real time.

REAL-TIME DIAG	1
REAL-TIME DIAG	
ENG SPEED SIG	
	1
	1
	1
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SELF-DIAGNOSTIC RESULT TEST MODE

Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode)		Malfunction is detected when	TCM self-diagnosis	OBD-II (DTC)
			Available by O/D OFF indicator lamp or "A/T"	Available by malfunction indicator lamp*2, "ENGINE" on CON-
"A/T"	"ENGINE"		on CONSULT-II	SULT-II or GST
Park/neutral position (PNP) switch circuit		TCM does not receive the correct		
_	PNP SW/CIRC	voltage signal (based on the gear position) from the switch.	_	P0705
Revolution sensor		TOM does not need to the need to		
VHCL SPEED SEN-A/T	VEH SPD SEN/ CIR AT	TCM does not receive the proper voltage signal from the sensor.	X	P0720
Vehicle speed sensor (Meter)		a TCM does not receive the proper		
VHCL SPEED SEN-MTR	_	TCM does not receive the proper voltage signal from the sensor.	X	_
A/T 1st gear function		A/T cannot be shifted to the 1st		
A/T 1ST GR FNCTN	A/T 1ST GR FNCTN	gear position even if electrical circuit is good.	_	P0731*1
A/T 2nd gear function		A/T cannot be shifted to the 2nd		
A/T 2ND GR FNCTN	A/T 2ND GR FNCTN	gear position even if electrical circuit is good.	_	P0732*1
A/T 3rd gear function		A/T cannot be shifted to the 3rd		
A/T 3RD GR FNCTN	A/T 3RD GR FNCTN	gear position even if electrical circuit is good.	P(P0733*1
A/T 4th gear function		A/T cannot be shifted to the 4th		
A/T 4TH GR FNCTN	A/T 4TH GR FNCTN	gear position even if electrical circuit is good.	_	P0734*1
A/T TCC S/V function (lock-up)		A/T connet norferm look we see if		
A/T TCC S/V FNCTN	A/T TCC S/V FNCTN	 A/T cannot perform lock-up even if electrical circuit is good. 	_	P0744*1

				[RE4F04B]
Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode) "A/T" "ENGINE"		Malfunction is detected when	TCM self-diagnosis	OBD-II (DTC)
			Available by O/D OFF indicator lamp or "A/T" on CONSULT-II	Available by malfunction indicator lamp*2, "ENGINE" on CON- SULT-II or GST
Shift solenoid valve A		TCM detects an improper voltage		3021-11 01 031
SHIFT SOLENOID/V A	SFT SOL A/CIRC	drop when it tries to operate the solenoid valve.	Х	P0750
Shift solenoid valve B SHIFT SOLENOID/V B	SFT SOL B/CIRC	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	х	P0755
Overrun clutch solenoid valve		TCM detects an improper voltage		
OVERRUN CLUTCH S/V	O/R CLUCH SOL/ CIRC	drop when it tries to operate the solenoid valve.	X	P1760
T/C clutch solenoid valve	9	TCM detects an improper voltage		
T/C CLUTCH SOL/V	TCC SOLENOID/ CIRC	drop when it tries to operate the solenoid valve.	X	P0740
Line pressure solenoid v	alve L/PRESS SOL/ CIRC	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	х	P0745
Throttle position sensor [accelerator pedal position (APP) sensor] signal		TCM receives an excessively low or high voltage from this sensor.	Х	P1705
THROTTLE POSI SEN TP/SEN/CIRC A/T				
Engine speed signal		TCM does not receive the proper voltage signal from the ECM.	Х	P0725
ENGINE SPEED SIG				
A/T fluid temperature sensor		TCM receives an excessively low	X	P0710
BATT/FLUID TEMP SEN	ATF TEMP SEN/ CIRC	or high voltage from the sensor.	^	F U/ TU
Engine control		The ECM-A/T communication line	X	U1000
A/T COMM LINE		is open or shorted.	, ,	C 1000
Turbine revolution senso	r	TCM does not receive the proper	X	P0710
TURBINE REV		voltage signal from the sensor.	^	1 0/ 10
TCM (RAM)		TCM memory (RAM) is malfunc-		
CONTROL UNIT (RAM)		tioning	-	_
TCM (ROM)		a TCM mamani (DOM) :		
CONTROL UNIT (ROM)	_	 TCM memory (ROM) is malfunctioning 	_	_
TCM (EEP ROM)				
CONT UNIT(EEP ROM)	_	 TCM memory (EEP ROM) is mal- functioning. 	_	_
Initial start		This is not a malfunction message		
INITIAL START	_	(Whenever shutting off a power supply to the TCM, this message appears on the screen.)	X	_
No failure (NO SELF DIAGNOSTIC FAILURE INDI- CATED FURTHER TESTING MAY BE REQUIRED**)		No failure has been detected.	Х	х

X: Applicable

^{-:} Not applicable

^{*1:} These malfunctions cannot be displayed by MIL [MAINE] if another malfunction is assigned to MIL.

[RE4F04B]

Α

*2: Refer to EC-713, "Malfunction Indicator Lamp (MIL)".

DATA MONITOR MODE (A/T)

		Monit	or item			
Item	Display	TCM Input signals	Main signals	Description	Remarks	В
Vehicle speed sensor 1 (A/T) (Revolution sensor)	VHCL/S SE-A/T [km/h] or [mph]	Х	_	Vehicle speed computed from signal of revolution sensor is displayed.	When racing engine in N or P with vehicle stationary, CONSULT-II data may not indicate 0 km/h (0 mph).	AT
Vehicle speed sensor 2 (Meter)	VHCL/S SE·MTR [km/h] or [mph]	X	_	Vehicle speed computed from signal of vehicle speed sensor is dis- played.	Vehicle speed display may not be accurate under approx. 10 km/h (6 mph). It may not indicate 0 km/h (0 mph) when vehicle is stationary.	E
Throttle position sensor [accelerator pedal position (APP) sensor]	THRTL POS SEN [V]	Х	_	Throttle position sensor signal voltage is dis- played.		F
A/T fluid temperature sensor	FLUID TEMP SE [V]	X	_	 A/T fluid temperature sensor signal voltage is displayed. Signal voltage lowers as 		G
Battery voltage	BATTERY VOLT	Х	_	fluid temperature rises. • Source voltage of TCM is displayed.		- H
Engine speed	ENGINE SPEED [rpm]	Х	Х	Engine speed, computed from engine speed signal, is displayed.	Engine speed display may not be accurate under approx. 800 rpm. It may not indicate 0 rpm even when engine is not running.	- I
Turbine revolution sensor	TURBINE REV	X	_	Checks changing speed then performs oil pres- sure control and torque down control.		K
Overdrive control switch	OVERDRIVE SW [ON/OFF]	Х	_	ON/OFF state computed from signal of overdrive control SW is displayed.		L
PN position (PNP) switch	PN POSI SW [ON/OFF]	Х	_	ON/OFF state computed from signal of PN position SW is displayed.		N
R position switch	R POSITION SW [ON/OFF]	Х	_	ON/OFF state computed from signal of R position SW is displayed.		
D position switch	D POSITION SW [ON/OFF]	Х	_	ON/OFF state computed from signal of D position SW is displayed.		
2 position switch	2 POSITION SW [ON/OFF]	Х	_	ON/OFF status, computed from signal of 2 position SW, is displayed.		
1 position switch	1 POSITION SW [ON/OFF]	Х	_	ON/OFF status, computed from signal of 1 position SW, is displayed.		
ASCD cruise signal	ASCD-CRUISE [ON/OFF]	х	_	Status of ASCD cruise signal is displayed. ON Cruising state OFF Normal running state	This is displayed even when no ASCD is mounted.	

[RE4F04B]

		Monite	or item		
Item	Display	TCM Input signals	Main signals	Description	Remarks
ASCD OD cut signal	ASCD-OD CUT [ON/OFF]	Х	_	Status of ASCD OD release signal is displayed. ON OD released OFF OD not released	This is displayed even when no ASCD is mounted.
Kickdown switch	KICKDOWN SW [ON/OFF]	Х	_	ON/OFF status, computed from signal of kick-down SW, is displayed.	This is displayed even when no kickdown switch is equipped.
Gear position	GEAR	_	Х	Gear position data used for computation by TCM, is displayed.	
Selector lever position	SLCT LVR POSI	_	Х	Selector lever position data, used for computa- tion by TCM, is displayed.	A specific value used for control is displayed if fail- safe is activated due to error.
Vehicle speed	VEHICLE SPEED [km/h] or [mph]	_	Х	Vehicle speed data, used for computation by TCM, is displayed.	
Throttle position sensor [accelerator pedal position (APP) sensor]	THROTTLE POSI [/8]	_	Х	Throttle position data, used for computation by TCM, is displayed.	A specific value used for control is displayed if fail- safe is activated due to error.
Stop lamp switch	BRAKE SW [ON/OFF]	х	_	ON/OFF status is displayed. ON Brake pedal is depressed. OFF Brake pedal is released.	
Line pressure duty	LINE PRES DTY [%]	_	Х	Control value of line pressure solenoid valve, computed by TCM from each input signal, is displayed.	
Torque converter clutch solenoid valve duty	TCC S/V DUTY [%]	_	Х	Control value of torque converter clutch solenoid valve, computed by TCM from each input signal, is displayed.	
Shift solenoid valve A	SHIFT S/V A [ON/OFF]	_	Х	Control value of shift sole- noid valve A, computed by TCM from each input signal, is displayed.	Control value of solenoid is displayed even if solenoid circuit is disconnected. The OFF signal is displayed
Shift solenoid valve B	SHIFT S/V B [ON/OFF]	_	Х	Control value of shift sole- noid valve B, computed by TCM from each input signal, is displayed.	if solenoid circuit is shorted.
Overrun clutch solenoid valve	OVERRUN/C S/ V [ON/OFF]	_	Х	Control value of overrun clutch solenoid valve computed by TCM from each input signal is dis- played.	
Self-diagnosis display lamp (O/D OFF indicator lamp)	SELF-D DP LMP [ON/OFF]	_	Х	Control status of O/D OFF indicator lamp is displayed.	

X: Applicable

—: Not applicable

[RE4F04B]

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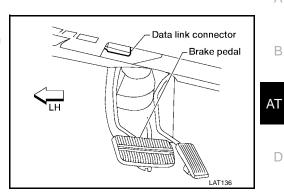
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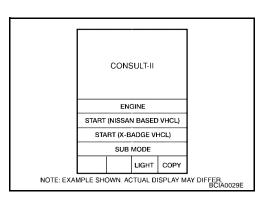
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DTC WORK SUPPORT MODE WITH CONSULT-II **CONSULT-II Setting Procedure**

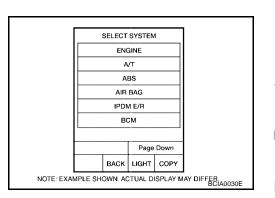
- Turn ignition switch OFF.
- Connect CONSULT-II to data link connector, which is located in left side dash panel.



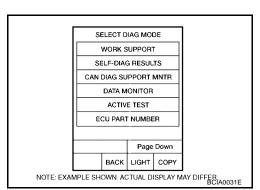
- 3. Turn ignition switch ON.
- Touch "START (NISSAN BASED VHCL)".



Touch "A/T".



Touch "DTC WORK SUPPORT".

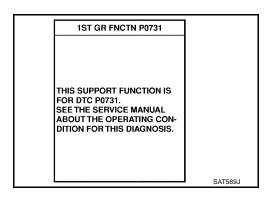


[RE4F04B]

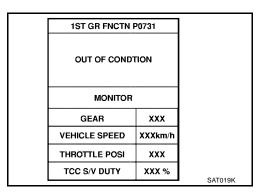
7. Touch select item menu (1ST, 2ND, etc.).

SELECT WORK ITEM	
1ST GR FNCTN P0731	
2ND GR FNCTN P0732	
3RD GR FNCTN P0733	
4TH GRFNCTN P0734	
TCC S/V FNCTN P0744	
	SAT018K

8. Touch "START".



9. Perform driving test according to "DTC CONFIRMATION PROCEDURE" in "TROUBLE DIAGNOSIS FOR DTC".



 When testing conditions are satisfied, CONSULT-II screen changes from "OUT OF CONDITION" to "TESTING".

1ST GR FNCTN	D0701	
151 GR FNCIN	PU/31	
TESTING		
MONITOR		
GEAR	xxx	
VEHICLE SPEED	XXXkm/h	
THROTTLE POSI		
TCC S/V DUTY		
		SAT591J

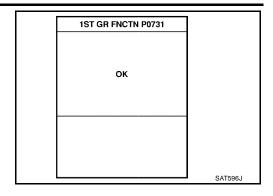
DOES A/T SHFT NORMAL CHECK FOR PROPER SHF TIMING AND SHFT SHOCK

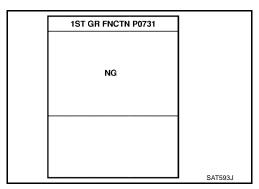
SAT595J

[RE4F04B] 10. Stop vehicle. If "NG" appears on the screen, malfunction may 1ST GR FNCTN P0731 exist. Go to "DIAGNOSTIC PROCEDURE". Α STOP VEHICLE В ΑT SAT592J D 1ST GR FNCTN P0731 Е NG SAT593J 11. Perform test drive to check gear shift feeling in accordance with 1ST GR FNCTN P0731 Н instructions displayed. DRIVE VHCL IN D RANGE SHIFTING 1→2→3→4 UNDER NORMAL ACCELERATION. DOES A/T SHFT NORMAL CHECK FOR PROPER SHF TIMING AND SHFT SHOCK SAT594J 12. Touch "YES" or "NO". 1ST GR FNCTN P0731 DRIVE VHCL IN D RANGE SHIFTING 1→2→3→4 UNDER M NORMAL ACCELERATION.

[RE4F04B]

13. CONSULT-II procedure ended.





If "NG" appears on the screen, a malfunction may exist. Go to "DIAGNOSTIC PROCEDURE".

DTC WORK SUPPORT MODE

DTC work support item	Description	Check item
1ST GR FNCTN P0731	Following items for "A/T 1st gear function (P0731)" can be confirmed. Self-diagnosis status (whether the diagnosis is being conducted or not) Self-diagnosis result (OK or NG)	 Shift solenoid valve A Shift solenoid valve B Each clutch Hydraulic control circuit
2ND GR FNCTN P0732	Following items for "A/T 2nd gear function (P0732)" can be confirmed. Self-diagnosis status (whether the diagnosis is being conducted or not) Self-diagnosis result (OK or NG)	Shift solenoid valve BEach clutchHydraulic control circuit
3RD GR FNCTN P0733	Following items for "A/T 3rd gear function (P0733)" can be confirmed. Self-diagnosis status (whether the diagnosis is being conducted or not) Self-diagnosis result (OK or NG)	Shift solenoid valve AEach clutchHydraulic control circuit
4TH GR FNCTN P0734	Following items for "A/T 4th gear function (P0734)" can be confirmed. Self-diagnosis status (whether the diagnosis is being conducted or not) Self-diagnosis result (OK or NG)	 Shift solenoid valve A Shift solenoid valve B Line pressure solenoid valve Each clutch Hydraulic control circuit
TCC S/V FNCTN P0744	Following items for "A/T TCC S/V function (lock-up) (P0744)" can be confirmed. Self-diagnosis status (whether the diagnosis is being conducted or not) Self-diagnosis result (OK or NG)	 Torque converter clutch sole- noid valve Each clutch Hydraulic control circuit

Diagnostic Procedure Without CONSULT-II

© OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)

ECS0062N

Refer to EC-803, "Generic Scan Tool (GST) Function".

[RE4F04B]

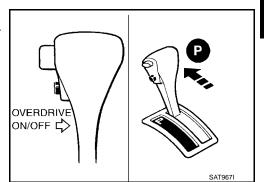
OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer to EC-713, "Malfunction Indicator Lamp (MIL)".

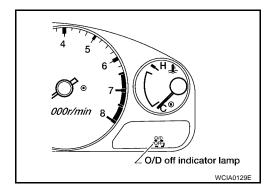
TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

1. CHECK O/D OFF INDICATOR LAMP

- Move selector lever to P position.
 Start engine and warm it up to normal engine operating temperature.
- 2. Turn ignition switch to OFF position.
- 3. Wait 5 seconds.
- 4. Turn ignition switch to ON position. (Do not start engine.)



5. Does O/D OFF indicator lamp come on for about 2 seconds?



Yes or No

No

Yes >> GO TO 2.

>> Stop procedure. Perform <u>AT-597, "1. O/D OFF Indicator Lamp Does Not Come On"</u> before proceeding.

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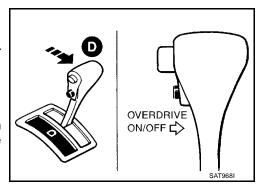
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2. Judgement procedure step 1

- 1. Turn ignition switch to OFF position.
- 2. Turn ignition switch to ACC position.
- 3. Move selector lever from P to D position.
- 4. Turn ignition switch to ON position. (Do not start engine.)
- 5. Depress and hold overdrive control switch in OFF position (the O/D OFF indicator lamp will be ON) until directed to release the switch. (If O/D OFF indicator lamp does not come on, refer to "Steps 3 and 4" in AT-597, "1. O/D OFF Indicator Lamp Does Not Come On").
- 6. Turn ignition switch to OFF position.
- 7. Turn ignition switch to ON position (Do not start engine.)
- 8. Release the overdrive control switch (the O/D OFF indicator lamp will be OFF).
- 9. Wait 2 seconds.
- 10. Move selector lever to 2 position.
- Depress and release overdrive control switch in ON position until next step is completed (the O/D OFF indicator lamp will be ON).



12. Depress and hold the overdrive control switch (the O/D OFF indicator lamp will be OFF) until directed to release the switch.

>> GO TO 3.



3. JUDGEMENT PROCEDURE STEP 2

- 1. Move selector lever to 1 position.
- 2. Release the overdrive control switch.
- 3. Depress and release the overdrive control switch (the O/D OFF indicator lamp will be ON).
- 4. Depress and release the overdrive control switch (the O/D OFF indicator lamp will be OFF).
- 5. Depress and hold the overdrive control switch (the O/D OFF indicator lamp will be ON) until directed to release the switch.
- 6. Depress accelerator pedal fully and release it.
- Release the overdrive control switch (the O/D OFF indicator lamp will begin to flash ON and OFF).

>> GO TO 4.



[RE4F04B]

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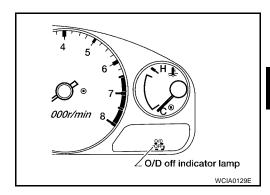
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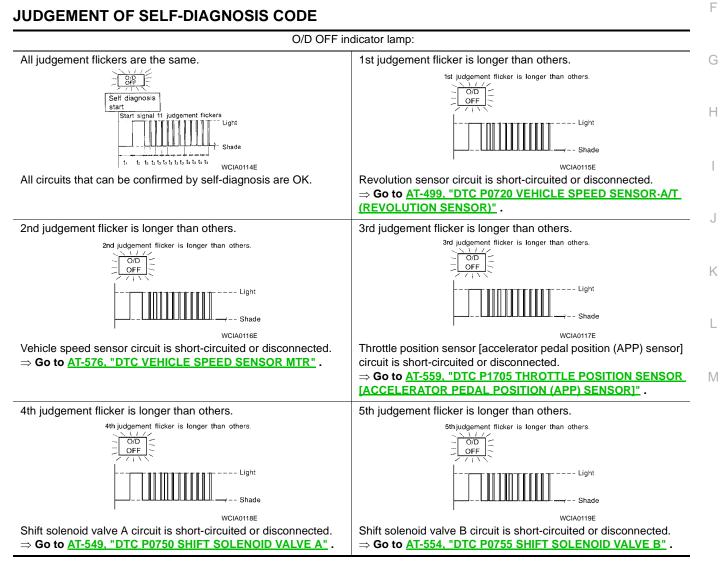
4. CHECK SELF-DIAGNOSTIC CODE

Check O/D OFF indicator lamp.

Refer to AT-441, "JUDGEMENT OF SELF-DIAGNOSIS CODE".



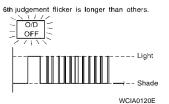
>> DIAGNOSIS END



[RE4F04B

O/D OFF indicator lamp:

6th judgement flicker is longer than others.



Overrun clutch solenoid valve circuit is short-circuited or discon-

⇒ Go to AT-564. "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE".

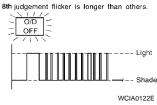
7th judgement flicker is longer than others.



Torque converter clutch solenoid valve circuit is short-circuited or

⇒ Go to AT-530. "DTC P0740 TORQUE CONVERTER CLUTCH **SOLENOID VALVE"** .

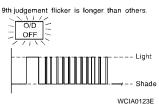
8th judgement flicker is longer than others.



A/T fluid temperature sensor is disconnected or TCM power source circuit is damaged.

⇒ Go to AT-493, "DTC P0710 A/T FLUID TEMPERATURE SEN-

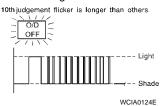
9th judgement flicker is longer than others.



Engine speed signal circuit is short-circuited or disconnected.

 \Rightarrow Go to AT-504, "DTC P0725 ENGINE SPEED SIGNAL" .

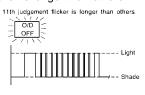
10th judgement flicker is longer than others.



Line pressure solenoid valve circuit is short-circuited or discon-

nected.

11th judgement flicker is longer than others.



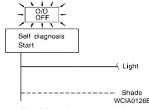
⇒ Go to AT-543, "DTC P0745 LINE PRESSURE SOLENOID VALVE".

The ECM-A/T communication line is open or shorted.

⇒ Go to AT-586, "DTC U1000 CAN COMMUNICATION LINE" .

Lamp comes on.

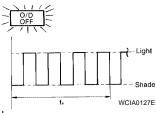
SOR CIRCUIT".



Park/neutral position (PNP) switch, overdrive control switch or throttle position switch circuit is disconnected or TCM is damaged.

⇒ Go to AT-627, "21. TCM Self-diagnosis Does Not Activate {Park/neutral Position (PNP), Overdrive Control and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor] Switches Circuit Checks}".

Flickers as shown below.



Battery power is low.

Battery has been disconnected for a long time.

Battery is connected conversely.

(When reconnecting TCM connectors. — This is not a problem.)

t1 = 2.5 seconds t2 = 2.0 seconds t3 = 1.0 second t4 = 1.0 second

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Introduction

The TCM receives a signal from the vehicle speed sensor, ECM (throttle enemies) or part/poutral position (DND) switch and provides

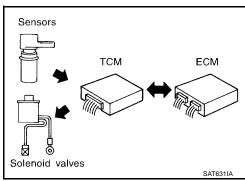
(throttle opening) or park/neutral position (PNP) switch and provides shift control or lock-up control via A/T solenoid valves. The TCM also communicates with the ECM by means of a signal

sent from sensing elements used with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.

Input and output signals must always be correct and stable in the operation of the A/T system. The A/T system must be in good operating condition and be free of valve seizure, solenoid valve malfunction, etc.

It is much more difficult to diagnose a problem that occurs intermittently rather than continuously. Most intermittent problems are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.

A visual check only, may not find the cause of the problems. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the "Work Flow". Refer to AT-447, "Work Flow"

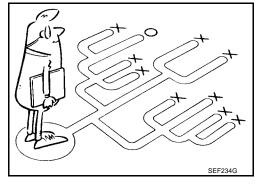




Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such problems, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A "DIAGNOSTIC WORKSHEET" like the example referenced at AT-444 should be used.

Start your diagnosis by looking for "conventional" problems first. This will help troubleshoot driveability problems on an electronically controlled engine vehicle.

Also check related Service bulletins for information.



[RE4F04B]

DIAGNOSTIC WORKSHEET Information from Customer KEY POINTS

WHAT Vehicle & A/T model WHEN Date, Frequencies WHERE Road conditions

HOW Operating conditions, Symptoms

Customer name MR/MS	Model & Year	VIN			
Trans. model	Engine	Mileage			
Incident Date	Manuf. Date	In Service Date			
Frequency	□ Continuous □ Intermittent (times a day)			
Symptoms	☐ Vehicle does not move. (☐ A	ny position 🚨 Particular position)			
	\square No up-shift (\square 1st \rightarrow 2nd \square	$2nd \rightarrow 3rd \Box 3rd \rightarrow O/D)$			
	\square No down-shift (\square O/D \rightarrow 3rd \square 3rd \rightarrow 2nd \square 2nd \rightarrow 1st)				
	□ Lockup malfunction				
	☐ Shift point too high or too low.				
	☐ Shift shock or slip (☐ N → D ☐ Lockup ☐ Any drive position)				
	☐ Noise or vibration				
	□ No kickdown				
	☐ No pattern select				
	□ Others				
O/D OFF indicator lamp	Blinks for about 8 seconds.				
	☐ Continuously lit	□ Not lit			
Malfunction indicator lamp (MIL)	☐ Continuously lit	□ Not lit			

[RE4F04B]

		stic Worksheet		AT 200	- A		
1.		Read the Fail-safe and listen to customer complaints.		AT-399	_		
2.	<u> </u>	□ Leakage (Follow specified procedure) □ Fluid condition □ Fluid level		AT-449	В		
3.	□F	Perform STALL TEST and PRESSURE TEST.		AT-449, AT-	AT		
		☐ Stall test — Mark possible damaged components/oth	ers.	<u>453</u>	AI		
		☐ Torque converter one-way clutch ☐ Reverse clutch ☐ Forward clutch ☐ Overrun clutch ☐ Forward one-way clutch	□ Low & reverse brake □ Low one-way clutch □ Engine □ Line pressure is low □ Clutches and brakes except high clutch and		D		
		☐ Pressure test — Suspected parts:	brake band are OK	_	Е		
4.					=		
	4-	4- Check before engine is started.					
	1.	1. SELF-DIAGNOSTIC PROCEDURE - Mark detected items.					
		□ Park/neutral position (PNP) switch, <u>AT-487</u> . □ A/T fluid temperature sensor, <u>AT-569</u> . □ Vehicle speed sensor A/T (Revolution sensor),	<u>AT-499</u> .		G		
		 □ Engine speed signal, AT-504. □ Turbine revolution sensor, AT-581. □ Torque converter clutch solenoid valve, AT-530 □ Line pressure solenoid valve, AT-543. 			Н		
		 □ Shift solenoid valve A, AT-549. □ Shift solenoid valve B, AT-554. □ Throttle position sensor [accelerator pedal position of the color of the colo	tion (APP) sensor, <u>AT-559</u> . and throttle position sensor [accelerator pedal posi-		I		
			J				
		□ A/T communication line, <u>AT-586</u> . □ Control unit (RAM), Control unit (ROM), <u>AT-589</u> □ Control unit (EEP ROM), <u>AT-591</u> . □ Battery	2.		K		
		□ Others			L		

[RE4F04B]

	4-	Check at idle	AT-456			
	2.	 □ 1. O/D OFF Indicator Lamp Does Not Come On, AT-597. □ 2. Engine Cannot Be Started In P and N Position, AT-598. □ 3. In P Position, Vehicle Moves Forward or Backward When Pushed, AT-600. □ 4. In N Position, Vehicle Moves, AT-600. □ 5. Large Shock. N → R Position, AT-602. □ 6. Vehicle Does Not Creep Backward In R Position, AT-604. □ 7. Vehicle Does Not Creep Forward In D, 2 or 1 Position, AT-607. 				
-	4-	Cruise test	AT-459			
	Part-1	AT-462				
		 □ 8. Vehicle Cannot Be Started From D1 , AT-609 . □ 9. A/T Does Not Shift: D1 → D2 or Does Not Kickdown: D4 → D2 , AT-612 . □ 10. A/T Does Not Shift: D2 → D3 , AT-614 . □ 11. A/T Does Not Shift: D3 → D4 , AT-617 . □ 12. A/T Does Not Perform Lock-up, AT-619 . □ 13. A/T Does Not Hold Lock-up Condition, AT-620 . □ 14. Lock-up Is Not Released, AT-621 . □ 15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3), AT-622 . 				
		Part-2	AT-465			
		□ 16. Vehicle Does Not Start From D1 , $\underline{AT-624}$. □ 9. A/T Does Not Shift: D1 \rightarrow D2 or Does Not Kickdown: D4 \rightarrow D2 , $\underline{AT-612}$. □ 10. A/T Does Not Shift: D2 \rightarrow D3 , $\underline{AT-614}$. □ 11. A/T Does Not Shift: D3 \rightarrow D4 , $\underline{AT-617}$.				
		Part-3	AT-467			
		 □ 18. A/T Does Not Shift: D3 → 22 , When Selector Lever D → 2 Position, AT-625 . □ 15. Engine Speed Does Not Return To Idle (Engine Brake In 22), AT-622 . □ 19. A/T Does Not Shift: 22 → 11 , When Selector Lever 2 → 1 Position, AT-626 . □ 20. Vehicle Does Not Decelerate By Engine Brake, AT-627 . □ SELF-DIAGNOSTIC PROCEDURE — Mark detected items. 				
		 □ Park/neutral position (PNP) switch, AT-487. □ A/T fluid temperature sensor, AT-493. □ Vehicle speed sensor·A/T (Revolution sensor), AT-499. □ Engine speed signal, AT-504. □ Turbine revolution sensor, AT-581. □ Torque converter clutch solenoid valve, AT-530. □ Line pressure solenoid valve, AT-543. □ Shift solenoid valve A, AT-549. □ Shift solenoid valve B, AT-554. □ Throttle position sensor [accelerator pedal position (APP) sensor], AT-559. □ Overrun clutch solenoid valve, AT-564. □ Park/neutral position (PNP), overdrive control and throttle position sensor [accelerator pedal position (APP) sensor] circuit checks, AT-627. □ A/T fluid temperature sensor and TCM power source, AT-484. □ Vehicle speed sensor·MTR, AT-576. □ A/T communication line, AT-586. □ Control unit (RAM), Control unit (ROM), AT-589. □ Control unit (EEP ROM), AT-591. □ Battery 				
		□ Others				
5.	□F	or self-diagnosis NG items, inspect each component. Repair or replace the damaged parts.	AT-639			
3 .	□P	erform all ROAD TEST and re-mark required procedures.	<u>AT-454</u>			
7.		erform DTC CONFIRMATION PROCEDURE for following MIL indicating items and check out NG items. er to EC-697 . "Emission-related Diagnostic Information". DTC (P0731) A/T 1st gear function, AT-508 .	EC-697			
		□ DTC (P0732) A/T 2nd gear function, <u>AT-513</u> . □ DTC (P0733) A/T 3rd gear function, <u>AT-518</u> . □ DTC (P0734) A/T 4th gear function, <u>AT-523</u> . □ DTC (P0744) A/T TCC S/V function (lock-up), <u>AT-535</u> .				

[RE4F04B]

8.	□ Perform the Diagnostic Procedures for all remaining items marked NG. Repair or replace the damaged parts. Refer to the Symptom Chart when you perform the procedures. (The chart also shows some other possible symptoms and the component inspection orders.)	AT-431 AT-438
9.	☐ Erase DTC from TCM and ECM memories.	AT-428

Work Flow HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

ECS0062P

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate. In general, each customer feels differently about a problem. It is important to fully understand the symptoms or conditions for a customer complaint.

Make good use of the two sheets provided, <u>AT-444, "Information from Customer"</u> and <u>AT-445, "Diagnostic Worksheet"</u>, to perform the best troubleshooting possible.

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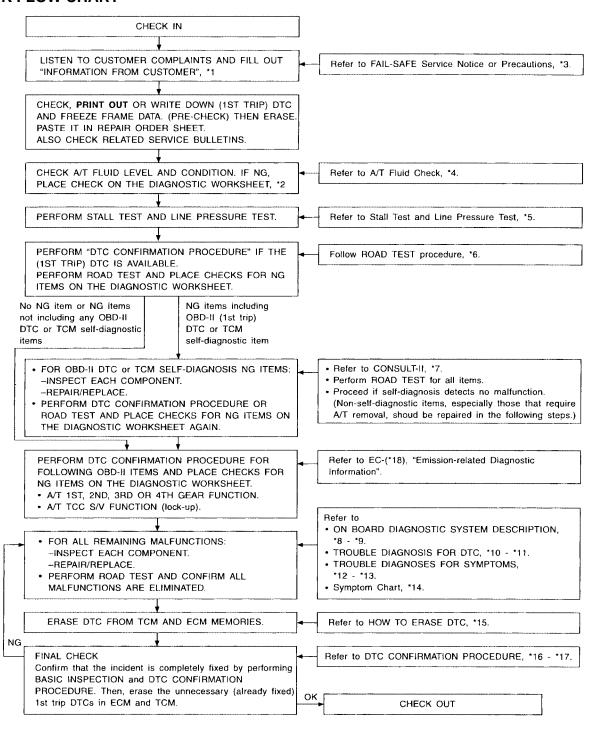
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WORK FLOW CHART



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*1:	<u>AT-444</u>	*2:	<u>AT-445</u>	*3:	AT-399
*4:	<u>AT-449</u>	*5:	<u>AT-449</u> , <u>AT-453</u>	*6:	<u>AT-454</u>
*7:	<u>AT-430</u>	*8:	<u>AT-426</u>	*9:	<u>AT-443</u>
*10:	<u>AT-487</u>	*11:	<u>AT-593</u>	*12:	<u>AT-593</u>
*13:	AT-632	*14:	<u>AT-470</u>	*15:	<u>AT-428</u>
*16:	AT-487	*17:	AT-589	*18:	EC-697

[RE4F04B]

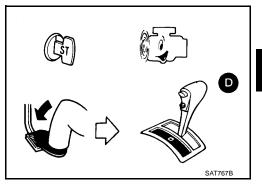
TROUBLE DIAGNOSIS - BASIC INSPECTION

A/T Fluid Check FLUID LEAKAGE CHECK

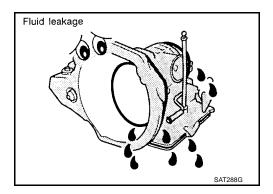
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ECS0062Q

- 1. Clean area suspected of leaking. For example, mating surface of converter housing and transmission case.
- 2. Start engine, apply foot brake, place selector lever in D position and wait a few minutes.
- 3. Stop engine.



4. Check for fresh leakage.



FLUID CONDITION CHECK

Fluid color	Suspected problem
Dark or black with burned odor	Wear of frictional material
Milky pink	Water contamination — Road water entering through filler tube or breather
Varnished fluid, light to dark brown and tacky	Oxidation — Over or under filling, — Overheating



FLUID LEVEL CHECK

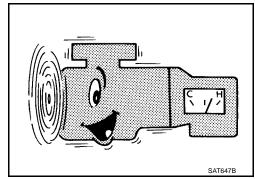
Refer to MA-31, "Checking A/T Fluid" .

Stall Test STALL TEST PROCEDURE

 Check A/T fluid and engine oil levels. If necessary, add fluid and oil

2. Drive vehicle for approx. 10 minutes or until fluid and oil reach operating temperature.

ATF operating temperature :50 - 80°C (122 - 176°F)



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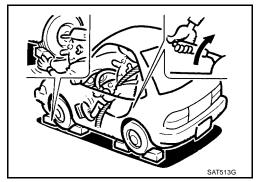
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ECS0062R

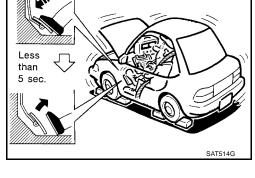
- Set parking brake and block wheels.
- 4. Install a tachometer where it can be seen by driver during test.
 - It is good practice to mark the point of specified engine rpm on indicator.

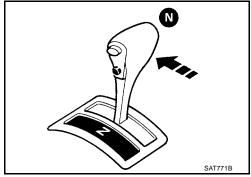


- 5. Start engine, apply foot brake, and place selector lever in D position.
- Accelerate to wide open throttle gradually while applying foot brake.
- 7. Quickly note the engine stall revolution and immediately release throttle.
 - During test, never hold throttle wide open for more than 5 seconds.

Stall revolution :2,350 - 2,800 rpm

- 8. Move selector lever to N position.
- 9. Cool off ATF.
 - Run engine at idle for at least one minute.
- Repeat steps 5 through 9 with selector lever in 2, 1 and R positions.





JUDGEMENT OF STALL TEST

The test result and possible damaged components relating to each result are shown in the illustrations on next page.

In order to pinpoint the possible damaged components, follow the procedure shown in $\underline{\text{AT-448}}$, "WORK FLOW CHART".

NOTE:

Stall revolution is too high in D, 2 or 1 position:

- Slippage occurs in 1st gear but not in 2nd and 3rd gears. Low one-way clutch slippage
- Slippage occurs in the following gears:
 1st through 3rd gears in D position and engine brake functions with overdrive control switch set to OFF.
 1st and 2nd gears in 2 position and engine brake functions with accelerator pedal released (fully closed throttle). Forward clutch or forward one-way clutch slippage

Stall revolution is too high in R position:

- Engine brake does not function in 1 position. Low & reverse brake slippage
- Engine brake functions in 1 position. Reverse clutch slippage

Stall revolution within specifications:

 Vehicle does not achieve speed of more than 80 km/h (50 MPH). One-way clutch seizure in torque converter housing

CAUTION:

Be careful since automatic fluid temperature increases abnormally.

Slippage occurs in 3rd and 4th gears in D position. High clutch slippage

[RE4F04B]

- Slippage occurs in 2nd and 4th gear in D position. Brake band slippage
- Engine brake does not function in 2nd and 3rd gears in D position, 2nd gear in 2 position, and 1st gear in 1 position with overdrive control switch set to OFF. Overrun clutch slippage

Stall revolution less than specifications:

Poor acceleration during starts. One-way clutch seizure in torque converter

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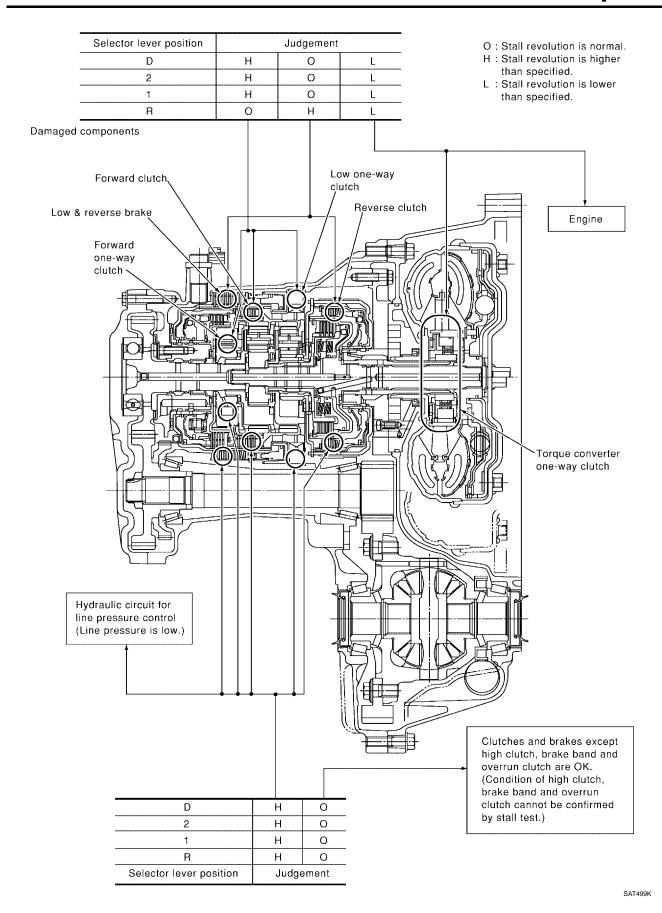
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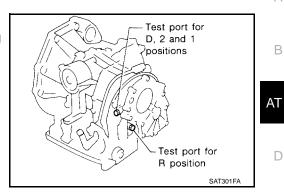


[RE4F04B]

Line Pressure Test LINE PRESSURE TEST PORTS

Location of line pressure test ports are shown in the illustration.

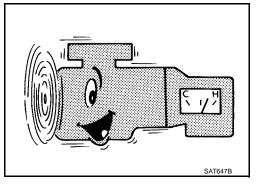
Always replace pressure plugs as they are self-sealing bolts.



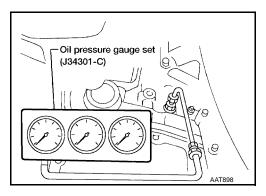
LINE PRESSURE TEST PROCEDURE

- 1. Check A/T fluid and engine oil levels. If necessary, add fluid and
- 2. Drive vehicle for approx. 10 minutes or until fluid and oil reach operating temperature.

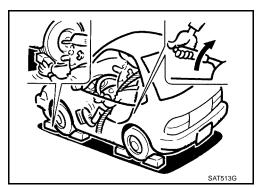
ATF operating temperature :50 - 80°C (122 -176°F)



Install pressure gauge to corresponding line pressure port.



- 4. Set parking brake and block wheels.
 - Continue to depress brake pedal fully while line pressure test is being performed at stall speed.



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[RE4F04B]

- 5. Start engine and measure line pressure at idle and stall speed.
 - When measuring line pressure at stall speed, follow the stall test procedure.

AT-453, "Line Pressure : Refer to SDS, AT-748, Test" : Refer to SDS, AT-748, "Line Pressure"



JUDGEMENT OF LINE PRESSURE TEST

	Judgement	Suspected parts	
	Line pressure is low in all positions.	Oil pump wear	
		Control piston damage	
		 Pressure regulator valve or plug sticking 	
		 Spring for pressure regulator valve damaged 	
		 Fluid pressure leakage between oil strainer and pressure regulator valve 	
		Clogged strainer	
	Line pressure is low in particular position.	Fluid pressure leakage between manual valve and particular clutch	
At idle		 For example, line pressure is: Low in R and 1 positions, but Normal in D and 2 positions. Therefore, fluid leakage exists at or around low and reverse brake circuit. Refer to AT-410, "CLUTCH AND BAND CHART". 	
	Line pressure is high.	A/T fluid temperature sensor damaged	
		Line pressure solenoid valve sticking	
		Short circuit of line pressure solenoid valve circuit	
		Pressure modifier valve sticking	
		Pressure regulator valve or plug sticking	
		Open in dropping resistor circuit	
	Line pressure is low.	Line pressure solenoid valve sticking	
		Short circuit of line pressure solenoid valve circuit	
At stall speed		Pressure regulator valve or plug sticking	
		Pressure modifier valve sticking	
		Pilot valve sticking	

Road Test DESCRIPTION

ECS0062T

- The purpose of the test is to determine overall performance of A/ T and analyze causes of problems.
- The road test consists of the following three parts:
- 1. Check before engine is started
- 2. Check at idle
- 3. Cruise test

NOAD TEST PROCEDURE	
1. Check before engine is started	l.
\Box	
2. Check at idle.	
\bigcirc	
3. Cruise test.	
SA	T786A

[RE4F04B]

 Before road test, familiarize yourself with all test procedures and items to check.

Conduct tests on all items until specified symptom is found. Troubleshoot items which check out No Good after road test. Refer to AT-426, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION" and AT-593, "TROUBLE DIAGNOSIS FOR SYMPTOMS".



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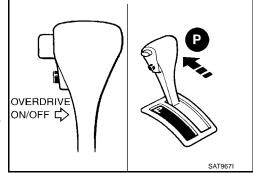
1. CHECK BEFORE ENGINE IS STARTED

1. CHECK O/D OFF INDICATOR LAMP

- Park vehicle on flat surface.
- 2. Move selector lever to P position.
- Turn ignition switch to OFF position. Wait at least 5 seconds.
- Turn ignition switch to ON position. (Do not start engine.)
- Does O/D OFF indicator lamp come on for about 2 seconds? Yes or No

Yes >> GO TO 2.

>> Stop ROAD TEST. Go to AT-597, "1. O/D OFF Indicator No Lamp Does Not Come On".



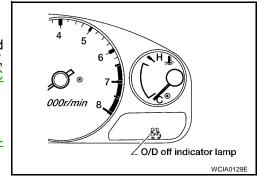
2. CHECK O/D OFF INDICATOR LAMP

Does O/D OFF indicator lamp flicker for about 8 seconds? Yes or No

>> TCM is in fail-safe mode. Perform self-diagnosis and Yes check NG items on the DIAGNOSTIC WORKSHEET, AT-445 . Refer to AT-439, "TCM SELF-DIAGNOSTIC

PROCEDURE (NO TOOLS)". No >> 1. Turn ignition switch to OFF position.

- 2. Perform self-diagnosis and note NG items. Refer to AT-439, "TCM SELF-DIAGNOSTIC PROCE-**DURE (NO TOOLS)**".
- 3. Go to AT-456, "2. CHECK AT IDLE".



2. CHECK AT IDLE

1. CHECK ENGINE START

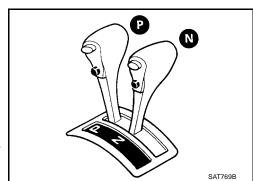
- 1. Park vehicle on flat surface.
- 2. Move selector lever to P position.
- Turn ignition switch to OFF position.
- Turn ignition switch to START position.
- 5. Is engine started?

Yes or No

Yes >> Stop ROAD TEST.

No

>> Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-598, "2. Engine Cannot Be Started In P and N Position" .



2. CHECK ENGINE START

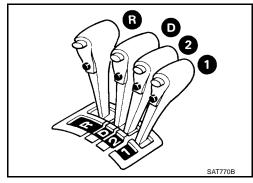
- 1. Turn ignition switch to ACC position.
- 2. Move selector lever to D, 1, 2 or R position.
- 3. Turn ignition switch to START position.
- 4. Is engine started?

Yes or No

Yes

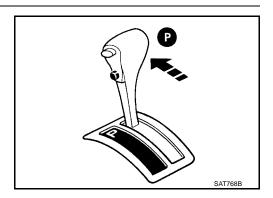
>> Stop ROAD TEST. Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-598, "2. Engine Cannot Be Started In P and N Position".

No >> GO TO 3.



3. CHECK VEHICLE MOVE

- 1. Move selector lever to P position.
- 2. Turn ignition switch to OFF position.
- 3. Release parking brake.



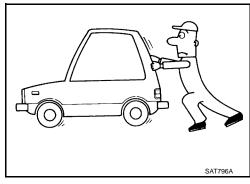
- 4. Push vehicle forward or backward.
- 5. Does vehicle move when it is pushed forward or backward?
- 6. Apply parking brake.

Yes or No

Yes

>> Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-600, "3. In P Position, Vehicle Moves Forward or Backward When Pushed". Continue ROAD TEST.

No >> GO TO 4.



4. CHECK VEHICLE MOVE

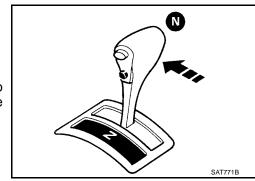
- 1. Start engine.
- 2. Move selector lever to N position.
- 3. Release parking brake.
- 4. Does vehicle move forward or backward?

Yes or No

Yes

>> Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-600, "4. In N Position, Vehicle Moves" . Continue ROAD TEST.

No >> GO TO 5.



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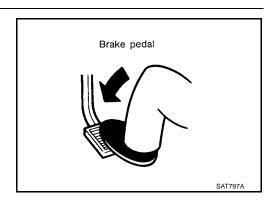
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5. CHECK SHIFT LOCK

1. Apply foot brake.

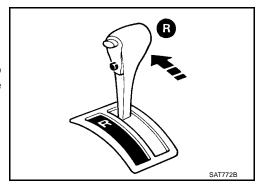


- 2. Move selector lever to R position.
- 3. Is there large shock when changing from N to R position?

Yes or No

Yes >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-602, "5. Large Shock N \to R Position" . Continue ROAD TEST.

No >> GO TO 6.



6. CHECK VEHICLE MOVE

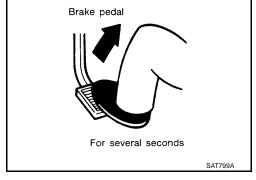
- Release foot brake for several seconds.
- 2. Does vehicle creep backward when foot brake is released?

Yes or No

Yes >> GO TO 7.

No

>> Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-604, "6. Vehicle Does Not Creep Backward In R Position". Continue ROAD TEST.



7. CHECK VEHICLE MOVE

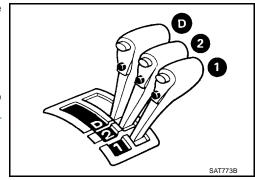
- 1. Move selector lever to D, 2 and 1 positions and check if vehicle creeps forward.
- 2. Does vehicle creep forward in all three positions?

Yes or No

Yes \rightarrow Go to AT-459, "3. CRUISE TEST".

No

>> Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-607, "7. Vehicle Does Not Creep Forward in D, 2 or 1 Position". Continue ROAD TEST.



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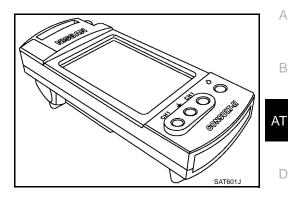
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3. CRUISE TEST

Check all items listed in Parts 1 through 3.



(II) With CONSULT-II

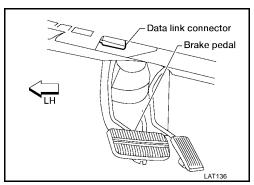
- Using CONSULT-II, conduct a cruise test and record the result.
- Print the result and ensure that shifts and lock-ups take place as per Shift Schedule. Refer to AT-747, "Shift Schedule"

CONSULT-II Setting Procedure

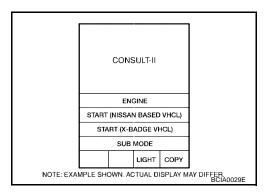
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carries out CAN communication.

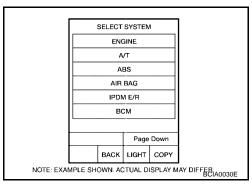
With the ignition switch OFF, connect CONSULT-II and CON-SULT-II CONVERTER to the data link connector, then turn ignition switch ON.



2. Touch "START (NISSAN BASED VHCL)".

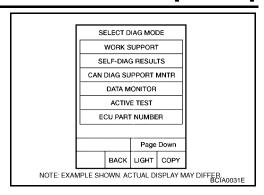


3. Touch "A/T".

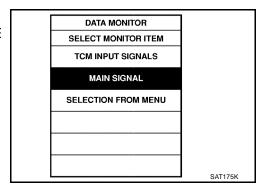


[RE4F04B]

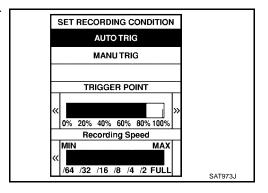
4. Touch "DATA MONITOR".



- 5. Touch "MAIN SIGNAL" or "TCM INPUT SIGNALS".
- 6. See "NUMERICAL DISPLAY", "BARCHART DISPLAY" or "LINE GRAPH DISPLAY".



- 7. Touch "SETTING" to set recording condition ("AUTO TRIG" or "MANU TRIG") and touch "BACK".
- 8. Touch "START".



9. When performing cruise test, touch "RECORD".

DATA MOI	NITOR	
MONITOR	NO DTC	
ENGINE SPEED	XXX rpm	
GEAR	xxx	
SLCT LVR POSI	N/P	
VEHICLE SPEED	XXX km/h	
THROTTLE POSI	xxx	
LINE PRES DTY	XX%	
TCC S/V DUTY	XX%	
SHIFT S/V A	xx	
SHIFT S/V B	ХХ	
		SAT134k

[RE4F04B]

10. After finishing cruise test part 1, touch "STOP".

DATA MON	IITOR	
Recording Data X	M DTC DETECTED	
ENGINE SPEED	XXX rpm	
GEAR	xxx	
SLCT LVR POSI	N/P	
VEHICLE SPEED	XXX km/h	
THROTTLE POSI	XXX	
LINE PRES DTY	XX%	
TCC S/V DUTY	XX%	
SHIFT S/V A	XX	
SHIFT S/V B	XX	
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11. Touch "STORE" and touch "BACK".

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- 12. Touch "DISPLAY".
- 13. Touch "PRINT".
- 14. Check the monitor data printed out.
- 15. Continue cruise test part 2 and 3.

Trigger	VHCL S/SEN A/T	VHCL S/SEN MTR	THRTL POSI SEN	
1	km/h	km/h	V	
				SAT975J

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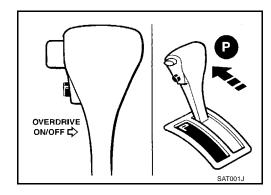
Cruise Test — Part 1

1. CHECK STARTING GEAR (D1) POSITION

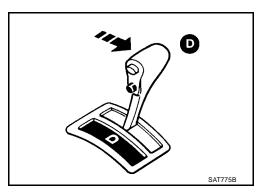
1. Drive vehicle for approx. 10 minutes to warm engine oil and ATF up to operating temperature.

:50 - 80°C (122 - 176°F) ATF operating tempera-

- 2. Park vehicle on flat surface.
- 3. Set overdrive control switch to ON position.
- 4. Move selector lever to P position.
- 5. Start engine.



Move selector lever to D position.



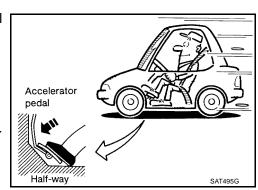
- 7. Accelerate vehicle by constantly depressing accelerator pedal half-way.
- 8. Does vehicle start from D1?
 - **Read gear position.**

Yes or No

Yes >> GO TO 2.

No

>> Go to AT-609, "8. Vehicle Cannot Be Started From D1" Continue ROAD TEST.



[RE4F04B]

2. CHECK SHIFT UP (D1 TO D2)

Does A/T shift from D₁ to D₂ at the specified speed?

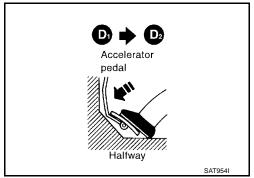
Read gear position, throttle opening and vehicle speed.

Specified speed when :Refer to AT-747, "Shift shifting from D₁ to D₂ Schedule".

Yes or No

Yes >> GO TO 3.

Nο >> Go to AT-612, "9. A/T Does Not Shift: D1 \rightarrow D2 or Does Not Kickdown: D4 \rightarrow D2". Continue ROAD TEST.



3. CHECK SHIFT UP (D2 TO D3)

Does A/T shift from D₂ to D₃ at the specified speed?

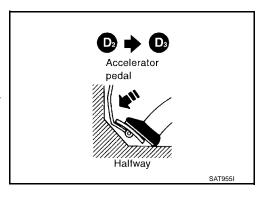
Read gear position, throttle opening and vehicle speed.

:Refer to AT-747, "Shift Specified speed when Schedule". shifting from D₂ to D₃

Yes or No

Yes >> GO TO 4.

>> Go to AT-614, "10. A/T Does Not Shift: D2 \rightarrow D3" . Con-No tinue ROAD TEST.



4. CHECK SHIFT UP (D3 TO D4)

Does A/T shift from D₃ to D₄ at the specified speed?

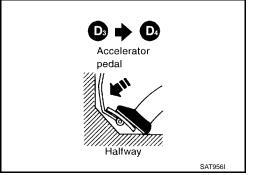
Read gear position, throttle opening and vehicle speed.

:Refer to AT-747, "Shift Specified speed when shifting from D₃ to D₄ Schedule".

Yes or No

>> GO TO 5. Yes

Nο >> Go to AT-617, "11. A/T Does Not Shift: D3 \rightarrow D4" . Continue ROAD TEST.



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5. CHECK LOCK-UP (D4 TO D4 L/U)

Does A/T perform lock-up at the specified speed?

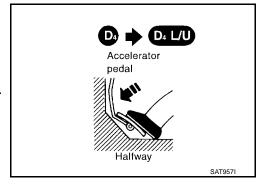
Read vehicle speed, throttle opening when lock-up duty becomes 94%.

Specified speed when lock-up occurs: Refer to AT-747, "Shift Schedule".

Yes or No

Yes >> GO TO 6.

No >> Go to AT-619, "12. A/T Does Not Perform Lock-up" . Continue ROAD TEST.



6. CHECK HOLD LOCK-UP

Does A/T hold lock-up condition for more than 30 seconds?

Yes or No

Yes >> GO TO 7.

No >> Go to AT-620, "13. A/T Does Not Hold Lock-up Condition".

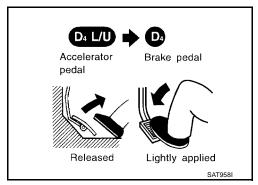
7. CHECK SHIFT DOWN (D4 L/U TO D4)

- 1. Release accelerator pedal.
- 2. Is lock-up released when accelerator pedal is released?

Yes or No

Yes >> GO TO 8.

No >> Go to <u>AT-621, "14. Lock-up Is Not Released"</u>. Continue ROAD TEST.



8. CHECK SHIFT DOWN (D4 TO D3)

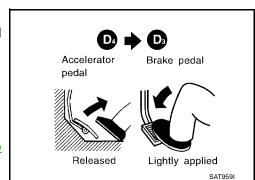
- 1. Decelerate vehicle by applying foot brake lightly.
- Does engine speed return to idle smoothly when A/T is shifted from D4 to D3?
 - Read gear position and engine speed.

Yes or No

Yes >> 1. Stop vehicle.

2. Go to AT-465, "Cruise Test — Part 2".

No >> Go to AT-622, "15. Engine Speed Does Not Return To Idle (Light Braking $D_4 \rightarrow D_3$)". Continue ROAD TEST.



[RE4F04B]

Cruise Test — Part 2

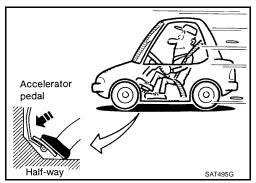
1. CHECK STARTING GEAR (D1) POSITION

- 1. Confirm overdrive control switch is in ON position.
- 2. Confirm selector lever is in D position.
- 3. Accelerate vehicle by half throttle again.
- 4. Does vehicle start from D1?
 - Read gear position.

Yes or No

Yes >> GO TO 2.

No >> Go to AT-624, "16. Vehicle Does Not Start From D1" .
Continue ROAD TEST.



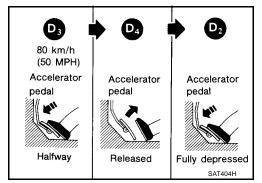
2. CHECK SHIFT UP AND SHIFT DOWN (D3 TO D4 TO D2)

- 1. Accelerate vehicle to 80 km/h (50 MPH) as shown in illustration.
- 2. Release accelerator pedal and then quickly depress it fully.
- 3. Does A/T shift from D4 to D2 as soon as accelerator pedal is depressed fully?
 - Read gear position and throttle opening.

Yes or No

Yes >> GO TO 3.

No >> Go to AT-612, "9. A/T Does Not Shift: $D1 \rightarrow D2$ or Does Not Kickdown: $D4 \rightarrow D2$ ". Continue ROAD TEST.



3. CHECK SHIFT UP (D2 TO D3)

Does A/T shift from D₂ to D₃ at the specified speed?

Read gear position, throttle opening and vehicle speed.

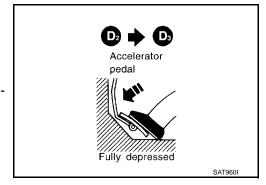
Specified speed when :Refer to AT-747, "Shift shifting from D2 to D3 Schedule".

Yes or No

No

Yes >> GO TO 4.

>> Go to AT-614, "10. A/T Does Not Shift: $D_2 \rightarrow D_3$ " . Continue ROAD TEST.



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[RE4F04B]

4. CHECK SHIFT UP (D $_3$ TO D $_4$) AND ENGINE BRAKE

Release accelerator pedal after shifting from D2 to D3.

Does A/T shift from D3 to D4 and does vehicle decelerate by engine brake?

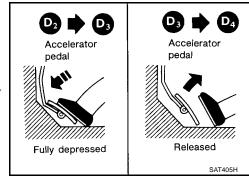
Read gear position, throttle opening and vehicle speed.

Yes or No

Yes >> 1. Stop vehicle.

2. Go to AT-467, "Cruise Test — Part 3".

No >> Go to <u>AT-617, "11. A/T Does Not Shift: D3 \rightarrow D4" . Continue ROAD TEST.</u>



[RE4F04B]

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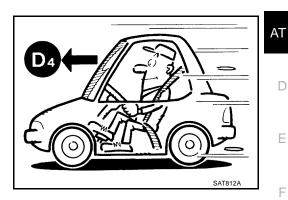
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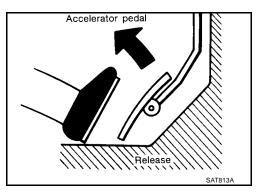
Cruise Test — Part 3

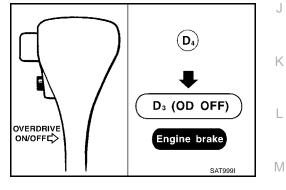
1. VEHICLE SPEED (D4) POSITION

- 1. Confirm overdrive control switch is in ON position.
- 2. Confirm selector lever is in D position.
- 3. Accelerate vehicle using half-throttle to D4.



- 4. Release accelerator pedal.
- 5. Set overdrive control switch to OFF position while driving in D4.
- 6. Does A/T shift from D4 to D3 (O/D OFF)?
 - (III) Read gear position and vehicle speed.





Yes or No

Yes >> GO TO 2.

No >> Go to AT-625, "17. A/T Does Not Shift: D4 \rightarrow D3 , When Overdrive Control Switch ON \rightarrow OFF" . Continue ROAD TEST.

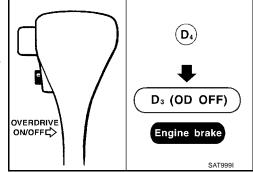
2. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

Yes >> GO TO 3.

No >> Go to AT-622, "15. Engine Speed Does Not Return To Idle (Light Braking $D4 \rightarrow D3$)". Continue ROAD TEST.



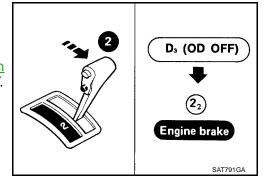
$3. \ \mathsf{CHECK} \ \mathsf{SHIFT} \ \mathsf{DOWN} \ (\mathsf{D}_3 \ \ \mathsf{TO} \ \mathsf{D}_2 \,)$

- 1. Move selector lever from D to 2 position while driving in D3 (O/D OFF).
- 2. Does A/T shift from D3 (O/D OFF) to 22?
 - Read gear position.

Yes or No

Yes >> GO TO 4.

No >> Go to AT-625, "18. A/T Does Not Shift: D3 \rightarrow 22 , When Selector Lever D \rightarrow 2 Position" . Continue ROAD TEST.



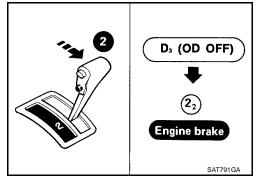
4. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

Yes >> GO TO 5.

No >> Go to AT-622, "15. Engine Speed Does Not Return To Idle (Light Braking D4 \rightarrow D3)". Continue ROAD TEST.



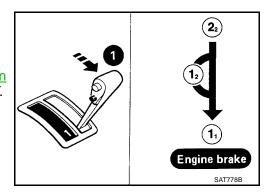
5. CHECK SHIFT DOWN (22 TO 11)

- 1. Move selector lever from 2 to 1 position while driving in 22.
- 2. Does A/T shift from 22 to 11 position?
 - Read gear position.

Yes or No

Yes >> GO TO 6.

No >> Go to AT-626, "19. A/T Does Not Shift: $22 \rightarrow 11$, When Selector Lever $2 \rightarrow 1$ Position". Continue ROAD TEST.



TROUBLE DIAGNOSIS - BASIC INSPECTION

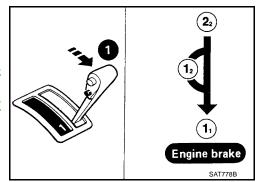
[RE4F04B]

6. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake? Yes or No

Yes >> 1. Stop vehicle.

- 2. Perform self-diagnosis. Refer to <u>AT-439, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)"</u>.
- No >> Go to <u>AT-627</u>, "20. <u>Vehicle Does Not Decelerate By Engine Brake"</u>. Continue ROAD TEST.



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[RE4F04B]

TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

PFP:00000

Symptom Chart

ECS0062U

Numbers are arranged in order of inspection. Perform inspections starting with number one and work up.

Items	Symptom	Condition	Diagnostic Item	Reference Page
			Throttle position sensor {accelerator pedal position (APP) sensor]	<u>AT-559</u>
			Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-499, AT-576
	Torque converter	ON vehicle	3. Engine speed signal	AT-504
	is not locked up.		4. A/T fluid temperature sensor	AT-569
			5. Line pressure test	AT-453
			6. Torque converter clutch solenoid valve	AT-530
			7. Control valve assembly	AT-639
		OFF vehicle	8. Torque converter	<u>AT-652</u>
			1. Fluid level	AT-449
No Lock-up Engagement/ TCC Inoperative			Throttle position sensor {accelerator pedal position (APP) sensor]	AT-559
. CCoperac	Torque converter clutch piston slip.	ON vehicle	3. Line pressure test	<u>AT-453</u>
			4. Torque converter clutch solenoid valve	AT-530
			5. Line pressure solenoid valve	<u>AT-543</u>
			6. Control valve assembly	<u>AT-639</u>
		OFF vehicle	7. Torque converter	AT-652
	Lock-up point is extremely high or	ON vehicle	Throttle position sensor {accelerator pedal position (APP) sensor]	AT-559
			Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-499, AT-576
	low.		3. Torque converter clutch solenoid valve	AT-530
			4. Control valve assembly	AT-639
			1. Engine idling rpm	EC-726
			Throttle position sensor {accelerator pedal position (APP) sensor]	AT-559
			3. Line pressure test	AT-453
	Sharp shock in	ON vehicle	4. A/T fluid temperature sensor	AT-569
Shift Shock	shifting from N to D position.		5. Engine speed signal	AT-504
	2 200		6. Line pressure solenoid valve	<u>AT-543</u>
			7. Control valve assembly	AT-639
			8. Accumulator N-D	AT-652
		OFF vehicle	9. Forward clutch	AT-697

[RE4F04B]					
Items	Symptom	Condition	Diagnostic Item	Reference Page	
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	Α
	T		2. Line pressure test	AT-453	
	Too sharp a shock in change	ON vehicle	3. Accumulator servo release	<u>AT-652</u>	- E
	from D ₁ to D ₂ .		4. Control valve assembly	AT-639	
			5. A/T fluid temperature sensor	AT-569	АТ
		OFF vehicle	6. Brake band	AT-652	
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	
	Tanahama	ON vehicle	2. Line pressure test	AT-453	
	Too sharp a shock in change		3. Control valve assembly	AT-639	-
	from D ₂ to D ₃ .		4. A/T fluid temperature sensor	AT-493	- E
		055 111	5. High clutch	AT-692	
		OFF vehicle	6. Brake band	AT-652	F
Shift Shock			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	
		ON vehicle	2. Line pressure test	AT-453	
	Too sharp a		3. Control valve assembly	AT-639	
	shock in change from D3 to D4.		4. A/T fluid temperature sensor	AT-493	
	10.1120 10.211	OFF vehicle	5. Brake band	AT-652	
			6. Overrun clutch	AT-697	
			7. Forward one-way clutch	AT-652	
	Gear change shock felt during deceleration by	ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	
			2. Line pressure test	AT-453	
	releasing acceler-		3. Overrun clutch solenoid valve	AT-564	
	ator pedal.		4. Control valve assembly	AT-639	
	Large shock	ON vehicle	1. Control valve assembly	AT-639	-
	to 11 in 1 position.	ON vehicle	2. Low & reverse brake	AT-703	l
	Too high a gear		Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	
	change point from D1 to D2, from D2 to D3, from	ON vehicle	2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<u>AT-499, AT-576</u>	Λ
	D3 to D4.		3. Shift solenoid valve A	<u>AT-549</u>	_
			4. Shift solenoid valve B	<u>AT-554</u>	_
Improper Shift Timing	Gear change	ON vehicle	1. Fluid level	AT-449	=,
9	directly from D1	311 10111010	2. Accumulator servo release	AT-652	<u>-</u>
	to D ₃ occurs.	OFF vehicle	3. Brake band	AT-652	=,
	Too high a change point from	ONLOGE	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	_
	D4 to D3 , from D3 to D2 , from D2 to D1 .	ON vehicle	2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-499, AT-576	

				[KE4FU4B
Items	Symptom	Condition	Diagnostic Item	Reference Page
	Kickdown does		Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559
	not operate when depressing pedal in D4 within kick-	ON vehicle	2. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	<u>AT-499, AT-576</u>
	down vehicle		3. Shift solenoid valve A	<u>AT-549</u>
	speed.		4. Shift solenoid valve B	AT-554
	Kickdown oper- ates or engine		Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<u>AT-499</u> , <u>AT-576</u>
Improper Shift Timing	overruns when depressing pedal in D4 beyond	ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559
riming	kickdown vehicle		3. Shift solenoid valve A	AT-549
	speed limit.		4. Shift solenoid valve B	AT-554
	Gear change from 22 to 23 in 2 position.	ON vehicle	Park/neutral position (PNP) switch adjust- ment	AT-641
			2. Control cable adjustment	AT-642
	Gear change from 11 to 12 in 1	ON vehicle	Park/neutral position (PNP) switch adjust- ment	AT-641
	position.		2. Control cable adjustment	AT-642
		ON vehicle	1. Fluid level	AT-449
	Failure to change gear from D4 to D3.		Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559
			3. Overrun clutch solenoid valve	AT-564
			4. Shift solenoid valve A	<u>AT-549</u>
			5. Line pressure solenoid valve	AT-543
			6. Control valve assembly	AT-639
		OFF vehicle	7. Brake band	AT-652
			8. Overrun clutch	AT-697
			1. Fluid level	AT-449
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559
	Failure to change gear from D ₃ to	ON vehicle	3. Shift solenoid valve A	AT-549
No Down Shift	D ₂ or from D ₄ to		4. Shift solenoid valve B	AT-554
	D2 .		5. Control valve assembly	AT-639
		OFF vehicle	6. High clutch	AT-692
		3.1. VOITIOIO	7. Brake band	AT-652
			1. Fluid level	AT-449
		ON 1::	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559
	Failure to change	ON vehicle	3. Shift solenoid valve A	AT-549
	gear from D ₂ to D ₁ or from D ₃ to		4. Shift solenoid valve B	AT-554
	D1 .		5. Control valve assembly	AT-639
			6. Low one-way clutch	AT-652
		OFF vehicle	7. High clutch	<u>AT-692</u>
			8. Brake band	<u>AT-652</u>

				[RE4F04B]	
Items	Symptom	Condition	Diagnostic Item	Reference Page	
	Failure to change		Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	Α
	from D ₃ to 2 ₂ when changing	ON vehicle	2. Shift solenoid valve B	<u>AT-554</u>	D
	lever into 2 posi-		3. Control valve assembly	AT-639	В
	tion. AT-625		4. Control cable adjustment	<u>AT-642</u>	
	<u>A1-025</u>	OFF vehicle	5. Brake band	AT-652	AT
No Down Shift			Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-499, AT-576	
		ON vehicle	2. Shift solenoid valve A	<u>AT-549</u>	D
	Does not change from 12 to 11 in 1		3. Control valve assembly	<u>AT-639</u>	
	position.		4. Overrun clutch	<u>AT-697</u>	
		OFF vehicle	5. Brake band	AT-652	
			6. Low & reverse brake	<u>AT-703</u>	
			Control cable adjustment	<u>AT-642</u>	F
			2. Shift solenoid valve A	<u>AT-549</u>	
			3. Control valve assembly	<u>AT-639</u>	
	Failure to change gear from D1 to D2.	ON vehicle OFF vehicle	4. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-499, AT-576	G
			5. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	Н
			6. Brake band	AT-652	
No Up Shift			Control cable adjustment	AT-642	
			2. Shift solenoid valve B	<u>AT-554</u>	1
			3. Control valve assembly	AT-639	=
	Failure to change gear from D2 to	ON vehicle	4. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-499, AT-576	J
	D3 .		5. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	K
		055 111	6. High clutch	AT-692	
		OFF vehicle	7. Brake band	AT-652	
			Park/neutral position (PNP) switch adjustment	AT-641	L
			2. Overdrive control switch	<u>AT-627</u>	
			3. Shift solenoid valve A	<u>AT-549</u>	N
No Up Shift	Failure to change gear from D3 to D4.	ON vehicle	4. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-499, AT-576	
			5. Throttle position sensor [accelerator pedal position (APP) sensor	AT-641	
			6. A/T fluid temperature sensor	AT-569	
		OFF vehicle	7. Brake band	AT-652	

Items	Symptom	Condition	Diagnostic Item	Reference Page
Keme			1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559
			Park/neutral position (PNP) switch adjust- ment	AT-641
			3. Overdrive control switch	AT-627
	A/T does not shift to D4 when driv-	ON vehicle	Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-499, AT-576
No Up Shift	ing with over-		5. Shift solenoid valve A	AT-549
	drive control switch ON.		6. Overrun clutch solenoid valve	AT-564
	SWILCH OIV.		7. Control valve assembly	AT-639
			8. A/T fluid temperature sensor	AT-569
			9. Line pressure solenoid valve	AT-543
			10. Brake band	AT-652
		OFF vehicle	11. Overrun clutch	AT-697
			Control cable adjustment	AT-642
		ON vehicle OFF vehicle	2. Line pressure test	<u>AT-453</u>
	Vehicle will not		3. Stall test	<u>AT-449</u>
	run in R position		4. Line pressure solenoid valve	AT-543
	(but runs in D, 2 and 1 positions).		5. Control valve assembly	AT-639
	Clutch slips.		6. Reverse clutch	<u>AT-689</u>
Slips/Will Not	Very poor acceleration.		7. High clutch	AT-692
Engage	AT-604		8. Forward clutch	AT-697
			9. Overrun clutch	AT-697
			10. Low & reverse brake	<u>AT-703</u>
	Vehicle will not	ON vehicle	Control cable adjustment	AT-642
	run in D and 2 positions (but runs in 1 and R positions).	OFF vehicle	2. Low one-way clutch	AT-652
			1. Fluid level	AT-449
			2. Stall test	AT-449
		ON 1:1	3. Line pressure test	AT-453
	Vehicle will not run in D, 1, 2	ON vehicle	4. Line pressure solenoid valve	AT-543
	positions (but		5. Control valve assembly	AT-639
Slips/Will Not Engage	runs in R position). Clutch slips.		6. Accumulator N-D	<u>AT-652</u>
Lilyaye	Very poor accel-		7. Reverse clutch	<u>AT-689</u>
	eration. AT-607		8. High clutch	AT-692
	<u> A1-007</u>	OFF vehicle	9. Forward clutch	<u>AT-697</u>
			10. Forward one-way clutch	<u>AT-652</u>
			11. Low one-way clutch	AT-652

[RE4F04B]

Items	Symptom	Condition	Diagnostic Item	Reference Page	
			1. Fluid level	<u>AT-449</u>	_
			2. Control cable adjustment	<u>AT-642</u>	_
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	_
			4. Line pressure test	AT-453	-
			5. Line pressure solenoid valve	AT-543	_
		ON vehicle	6. Control valve assembly	<u>AT-639</u>	
	Clutches or		7. Accumulator N-D	AT-652	_
	brakes slip some-		8. Shift solenoid valve A	AT-549	
	what in starting.		9. Shift solenoid valve B	<u>AT-554</u>	
			10. Overrun clutch solenoid valve	AT-564	
			11. Torque converter clutch solenoid valve	AT-530	
		OFF vehicle	12. Forward clutch	<u>AT-697</u>	_
			13. Reverse clutch	<u>AT-689</u>	
ps/Will Not			14. Low & reverse brake	<u>AT-703</u>	
ngage			15. Oil pump	AT-670	
			16. Torque converter	<u>AT-652</u>	
		ON vehicle	1. Fluid level	AT-449	_ _ -
			2. Line pressure test	AT-453	
	No creep at all.		3. Control valve assembly	<u>AT-639</u>	
	AT-604, AT-607		4. Forward clutch	AT-697	
		OFF vehicle	5. Oil pump	AT-670	
			6. Torque converter	AT-652	
			1. Fluid level	AT-449	
	Almost no shock		Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	_
	or clutches slip- ping in change	ON vehicle	3. Line pressure test	AT-453	
	from D ₁ to D ₂ .		4. Accumulator servo release	AT-652	
			5. Control valve assembly	AT-639	
		OFF vehicle	6. Brake band	AT-652	

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				[RE4F04E
Items	Symptom	Condition	Diagnostic Item	Reference Page
			1. Fluid level	AT-449
	Almost no shock	ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559
	or slipping in		3. Line pressure test	AT-453
	change from D2 to D3.		4. Control valve assembly	AT-639
		OFF vehicle	5. High clutch	AT-692
		OFF vehicle	6. Forward clutch	AT-697
			1. Fluid level	AT-449
	Almost no shock or slipping in	ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559
	change from D ₃		3. Line pressure test	<u>AT-453</u>
	to D4 .		4. Control valve assembly	AT-639
		OFF vehicle	5. Brake band	AT-652
			1. Fluid level	AT-449
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559
	Races extremely	ON vehicle	3. Line pressure test	AT-453
	fast or slips in changing from D4		4. Line pressure solenoid valve	<u>AT-543</u>
	to D3 when		5. Shift solenoid valve B	AT-549
	depressing pedal.		6. Control valve assembly	AT-639
Slips/Will Not		OFF vehicle	7. Brake band	AT-652
Engage			8. Forward clutch	AT-697
		ON vehicle	1. Fluid level	AT-449
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559
	Races extremely		3. Line pressure test	AT-453
	fast or slips in		4. Line pressure solenoid valve	<u>AT-543</u>
	changing from D4 to D2 when		5. Shift solenoid valve A	<u>AT-549</u>
	depressing pedal.		6. Shift solenoid valve B	AT-549
			7. Control valve assembly	AT-639
		OFFhisto	8. Brake band	AT-652
		OFF vehicle	9. High clutch	AT-692
			10. Forward clutch	AT-697
			1. Fluid level	AT-449
			Throttle position sensor [accelerator pedal position (APP) sensor]	<u>AT-559</u>
	Races extremely	ON vehicle	3. Line pressure test	AT-453
	fast or slips in changing from D3		4. Line pressure solenoid valve	AT-543
	to D2 when		5. Control valve assembly	AT-639
	depressing pedal.		6. Shift solenoid valve B	AT-549
		OFF vehicle	7. Brake band	AT-652
		OFF vehicle	8. High clutch	AT-692

				[RE4F04B]	-
Items	Symptom	Condition	Diagnostic Item	Reference Page	-
			1. Fluid level	AT-449	- A
			Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	- D
			3. Line pressure test	AT-453	- B
	Races extremely	ON vehicle	4. Line pressure solenoid valve	AT-543	-
	fast or slips in changing from D4		5. Shift solenoid valve A	<u>AT-549</u>	AT
	or D ₃ to D ₁ when		6. Shift solenoid valve B	AT-549	=
	depressing pedal.		7. Control valve assembly	AT-639	
			8. Forward clutch	AT-697	- D
		OFF vehicle	9. Forward one-way clutch	AT-652	_
Slips/Will Not			10. Low one-way clutch	AT-652	E
Engage			1. Fluid level	<u>AT-449</u>	=
			2. Control cable adjustment	AT-642	=
		ON vehicle	3. Line pressure test	AT-453	F
			4. Line pressure solenoid valve	<u>AT-543</u>	-
	Vehicle will not		5. Oil pump	<u>AT-670</u>	- (-
	run in any posi- tion.	OFF vehicle	6. High clutch	AT-692	_ (
			7. Brake band	AT-652	-
			8. Low & reverse brake	<u>AT-703</u>	-
			9. Torque converter	AT-652	=
			10. Parking components	<u>AT-667</u>	-
	Engine cannot be	ON vehicle	1. Ignition switch and starter	PG-3, SC-9	-
	started in P and N		2. Control cable adjustment	AT-642	=
	positions. AT-598		Park/neutral position (PNP) switch adjust- ment	<u>AT-641</u>	_
	Engine starts in	ON vehicle	1. Control cable adjustment	AT-642	=
	positions other than P and N. AT-598		Park/neutral position (PNP) switch adjust- ment	AT-641	K
			1. Fluid level	<u>AT-449</u>	-
			2. Line pressure test	AT-453	- L
NOT USED	Transaxle noise	ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor] (Adjustment)	EC-748	- [\
	in P and N positions.		Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-499, AT-576	_ ''
		OFF vehicle	5. Oil pump	<u>AT-670</u>	-
		OFF verilicie	6. Torque converter	AT-652	_
	Vehicle moves	ON vehicle	Control cable adjustment	AT-642	-
	when changing into P position or parking gear does not disengage when shifted out of P position. AT-600	OFF vehicle	2. Parking components	AT-667	-

Items	Symptom	Condition	Diagnostic Item	Reference Page
	Vehicle runs in N	ON vehicle	1. Control cable adjustment	AT-642
	position. AT-600		2. Forward clutch	AT-697
	<u> </u>	OFF vehicle	3. Reverse clutch	AT-689
			4. Overrun clutch	AT-697
			1. Fluid level	AT-449
		ON vehicle	2. Line pressure test	AT-453
		On venicle	3. Line pressure solenoid valve	AT-543
	Vehicle braked when shifting into		4. Control valve assembly	AT-639
	R position.		5. High clutch	AT-692
		OFF vehicle	6. Brake band	AT-652
		OFF venicle	7. Forward clutch	AT-697
			8. Overrun clutch	AT-697
	Excessive creep.	ON vehicle	1. Engine idling rpm	EC-726
	Engine stops	ON vehicle	1. Engine idling rpm	EC-726
OT USED			2. Fluid level	AT-449
	when shifting lever into R, D, 2		3. Torque converter clutch solenoid valve	<u>AT-530</u>
	and 1.		4. Control valve assembly	AT-639
		OFF vehicle	5. Torque converter	AT-652
		ON vehicle	1. Fluid level	<u>AT-449</u>
	Vehicle braked by		2. Reverse clutch	AT-689
	gear change from	OFF vehicle	3. Low & reverse brake	AT-703
	D1 to D2.	Of F verificie	4. High clutch	AT-692
			5. Low one-way clutch	AT-652
	Vehicle braked by	ON vehicle	1. Fluid level	AT-449
	gear change from D2 to D3.	OFF vehicle	2. Brake band	AT-652
		ON vehicle	1. Fluid level	<u>AT-449</u>
	Vehicle braked by gear change from		2. Overrun clutch	AT-697
	D3 to D4.	OFF vehicle	3. Forward one-way clutch	AT-652
			4. Reverse clutch	AT-689

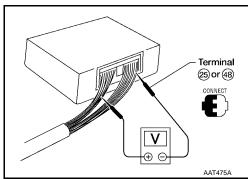
		1		- I	
Items	Symptom	Condition	Diagnostic Item	Reference Page	_
			1. Fluid level	<u>AT-449</u>	_
			Park/neutral position (PNP) switch adjust- ment	<u>AT-641</u>	
			3. Overdrive control switch	AT-627	
		ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	AT-559	Α
	Maximum enood		5. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	AT-499, AT-576	
	Maximum speed not attained.		6. Shift solenoid valve A	AT-549	_
	Acceleration		7. Shift solenoid valve B	AT-554	
	poor.		8. Control valve assembly	AT-639	_
			9. Reverse clutch	AT-689	_
			10. High clutch	AT-692	_
		055 1:1	11. Brake band	AT-652	_
		OFF vehicle	12. Low & reverse brake	AT-703	_
			13. Oil pump	<u>AT-670</u>	_
			14. Torque converter	AT-652	-
	Transaxle noise	ON vehicle	1. Fluid level	AT-449	_
	in D, 2, 1 and R positions. Engine brake does not operate	ON vehicle	2. Torque converter	AT-652	
		ON vehicle OFF vehicle	Park/neutral position (PNP) switch adjust- ment	AT-641	_
OT USED			2. Control cable adjustment	AT-642	-
			3. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-499, AT-576	
	in "1" position. AT-627		4. Control valve assembly	AT-639	_
	<u>A1-021</u>		5. Overrun clutch solenoid valve	AT-564	_
			6. Overrun clutch	AT-697	
			7. Low & reverse brake	AT-703	_
			1. Fluid level	AT-449	_
			2. Engine idling rpm	EC-726	_
		ON vehicle	Throttle position sensor [accelerator pedal position (APP) sensor]	<u>AT-559</u>	_
			4. Line pressure test	AT-453	_
			5. Line pressure solenoid valve	AT-543	_
			6. Control valve assembly	<u>AT-639</u>	_
	Transaxle over-		7. Oil pump	<u>AT-670</u>	_
	heats.		8. Reverse clutch	<u>AT-689</u>	_
			9. High clutch	AT-692	_
			10. Brake band	AT-652	_
		OFF vehicle	11. Forward clutch	AT-697	_
			12. Overrun clutch	AT-697	_
			13. Low & reverse brake	AT-703	_
			14. Torque converter	AT-652	_

[RE4F04B]

Items	Symptom	Condition	Diagnostic Item	Reference Page
		ON vehicle	1. Fluid level	AT-449
	ATF shoots out		2. Reverse clutch	AT-689
	during operation.		3. High clutch	AT-692
	White smoke emitted from	OFF vehicle	4. Brake band	AT-652
	exhaust pipe dur-	OFF Verlicie	5. Forward clutch	AT-697
	ing operation.		6. Overrun clutch	AT-697
			7. Low & reverse brake	<u>AT-703</u>
NOT USED		ON vehicle	1. Fluid level	<u>AT-449</u>
NOT USED			2. Torque converter	<u>AT-652</u>
			3. Oil pump	AT-670
	Offensive smell at		4. Reverse clutch	AT-689
	fluid charging	OFF vehicle	5. High clutch	<u>AT-692</u>
	pipe.	OFF VEHICLE	6. Brake band	AT-652
			7. Forward clutch	AT-697
			8. Overrun clutch	<u>AT-697</u>
			9. Low & reverse brake	<u>AT-703</u>

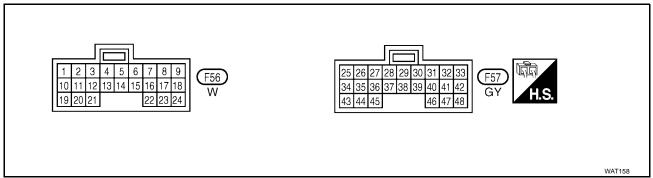
TCM Terminals and Reference Value PREPARATION





Measure voltage between each terminal and terminal 25 or 48 by following "TCM INSPECTION TABLE".

TCM HARNESS CONNECTOR TERMINAL LAYOUT



TCM INSPECTION TABLE

(Data are reference values.)

[RE4F04B]

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Termi- nal No.	Wire color	Item		Condition	Judgement standard (Approx.)
	544	Line pressure		When releasing accelerator pedal after warming up engine.	1.5 - 3.0V
1	R/W	solenoid valve		When depressing accelerator pedal fully after warming up engine.	0V
	D./D	Line pressure solenoid valve	To a	When releasing accelerator pedal after warming up engine.	4 - 14V
2	P/B	(with dropping resistor)		When depressing accelerator pedal fully after warming up engine.	0V
	24/0	Torque converter		When A/T performs lock-up.	8 - 15V
3	Y/G	clutch solenoid valve		When A/T does not perform lock-up.	0V
5*	L	CAN-H	_	_	_
6*	Υ	CAN-L	_	_	_
10	BR/R	Power source	CON	When turning ignition switch to ON.	Battery voltage
.0	BIVIX		COFF	When turning ignition switch to OFF.	0V
44	1.00/	Shift solenoid		When shift solenoid valve A operates. (When driving in D1 or D4.)	Battery voltage
11	L/W	valve A		When shift solenoid valve A does not operate. (When driving in D2 or D3.)	0V
40	1.07	Shift solenoid		When shift solenoid valve B operates. (When driving in D1 or D2.)	Battery voltage
12	L/Y	valve B		When shift solenoid valve B does not operate. (When driving in D3 or D4.)	0V
10	BR/R	Dower course	(CON)	With ignition switch ON.	Battery voltage
19	BK/K	Power source	COFF	With ignition switch OFF.	OV
00	L/D	Overrun clutch		When overrun clutch solenoid valve operates.	Battery voltage
20	L/B	solenoid valve		When overrun clutch solenoid valve does not operate.	0V
25	В	Ground		_	_
26	BR/Y	PNP switch 1	Con	When setting selector lever to 1 position.	Battery voltage
		position		When setting selector lever to other positions.	0V
27	B/R	PNP switch 2 position		When setting selector lever to 2 position.	Battery voltage
		200111011	Wa	When setting selector lever to other positions.	0V
28	R/B	Power source	COFF	With ignition switch OFF.	Battery voltage
,	, -	(Memory back-up)	CON	With ignition switch ON.	Battery voltage

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					[KE4FU4D]
Termi- nal No.	Wire color	Item		Condition	Judgement standard (Approx.)
29	W	Revolution sensor		When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item.	450 Hz
				When vehicle is parked.	Under 1.3V or over 4.5V
30**	G/B	Data link connector (RX)		_	_
31**	GY/L	Data link connector (TX)		_	_
32	R	Songer power	CON	Ignition switch ON.	4.5 - 5.5V
32	K	Sensor power	COFF	Ignition switch OFF.	oV
34	W/G	PNP switch D		When setting selector lever to D position.	Battery voltage
		position		When setting selector lever to other positions.	0V
35	G/Y	PNP switch R		When setting selector lever to R position.	Battery voltage
		position	%∑'√	When setting selector lever to other positions.	0V
36	LG	PNP switch P or N position		When setting selector lever to P or N position.	Battery voltage
		position		When setting selector lever to other positions.	0V
38	G	Turbine revolution sensor	The state of the s	When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item.	240 Hz
				When vehicle is parked.	Under 1.3V or over 4.5V
39	L/OR	Engine speed signal	CON	Refer to EC-782, "ECM INSPECTION TABLE".	,
40	PU/R	Vehicle speed sensor		When moving vehicle at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more.	Voltage varies between less than 1V and more than 4.5V

[RE4F04B]

Termi- nal No.	Wire color	Item		Condition	Judgement standard (Approx.)
41	GY	Throttle position sensor [accelera- tor pedal position (APP) sensor]	CON	When depressing accelerator pedal slowly after warming up engine. (Voltage rises gradually in response to throttle position.)	Fully-closed throttle: 0.5V Fully-open throttle: 4V
42	B/W	Sensor ground	_	_	_
47	BR	A/T fluid tempera-		When ATF temperature is 20°C (68°F).	1.5V
	311	ture sensor		When ATF temperature is 80°C (176°F).	0.5V
48	В	Ground	1	_	

^{*:} These terminals are connected to the ECM.

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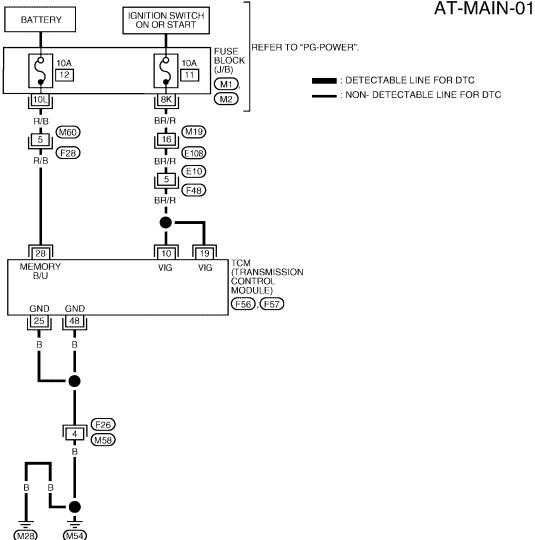
^{**:} These terminals are connected to the Data link connector.

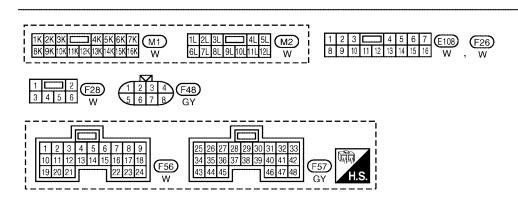
TROUBLE DIAGNOSIS FOR POWER SUPPLY

PFP:00000

ECS0062X

Wiring Diagram — AT — MAIN





TROUBLE DIAGNOSIS FOR POWER SUPPLY

[RE4F04B]

TCM TERMIN	NALS AND REFE	RENCE VALUE MEASURED BET	WEEN EACH TERMINAL AND 25 O	R 48 (TCM GROUND)
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
10	BR/R	POWER SOURCE	IGNITION ON	BATTERY VOLTAGE
10	DIX/IX	FOWER SOURCE	IGNITION OFF	APPROX. 0V
19	BR/R	POWER SOURCE	IGNITION ON	BATTERY VOLTAGE
19	BK/K	FOWER SOURCE	IGNITION OFF	APPROX. 0V
25	В	GROUND	_	_
28	R/B	POWER SOURCE	IGNITION ON	BATTERY VOLTAGE
20	N/B	(MEMORY BACKUP)	IGNITION OFF	BATTERY VOLTAGE
48	В	GROUND	_	_

Diagnostic Procedure

ECS0062Y

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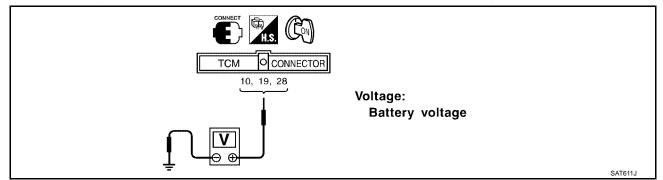
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1. CHECK TCM POWER SOURCE STEP 1

- 1. Turn ignition switch to ON position. (Do not start engine.)
- 2. Check voltage between TCM terminals 10 (BR/R), 19 (BR/R), 28 (R/B) and ground.



OK or NG

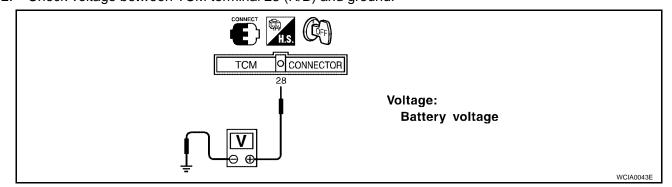
OK >> GO TO 2. NG >> GO TO 3.

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2. CHECK TCM POWER SOURCE STEP 2

- 1. Turn ignition switch to OFF position.
- 2. Check voltage between TCM terminal 28 (R/B) and ground.



OK or NG

OK >> GO TO 4. NG >> GO TO 3.

TROUBLE DIAGNOSIS FOR POWER SUPPLY

[RE4F04B]

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between ignition switch and TCM terminals 10, 19 and 28 (Main harness)
- Fuse
- Ignition switch Refer to <u>PG-3</u>, "<u>POWER SUPPLY ROUTING</u>".

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. CHECK TCM GROUND CIRCUIT

- 1. Turn ignition switch to OFF position.
- 2. Disconnect TCM harness connector.
- 3. Check continuity between TCM terminals 25, 48 and ground. Refer to AT-484, "Wiring Diagram AT <a href="MAIN".

Continuity should exist.

OK or NG

OK >> INSPECTION END

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

[RE4F04B]

DTC P0705 PARK/NEUTRAL POSITION SWITCH

PFP:32006

ECS0062Z

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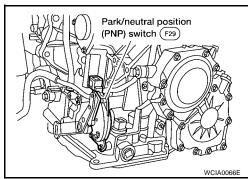
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Description

- The park/neutral position (PNP) switch includes a transmission range switch.
- The transmission range switch detects the selector lever position and sends a signal to the TCM.



On Board Diagnosis Logic

ECS00630

Diagnostic trouble code PNP SW/CIRC with CONSULT-II or P0705 without CONSULT-II is detected when TCM does not receive the correct voltage signal from the switch based on the gear position.

Possible Cause

Check the following items.

- Harness or connectors (The park/neutral position (PNP) switch circuit is open or shorted.)
- Park/neutral position (PNP) switch

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS00632

CAUTION:

Always drive vehicle at a safe speed.

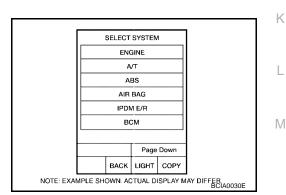
NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

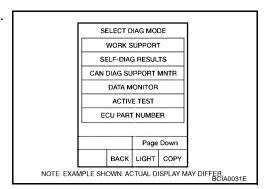
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch ON.



Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.



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[RE4F04B]

3. Start engine and maintain the following conditions for at least 5 consecutive seconds.

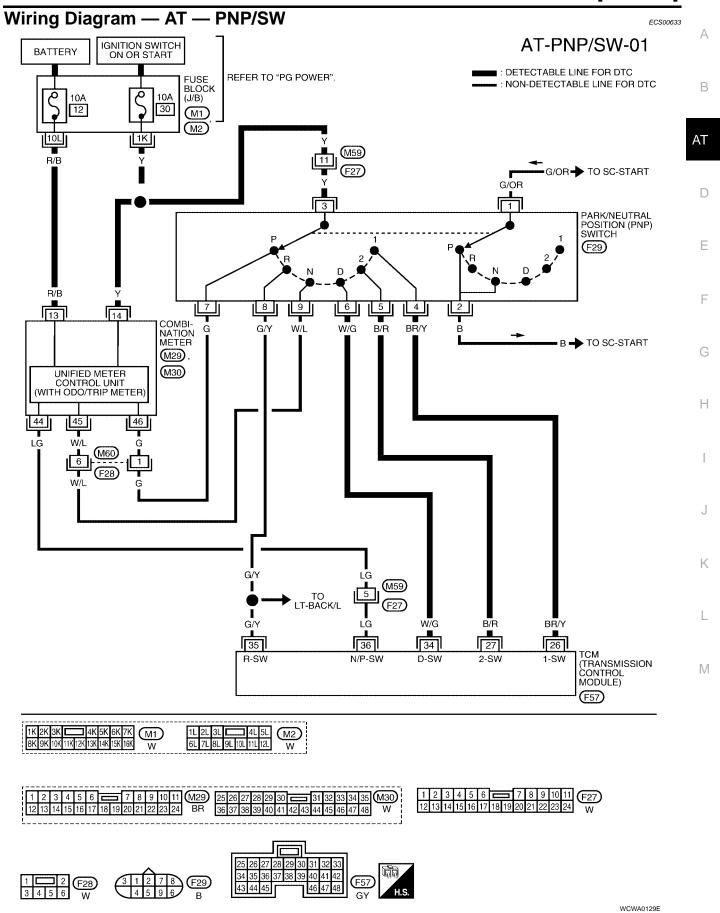
VHCL SPEED SE: 10 km/h (6 MPH) or more

THRTL POS SEN: More than 1.3V

Selector lever: D position (O/D ON or OFF)

WITH GST

Follow the procedure "With CONSULT-II".



[RE4F04B]

TCM TERMINA	ALS AND REFER	RENCE VALUE MEASURED BET	WEEN EACH TERMINAL AND 25 OF	R 48 (TCM GROUND)
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
26	BR/Y	PNP SWITCH	IGNITION ON AND SELECTOR LEVER IN 1 POSITION	BATTERY VOLTAGE
20	DIV I	1 POSITION	IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	APPROX. 0V
27	BR	PNP SWITCH	IGNITION ON AND SELECTOR LEVER IN 2 POSITION	BATTERY VOLTAGE
21	ЫK	2 POSITION	IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	APPROX. 0V
34	W/G	PNP SWITCH	IGNITION ON AND SELECTOR LEVER IN D POSITION	BATTERY VOLTAGE
J4	W/G	D POSITION	IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	APPROX. 0V
35	G/Y	PNP SWITCH	IGNITION ON AND SELECTOR LEVER IN R POSITION	BATTERY VOLTAGE
33	G/ I	R POSITION	IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	APPROX. 0V
36	LG	PNP SWITCH	IGNITION ON AND SELECTOR LEVER IN P OR N POSITION	BATTERY VOLTAGE
30	LG	P OR N POSITION	IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	APPROX. 0V

Diagnostic Procedure

ECS00634

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 2. No >> GO TO 6.

2. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITH CONSULT-II)

With CONSULT-II

- Turn ignition switch to ON position. (Do not start engine.)
- Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Read out P, R, N, D, 2 and 1 position switches moving selector lever to each position.
 Check that the signal of the selector lever position is indicated properly.

OK or NG

OK >> GO TO 7. NG >> GO TO 3.

DATA MONIT	OR	
MONITORING		
PN POSI SW	OFF	
R POSITION SW	OFF	
D POSITION SW	OFF	
2 POSITION SW	ON	
1 POSITION SW	OFF	
		SAT701J

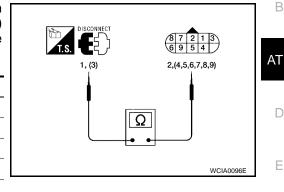
[RE4F04B]

3. DETECT MALFUNCTIONING ITEM

Check the following item:

Park/neutral position (PNP) switch Check continuity between park/neutral position (PNP) switch F29 terminals 1 (G/OR) and 2 (B) and between terminals 3 (Y) and 4 (BR/Y), 5 (B/R), 6 (W/G), 7 (G), 8 (G/Y) and 9 (W/L) while moving manual shaft through each position.

Lever position	Termi	nal No.
Р	3 - 7	1 - 2
R	3 - 8	
N	3 - 9	1 - 2
D	3 - 6	
2	3 - 5	
1	3 - 4	



OK or NG

OK >> GO TO 5. NG >> GO TO 4.

4. CHECK MANUAL CONTROL CABLE ADJUSTMENT

Check PNP switch again with manual control cable disconnected from manual shaft of A/T assembly. Refer to test group 1.

OK or NG

OK >> Adjust manual control cable. Refer to AT-642, "Control Cable Adjustment".

NG >> Repair or replace PNP switch.

5. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between ignition switch and park/neutral position (PNP) switch (Main harness)
- Harness for short or open between park/neutral position (PNP) switch and TCM (Main harness)
- Fuse
- Ignition switch Refer to PG-3, "POWER SUPPLY ROUTING".

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts. D

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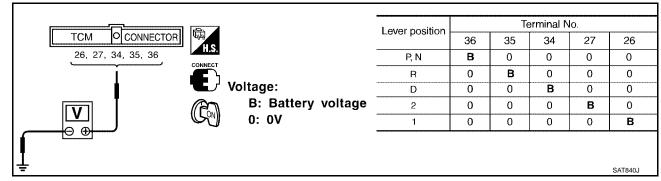
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[RE4F04B]

6. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITHOUT CONSULT-II)

Without CONSULT-II

- 1. Turn ignition switch to ON position. (Do not start engine.)
- 2. Check voltage between TCM terminals 26 (BR/Y), 27 (B/R), 34 (W/G), 35 (G/Y), 36 (LG) and ground while moving selector lever through each position.



OK or NG

OK >> GO TO 7. NG >> GO TO 5.

7. CHECK DTC

Perform AT-487, "Diagnostic Trouble Code (DTC) Confirmation Procedure".

OK or NG

OK >> INSPECTION END

NG >> GO TO 8.

8. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

[RE4F04B]

DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

PFP:31940

ECS00635

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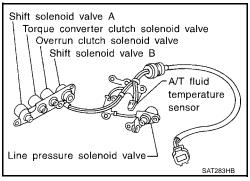
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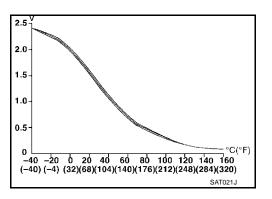
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Description

The A/T fluid temperature sensor detects the A/T fluid temperature and sends a signal to the TCM.





CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification (Approximately)
A/T fluid temperature sensor	Cold [20°C (68°F)]	1.5V	2.5 kΩ
	↓	↓	↓
	Hot [80°C (176°F)]	0.5V	0.3 kΩ

On Board Diagnosis Logic

CS00636

Diagnostic trouble code ATF TEMP SEN/CIRC with CONSULT-II or P0710 without CONSULT-II is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause

Check the following items.

M

- Harness or connectors (The sensor circuit is open or shorted.)
- A/T fluid temperature sensor

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS00638

CAUTION:

Always drive vehicle at a safe speed.

NOTE

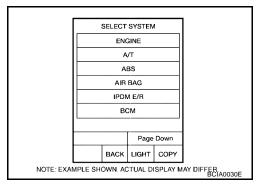
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

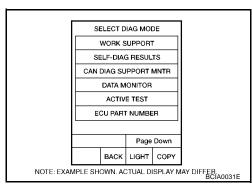
After the repair, perform the following procedure to confirm the malfunction is eliminated.

[RE4F04B]

WITH CONSULT-II

1. Turn ignition switch ON and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.





2. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)

CMPS-RPM (REF): 450 rpm or more

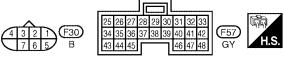
VHCL SPEED SE: 10 km/h (6 MPH) or more

THRTL POS SEN: More than 1.2V Selector lever: D position (O/D ON)

WITH GST

Follow the procedure "With CONSULT-II".

DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT [RE4F04B] Wiring Diagram — AT — FTS ECS00639 Α AT-FTS-01 ■ : DETECTABLE LINE FOR DTC В : NON-DETECTABLE LINE FOR DTC A/T FLUID TEMPERATURE SENSOR W. ΑT D TERMINAL CORD ASSEMBLY Е (F30) Н в/w 67 B/W 47 42 TCM (TRANSMISSION CONTROL MODULE) GND-A OIL TEMP GND SENS (F60) SENS (F57) M REFER TO THE FOLLOWING.



(F60) - ELECTRICAL UNITS

BCWA0249E

[RE4F04B]

TCM TERMIN	IALS AND REFE	RENCE VALUE MEASURED BET	WEEN EACH TERMINAL AND 25 OF	R 48 (TCM GROUND)
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
42	B/W	SENSOR GROUND	_	_
47	BR	A/T FLUID TEMPERATURE	IGNITION ON AND ATF TEMPER- ATURE IS 20°C (68°F)	APPROX. 1.5V
47	ΒK	SENSOR	IGNITION ON AND ATF TEMPER- ATURE IS 80°C (176°F)	APPROX. 0.5V

Diagnostic Procedure

ECS0063A

1. INSPECTION START

Do you have CONSULT-II?

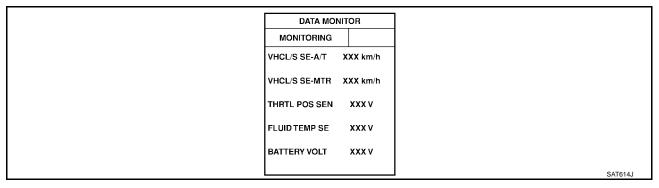
Yes or No

Yes >> GO TO 2. No >> GO TO 6.

2. CHECK INPUT SIGNAL OF A/T FLUID TEMPERATURE SENSOR (WITH CONSULT-II)

(II) With CONSULT-II

- 1. Start engine.
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out the value of "FLUID TEMP SE".



Voltage :Cold [20°C (68°F)] \rightarrow Hot [80°C (176°F)] :Approximately 1.5V \rightarrow 0.5V

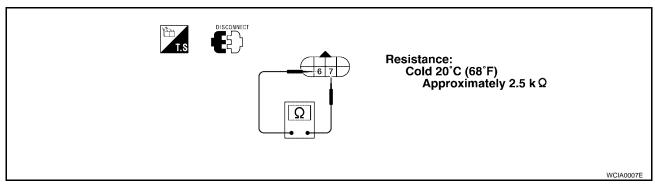
OK or NG

OK >> GO TO 7. NG >> GO TO 3.

[RE4F04B]

3. CHECK A/T FLUID TEMPERATURE SENSOR WITH TERMINAL CORD ASSEMBLY

- 1. Turn ignition switch to OFF position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- Check resistance between terminal cord assembly F30 terminals 6 and 7 (component side) when A/T is cold.



4. Reinstall any part removed.

OK or NG

>> GO TO 4. OK NG >> GO TO 5.

4. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short to ground or short to power or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM Refer to AT-484, "TROUBLE DIAGNOSIS FOR POWER SUPPLY".

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

5. DETECT MALFUNCTIONING ITEM

- 1. Remove oil pan.
- 2. Check the following items:
- A/T fluid temperature sensor Check resistance between two terminals while changing temperature as shown in figure.

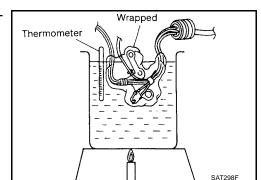
Temperature	Resistance (Approx.)
20°C (68°F)	2.5kΩ
80°C (176°F)	0.3kΩ

Harness of terminal cord assembly for short or open

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.



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[RE4F04B]

6. CHECK INPUT SIGNAL OF A/T FLUID TEMPERATURE SENSOR (WITHOUT CONSULT-II)

Without CONSULT-II

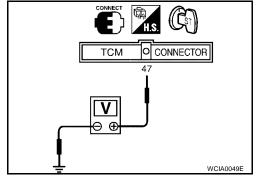
- 1. Start engine.
- 2. Check voltage between TCM connector F57 terminal 47 (BR) and ground while warming up A/T.

Voltage :Cold [20°C (68°F)] \rightarrow Hot [80°C (176°F)]

:Approximately 1.5V → 0.5V

OK or NG

OK >> GO TO 7. NG >> GO TO 3.



7. CHECK DTC

Perform AT-493, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> INSPECTION END

NG >> GO TO 8.

8. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR)

PFP:32702

ECS0063B

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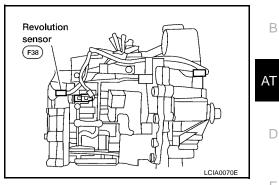
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Description

The revolution sensor detects the revolution of the idler gear parking pawl lock gear and emits a pulse signal. The pulse signal is sent to the TCM which converts it into vehicle speed.



On Board Diagnosis Logic

Diagnostic trouble code VEH SPD SEN/CIR AT with CONSULT-II or P0720 without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor.

Possible Cause ECS0063D

Check the following items.

- Harness or connectors (The sensor circuit is open or shorted.)
- Revolution sensor

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0063E

ECS0063C

CAUTION:

- Always drive vehicle at a safe speed.
- Be careful not to rev engine into the red zone on the tachometer.

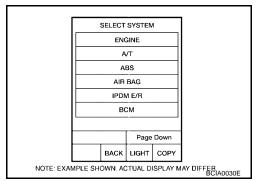
NOTE:

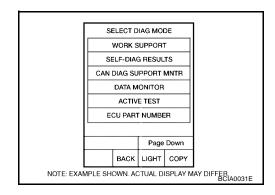
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.

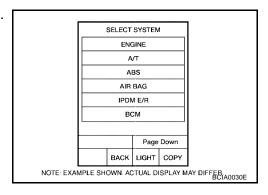


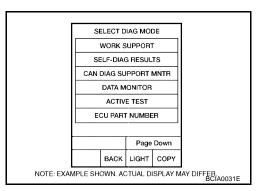


AT-499 Revision: July 2004 2005 Sentra

[RE4F04B]

- Drive vehicle and check for an increase of "VHCL/S SE-MTR" value. If the check result is NG, go to <u>AT-502, "Diagnostic Procedure"</u>. If the check result is OK, go to following step.
- 3. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.





Start engine and maintain the following conditions for at least 5 consecutive seconds.

VHCL SPEED SE: 30 km/h (19 MPH) or more

THRTL POS SEN: More than 1.2V Selector lever: D position (O/D ON)

Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving

conditions required for this test.

If the check result is NG, go to AT-502, "Diagnostic Procedure" .

If the check result is OK, go to following step.

5. Maintain the following conditions for at least 5 consecutive seconds.

CMPS-RPM (REF): 3,500 rpm or more THRTL POS SEN: More than 1.2V Selector lever: D position (O/D ON)

Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving

conditions required for this test.

WITH GST

Follow the procedure "With CONSULT-II".

Wiring Diagram — AT — VSSA/T

ECS0063F

AT-VSSA/T-01

: DETECTABLE LINE FOR DTC
: NON- DETECTABLE LINE FOR DTC

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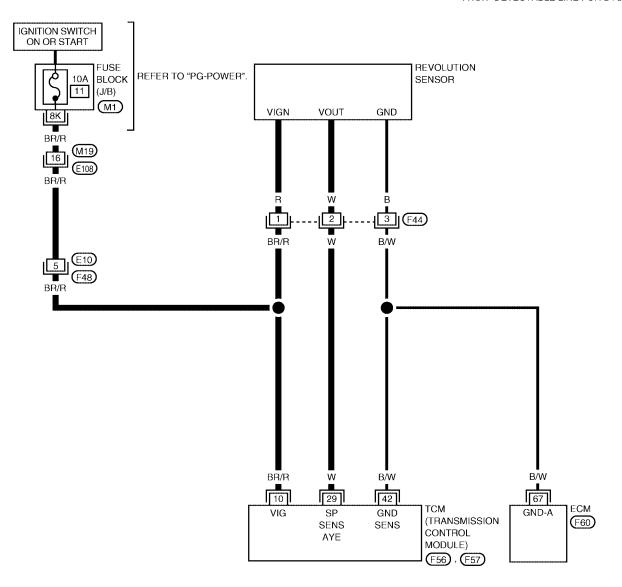
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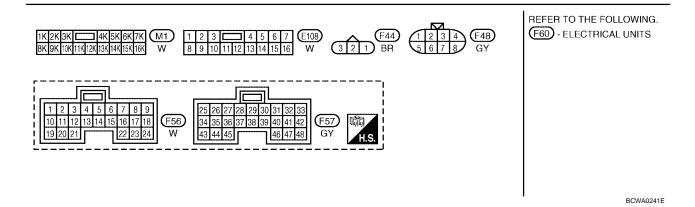
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TERMINALS	AND REFERENC	E VALUE MEASURED BETWEE	N EACH TERMINAL	
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
10	BR/R	POWER SOURCE	IGNITION OFF	APPROX. 0V
10	DIV/IX	FOWER SOURCE	IGNITION ON	BATTERY VOLTAGE
29	W	REVOLUTION SENSOR	VEHICLE MOVING AT 20 KM/H (12 MPH). USE THE CONSULT-II PULSE FREQUENCY MEASURING FUNCTION. A CIRCUIT TESTER CANNOT BE USED TO TEST THIS ITEM. CAUTION: CONNECT THE DIAGNOSIS DATA LINK CABLE TO THE VEHICLE DIAGNOSIS CONNECTOR.	450 HZ
			VEHICLE NOT MOVING.	LESS THAN 1.3V OR GREATER THAN 4.5V
42	B/W	SENSOR GROUND	_	_

Diagnostic Procedure

ECS0063G

1. CHECK INPUT SIGNAL (WITH CONSULT-II)

(II) With CONSULT-II

- 1. Start engine.
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out the value of "VHCL/S SE·A/T" while driving. Check the value changes according to driving speed.

DATA MONITOR	
MONITORING	
VHCL/S SE-A/T XXX km/h	
VHCL/S SE-MTR XXX km/h	
THRTL POS SEN XXX V	
FLUID TEMP SE XXX V	
BATTERY VOLT XXX V	
	SAT614J

OK or NG

OK >> GO TO 3. NG >> GO TO 2.

2. CHECK REVOLUTION SENSOR (WITH CONSULT-II)

(II) With CONSULT-II

1. Start engine.

NSULT-II pulse frequency measuring func- *1 ITION: nect the diagnosis data link cable to vehicle diagnosis connector. A circuit tester cannot be used to test this .	Condition	Judgement standard (Approx.)
Under 1.2V or	When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function. *1 CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item.	450 Hz
en vehicle parks.	When vehicle parks.	Under 1.3V or over 4.5V

- Harness for short or open between TCM, ECM and revolution sensor
- Harness for short or open between ignition switch and revolution sensor

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

3. CHECK DTC

Perform AT-499, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

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DTC P0725 ENGINE SPEED SIGNAL

[RE4F04B]

DTC P0725 ENGINE SPEED SIGNAL

PFP:24825

Description

The engine speed signal is sent from the ECM to the TCM.

On Board Diagnosis Logic

FCS00631

Diagnostic trouble code ENGINE SPEED SIG with CONSULT-II or P0725 without CONSULT-II is detected when TCM does not receive the proper voltage signal from ECM.

Possible Cause

Check harness or connectors. (The sensor circuit is open or shorted.)

Diagnostic Trouble Code (DTC) Confirmation Procedure

FCS0063K

CAUTION:

Always drive vehicle at a safe speed.

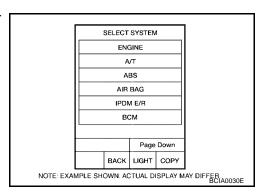
NOTF:

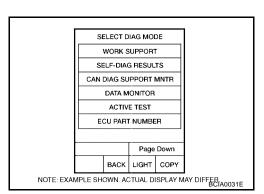
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch ON and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.





Start engine and maintain the following conditions for at least 10 consecutive seconds.

VHCL SPEED SE: 10 km/h (6 MPH) or more

THRTL POS SEN: More than 1.2V Selector lever: D position (O/D ON)

WITH GST

Follow the procedure "With CONSULT-II".

DTC P0725 ENGINE SPEED SIGNAL

TACHO 103 L/OR

L/OR 39

TCM (TRANSMISSION CONTROL MODULE)

ECM F59

L/OR ----- TO DI-METER

[RE4F04B]

Wiring Diagram — AT — ENGSS

ECS0063L

AT-ENGSS-01

A

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC

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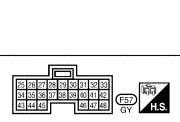
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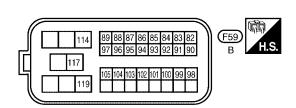
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WCWA0132E

DTC P0725 ENGINE SPEED SIGNAL

[RE4F04B]

TCM TERMIN	TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	LOR ITEM CONDITION DATA (DC)			
39	L/OR ENGINE SPEED SIGNAL	WITH ENGINE RUNNING AT IDLE SPEED	APPROX. 0.6V		
39	LJOIX	ENGINE SPEED SIGNAL	WITH ENGINE RUNNING AT 3,000 RPM	APPROX. 2.2V	

Diagnostic Procedure

ECS0063M

1. CHECK DTC WITH ECM

Check P code with CONSULT-II "ENGINE".

Turn ignition switch ON and select "SELF-DIAGNOSTIC RESULTS" mode for "ENGINE" with CONSULT-II.

Refer to EC-713, "Malfunction Indicator Lamp (MIL)".

OK or NG

OK (with CONSULT-II)>>GO TO 2.

OK (without CONSULT-II)>>GO TO 4.

NG >> Check ignition signal circuit for engine control. Refer to <u>EC-1312</u>, "IGNITION SIGNAL".

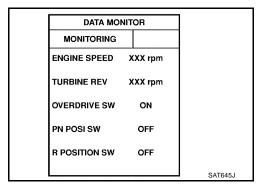
2. CHECK INPUT SIGNAL (WITH CONSULT-II)

(II) With CONSULT-II

- 1. Start engine.
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Read out the value of "ENGINE SPEED". Check engine speed changes according to throttle position.

OK or NG

OK >> GO TO 6. NG >> GO TO 3.



3. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM and ECM
- Resistor and ignition coil Refer to <u>EC-1312</u>, "IGNITION SIGNAL"

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

DTC P0725 ENGINE SPEED SIGNAL

[RE4F04B]

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4. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

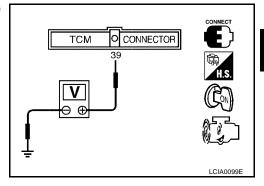
Without CONSULT-II

- 1. Start engine.
- 2. Check voltage between TCM connector F57 terminal 39 (L/OR) and ground.

Voltage :0.6 (Idle speed) - 2.2V (3,000 rpm)

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



5. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM and ECM
- Resistor and ignition coil Refer to <u>EC-1312</u>, "IGNITION SIGNAL"

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

6. CHECK DTC

Perform AT-504, "Diagnostic Trouble Code (DTC) Confirmation Procedure".

OK or NG

OK >> INSPECTION END

NG >> GO TO 7.

7. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

[RE4F04B]

DTC P0731 A/T 1ST GEAR FUNCTION

PFP:31940

Description

ECS0063N

- This malfunction will not be detected while the O/D OFF indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into first gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

ECS00630

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:

Torque converter slip ratio = $A \times C/B$

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

If the actual gear position is higher than the position (1st) supposed by TCM, the slip ratio will be more than normal. In case the ratio exceeds the specified value, TCM judges this diagnosis malfunction.

This malfunction will be caused when either shift solenoid valve A is stuck open or shift solenoid valve B is stuck open.

Gear positions supposed by TCM are as follows.

In case of gear position with no malfunctions: 1, 2, 3 and 4 positions

In case of gear position with shift solenoid valve A stuck open: 2*, 2, 3 and 3 positions

In case of gear position with shift solenoid valve B stuck open: 4*, 3, 3 and 4 positions to each gear position above

*: P0731 is detected.

Diagnostic trouble code A/T 1ST GR FNCTN with CONSULT-II or P0731 without CONSULT-II is detected when A/T cannot be shifted to the 1st gear position even if electrical circuit is good.

Possible Cause

Check the following items.

- Shift solenoid valve A
- Shift solenoid valve B
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0063Q

CAUTION:

- Always drive vehicle at a safe speed.
- Be careful not to rev engine into the red zone on the tachometer.

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always drive vehicle on a level road to improve the accuracy of test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

[RE4F04B]

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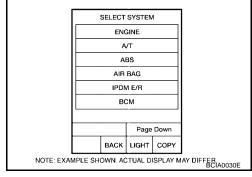
WITH CONSULT-II

- Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.

FLUID TEMP SEN: 0.4 - 1.5V

If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).

Select "1ST GR FNCTN P0731" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".



SELECT DIAG MODE

WORK SUPPORT SELF-DIAG RESULTS

CAN DIAG SUPPORT MNTR

DATA MONITOR

ACTIVE TEST

ECU PART NUMBER

Page Down

BACK LIGHT COPY

NOTE: EXAMPLE SHOWN. ACTUAL DISPLAY MAY DIFFER BC(A0031E

4. Accelerate vehicle to 20 to 25 km/h (12 to 16 MPH) under the following condition and release the accelerator pedal completely.

THROTTLE POSI: Less than 1.0/8 (at all times during step 4) Selector lever: D position (O/D ON)

- Check that "GEAR" shows "2" after releasing pedal.
- Depress accelerator pedal to WOT (more than 7.0/8 of "THROT-TLE POSI") quickly from a speed of 20 to 25 km/h (12 to 16 MPH) until "TESTING" changes to "STOP VEHICLE" or "COM-PLETED". (It will take approximately 3 seconds.) If the check result NG appears on CONSULT-II screen, go to AT-

511, "Diagnostic Procedure".

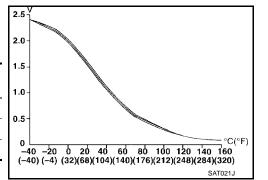
If "STOP VEHICLE" appears on CONSULT-II screen, go to the following step.

- Check that "GEAR" shows "1" when depressing accelerator pedal to WOT.
- If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAG RESULTS" for "ENGINE". In case a 1st trip DTC other than P0731 is shown, refer to applicable "TROUBLE DIAG-NOSIS FOR DTC".
- 6. Stop vehicle.
- 7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)

Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 \rightarrow 2 \rightarrow 3 \rightarrow 4
No malfunction exists.	$1 \rightarrow 2 \rightarrow 3 \rightarrow 4$
Malfunction for P0731 exists.	$2 \rightarrow 2 \rightarrow 3 \rightarrow 3$
Manufaction for FO731 exists.	$4 \rightarrow 3 \rightarrow 3 \rightarrow 4$

Make sure that "OK" is displayed. (If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE".)

Refer to <u>AT-511, "Diagnostic Procedure"</u>. Refer to <u>AT-747, "Shift Schedule"</u>.



WITH GST

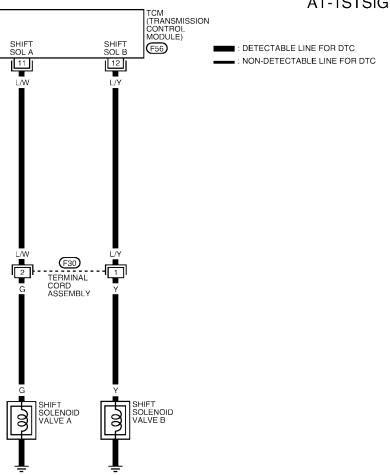
Follow the procedure "With CONSULT-II".

AT-509 Revision: July 2004 2005 Sentra

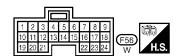
Wiring Diagram — AT — 1ST

ECS0063R

AT-1STSIG-01







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[RE4F04B]

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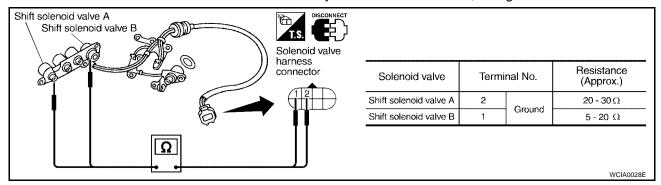
M TERMIN	NALS AND REFE	RENCE VALUE MEASURED BE	TWEEN EACH TERMINAL AND 25 O	R 48 (TCM GROUND)
ERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
11 L/W	1.00/	W SHIFT SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D1 OR D4)	BATTERY VOLTAGE
	L/VV		WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D2 OR D3)	APPROX. 0V
12 L/Y	LAV CHIET COLENOID VALVE D	WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D1 OR D2)	BATTERY VOLTAGE	
	L/Y	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B IS NOT OPERATING (DRIVING IN D3 OR D4)	APPROX. 0V

Diagnostic Procedure

ECS0063S

1. CHECK VALVE RESISTANCE

- Remove control valve assembly. Refer to <u>AT-639, "REMOVAL"</u>.
- Shift solenoid valve A
- Shift solenoid valve B
- 2. Check resistance between terminal cord assembly F30 terminals 1 and 2, and ground.



OK or NG

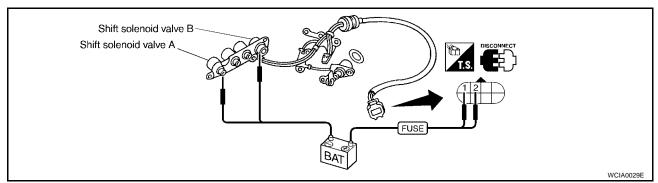
OK >> GO TO 2.

NG >> Repair or replace damaged parts.

M

2. CHECK VALVE OPERATION

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Shift solenoid valve A
- Shift solenoid valve B
- 2. Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.



OK or NG

OK >> GO TO 3.

NG >> Repair or replace shift solenoid valve assembly.

3. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to <u>AT-674, "DISAS-SEMBLY"</u>.
- 2. Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.

OK or NG

OK >> GO TO 4.

NG >> Repair control valve assembly.

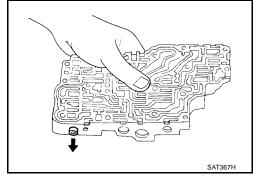
4. CHECK DTC

Perform AT-508, "Diagnostic Trouble Code (DTC) Confirmation Procedure".

OK or NG

OK >> INSPECTION END

NG >> Check transaxle internal components (clutch, brake, etc.).



[RE4F04B]

DTC P0732 A/T 2ND GEAR FUNCTION

PFP:31940

Description

FCS0063T

Α

- This malfunction will not be detected while the O/D OFF indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into second gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

FCS006311

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This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:

Torque converter slip ratio = A x C/B

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

If the actual gear position is higher than the position (2nd) supposed by TCM, the slip ratio will be more than normal. In case the ratio exceeds the specified value, TCM judges this diagnosis malfunction.

This malfunction will be caused when shift solenoid valve B is stuck open.

Gear positions supposed by TCM are as follows.

In case of gear position with no malfunctions: 1, 2, 3 and 4 positions

In case of gear position with shift solenoid valve B stuck open: 4, 3*, 3 and 4 positions to each gear position above

*: P0732 is detected.

Diagnostic trouble code A/T 2ND GR FNCTN with CONSULT-II or P0732 without CONSULT-II is detected when A/T cannot be shifted to the 2nd gear position even if electrical circuit is good.

Possible Cause

Check the following items.

- Shift solenoid valve B
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0063W

CAUTION:

- Always drive vehicle at a safe speed.
- Be careful not to rev engine into the red zone on the tachometer.

NOTE

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always drive vehicle on a level road to improve the accuracy of test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

- Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.

FLUID TEMP SEN: 0.4 - 1.5V

If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).

- Select "2ND GR FNCTN P0732" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".
- 4. Accelerate vehicle to 63 to 68 km/h (39 to 42 MPH) under the following condition and release the accelerator pedal completely.

THROTTLE POSI: Less than 1.0/8 Selector lever: D position (O/D ON)

- Check that "GEAR" shows "3" or "4" after releasing pedal.
- Depress accelerator pedal to WOT (more than 7.0/8 of "THROT-TLE POSI") quickly from a speed of 63 to 68 km/h (39 to 42 MPH) until "TESTING" changes to "STOP VEHICLE" or "COM-PLETE". (It will take approximately 3 seconds.)
 If the check result NG appears on CONSULT-II screen, go to AT-

If the check result NG appears on CONSULT-II screen, go to <u>AT-516</u>, "Diagnostic Procedure".

If "STOP VEHICLE" appears on CONSULT-II screen, go to following step.

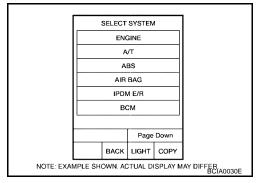
- Check that "GEAR" shows "2" when depressing accelerator pedal to WOT.
- If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAG RESULTS" for "ENGINE". In case a 1st trip DTC other than P0732 is shown, refer to applicable "TROUBLE DIAGNOSIS FOR DTC".
- 6. Stop vehicle.
- 7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)

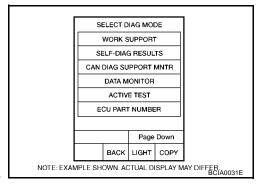
Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 \rightarrow 2 \rightarrow 3 \rightarrow 4	
No malfunction exists	$1 \to 2 \to 3 \to 4$	
Malfunction for P0732 exists.	$4 \rightarrow 3 \rightarrow 3 \rightarrow 4$	

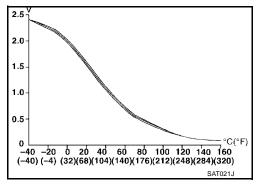
8. Make sure that "OK" is displayed. (If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE".) Refer to <u>AT-516, "Diagnostic Procedure"</u>. Refer to <u>AT-747, "Shift Schedule"</u>.



Follow the procedure "With CONSULT-II".







[RE4F04B]

Wiring Diagram — AT — 2ND

ECS0063X

AT-2NDSIG-01

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■ : DETECTABLE LINE FOR DTC ■ : NON-DETECTABLE LINE FOR DTC

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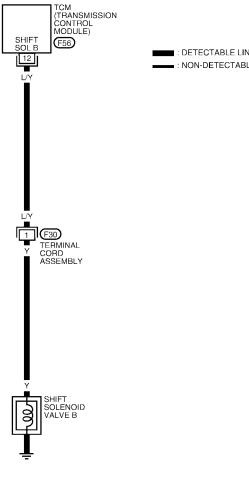
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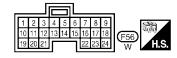
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[RE4F04B]

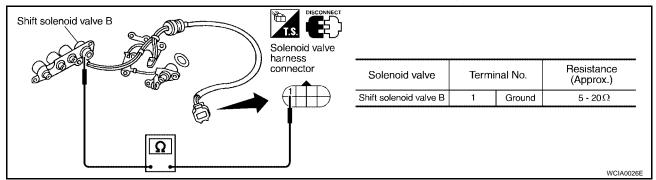
TCM TERMIN	TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)					
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)		
12	I/Y	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D1 OR D2)	BATTERY VOLTAGE		
12	L/I	SIII I SOLLNOID VALVE B	WHEN SHIFT SOLENOID VALVE B IS NOT OPERATING (DRIVING IN D3 OR D4)	APPROX. 0V		

Diagnostic Procedure

ECS0063Y

1. CHECK VALVE RESISTANCE

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Shift solenoid valve B
- 2. Check resistance between terminal cord assembly F30 terminal 1 and ground.



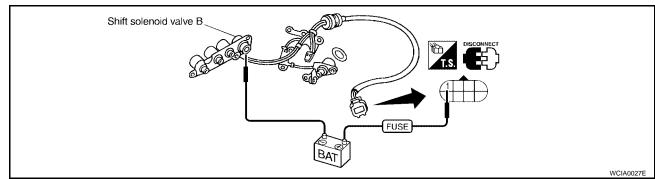
OK or NG

OK >> GO TO 2.

NG >> Repair or replace shift solenoid valve assembly.

2. CHECK VALVE OPERATION

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Shift solenoid valve B
- 2. Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.



OK or NG

OK >> GO TO 3.

NG >> Repair or replace shift solenoid valve assembly.

[RE4F04B]

3. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to <u>AT-674, "DISAS-SEMBLY"</u>.
- 2. Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.

OK or NG

OK >> GO TO 4.

NG >> Repair control valve assembly.

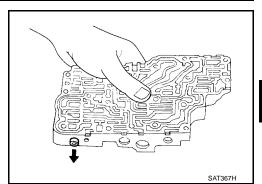


Perform AT-513, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> INSPECTION END

NG >> Check transaxle internal components (clutch, brake, etc.).



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[RE4F04B]

DTC P0733 A/T 3RD GEAR FUNCTION

PFP:31940

Description

ECS0063Z

- This malfunction will not be detected while the O/D OFF indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into third gear position as instructed by the TCM.
 This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning servo piston or brake band, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

ECS00640

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:

Torque converter slip ratio = $A \times C/B$

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

If the actual gear position is higher than the position (3rd) supposed by TCM, the slip ratio will be more than normal. In case the ratio exceeds the specified value, TCM judges this diagnosis malfunction.

This malfunction will be caused when shift solenoid valve A is stuck closed.

Gear positions supposed by TCM are as follows.

In case of gear position with no malfunctions: 1, 2, 3 and 4 positions

In case of gear position with shift solenoid valve A stuck closed: 1, 1, 4* and 4 positions to each gear position above

*: P0733 is detected.

Diagnostic trouble code A/T 3RD GR FNCTN with CONSULT-II or P0733 without CONSULT-II is detected when A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.

Possible Cause

Check the following items.

- Shift solenoid valve A
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS00642

CAUTION:

- Always drive vehicle at a safe speed.
- Be careful not to rev engine into the red zone on the tachometer.

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always drive vehicle on a level road to improve the accuracy of test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

[RE4F04B]

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WITH CONSULT-II

- Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.

FLUID TEMP SEN: 0.4 - 1.5V

If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).

- Select "3RD GR FNCTN P0733" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".
- Accelerate vehicle to 80 to 95 km/h (50 to 59 MPH) under the following condition and release the accelerator pedal completely.

THROTTLE POSI: Less than 1.0/8 (at all times during step 4) Selector lever: D position (OD "ON")

- Check that "GEAR" shows "4" after releasing pedal.
- Depress accelerator pedal steadily with 3.5/8 4.5/8 of "THROT-TLE POSI" from a speed of 80 to 95 km/h (50 to 59 MPH) until "TESTING" changes to "STOP VEHICLE" or "COMPLETED". (It will take approximately 3 seconds.)

If the check result NG appears on CONSULT-II screen, go to <u>AT-521</u>, "Diagnostic Procedure".

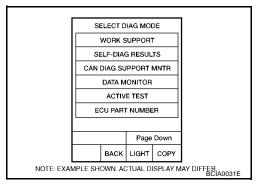
If "STOP VEHICLE" appears on CONSULT-II screen, go to following step.

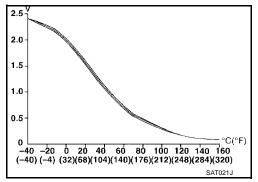
- Check that "GEAR" shows "3" when depressing accelerator pedal with 3.5/8 - 4.5/8 of "THROTTLE POSI".
- If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAG RESULTS" for "ENGINE". In case a 1st trip DTC other than P0733 is shown, refer to applicable "TROUBLE DIAGNOSIS FOR DTC".
- 6. Stop vehicle.
- Follow the instruction displayed. (Check for normal shifting referring to the table below.)

Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 \rightarrow 2 \rightarrow 3 \rightarrow 4	
No malfunction exists.	$1 \rightarrow 2 \rightarrow 3 \rightarrow 4$	
Malfunction for P0733 exists.	$1 \rightarrow 1 \rightarrow 4 \rightarrow 4$	

Make sure that "OK" is displayed. (If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE".) Refer to <u>AT-521, "Diagnostic Procedure"</u>. Refer to <u>AT-747, "Shift Schedule"</u>.

SELECT SYSTEM ENGINE A/T ABS AIR BAG IPDM E/R BCM Page Down BACK LIGHT COPY NOTE: EXAMPLE SHOWN. ACTUAL DISPLAY MAY DIFFEB ACOUNTS BELACOUNTS BEL





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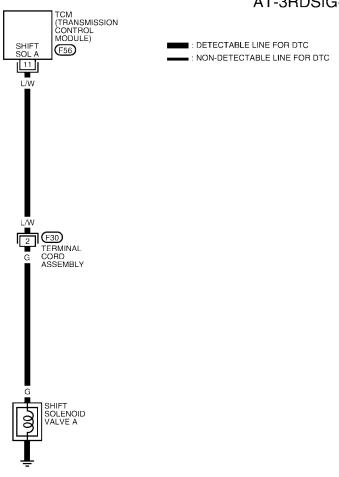
Follow the procedure "With CONSULT-II".

Revision: July 2004 AT-519 2005 Sentra

Wiring Diagram — AT — 3RD

ECS00643

AT-3RDSIG-01





WCWA0023E

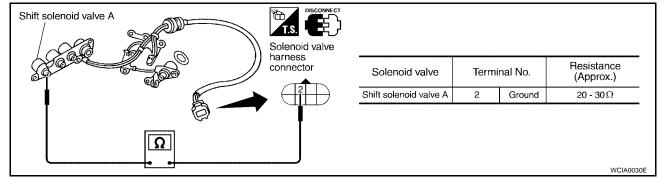
[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)					
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)	
11	L/W	SHIFT SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D1 OR D4)	BATTERY VOLTAGE	
"	L) VV	SHILL SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D2 OR D3)	APPROX. 0V	

Diagnostic Procedure

1. CHECK VALVE RESISTANCE

- Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Shift solenoid valve A
- 2. Check resistance between terminal cord assembly F30 terminal 2 and ground.



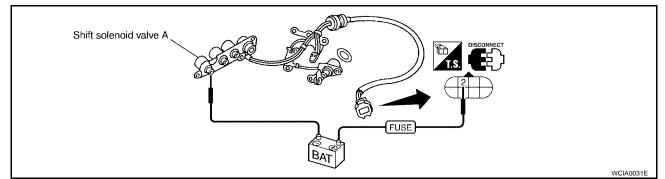
OK or NG

OK >> GO TO 2.

NG >> Repair or replace shift solenoid valve assembly.

2. CHECK VALVE OPERATION

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Shift solenoid valve A
- Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.



OK or NG

OK >> GO TO 3.

NG >> Repair or replace shift solenoid valve assembly.

AT-521 2005 Sentra Revision: July 2004

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3. CHECK CONTROL VALVE

- 1. Disassemble control valve assembly. Refer to <u>AT-674, "DISAS-SEMBLY"</u>.
- 2. Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.

OK or NG

OK >> GO TO 4.

NG >> Repair control valve assembly.

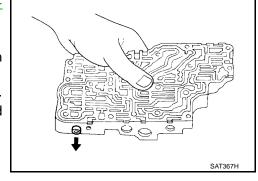
4. CHECK DTC

Perform <u>AT-518, "Diagnostic Trouble Code (DTC) Confirmation Procedure"</u>.

OK or NG

OK >> INSPECTION END

NG >> Check transaxle internal components (clutch, brake, etc.).



[RE4F04B]

DTC P0734 A/T 4TH GEAR FUNCTION

PFP:31940

Description

This malfunction will not be detected while the O/D OFF indicator lamp is indicating another self-diagnosis

malfunction. В This malfunction is detected when the A/T does not shift into fourth gear position as instructed by the

TCM, or if the line pressure is low. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning oil pump or torque converter clutch, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification	
Torque converter clutch solenoid valve duty	Lock-up OFF ↓ Lock-up ON	Approximately 4% ↓ Approximately 94%	
Line pressure solenoid valve duty Small throttle opening (Low line pressure) ↓ Large throttle opening (High line pressure)		Approximately 24% ↓ Approximately 95%	

On Board Diagnosis Logic

FCS00646

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:

Torque converter slip ratio = A x C/B

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

If the actual gear position is much lower than the position (4th) supposed by TCM, the slip ratio will be much less than normal. In case the ratio does not reach the specified value, TCM judges this diagnosis malfunction. This malfunction will be caused when shift solenoid valve B is stuck closed.

Gear positions supposed by TCM are as follows.

In case of gear position with no malfunctions: 1, 2, 3 and 4 positions

In case of gear position with shift solenoid valve B stuck closed: 1, 2, 2 and 1* positions to each gear position above

*: P0734 is detected.

Diagnostic trouble code A/T 4TH GR FNCTN with CONSULT-II or P0734 without CONSULT-II is detected when A/T cannot be shifted to the 4th gear position even if electrical circuit is good.

Possible Cause FCS00647

Check the following items.

- Shift solenoid valve A
- Shift solenoid valve B
- Line pressure solenoid valve
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

CAUTION:

- Always drive vehicle at a safe speed.
- If conducting this "DTC CONFIRMATION PROCEDURE" again, always turn ignition switch OFF and wait at least 10 seconds before continuing.
- Be careful not to rev engine into the red zone on the tachometer.

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NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

TESTING CONDITION:

Always drive vehicle on a level road to improve the accuracy of test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

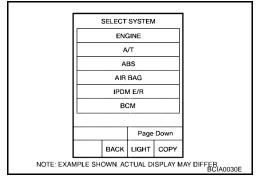
WITH CONSULT-II

- 1. Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.

FLUID TEMP SEN: 0.4 - 1.5V

If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).

3. Select "4TH GR FNCTN P0734" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".



SELECT DIAG MODE

WORK SUPPORT SELF-DIAG RESULTS

CAN DIAG SUPPORT MNTR

DATA MONITOR

ACTIVE TEST

ECU PART NUMBER

Page Down

BACK LIGHT COPY

NOTE: EXAMPLE SHOWN, ACTUAL DISPLAY MAY DIFFER BC(A0031E

 Accelerate vehicle to 60 to 70 km/h (37 to 43 MPH) under the following condition and release the accelerator pedal completely.

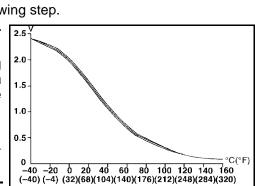
THROTTLE POSI: Less than 5.5/8 (at all times during step 4) Selector lever: D position (O/D ON)

- Check that "GEAR" shows "3" after releasing pedal.
- Depress accelerator pedal steadily with 1.0/8 2.0/8 of "THROT-TLE POSI" from a speed of 60 to 70 km/h (37 to 43 MPH) until "TESTING" has turned to "STOP VEHICLE" or "COMPLETED". (It will take approximately 3 seconds.)
 If the check result NG appears on CONSULT-II screen, go to AT-

526, "Diagnostic Procedure". If "STOP VEHICLE" appears on CONSULT-II screen, go to following step.

- Check that "GEAR" shows "4" when depressing accelerator pedal with 1.0/8 2.0/8 of "THROTTLE POSI".
- If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAG RESULTS" for "ENGINE". In case a 1st trip DTC other than P0734 is shown, refer to applicable "TROUBLE DIAGNOSIS FOR DTC".
- 6. Stop vehicle.
- 7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)

Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 \rightarrow 2 \rightarrow 3 \rightarrow 4
No malfunction exists	$1 \to 2 \to 3 \to 4$
Malfunction for P0734 exists.	$1 \to 2 \to 2 \to 1$



Make sure that "OK" is displayed. (If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE".)
 Refer to <u>AT-526, "Diagnostic Procedure"</u>.
 Refer to <u>AT-747, "Shift Schedule"</u>.

WITH GST

Follow the procedure "With CONSULT-II".

[RE4F04B]

Wiring Diagram — AT — 4TH

ECS00649

AT-4THSIG-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC

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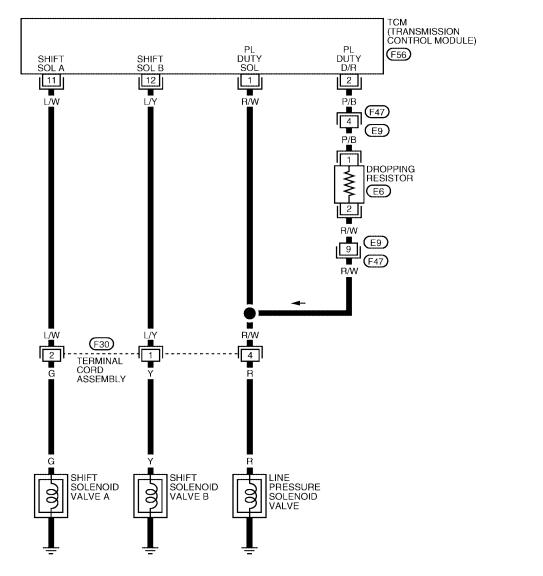
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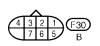
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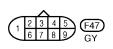
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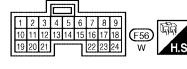
В











BCWA0242E

[RE4F04B]

TCM TERMIN	TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)			
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
1 R/W	LINE PRESSURE SOLENOID	WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	APPROX. 1.5 - 3.0V	
	10,00	VALVE	WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	APPROX. 0V
2	P/B	LINE PRESSURE SOLENOID VALVE (DROPPING RESIS-	WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	APPROX. 4 - 14V
۷	Z P/B VALVE (DR)		WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	APPROX. 0V
11	11 L/W SHIFT SOLENOID VALVE A	CHIET COLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D1 OR D4)	BATTERY VOLTAGE
		STILL TOOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D2 OR D3)	APPROX. 0V
12 L/Y	L/Y SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D1 OR D2)	BATTERY VOLTAGE	
	U I	L/1 SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE BE IS NOT OPERATING (DRIV- ING IN D3 OR D4)	APPROX. 0V

Diagnostic Procedure

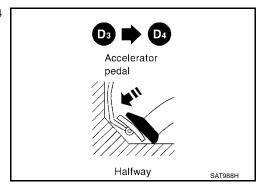
ECS0064A

1. CHECK SHIFT UP (D3 TO D4)

During AT-462, "Cruise Test — Part 1" , does A/T shift from D3 to D4 at the specified speed?

Yes or No

Yes >> GO TO 11. No >> GO TO 2.



2. CHECK LINE PRESSURE

Perform line pressure test.

Engine Speed	Line Pressure kPa (kg/cm² , psi)		
RPM	D, 2 and 1 Position	R Position	
Idle	500 (5.1, 73)	778 (7.9, 113)	
Stall	1,223 (12.6, 179)	1,918 (19.6, 278)	

Refer to AT-453, "Line Pressure Test".

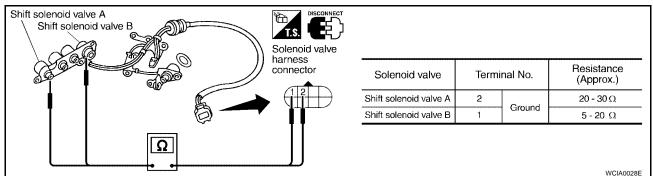
OK or NG

OK >> GO TO 3. NG >> GO TO 7.

[RE4F04B]

3. CHECK VALVE RESISTANCE

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Shift solenoid valve A
- Shift solenoid valve B
- 2. Check resistance between terminal cord assembly connector F30 terminals 1 and 2 and ground.



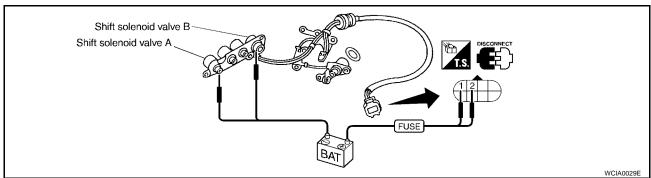
OK or NG

OK >> GO TO 5.

NG >> Replace solenoid valve assembly.

4. CHECK VALVE OPERATION

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Shift solenoid valve A
- Shift solenoid valve B
- 2. Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.



OK or NG

OK >> GO TO 5.

NG >> Replace solenoid valve assembly.

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5. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to <u>AT-674, "DISAS-SEMBLY"</u>.
- Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.

OK or NG

OK >> GO TO 6.

NG >> Repair control valve.

6. CHECK SHIFT UP (D3 TO D4)

Does A/T shift from D₃ to D₄ at the specified speed?

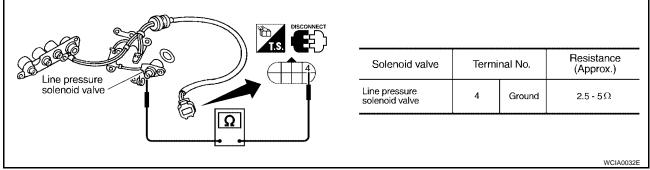
Yes or No

Yes >> GO TO 11.

No >> Check transaxle internal components (clutch, brake, etc.).

7. CHECK VALVE RESISTANCE

- Remove control valve assembly. Refer to <u>AT-639, "REMOVAL"</u>.
- Line pressure solenoid valves
- 2. Check resistance between the terminal cord assembly connector F30 terminal 4 and ground.



OK or NG

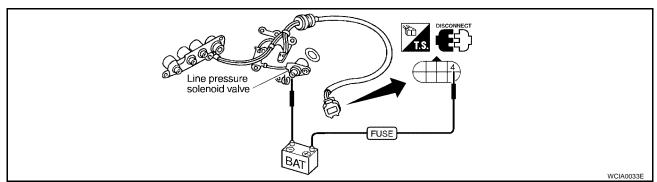
OK >> GO TO 9.

NG >> Replace solenoid valve assembly.

[RE4F04B]

8. CHECK VALVE OPERATION

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL" .
- Line pressure solenoid valves
- 2. Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.



OK or NG

OK >> GO TO 9.

NG >> Replace solenoid valve assembly.

9. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to <u>AT-674, "DISAS-SEMBLY"</u>.
- 2. Check line pressure circuit valves for sticking.
- Pressure regulator valve
- Pilot valve
- Pressure modifier valve

OK or NG

OK >> GO TO 10.

NG >> Repair control valve.

10. CHECK SHIFT UP (D3 TO D4)

Does A/T shift from D₃ to D₄ at the specified speed?

Yes or No

Yes >> GO TO 11.

No >> Check transaxle internal components (clutch, brake, etc.).

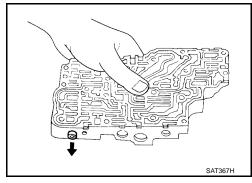
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Perform AT-523, "Diagnostic Trouble Code (DTC) Confirmation Procedure".

OK or NG

OK >> INSPECTION END

NG >> Perform "Cruise test — Part 1" again and return to the start point of this test group.



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[RE4F04B]

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

ECS0064B

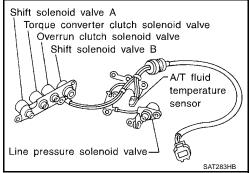
Description

The torque converter clutch solenoid valve is activated, with the gear

in D4, by the TCM in response to signals sent from the vehicle speed and the ECM (throttle opening). Lock-up piston operation will then be controlled.

Lock-up operation, however, is prohibited when A/T fluid temperature is too low.

When the accelerator pedal is depressed (less than 2/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Torque converter clutch solenoid valve duty	Lock-up OFF ↓ Lock-up ON	Approximately 4% ↓ Approximately 94%

On Board Diagnosis Logic

Diagnostic trouble code TCC SOLENOID/CIRC with CONSULT-II or P0740 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause ECS0064D

Check the following items.

- Torque converter clutch solenoid valve
- Harness or connectors (The solenoid circuit is open or shorted.)

Diagnostic Trouble Code (DTC) Confirmation Procedure

FCS0064F

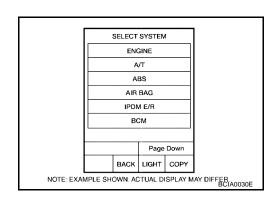
NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

Turn ignition switch ON.



[RE4F04B]

2. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II and wait at least 1 second.

Ι	SE	LECT D	IAG MOI	DE	
	WORK SUPPORT				
	SELF-DIAG RESULTS				
	CAN D	IAG SU	PPORT I	MNTR	
	DATA MONITOR				
	ACTIVE TEST				
	ECU PART NUMBER				
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NOTE: EXAMPLE SHOWN. ACTUAL DISPLAY MAY DIFFER BC(A0031E					

WITH GST

Follow the procedure "With CONSULT-II".

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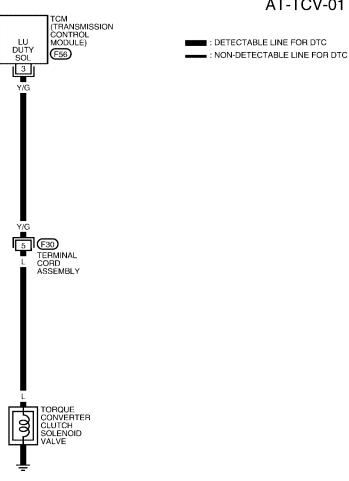
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[RE4F04B]

Wiring Diagram — AT — TCV

ECS0064F

AT-TCV-01





WCWA0133E

[RE4F04B]

TCM TERMIN	TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)	
3	V/G	Y/G TORQUE CONVERTER CLUTCH SOLENOID VALVE	WITH TORQUE CONVERTER LOCK-UP	APPROX. 8 - 15V	
3	176		WITHOUT TORQUE CON- VERTER LOCK-UP	APPROX. 0V	

Diagnostic Procedure

ECS0064G

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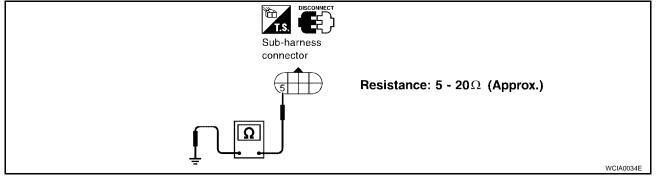
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1. CHECK VALVE RESISTANCE

- 1. Turn ignition switch to OFF position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- 3. Check resistance between terminal cord assembly connector F30 terminal 5 and ground.

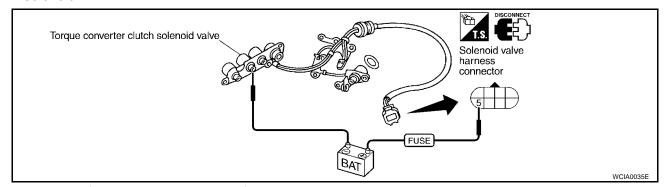


OK or NG

OK >> GO TO 3. NG >> GO TO 2.

2. CHECK VALVE OPERATION

- 1. Remove oil pan.
- 2. Check the following items:
- Torque converter clutch solenoid valve
- Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.



Harness of terminal cord assembly for short or open

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

Revision: July 2004 AT-533 2005 Sentra

[RE4F04B]

3. CHECK POWER SOURCE CIRCUIT

- 1. Turn ignition switch to OFF position.
- 2. Disconnect TCM harness connector.
- 3. Check continuity between terminal cord assembly harness connector F30 terminal 5 and TCM harness connector F56 terminal 3. Refer to AT-532, "Wiring Diagram AT TCV".

Continuity should exist.

4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK DTC

Perform AT-530, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> INSPECTION END

NG >> GO TO 5.

5. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

[RE4F04B]

DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)

PFP:31940

Description

ECS0064H

- This is an OBD-II self-diagnostic item and not available in TCM self-diagnosis.
- This malfunction will not be detected while the O/D OFF indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into fourth gear position or the torque converter clutch does not lock up as instructed by the TCM. This is not caused by electrical malfunction (circuits) open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning oil pump or torque converter clutch, etc.

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CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Torque converter clutch solenoid valve duty	Lock-up OFF ↓ Lock-up ON	Approximately 4% ↓ Approximately 94%

On Board Diagnosis Logic

ECS0064I

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:

Torque converter slip ratio = A x C/B

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

If the actual gear position is much lower than the position (4th) supposed by TCM, the slip ratio will be much less than normal. In case the ratio does not reach the specified value, TCM judges this diagnosis malfunction. This malfunction will be caused when shift solenoid valve B is stuck closed.

Gear positions supposed by TCM are as follows.

In case of gear position with no malfunctions: 1, 2, 3 and 4 positions

In case of gear position with shift solenoid valve B stuck closed: 1, 2, 2 and 1* positions to each gear position above

*: P0744 is detected.

Diagnostic trouble code A/T TCC S/V FNCTN with CONSULT-II or P0744 without CONSULT-II is detected when A/T cannot perform lock-up even if electrical circuit is good.

Possible Cause ECS0064J

Check the following items.

- Line pressure solenoid valve
- Torque converter clutch solenoid valve
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0064K

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

AT-535 Revision: July 2004 2005 Sentra

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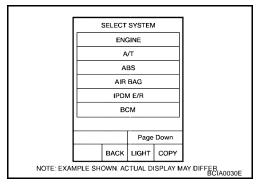
WITH CONSULT-II

- Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.

FLUID TEMP SEN: 0.4 - 1.5V

If out of range, drive vehicle to decrease voltage (warm up the fluid) or stop engine to increase voltage (cool down the fluid).

3. Select "TCC S/V FNCTN P0744" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".



SELECT DIAG MODE

WORK SUPPORT

SELF-DIAG RESULTS
CAN DIAG SUPPORT MNTR

DATA MONITOR

ACTIVE TEST

ECU PART NUMBER

Page Down

NOTE: EXAMPLE SHOWN. ACTUAL DISPLAY MAY DIFFER BCIA0031E

4. Accelerate vehicle to more than 70 km/h (43 MPH) and maintain the following condition continuously until "TESTING" has turned to "COMPLETE". (It will take approximately 30 seconds after "TESTING" shows.)

THROTTLE POSI: 1.0/8 - 2.0/8 (at all times during step 4)

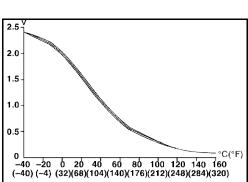
Selector lever: D position (O/D ON) TCC S/V DUTY: More than 94%

VHCL/S SE-A/T: Constant speed of more than 70 km/h (43 MPH)

- Check that "GEAR" shows "4".
- For shift schedule, refer to <u>AT-747, "Shift Schedule"</u>.
- If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0744 is shown, refer to applicable "TROUBLE DIAGNOSIS FOR DTC".
- 5. Make sure that "OK" is displayed. (If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE".)

Refer to AT-538, "Diagnostic Procedure".

Refer to AT-747, "Shift Schedule".



WITH GST

Follow the procedure "With CONSULT-II".

[RE4F04B]

Wiring Diagram — AT — TCCSIG

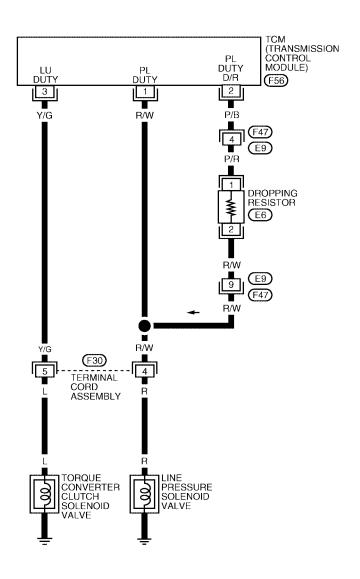
ECS0064L

AT-TCCSIG-01

: DETECTABLE LINE FOR DTC
: NON- DETECTABLE LINE FOR DTC

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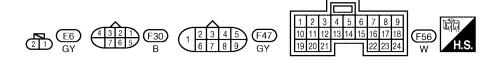
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[RE4F04B]

TCM TERMIN	TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)	
1	1 R/W	LINE PRESSURE SOLENOID VALVE	WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	APPROX. 1.5 - 3.0V	
	10,00		WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	APPROX. 0V	
2	2 P/B LINE PRESSURE SOLENOID VALVE (DROPPING RESISTOR)		WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	APPROX. 4 - 14V	
۷		WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	APPROX. 0V		
3 Y/G	TORQUE CONVERTER CLUTCH SOLENOID VALVE	WITH TORQUE CONVERTER LOCK-UP	APPROX. 8 - 15V		
		WITHOUT TORQUE CON- VERTER LOCK-UP	APPROX. 0V		

Diagnostic Procedure

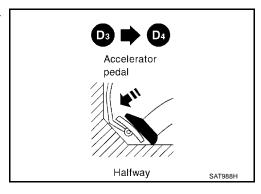
ECS0064M

1. CHECK SHIFT UP (D3 TO D4)

During AT-462, "Cruise Test — Part 1" , does A/T shift from D3 to D4 at the specified speed?

Yes or No

Yes >> GO TO 11. No >> GO TO 2.



2. CHECK LINE PRESSURE

Perform line pressure test.

Engine Speed	Line Pressure kPa (kg/cm² , psi)		
RPM	D, 2 and 1 Position	R Position	
Idle	500 (5.1, 73)	778 (7.9, 113)	
Stall	1,223 (12.6, 179)	1,918 (19.6, 278)	

Refer to AT-453, "Line Pressure Test".

OK or NG

OK >> GO TO 3. NG >> GO TO 6.

[RE4F04B]

3. CHECK CONTROL VALVE

- 1. Disassemble control valve assembly. Refer to AT-674, "DISAS-SEMBLY".
- Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.

OK or NG

OK >> GO TO 4.

NG >> Repair control valve.



Does A/T shift from D₃ to D₄ at the specified speed?

Yes or No

Yes >> GO TO 5.

>> Check transaxle internal components (clutch, brake, etc.). No

5. CHECK DTC

Perform AT-535, "Diagnostic Trouble Code (DTC) Confirmation Procedure".

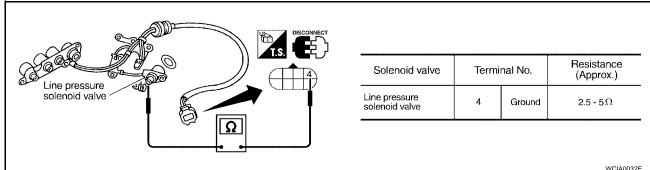
OK or NG

OK >> INSPECTION END

NG >> GO TO 11. Check for proper lock-up.

6. CHECK VALVE RESISTANCE

- Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Line pressure solenoid valve
- Check resistance to the terminal and ground.



OK or NG

OK >> GO TO 8.

NG >> Replace solenoid valve assembly. SAT367H

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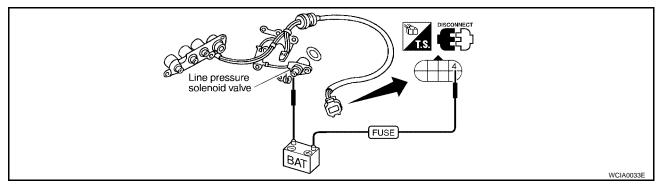
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7. CHECK VALVE OPERATION

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Line pressure solenoid valve
- Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.



OK or NG

OK >> GO TO 8.

NG >> Replace solenoid valve assembly.

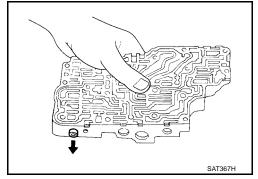
8. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to <u>AT-674, "DISAS-SEMBLY"</u>.
- 2. Check line pressure circuit valves for sticking.
- Pressure regulator valve
- Pilot valve
- Pressure modifier valve

OK or NG

OK >> GO TO 9.

NG >> Repair control valve.



9. CHECK SHIFT UP (D₃ TO D₄)

Does A/T shift from D₃ to D₄ at the specified speed?

Yes or No

Yes >> GO TO 10.

No >> Check transaxle internal components (clutch, brake, etc.).

10. снеск отс

Perform AT-535, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> INSPECTION END

NG >> GO TO 11. Check for proper lock-up.

DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)

[RE4F04B]

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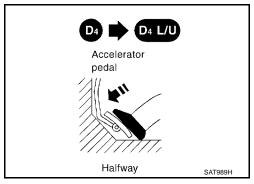
11. CHECK LOCK-UP

During $\underline{\text{AT-462}}$, "Cruise $\underline{\text{Test}}$ — $\underline{\text{Part 1"}}$, does A/T perform lock-up at the specified speed?

Yes or No

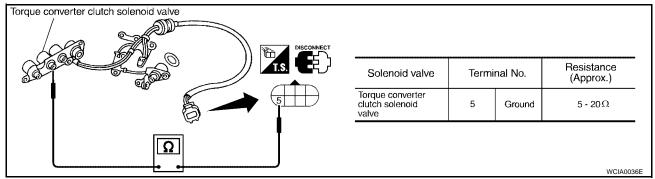
Yes >> Perform "Cruise test — Part 1" again and return to the start point of this test group.

No >> GO TO 12.



12. CHECK VALVE RESISTANCE

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Torque converter clutch solenoid valve
- 2. Check resistance between terminal cord assembly connector F30 terminal 5 and ground.



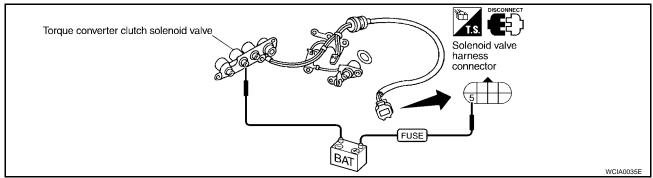
OK or NG

OK >> GO TO 14.

NG >> Replace solenoid valve assembly.

13. CHECK VALVE OPERATION

- Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Torque converter clutch solenoid valve
- Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.



OK or NG

OK >> GO TO 14.

NG >> Replace solenoid valve assembly.

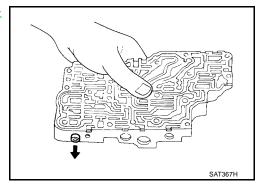
14. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to <u>AT-674, "DISAS-SEMBLY"</u>.
- 2. Check control valves for sticking.
- Torque converter clutch control valve
- Torque converter clutch relief valve

OK or NG

OK >> GO TO 15.

NG >> Repair control valve.



15. CHECK LOCK-UP

Does A/T perform lock-up at the specified speed?

Yes or No

Yes >> GO TO 16.

No >> Check transaxle internal components (clutch, brake, etc.).

16. снеск отс

Perform AT-535, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> INSPECTION END

NG >> Perform "Cruise test — Part 1" again and return to the start point of this test group.

[RE4F04B]

PFP:31940

ECS0064N

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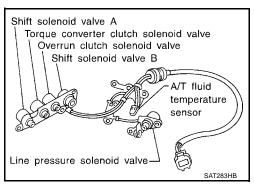
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DTC P0745 LINE PRESSURE SOLENOID VALVE

Description

The line pressure solenoid valve regulates the oil pump discharge pressure to suit the driving condition in response to a signal sent from the TCM.



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Line pressure solenoid valve duty	Small throttle opening (Low line pressure) ↓ Large throttle opening (High line pressure)	Approximately 24% ↓ Approximately 95%

On Board Diagnosis Logic

ECS00640

Diagnostic trouble code L/PRESS SOL/CIRC with CONSULT-II or P0745 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

Check the following items.

- Harness or connectors (The solenoid circuit is open or shorted.)
- Line pressure solenoid valve

Diagnostic Trouble Code (DTC) Confirmation Procedure

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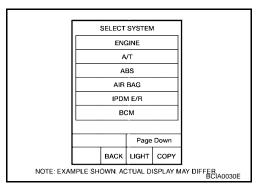
NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

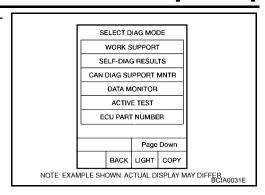
WITH CONSULT-II

 Turn ignition switch ON and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.



[RE4F04B]

2. Depress accelerator pedal completely and wait at least 5 seconds.



WITH GST

Follow the procedure "With CONSULT-II".

[RE4F04B]

Wiring Diagram — AT — LPSV

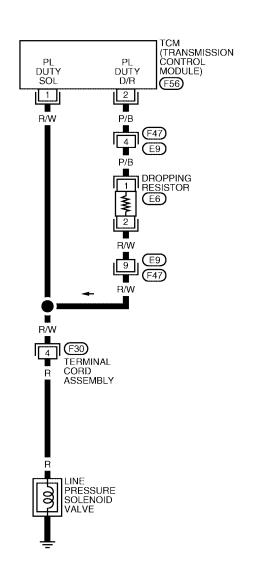
ECS0064R

AT-LPSV-01

: DETECTABLE LINE FOR DTC
: NON- DETECTABLE LINE FOR DTC

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[RE4F04B]

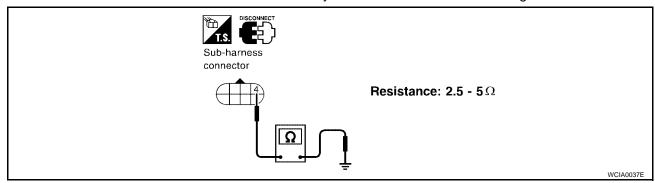
TCM TERMIN	IALS AND REFE	RENCE VALUE MEASURED BET	WEEN EACH TERMINAL AND 25 OF	R 48 (TCM GROUND)
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
1	R/W	LINE PRESSURE SOLENOID	WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	APPROX. 1.5 - 3.0V
·	17,77	VALVE	WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	APPROX. 0V
2	P/B	LINE PRESSURE SOLENOID VALVE (DROPPING RESIS-	WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	APPROX. 4 - 14V
2	1 / 5	TOR)	WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	APPROX. 0V

Diagnostic Procedure

ECS0064S

1. CHECK VALVE RESISTANCE

- 1. Turn ignition switch to OFF position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- 3. Check resistance between terminal cord assembly connector F30 terminal 4 and ground.

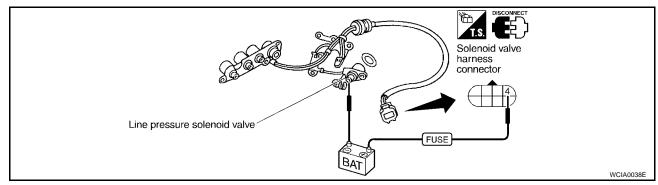


OK or NG

OK >> GO TO 3. NG >> GO TO 2.

2. CHECK VALVE OPERATION

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Line pressure solenoid valve
- Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.



Harness of terminal cord assembly for short or open

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

[RE4F04B]

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3. CHECK POWER SOURCE AND DROPPING RESISTOR CIRCUIT

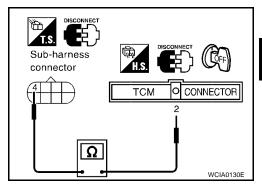
- 1. Turn ignition switch to OFF position.
- 2. Disconnect TCM harness connector.
- Check resistance between terminal cord assembly harness connector F30 terminal 4 and TCM harness connector F56 terminal

Resistance

: Approximately 12 Ω

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



4. DETECT MALFUNCTIONING ITEM

Check the following items:

- Dropping resistor
- Check resistance between two terminals.

Resistance

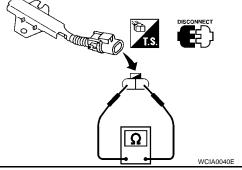
: Approximately 12 Ω

Harness for short or open between TCM terminal 2 and terminal cord assembly (Main harness)

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.



5. CHECK POWER SOURCE CIRCUIT

- Turn ignition switch to OFF position.
- Check continuity between terminal cord assembly connector F30 terminal 4 and TCM harness connector F56 terminal 1. Refer to AT-545, "Wiring Diagram — AT — LPSV".

Continuity should exist.

3. Reinstall any part removed.

OK or NG

OK

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK DTC

Perform AT-543, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> INSPECTION END

NG >> GO TO 7.

[RE4F04B]

7. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

[RE4F04B]

DTC P0750 SHIFT SOLENOID VALVE A

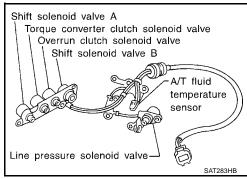
PFP:31940

ECS0064T

Description

Shift solenoid valves A and B are turned ON or OFF by the TCM in response to signals sent from the park/neutral position (PNP) switch,

vehicle speed and ECM (throttle opening). Gears will then be shifted to the optimum position.



Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

ECS0064U

Diagnostic trouble code SFT SOL A/CIRC with CONSULT-II or P0750 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause Н FCS0064V

Check the following items.

- Harness or connectors (The solenoid circuit is open or shorted.)
- Shift solenoid valve A

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0064W

CAUTION:

Always drive vehicle at a safe speed.

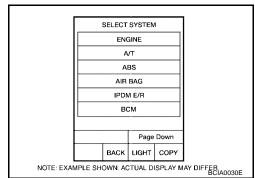
NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

Turn ignition switch ON and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.



AT-549 Revision: July 2004 2005 Sentra

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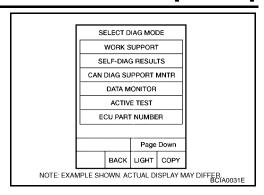
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[RE4F04B]

- 2. Start engine.
- 3. Drive vehicle in D position and allow the transmission to shift 1 \rightarrow 2 ("GEAR").



WITH GST

Follow the procedure "With CONSULT-II".

[RE4F04B]

Wiring Diagram — AT — SSV/A

ECS0064X

AT-SSV/A-01

■ : DETECTABLE LINE FOR DTC
■ : NON-DETECTABLE LINE FOR DTC

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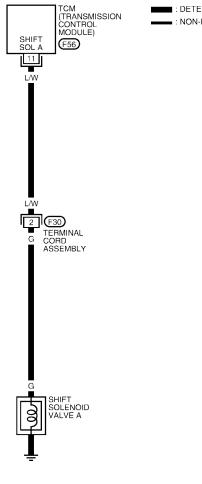
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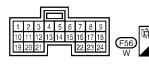
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[RE4F04B]

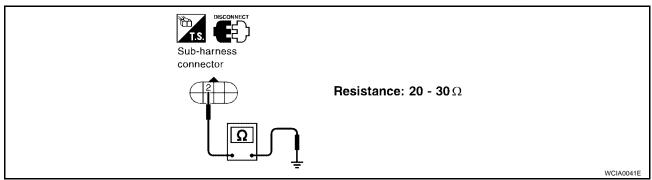
TCM TERMIN	IALS AND REFEI	RENCE VALUE MEASURED BET	WEEN EACH TERMINAL AND 25 OI	R 48 (TCM GROUND)
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
11	L/W	SHIFT SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D1 OR D4)	BATTERY VOLTAGE
11	L) VV	STILL SOLLINGID VALVE A	WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D2 OR D3)	APPROX. 0V

Diagnostic Procedure

ECS0064Y

1. CHECK VALVE RESISTANCE

- 1. Turn ignition switch to OFF position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- 3. Check resistance between terminal cord assembly connector F30 terminal 2 and ground.

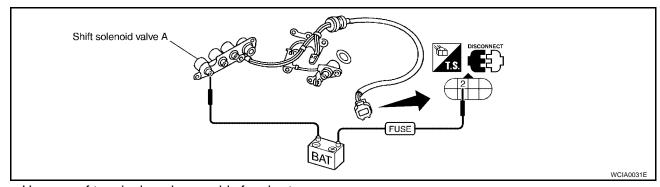


OK or NG

OK >> GO TO 3. NG >> GO TO 2.

2. CHECK VALVE OPERATION

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Check the following items:
- Shift solenoid valve A
- Operation check
- Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.



Harness of terminal cord assembly for short or open

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

[RE4F04B]

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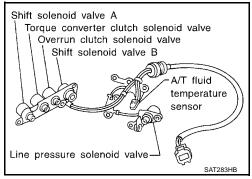
3. CHECK POWER SOURCE CIRCUIT Α 1. Turn ignition switch to OFF position. 2. Disconnect TCM harness connector. В 3. Check continuity between terminal cord assembly harness connector F30 terminal 2 and TCM harness connector F56 terminal 11. Refer to AT-551, "Wiring Diagram — AT — SSV/A". Continuity should exist. 4. Reinstall any part removed. OK or NG D OK >> GO TO 4. NG >> Repair open circuit or short to ground or short to power in harness or connectors. 4. CHECK DTC Е Perform AT-549, "Diagnostic Trouble Code (DTC) Confirmation Procedure" . OK or NG OK >> INSPECTION END NG >> GO TO 5. 5. CHECK TCM INSPECTION 1. Perform TCM input/output signal inspection. 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector. Н OK or NG OK >> INSPECTION END NG >> Repair or replace damaged parts.

PFP:31940

ECS0064Z

Description

Shift solenoid valves A and B are turned ON or OFF by the TCM in response to signals sent from the park/neutral position (PNP) switch, vehicle speed and ECM (throttle opening). Gears will then be shifted to the optimum position.



Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

ECS00650

Diagnostic trouble code SFT SOL B/CIRC with CONSULT-II or P0755 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

Check the following items.

- Harness or connectors (The solenoid circuit is open or shorted.)
- Shift solenoid valve B

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS00652

CAUTION:

Always drive vehicle at a safe speed.

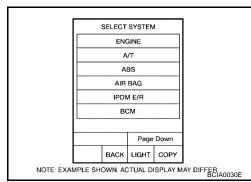
NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch ON and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.



[RE4F04B]

- 2. Start engine.
- 3. Drive vehicle in D position and allow the transmission to shift 1 \rightarrow 2 \rightarrow 3 ("GEAR").

					_
	SE	LECT D	IAG MOI	DE	
	WORK SUPPORT				
	SELF-DIAG RESULTS				
	CAN DIAG SUPPORT MNTR				
	DATA MONITOR				
	ACTIVE TEST				
	ECU PART NUMBER				
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Follow the procedure "With CONSULT-II".

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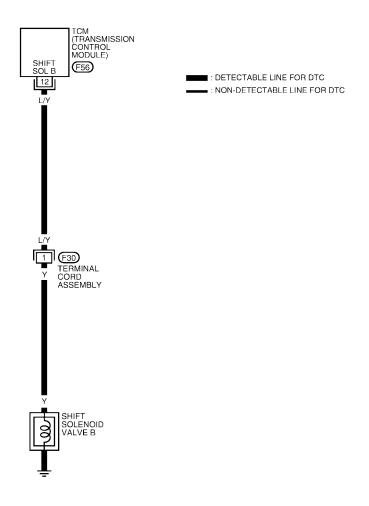
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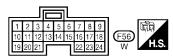
Wiring Diagram — AT — SSV/B

ECS00653

AT-SSV/B-01







[RE4F04B]

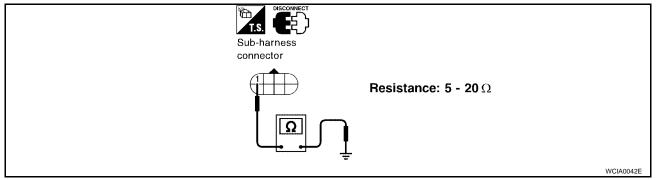
TCM TERMIN	IALS AND REFE	RENCE VALUE MEASURED BET	WEEN EACH TERMINAL AND 25 O	R 48 (TCM GROUND)
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
12	L/Y	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D1 OR D2)	BATTERY VOLTAGE
12	UI	STILL T SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE BE IS NOT OPERATING (DRIV- ING IN D3 OR D4)	APPROX. OV

Diagnostic Procedure

CS00654

1. CHECK VALVE RESISTANCE

- 1. Turn ignition switch to OFF position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- 3. Check resistance between terminal cord assembly connector F30 terminal 1 and ground.

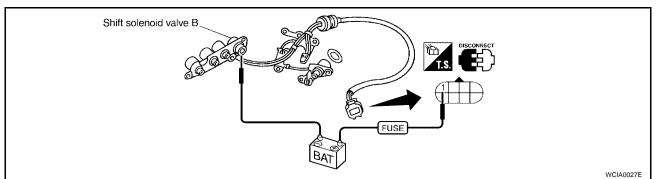


OK or NG

OK >> GO TO 3. NG >> GO TO 2.

2. CHECK VALVE OPERATION

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- Check the following items:
- Shift solenoid valve B
- Operation check
- Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.



Harness of terminal cord assembly for short or open

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

Revision: July 2004 AT-557 2005 Sentra

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[RE4F04B]

3. CHECK POWER SOURCE CIRCUIT

- 1. Turn ignition switch to OFF position.
- 2. Disconnect TCM harness connector.
- 3. Check continuity between terminal cord assembly harness connector F30 terminal 1 and TCM harness connector F56 terminal 12. Refer to <u>AT-556</u>, "Wiring Diagram AT SSV/B".

Continuity should exist.

4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK DTC

Perform AT-554, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> INSPECTION END

NG >> GO TO 5.

5. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSI-TION (APP) SENSOR1

[RE4F04B]

DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Description ECS00655

The throttle position sensor [accelerator pedal position (APP) sensor] is part of the system that controls throttle position. This system also uses an electric throttle control actuator which consists of a throttle control motor and throttle position sensors. Accelerator pedal position signal is sent to the ECM.

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Throttle position sensor	Fully-closed throttle	Approximately 0.5V
[accelerator pedal position (APP) sensor]	Fully-open throttle	Approximately 4V

On Board Diagnosis Logic

FCS00656

ΑT

Diagnostic trouble code TP SEN/CIRC A/T with CONSULT-II or P1705 without CONSULT-II is detected when TCM receives an excessively low or high voltage from the ECM.

Possible Cause ECS00657

Check the following items.

Harness or connectors (The sensor circuit is open or shorted.)

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS00658

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CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.

Accelerator pedal condition	THRTL POS SEN	CLOSED THL/SW	W/O THRL/P-SW
Fully released	Less than 4.7V	ON	OFF
Partially depressed	0.1 - 4.6V	OFF	OFF
Fully depressed	1.9 - 4.6V	OFF	ON

If the check result is NG, go to AT-562, "Diagnostic Procedure". If the check result is OK, go to following step.

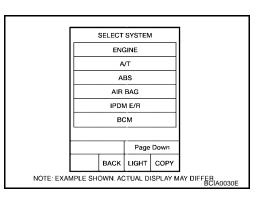
- Turn ignition switch ON and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- Start engine and maintain the following conditions for at least 3 consecutive seconds. Then release accelerator pedal completely.

VHCL SPEED SE: 10 km/h (6 MPH) or more THRTL POS SEN: Approximately 3V or less

Selector lever: D position (O/D ON)

If the check result is NG, go to AT-562, "Diagnostic Procedure".

If the check result is OK, go to following step.



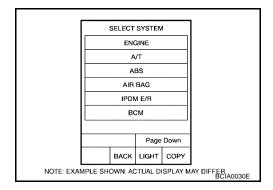
	SE	LECT D	IAG MOI	DE	
	WORK SUPPORT				
	SE	LF-DIA	3 RESUL	TS	
	CAN	DIAG SL	IPPORT I	MNTR	
		DATA M	ONITOR		
		ACTIV	E TEST		
	EC	CU PART	ГИЦМВЕ	R	
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		BACK	LIGHT	COPY	
NOTE: EXAM	/IPLE SHO	OWN. AC	CTUAL DI	SPLAY N	IAY DIFFER BCIA0031E

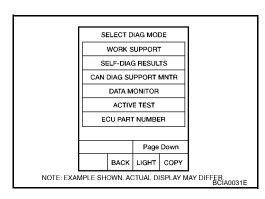
Maintain the following conditions for at least 3 consecutive seconds. Then release accelerator pedal completely.

DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

[RE4F04B]

VHCL SPEED SE: 10 km/h (6 MPH) or more Accelerator pedal: Wide open throttle Selector lever: D position (O/D ON)





WITH GST

Follow the procedure "With CONSULT-II".

DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

[RE4F04B]

Wiring Diagram — AT — TPS

ECS00659

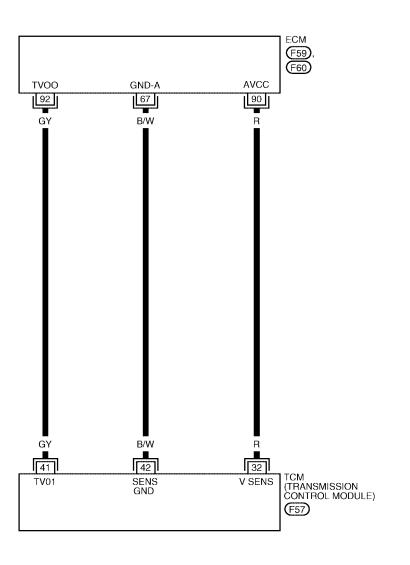
AT-TPS-01

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: NON-DETECTABLE LINE FOR DTC

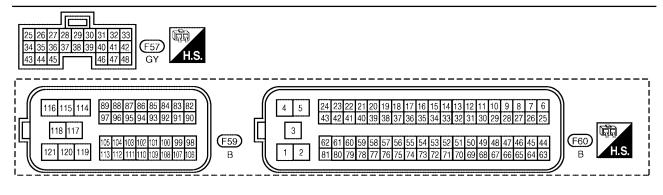
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DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

[RE4F04B]

TERMINALS	AND REFERENC	E VALUE MEASURED BETWEE	N EACH TERMINAL AND 25 OR 48 (TCM GROUND)
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
32	R	SENSOR POWER	IGNITION SWITCH ON	4.5 - 5.5V
32	K	SENSOR FOWER	IGNITION SWITCH OFF	OV
41	GY	THROTTLE POSITION SEN- SOR [ACCELERATOR PEDAL	IGNITION ON AND ACCELERA- TOR PEDAL IS DEPRESSED	FULLY CLOSED THROTTLE: 0.5V
41	Gi	POSITION (APP) SENSOR]	SLOWLY AFTER WARMING UP ENGINE	WIDE OPEN THROTTLE: 4.0V
42	B/W	SENSOR GROUND	_	_

Diagnostic Procedure

ECS0065A

1. CHECK DTC WITH ECM

Check P code with CONSULT-II "ENGINE".
 Turn ignition switch ON and select "SELF DIAGNOSTIC RESULTS" mode for "ENGINE" with CONSULT-II

Refer to EC-713, "Malfunction Indicator Lamp (MIL)".

OK or NG

OK (with CONSULT-II)>>GO TO 2.

OK (without CONSULT-II)>>GO TO 3.

NG >> Check throttle position ser

>> Check throttle position sensor [accelerator pedal position (APP) sensor] circuit for engine control. Refer to EC-971, "DTC P0222, P0223 TP SENSOR" and EC-1304, "DTC P2138 APP SENSOR"

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

(III) With CONSULT-II

- Turn ignition switch to ON position. (Do not start engine.)
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out the value of "THRTL POS SEN".

	DATA MONITOR	
мо	NITORING	
VHCL	S SE-A/T XXX F	km/h
VHCL	S SE-MTR XXX I	km/h
THRT	POS SEN XXX	xv
FLUID	TEMP SE XXX	xv
BATTE	RY VOLT XXX	xv

Voltage:

Fully-closed throttle :Approximately 0.5V
Fully-open throttle :Approximately 4V

OK or NG

OK >> GO TO 4.

NG >> Check harness for short or open between ECM and TCM regarding throttle position sensor [accelerator pedal position (APP) sensor] circuit. (Main harness)

DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSI-TION (APP) SENSOR]

[RE4F04B]

3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

⊗ Without CONSULT-II

Turn ignition switch to ON position. (Do not start engine.) 1.

2. Check voltage between TCM terminals 41 (GY) and 42 (B/W) while accelerator pedal is depressed slowly.

Voltage:

Fully-closed throttle :Approximately 0.5V

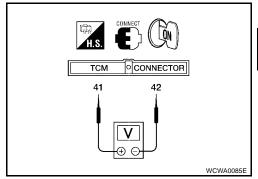
valve

Fully-open throttle :Approximately 4V

valve

(Voltage rises gradually in response to throttle posi-

tion.)



OK or NG

OK >> GO TO 4.

NG >> Check harness for short or open between ECM and TCM regarding throttle position sensor [accelerator pedal position (APP) sensor] circuit. (Main harness)

4. CHECK TCM INSPECTION

Perform TCM input/output signal inspection. 1.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts. ΑT

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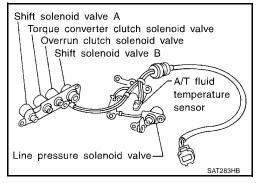
DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

PFP:31940

Description

ECS0065B

The overrun clutch solenoid valve is activated by the TCM in response to signals sent from the park/neutral position (PNP) switch, overdrive control switch, vehicle speed and ECM (throttle opening). The overrun clutch operation will then be controlled.



On Board Diagnosis Logic

ECS0065C

Diagnostic trouble code O/R CLTCH SOL/CIRC with CONSULT-II or P1760 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

Check the following items.

- Harness or connectors (The solenoid circuit is open or shorted.)
- Overrun clutch solenoid valve

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0065E

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

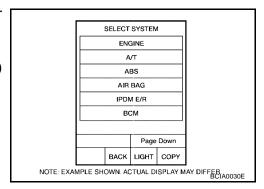
TESTING CONDITION:

Always drive vehicle on a level road to improve accuracy of test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

- 1. Turn ignition switch ON and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- Start engine.
- 3. Accelerate vehicle to a speed of more than 10 km/h (6 MPH) with D position (O/D ON).



Release accelerator pedal completely with D position (O/D OFF).

DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

[RE4F04B]

WITH GST

Follow the procedure "With CONSULT-II".

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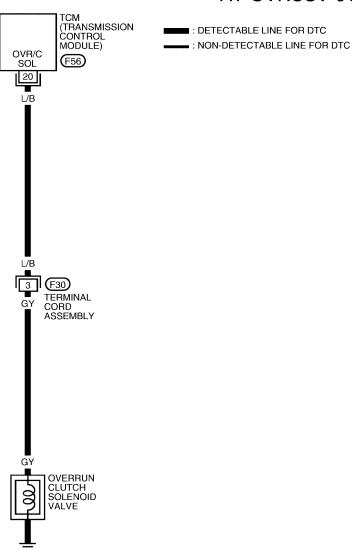
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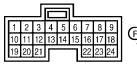
Wiring Diagram — AT — OVRCSV

ECS0065F

AT-OVRCSV-01









WCWA0031E

DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
20 L/B OVERRUN CLUTCH SO NOID VALVE		OVEDBLIN OLLITCH SOLE	WHEN OVERRUN CLUTCH SOLENOID VALVE OPERATES	BATTERY VOLTAGE
		WHEN OVERRUN CLUTCH SOLENOID VALVE DOES NOT OPERATE	APPROX. 0V	

Diagnostic Procedure

CS0065G

1. CHECK VALVE RESISTANCE

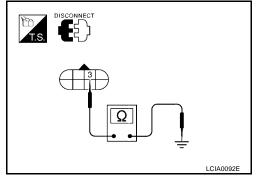
- Turn ignition switch to OFF position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- 3. Check resistance between terminal cord assembly F30 terminal 3 (component side) and ground.

Resistance

: **20 - 30** Ω

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



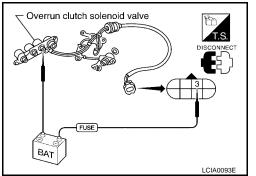
2. CHECK VALVE OPERATION

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL" .
- 2. Check the following items:
- Overrun clutch solenoid valve
- Operation check
- Check solenoid valve by listening for its operating sound while applying battery voltage and ground to the solenoid.
- Harness of terminal cord assembly for short or open

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.



3. CHECK POWER SOURCE CIRCUIT

- 1. Turn ignition switch to OFF position.
- 2. Disconnect TCM harness connector.
- 3. Check continuity between terminal cord assembly connector F30 terminal 3 and TCM harness connector F56 terminal 20. Refer to AT-566, "Wiring Diagram AT OVRCSV".

Continuity should exist.

4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

Revision: July 2004 AT-567 2005 Sentra

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DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

[RE4F04B]

4. CHECK DTC

Perform AT-564, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> INSPECTION END

NG >> GO TO 5.

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

[RE4F04B]

DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM **POWER SOURCE)**

ECS0065H

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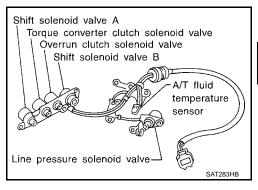
ΑT

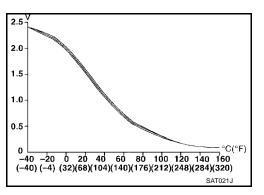
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Description

The A/T fluid temperature sensor detects the A/T fluid temperature and sends a signal to the TCM.





CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Tremainer epodination data are relevance.				
Monitor item	Monitor item Condition Specification (Approximately)		Approximately)	
A/T fluid temperature sensor	Cold [20°C (68°F)] ↓ Hot [80°C (176°F)]	1.5V ↓ 0.5V	2.5 kΩ ↓ 0.3 kΩ	

On Board Diagnosis Logic

Diagnostic trouble code BATT/FLUID TEMP SEN with CONSULT-II or 8th judgement flicker without CON-SULT-II is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause ECS0065J M

Check the following items.

- Harness or connectors (The sensor circuit is open or shorted.)
- A/T fluid temperature sensor

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0065K

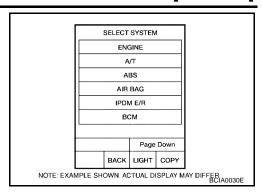
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

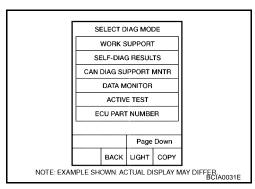
Start engine.

[RE4F04B]

Select "DATA MONITOR" mode for "A/T" with CONSULT-II.

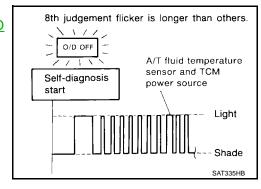


 Drive vehicle under the following conditions: Selector lever in D, vehicle speed higher than 20 km/h (12 MPH).



WITHOUT CONSULT-II

- Start engine.
- Drive vehicle under the following conditions:
 Selector lever in D, vehicle speed higher than 20 km/h (12 MPH).
- Perform self-diagnosis.
 Refer to <u>AT-439</u>, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)"



[RE4F04B]

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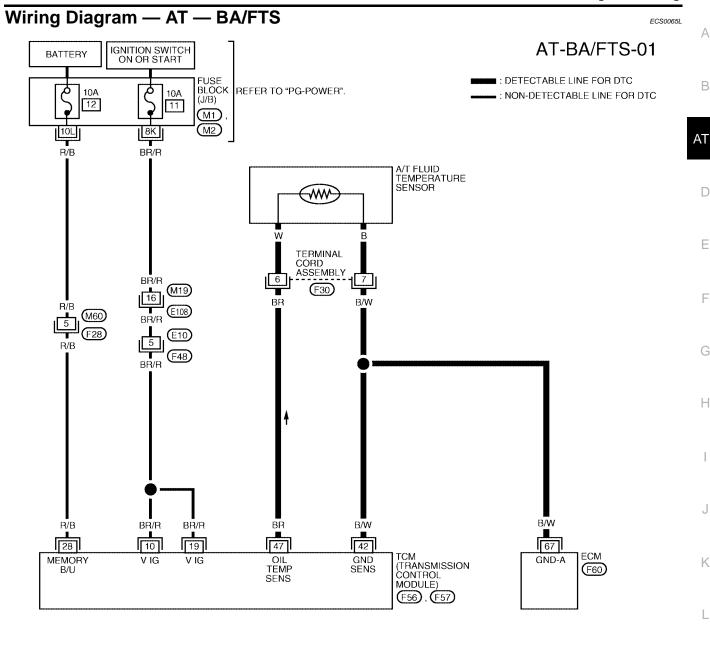
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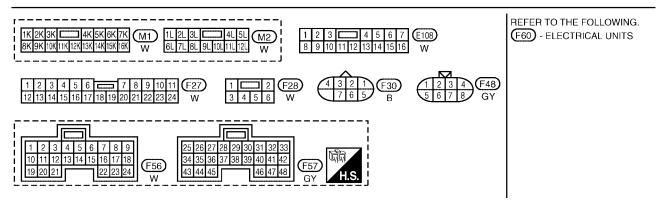
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BCWA0251E

[RE4F04B]

TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
10	BR/R	POWER SOURCE	IGNITION ON	BATTERY VOLTAGE
			IGNITION OFF	APPROX. 0V
19	BR/R	POWER SOURCE	IGNITION ON	BATTERY VOLTAGE
			IGNITION OFF	APPROX. 0V
28	R/B	POWER SOURCE (MEMORY BACKUP)	IGNITION ON	BATTERY VOLTAGE
			IGNITION OFF	BATTERY VOLTAGE
42	B/W	SENSOR GROUND	_	_
47	BR	A/T FLUID TEMPERATURE SENSOR	IGNITION ON WITH ATF TEM- PERATURE AT 20°C (68°F)	APPROX. 1.5V
			IGNITION ON WITH ATF TEM- PERATURE AT 80°C (176°F)	APPROX. 0.5V

Diagnostic Procedure

ECS0065M

1. CHECK INPUT SIGNAL OF A/T FLUID TEMPERATURE SENSOR (WITH CONSULT-II)

(II) With CONSULT-II

- 1. Start engine.
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out the value of "FLUID TEMP SE".

DATA MONITOR	
MONITORING	
VHCL/S SE-A/T XXX km/h	
VHCL/S SE-MTR XXX km/h	
THRTL POS SEN XXX V	
FLUID TEMP SE XXX V	
BATTERY VOLT XXX V	
	\$

Voltage :Cold [20°C (68°F)] \rightarrow Hot [80°C (176°F)]

:Approximately 1.5V \rightarrow 0.5V

OK or NG

OK >> GO TO 9. NG >> GO TO 2.

2. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Harness for short or open between battery and TCM (Main harness)
- Ground circuit for ECM Refer to EC-833, "POWER SUPPLY AND GROUND CIRCUIT".

OK or NG

OK >> GO TO 9.

NG >> Repair or replace damaged parts.

[RE4F04B]

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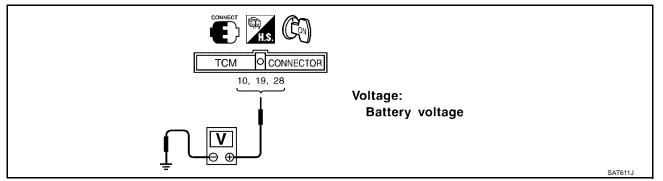
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3. CHECK TCM POWER SOURCE STEP 1

 Turn ignition switch to ON position. (Do not start engine.)

2. Check voltage between TCM terminals 10, 19, 28 and ground.

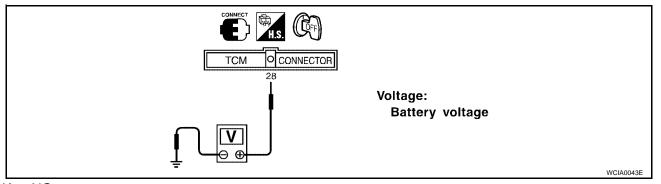


OK or NG

OK >> GO TO 4. NG >> GO TO 5.

4. CHECK TCM POWER SOURCE STEP 2

- 1. Turn ignition switch to OFF position.
- 2. Check voltage between TCM terminal 28 and ground.



OK or NG

OK >> GO TO 6. NG >> GO TO 5.

5. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between ignition switch and TCM (Main harness)
- Harness for short or open between battery and TCM (Main harness)
- Ignition switch and fuse Refer to <u>PG-3</u>, "<u>POWER SUPPLY ROUTING</u>".

OK or NG

OK >> GO TO 6.

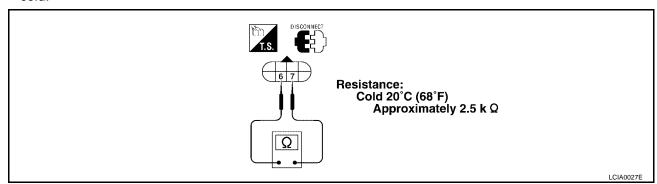
NG >> Repair or replace damaged parts.

Revision: July 2004 AT-573 2005 Sentra

[RE4F04B]

6. CHECK A/T FLUID TEMPERATURE SENSOR WITH TERMINAL CORD ASSEMBLY

- 1. Turn ignition switch to OFF position.
- 2. Disconnect terminal cord assembly connector in engine compartment.
- 3. Check resistance between terminal cord assembly F30 terminals 6 and 7 (component side) when A/T is cold.



4. Reinstall any part removed.

OK or NG

OK (without CONSULT-II) >> GO TO 8. NG >> GO TO 7.

7. DETECT MALFUNCTIONING ITEM

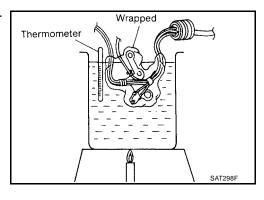
- 1. Remove oil pan.
- 2. Check the following items:
- A/T fluid temperature sensor
- Check resistance between two terminals while changing temperature as shown.

Temperature	Resistance (Approx.)	
20°C (68°F)	2.5kΩ	
80°C (176°F)	0.3kΩ	

 Harness of terminal cord assembly for short or open OK or NG

OK (without CONSULT-II) >> GO TO 8.

NG >> Repair or replace damaged parts.



[RE4F04B]

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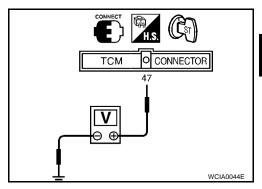
8. CHECK INPUT SIGNAL OF A/T FLUID TEMPERATURE SENSOR (WITHOUT CONSULT-II)

Without CONSULT-II

- 1. Start engine.
- 2. Check voltage between TCM terminal 47 and ground while warming up A/T.

Voltage :Cold [20°C (68°F)] \rightarrow Hot [80°C (176°F)] :Approximately 1.5V \rightarrow 0.5V

- 3. Turn ignition switch to OFF position.
- 4. Disconnect TCM harness connector.
- Check resistance between TCM harness connector terminal 42 and ground. Refer to <u>AT-571, "Wiring Diagram — AT — BA/FTS"</u>



Continuity should exist.

OK or NG

OK >> GO TO 10. NG >> GO TO 9.

9. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM
 Refer to <u>PG-3</u>, "<u>POWER SUPPLY ROUTING</u>".

OK or NG

OK >> GO TO 10.

NG >> Repair or replace damaged parts.

10. CHECK DTC

Perform AT-569, "Diagnostic Trouble Code (DTC) Confirmation Procedure".

OK or NG

OK >> INSPECTION END

NG >> GO TO 11.

11. CHECK TCM INSPECTION

- Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

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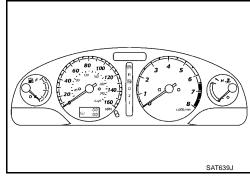
DTC VEHICLE SPEED SENSOR MTR

PFP:24814

ECS0065N

Description

The vehicle speed sensor MTR is built into the speedometer assembly. The sensor functions as an auxiliary device to the revolution sensor when it is malfunctioning. The TCM will then use a signal sent from the vehicle speed sensor MTR.



On Board Diagnosis Logic

ECS00650

Diagnostic trouble code VHCL SPEED SEN-MTR with CONSULT-II or 2nd judgement flicker without CON-SULT-II is detected when TCM does not receive the proper voltage signal from the sensor.

Possible Cause

Check the following items.

- Harness or connectors (The sensor circuit is open or shorted.)
- Vehicle speed sensor

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0065Q

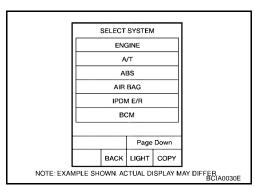
CAUTION:

- Always drive vehicle at a safe speed.
- If conducting this "DTC Confirmation Procedure" again, always turn ignition switch OFF and wait at least 10 seconds before continuing.

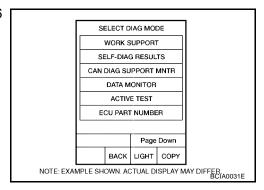
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

 Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.



Start engine and accelerate vehicle from 0 to 25 km/h (0 to 16 MPH).



WITHOUT CONSULT-II

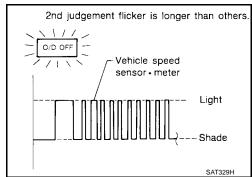
Start engine.

DTC VEHICLE SPEED SENSOR MTR

[RE4F04B]

2. Drive vehicle under the following conditions: Selector lever in D and vehicle speed higher than 25 km/h (16 MPH).

Perform self-diagnosis.
 Refer to AT-439, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)"



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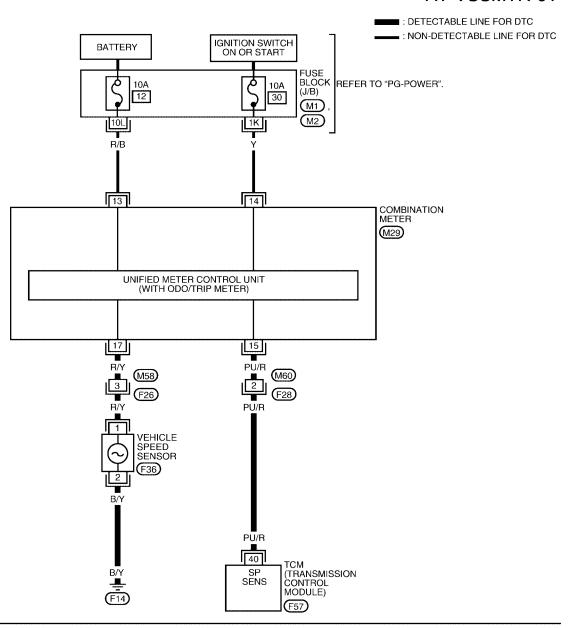
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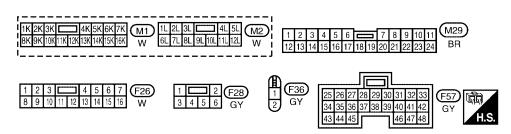
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Wiring Diagram — AT — VSSMTR

ECS0065R

AT-VSSMTR-01





WCWA0137E

DTC VEHICLE SPEED SENSOR MTR

[RE4F04B]

TC	TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)						
-	TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)		
_	40	PU/R	VEHICLE SPEED SENSOR	WHEN MOVING VEHICLE AT 2 TO 3 KM/H (1 TO 2 MPH) FOR 1 M (3 FT)	VOLTAGE VARIES BETWEEN LESS THAN 1V AND MORE THAN 4.5V		

Diagnostic Procedure

ECS0065S

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1. CHECK INPUT SIGNAL

(III) With CONSULT-II

DATA MONITOR		
MONITORING		
XXX k	xxx	KX km/h
XXX k	xxx	KX km/h
XXX	XX	xxx v
XXX	XX	xxx v
XXX	XX	XX)

- 1. Start engine.
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out the value of "VHCL/S SE-MTR" while driving. Check the value changes according to driving speed.

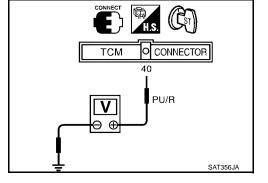
Without CONSULT-II

- 1. Start engine.
- 2. Check voltage between TCM terminal 40 and ground while driving at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more.

Voltage :Voltage varies between less than 1V and more than 4.5V.

OK or NG

OK >> GO TO 3. NG >> GO TO 2.



2. DETECT MALFUNCTIONING ITEM

Check the following items:

- Vehicle speed sensor and ground circuit for vehicle speed sensor Refer to <u>DI-4</u>, "<u>METERS AND GAUGES</u>".
- Harness for short or open between TCM and vehicle speed sensor (Main harness)

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

DTC VEHICLE SPEED SENSOR MTR

[RE4F04B]

3. CHECK DTC

Perform AT-576, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

shift timing during deceleration and improved shifting.

PFP:31935

ECS0065T

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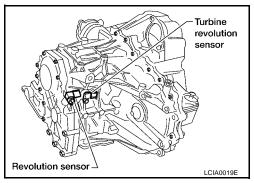
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Description

The turbine revolution sensor detects input shaft rpm (revolutions per minute). It is located on the input side of the automatic transaxle. The vehicle speed sensor A/T (Revolution sensor) is located on the output side of the automatic transaxle. With the two sensors, input and output shaft rpms are accurately detected. The result is optimal



ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check items (Possible cause)	
: TURBINE REV S: 10th judgement flicker	TCM does not receive the proper voltage signal from the sensor.	 Harness or connectors (The sensor circuit is open or shorted.) Turbine revolution sensor 	

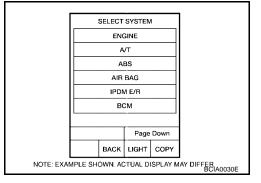
DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

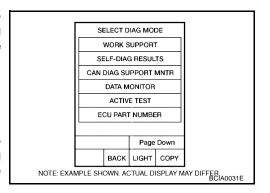
- Always drive vehicle at a safe speed.
- If conducting this "DTC CONFIRMATION PROCEDURE" again, always turn ignition switch OFF and wait at least 5 seconds before continuing.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

- With CONSULT-II
- Start engine.



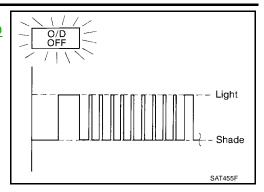
- Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Drive vehicle under the following conditions: Selector lever in D, vehicle speed higher than 40 km/h (25 MPH), engine speed higher than 1,500 rpm, throttle opening greater than 1.0/8 of the full throttle position and driving for more than 5 seconds.
- Without CONSULT-II
- 1. Start engine.
- Drive vehicle under the following conditions: Selector lever in "D" and vehicle speed higher than 40 km/h (25 MPH), engine speed higher than 1,500 rpm, throttle opening greater than 1/8 of the full throttle position and driving for more than 5 seconds.



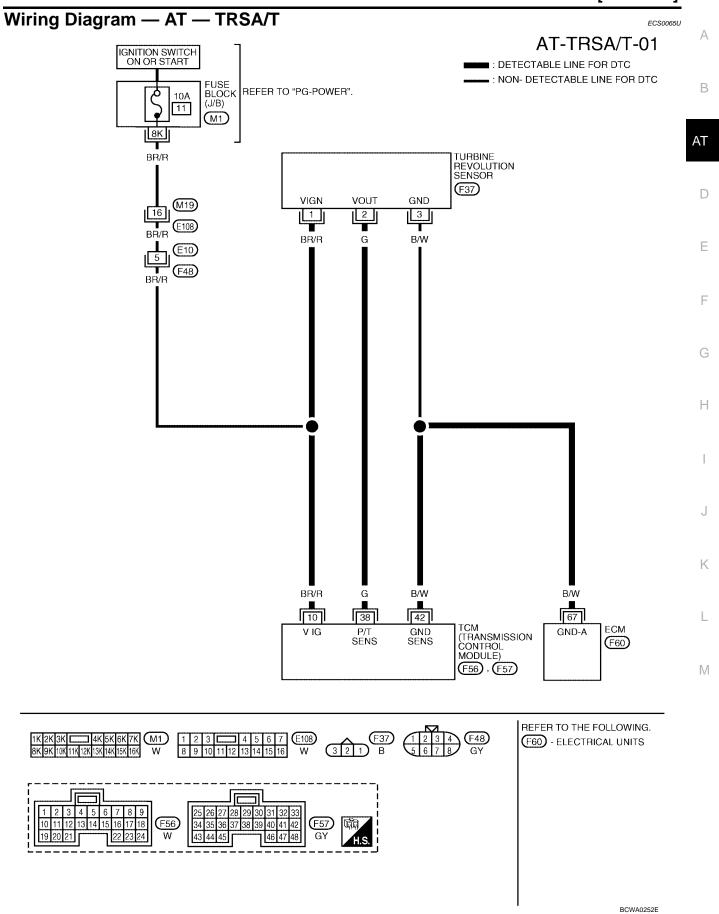
Revision: July 2004 AT-581 2005 Sentra

[RE4F04B]

3. Perform self-diagnosis.
Refer to AT-439, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)".



[RE4F04B]



[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)					
TERMINAL			DATA (DC)		
10	BR/R	TURBINE REVOLUTION SEN- SOR (POWER)	IGNITION ON	BATTERY VOLTAGE	
	G TURBINE REVOLUTION SEN SOR (SIGNAL)		WHEN MOVING AT 20 KM/H (12 MPH), USE THE CONSULT-II PULSE FREQUENCY MEASURING FUNCTION.*1		
38		TURBINE REVOLUTION SEN- SOR (SIGNAL)	CAUTION: CONNECT THE DIAGNOSIS DATA LINK CABLE TO THE VEHICLE DIAGNOSIS CONNECTOR. *1: A CIRCUIT TESTER CANNOT	240 Hz	
		BE USED TO TEST THIS ITEM. WHEN VEHICLE IS PARKED.	UNDER 1.3V OR OVER 4.5V		
42	B/W	SENSOR GROUND	WITEN VEHICLE 13 FARRED.	UNDER 1.3V OR OVER 4.3V	
74	۵/۷۷	SENSON GROUND	_	_	

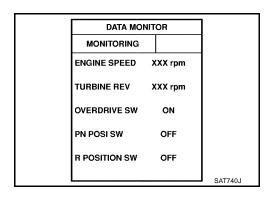
Diagnostic Procedure

ECS0065V

1. CHECK INPUT SIGNAL

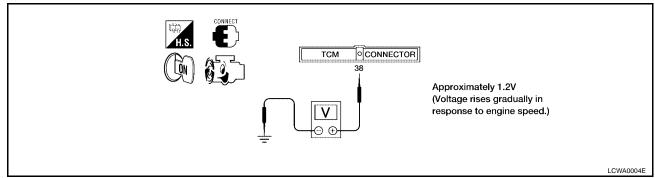
(III) With CONSULT-II

- 1. Start engine.
- Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out the value of "TURBINE REF" while driving. Check the value changes according to driving speed.



Without CONSULT-II

- 1. Start engine.
- 2. Check voltage between TCM terminal 38 and ground (measure in AC range).



OK or NG

OK >> GO TO 3. NG >> GO TO 2.

[RE4F04B]

2. DETECT MALFUNCTIONING ITEM

Check harness for short or open between TCM and turbine revolution sensor.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

3. CHECK DTC

Perform DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION, <u>AT-581</u>, "<u>DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE"</u>.

OK or NG

OK >> INSPECTION END.

NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.

2. If NG, recheck TCM pin terminal for damage or loose connection with harness connector.

OK or NG

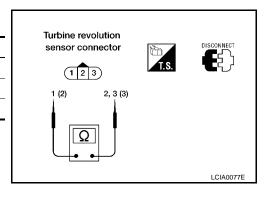
OK >> INSPECTION END.

NG >> Repair or replace damaged parts.

Component Inspection TURBINE REVOLUTION SENSOR

Check resistance between terminals 1, 2 and 3.

Termi	Resistance (Approx.)	
1	2	2.4 - 2.8kΩ
1	3	No continuity
2	3	No continuity



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DTC U1000 CAN COMMUNICATION LINE

[RE4F04B]

DTC U1000 CAN COMMUNICATION LINE

PFP:23710

Description

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

On Board Diagnosis Logic

ECS0065Y

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "CAN COMM CIRCUIT" with CONSULT-II or U1000 without CONSULT-II is detected when TCM cannot communicate to other control unit.

Possible Cause

Harness or connectors

(CAN communication line is open or shorted.)

DTC Confirmation Procedure

ECS00660

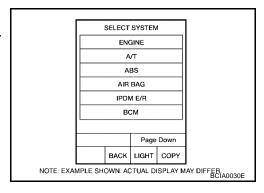
NOTE:

If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

(II) WITH CONSULT-II

- Turn ignition switch to ON position. (Do not start engine.)
- 2. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- 3. Start engine and wait for at least 6 seconds.
- If DTC is detected, go to <u>AT-588, "Diagnostic Procedure"</u>.



WITH GST

Follow the procedure "WITH CONSULT-II".

DTC U1000 CAN COMMUNICATION LINE

[RE4F04B]

Wiring Diagram — AT — CAN

CS00661

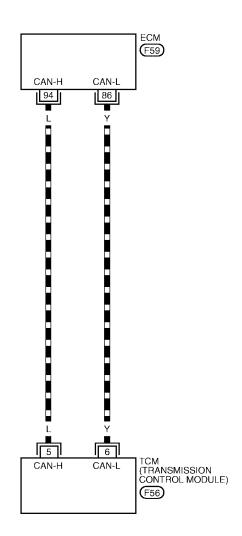
AT-CAN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC

: DATA LINE

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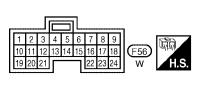
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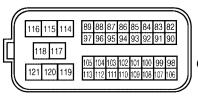
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BCWA0253E

DTC U1000 CAN COMMUNICATION LINE

[RE4F04B]

Diagnostic Procedure

1. CHECK CAN COMMUNICATION CIRCUIT

ECS00662

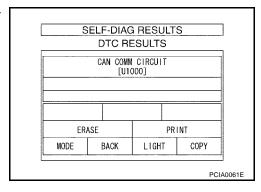
With CONSULT-II

- 1. Turn ignition switch "ON" and start engine.
- Select "SELF-DIAG RESULTS" mode for "A/T" with CONSULT-II.

Is any malfunction of the "CAN COMM CIRCUIT" indicated?

YES >> Print out CONSULT-II screen, GO TO LAN section. Refer to LAN - <u>LAN-4, "CAN Communication Unit"</u>

NO >> INSPECTION END.



DTC CONTROL UNIT (RAM), CONTROL UNIT (ROM)

[RE4F04B]

PFP:31036

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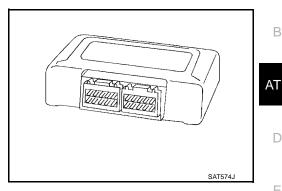
ECS00665

ECS00666

DTC CONTROL UNIT (RAM), CONTROL UNIT (ROM)

Description

The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The unit controls the A/T.



On Board Diagnosis Logic

Diagnostic trouble code CONTROL UNIT (RAM), CONTROL UNIT (ROM) with CONSULT-II is detected when TCM memory (RAM) or (ROM).

Possible Cause

Check TCM.

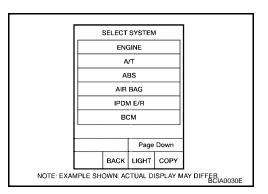
Diagnostic Trouble Code (DTC) Confirmation Procedure

NOTE:

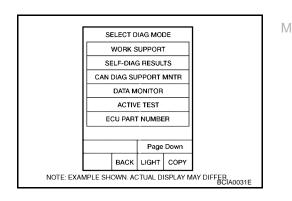
If "DTC Confirmation Procedure" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

- Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Start engine.



Run engine for at least 2 seconds at idle speed.



DTC CONTROL UNIT (RAM), CONTROL UNIT (ROM)

[RE4F04B]

Diagnostic Procedure

ECS00667

1. INSPECTION START

(III) With CONSULT-II

- 1. Turn ignition switch ON and select "SELF DIAGNOSIS" mode for A/T with CONSULT-II.
- 2. Touch "ERASE".
- 3. Perform AT-589, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .
- 4. Is the "CONTROL UNIT (RAM)" or "CONTROL UNIT (ROM)" displayed again?

Yes or No

Yes >> Replace TCM.

No >> INSPECTION END

DTC CONTROL UNIT (EEP ROM)

[RE4F04B]

DTC CONTROL UNIT (EEP ROM)

PFP:31036

Description

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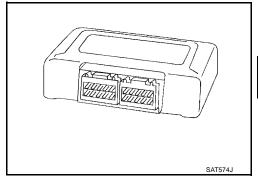
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The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The unit controls the A/T.



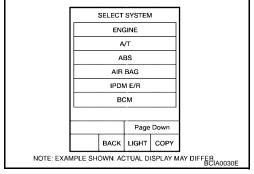
ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when	Check item (Possible cause)
: CONT UNIT (EEP ROM)	TCM memory (EEP ROM) is malfunctioning.	• TCM

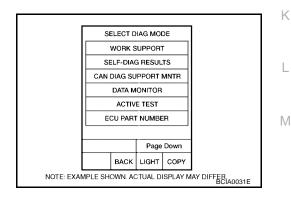
DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCE-DURE" has been previously conducted, always turn ignition switch OFF and wait at least 5 seconds before conducting the next test.

- (III) With CONSULT-II
- Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 2. Start engine.



3. Run engine for at least 2 seconds at idle speed.



Revision: July 2004 AT-591 2005 Sentra

DTC CONTROL UNIT (EEP ROM)

[RE4F04B]

Diagnostic Procedure

CS00669

1. CHECK DTC

(III) With CONSULT-II

- 1. Turn ignition switch ON and select "SELF DIAGNOSIS" mode for A/T with CONSULT-II.
- 2. Move selector lever to "R" position.
- 3. Depress accelerator pedal (Full throttle position).
- 4. Touch "ERASE".
- 5. Turn ignition switch OFF position for 10 seconds.

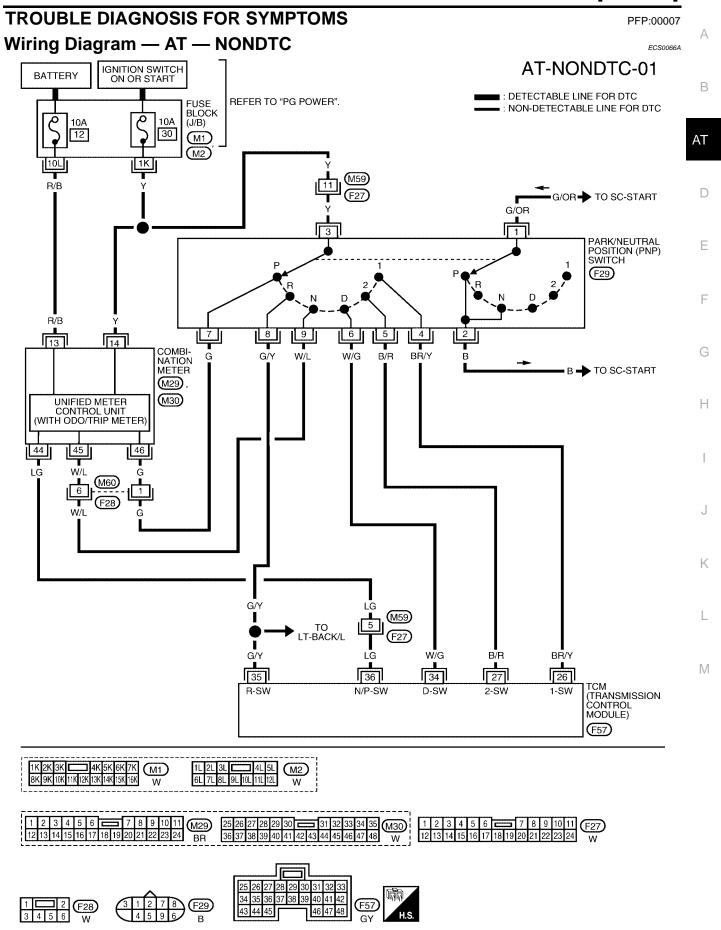
Perform AT-591, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE".

Is the "CONT UNIT (EEP ROM)" displayed again?

Yes >> Replace TCM.

No >> INSPECTION END

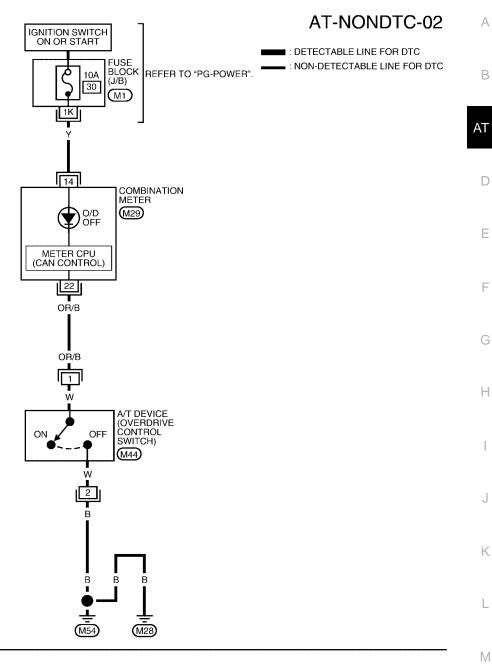
[RE4F04B]



[RE4F04B]

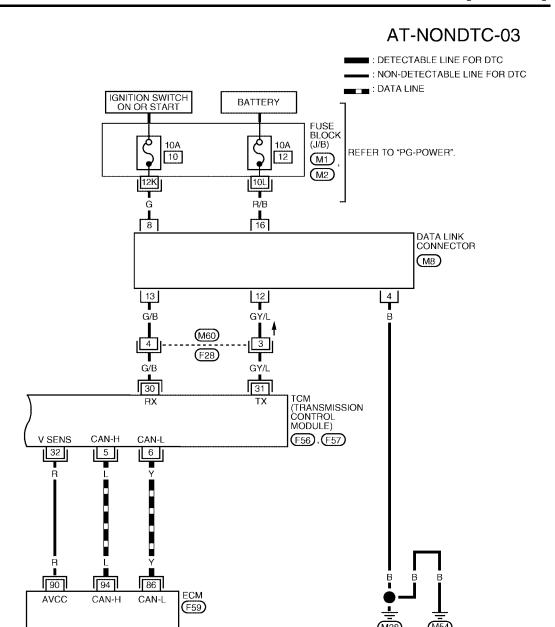
TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)					
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)	
26	BR/Y	PNP SWITCH 1 POSITION	IGNITION ON AND SELECTOR LEVER IN 1 POSITION	BATTERY VOLTAGE	
20			IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	APPROX. 0V	
27	D/D	B/R PNP SWITCH	IGNITION ON AND SELECTOR LEVER IN 2 POSITION	BATTERY VOLTAGE	
ZI	D/IX	2 POSITION	IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	APPROX. 0V	
34	W/G	G PNP SWITCH D POSITION	IGNITION ON AND SELECTOR LEVER IN D POSITION	BATTERY VOLTAGE	
04			IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	APPROX. 0V	
35	G/Y	PNP SWITCH	IGNITION ON AND SELECTOR LEVER IN R POSITION	BATTERY VOLTAGE	
33	G/1	R POSITION	IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	APPROX. 0V	
36)	LG PNP SWITCH	IGNITION ON AND SELECTOR LEVER IN P OR N POSITION	BATTERY VOLTAGE	
30		P OR N POSITION	IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	APPROX. 0V	

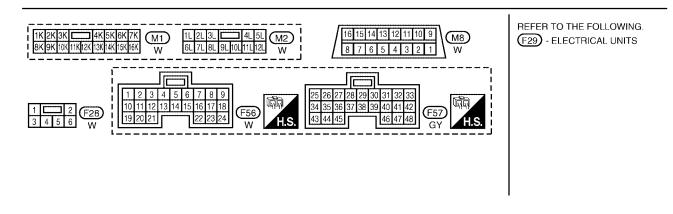
[RE4F04B]



1K 2K 3K 4K 5K 6K 7K M1 1 2 3 4 5 6 7 8 9 10 11 M29 7 6 5 4 3 2 1 W

WCWA0141E





BCWA0254E

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)						
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)		
5	L	CAN-H	_	_		
6	Y	CAN-L	_	_		
30	G/B	DATA LINK CONNECTOR (RX)	_	_		
31	GY/L	DATA LINK CONNECTOR (TX)	_	_		
32	R	R SENSOR POWER	IGNITION SWITCH ON	APPROX. 4.5 - 5.5v		
32		R SENSOR FOWER	IGNITION SWITCH OFF	APPROX. 0V		

1. O/D OFF Indicator Lamp Does Not Come On

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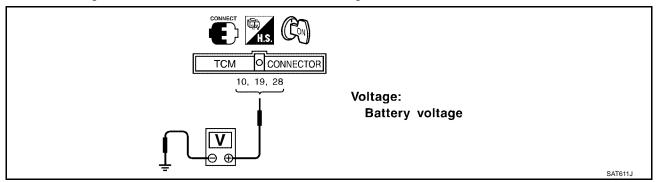
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SYMPTOM:

O/D OFF indicator lamp does not come on for about 2 seconds when turning ignition switch to ON.

1. CHECK TCM POWER SOURCE

- 1. Turn ignition switch to ON position. (Do not start engine.)
- 2. Check voltage between TCM terminals 10, 19, 28 and ground.

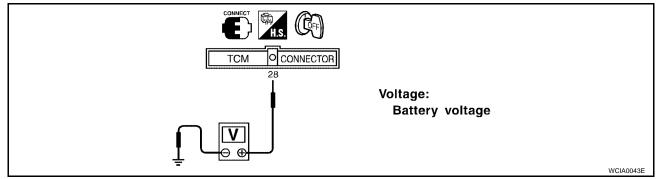


OK or NG

OK >> GO TO 2. NG >> GO TO 3.

2. CHECK POWER SOURCE STEP 2

- 1. Turn ignition switch to OFF position.
- 2. Check voltage between TCM terminal 28 and ground.



OK or NG

OK >> GO TO 4. NG >> GO TO 3.

3. detect malfunctioning item

Check the following items:

- Harness for short or open between ignition switch and TCM (Main harness) Refer to AT-484, "Wiring Diagram — AT — MAIN".
- Harness for short or open between battery and TCM (Main harness) Refer to AT-484, "Wiring Diagram — AT — MAIN".
- Ignition switch and fuse Refer to PG-3, "POWER SUPPLY ROUTING".

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. CHECK TCM GROUND CIRCUIT

- Turn ignition switch to OFF position.
- Disconnect TCM harness connector.
- Check continuity between TCM terminals 25, 48 and ground.

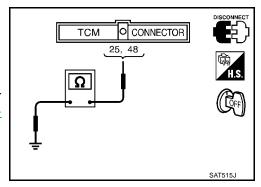
Continuity should exist.

OK or NG

OK >> GO TO 5.

NG

>> Repair open circuit or short to ground or short to power in harness or connectors. Refer to AT-484, "Wiring Diagram — AT — MAIN".



5. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness and fuse for short or open between ignition switch and O/D OFF indicator lamp (Main harness) Refer to PG-3, "POWER SUPPLY ROUTING".
- Harness for short or open between O/D OFF indicator lamp and TCM.

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

6. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 8.

/. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

2. Engine Cannot Be Started In P and N Position

SYMPTOM:

Revision: July 2004

AT-598

[RE4F04B]

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- Engine cannot be started with selector lever in P or N position.
- Engine can be started with selector lever in D, 2, 1 or R position.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

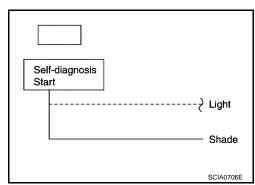
── Without CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

Yes >> Check park/neutral position (PNP) switch circuit. Refer to <u>AT-487, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"</u>.

No >> GO TO 2.



2. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH

Check for short or open of park/neutral position (PNP) switch harness connector terminals 1 and 2. Refer to AT-489, "Wiring Diagram — AT — PNP/SW" .

OK or NG

NG

OK >> GO TO 3.

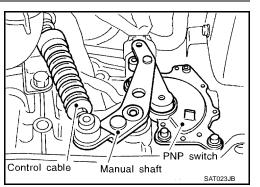
NG >> Repair or replace park/neutral position (PNP) switch.

3. CHECK STARTING SYSTEM

Check control cable. Refer to $\underline{\text{AT-642}},\, "\text{Control Cable Adjustment"}$. OK or NG

OK >> **GO TO 4.**

>> Adjust control cable. Refer to <u>AT-642, "Control Cable</u> Adjustment"



4. CHECK STARTING SYSTEM

Check starting system. Refer to $\underline{\text{SC-9, "STARTING SYSTEM"}}$.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

Revision: July 2004 AT-599 2005 Sentra

3. In P Position, Vehicle Moves Forward or Backward When Pushed

FCS0066E

Vehicle moves when it is pushed forward or backward with selector lever in P position.

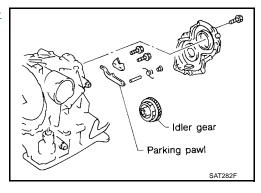
1. CHECK PARKING COMPONENTS

Check parking components. Refer to <u>AT-647, "OVERHAUL"</u> and <u>AT-724, "ASSEMBLY"</u>.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.



4. In N Position, Vehicle Moves

ECS0066E

SYMPTOM:

Vehicle moves forward or backward when selecting N position.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

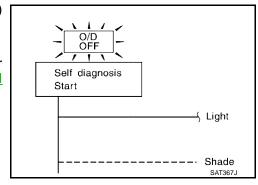
Without CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

Yes >> Check park/neutral position (PNP) switch circuit. Refer to AT-487, "DTC P0705 PARK/NEUTRAL POSITION SWITCH".

No >> GO TO 2.



2. CHECK CONTROL LINKAGE

Check control cable.

OK or NG

OK >> GO TO 4. NG >> GO TO 3.

[RE4F04B]

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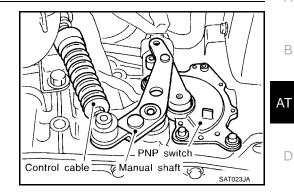
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3. ADJUST CONTROL CABLE

Adjust control cable.

>> Refer to AT-642, "Control Cable Adjustment" .

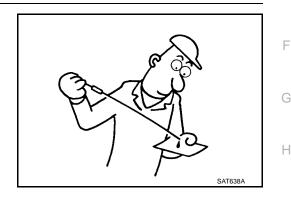


4. CHECK A/T FLUID LEVEL

Check A/T fluid level.

OK or NG

OK >> GO TO 5. NG >> Refill ATF.

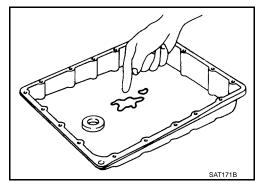


5. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

>> GO TO 7. OK >> GO TO 6. NG



6. DETECT MALFUNCTIONING ITEM

- 1. Disassemble A/T.
- 2. Check the following items:
- Forward clutch assembly
- Overrun clutch assembly
- Reverse clutch assembly

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 8.

8. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

5. Large Shock N \rightarrow R Position

ECS0066F

SYMPTOM:

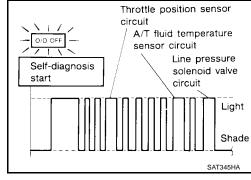
There is large shock when changing from N to R position.

1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to A/T fluid temperature sensor, line pressure solenoid valve or throttle position sensor [accelerator pedal position (APP) sensor] circuit?

Yes or No

Yes >> GO TO 2. No >> GO TO 3.



2. CHECK DAMAGED CIRCUIT

Check damaged circuit.

>> Refer to AT-493, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT", AT-543, "DTC P0745 LINE PRESSURE SOLENOID VALVE", and AT-559, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]".

3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

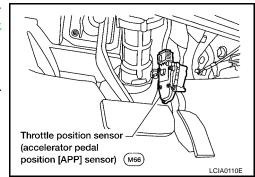
Check throttle position sensor [accelerator pedal position (APP) sensor. Refer to $\underline{\text{EC-971}}$, "DTC P0222, P0223 TP SENSOR", and $\underline{\text{EC-1282}}$, "DTC P2122, P2123 APP SENSOR".

OK or NG

NG

OK >> GO TO 4.

>> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



[RE4F04B]

4. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in D position. Refer to <u>AT-453, "Line Pressure Test"</u> .

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



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5. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

6. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 7.

7. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

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6. Vehicle Does Not Creep Backward In R Position

SYMPTOM:

Vehicle does not creep backward when selecting R position.

1. CHECK A/T FLUID LEVEL

Check A/T fluid level.

OK or NG

OK >> GO TO 2. NG >> Refill ATF.



2. CHECK STALL REVOLUTION

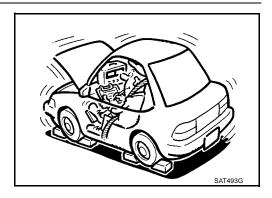
Check stall revolution with selector lever in 1 and R positions.

OK or NG

OK >> GO TO 5.

OK in 1 position, NG in R position>>GO TO 3.

NG in both 1 and R positions>>GO TO 4.



3. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve
- 3. Disassemble A/T.
- 4. Check the following items:
- Oil pump assembly
- Torque converter
- Reverse clutch assembly
- High clutch assembly

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

[RE4F04B]

4. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve
- 3. Disassemble A/T.
- 4. Check the following items:
- Oil pump assembly
- Torque converter
- Reverse clutch assembly
- High clutch assembly
- Low & reverse brake assembly
- Low one-way clutch

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in R position. Refer to AT-453, "Line Pressure Test" .

OK or NG

OK >> GO TO 7. NG >> GO TO 6.



6. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve
- 3. Disassemble A/T.
- 4. Check the following item:
- Oil pump assembly

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

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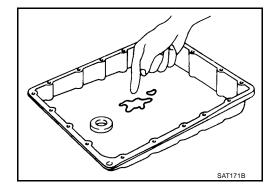
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7. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 9. NG >> GO TO 8.



8. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve
- 3. Disassemble A/T.
- 4. Check the following items:
- Oil pump assembly
- Torque converter
- Reverse clutch assembly
- High clutch assembly
- Low & reverse brake assembly
- Low one-way clutch

OK or NG

OK >> GO TO 9.

NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 10.

10. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

[RE4F04B]

7. Vehicle Does Not Creep Forward in D, 2 or 1 Position

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SYMPTOM:

Vehicle does not creep forward when selecting D, 2 or 1 position.

1. CHECK A/T FLUID LEVEL

Check A/T fluid level.

OK or NG

OK >> GO TO 2.

NG >> Refill ATF.



2. CHECK STALL REVOLUTION

Check stall revolution with selector lever in D position. Refer to AT-449, "Stall Test".

OK or NG

OK >> GO TO 4. >> GO TO 3. NG



3. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot fil-
- Line pressure solenoid valve
- 3. Disassemble A/T.
- 4. Check the following items:
- Oil pump assembly
- Forward clutch assembly
- Forward one-way clutch
- Low one-way clutch
- Low & reverse brake assembly
- Torque converter

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts. Е

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4. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in D position. Refer to AT-453, "Line Pressure Test" .

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



5. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL" .
- 2. Check the following items:
- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve
- 3. Disassemble A/T.
- 4. Check the following item:
- Oil pump assembly

OK or NG

OK >> GO TO 6.

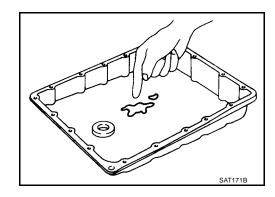
NG >> Repair or replace damaged parts.

6. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 8. NG >> GO TO 7.



[RE4F04B]

7. DETECT MALFUNCTIONING ITEM Α 1. Remove control valve assembly. Refer to AT-639, "REMOVAL". 2. Check the following items: В Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot fil-Line pressure solenoid valve 3. Disassemble A/T. 4. Check the following items: Oil pump assembly D Forward clutch assembly Forward one-way clutch Low one-way clutch Е Low & reverse brake assembly Torque converter OK or NG OK >> GO TO 8. NG >> Repair or replace damaged parts. 8. CHECK SYMPTOM Check again. Н OK or NG OK >> INSPECTION END NG >> GO TO 9. 9. CHECK TCM INSPECTION Perform TCM input/output signal inspection. 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector. OK or NG OK >> INSPECTION END NG >> Repair or replace damaged parts. 8. Vehicle Cannot Be Started From D1 ECS00661 SYMPTOM: Vehicle cannot be started from D1 on Cruise test — Part 1. M 1. CHECK SYMPTOM

Is "6. Vehicle Does Not Creep Backward In R Position" OK?

Yes or No

Yes >> GO TO 2.

No >> Go to AT-604, "6. Vehicle Does Not Creep Backward In R Position".

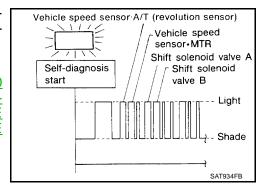
2. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to vehicle speed sensor-A/T (revolution sensor), shift solenoid valve A, B or vehicle speed sensor-MTR after cruise test?

Yes or No

Yes >> Check damaged circuit. Refer to AT-499, "DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR)", AT-549, "DTC P0750 SHIFT SOLENOID VALVE A", or AT-554, "DTC P0755 SHIFT SOLENOID VALVE B".

No >> GO TO 3.



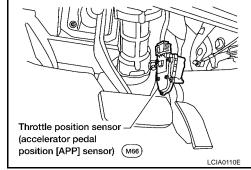
3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to EC-888, "DTC P0122, P0123 TP SENSOR" and EC-1282, "DTC P2122, P2123 APP SENSOR".

OK or NG

OK >> GO TO 4.

NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

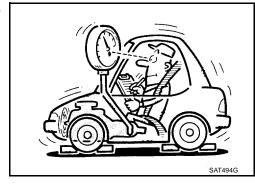


4. CHECK LINE PRESSURE

Check line pressure at stall point with selector lever in D position. Refer to AT-453, "Line Pressure Test" .

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



[RE4F04B]

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5. DETECT MALFUNCTIONING ITEM

- Remove control valve assembly. Refer to AT-639, "REMOVAL". 1.
- 2. Check the following items:
- Shift valve A
- Shift valve B
- Shift solenoid valve A
- Shift solenoid valve B
- Pilot valve
- Pilot filter
- 3. Disassemble A/T.
- 4. Check the following items:
- Forward clutch assembly
- Forward one-way clutch
- Low one-way clutch
- High clutch assembly
- Torque converter
- Oil pump assembly

OK or NG

OK >> GO TO 8.

NG >> Repair or replace damaged parts.

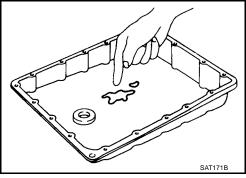
6. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 7.

NG >> GO TO 5.



7. DETECT MALFUNCTIONING ITEM

- Remove control valve assembly. Refer to AT-639, "REMOVAL" .
- 2. Check the following items:
- Shift valve A
- Shift valve B
- Shift solenoid valve A
- Shift solenoid valve B
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 8.

NG >> Repair or replace damage parts. M

8. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 9.

9. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

9. A/T Does Not Shift: D1 \rightarrow D2 or Does Not Kickdown: D4 \rightarrow D2

ECS0066J

SYMPTOM:

A/T does not shift from D₁ to D₂ at the specified speed.

A/T does not shift from D4 to D2 when depressing accelerator pedal fully at the specified speed.

1. CHECK SYMPTOM

Are "7. Vehicle Does Not Creep Forward In D, 2 Or 1 Position" and "8. Vehicle Cannot Be Started From D1 " OK?

Yes or No

Yes >> GO TO 2.

No >> Go to AT

>> Go to AT-607, "7. Vehicle Does Not Creep Forward in D, 2 or 1 Position" and AT-609, "8. Vehicle Cannot Be Started From D1".

2. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

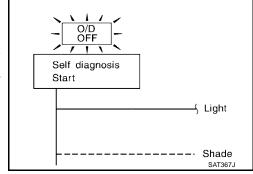
Without CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

Yes >> Check park/neutral position (PNP) switch circuit. Refer to <u>AT-487, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"</u>.

No >> GO TO 3.



3. CHECK VEHICLE SPEED SENSOR-A/T AND VEHICLE SPEED SENSOR-MTR CIRCUIT

Check vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuit. Refer to <u>AT-499</u>, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)" and <u>AT-576</u>, "DTC VEHICLE SPEED SENSOR MTR".

OK or NG

OK >> GO TO 4.

NG >> Repair or replace vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuits.

[RE4F04B]

4. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR

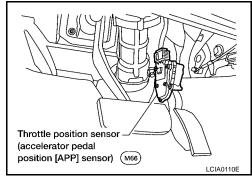
Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to $\underline{\text{EC-888}}$, "DTC P0122, P0123 TP SENSOR" and $\underline{\text{EC-1282}}$, "DTC P2122, P2123 APP SENSOR".

OK or NG

OK >> GO TO 5.

NG >> Repa

>> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



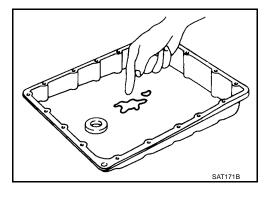
5. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 7.

NG >> GO TO 6.



6. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Shift valve A
- Shift solenoid valve A
- Pilot valve
- Pilot filter
- 3. Disassemble A/T.
- 4. Check the following items:
- Servo piston assembly
- Brake band
- Oil pump assembly

OK or NG

OK >> GO TO 8.

NG >> Repair or replace damaged parts.

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[RE4F04B]

7. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Shift valve A
- Shift solenoid valve A
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 8.

NG >> Repair or replace damaged parts.

8. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 9.

9. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

10. A/T Does Not Shift: D2 \rightarrow D3

ECS0066K

SYMPTOM:

A/T does not shift from D₂ to D₃ at the specified speed.

1. CHECK SYMPTOM

Are "7. Vehicle Does Not Creep Forward In D, 2 Or 1 Position" and "8. Vehicle Cannot Be Started From D1 " OK?

Yes or No

Yes >> GO TO 2.

No >> Go to AT-607, "7. Vehicle Does Not Creep Forward in D, 2 or 1 Position" and AT-609, "8. Vehicle Cannot Be Started From D1".

[RE4F04B]

2. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT

(III) With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

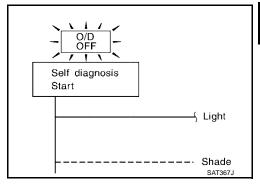
Without CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

Yes >> Check park/neutral position (PNP) switch circuit. Refer to <u>AT-487, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"</u>.

No >> GO TO 3.



3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

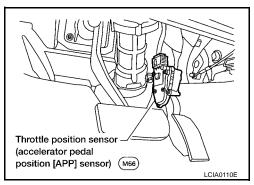
Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to $\underline{\text{EC-888}}$, "DTC P0122, P0123 TP SENSOR" and $\underline{\text{EC-1282}}$, "DTC P2122, P2123 APP SENSOR".

OK or NG

OK >> GO TO 4.

NG >> Repair of

>> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



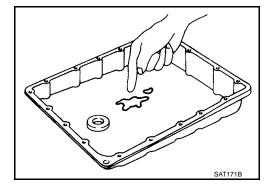
4. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 6.

NG >> GO TO 5.



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[RE4F04B]

5. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Shift valve B
- Shift solenoid valve B
- Pilot valve
- Pilot filter
- 3. Disassemble A/T.
- 4. Check the following items:
- Servo piston assembly
- High clutch assembly
- Oil pump assembly

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Shift valve B
- Shift solenoid valve B
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 8.

8. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

[RE4F04B]

11. A/T Does Not Shift: D₃ → D₄

ECS0066L

SYMPTOM:

- A/T does not shift from D3 to D4 at the specified speed.
- A/T must be warm before D₃ to D₄ shift will occur.

1. CHECK SYMPTOM

ΑT

Α

Are "7. Vehicle Does Not Creep Forward In D, 2 Or 1 Position" and "8. Vehicle Cannot Be Started From D1 OK?

Yes or No

Nο

D

Yes >> GO TO 2.

clo

>> Go to <u>AT-607, "7. Vehicle Does Not Creep Forward in D, 2 or 1 Position"</u> and <u>AT-609, "8. Vehicle Cannot Be Started From D1"</u>.

2. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-II

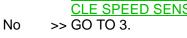
Does self-diagnosis, after cruise test, show damage to any of the following circuits?

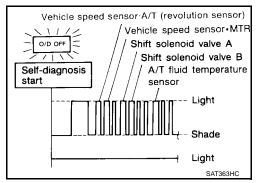
- Park/neutral position (PNP) switch
- Overdrive control switch
- A/T fluid temperature sensor
- Vehicle speed sensor-A/T (revolution sensor)
- Shift solenoid valve A or B
- Vehicle speed sensor·MTR

Yes or No

Yes

>> Check damaged circuit. Refer to AT-487, "DTC P0705 PARK/NEUTRAL POSITION SWITCH", AT-493, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT", AT-499, "DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR)", AT-549, "DTC P0750 SHIFT SOLENOID VALVE A", AT-554, "DTC P0755 SHIFT SOLENOID VALVE B", or AT-576, "DTC VEHICLE SPEED SENSOR MTR".





$3.\,$ check throttle position sensor [accelerator pedal position (app) sensor]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to <u>EC-888</u>, "<u>DTC P0122</u>, <u>P0123 TP SENSOR</u>" and <u>EC-1304</u>, "<u>DTC P2138 APP SENSOR</u>".

OK or NG

OK

>> GO TO 4.

NG

>> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

Throttle position sensor
(accelerator pedal position [APP] sensor)

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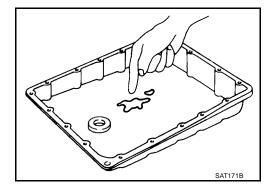
L

4. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 6. NG >> GO TO 5.



5. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL" .
- 2. Check the following items:
- Shift valve B
- Overrun clutch control valve
- Shift solenoid valve B
- Pilot valve
- Pilot filter
- 3. Disassemble A/T.
- 4. Check the following items:
- Servo piston assembly
- Brake band
- Torque converter
- Oil pump assembly

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Shift valve B
- Overrun clutch control valve
- Shift solenoid valve B
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 8.

[RE4F04B]

8. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

12. A/T Does Not Perform Lock-up

ECS0066M

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SYMPTOM:

A/T does not perform lock-up at the specified speed.

1. CHECK SELF-DIAGNOSTIC RESULTS

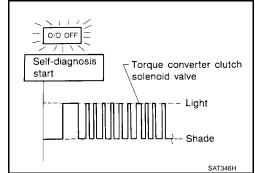
Does self-diagnosis show damage to torque converter clutch solenoid valve circuit after cruise test?

Yes or No

Yes

>> Check torque converter clutch solenoid valve circuit. Refer to AT-530, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE".

>> GO TO 2. No



$2.\,$ check throttle position sensor [accelerator pedal position (app) sensor]

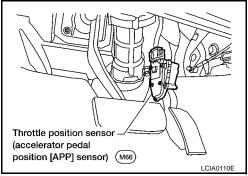
Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to EC-971, "DTC P0222, P0223 TP SENSOR" and EC-1304, "DTC P2138 APP SENSOR".

OK or NG

OK >> GO TO 3.

NG

>> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



3. DETECT MALFUNCTIONING ITEM

- Remove control valve. Refer to AT-639, "REMOVAL". 1.
- 2. Check following items:
- Torque converter clutch control valve
- Torque converter relief valve
- Torque converter clutch solenoid valve
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 5.

5. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

13. A/T Does Not Hold Lock-up Condition

ECS0066N

SYMPTOM:

A/T does not hold lock-up condition for more than 30 seconds.

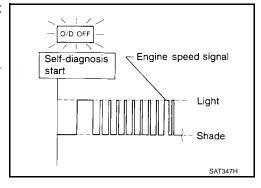
1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to engine speed signal circuit after cruise test?

Yes or No

Yes >> Check engine speed signal circuit. Refer to <u>AT-504</u>, "<u>DTC P0725 ENGINE SPEED SIGNAL"</u>.

No >> GO TO 2.

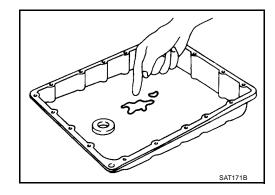


2. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 4. NG >> GO TO 3.



[RE4F04B]

3. DETECT MALFUNCTIONING ITEM	А
Remove control valve assembly. Refer to <u>AT-639, "REMOVAL"</u> .	
2. Check the following items:	
 Torque converter clutch control valve 	В
- Pilot valve	
- Pilot filter	AT
3. Disassemble A/T. 4. Check terrus convertor and oil nump assembly.	
 Check torque converter and oil pump assembly. OK or NG 	_
OK >> GO TO 5.	D
NG >> Repair or replace damaged parts.	
4. DETECT MALFUNCTIONING ITEM	Е
Remove control valve assembly. Refer to <u>AT-639, "REMOVAL"</u> .	
2. Check the following items:	F
 Torque converter clutch control valve 	
- Pilot valve	G
- Pilot filter	
OK or NG OK >> GO TO 5.	
OK >> GO TO 5. NG >> Repair or replace damaged parts.	Н
5. CHECK SYMPTOM	
Check again.	
OK or NG	
OK >> INSPECTION END	J
NG >> GO TO 6.	
6. CHECK TCM INSPECTION	K
1. Perform TCM input/output signal inspection.	
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.	L
OK or NG	_
OK >> INSPECTION END NG >> Repair or replace damaged parts.	
	M
14. Lock-up Is Not Released	ECS00660

SYMPTOM:

Lock-up is not released when accelerator pedal is released.

1. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR] CIR-CUIT

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to the throttle position switch [accelerator pedal position (APP) sensor] circuit?

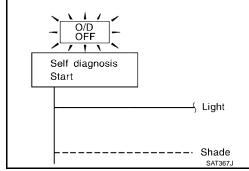
⊗ Without CONSULT-II

Does self-diagnosis show damage to the throttle position sensor [accelerator pedal position (APP) sensor] circuit?

Yes or No

Yes >> Check the throttle position switch [accelerator pedal position (APP) sensor circuit. Refer to EC-888, "DTC P0122, P0123 TP SENSOR" and EC-1304, "DTC P2138 APP SENSOR".

No >> GO TO 2.



2. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 3.

3. CHECK TCM INSPECTION

- Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

15. Engine Speed Does Not Return To Idle (Light Braking D4 \rightarrow D3) SYMPTOM:

ECS0066P

- Engine speed does not smoothly return to idle when A/T shifts from D4 to D3.
- Vehicle does not decelerate by engine brake when turning overdrive control switch OFF.
- Vehicle does not decelerate by engine brake when shifting A/T from D to 2 position.

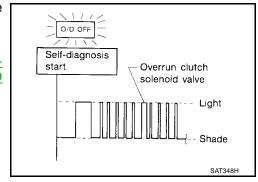
1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to overrun clutch solenoid valve circuit after cruise test?

Yes or No

Yes >> Check overrun clutch solenoid valve circuit. Refer to AT-564, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE".

No >> GO TO 2.



[RE4F04B]

2. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

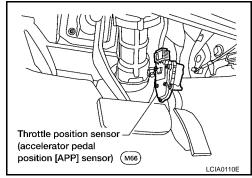
Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to $\underline{\text{EC-888, "DTC P0122, P0123 TP SENSOR"}}$ and $\underline{\text{EC-1304, "DTC P2138 APP SENSOR"}}$.

OK or NG

OK >> GO TO 3.

NG >> Re

>> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



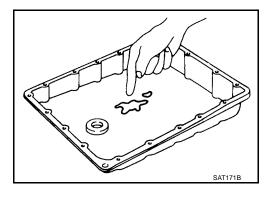
3. CHECK A/T FLUID CONDITION

- 1. Remove oil pan.
- 2. Check A/T fluid condition.

OK or NG

OK >> GO TO 5.

NG >> GO TO 4.



4. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Overrun clutch control valve
- Overrun clutch reducing valve
- Overrun clutch solenoid valve
- 3. Disassemble A/T.
- 4. Check the following items:
- Overrun clutch assembly
- Oil pump assembly

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

5. DETECT MALFUNCTIONING ITEM

- 1. Remove control valve assembly. Refer to AT-639, "REMOVAL".
- 2. Check the following items:
- Overrun clutch control valve
- Overrun clutch reducing valve
- Overrun clutch solenoid valve

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

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6. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 7.

7. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

16. Vehicle Does Not Start From D1

ECS0066Q

SYMPTOM:

Vehicle does not start from D1 on Cruise test — Part 2.

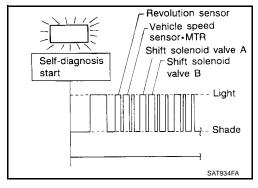
1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to vehicle speed sensor-A/T (revolution sensor), shift solenoid valve A, B or vehicle speed sensor-MTR after cruise test?

Yes or No

Yes >> Check damaged circuit. Refer to AT-499, "DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR)", AT-549, "DTC P0750 SHIFT SOLENOID VALVE A", AT-554, "DTC P0755 SHIFT SOLENOID VALVE B" or AT-576, "DTC VEHICLE SPEED SENSOR MTR".

No >> GO TO 2.



2. CHECK SYMPTOM

Check again.

OK or NG

OK >> Go to AT-609, "8. Vehicle Cannot Be Started From D1".

NG >> GO TO 3.

3. CHECK TCM INSPECTION

- Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

[RE4F04B]

17. A/T Does Not Shift: D4 $\, ightarrow$ D3 , When Overdrive Control Switch ON ightarrow OFF

SYMPTOM:

A/T does not shift from D₄ to D₃ when changing overdrive control switch to OFF position.

1. CHECK OVERDRIVE SWITCH CIRCUIT

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to overdrive control switch circuit?

Without CONSULT-II

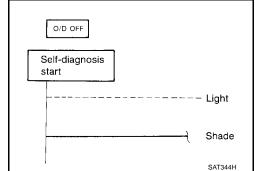
Does self-diagnosis show damage to overdrive control switch circuit?

Yes or No

Yes

>> Check overdrive control switch circuit. Refer to AT-627,
"21. TCM Self-diagnosis Does Not Activate {Park/neutral Position (PNP), Overdrive Control and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor]
Switches Circuit Checks}".

No >> Go to AT-614, "10. A/T Does Not Shift: $D2 \rightarrow D3$ ".



18. A/T Does Not Shift: D3 $\, ightarrow$ 22 , When Selector Lever D ightarrow 2 Position

SYMPTOM:

A/T does not shift from D₃ to 2₂ when changing selector lever from D to 2 position.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

Without CONSULT-II

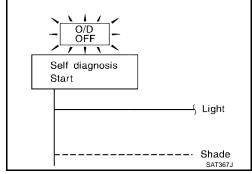
Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

Yes

>> Check park/neutral position (PNP) switch circuit. Refer to <u>AT-487, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"</u>.

No >> Go to AT-612, "9. A/T Does Not Shift: $D_1 \rightarrow D_2$ or Does Not Kickdown: $D_4 \rightarrow D_2$ ".



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[RE4F04B]

19. A/T Does Not Shift: 22 $\,\rightarrow$ 11 , When Selector Lever 2 \rightarrow 1 Position

ECS0066T

SYMPTOM:

A/T does not shift from 22 to 11 when changing selector lever from 2 to 1 position.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

Without CONSULT-II

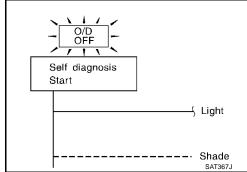
Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

Yes

>> Check park/neutral position (PNP) switch circuit. Refer to <u>AT-487, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"</u>.

No >> GO TO 2.



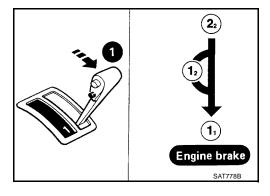
2. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 3.



3. CHECK TCM INSPECTION

- 1. Perform TCM input/output signal inspection.
- 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

[RE4F04B]

20. Vehicle Does Not Decelerate By Engine Brake

SYMPTOM:

Vehicle does not decelerate by engine brake when shifting from 22 (12) to 11.

1. CHECK SYMPTOM

Is "6. Vehicle Does Not Creep Backward In R Position" OK?

Yes or No

Yes >> Go to AT-622, "15. Engine Speed Does Not Return To Idle (Light Braking D4 \rightarrow D3)".

>> Go to AT-604, "6. Vehicle Does Not Creep Backward In R Position".

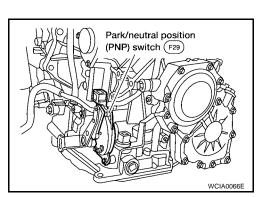
21. TCM Self-diagnosis Does Not Activate (Park/neutral Position (PNP), Overdrive Control and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor | Switches Circuit Checks |

ECS0066V

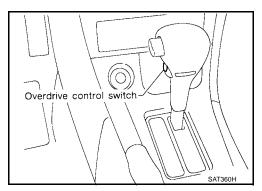
O/D OFF indicator lamp does not come on in TCM self-diagnostic procedure even if the lamp circuit is good.

DESCRIPTION

Park/neutral position (PNP) switch The park/neutral (PNP) switch assembly includes a transmission range switch. The transmission range switch detects the selector lever position and sends a signal to the TCM.

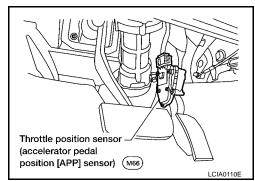


Overdrive control switch Detects the overdrive control switch position (ON or OFF) and sends a signal to the TCM.



Throttle position sensor [accelerator pedal position (APP) sen-

The throttle position sensor [accelerator pedal position (APP) sensor] is part of the system that controls the throttle position. This system also uses an electric throttle control actuator, which consists of a throttle control motor and throttle position sensors. Accelerator pedal position signal is sent to the ECM.



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DIAGNOSTIC PROCEDURE

NOTE:

The diagnostic procedure includes inspections for the overdrive control switch circuits.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITH CONSULT-II)

(II) With CONSULT-II

- Turn ignition switch to ON position. (Do not start engine.)
- Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. Read out P/N, R, D, 2 and 1 position switches moving selector lever to each position. Check that the signal of the selector lever position is indicated properly.

OK or NG

OK >> GO TO 5. NG >> GO TO 2.

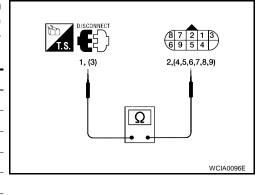
DATA MONIT	OR	
MONITORING		
PN POSI SW	OFF	
R POSITION SW	OFF	
D POSITION SW	OFF	
2 POSITION SW	ON	
1 POSITION SW	OFF	
		SAT701J

2. DETECT MALFUNCTIONING ITEM

Check the following items:

- Park/neutral position (PNP) switch
- Check continuity between park/neutral position (PNP) switch F29 terminals 1 (G/OR) and 2 (B) and between terminals 3 (Y) and 4 (OR), 5 (L), 6 (W/G), 7 (BR/W), 8 G/W), 9 (G) while moving manual shaft through each position.

Lever position	Termi	nal No.
Р	3 - 7	1 - 2
R	3 - 8	
N	3 - 9	1 - 2
D	3 - 6	
2	3 - 5	
1	3 - 4	



- If NG, check again with manual control cable disconnected from manual shaft of A/T assembly. Refer to step a.
- If OK on step b, adjust manual control cable. Refer to AT-642, "Control Cable Adjustment".
- If NG on step b, remove park/neutral position (PNP) switch from A/T and check continuity of park/neutral position (PNP) switch terminals. Refer to step a.
- If OK on step d, adjust park/neutral position (PNP) switch. Refer to <u>AT-641, "Park/Neutral Position (PNP)</u>
 Switch Adjustment".
- If NG on step d, replace park/neutral position (PNP) switch.
- Harness for short or open between ignition switch and park/neutral position (PNP) switch (Main harness)
- Harness for short or open between park/neutral position (PNP) switch and TCM (Main harness)

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

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3. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITHOUT CONSULT-II)

Without CONSULT-II

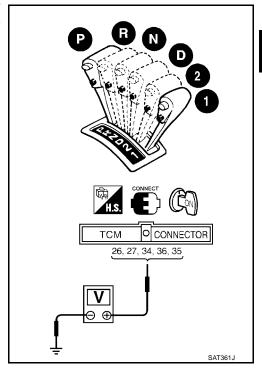
- 1. Turn ignition switch to ON position. (Do not start engine.)
- Check voltage between TCM terminals 26 (OR), 27 (L), 34 (W/G), 35 (G/W), 36 (BR/W) and ground while moving selector lever through each position.

Lever position	Terminal No.				
	36	35	34	27	26
P,N	В	0	0	0	0
R	0	В	0	0	0
D	0	0	В	0	0
2	0	0	0	В	0
1	0	0	0	0	В

Voltage:

B: Battery voltage

0 : 0V



OK or NG

OK >> GO TO 6. NG >> GO TO 4.

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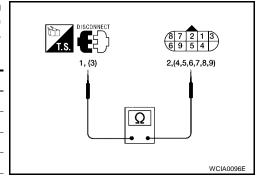
L

4. DETECT MALFUNCTIONING ITEM

Check the following items:

- Park/neutral position (PNP) switch
- Check continuity between park/neutral position (PNP) switch F29 terminals 1 (G/OR) and 2 (B) and between terminals 3 (Y) and 4 (OR), 5 (L), 6 (W/G), 7 (BR/W), 8 G/W), 9 (G) while moving manual shaft through each position.

Lever position	Termi	nal No.
Р	3 - 7	1 - 2
R	3 - 8	
N	3 - 9	1 - 2
D	3 - 6	
2	3 - 5	
1	3 - 4	



- If NG, check again with manual control cable disconnected from manual shaft of A/T assembly. Refer to step a.
- If OK on step b, adjust manual control cable. Refer to <u>AT-642, "Control Cable Adjustment"</u>.
- If NG on step b, remove park/neutral position (PNP) switch from A/T and check continuity of park/neutral position (PNP) switch terminals. Refer to step a.
- If OK on step d, adjust park/neutral position (PNP) switch. Refer to <u>AT-641, "Park/Neutral Position (PNP)</u>
 Switch Adjustment".
- If NG on step d, replace park/neutral position (PNP) switch.
- Harness for short or open between ignition switch and park/neutral position (PNP) switch (Main harness)
- Harness for short or open between park/neutral position (PNP) switch and TCM (Main harness)

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

5. CHECK OVERDRIVE CONTROL SWITCH CIRCUIT (WITH CONSULT-II)

(III) With CONSULT-II

- Turn ignition switch to ON position. (Do not start engine.)
- 2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
- Read out "OVERDRIVE SW".
 Check the signal of the overdrive control switch is indicated properly.

(Overdrive control switch "ON" displayed on CONSULT-II means overdrive "OFF".)

OK or NG

OK >> GO TO 7. NG >> GO TO 6.

DATA MON	IITOR
MONITORING	
ENGINE SPEED	XXX rpm
TURBINE REV	XXX rpm
OVERDRIVE SW	ON
PN POSI SW	OFF
R POSITION SW	OFF

[RE4F04B]

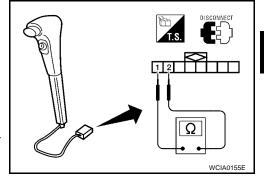
6. DETECT MALFUNCTIONING ITEM

Check the following items:

- Overdrive control switch M44.
- Check continuity between terminals 1 and 2.

Switch position	Continuity
ON	No
OFF	Yes

- Harness for short or open between TCM and overdrive control switch (Main harness)
- Harness of ground circuit for overdrive control switch (Main harness) for short or open



OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Perform throttle position sensor [accelerator pedal position (APP) sensor] inspection. Refer to <u>AT-559</u>,
 "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]".

OK or NG

OK >> GO TO 8.

NG >> Repair or replace damaged parts.

8. CHECK TCM INSPECTION

1. Perform TCM input/output inspection. Refer to AT-480, "TCM INSPECTION TABLE".

OK or NG

OK >> INSPECTION END.

NG >> Inspect TCM terminals and related wiring harnesses for damage or loose connections. Repair or replace damaged parts.

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A/T SHIFT LOCK SYSTEM

PFP:34950

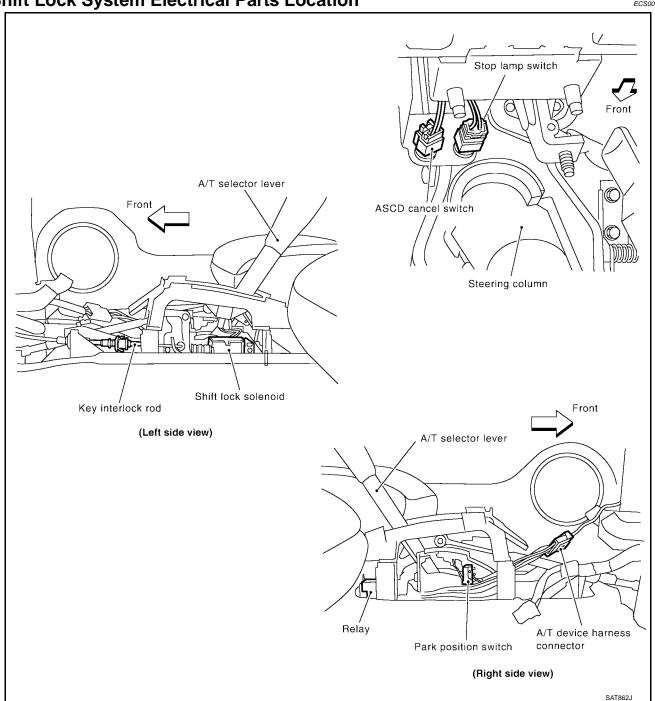
ECS0066W

Description

- The mechanical key interlock mechanism also operates as a shift lock:
 With the key switch turned to ON, the selector lever cannot be shifted from "P" (parking) to any other position unless the brake pedal is depressed.
 - With the key removed, the selector lever cannot be shifted from "P" to any other position.
 - The key cannot be removed unless the selector lever is placed in "P".
- The shift lock and key interlock mechanisms are controlled by the ON-OFF operation of the shift lock solenoid and by the operation of the rotator and slider located inside the key cylinder.

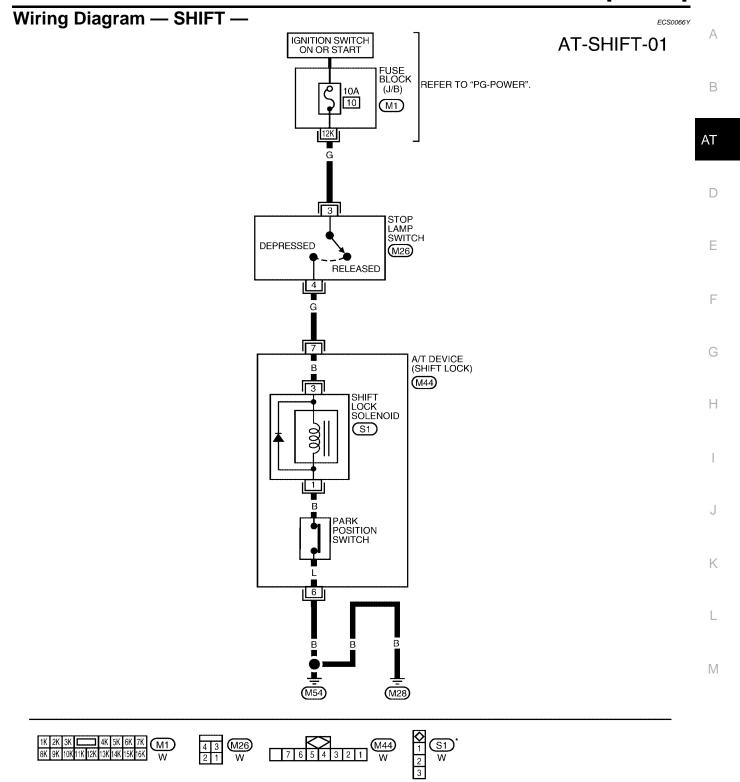
Shift Lock System Electrical Parts Location





A/T SHIFT LOCK SYSTEM

[RE4F04B]



*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

WCWA0126E

Diagnostic Procedure

ECS0066Z

SYMPTOM 1:

- Selector lever cannot be moved from "P" position with key in ON position and brake pedal applied.
- Selector lever can be moved from "P" position with key in ON position and brake pedal released.
- Selector lever can be moved from "P" position when key is removed from key cylinder.

SYMPTOM 2:

Ignition key cannot be removed when selector lever is set to "P" position. It can be removed when selector lever is set to any position except "P".

1. CHECK KEY INTERLOCK CABLE

Check key interlock cable for damage.

OK or NG

OK >> GO TO 2.

NG >> Repair key interlock cable. Refer to <u>AT-637, "Components"</u>.

2. CHECK SELECTOR LEVER POSITION

Check selector lever position for damage.

OK or NG

OK >> GO TO 3.

NG >> Check selector lever. Refer to AT-642, "Control Cable Adjustment".

3. CHECK POWER SOURCE

Turn ignition switch to "ON" position. (Do not start engine.)

Check voltage between A/T device harness connector M44 terminal 7 (G) and ground.

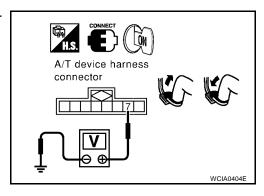
Voltage:

Brake pedal depressed: Battery voltage

Brake pedal released: 0V

OK or NG

OK >> GO TO 5. NG >> GO TO 4.



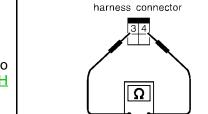
4. DETECT MALFUNCTIONING ITEM

Check the following items.

- 1. Harness for open or short between fuse block (J/B) connector M1 terminal 12K and stop lamp switch harness connector M26 terminal 3.
- 2. Harness for open or short stop lamp switch harness connector M26 terminal 4 and A/T device harness connector M44 terminal 7 (G).
- 3. 10A fuse [10, located in the fuse block (J/B)].
- 4. Check continuity between stop lamp switch harness connector M26 terminals 3 (G) and 4 (G).

Condition	Continuity
When brake pedal is depressed	Yes
When brake pedal is released	No

Check stop lamp switch after adjusting brake pedal —refer to BR-12, "STOP LAMP SWITCH AND ASCD CANCEL SWITCH CLEARANCE"



Stop lamp switch

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK GROUND CIRCUIT

- 1. Turn ignition switch to "OFF" position.
- 2. Disconnect A/T device harness connector.
- 3. Check continuity between A/T device harness M44 terminal 6 (B) and ground.

Continuity should exist

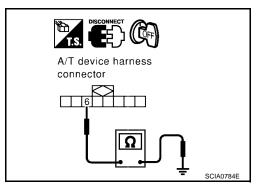
Continuity should exist.

If OK, check harness for short to power.

OK or NG

OK >> GO TO 6.

NG >> Repair open circuit in harness.



6. CHECK PARK POSITION SWITCH

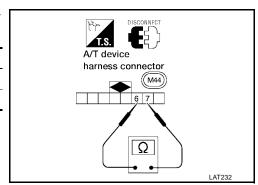
Check continuity between A/T device harness connector M44 terminals 6 (B) and 7 (G).

Selector lever position	Continuity
"P" position	Yes
Other position	No

OK or NG

OK >> GO TO 7.

NG >> Replace park position switch.



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7. CHECK SHIFT LOCK SOLENOID

- 1. Connect A/T device harness connector.
- 2. Turn ignition switch to "ON" position.
- 3. Check operation sound.

Condition	Brake pedal	Operation sound
When ignition switch is turned to "ON" position and	Depressed	Yes
selector lever is in the "P" position.	Released	No

OK or NG

OK >> GO TO 8.

NG >> Replace shift lock solenoid.

8. CHECK SHIFT LOCK OPERATION

- 1. Reconnect shift lock harness connector.
- 2. Turn ignition switch from "OFF" to "ON" position. (Do not start engine.)
- 3. Recheck shift lock operation.

OK or NG

OK >> INSPECTION END

NG >> GO TO 9.

9. CHECK A/T DEVICE INSPECTION

- 1. Perform A/T device input/output signal inspection test.
- 2. If NG, recheck harness connector connection.

OK or NG

OK >> INSPECTION END

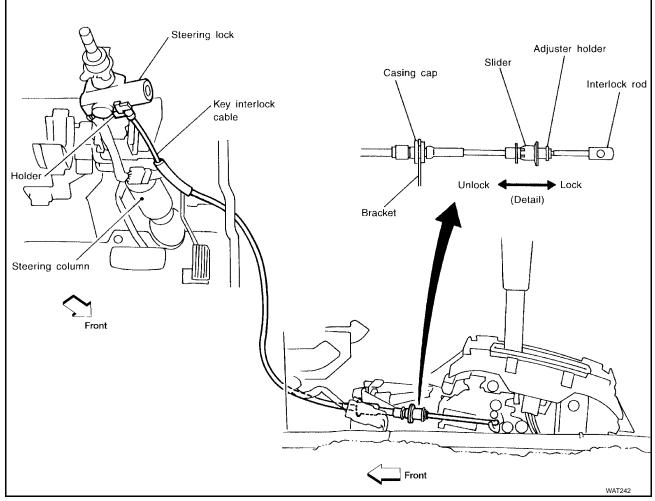
NG >> Repair or replace damaged parts.

KEY INTERLOCK CABLE

PFP:34908

Components

ECS00670

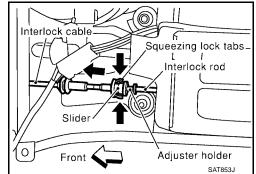


CAUTION:

- Install key interlock cable in such a way that it will not be damaged by sharp bends, twists or interference with adjacent parts.
- After installing key interlock cable to control device, make sure that casing cap and bracket are firmly secured in their positions.

Removal ECS00671

 Unlock slider by squeezing lock tabs on slider from adjuster holder and remove interlock rod from cable.



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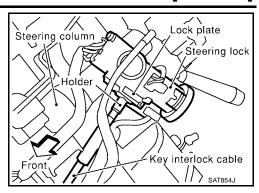
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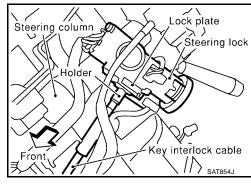
Remove lock plate from steering lock assembly and remove key interlock cable.



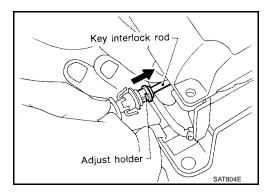
Installation

ECS00672

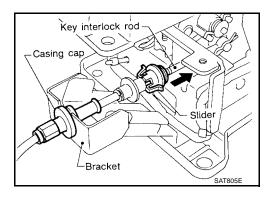
- 1. Turn ignition key to lock position.
- 2. Set A/T selector lever to P position.
- 3. Set key interlock cable to steering lock assembly and install lock plate.
- Clamp cable to steering column and attach to control cable with band.



5. Insert interlock rod into adjuster holder.



- 6. Install casing cap to bracket.
- 7. Move slider in order to connect adjuster holder to interlock rod.



ON-VEHICLE SERVICE

[RE4F04B]

ON-VEHICLE SERVICE

PFP:00000

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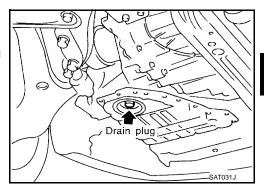
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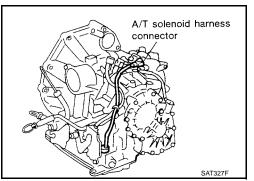
Control Valve Assembly and Accumulators

REMOVAL

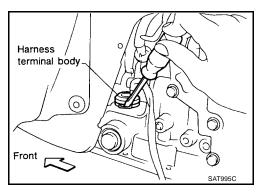
- 1. Drain ATF from transaxle.
- 2. Remove oil pan and gasket.
 - Always replace oil pan bolts as they are self-sealing bolts.



3. Disconnect A/T solenoid harness connector.



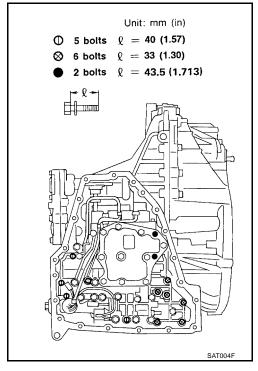
- 4. Remove snap ring from terminal cord assembly harness terminal body.
- 5. Remove terminal cord assembly harness from transmission case by pushing on terminal body.



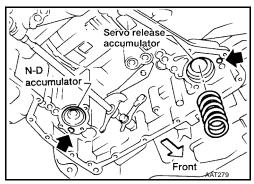
Remove control valve assembly by removing fixing bolts I , X and ●.

Bolt length, number and location are shown in the illustration.

- Be careful not to drop manual valve and servo release accumulator return spring.
- 7. Disassemble and inspect control valve assembly if necessary. Refer to AT-674, "Control Valve Assembly".

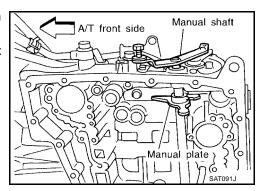


- 8. Remove servo release and N-D accumulators by applying compressed air if necessary.
 - Hold each piston with a rag.



INSTALLATION

- Set manual shaft in Neutral, then align manual plate with groove in manual valve.
- After installing control valve assembly, make sure that selector lever can be moved to all positions.

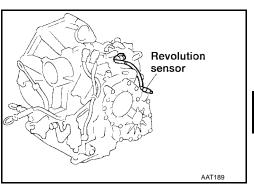


ON-VEHICLE SERVICE

[RE4F04B]

Revolution Sensor Replacement

- 1. Remove under cover.
- Remove revolution sensor from A/T.
- 3. Reinstall any part removed.
 - Always use new sealing parts.



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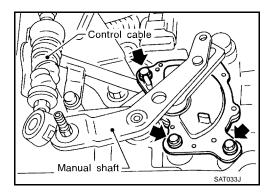
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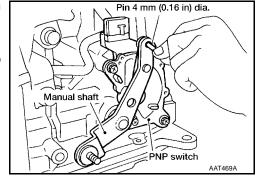
ECS00675

Park/Neutral Position (PNP) Switch Adjustment

- Remove control cable from manual shaft.
- 2. Set manual shaft in N position.
- 3. Loosen park/neutral position (PNP) switch fixing bolts.



- 4. Insert pin into adjustment holes in both park/neutral position (PNP) switch and manual shaft as near vertical as possible.
- 5. Reinstall any part removed.
- 6. Check continuity of park/neutral position (PNP) switch. Refer to $\underline{\text{AT-490, "Diagnostic Procedure"}}$.



FCS00676

Control Cable Adjustment

Move selector lever from the P position to the 1 position. You should be able to feel the detents in each position. If the detents cannot be felt or the pointer indicating the position is improperly aligned, the control cable needs adjustment.

- 1. Place selector lever in P position.
- Loosen control cable lock nut and place manual shaft in P position.

CAUTION:

Turn wheels more than 1/4 rotations and apply the park lock.

3. Push control cable in the direction of the arrow shown in the illustration by specified force.

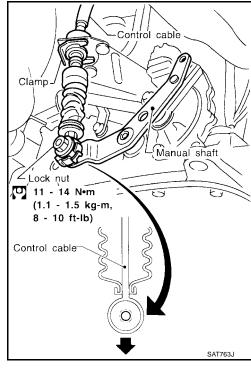
Specified force : 4.9 - 9.8 N (0.5 - 1.0 kg, 1.1 - 2.2 lb)

- 4. Tighten control cable lock nut.
- 5. Move selector lever from P to 1 position again. Make sure that selector lever moves smoothly.
 - Make sure that the starter operates when the selector lever is placed in the N or P position.
 - Make sure that the transmission is locked properly when the selector lever is placed in the P position.

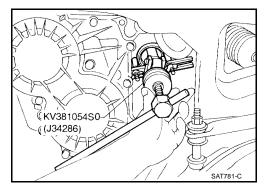
Differential Side Oil Seal Replacement

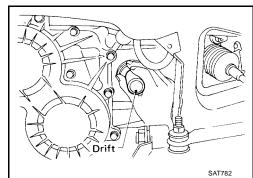
- 1. Remove drive shaft assembly. Refer to FAX-14, "Removal".
- Remove oil seal.

- 3. Install oil seal.
 - Apply ATF before installing.



ECS00677





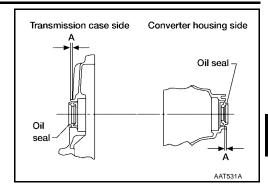
ON-VEHICLE SERVICE

[RE4F04B]

• Install oil seals so dimension A is within specification

A : -0.5 mm (-0.02 in) to 0.5 mm (0.02 in)

4. Reinstall any part removed.



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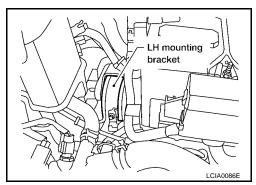
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REMOVAL AND INSTALLATION

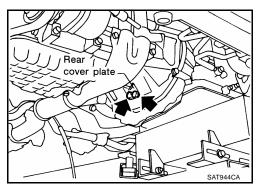
PFP:00000

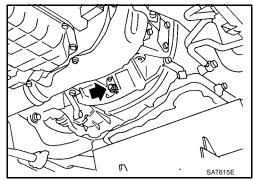
Removal ECS00678

- 1. Remove battery and bracket.
- 2. Remove air duct and air cleaner assembly, refer to EM-106, "REMOVAL" .
- 3. Disconnect terminal cord assembly harness connector and park/neutral position (PNP) switch harness connectors.
- 4. Disconnect harness connectors of mass air flow sensor, intake air temperature sensor, revolution sensor, turbine revolution sensor, vehicle speed sensor and ground cable.
- 5. Remove LH mounting bracket from transaxle and body.
- 6. Disconnect control cable at transaxle side.
- 7. Remove drive shafts, refer to FAX-14, "Removal".
- 8. Drain ATF.
- 9. Remove push clips and engine undercover.
- 10. Disconnect fluid cooler piping.
- 11. Disconnect and remove starter motor from transaxle, refer to SC-21, "Removal" .



- 12. Support engine by placing a jack under oil pan.
 - Do not place jack under oil pan drain plug.
- 13. Remove center member.
- 14. Remove rear cover plate and bolts securing torque converter to drive plate.
 - Rotate crankshaft for access to securing bolts.

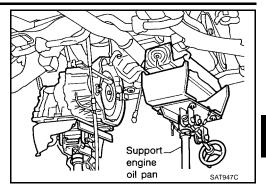




REMOVAL AND INSTALLATION

[RE4F04B]

- 15. Support transaxle with a jack.
- 16. Remove bolts fixing A/T to engine.
- 17. Lower transaxle while supporting it with a jack.



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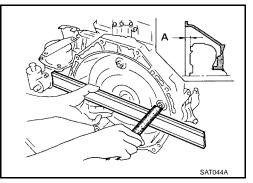
ECS00679

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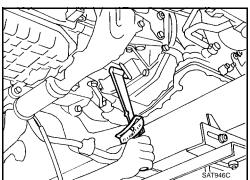
Installation

When connecting torque converter to transaxle, measure distance "A" to be certain that they are correctly assembled.

Distance "A" : 14 mm (0.55 in) or more



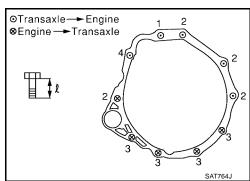
- Install bolts fixing converter to drive plate.
- With converter installed, rotate crankshaft several turns to check that transaxle rotates freely without binding.



- Tighten bolts securing transaxle.
- Tighten LH mounting bracket bolts to the specified torque. Refer to EM-159, "Removal and Installation".
- Tighten center member bolts to the specified torque.
 Refer to EM-159, "Removal and Installation".
- Tighten rear plate cover bolts to the specified torque. Refer to <u>EM-115</u>, "OIL PAN AND OIL STRAINER".

Bolt No.	Tightening torque N-m (kg-m, ft-lb)	I mm (in)
1	70 - 79 (7.1 - 8.1, 52 - 58)	65 (2.56)
2	70 - 79 (7.1 - 8.1, 52 - 58)	52 (2.05)
3	70 - 79 (7.1 - 8.1, 52 - 58)	40 (1.57)
4	78 - 98 (7.9 - 10.0, 58 - 72)	124 (4.88)

Reinstall any part removed.



REMOVAL AND INSTALLATION

[RE4F04B]

- Check fluid level in transaxle.
- Move selector lever through all positions to be sure that transaxle operates correctly.
 - With parking brake applied, rotate engine at idling. Move selector lever through N to D, to 2, to 1 and to R position. A slight shock should be felt by hand gripping selector each time transaxle is shifted.
- Perform road test. Refer to <u>AT-454, "Road Test"</u>.



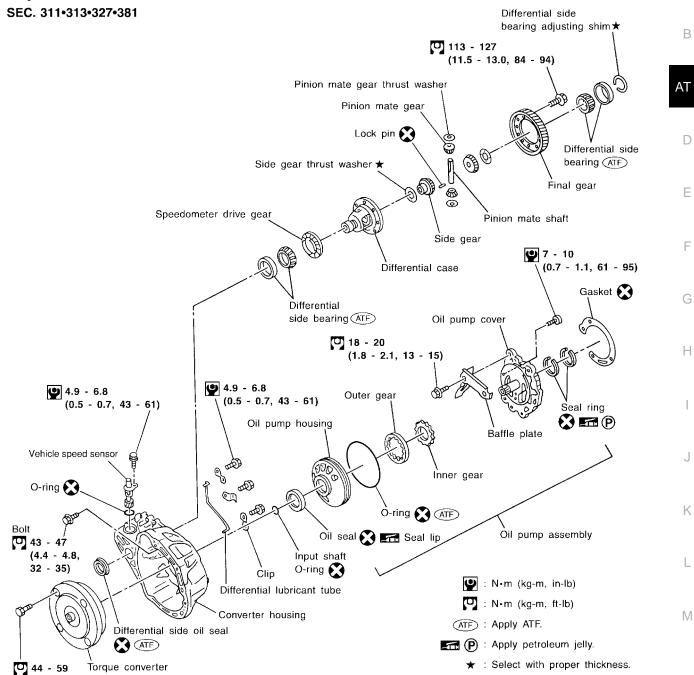
OVERHAUL PFP:00000

Components

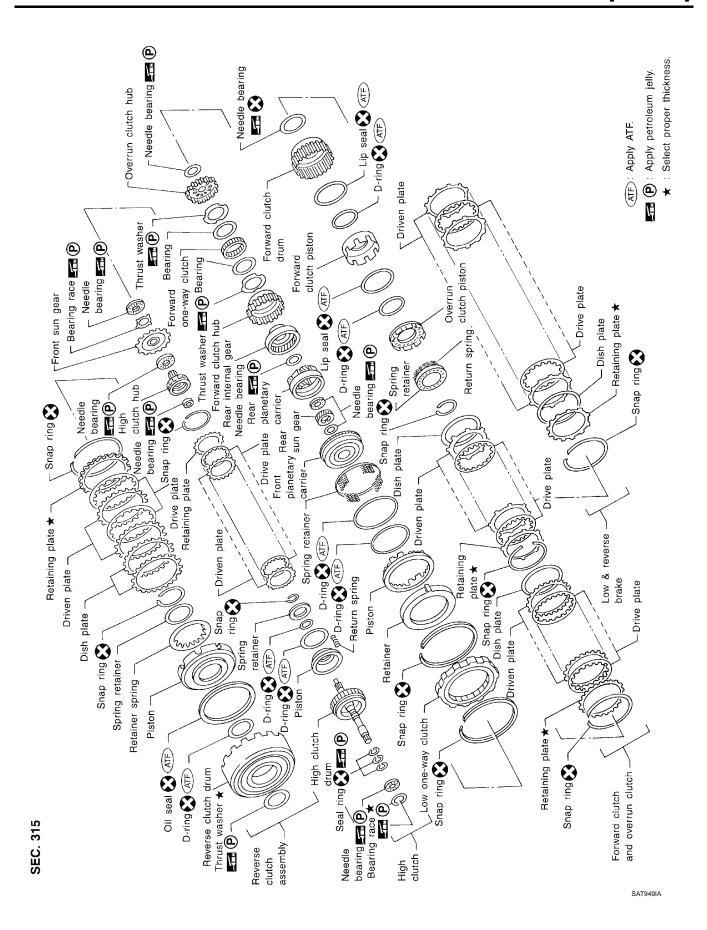
(4.5 - 6.0, 33 - 43)

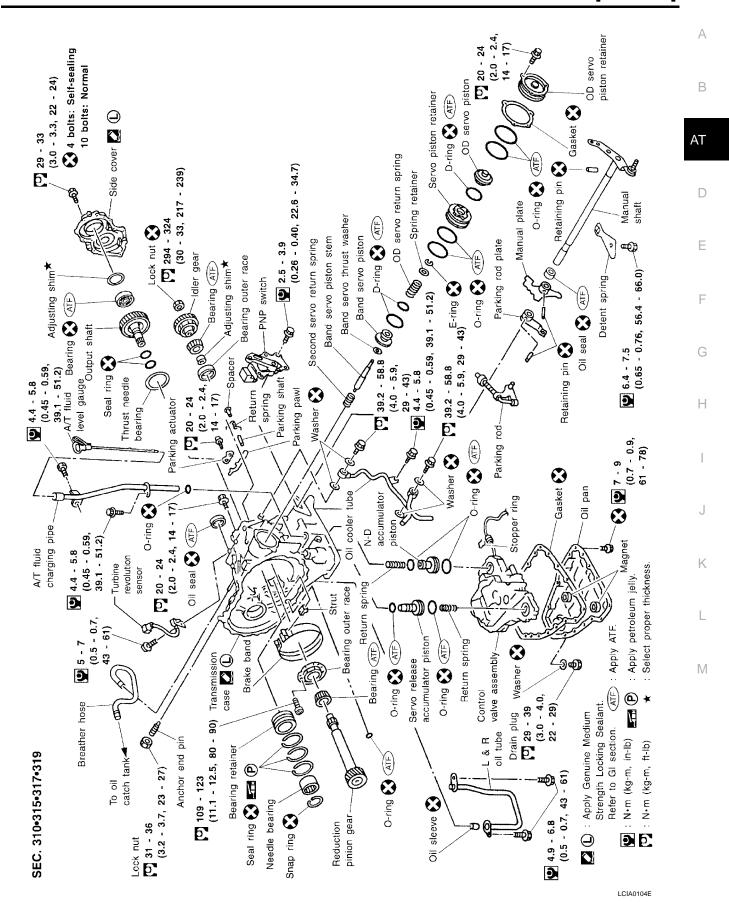
ECS0067A

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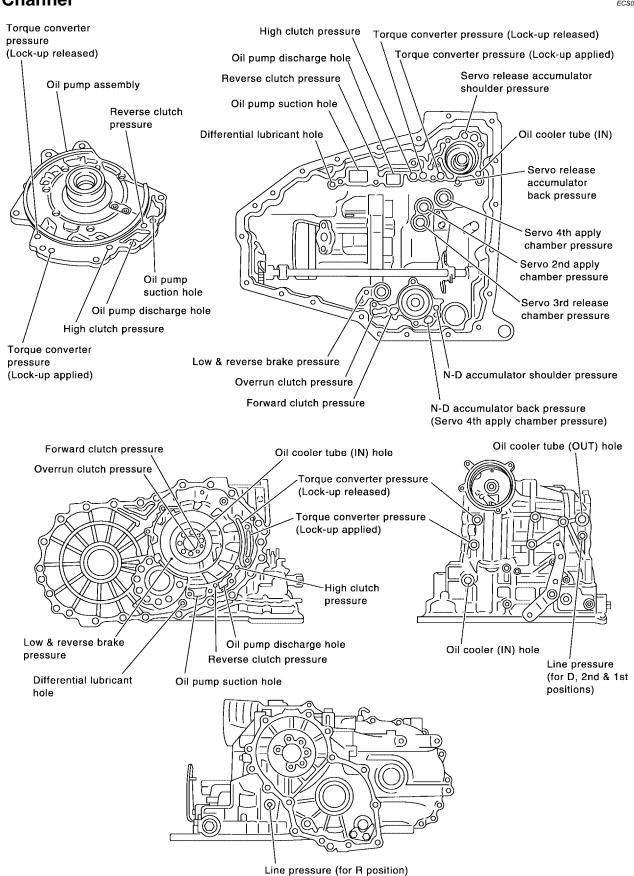


LCIA0103E





Oil Channel ECS0067B



Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

CS0067C

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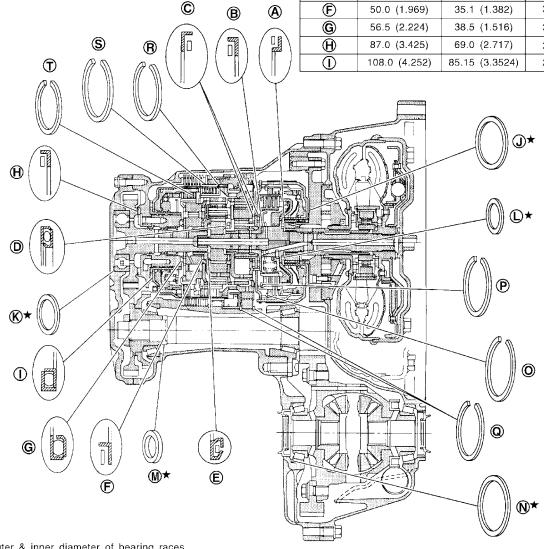
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Outer diameter of thrust washers

ltem number	Outer diameter mm (in)	Parts number*
① ★	76.0 (2.992)	31508 80X13 - 31508 80X20
€ *	80.0 (3.150)	31438 80X60 - 31438 80X70

Item number	Outer diameter mm (in)	Inner diameter mm (in)	Parts number*
A	50.0 (1.969)	35.1 (1.382)	31407 80X10
B	42.0 (1.654)	23.7 (0.933)	31407 80X01
©	70.0 (2.756)	50.0 (1.969)	31407 80X09
(D)	51.0 (2.008)	33.1 (1.303)	31407 80X02
Ē	48.0 (1.890)	30.0 (1.181)	31407 80X03
Ē	50.0 (1.969)	35.1 (1.382)	31407 80X10
G	56.5 (2.224)	38.5 (1.516)	31407 80X08
\oplus	87.0 (3.425)	69.0 (2.717)	31407 80X07
①	108.0 (4.252)	85.15 (3.3524)	31407 80X06

Outer and inner diameter of needle bearings



Outer & inner diameter of bearing races, adjusting shims and adjusting spacer

Item number	Outer diameter mm (in)	Inner diameter mm (in)	Parts number*		
⊕ *	51.0 (2.008)	36.0 (1.417)	31435 80X00 - 31439 80X14		
™ *	38.0 (1.496)	28.1 (1.106)	31439 85X01 - 31439 85X06 31439 83X11 - 31439 83X24 31439 81X00 - 31439 81X24 31439 81X46 - 31439 81X49 31439 81X60 - 31439 81X74		
N ★	75.0 (2.953)	67.0 (2.638)	31438 80X00 - 31439 80X11		

 \bigstar : Select proper thickness.

 $\,^{\star}\,$: Always check with the Parts Department for the latest parts information.

Outer diameter of snap rings

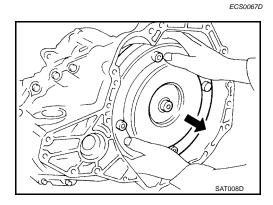
Item number	Outer diameter mm (in)	Parts number*					
0	150 (5.91)	31506 80X13					
P	119.1 (4.689)	31506 80X06					
Q	182.8 (7.197)	31506 80X08					
®	144.8 (5.701)	31506 80X03					
S	173.8 (6.843)	31506 80X09					
T	133.9 (5.272)	31506 80X01					

SAT565K

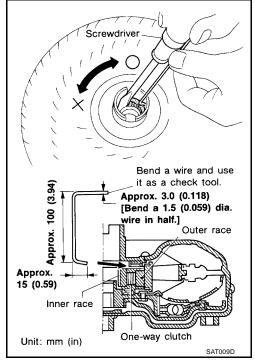
DISASSEMBLY PFP:31020

Disassembly

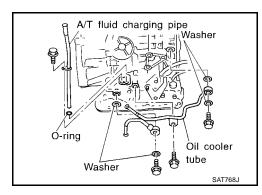
- 1. Drain ATF through drain plug.
- 2. Remove torque converter.



- 3. Check torque converter one-way clutch using check tool.
- a. Insert check tool into the groove of bearing support built into one-way clutch outer race.
- b. When fixing bearing support with check tool, rotate one- way clutch spline using screwdriver.
- c. Check that inner race rotates clockwise only. If not, replace torque converter assembly.



4. Remove A/T fluid charging pipe and fluid cooler tube.



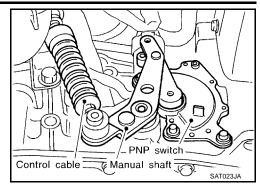
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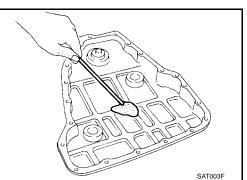
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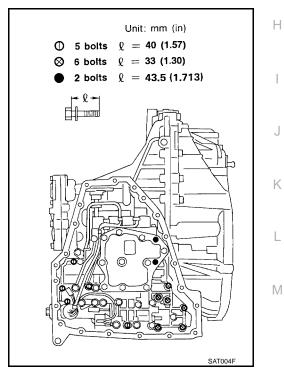
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- 5. Set manual shaft to position P.
- 6. Remove park/neutral position (PNP) switch.

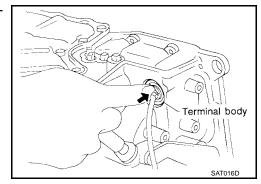


- 7. Remove oil pan and oil pan gasket.
 - Always replace oil pan bolts as they are self-sealing bolts.
- 8. Check foreign materials in oil pan to help determine causes of malfunction. If the fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
 - If frictional material is detected, replace radiator after repair of A/T. Refer to <u>CO-32</u>, "<u>RADIATOR</u>".
- Remove control valve assembly according to the following procedures.
- a. Remove control valve assembly mounting bolts I, X and ●.
- b. Remove snap ring from terminal cord assembly connector.



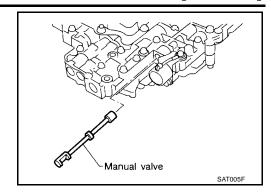


 Push terminal body into transmission case and draw out solenoid harness.

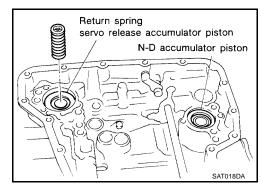


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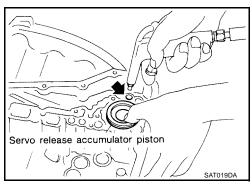
10. Remove manual valve from control valve assembly.



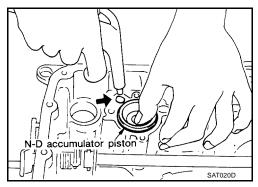
11. Remove return spring from servo release accumulator piston.



12. Remove servo release accumulator piston with compressed air.



- 13. Remove O-rings from servo release accumulator piston.
- 14. Remove N-D accumulator piston and return spring with compressed air.

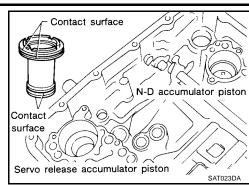


15. Remove O-rings from N-D accumulator piston.

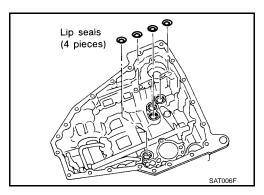
DISASSEMBLY

[RE4F04B]

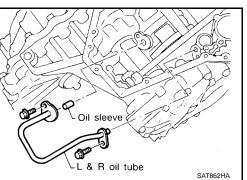
16. Check accumulator pistons and contact surface of transmission case for damage.



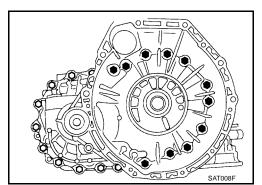
- 17. Check accumulator return springs for damage and free length.
- 18. Remove lip seals.



19. Remove L & R oil tube and oil sleeve.



- 20. Remove converter housing according to the following procedures.
- a. Remove converter housing mounting bolts.
- b. Remove converter housing by tapping it lightly.



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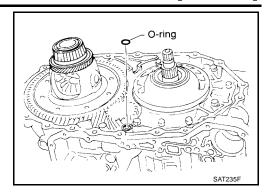
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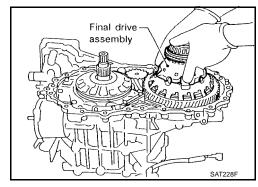
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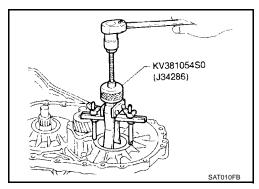
c. Remove O-ring from differential oil port.



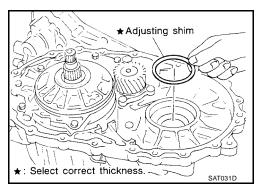
21. Remove final drive assembly from transmission case.



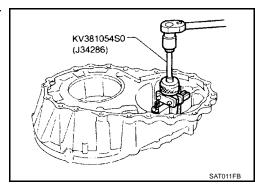
22. Remove differential side bearing outer race and side bearing adjusting shim from transmission case.



23. Remove differential side bearing adjusting shim from transmission case.



24. Remove differential side bearing outer race from converter housing.



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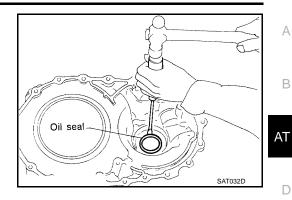
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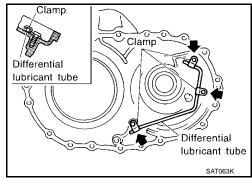
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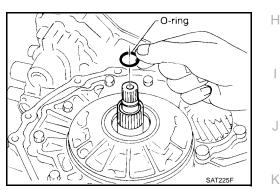
- 25. Remove oil seal with screwdriver from converter housing.
 - Be careful not to damage case.



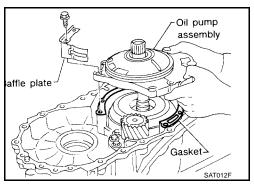
26. Remove differential lubricant tube from converter housing.



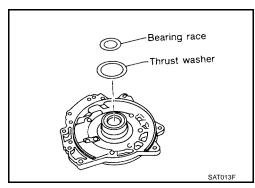
- 27. Remove oil pump according to the following procedures.
- Remove O-ring from input shaft.



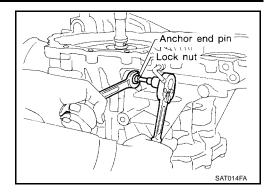
Remove oil pump assembly, baffle plate and gasket from transmission case.



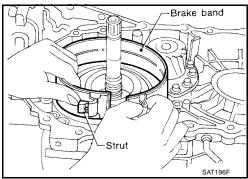
Remove thrust washer and bearing race from oil pump assembly.



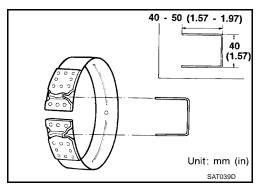
- 28. Remove brake band according to the following procedures.
- a. Loosen lock nut, then back off anchor end pin.
 - Do not reuse anchor end pin.



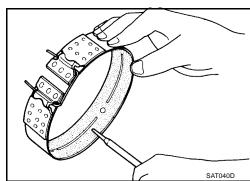
b. Remove brake band and strut from transmission case.



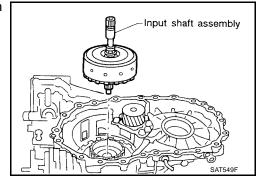
 To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown. Leave the clip in position after removing the brake band.



c. Check brake band facing for damage, cracks, wear or burns.



- 29. Remove input shaft assembly (high clutch) and reverse clutch according to the following procedures.
- a. Remove input shaft assembly (high clutch) with reverse clutch.



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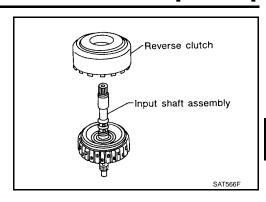
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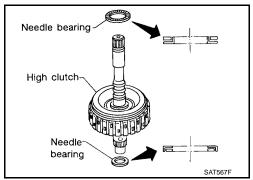
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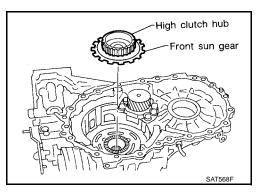
b. Remove input shaft assembly (high clutch) from reverse clutch.



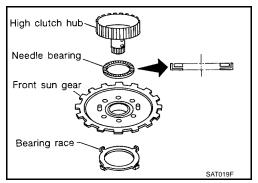
 Remove needle bearings from high clutch drum and check for damage or wear.



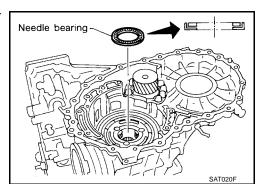
d. Remove high clutch hub and front sun gear from transmission case.



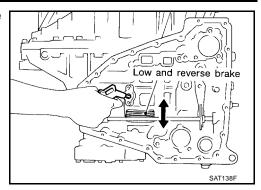
- e. Remove front sun gear and needle bearing from high clutch hub and check for damage or wear.
- f. Remove bearing race from front sun gear and check for damage or wear.



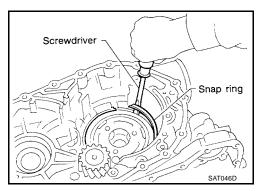
30. Remove needle bearing from transmission case and check for damage or wear.



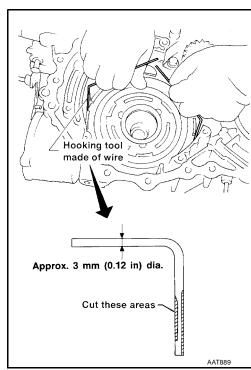
31. Apply compressed air and check to see that low and reverse brake operates.



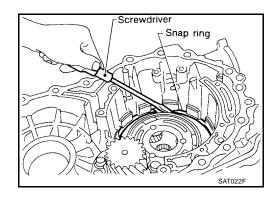
- 32. Remove low one-way clutch and front planetary carrier assembly according to the following procedures.
- a. Remove snap ring with flat-bladed screwdriver.



b. Remove low one-way clutch with a hook made of wire.

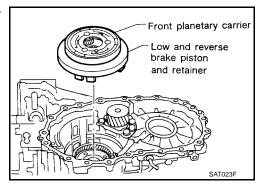


c. Remove snap ring with flat-bladed screwdriver.



[RE4F04B]

Remove front planetary carrier with low and reverse brake piston and retainer.



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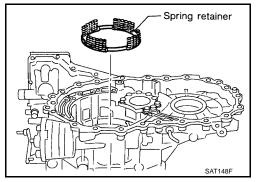
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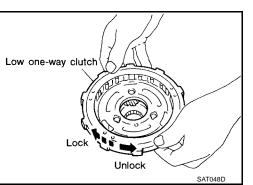
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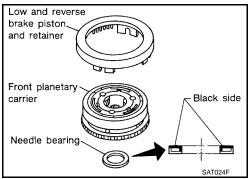
- e. Remove low and reverse brake spring retainer.
 - Do not remove return springs from spring retainer.



f. Check that low one-way clutch rotates in the direction of the arrow and locks in the opposite direction.



- g. Remove needle bearing, low and reverse brake piston and retainer from front planetary carrier.
- h. Check front planetary carrier, low one-way clutch and needle bearing for damage or wear.



 Check clearance between planetary gears and planetary carrier with feeler gauge.

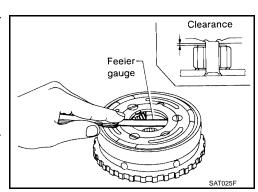
Standard : 0.20 - 0.70 mm (0.0079 - 0.0276 in)

clearance

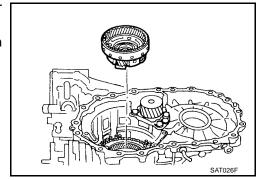
Allowable : 0.80 mm (0.0315 in)

limit

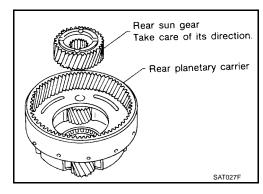
Replace front planetary carrier if the clearance exceeds allowable limit.



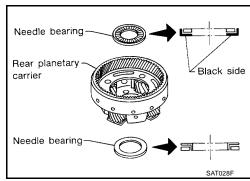
- 33. Remove rear planetary carrier assembly and rear sun gear according to the following procedures.
- Remove rear planetary carrier assembly from transmission case.



b. Remove rear sun gear from rear planetary carrier.



c. Remove needle bearings from rear planetary carrier assembly.



- d. Check rear planetary carrier, rear sun gear and needle bearings for damage or wear.
- e. Check clearance between pinion washer and rear planetary carrier with feeler gauge.

Standard : 0.20 - 0.70 mm (0.0079 - 0.0276

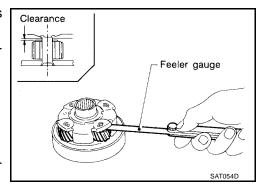
clearance in)

Allowable : 0.80 mm (0.0315 in)

limit

Replace rear planetary carrier if the clearance exceeds allowable limit.

34. Remove rear internal gear and forward clutch hub from transmission case.



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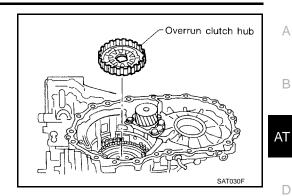
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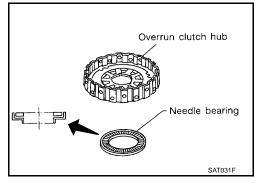
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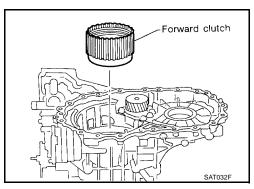
35. Remove overrun clutch hub from transmission case.



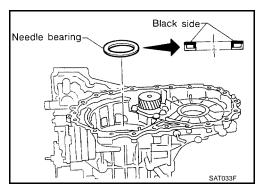
36. Remove needle bearing from overrun clutch hub and check for damage or wear.



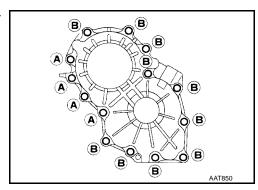
37. Remove forward clutch assembly from transmission case.



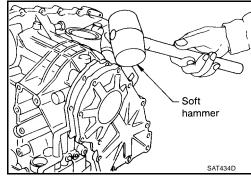
38. Remove needle bearing from transmission case.



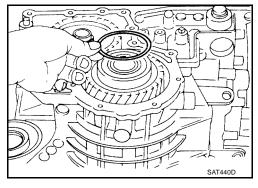
- 39. Remove output shaft assembly according to the following proce-
- a. Remove side cover bolts.
 - Do not mix bolts A and B.
 - Always replace bolts A as they are self-sealing bolts.



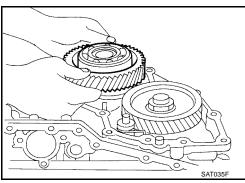
- b. Remove side cover by lightly tapping it with a soft hammer.
 - Be careful not to drop output shaft assembly. It might come out when removing side cover.



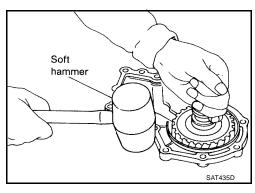
c. Remove adjusting shim.



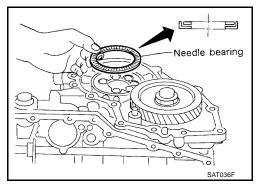
d. Remove output shaft assembly.



• If output shaft assembly came off with side cover, tap cover with a soft hammer to separate.



e. Remove needle bearing.



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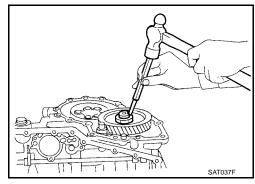
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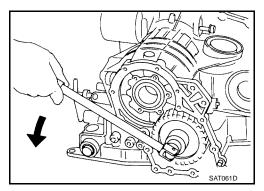
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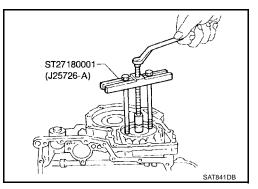
- 40. Disassemble reduction pinion gear according to the following procedures.
- a. Set manual shaft to position P to fix idler gear.
- b. Unlock idler gear lock nut using a pin punch.



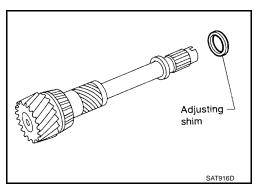
- c. Remove idler gear lock nut.
 - Do not reuse idler gear lock nut.



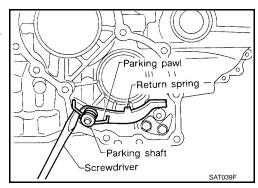
d. Remove idler gear with puller.



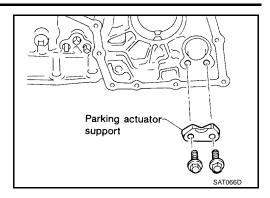
- e. Remove reduction pinion gear.
- f. Remove adjusting shim from reduction pinion gear.



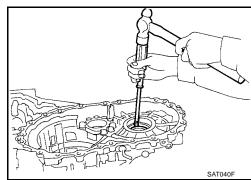
- 41. Remove return spring from parking shaft with screwdriver.
- 42. Draw out parking shaft and remove parking pawl from transmission case.
- 43. Check parking pawl and shaft for damage or wear.



- 44. Remove parking actuator support from transmission case.
- 45. Check parking actuator support for damage or wear.



46. Remove side oil seal with screwdriver from transmission case.



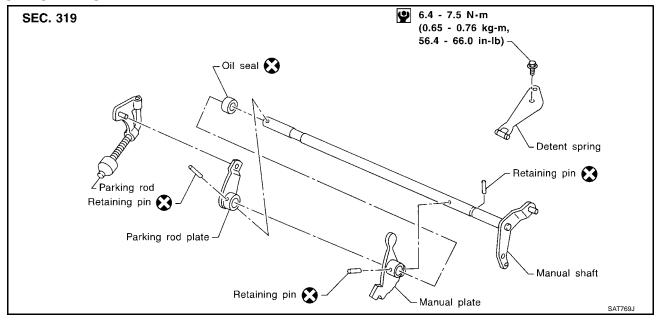
[RE4F04B]

REPAIR FOR COMPONENT PARTS

PFP:00000

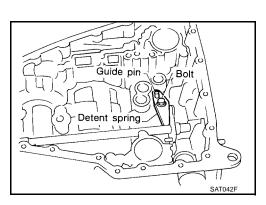
Manual Shaft COMPONENTS

ECS0067E

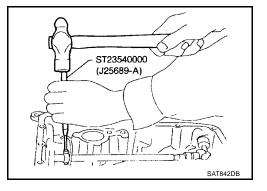


REMOVAL

1. Remove detent spring from transmission case.



2. Drive out manual plate retaining pin.



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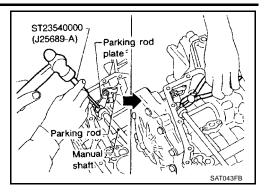
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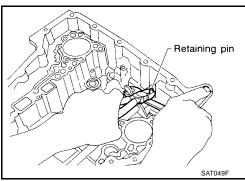
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[RE4F04B]

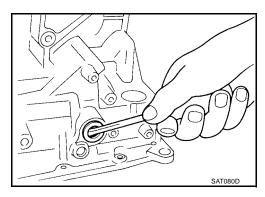
- 3. Drive and pull out parking rod plate retaining pin.
- 4. Remove parking rod plate from manual shaft.
- 5. Draw out parking rod from transmission case.



- 6. Pull out manual shaft retaining pin.
- 7. Remove manual shaft and manual plate from transmission case.



Remove manual shaft oil seal.

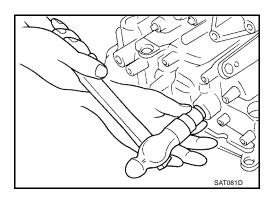


INSPECTION

• Check component parts for wear or damage. Replace if necessary.

INSTALLATION

- 1. Install manual shaft oil seal.
 - Apply ATF to outer surface of oil seal.



[RE4F04B]

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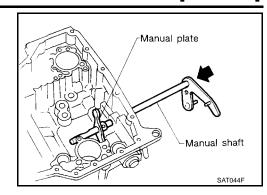
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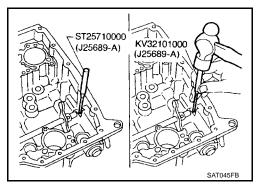
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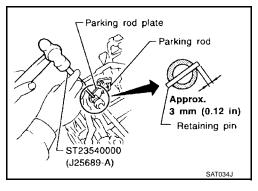
2. Install manual shaft and manual plate.



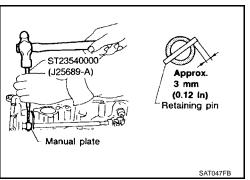
- 3. Align groove of manual shaft and hole of transmission case.
- 4. Install manual shaft retaining pin up to bottom of hole.



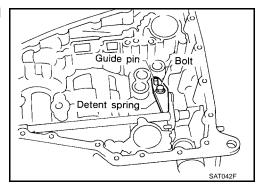
- 5. Install parking rod to parking rod plate.
- 6. Set parking rod assembly onto manual shaft and drive retaining pin.
 - Both ends of pin should protrude.



- 7. Drive manual plate retaining pin.
 - Both ends of pin should protrude.



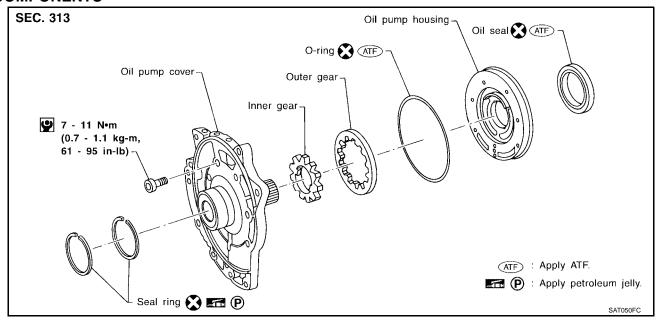
 Install detent spring. Tighten detent spring bolts to the specified torque. Refer to <u>AT-667, "COMPONENTS"</u>.



Revision: July 2004 AT-669 2005 Sentra

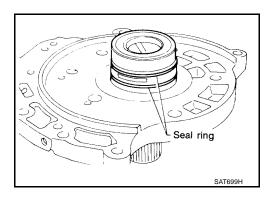
Oil Pump COMPONENTS

CS0067F

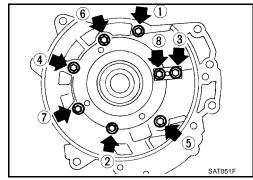


DISASSEMBLY

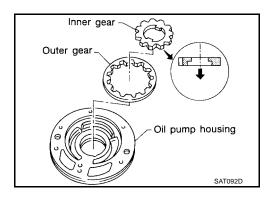
Remove seal rings.



2. Loosen bolts in a crisscross pattern and remove oil pump cover.

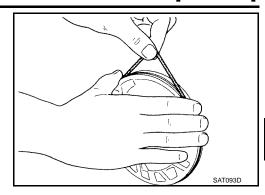


3. Remove inner and outer gear from oil pump housing.

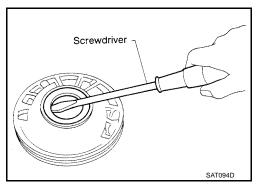


[RE4F04B]

4. Remove O-ring from oil pump housing.



5. Remove oil pump housing oil seal.



INSPECTION

Oil Pump Housing, Oil Pump Cover, Inner Gear and Outer Gear

Check for wear or damage.

Side Clearances

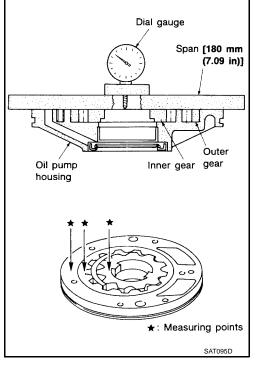
 Measure side clearance of inner and outer gears in at least four places around each outside edge. Maximum measured values should be within specified positions.

Standard clearance : 0.030 - 0.050 mm (0.0012 - 0.0020 in)

• If clearance is less than standard, select inner and outer gear as a set so that clearance is within specifications.

Inner and outer gear : Refer to <u>AT-752, "OIL</u> PUMP".

 If clearance is more than standard, replace whole oil pump assembly except oil pump cover.



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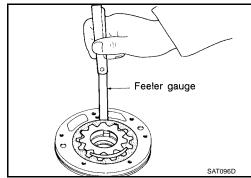
Measure clearance between outer gear and oil pump housing.

Standard clearance : 0.111 - 0.181 mm

(0.0044 - 0.0071 in)

Allowable limit : 0.181 mm (0.0071 in)

 If not within allowable limit, replace whole oil pump assembly except oil pump cover.



SEAL RING CLEARANCE

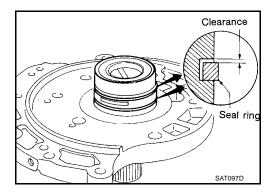
Measure clearance between seal ring and ring groove.

Standard clearance : 0.1 - 0.25 mm

(0.0039 - 0.0098 in)

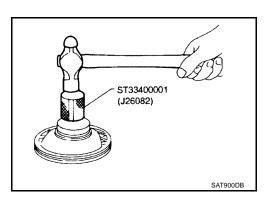
Allowable limit : 0.25 mm (0.0098 in)

If not within allowable limit, replace oil pump cover assembly.

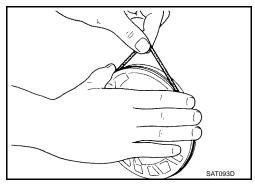


ASSEMBLY

1. Install oil seal on oil pump housing.

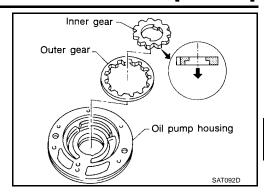


- 2. Install O-ring on oil pump housing.
 - Apply ATF to O-ring.

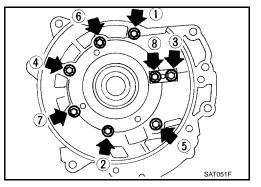


[RE4F04B]

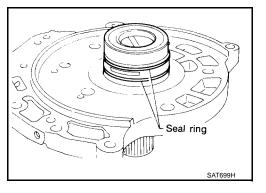
- Install inner and outer gears on oil pump housing.
 - Be careful of direction of inner gear.



- 4. Install oil pump cover on oil pump housing.
- Wrap masking tape around splines of oil pump cover assembly to protect seal. Position oil pump cover assembly on oil pump housing assembly, then remove masking tape.
- Tighten bolts in a crisscross pattern. Tighten oil pump cover bolts to the specified torque. Refer to <u>AT-670, "COMPONENTS"</u>



- 5. Install new seal rings carefully after packing ring groove with petroleum jelly.
 - Do not spread gap of seal ring excessively while installing. The ring may be deformed.



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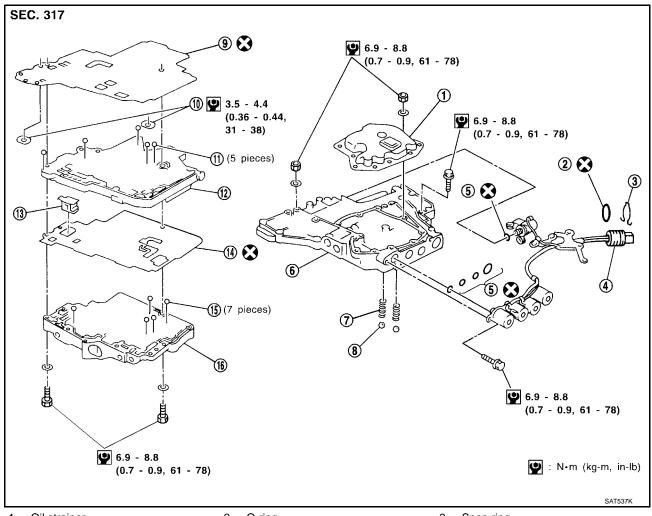
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Control Valve Assembly COMPONENTS

ECS0067G



- Oil strainer Terminal body
- Oil cooler relief valve spring 7.
- 10 Support plate
- 13 Pilot filter
- 16 Control valve upper body

- 2. O-ring
- 5. O-rings
- Check ball 8.
- 11 Steel ball
- 14 Separating plate

- 3. Snap ring
- Control valve lower body 6.
- Separating plate
- 12 Control valve inter body
- 15 Steel ball

DISASSEMBLY

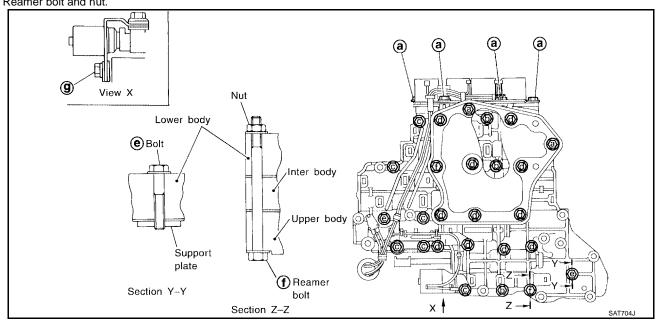
Disassemble upper, inter and lower bodies.

[RE4F04B]

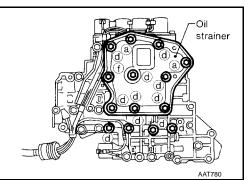
Bolt length, number and location:

Bolt symbol	а	b	С	d	е	f	g
Bolt length " ℓ " mm (in)	13.5 (0.531)	58.0 (2.283)	40.0 (1.575)	66.0 (2.598)	33.0 (1.299)	78.0 (3.071)	18.0 (0.709)
Number of bolts	6	3	6	11	2	2	1

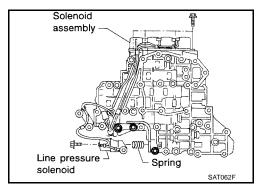
f: Reamer bolt and nut.



Remove bolts ${\bf a}$, ${\bf d}$ and nut ${\bf f}$ and remove oil strainer from con-1. trol valve assembly.



Remove solenoid valve assembly and line pressure solenoid valve from control valve assembly.



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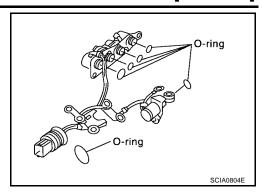
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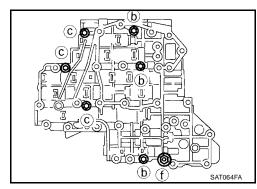
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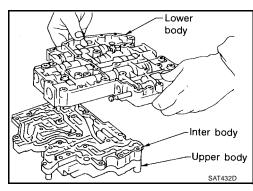
3. Remove O-rings from solenoid valves and terminal body.



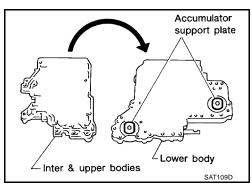
4. Place upper body facedown, and remove bolts **b**, **c** and nut **f**.



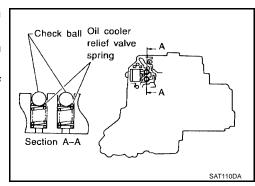
5. Remove inter body from lower body.



6. Turn over lower body, and remove accumulator support plate.

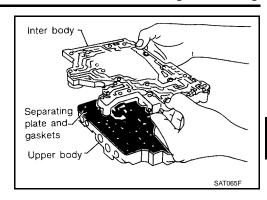


- 7. Remove bolts ${\bf e}$, separating plate and separating gasket from lower body.
- 8. Remove check balls and oil cooler relief valve springs from lower body.
 - Be careful not to lose check balls and oil cooler relief valve springs.

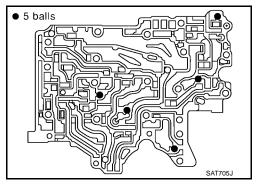


[RE4F04B]

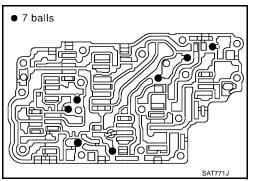
9. Remove inter body from upper body.



- 10. Check to see that steel balls are properly positioned in inter body and then remove them.
 - Be careful not to lose steel balls.



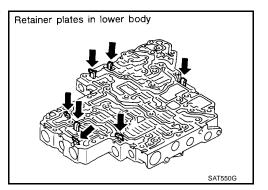
- 11. Check to see that steel balls are properly positioned in upper body and then remove them.
 - Be careful not to lose steel balls.



INSPECTION

Lower and Upper Bodies

 Check to see that retainer plates are properly positioned in lower body.



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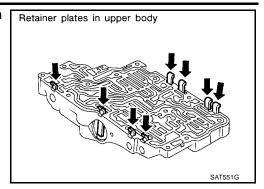
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- Check to see that retainer plates are properly positioned in upper body.
- Be careful not to lose these parts.

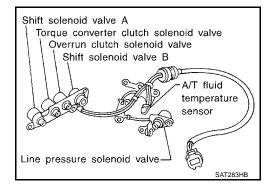


Oil Strainer

Check wire netting of oil strainer for damage.

Shift Solenoid Valves "A" and "B", Line Pressure Solenoid Valve, Torque Converter Clutch Solenoid Valve and Overrun Clutch Solenoid Valve

- Measure resistance.
- For shift solenoid valve A, refer to <u>AT-552</u>.
- For shift solenoid valve B, refer to <u>AT-557</u>.
- For line pressure solenoid valve, refer to <u>AT-546</u>.
- For torque converter clutch solenoid valve, refer to AT-533.
- For overrun clutch solenoid valve, refer to <u>AT-567</u>.

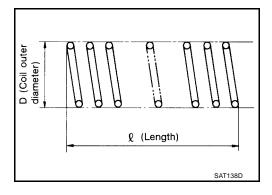


Oil Cooler Relief Valve Spring

- Check springs for damage or deformation.
- Measure free length and outer diameter.

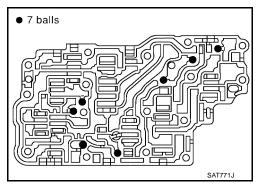
Inspection standard

: Refer to AT-748, "CON-TROL VALVE AND PLUG RETURN SPRINGS".



ASSEMBLY

- 1. Install upper, inter and lower body.
- a. Place oil circuit of upper body face up. Install steel balls in their proper positions.



[RE4F04B]

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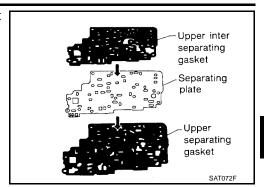
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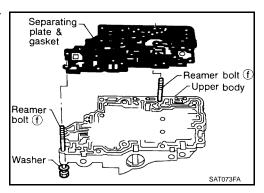
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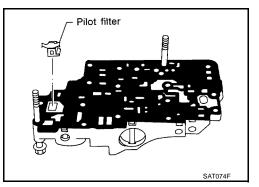
 Install upper separating gasket, upper inter separating gasket and upper separating plate in order shown in illustration.



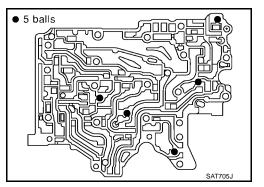
 Install reamer bolts f from bottom of upper body. Using reamer bolts as guides, install separating plate and gaskets as a set.



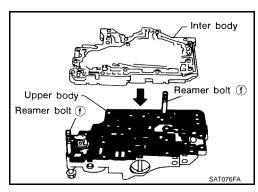
d. Install pilot filter.



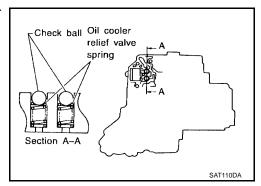
e. Place lower body as shown in illustration (side of inter body face up). Install steel balls in their proper positions.



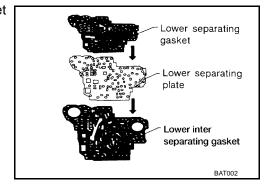
- f. Install inter body on upper body using reamer bolts **f** as guides.
 - Be careful not to dislocate or drop steel balls.



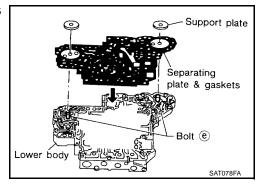
g. Install check balls and oil cooler relief valve springs in their proper positions in lower body.



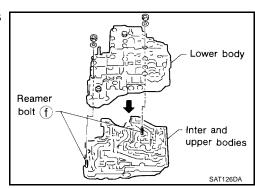
h. Install lower separating gasket, lower inter separating gasket and lower separating plate in order shown in illustration.



i. Install bolts **e** from bottom of lower body. Using bolts **e** as guides, install separating plate and gaskets as a set.

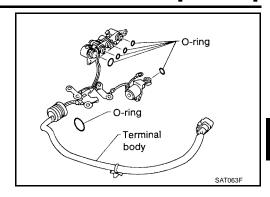


- j. Temporarily install support plates on lower body.
- k. Install lower body on inter body using reamer bolts **f** as guides and tighten reamer bolts **f** slightly.



[RE4F04B]

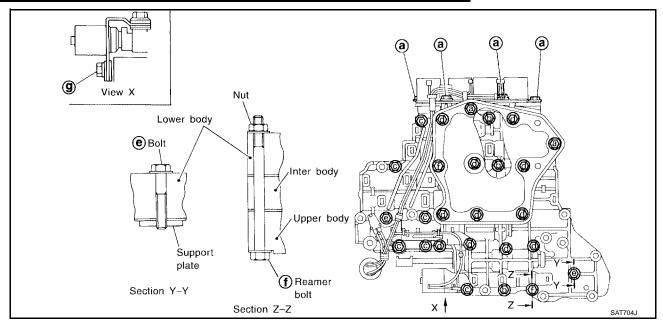
- 2. Install O-rings to solenoid valves and terminal body.
 - Apply ATF to O-rings.



3. Install and tighten bolts.

Bolt length, number and location:

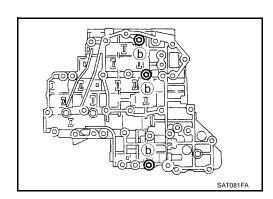
Bolt symbol	а	b	С	d	е	f	g
Bolt length " ℓ " mm (in)	13.5 (0.531)	58.0 (2.283)	40.0 (1.575)	66.0 (2.598)	33.0 (1.299)	78.0 (3.071)	18.0 (0.709)
Number of bolts	6	3	6	11	2	2	1



a. Install and tighten bolts **b** to specified torque.



: 7 - 9 N·m (0.7 - 0.9 kg-m, 61 - 78 in-lb)



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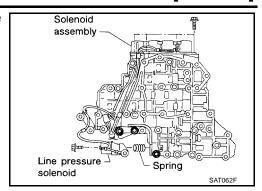
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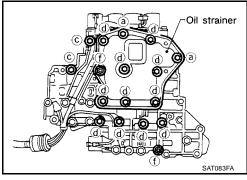
[RE4F04B]

b. Install solenoid valve assembly and line pressure solenoid valve to lower body.



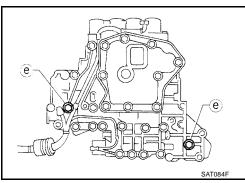
c. Set oil strainer, then tighten bolts ${\bf a}$, ${\bf c}$, ${\bf d}$ and nuts ${\bf f}$ to specified torque.

• : 7 - 9 N·m (0.7 - 0.9 kg-m, 61 - 78 in-lb)



d. Tighten bolts **e** to specified torque.

: 3.4 - 4.4 N·m (0.35 - 0.45 kg-m, 30.4 - 39.1 in-lb)



Control Valve Upper Body COMPONENTS

Apply ATF to all components before installation.

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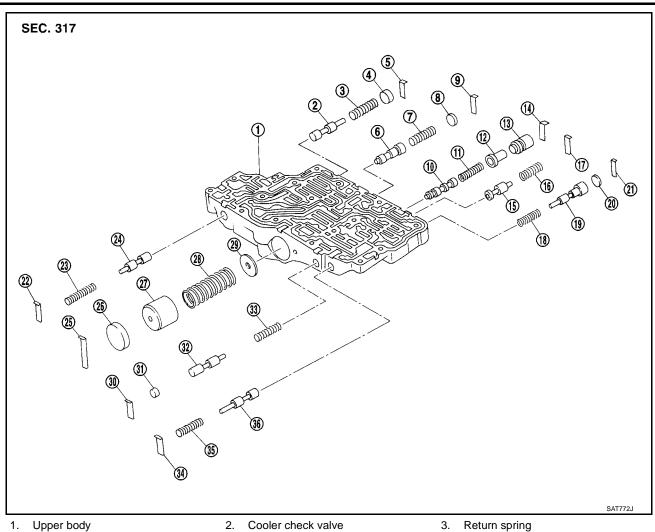
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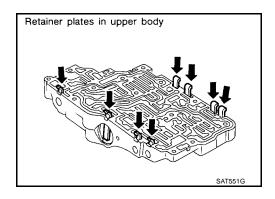
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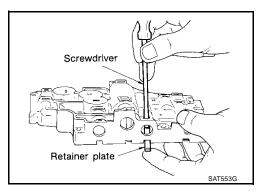
1.	Upper body	2.	Cooler check valve	3.	Return spring
4.	Plug	5.	Retainer plate	6.	1-2 accumulator valve
7.	Return spring	8.	Plug	9.	Retainer plate
10	Torque converter clutch control valve	11	Return spring	12	Torque converter clutch control plug
13	Torque converter clutch control	14	Retainer plate	15	Torque converter relief valve
	sleeve				
16	Return spring	17	Retainer plate	18	Return spring
19	Overrun clutch reducing valve	20	Plug	21	Retainer plate
22	Retainer plate	23	Return spring	24	Pilot valve
25	Retainer plate	26	Plug	27	1-2 accumulator piston
•		•			
28	Return spring	29	1-2 accumulator retainer plate	30	Retainer plate
•		•		•	
31	Plug	32	1st reducing valve	33	Return spring
•		•		•	
34	Retainer plate	35	Return spring	36	3-2 timing valve

DISASSEMBLY

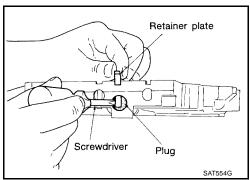
- 1. Remove valves at retainer plates.
 - Do not use a magnetic pick-up tool.



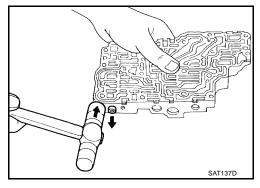
a. Use a screwdriver to remove retainer plates.



- b. Remove retainer plates while holding spring, plugs or sleeves.
 - Remove plugs slowly to prevent internal parts from jumping out.



- c. Place mating surface of valve body face down, and remove internal parts.
 - If a valve is hard to remove, place valve body face down and lightly tap it with a soft hammer.
 - Be careful not to drop or damage valves and sleeves.



[RE4F04B]

INSPECTION

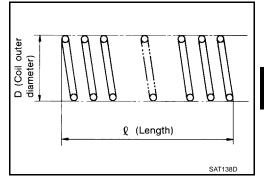
Valve Spring

Measure free length and outer diameter of each valve spring.
 Also check for damage or deformation.

Inspection standard

: Refer to AT-748, "CON-TROL VALVE AND PLUG RETURN SPRINGS".

Replace valve springs if deformed or fatigued.

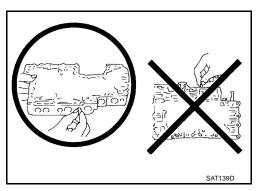


Control Valves

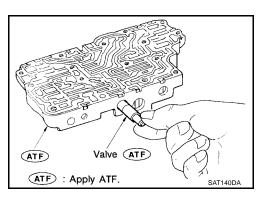
Check sliding surfaces of valves, sleeves and plugs.

ASSEMBLY

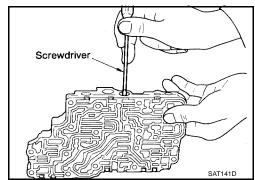
• Lay control valve body down when installing valves. Do not stand the control valve body upright.



- 1. Lubricate the control valve body and all valves with ATF. Install control valves by sliding them carefully into their bores.
 - Be careful not to scratch or damage valve body.



 Wrap a small screwdriver with vinyl tape and use it to insert the valves into their proper positions.



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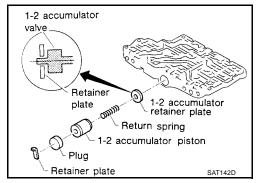
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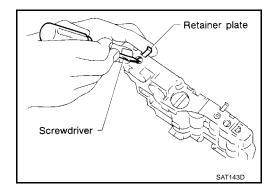
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1-2 Accumulator Valve

- Install 1-2 accumulator valve. Align 1-2 accumulator retainer plate from opposite side of control valve body.
- Install return spring, 1-2 accumulator piston and plug.



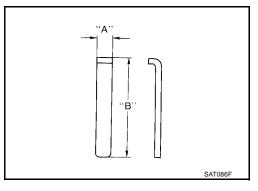
- 1. Install retainer plates.
 - While pushing plug or return spring, install retainer plate.



Retainer Plate (Upper Body)

Unit: mm (in)

No.	Name of control valve	Width A	Length B	
22	Pilot valve			
30	1st reducing valve		21.5 (0.846)	
34	3-2 timing valve			
17	Torque converter relief valve			
9	1-2 accumulator valve	6.0 (0.236)	38.5 (1.516)	
25	1-2 accumulator piston valve			
21	Overrun clutch reducing valve		24.0 (0.945)	
5	Cooler check valve			
14	Torque converter clutch control valve		28.0 (1.102)	

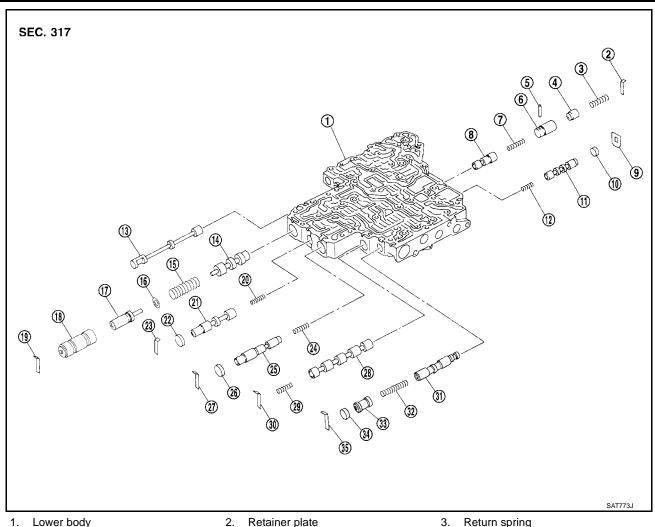


Install proper retainer plates.
 Refer to <u>AT-682</u>, "Control Valve Upper Body".

Control Valve Lower Body COMPONENTS

ECS00671

Apply ATF to all components before installation.



Piston

Return spring

10 Plug

Manual valve 13

16 Spring seat

Retainer plate 19

Plug 22

28

Accumulator control valve 25

Shift valve A

31 Shuttle valve

Plug 34

- Retainer plate
- 5. Parallel pin
- Pressure modifier valve 8.
- 11 Shift valve B

Pressure regulator valve

Plug 17

20 Return spring

23 Retainer plate

26 Plug

29 Return spring

32 Return spring

35 Retainer plate Return spring

6. Sleeve

9. Retainer plate

12 Return spring

15 Return spring

18 Sleeve

21 Overrun clutch control valve

24 Return spring

27 Retainer plate

30 Retainer plate

33 Plug Α

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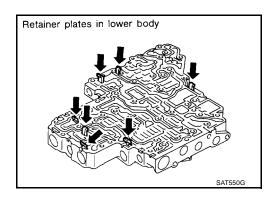
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DISASSEMBLY

Remove valves at retainer plate.
 For removal procedures, refer to <u>AT-684, "DISASSEMBLY"</u>.



INSPECTION

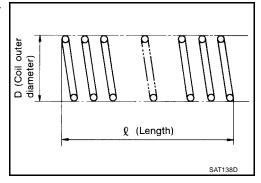
Valve Springs

Check each valve spring for damage or deformation. Also measure free length and outer diameter.

Inspection standard

: Refer to AT-748, "CON-TROL VALVE AND PLUG RETURN SPRINGS".

Replace valve springs if deformed or fatigued.

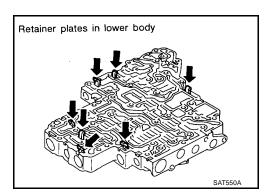


Control Valves

• Check sliding surfaces of control valves, sleeves and plugs for damage.

ASSEMBLY

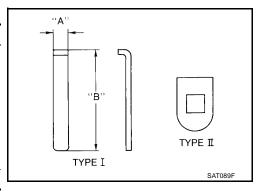
Install control valves.
 For installation procedures, refer to <u>AT-685, "ASSEMBLY"</u>.



Retainer Plate (Lower Body)

Unit: mm (in)

				. ,
No.	Name of control valve and plug	Width A	Length B	Type
19	Pressure regulator valve	6.0 (0.236)	28.0 (1.102)	I
27	Accumulator control valve			
30	Shift valve A			
23	Overrun clutch control valve			
2	Pressure modifier valve			
35	Shuttle valve			
9	Shift valve B	_	_	II



Install proper retainer plates.
 Refer to <u>AT-686, "Control Valve Lower Body"</u>.

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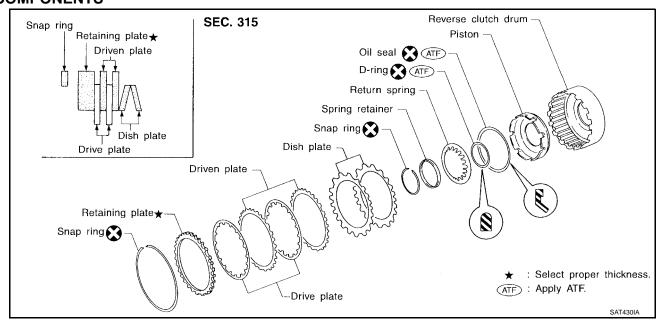
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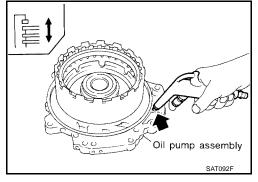
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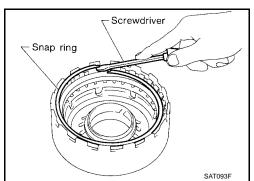
Reverse Clutch COMPONENTS



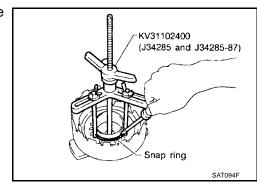
DISASSEMBLY

- 1. Check operation of reverse clutch
- a. Install seal ring onto drum support of oil pump cover and install reverse clutch assembly. Apply compressed air to oil hole.
- b. Check to see that retaining plate moves to snap ring.
- If retaining plate does not contact snap ring:
 - D-ring might be damaged.
 - Oil seal might be damaged.
 - Fluid might be leaking past piston check ball.
- Remove snap ring.
- 3. Remove drive plates, driven plates, retaining plate, and dish plates.

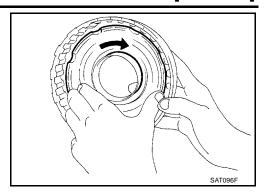




- 4. Set Tool on spring retainer and remove snap ring from reverse clutch drum while compressing return springs.
 - Set Tool directly over springs.
 - Do not expand snap ring excessively.
- 5. Remove spring retainer and return springs.



- 6. Remove piston from reverse clutch drum by turning it.
- 7. Remove D-ring and oil seal from piston.



INSPECTION

Reverse Clutch Snap Ring, Spring Retainer and Return Springs

• Check for deformation, fatigue or damage. If necessary, replace.

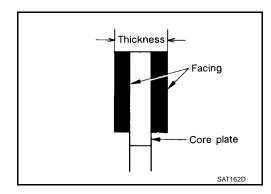
Reverse Clutch Drive Plates

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate:

Standard value : 1.6 mm (0.063 in)
Wear limit : 1.4 mm (0.055 in)

If not within wear limit, replace.

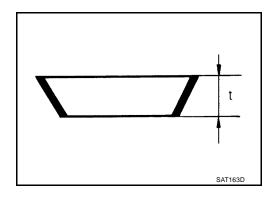


Reverse Clutch Dish Plates

- Check for deformation or damage.
- Measure thickness of dish plate.

Thickness of dish plate : 3.08 mm (0.1213 in)

If deformed or fatigued, replace.

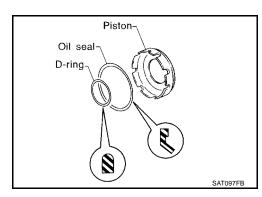


Reverse Clutch Piston

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure that air leaks past ball.

ASSEMBLY

- 1. Install D-ring and oil seal on piston.
 - Take care with the direction of oil seal.
 - Apply ATF to both parts.



[RE4F04B]

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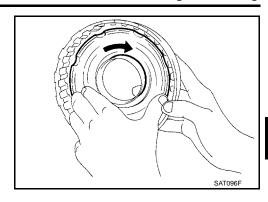
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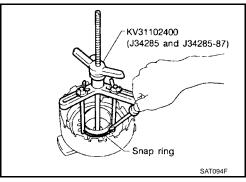
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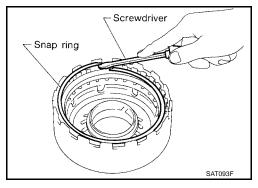
- 2. Install piston assembly by turning it slowly.
 - Apply ATF to inner surface of drum.



3. Install return springs and spring retainer on piston.



- 4. Set Tool on spring retainer and install snap ring while compressing return springs.
 - Set Tool directly over return springs.
- 5. Install drive plates, driven plates, retaining plate and dish plates.
 - Take care with order of plates.
- 6. Install snap ring.



7. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate.

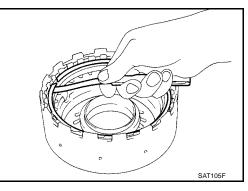
Specified clearance

Standard : 0.5 - 0.8 mm (0.020 - 0.031 in)

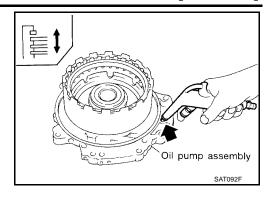
Allowable limit : 1.2 mm (0.047 in)

Retaining plate : Refer to <u>AT-749, "REVERSE</u>

CLUTCH".

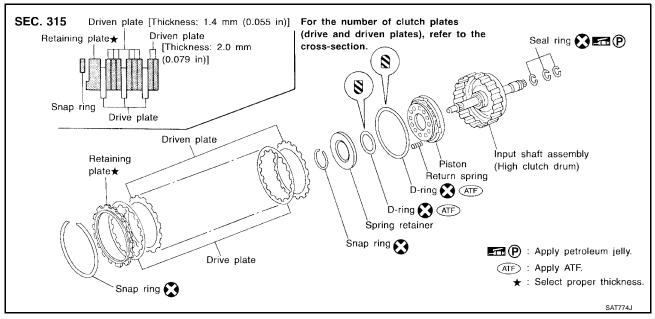


8. Check operation of reverse clutch. Refer to <u>AT-689</u>, "<u>DISASSEMBLY</u>".



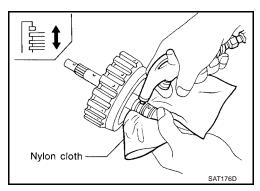
High Clutch COMPONENTS

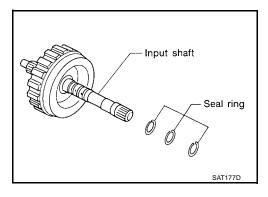
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DISASSEMBLY

- Check operation of high clutch.
- a. Apply compressed air to oil hole of input shaft with nylon cloth.
 - Stop up hole on opposite side of input shaft with nylon cloth.
- b. Check to see that retaining plate moves to snap ring.
- c. If retaining plate does not contact snap ring:
 - D-ring might be damaged.
 - Oil seal might be damaged.
 - Fluid might be leaking past piston check ball.
- 2. Remove seal rings from input shaft.
 - Always replace when removed.





[RE4F04B]

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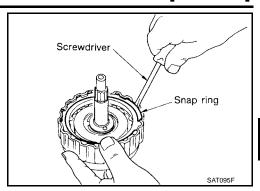
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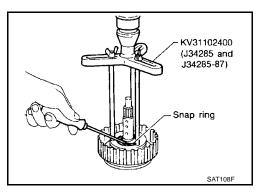
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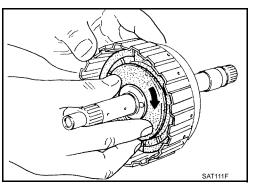
- 3. Remove snap ring.
- 4. Remove drive plates, driven plates and retaining plate.



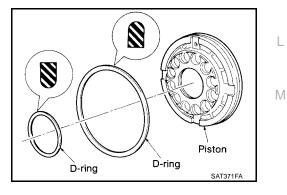
- 5. Set Tool on spring retainer and remove snap ring from high clutch drum while compressing return springs.
 - Set Tool directly over springs.
 - Do not expand snap ring excessively.
- 6. Remove spring retainer and return springs.



Remove piston from high clutch drum by turning it.



Remove D-rings from piston.



INSPECTION

High Clutch Snap Ring, Spring Retainer and Return Springs

- Check for deformation, fatigue or damage.
 If necessary, replace.
- When replacing spring retainer and return springs, replace them as a set.

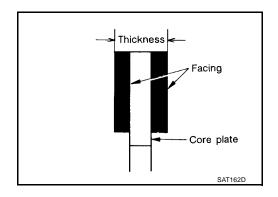
High Clutch Drive Plates

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate:

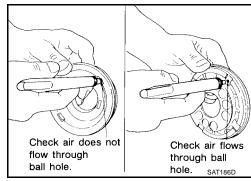
Standard value : 1.6 mm (0.063 in)
Wear limit : 1.4 mm (0.055 in)

If not within wear limit, replace.



High Clutch Piston

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure that air leaks past ball.



Seal Ring Clearance

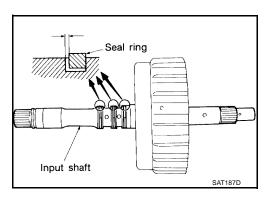
- Install new seal rings onto input shaft.
- Measure clearance between seal ring and ring groove.

Standard clearance : 0.08 - 0.23 mm

(0.0031 - 0.0091 in)

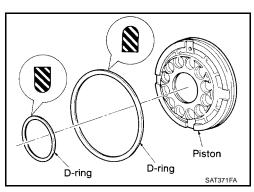
Allowable limit : 0.23 mm (0.0091 in)

If not within allowable limit, replace input shaft assembly.



ASSEMBLY

- 1. Install D-rings on piston.
 - Apply ATF to both parts.



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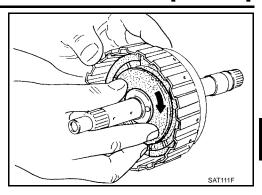
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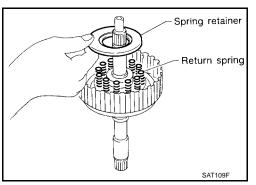
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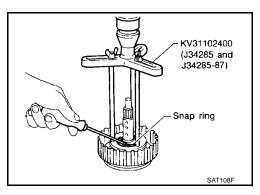
- 2. Install piston assembly by turning it slowly.
 - Apply ATF to inner surface of drum.



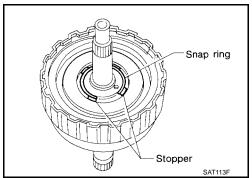
3. Install return springs and spring retainer on piston.



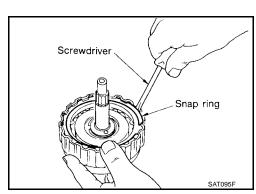
- 4. Set Tool on spring retainer and install snap ring while compressing return springs.
 - Set Tool directly over return springs.



• Do not align snap ring gap with spring retainer stopper.



- 5. Install drive plates, driven plates and retaining plate.
 - Take care with the order and direction of plates.



- 6. Install snap ring.
- 7. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate.

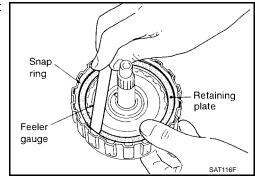
Specified clearance

Standard : 1.8 - 2.2 mm (0.071 - 0.087 in)

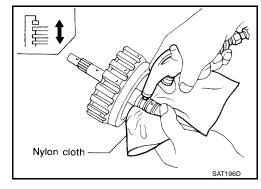
Allowable limit : 2.8 mm (0.110 in)

Retaining plate : Refer to <u>AT-749, "HIGH</u>

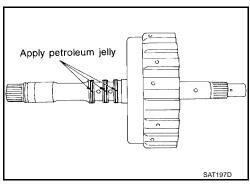
CLUTCH".



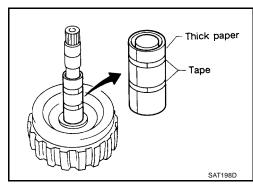
8. Check operation of high clutch. Refer to <u>AT-692</u>, "<u>DISASSEMBLY</u>".



- 9. Install seal rings to input shaft.
 - Apply petroleum jelly to seal rings.
 - Always replace when removed.

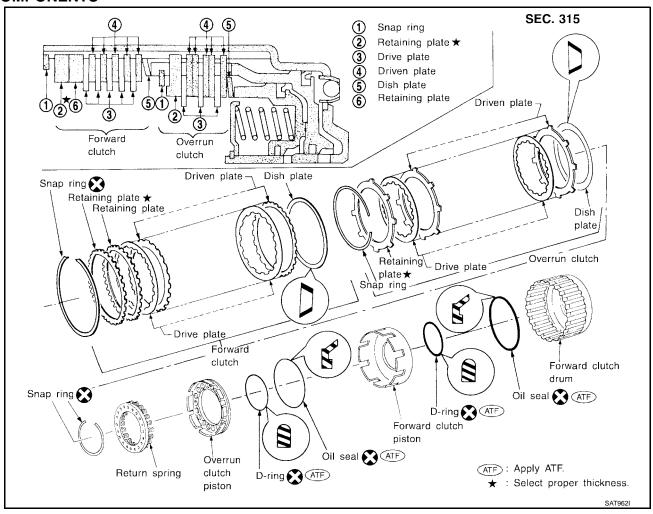


 Roll paper around seal rings to prevent seal rings from spreading.



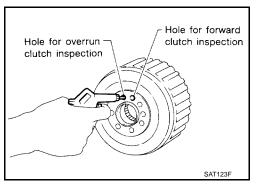
Forward And Overrun Clutches COMPONENTS

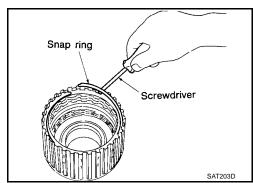
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DISASSEMBLY

- 1. Check operation of forward clutch and overrun clutch.
- a. Install bearing retainer on forward clutch drum.
- b. Apply compressed air to oil hole of forward clutch drum.
- c. Check to see that retaining plate moves to snap ring.
- d. If retaining plate does not contact snap ring:
 - D-ring might be damaged.
 - Oil seal might be damaged.
 - Fluid might be leaking past piston check ball.
- 2. Remove snap ring for forward clutch.
- 3. Remove drive plates, driven plates, retaining plate and dish plate for forward clutch.





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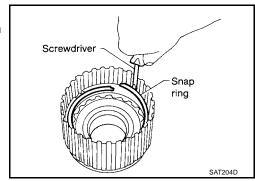
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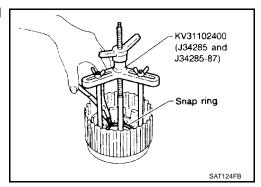
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Revision: July 2004 AT-697 2005 Sentra

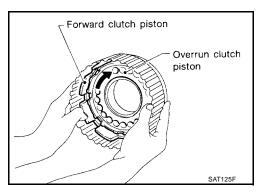
- 4. Remove snap ring for overrun clutch.
- 5. Remove drive plates, driven plates, retaining plate and dish plate for overrun clutch.



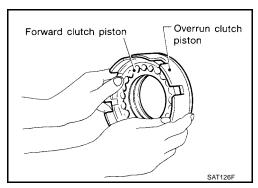
- 6. Set Tool on spring retainer and remove snap ring from forward clutch drum while compressing return springs.
 - Set Tool directly over return springs.
 - Do not expand snap ring excessively.
- 7. Remove spring retainer and return springs.
 - Do not remove return springs from spring retainer.



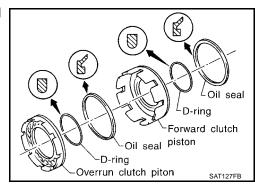
8. Remove forward clutch piston with overrun clutch piston from forward clutch drum by turning it.



Remove overrun clutch piston from forward clutch piston by turning it.



10. Remove D-rings and oil seals from forward clutch piston and overrun clutch piston.



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INSPECTION

Snap Rings, Spring Retainer and Return Springs

- Check for deformation, fatigue or damage.
- Replace if necessary.
- When replacing spring retainer and return springs, replace them as a set.

Forward Clutch and Overrun Clutch Drive Plates

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate:

Forward clutch

Standard value : 1.6 mm (0.063 in) **Wear limit** : 1.4 mm (0.055 in)

Overrun clutch

Standard value : 1.6 mm (0.063 in) **Wear limit** : 1.4 mm (0.055 in)

If not within wear limit, replace.

Forward Clutch and Overrun Clutch Dish Plates

- Check for deformation or damage.
- Measure thickness of dish plate.

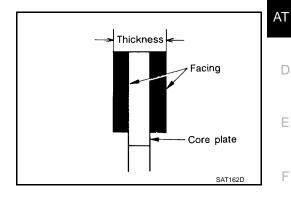
Thickness of dish plate

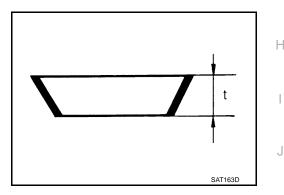
Forward clutch : 2.7 mm (0.106 in) Overrun clutch : 2.7 mm (0.106 in)

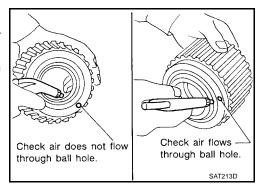
If deformed or fatigued, replace.

Forward Clutch Drum

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole from outside of forward clutch drum. Make sure air leaks past ball.
- Apply compressed air to oil hole from inside of forward clutch drum. Make sure there is no air leakage.



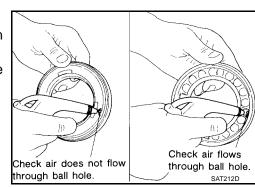




Overrun Clutch Piston

Revision: July 2004

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side. Make sure that air leaks past ball.

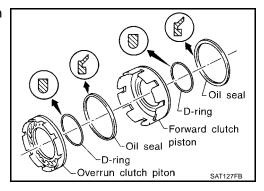


2005 Sentra

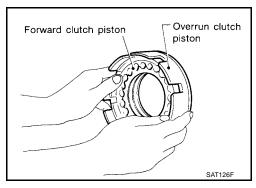
AT-699

ASSEMBLY

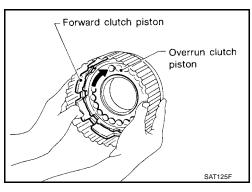
- 1. Install D-rings and oil seals on forward clutch piston and overrun clutch piston.
 - Take care with direction of oil seal.
 - Apply ATF to both parts.



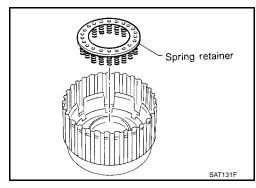
- 2. Install overrun clutch piston assembly on forward clutch piston by turning it slowly.
 - Apply ATF to inner surface of forward clutch piston.



- 3. Install forward clutch piston assembly on forward clutch drum by turning it slowly.
 - Apply ATF to inner surface of drum.

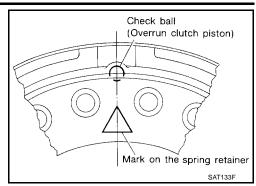


4. Install return spring on overrun clutch piston.



[RE4F04B]

• Align the mark on spring retainer with check ball in overrun clutch piston.



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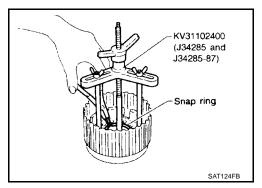
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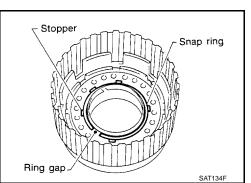
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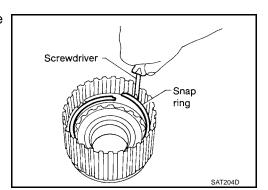
- 5. Set Tool on spring retainer and install snap ring while compressing return springs.
 - Set Tool directly over return springs.



• Do not align snap ring gap with spring retainer stopper.



- 6. Install drive plates, driven plates, retaining plate and dish plate for overrun clutch.
 - Take care with order of plates.



7. Install snap ring for overrun clutch.

[RE4F04B]

8. Measure clearance between overrun clutch retaining plate and snap ring.

If not within allowable limit, select proper retaining plate.

Specified clearance

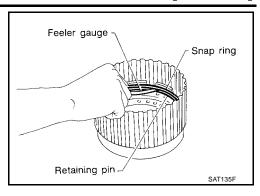
Standard : 0.7 - 1.1 mm (0.028 - 0.043 in)

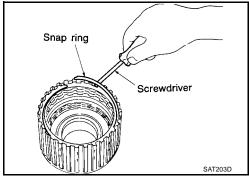
Allowable limit : 1.7 mm (0.067 in)

Overrun clutch retain- Refer to AT-750, "OVERRUN

ing plate <u>CLUTCH"</u>.

- Install drive plates, driven plates, retaining plate and dish plate for forward clutch.
 - Take care with order of plates.
- 10. Install snap ring for forward clutch.





11. Measure clearance between forward clutch retaining plate and snap ring.

If not within allowable limit, select proper retaining plate.

Specified clearance

Standard : 0.45 - 0.85 mm

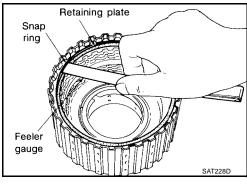
(0.0177 - 0.0335 in)

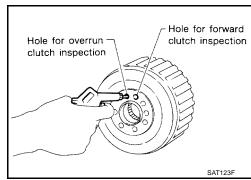
Allowable limit : 1.85 mm (0.0728 in)

Forward clutch retain- : Refer to AT-749, "FOR-

ing plate WARD CLUTCH".

- 12. Check operation of forward clutch. Refer to AT-697, "DISASSEMBLY".
- Check operation of overrun clutch. Refer to <u>AT-697</u>, "<u>DISASSEMBLY</u>".





[RE4F04B]

Low & Reverse Brake COMPONENTS

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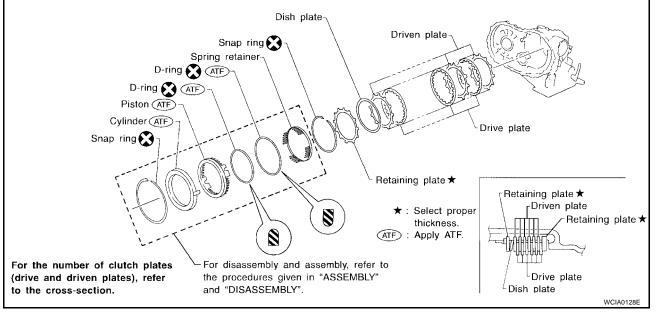
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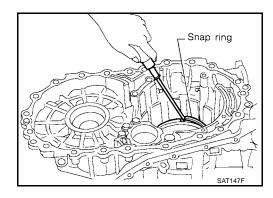
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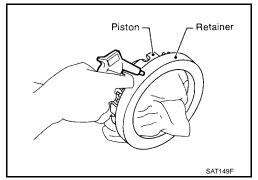


DISASSEMBLY

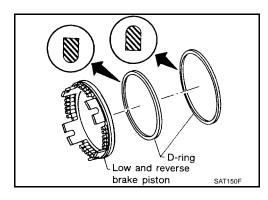
- Check operation of low & reverse brake.
- a. Apply compressed air to oil hole of transmission case.
- b. Check to see that retaining plate moves to snap ring.
- c. If retaining plate does not contact snap ring:
 - D-ring might be damaged.
 - Fluid might be leaking past piston check ball.



- 2. In order to remove piston, apply compressed air to oil hole of retainer while holding piston.
 - Apply air gradually and allow piston to come out evenly.



3. Remove D-rings from piston.



Revision: July 2004 AT-703 2005 Sentra

INSPECTION

Low and Reverse Brake Snap Ring, Spring Retainer and Return Springs

- Check for deformation, fatigue or damage.
 If necessary, replace.
- When replacing spring retainer and return springs, replace them as a set.

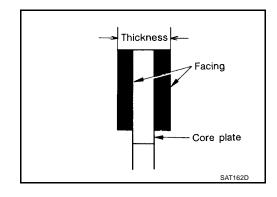
Low and Reverse Brake Drive Plate

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate

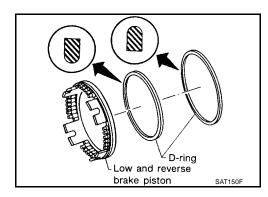
Standard value : 1.8 mm (0.071 in)
Wear limit : 1.6 mm (0.063 in)

If not within wear limit, replace.

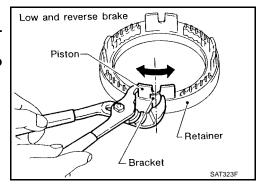


ASSEMBLY

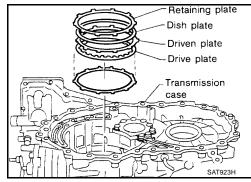
- 1. Install D-rings on piston.
 - Apply ATF to both parts.



- 2. Set and align piston with retainer.
 - This operation is required in order to engage the protrusions of piston to return springs correctly.
 Further procedures are given in "ASSEMBLY". Refer to AT-724, "ASSEMBLY".



- 3. Install driven plates, drive plates, retaining plate and dish plate on transmission case.
 - Take care with order of plates and direction of dish plate.



[RE4F04B]

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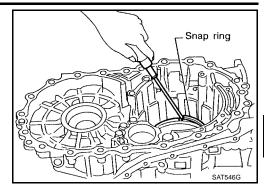
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4. Install snap ring.



5. Measure clearance between driven plate and transmission case. If not within allowable limit, select proper retaining plate. (front side)

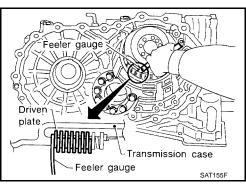
Specified clearance

Standard : 1.7 - 2.1 mm (0.067 - 0.083 in)

Allowable limit : 3.3 mm (0.130 in)

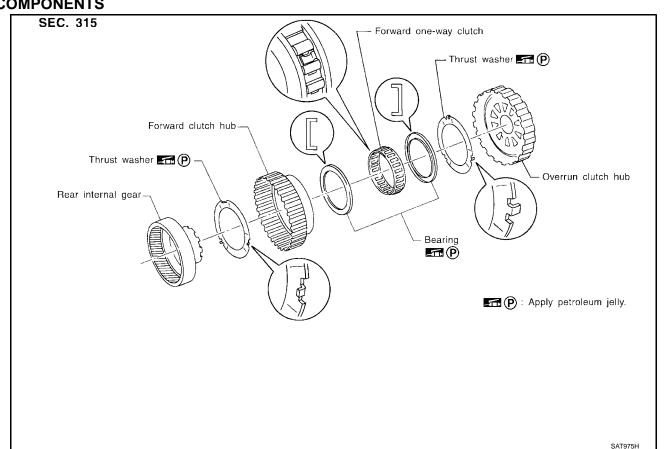
Retaining plate Refer to <u>AT-750, "LOW & </u>

REVERSE BRAKE".



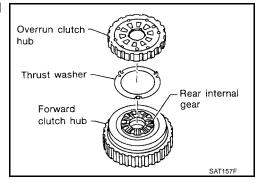
Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub COMPONENTS

ECS0067N

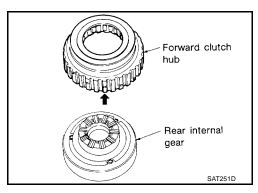


DISASSEMBLY

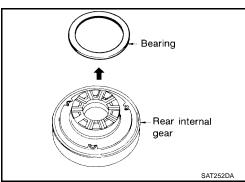
 Remove overrun clutch hub and thrust washer from forward clutch hub.



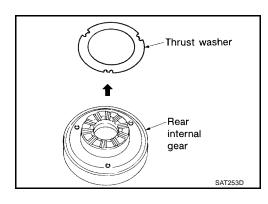
2. Remove forward clutch hub from rear internal gear.



3. Remove bearing from rear internal gear.

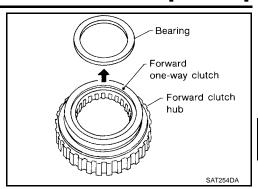


4. Remove thrust washer from rear internal gear.

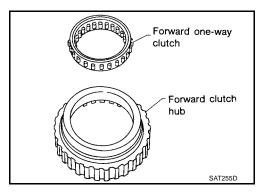


[RE4F04B]

5. Remove bearing from forward one-way clutch.



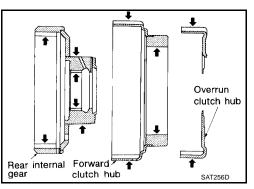
6. Remove forward one-way clutch from forward clutch hub.



INSPECTION

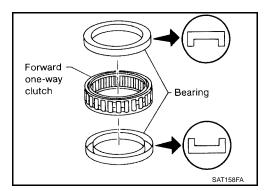
Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub

Check rubbing surfaces for wear or damage.



Bearings and Forward One-Way Clutch

- Check bearings for deformation and damage.
- Check forward one-way clutch for wear and damage.



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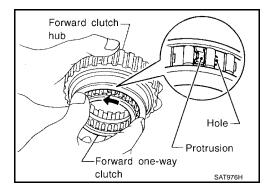
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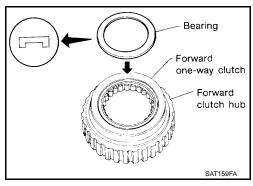
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ASSEMBLY

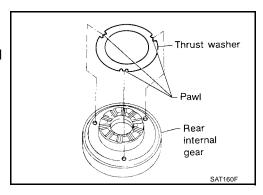
- 1. Install forward one-way clutch on forward clutch.
 - Take care with the direction of forward one-way clutch.



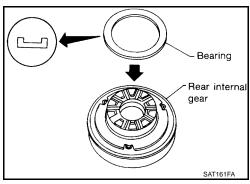
- 2. Install bearing on forward one-way clutch.
 - Apply petroleum jelly to bearing.



- 3. Install thrust washer on rear internal gear.
 - Apply petroleum jelly to thrust washer.
 - Align hooks of thrust washer with holes of rear internal gear.



- 4. Install bearing on rear internal gear.
 - Apply petroleum jelly to bearing.



[RE4F04B]

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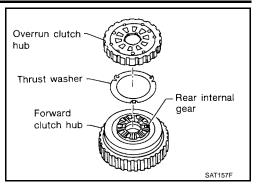
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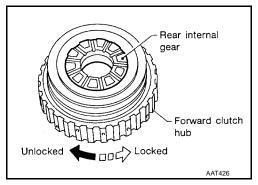
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- 5. Install thrust washer and overrun clutch hub.
 - Apply petroleum jelly to thrust washer.
 - Align hooks of thrust washer with holes of overrun clutch hub.
 - Align projections of rear internal gear with holes of overrun clutch hub.

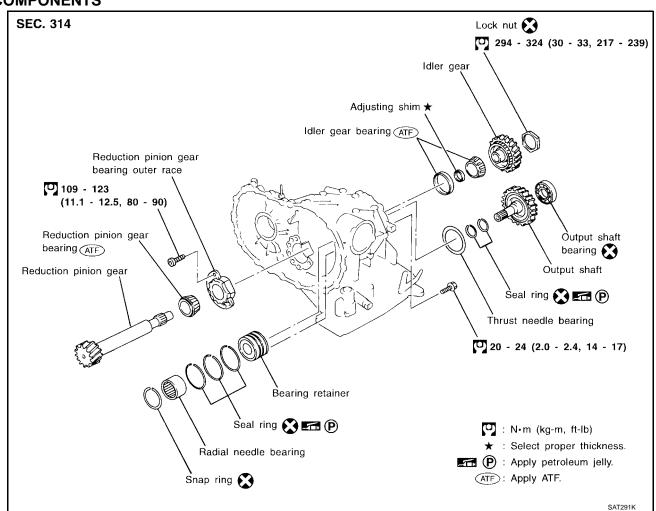


- 6. Install forward clutch hub on rear internal gear.
 - Check operation of forward one-way clutch.
 Hold rear internal gear and turn forward clutch hub.
 Check forward clutch hub for correct locking and unlocking directions.
 - If not as shown in illustration, check installation direction of forward one-way clutch.



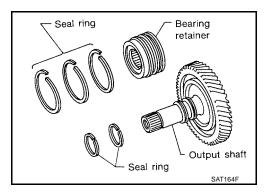
Output Shaft, Idler Gear, Reduction Pinion Gear and Bearing Retainer COMPONENTS

ECS00670

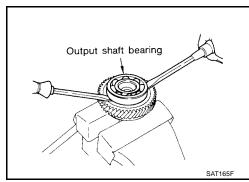


DISASSEMBLY

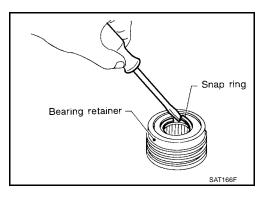
1. Remove seal rings from output shaft and bearing retainer.



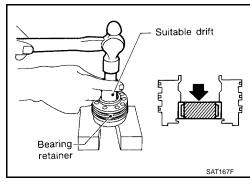
- 2. Remove output shaft bearing with screwdrivers.
 - Always replace bearing with a new one when removed.
 - Do not damage output shaft.



3. Remove snap ring from bearing retainer.



4. Remove needle bearing from bearing retainer.



[RE4F04B]

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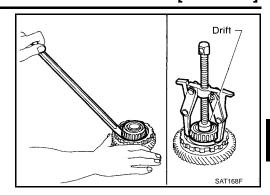
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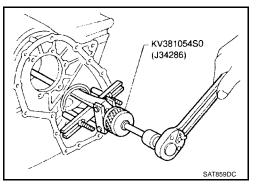
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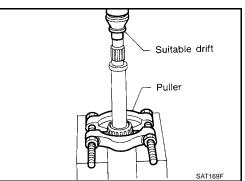
5. Remove idler gear bearing inner race from idler gear.



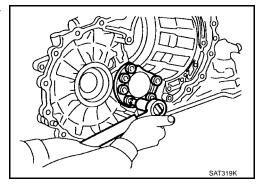
6. Remove idler gear bearing outer race from transmission case.



7. Press out reduction pinion gear bearing inner race from reduction pinion gear.



8. Remove reduction pinion gear bearing outer race from transmission case.



INSPECTION

Output Shaft, Idler Gear and Reduction Pinion Gear

- Check shafts for cracks, wear or bending.
- Check gears for wear, chips and cracks.

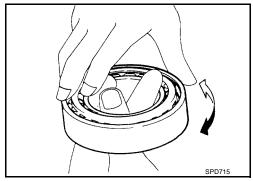
Bearing

retainer

SAT171F

Bearing

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- When replacing taper roller bearing, replace outer and inner race as a set.



Seal Ring Clearance

- Install new seal rings to output shaft.
- Measure clearance between seal ring and ring groove of output shaft.

Standard clearance : 0.10 - 0.25 mm

(0.0039 - 0.0098 in)

Allowable limit : 0.25 mm (0.0098 in)

- If not within allowable limit, replace output shaft.
- Install new seal rings to bearing retainer.
- Measure clearance between seal ring and ring groove of bearing retainer.

Standard clearance : 0.10 - 0.30 mm

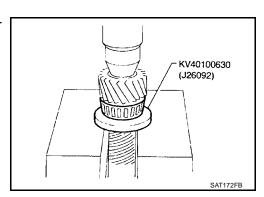
(0.0039 - 0.0118 in)

Allowable limit : 0.30 mm (0.0118 in)

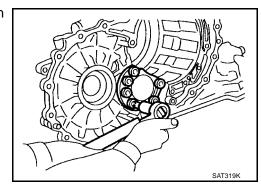
If not within allowable limit, replace bearing retainer.



Press reduction pinion gear bearing inner race on reduction pinion gear.



- Install reduction pinion gear bearing outer race on transmission case.
 - : 109 123 N·m (11.1 12.5 kg-m, 80 90 ft-lb) (0)



Seal ring

Output shaft

Clearance

[RE4F04B]

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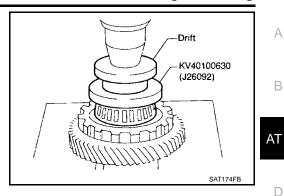
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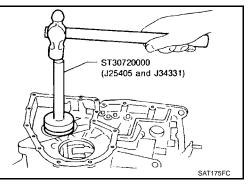
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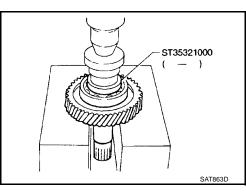
Press idler gear bearing inner race on idler gear.



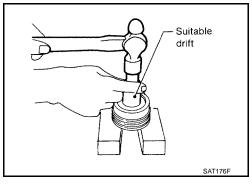
Install idler gear bearing outer race on transmission case.



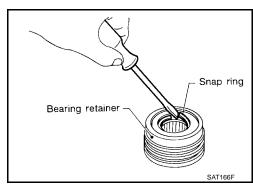
Press output shaft bearing on output shaft.



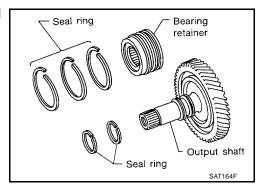
Press needle bearing on bearing retainer.



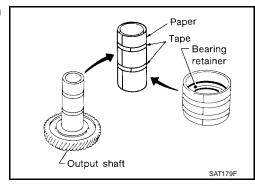
Install snap ring to bearing retainer.



AT-713 Revision: July 2004 2005 Sentra 8. After packing ring grooves with petroleum jelly, carefully install new seal rings on output shaft and bearing retainer.

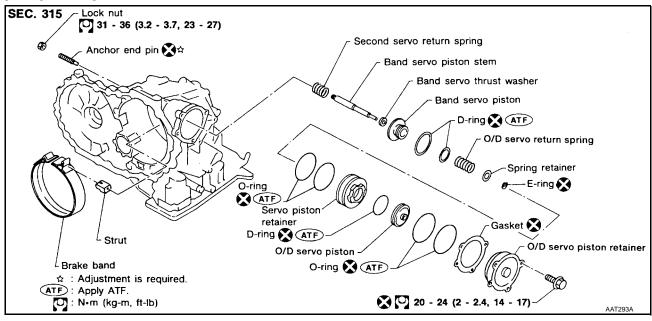


 Roll paper around seal rings to prevent seal rings from spreading.



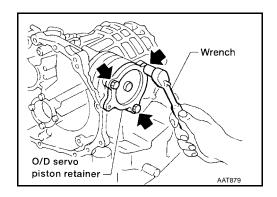
Band Servo Piston Assembly COMPONENTS

ECS0067P



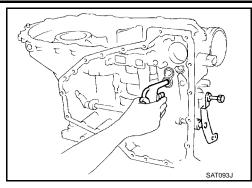
DISASSEMBLY

Remove band servo piston fixing bolts.



[RE4F04B]

- Apply compressed air to oil hole in transmission case to remove O/D servo piston retainer and band servo piston assembly.
 - Hold band servo piston assembly with a rag or nylon waste.



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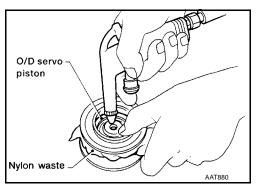
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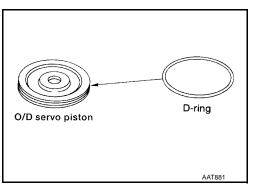
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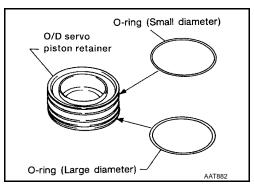
- 3. Apply compressed air to oil hole in O/D servo piston retainer to remove O/D servo piston from retainer.
 - Hold O/D band servo piston while applying compressed air.



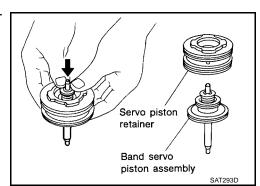
4. Remove D-ring from O/D servo piston.



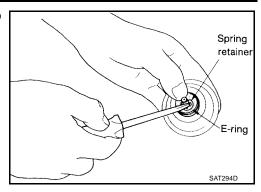
5. Remove O-rings from O/D servo piston retainer.



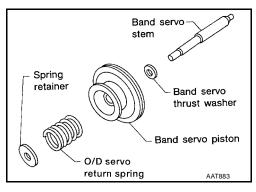
6. Remove band servo piston assembly from servo piston retainer by pushing it forward.



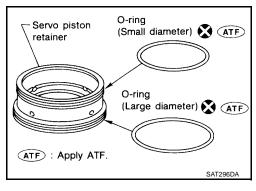
7. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, remove E-ring.



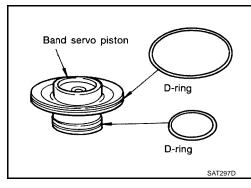
8. Remove O/D servo return spring, band servo thrust washer and band servo piston stem from band servo piston.



9. Remove O-rings from servo piston retainer.



10. Remove D-rings from band servo piston.



INSPECTION

Pistons, Retainers and Piston Stem

Check frictional surfaces for abnormal wear or damage.

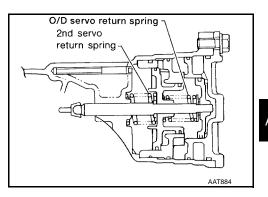
[RE4F04B]

Return Springs

- Check for deformation or damage.
- Measure free length and outer diameter.

Inspection standard

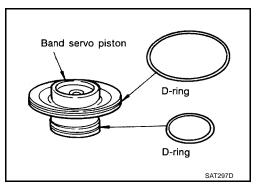
: Refer to <u>AT-753</u>, "RETURN SPRING".



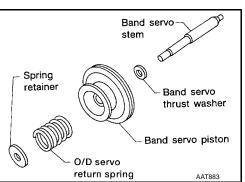
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ASSEMBLY

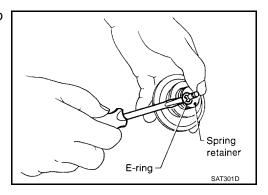
- 1. Install D-rings to servo piston retainer.
 - Apply ATF to D-rings.
 - Pay attention to position of each O-ring.



Install band servo piston stem, band servo thrust washer, O/D servo return spring and spring retainer to band servo piston.



Place piston stem end on a wooden block. While pushing servo piston spring retainer down, install E-ring.



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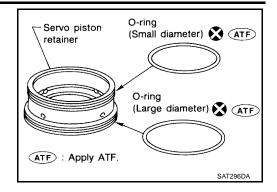
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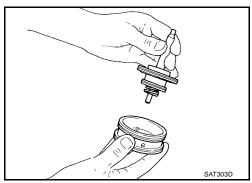
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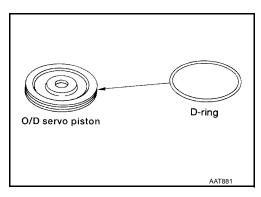
- 4. Install O-rings to servo piston retainer.
 - Apply ATF to O-rings.
 - Pay attention to position of each O-ring.



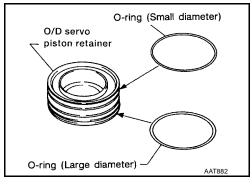
5. Install band servo piston assembly to servo piston retainer by pushing it inward.



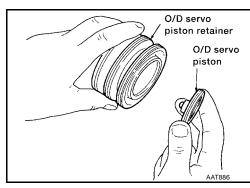
- 6. Install D-ring to O/D servo piston.
 - Apply ATF to D-ring.



- 7. Install O-rings to O/D servo piston retainer.
 - Apply ATF to O-rings.
 - Pay attention to position of each O-ring.

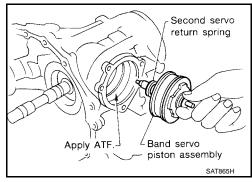


8. Install O/D servo piston to O/D servo piston retainer.

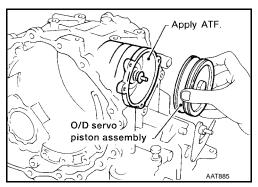


[RE4F04B]

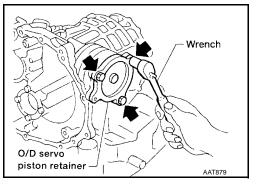
- Install band servo piston assembly and 2nd servo return spring to transmission case.
 - Apply ATF to O-ring of band servo piston and transmission case.



- 10. Install O/D servo piston assembly to transmission case.
 - Apply ATF to O-ring of band servo piston and transmission case.

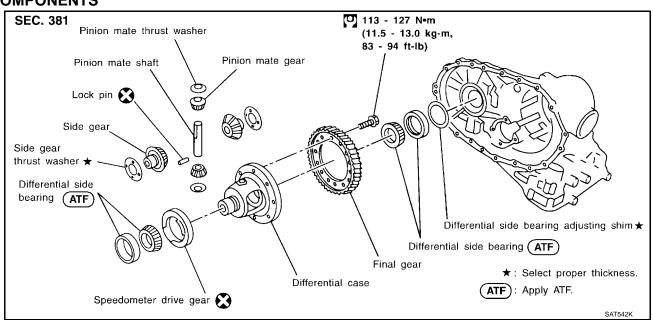


11. Install O/D servo piston retainer to transmission case. Refer to AT-717, "ASSEMBLY".



Final Drive COMPONENTS

ECS0067Q



AT-719 2005 Sentra Revision: July 2004

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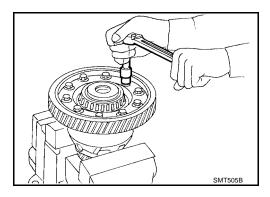
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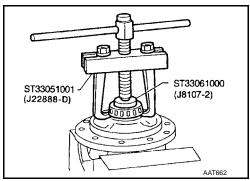
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DISASSEMBLY

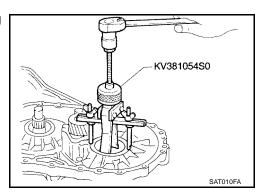
1. Remove final gear.



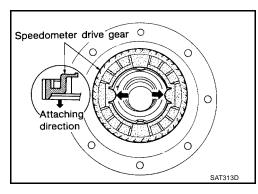
- 2. Press out differential side bearings.
 - Be careful not to mix up the right and left bearings.



3. Remove differential side bearing outer race and side bearing adjusting shim from transaxle case.



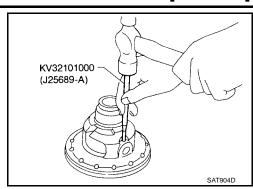
4. Remove speedometer drive gear.



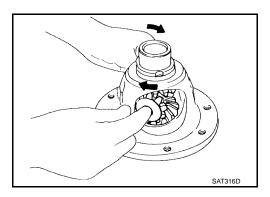
REPAIR FOR COMPONENT PARTS

[RE4F04B]

5. Drive out pinion mate shaft lock pin.



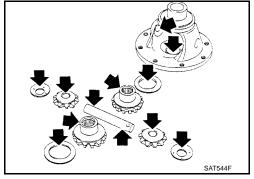
- 6. Draw out pinion mate shaft lock pin.
- 7. Remove pinion mate gears and side gears.



INSPECTION

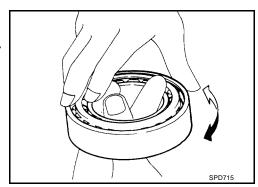
Gear, Washer, Shaft and Case

- Check mating surfaces of differential case, side gears and pinion mate gears.
- Check washers for wear.



Bearings

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- When replacing taper roller bearing, replace outer and inner race as a set.



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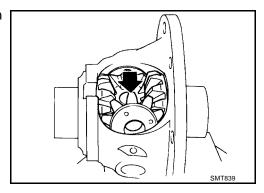
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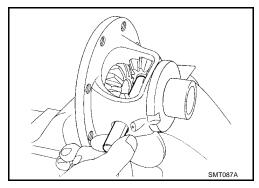
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ASSEMBLY

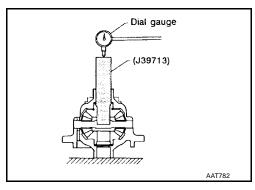
- 1. Attach side gear thrust washers to side gears, then install pinion mate thrust washers and pinion mate gears in place.
 - Apply ATF to any parts.



- 2. Insert pinion mate shaft.
 - When inserting, be careful not to damage pinion mate thrust washers.



- 3. Measure clearance between side gear and differential case with washers following the procedure below:
- a. Set Tool and dial indicator on side gear.



b. Move side gear up and down to measure dial indicator deflection. Always measure indicator deflection on both side gears.

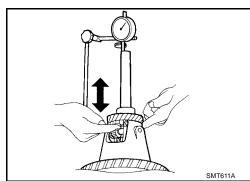
Clearance between side gear and differential case with washer

: 0.1 - 0.2 mm (0.004 - 0.008 in)

c. If not within specification, adjust clearance by changing thickness of differential side gear thrust washers.

Differential side gear thrust washers

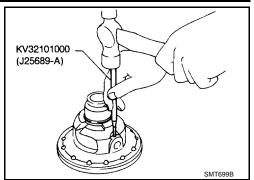
: Refer to AT-751, "DIF-FERENTIAL SIDE GEAR THRUST WASHERS".



REPAIR FOR COMPONENT PARTS

[RE4F04B]

- 4. Install lock pin.
 - Make sure that lock pin is flush with case.



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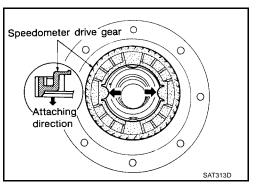
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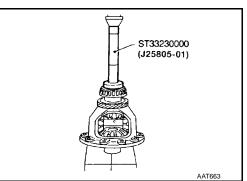
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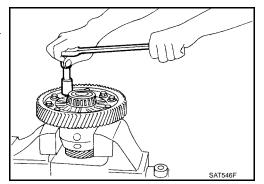
- 5. Install speedometer drive gear on differential case.
 - Align the projection of speedometer drive gear with the groove of differential case.



6. Press on differential side bearings.



7. Install final gear and tighten fixing bolts in a crisscross pattern. Tighten final gear bolts to the specified torque. Refer to AT-719, <a href=""COMPONENTS".



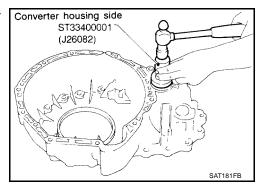
Revision: July 2004 AT-723 2005 Sentra

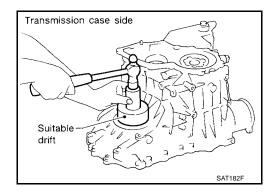
ASSEMBLY PFP:00000

Assembly (1)

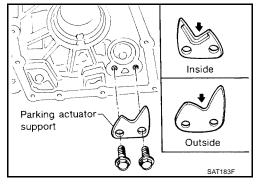
ECS0067R

1. Install differential side oil seals on transmission case and converter housing.

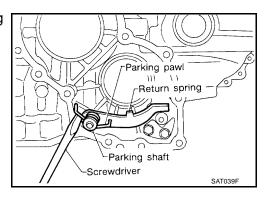




- 2. Install parking actuator support to transmission case. Tighten parking actuator support bolts to the specified torque. Refer to AT-647. "OVERHAUL".
 - Pay attention to direction of parking actuator support.



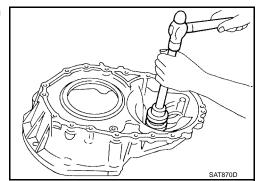
- 3. Install parking pawl on transmission case and fix it with parking shaft.
- 4. Install return spring.



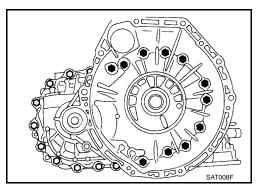
Adjustment (1)
DIFFERENTIAL SIDE BEARING PRELOAD

ECS0067S

- 1. Install differential side bearing outer race without adjusting shim on transmission case.
- 2. Install differential side bearing outer race on converter housing.



- 3. Place final drive assembly on transmission case.
- Install transmission case on converter housing. Tighten transmission case fixing bolts to the specified torque. Refer to <u>AT-647</u>, "OVERHAUL".



- 5. Attach dial indicator on differential case at converter housing side.
- 6. Insert Tool into differential side gear from transmission case side.
- 7. Move Tool up and down and measure dial indicator deflection.
- Select proper thickness of differential side bearing adjusting shim(s).

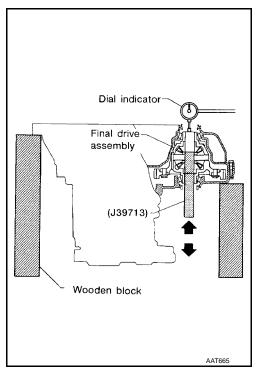
Suitable shim thickness = Dial indicator deflection + Specified bearing preload

Differential side bearing preload adjusting shim

: Refer to AT-751, "DIF-FERENTIAL SIDE BEAR-ING PRELOAD

<u>ADJUSTING SHIMS"</u>.

Bearing preload : 0.05 - 0.09 mm (0.0020 - 0.0035 in)



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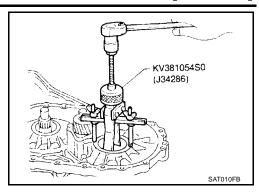
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- 9. Remove converter housing from transmission case.
- 10. Remove final drive assembly from transmission case.
- 11. Remove differential side bearing outer race from transmission case.
- 12. Reinstall differential side bearing outer race and shim(s) selected from SDS table on transmission case.
- 13. Reinstall converter housing on transmission case and tighten transmission case fixing bolts to the specified torque. Refer to AT-647, "OVERHAUL".

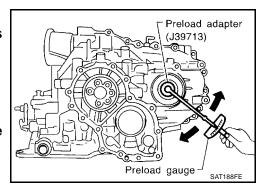


- 14. Insert Tool and measure turning torque of final drive assembly.
 - Turn final drive assembly in both directions several times to seat bearing rollers correctly.

Turning torque of final : 0.78 - 1.37 N·m drive assembly (New bearing) : 0.78 - 1.20 kg-cm, 6.9 - 12.2 in-lb)

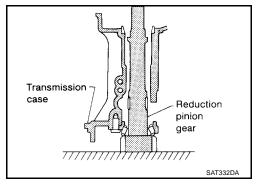
- When old bearing is used again, turning torque will be slightly less than the above.
- Make sure torque is close to the specified range.

Preload adapter : J39713



REDUCTION PINION GEAR BEARING PRELOAD

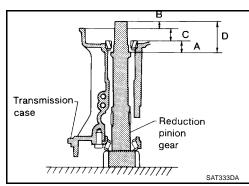
- Remove transmission case and final drive assembly from converter housing.
- 2. Select proper thickness of reduction pinion gear bearing adjusting shim using the following procedures.
- a. Place reduction pinion gear on transmission case as shown.



- b. Place idler gear bearing on transmission case.
- c. Measure dimensions "B" "C" and "D" and calculate dimension "A".

$$A = D - (B + C)$$
"A"

: Distance between the surface of idler gear bearing inner race and the adjusting shim mating surface of reduction pinion gear.



ASSEMBLY

[RE4F04B]

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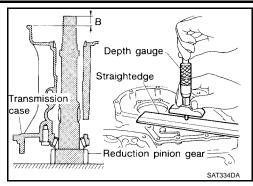
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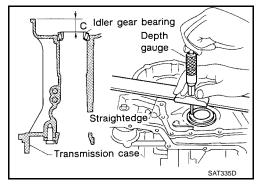
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- Measure dimension "B" between the end of reduction pinion gear and the surface of transmission case.
- Measure dimension "B" in at least two places.



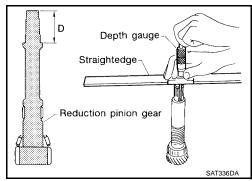
 Measure dimension "C" between the surface of idler gear bearing inner race and the surface of transmission case.

• Measure dimension "C" in at least two places.



- Measure dimension "D" between the end of reduction pinion gear and the adjusting shim mating surface of reduction pinion gear.
- Measure dimension "D" in at least two places.
- Calculate dimension "A".

$$A = D - (B + C)$$



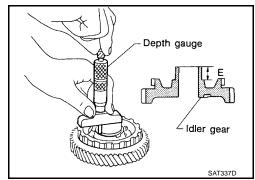
- d. Measure dimension "E" between the end of idler gear and the idler gear bearing inner race mating surface of idler gear.
 - Measure dimension "E" in at least two places.
- e. Select proper thickness of reduction pinion gear bearing adjusting shim.

Proper shim thickness = $A - E - 0.05 \text{ mm } (0.0020 \text{ in})^*$

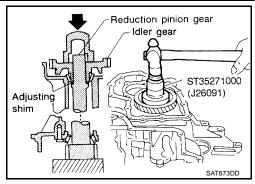


Reduction pinion gear bearing adjusting shim

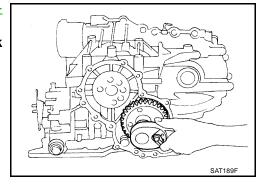
: Refer to AT-752. "REDUCTION PINION GEAR BEARING ADJUST-ING SHIMS".



- 3. Install reduction gear and reduction gear bearing adjusting shim selected in step 2-e on transmission case.
- 4. Press idler gear bearing inner race on idler gear.
- 5. Press idler gear on reduction gear.
 - Press idler gear until idler gear fully contacts adjusting shim.



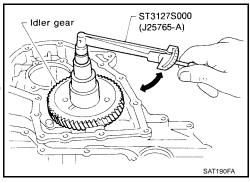
- 6. Tighten idler gear lock nut to the specified torque. Refer to AT-647, "OVERHAUL".
 - Lock idler gear with parking pawl when tightening lock nut.



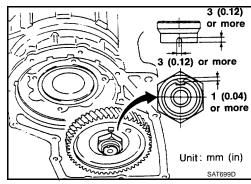
- 7. Measure turning torque of reduction pinion gear.
 - When measuring turning torque, turn reduction pinion gear in both directions several times to seat bearing rollers correctly.

Turning torque of : 0.05 - 0.39 N·m (0.5 - 4.0 kg-cm, reduction pinion gear 0.43 - 3.47 in-lb)

 If turning torque is out of specification, decrease or increase thickness of reduction pinion gear bearing adjusting shim.

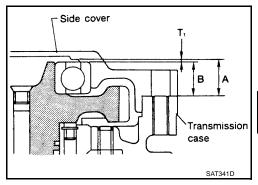


8. After properly adjusting turning torque, clinch idler gear lock nut as shown.

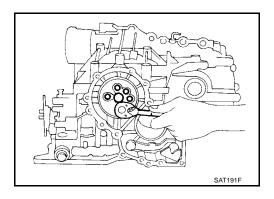


OUTPUT SHAFT END PLAY

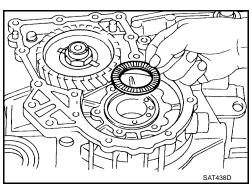
- Measure clearance between side cover and the end of the output shaft bearing.
- Select proper thickness of adjusting shim so that clearance is within specifications.



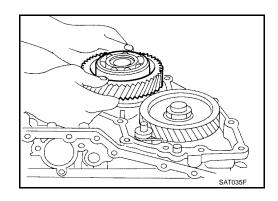
Install bearing retainer for output shaft.



2. Install output shaft thrust needle bearing on bearing retainer.



3. Install output shaft on transmission case.



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- Measure dimensions "ℓ1" and "ℓ2" at side cover and then calculate dimension "A".
 - Measure dimension " ℓ 1" and " ℓ 2" in at least two places.

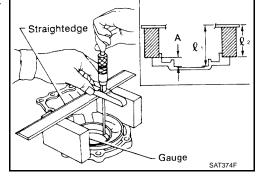
"A"

: Distance between transmission case fitting surface and adjusting shim mating surface.

$$A = \ell 1 - \ell 2$$

ℓ 2

: Height of gauge



Straightedge

- 5. Measure dimensions " ℓ 2" and " ℓ 3" and then calculate dimension "B".
 - Measure " ℓ 2" and " ℓ 3" in at least two places.

"B"

: Distance between the end of output shaft bearing outer race and the side cover fitting surface of transmission case.

$$B = \ell 2 - \ell 3$$

ℓ 2

: Height of gauge

6. Select proper thickness of adjusting shim so that output shaft end play (clearance between side cover and output shaft bearing) is within specifications.

Output shaft end play

end play : (

: 0 - 0.15 mm (0 - 0.0059 in)

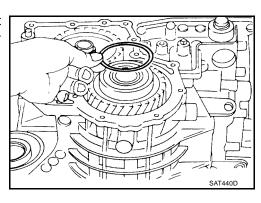
(A - B)

Output shaft end play adjusting shims

: Refer to <u>AT-754, "OUT-</u> <u>PUT SHAFT ADJUSTING</u>

SHIMS".

7. Install adjusting shim on output shaft bearing.

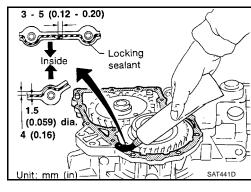


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Assembly (2)

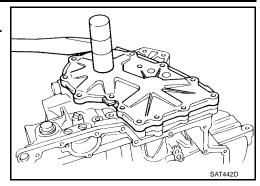
1. Apply anaerobic liquid gasket to transmission case as shown in illustration. Refer to GI-45, "Recommended Chemical Products and Sealants"



ASSEMBLY

[RE4F04B]

- 2. Set side cover on transmission case.
 - Apply locking sealant to the mating surface of transmission case.



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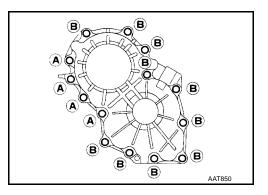
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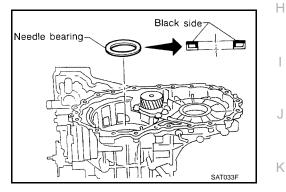
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3. Tighten side cover fixing bolts to specified torque. Refer to AT-647, "OVERHAUL".

- Do not mix bolts A and B.
- Always replace bolts A as they are self-sealing bolts.



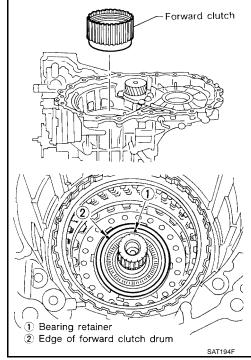
- 4. Remove paper rolled around bearing retainer.
- 5. Install thrust washer on bearing retainer.
 - Apply petroleum jelly to thrust washer.



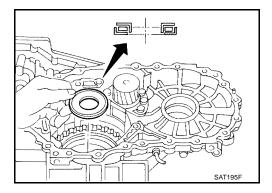
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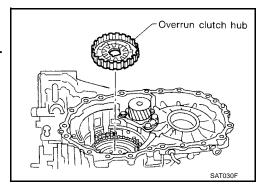
- 6. Install forward clutch assembly.
 - Align teeth of low & reverse brake drive plates before installing.
 - Make sure that bearing retainer seal rings are not spread.
 - If forward clutch assembly is correctly seated, points 1 and 2 are at almost same level.



- 7. Install thrust needle bearing on bearing retainer.
 - Apply petroleum jelly to thrust needle bearing.
 - Pay attention to direction of thrust needle bearing.



- 8. Install overrun clutch hub.
 - Apply petroleum jelly to thrust washers.
 - Align teeth of overrun clutch drive plates before installing.



[RE4F04B]

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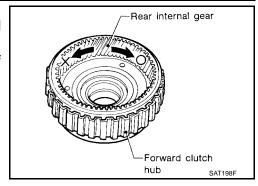
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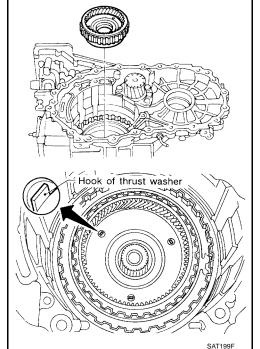
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- Hold forward clutch hub and turn rear internal gear.
 Check overrun clutch hub for correct directions of lock and unlock.
 - If not shown as illustrated, check installed direction of forward one-way clutch.



10. Install forward clutch hub and rear internal gear assembly.

- Align teeth of forward clutch drive plates before installing.
- Check that three hooks of thrust washer are correctly aligned after installing.



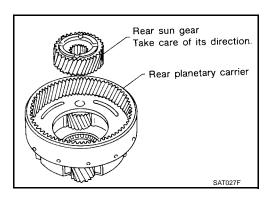
- 11. Install rear planetary carrier assembly and rear sun gear according to the following procedures.
- a. Install needle bearings on rear planetary carrier.
 - Apply petroleum jelly to needle bearings.
 - Pay attention to direction of needle bearings.
- Needle bearing

 Rear planetary carrier

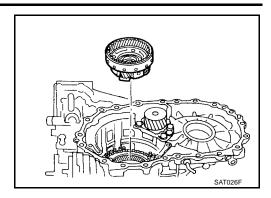
 Black side

 Needle bearing

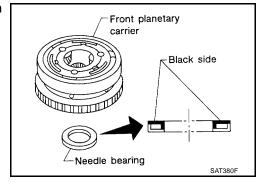
- Install rear sun gear on rear planetary carrier.
 - Pay attention to direction of rear sun gear.



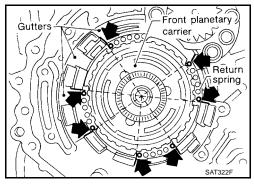
c. Install rear planetary carrier on transmission case.



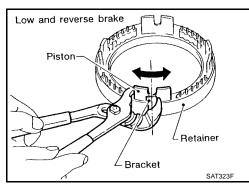
- 12. Install thrust needle bearing on front planetary carrier, then install them together on transmission case.
 - Apply petroleum jelly to thrust needle bearing.
 - Pay attention to direction of thrust needle bearing.



- 13. Install low and reverse brake piston according to the following procedures.
- a. Set and align return springs to transmission case gutters as shown in illustration.



b. Set and align piston with retainer.



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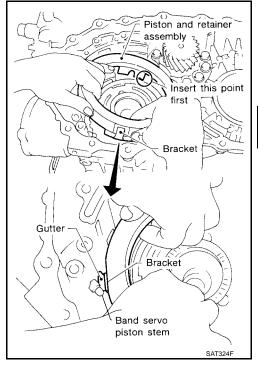
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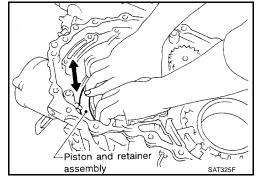
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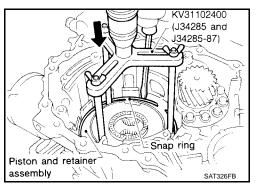
- c. Install piston and retainer assembly on the transmission case.
 - Align bracket to specified gutter as indicated in illustration.



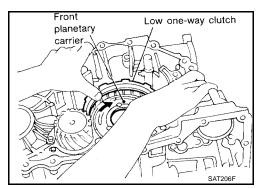
- d. Check that each protrusion of piston is correctly set to corresponding return spring as follows.
 - Push piston and retainer assembly evenly and confirm they move smoothly.
 - If they can not move smoothly, remove piston and retainer assembly and align return spring correctly as instructed in step "a".



e. Push down piston and retainer assembly and install snap ring.

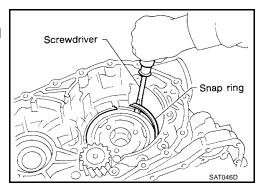


14. Install low one-way clutch to front planetary carrier by turning carrier in the direction of the arrow shown.

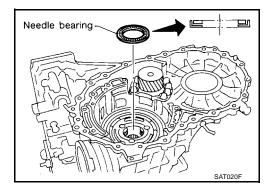


Revision: July 2004 AT-735 2005 Sentra

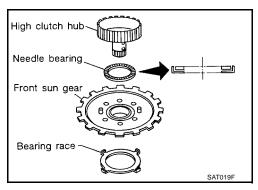
- 15. Install snap ring with screwdriver.
 - Forward clutch and bearing must be correctly installed for snap ring to fit into groove of transmission case.



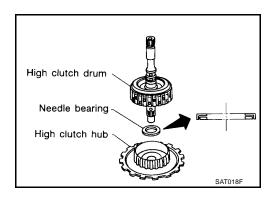
- 16. Install needle bearing on transmission case.
 - Apply petroleum jelly to needle bearing.
 - Pay attention to direction of needle bearing.



- 17. Install bearing race, needle bearing and high clutch hub on front sun gear.
 - Apply petroleum jelly to needle bearing.
 - Pay attention to direction of needle bearing.

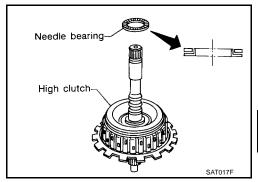


18. Install needle bearing and high clutch drum on high clutch hub.

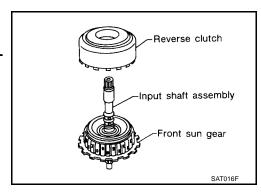


[RE4F04B]

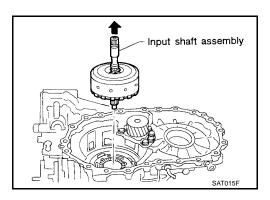
- 19. Install needle bearing on high clutch drum.
 - Apply petroleum jelly to needle bearing.
 - Pay attention to direction of needle bearing.



- 20. Remove paper rolled around input shaft.
- 21. Install input shaft assembly in reverse clutch.
 - · Align teeth of reverse clutch drive plates before installing.



- 22. Install reverse clutch assembly on transmission case.
 - Align teeth of high clutch drive plates before installing.



Adjustment (2)

When any parts listed below are replaced, adjust total end play and reverse clutch end play.

Part name	Total end play	Reverse clutch end play
Transmission case	•	•
Overrun clutch hub	•	•
Rear internal gear	•	•
Rear planetary carrier	•	•
Rear sun gear	•	•
Front planetary carrier	•	•
Front sun gear	•	•
High clutch hub	•	•
High clutch drum	•	•
Oil pump cover	•	•
Reverse clutch drum	_	•

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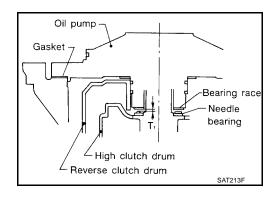
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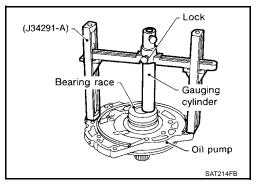
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TOTAL END PLAY

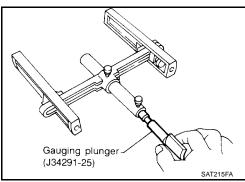
Adjust total end play "T1".



a. With original bearing race installed, place Tool onto oil pump. The long ends of legs should be placed firmly on machined surface of oil pump assembly. The gauging cylinder should rest on top of bearing race. Lock gauging cylinder in place with set screw.



b. Install gauging plunger into cylinder.



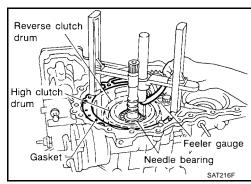
- c. With needle bearing installed on high clutch drum, place Tool legs on machined surface of transmission case (with gasket). Then allow plunger to rest on needle bearing.
- d. Measure gap between cylinder and plunger. This measurement should give exact total end play.

Total end play "T1" : 0.25 - 0.55 mm (0.0098 - 0.0217 in)

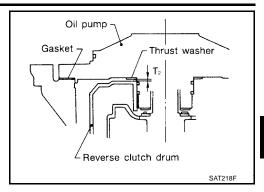
If end play is out of specification, decrease or increase thickness of bearing race as necessary.

Available bearing race for adjusting total end play

: Refer to AT-754, "BEAR-ING RACE FOR ADJUST-ING TOTAL END PLAY".



Adjust reverse clutch drum end play "T2".



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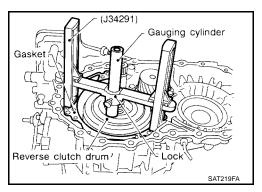
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 Place Tool on machined surface of transmission case (with gasket). Then allow gauging cylinder to rest on reverse clutch drum. Lock cylinder in place with set screw.

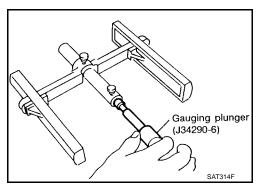


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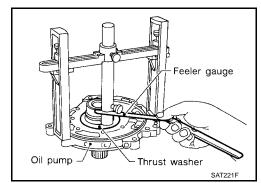
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b. Install gauging plunger into cylinder.



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- c. With original thrust washer installed on oil pump, place Tool legs onto machined surface of oil pump assembly. Then allow plunger to rest on thrust washer.
- Measure gap between cylinder and plunger with feeler gauge. This measurement should give exact reverse clutch drum end play.

Reverse clutch drum : 0.55 - 0.90 mm (0.0217 - 0.0354 end play "T2" in)

• If end play is out of specification, decrease or increase thickness of thrust washer as necessary.

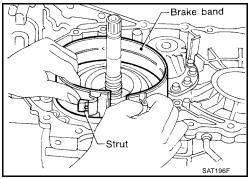
Available thrust washer for adjusting reverse clutch drum end play

: Refer to <u>AT-754,</u> "THRUST WASHERS FOR ADJUSTING REVERSE CLUTCH DRUM END PLAY".

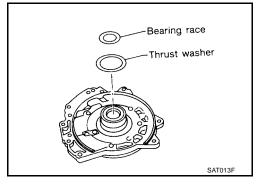
Assembly (3)

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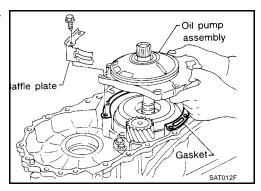
- Install anchor end pin and lock nut on transmission case.
- Place brake band on outside of reverse clutch drum. Tighten anchor end pin just enough so that brake band is evenly fitted on reverse clutch drum.



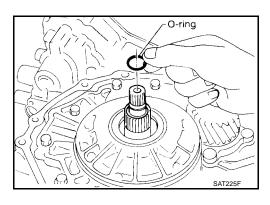
- Place bearing race selected in total end play adjustment step on oil pump cover.
 - Apply petroleum jelly to bearing race.
- 4. Place thrust washer selected in reverse clutch end play step on reverse clutch drum.
 - Apply petroleum jelly to thrust washer.



- 5. Install oil pump assembly, baffle plate and gasket on transmission case.
- 6. Tighten oil pump fixing bolts to the specified torque.



- 7. Install O-ring to input shaft.
 - Apply ATF to O-ring.



[RE4F04B]

- 8. Adjust brake band.
- a. Tighten anchor end pin to the specified torque.

Anchor end pin : Refer to AT-751, "BRAKE

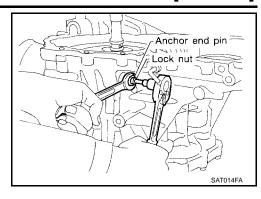
BAND".

- b. Back off anchor end pin two and a half turns.
- c. While holding anchor end pin, tighten lock nut.

Lock nut : Refer to AT-751, "BRAKE

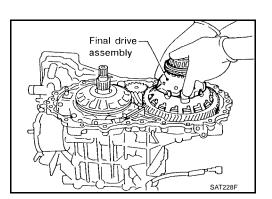
BAND".

9. Apply compressed air to oil holes of transmission case and check operation of brake band.

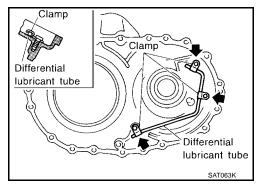


SAT397D

10. Install final drive assembly on transmission case.



11. Install differential lubricant tube on converter housing. Tighten differential lubricant tube bolts to the specified torque. Refer to AT-647, "OVERHAUL".



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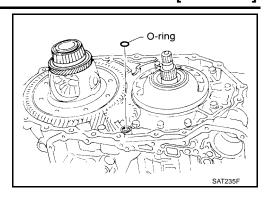
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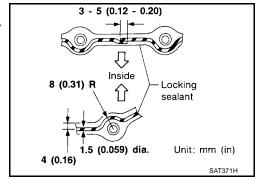
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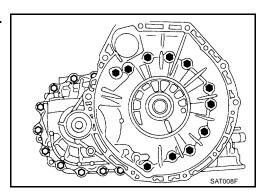
12. Install O-ring on differential oil port of transmission case.



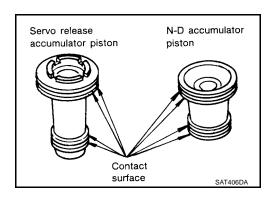
- 13. Install converter housing on transmission case.
 - Apply locking sealant to mating surface of converter housing.



• Tighten converter housing bolts to the specified torque. Refer to <u>AT-647, "OVERHAUL"</u>.



- 14. Install accumulator piston.
- a. Check contact surface of accumulator piston for damage.



ASSEMBLY

[RE4F04B]

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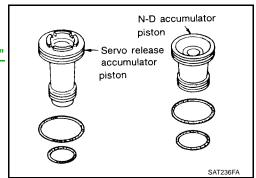
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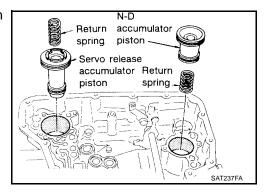
- b. Install O-rings on accumulator piston.
 - Apply ATF to O-rings.

Accumulator piston O-rings : Refer to AT-748, "O-RING"

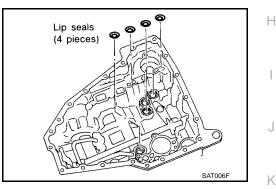


- c. Install accumulator pistons and return springs on transmission case.
 - Apply ATF to inner surface of transmission case.

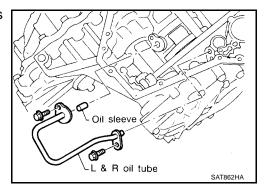
Return springs : Refer to <u>AT-749,</u> "RETURN SPRING".



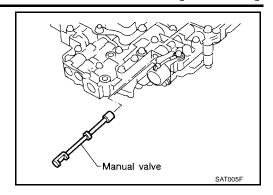
- 15. Install lip seals for band servo oil holes on transmission case.
 - Apply petroleum jelly to lip seals.



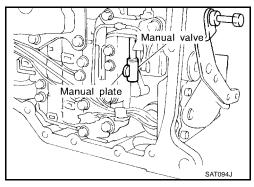
16. Install L & R oil tube and oil sleeve. Tighten L & R oil tube bolts to the specified torque. Refer to <u>AT-647, "OVERHAUL"</u>.



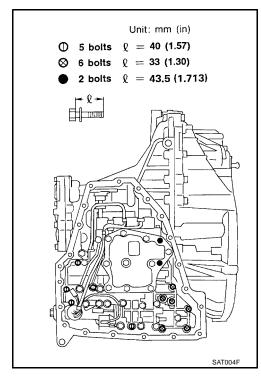
- 17. Install control valve assembly.
- a. Insert manual valve into control valve assembly.
 - Apply ATF to manual valve.



- b. Set manual shaft in Neutral position.
- c. Install control valve assembly on transmission case while aligning manual valve with manual plate.
- d. Pass terminal cord assembly connector through transmission case and install terminal body on transmission case by pushing it.
- e. Install snap ring to terminal cord assembly connector.



f. Tighten bolts I, X and ●.



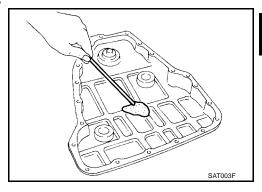
Bolt length, number and location:

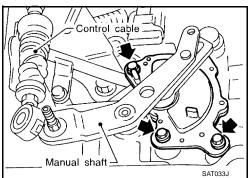
Bolt	I	Х	•
Bolt length " ℓ " $\stackrel{\square}{\longleftarrow}$ mm (in)	40 (1.57)	33 (1.30)	43.5 (1.713)
Number of bolts	5	6	2

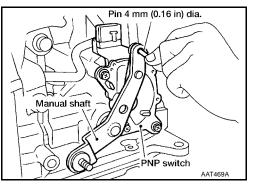
- 18. Install oil pan.
- a. Attach a magnet to oil pan.
- Install new oil pan gasket on transmission case.
- c. Install oil pan on transmission case.
 - Always replace oil pan bolts as they are self-sealing bolts.
 - Tighten four bolts in a criss-cross pattern to prevent dislocation of gasket.
- d. Tighten oil pan bolts and drain plug to the specified torque. Refer to AT-647, "OVERHAUL".
- 19. Install park/neutral position (PNP) switch.

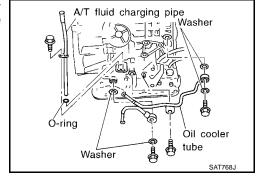
d. Use a 4 mm (0.16 in) pin for this adjustment.

- a. Set manual shaft in P position.
- Temporarily install park/neutral position (PNP) switch on manual shaft.
- Move selector lever to N position.
 - _____ M
- i. Insert the pin straight into the manual shaft adjustment hole.
- ii. Rotate park/neutral position (PNP) switch until the pin can also be inserted straight into hole in park/neutral position (PNP) switch.
- e. Tighten park/neutral position (PNP) switch fixing bolts. Refer to AT-647, "OVERHAUL".
- f. Remove pin from adjustment hole after adjusting park/neutral position (PNP) switch.
- 20. Install A/T fluid charging pipe and fluid cooler tube to transmission case. Tighten A/T fluid charging pipe and fluid cooler tube bolts to the specified torque. Refer to AT-647, "OVERHAUL".









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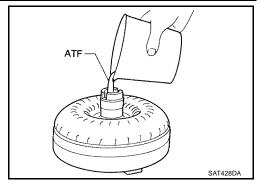
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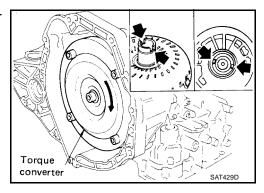
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- 21. Install torque converter.
- a. Pour ATF into torque converter.
 - Approximately 1 liter (1-1/8 US qt, 7/8 Imp qt) of fluid is required for a new torque converter.
 - When reusing old torque converter, add the same amount of fluid as was drained.



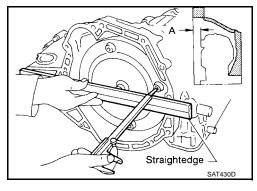
b. Install torque converter while aligning notches of torque converter with notches of oil pump.



c. Measure distance "A" to check that torque converter is in proper position.

Distance A

: 14 mm (0.55 in) or more



[RE4F04B]

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ECS0067W

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Engine		QR25DE	
Automatic transaxle mod	lel	RE4F04B	
Automatic transaxle assembly	Model code number	85X63	
	1st	2.785	Α
	2nd	1.545	
Transcyle goor ratio	3rd	1.000	
Transaxle gear ratio	4th	0.694	
	Reverse	2.272	
	Final drive	4.087	
Recommended fluid		Nissan Matic "D" (Continental U.S. and Alaska) or Canada Nissan Automatic Transmission Fluid*	
Fluid capacity ℓ (US qt, Imp qt)		8.5 (9, 7.5)	

^{*:} Refer to MA-13, "RECOMMENDED FLUIDS AND LUBRICANTS" .

Shift Schedule VEHICLE SPEED WHEN SHIFTING GEARS THROTTLE POSITION

ECS0067X

Throttle	Chift pottorn	Vehicle speed km/h (MPH)					
position	Shift pattern	$D1 \rightarrow D2$	$D2 \rightarrow D3$	D3 → D4	D4 → D3	D3 → D2	D2 → D1
Full throttle	Comfort	52 - 60 (32 - 37)	97 - 105 (60 - 66)	153 - 161 (95 - 100)	149 - 157 (93 - 98)	87 - 95 (41 - 54)	41 - 49 (25 - 30)
Full throttle Auto power	Auto power	52 - 60 (32 - 37)	97 - 105 (60 - 66)	153 - 161 (95 - 100)	149 - 157 (93 - 98)	87 - 95 (41 - 54)	41 - 49 (25 - 30)
Half throttle —	Comfort	37 - 45 (23 - 28)	67 - 75 (42 - 47)	119 - 127 (74 - 79)	90 - 98 (56 - 61)	39 - 47 (24 - 27)	24 - 32 (15 - 20)
	Auto power	39 - 47 (24 - 29)	73 - 81 (45 - 50)	119 - 127 (74 - 79)	90 - 98 (56 - 61)	46 - 54 (26 - 34)	24 - 32 (15 - 20)

VEHICLE SPEED WHEN PERFORMING AND RELEASING LOCK-UP

Unit: km/h (MPH)

Selector lever position	D4 (O/D ON) position		D ₃ (O/D OFF) position	
Shift pattern	Comfort	Auto power	Comfort	Auto power
Lock-up "ON"	62 - 70 (38 - 43)	62 - 70 (38 - 43)	86 - 94 (53 - 58)	86 - 94 (53 - 58)
Lock-up "OFF"	51 - 59 (31 - 36)	51 - 59 (31 - 36)	83 - 91 (52 - 57)	83 - 91 (52 - 57)

NOTE:

- Lock-up vehicle speed indicates the speed in D4 (O/D ON) position.
- Perform lock-up inspection after warming up engine.
- Lock-up vehicle speed may vary depending on the driving conditions and circumstances.

Stall Revolution ECS0067Y

Engine	Stall revolution rpm
QR25DE	2,350 - 2,800

[RE4F04B]

Line Pressure		EC\$0067Z
Engine speed	Line pressure	kPa (kg/cm² , psi)
rpm	D, 2 and 1 positions	R position
Idle	500 (5.1, 73)	778 (7.9, 113)
Stall	1,223 (12.6, 179)	1,918 (19.6, 278)

Control Valves CONTROL VALVE AND PLUG RETURN SPRINGS

ECS00680

Unit: mm (in)

				14	Offic fillif (iii	
		Parts	Item			
		. 4.10	Part No.*	Free length	Outer diameter	
	23	Pilot valve spring	31742-80L13	38.98 (1.535)	8.9 (0.350)	
	7	1-2 accumulator valve spring	31742-80L15	20.5 (0.807)	6.95 (0.274)	
	28	1-2 accumulator piston spring	31742-80L14	55.26 (2.176)	19.6 (0.772)	
	33	1st reducing valve spring	31742-80L08	27.0 (1.063)	7.0 (0.276)	
Upper body	35	3-2 timing valve spring	31736-01X00	23.0 (0.906)	6.65 (0.262)	
	18	Overrun clutch reducing valve spring	31742-80L09	37.5 (1.476)	6.9 (0.272)	
	16	Torque converter relief valve spring	31742-80L10	31.0 (1.220)	9.0 (0.354)	
	11	Torque converter clutch control valve	31742-80L16	56.98 (2.243)	6.5 (0.256)	
	3	Cooler check valve spring	31742-85X01	29.4 (1.157)	6.0 (0.236)	
	15	Pressure regulator valve spring	31742-80L01	45.0 (1.772)	15.0 (0.591)	
	20	Overrun clutch control valve spring	31762-80L00	21.7 (0.854)	7.0 (0.276)	
	24	Accumulator control valve spring	31742-80L02	22.0 (0.866)	6.5 (0.256)	
	29	Shift valve A spring	31762-80L00	21.7 (0.854)	7.0 (0.276)	
Lower body	32	Shuttle valve spring	31762-41X04	51.0 (2.008)	5.65 (0.222)	
	12	Shift valve B spring	31762-80L00	21.7 (0.854)	7.0 (0.276)	
	7	Dragoura modifier volve apring	31742-80L13	30.5 (1.201)	9.8 (0.386)	
3	Pressure modifier valve spring	31742-80L04	32.0 (1.260)	6.9 (0.272)		
	_	Oil cooler relief valve spring	31742-80L12	17.02 (0.670)	8.0 (0.315)	

^{*:} Always check with the Parts Department for the latest parts information.

Accumulator O-RING

ECS00681

Unit: mm (in)

Accumulator	Part No.*	Inner diameter (Small)	Part No.*	Inner diameter (Large)
Servo release accumulator	31526-41X03	26.9 (1.059)	31526-41X02	44.2 (1.740)
N-D accumulator	31526-31X08	34.6 (1.362)	31672-21X00	39.4 (1.551)

^{*:} Always check with the Parts Department for the latest parts information.

[RE4F04B]

RETURN SPRING

Unit: mm (in)

Accumulator	Part number*	Free length	Outer diameter
Servo release accumulator	31605-85X00	62.8 (2.473)	21 (0.827)
N-D accumulator	31605-80L03	43.5 (1.713)	28.0 (1.102)

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Clutch and Brakes REVERSE CLUTCH

ECS0068

Model code number		85X63		
Number of drive plates		2		
Number of driven plates		2		
Daise alst this large area (is)	Standard	1.6 (0.0	063)	
Drive plate thickness mm (in)	Allowable limit	1.4 (0.0	055)	
Driven plate thickness mm (in)	Standard	1.8 (0.0	070)	
Clearance mm (in)	Standard	0.5 - 0.8 (0.020 - 0.031)		
Clearance mm (in)	Allowable limit	1.2 (0.047)		
	L	Thickness mm (in)	Part number*	
Thickness of retaining plates		6.6 (0.260) 6.8 (0.268) 7.0 (0.276) 7.2 (0.283) 7.4 (0.291) 7.6 (0.299) 7.8 (0.307)	31537-80L00 31537-80L01 31537-80L02 31537-80L03 31537-80L04 31537-80L05 31537-80L06	

^{*:} Always check with the Parts Department for the latest parts information.

HIGH CLUTCH

Model code number		85X63		
Number of drive plates		3		
Number of driven plates		7*2 +	1*3	
D: 14 d:1	Standard	1.6 (0.	063)	
Drive plate thickness mm (in)	Allowable limit	1.4 (0.	055)	
Driven plate thickness mm (in)	Ota dad	*2	*3	
	Standard	1.4 (0.055)	2.0 (0.079)	
Ola (in)	Standard	1.8 - 2.2 (0.071 - 0.087)		
Clearance mm (in)	Allowable limit	2.8 (0.110)		
		Thickness mm (in)	Part number*	
Thickness of retaining plates		3.2 (0.126)	31537-80L20	
		3.4 (0.134)	31537-80L21	
		3.6 (0.142)	31537-80L22	
		3.8 (0.150)	31537-80L23	
		4.0 (0.157)	31537-80L24	

^{*:} Always check with the Parts Department for the latest parts information.

FORWARD CLUTCH

Model code number		85X63	
Number of drive plates		5	
Number of driven plates		5	
Drive plate this knoon many (in)	Standard	1.6 (0.063)	
Drive plate thickness mm (in)	Allowable limit	1.4 (0.055)	

^{*:} Always check with the Parts Department for the latest parts information.

[RE4F04B]

Driven plate thickness mm (in)	Standard	1.8 (0.0	071)
61 (1)	Standard	0.45 - 0.85 (0.0	177 - 0.0335)
Clearance mm (in)	Allowable limit	1.85 (0.0728)	
	1	Thickness mm (in)	Part number*
Thickness of retaining plates		3.2 (0.126)	31537-80L18
		3.4 (0.134)	31537-80L17
		3.6 (0.142)	31537-80L12
Thiotheos of Totalining Plates		3.8 (0.150)	31537-80L13
		4.0 (0.157)	31537-80L14
		4.2 (0.165)	31537-80L15
		4.4 (0.173)	31537-80L16

^{*:} Always check with the Parts Department for the latest parts information.

OVERRUN CLUTCH

Model code number		85X6	85X63	
Number of drive plates		3	3	
Number of driven plates		5		
Dais a plate this language area (in)	Standard	1.6 (0.0	063)	
Drive plate thickness mm (in)	Allowable limit	1.4 (0.0	055)	
Driven plate thickness mm (in)	Standard	1.8 (0.071)		
OL (1)	Standard	0.7 - 1.1 (0.028 - 0.043)		
Clearance mm (in)	Allowable limit	1.7 (0.067)		
		Thickness mm (in)	Part number*	
Thickness of retaining plates		3.0 (0.118) 3.2 (0.126) 3.4 (0.134) 3.6 (0.142) 3.8 (0.150)	31537-80L07 31537-80L08 31537-80L09 31537-80L10 31537-80L11	

^{*:} Always check with the Parts Department for the latest parts information.

LOW & REVERSE BRAKE

Model code number		85X6	85X63	
Number of drive plates		6	6	
Number of driven plates		6		
5 : 1.4 (1:1	Standard	1.8 (0.0	71)	
Drive plate thickness mm (in)	Allowable limit	1.6 (0.0	063)	
Driven plate thickness mm (in)	Standard	1.8 (0.0	71)	
Clearance mm (in)	Standard	1.7 - 2.1 (0.06	7 - 0.083)	
	Allowable limit	3.3 (0.1	30)	
		Thickness mm (in)	Part number*	
		2.0 (0.079)	31667-80L00	
		2.2 (0.087)	31667-80L01	
		2.4 (0.094)	31667-80L02	
Thickness of retaining plates		2.6 (0.102)	31667-80L03	
		2.8 (0.110)	31667-80L04	
		3.0 (0.118)	31667-80L05	
		3.2 (0.126)	31667-80L06	
		3.4 (0.134)	31667-80L07	

^{*:} Always check with the Parts Department for the latest parts information.

[RE4F04B]

CLUTCH AND BRAKE RETURN SPRINGS

Unit: mm (in)

Parts	Part number*	Free length	Outer diameter
Forward clutch (Overrun clutch) (22 pcs)	31505-80L00	21.4 (0.843)	10.3 (0.406)
High clutch (10 pcs)	31505-80L02	22.5 (0.886)	10.8 (0.425)
Low & reverse brake (24 pcs)	31505-80L01	24.1 (0.949)	6.6 (0.260)

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BRAKE BAND

Anchor end pin tightening torque N-m (kg-m, in-lb)	4.0 - 5.8 (0.4 - 0.6, 36 - 52)
Number of returning revolutions for anchor end pin	2.5
Lock nut tightening torque N-m (kg-m, ft-lb)	31 - 36 (3.2 - 3.7, 23 - 27)

Final Drive DIFFERENTIAL SIDE GEAR CLEARANCE

Clearance between side gear and differential case with 0.1 - 0.2 (0.004 - 0.008) washer mm (in)

DIFFERENTIAL SIDE GEAR THRUST WASHERS

Thickness mm (in)	Part number*
0.75 (0.0295)	38424-81X00
0.80 (0.0315)	38424-81X01
0.85 (0.0335)	38424-81X02
0.90 (0.0354)	38424-81X03
0.95 (0.0374)	38424-81X04

^{*:} Always check with the Parts Department for the latest parts information.

DIFFERENTIAL SIDE BEARING PRELOAD ADJUSTING SHIMS

Thickness mm (in)	Part number*
0.48 (0.0189)	31438-80X00
0.52 (0.0205)	31438-80X01
0.56 (0.0220)	31438-80X02
0.60 (0.0236)	31438-80X03
0.64 (0.0252)	31438-80X04
0.68 (0.0268)	31438-80X05
0.72 (0.0283)	31438-80X06
0.76 (0.0299)	31438-80X07
0.80 (0.0315)	31438-80X08
0.84 (0.0331)	31438-80X09
0.88 (0.0346)	31438-80X10
0.92 (0.0362)	31438-80X11

^{*:} Always check with the Parts Department for the latest parts information.

BEARING PRELOAD

Differential side bearing preload mm (in)	0.05 - 0.09 (0.0020 - 0.0035)		
TURNING TORQUE			
Turning torque of final drive assembly N-m (kg-cm, in-lb)	0.78 - 1.37 (8.0 - 14.0, 6.9 - 12.2)		

Planetary Carrier and Oil Pump PLANETARY CARRIER

Standard 0.20 - 0.70 (0.0079 - 0.0276) Clearance between planetary carrier and pinion washer mm (in) Allowable limit 0.80 (0.0315)

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^{*:} Always check with the Parts Department for the latest parts information.

[RE4F04B]

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Oil pump side clearance mm (in)		0.030 - 0.050 (0.001	0.030 - 0.050 (0.0012 - 0.0020)		
		Inner gea	Inner gear		
		Thickness mm (in)	Part number*		
Thickness of inner gears and outer gears		11.99 - 12.0 (0.4720 - 0.4724) 11.98 - 11.99 (0.4717 - 0.4720)	31346-80L00 31346-80L01		
		11.97 - 11.98 (0.4713 - 0.4717)	31346-80L02		
		Outer gea	Outer gear		
		Thickness mm (in)	Part number*		
		11.99 - 12.0 (0.4720 - 0.4724)	31347-80L00		
		11.98 - 11.99 (0.4717 - 0.4720)	31347-80L01		
		11.97 - 11.98 (0.4713 - 0.4717)	31347-80L02		
Clearance between oil pump			0.111 - 0.181 (0.0044 - 0.0071)		
housing and outer gear mm (in)	Allowable limit	0.181 (0.00	71)		
Oil pump cover seal ring	Standard	0.1 - 0.25 (0.0039	- 0.0098)		
clearance mm (in)	Allowable limit	0.25 (0.009	98)		

^{*:} Always check with the Parts Department for the latest parts information.

Input Shaft SEAL RING CLEARANCE

ECS00688

Input shaft seal ring clearance mm	Standard	0.08 - 0.23 (0.0031 - 0.0091)
(in)	Allowable limit	0.23 (0.0091)

SEAL RING

Outer diameter mm (in)	Inner diameter mm (in)	Width mm (in)	Part number*
26 (1.024)	22.4 (0.882)	1.971 (0.078)	31525-80X02

^{*:} Always check with the Parts Department for the latest parts information.

Reduction Pinion Gear TURNING TORQUE

ECS00686

Turning torque of reduction pinion gear N-m (kg-cm, in-lb)	0.05 - 0.39 (0.5 - 4.0, 0.43 - 3.47)
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REDUCTION PINION GEAR BEARING ADJUSTING SHIMS

NO.	Thickness mm (in)	Part number	NO.	Thickness mm (in)	Part number*
1	5.00 (0.1969)	31439-81X00	18	5.34 (0.2102)	31439-81X17
2	5.02 (0.1976)	31439-81X01	19	5.36 (0.2110)	31439-81X18
3	5.04 (0.1984)	31439-81X02	20	5.38 (0.2118)	31439-81X19
4	5.06 (0.1992)	31439-81X03	21	5.40 (0.2126)	31439-81X20
5	5.08 (0.2000)	31439-81X04	22	5.42 (0.2134)	31439-81X21
6	5.10 (0.2008)	31439-81X05	23	5.44 (0.2142)	31439-81X22
7	5.12 (0.2016)	31439-81X06	24	5.46 (0.2150)	31439-81X23
8	5.14 (0.2024)	31439-81X07	25	5.48 (0.2157)	31439-81X24
9	5.16 (0.2031)	31439-81X08	26	5.50 (0.2165)	31439-81X46
10	5.18 (0.2039)	31439-81X09	27	5.52 (0.2173)	31439-81X47
11	5.20 (0.2047)	31439-81X10	28	5.54 (0.2181)	31439-81X48
12	5.22 (0.2055)	31439-81X11	29	5.56 (0.2189)	31439-81X49
13	5.24 (0.2063)	31439-81X12	30	5.58 (0.2197)	31439-81X60
14	5.26 (0.2071)	31439-81X13	31	5.60 (0.2205)	31439-81X61
15	5.28 (0.2079)	31439-81X14	32	5.62 (0.2213)	31439-81X62

[RE4F04B]

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NO.	Thickness mm (in)	Part number	NO.	Thickness mm (in)	Part number*
16	5.30 (0.2087)	31439-81X15	33	5.64 (0.2220)	31439-81X63
17	5.32 (0.2094)	31439-81X16	34	5.66 (0.2228)	31439-81X64
35	5.68 (0.2236)	31439-81X65	50	4.70 (0.1850)	31439-83X10
36	5.70 (0.2244)	31439-81X66	51	4.72 (0.1858)	31439-83X11
37	5.72 (0.2252)	31439-81X67	52	4.74 (0.1866)	31439-83X12
38	5.74 (0.2260)	31439-81X68	53	4.76 (0.1874)	31439-83X13
39	5.76 (0.2268)	31439-81X69	54	4.78 (0.1882)	31439-83X14
40	5.78 (0.2276)	31439-81X70	55	4.80 (0.1890)	31439-83X15
41	5.80 (0.2283)	31439-81X71	56	4.82 (0.1898)	31439-83X16
42	5.82 (0.2291)	31439-81X72	57	4.84 (0.1906)	31439-83X17
43	5.84 (0.2299)	31439-81X73	58	4.86 (0.1913)	31439-83X18
44	5.86 (0.2307)	31439-81X74	59	4.88 (0.1921)	31439-83X19
45	4.60 (0.1811)	31439-85X05	60	4.90 (0.1929)	31439-83X20
46	4.62 (0.1819)	31439-85X06	61	4.92 (0.1937)	31439-83X21
47	4.64 (0.1827)	31439-85X07	62	4.94 (0.1945)	31439-83X22
48	4.66 (0.1835)	31439-85X08	63	4.96 (0.1953)	31439-83X23
49	4.68 (0.1843)	31439-85X09	64	4.98 (0.1961)	31439-83X24

^{*:} Always check with the Parts Department for the latest parts information.

Band Servo RETURN SPRING

ECS00687
Unit: mm (in)

 Return spring
 Part number*
 Free length
 Outer diameter

 2nd servo return spring
 31605-80L05
 32.5 (1.280)
 25.9 (1.020)

 OD servo return spring
 31605-80L06
 62.6 (2.465)
 21.7 (0.854)

Output Shaft SEAL RING CLEARANCE

ECS00688

Output shaft seal ring clearance mm	Standard	0.10 - 0.25 (0.0039 - 0.0098)
(in)	Allowable limit	0.25 (0.0098)

SEAL RING

Outer diameter mm (in)	Inner diameter mm (in)	Width mm (in)	Part number*
33.71 (1.327)	30.25 (1.191)	1.95 (0.077)	31525-80809

^{*:} Always check with the Parts Department for the latest parts information.

END PLAY

Output shaft end play mm (in)	0 - 0.15 (0 - 0.0059)

^{*:} Always check with the Parts Department for the latest parts information.

OUTPUT SHAFT ADJUSTING SHIMS

Thickness mm (in)	Part number*
0.80 (0.0315)	31438-80X60
0.84 (0.0331)	31438-80X61
0.88 (0.0346)	31438-80X62
0.92 (0.0362)	31438-80X63
0.96 (0.0378)	31438-80X64
1.00 (0.0394)	31438-80X65
1.04 (0.0409)	31438-80X66
1.08 (0.0425)	31438-80X67
1.12 (0.0441)	31438-80X68
1.16 (0.0457)	31438-80X69
1.20 (0.0472)	31438-80X70

^{*:} Always check with the Parts Department for the latest parts information.

Bearing Retainer SEAL RING CLEARANCE

ECS00689

Bearing retainer seal ring clearance mm (in)	Standard	0.10 - 0.30 (0.0039 - 0.0118)
	Allowable limit	0.30 (0.0118)
Total End Play		ECS0068A
Total end play mm (in)		0.25 - 0.55 (0.0098 - 0.0217)

BEARING RACE FOR ADJUSTING TOTAL END PLAY

Thickness mm (in)	Part number*
0.8 (0.031)	31435-80X00
1.0 (0.039)	31435-80X01
1.2 (0.047)	31435-80X02
1.4 (0.055)	31435-80X03
1.6 (0.063)	31435-80X04
1.8 (0.071)	31435-80X05
2.0 (0.079)	31435-80X06
0.9 (0.035)	31435-80X09
1.1 (0.043)	31435-80X10
1.3 (0.051)	31435-80X11
1.5 (0.059)	31435-80X12
1.7 (0.067)	31435-80X13
1.9 (0.075)	31435-80X14

^{*:} Always check with the Parts Department for the latest parts information.

Reverse Clutch End Play

ECS0068B

Reverse clutch end play mm (in)	0.55 - 0.90 (0.0217 - 0.0354)

THRUST WASHERS FOR ADJUSTING REVERSE CLUTCH DRUM END PLAY

Thickness mm (in)	Part number*
0.80 (0.0315)	31508-80X13
0.95 (0.0374)	31508-80X14
1.10 (0.0433)	31508-80X15
1.25 (0.0492)	31508-80X16
1.40 (0.0551)	31508-80X17
1.55 (0.0610)	31508-80X18
1.70 (0.0669)	31508-80X19
1.85 (0.0728)	31508-80X20

^{*:} Always check with the Parts Department for the latest parts information.

Removal and Installation

ECS0068C

Unit: mm (in)

	Office from (iii)
Distance between end of converter housing and torque converter	14 (0.55)

Shift Solenoid Valve	S			ECS0068D	
Gear position	1	2	3	4	
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)	
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)	
Solenoid Valves				ECS0068E	
Solenoid valves		Resistance (Approx.) Ω		Terminal No.	
Shift solenoid valve A		20 - 30		2	
Shift solenoid valve B		5 - 20		1	
Overrun clutch solenoid valve		20 - 30		3	
Line pressure solenoid valve		2.5 - 5		4	
Torque converter clutch solenoid	valve	5 - 20		5	
AT Fluid Temperatu Remarks: Specification data are re Monitor item			Specification (App	ECS0068F	
Worldon dem	Cold [20°C (68°F	·		2.5 kΩ	
A/T fluid temperature sensor	\	, · · · · · · · · · · · · · · · · · · ·		\downarrow	
Hot [80°		76°F)] 0.5V		0.3 kΩ	
Revolution Sensor				ECS0068G	
Condition			Judgement standard		
When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item.			ring func-	450 Hz (Approx.)	
When vehicle is parked.			U	Under 1.3V or over 4.5V	
Propping Resistor				ECS0068H	
Resistance		Approx. 1	2Ω		
Turbine Revolution S	Sensor			ECS00681	
Condition			Judgement standard		
When moving at 20 km/h (12 MP tion.*1 CAUTION:	H), use the CONSULT-II	pulse frequency measur	ring func-	240 Hz (Approx.)	
Connect the diagnosis data lin		liagnosis connector.			
*1: A circuit tester cannot be used	to test this item.				