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# SECTION **AT**

## AUTOMATIC TRANSAXLE

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# PRECAUTIONS

## PRECAUTIONS

PPF:00001

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

ECS005U9

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 harness connectors.

### Precautions for On Board Diagnostic (EURO-OBD) System of A/T and Engine — Euro-OBD —

ECS005UA

The ECM has an on board diagnostic system. It will light up the malfunction indicator (MI) 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 MI to light up.
- Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MI 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 MI 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 MI 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 for Trouble Diagnosis CAN SYSTEM

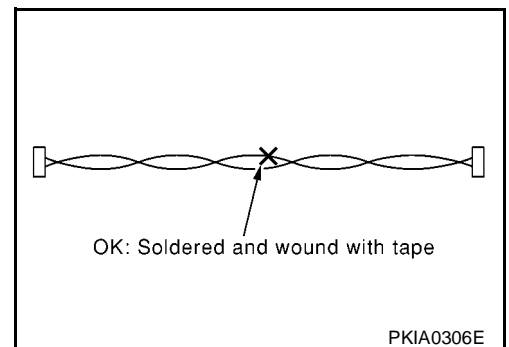
ECS005UB

- Do not apply voltage of 7.0V or higher to the measurement terminals.
- Use the tester with its open terminal voltage being 7.0V or less.

### Precautions for Harness Repair CAN SYSTEM

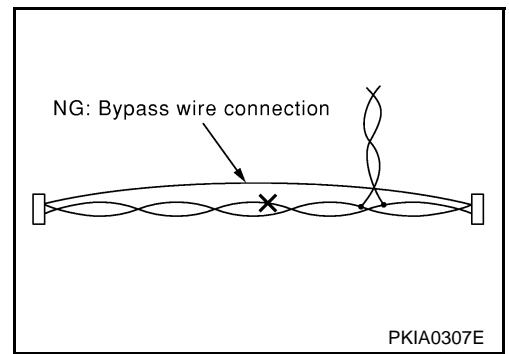
ECS005UC

- Solder the repaired parts, and wrap with tape. [Frays of twisted line must be within 110 mm (4.33 in)]



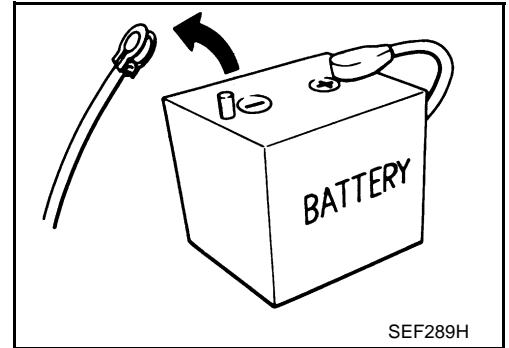
# PRECAUTIONS

- Do not perform bypass wire connections for the repair parts. (The spliced wire will become separated and the characteristics of twisted line will be lost.)

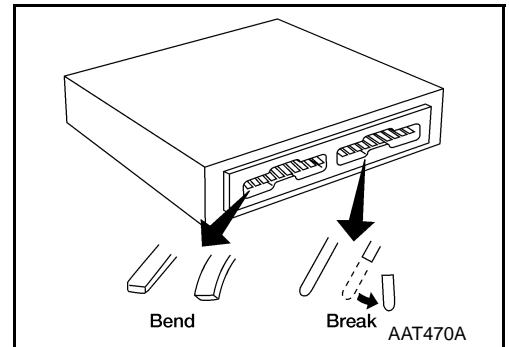


## Precautions

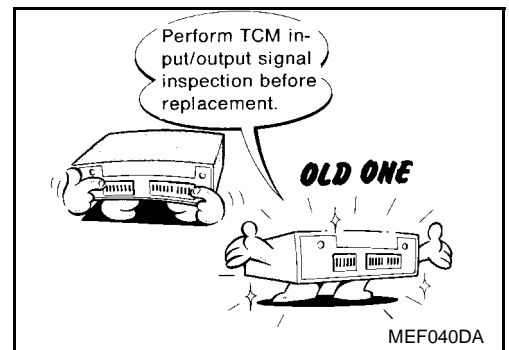
- Before connecting or disconnecting the TCM harness connector, turn ignition switch OFF and disconnect negative battery terminal. Failure to do so may damage the TCM. Because battery voltage is applied to TCM even if ignition switch is turned off.



- 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 [AT-103, "TCM Terminals and Reference Value"](#).)

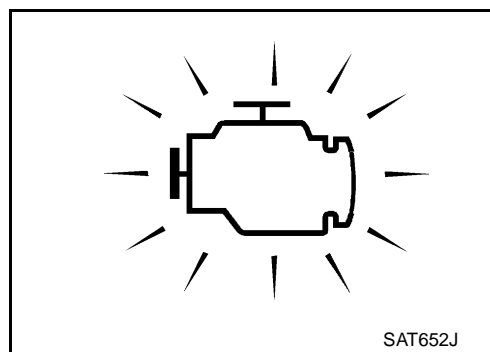


## PRECAUTIONS

- After performing each TROUBLE DIAGNOSIS, perform “DTC (Diagnostic Trouble Code) CONFIRMATION PROCEDURE”.

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.
- 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 [AT-12, "Changing A/T Fluid"](#) when changing A/T fluid.



### Service Notice or Precautions FAIL-SAFE

ECS005UE

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. Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#) (EXCEPT FOR EURO-OBD) or [AT-49, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) (EURO-OBD).

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-258](#) (EXCEPT FOR Euro-OBD) or [AT-58](#) (Euro-OBD).

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.

## PRECAUTIONS

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- 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.

### EURO-OBD SELF-DIAGNOSIS — EURO-OBD —

- 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 lamp or the malfunction indicator (MI). Refer to the table on [AT-40, "SELF-DIAGNOSTIC RESULT TEST MODE"](#) for the indicator used to display each self-diagnostic result.
- The self-diagnostic results indicated by the MI are automatically stored in both the ECM and TCM memories.  
**Always perform the procedure [AT-37, "HOW TO ERASE DTC"](#) to complete the repair and avoid unnecessary blinking of the MI.**
- 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
  - A/T 1st, 2nd, 3rd, or 4th gear function

\*: For details of EURO-OBD, refer to [AT-35, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"](#) .

- **Certain systems and components, especially those related to EURO-OBD, may use a new style slide-locking type harness connector.**  
**For description and how to disconnect, refer to [PG-86, "HARNES CONNECTOR"](#) .**

### Wiring Diagrams and Trouble Diagnosis

ECS005UF

When you read wiring diagrams, refer to the following:

- [GI-14, "How to Read Wiring Diagrams"](#).
- [PG-3, "POWER SUPPLY ROUTING"](#).

When you perform trouble diagnosis, refer to the following:

- [GI-10, "How to Follow Trouble Diagnoses"](#).
- "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT"



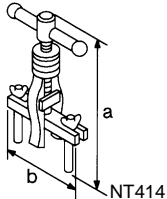
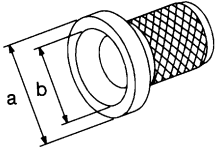
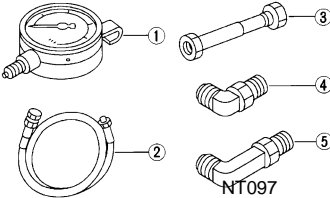
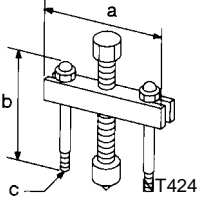
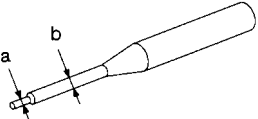

# PREPARATION

## PREPARATION

PFP:00100

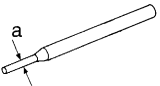
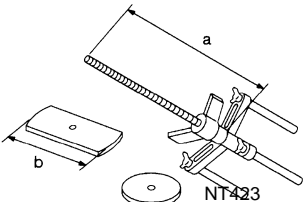
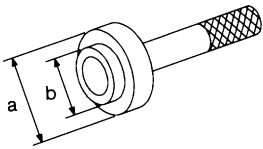
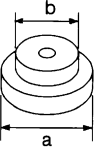
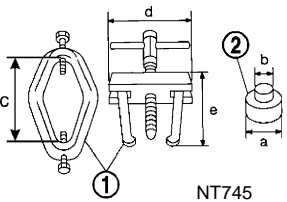
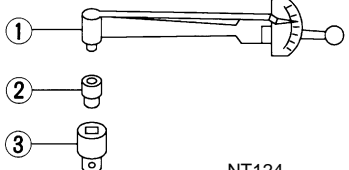
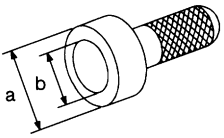
### Special Service Tools

ECS005UG

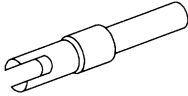
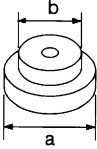
Tool number Tool name	Description
KV381054S0 Puller	 <ul style="list-style-type: none"> <li>● Removing differential side oil seals</li> <li>● Removing differential side bearing outer race</li> <li>● Removing idler gear bearing outer race</li> </ul> <p><b>a: 250 mm (9.84 in)</b> <b>b: 160 mm (6.30 in)</b></p>
ST33400001 Drift	 <ul style="list-style-type: none"> <li>● Installing differential side oil seal F04B</li> <li>● Installing oil seal on oil pump housing</li> </ul> <p><b>a: 60 mm (2.36 in) dia.</b> <b>b: 47 mm (1.85 in) dia.</b></p>
ST2505S001 Oil pressure gauge set 1. ST25051001 Oil pressure gauge 2. ST25052000 Hose 3. ST25053000 Joint pipe 4. ST25054000 Adapter 5. ST25055000 Adapter	 <ul style="list-style-type: none"> <li>● Measuring line pressure</li> </ul>
ST27180001 Puller	 <ul style="list-style-type: none"> <li>● Removing idler gear</li> </ul> <p><b>a: 100 mm (3.94 in)</b> <b>b: 110 mm (4.33 in)</b> <b>c: M8 x 1.25P</b></p>
ST23540000 Pin punch	 <ul style="list-style-type: none"> <li>● Removing and installing parking rod plate and manual plate pins</li> </ul> <p><b>a: 2.3 mm (0.091 in) dia.</b> <b>b: 4 mm (0.16 in) dia.</b></p>
ST25710000 Pin punch	 <ul style="list-style-type: none"> <li>● Aligning groove of manual shaft and hole of transmission case</li> </ul> <p><b>a: 2 mm (0.08 in) dia.</b></p>

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# PREPARATION

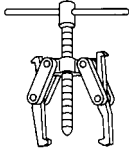
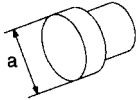
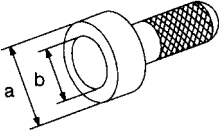
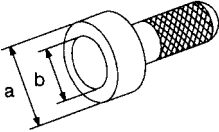
Tool number Tool name	Description
KV32101000 Pin punch	<ul style="list-style-type: none"> <li>● Removing and installing manual shaft retaining pin</li> <li>● Removing and installing pinion mate shaft lock pin</li> </ul> <p><b>a: 4 mm (0.16 in) dia.</b></p>  <p style="text-align: center;">NT410</p>
KV31102400 Clutch spring compressor	<ul style="list-style-type: none"> <li>● Removing and installing clutch return springs</li> <li>● Installing low and reverse brake piston</li> </ul> <p><b>a: 320 mm (12.60 in)</b> <b>b: 174 mm (6.85 in)</b></p>  <p style="text-align: center;">NT423</p>
ST37830000 Bearing installer	<ul style="list-style-type: none"> <li>● Installing idler gear bearing outer race</li> </ul> <p><b>a: 62 mm (2.44 in) dia.</b> <b>b: 39 mm (1.54 in) dia.</b></p>  <p style="text-align: center;">NT427</p>
ST35321000 Drift	<ul style="list-style-type: none"> <li>● Installing output shaft bearing</li> </ul> <p><b>a: 49 mm (1.93 in) dia.</b> <b>b: 41 mm (1.61 in) dia.</b></p>  <p style="text-align: center;">NT073</p>
ST3306S001 Differential side bearing puller set 1. ST33051001 Puller 2. ST33061000 Adapter	<ul style="list-style-type: none"> <li>● Removing differential side bearing inner race</li> </ul> <p><b>a: 39 mm (1.54 in) dia.</b> <b>b: 29.5 mm (1.16 in) dia.</b> <b>c: 130 mm (5.12 in)</b> <b>d: 135 mm (5.31 in)</b> <b>e: 120 mm (4.72 in)</b></p>  <p style="text-align: center;">NT745</p>
ST3127S000 Preload gauge 1. GG9103000 Torque wrench 2. HT62900000 Socket adapter	<ul style="list-style-type: none"> <li>● Checking differential side bearing preload</li> </ul>  <p style="text-align: center;">NT124</p>
ST35271000 Drift	<ul style="list-style-type: none"> <li>● Installing idler gear</li> <li>● Installing differential side bearing inner race</li> </ul> <p><b>a: 72 mm (2.83 in) dia.</b> <b>b: 63 mm (2.48 in) dia.</b></p>  <p style="text-align: center;">NT115</p>

# PREPARATION

Tool number Tool name	Description
KV38107700 Preload adapter	<ul style="list-style-type: none"> <li>● Selecting differential side bearing adjusting shim</li> <li>● Checking differential side bearing preload</li> </ul>  <p style="text-align: center;">NT087</p>
ST30633000 Drift	<ul style="list-style-type: none"> <li>● Installing differential side bearing inner race</li> </ul> <p><b>a: 67 mm (2.64 in) dia.</b> <b>b: 49 mm (1.93 in) dia.</b></p>  <p style="text-align: center;">NT073</p>

## Commercial Service Tools

ECS00611

Tool name	Description
Puller	<ul style="list-style-type: none"> <li>● Removing idler gear bearing inner race</li> <li>● Removing and installing band servo piston snap ring</li> </ul>  <p style="text-align: center;">NT077</p>
Drift	<p>Removing idler gear bearing inner race <b>a: 34 mm (1.34 in) dia.</b></p>  <p style="text-align: center;">NT109</p>
Drift	<p>Installing differential left side bearing <b>a: 86 mm (3.39 in) dia.</b> <b>b: 80 mm (3.15 in) dia.</b></p>  <p style="text-align: center;">NT115</p>
Drift	<p>Installing differential right side bearing <b>a: 46 mm (1.81 in) dia.</b> <b>b: 40 mm (1.57 in) dia.</b></p>  <p style="text-align: center;">NT115</p>

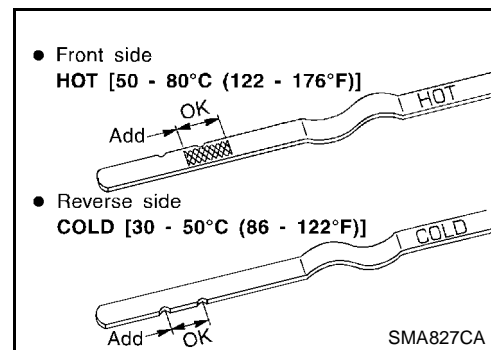
## A/T FLUID

PFP:KLE40

### Checking A/T Fluid

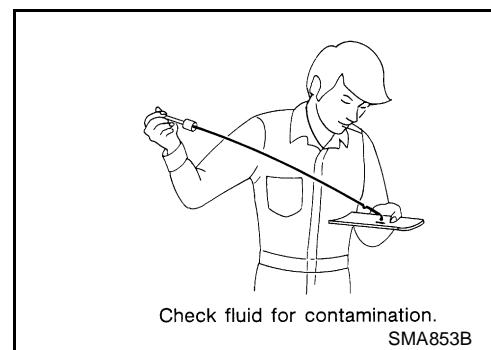
ECS005UI

1. Warm up engine.
2. Check for fluid leakage.
3. Before driving, fluid level can be checked at fluid temperatures of 30 to 50°C (86 to 122°F) using "COLD" range on dipstick.
- a. Park vehicle on level surface and set parking brake.
- b. Start engine and move selector lever through each gear position. Leave selector lever in "P" position.
- c. Check fluid level with engine idling.
- d. Remove dipstick and note reading. If level is at low side of either range, and fluid to the charging pipe.
- e. Re-insert dipstick into charging pipe as far as it will go.
- f. Remove dipstick and note reading. If reading is at low side of range, add fluid to the charging pipe.



### Do not overfill.

4. Drive vehicle for approximately 5 minutes in urban areas.
5. Re-check fluid level at fluid temperatures of 50 to 80°C (122 to 176°F) using "HOT" range on dipstick.
6. Check fluid condition.
  - If fluid is very dark or smells burned, refer to AT section for checking operation of A/T. Flush cooling system after repair of A/T.
  - 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-11, "RADIATOR"](#) or [CO-14, "RADIATOR \(ALUMINUM TYPE\)"](#).



### Changing A/T Fluid

ECS005UJ

1. Warm up A/T fluid.
2. Stop engine.
3. Drain A/T fluid from drain plug and refill with new A/T fluid. Always refill same volume with drained fluid.

#### Fluid grade:

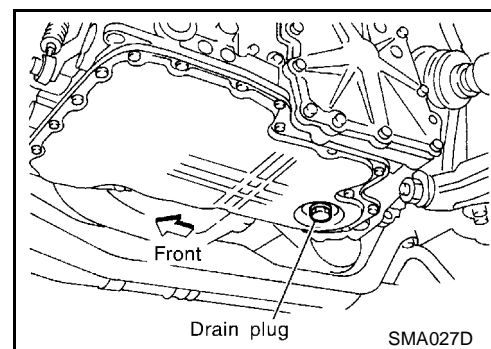
**Genuine Nissan ATF or equivalent. Refer to [MA-16, "RECOMMENDED FLUIDS AND LUBRICANTS"](#).**

#### Fluid capacity (With torque converter):

**Approx. 7.0 l (6-1/8 Imp qt)**

#### Drain plug:

 : **29 - 39 N·m (3.0 - 4.0 kg·m, 22 - 29 ft·lb)**



4. Run engine at idle speed for five minutes.
5. Check fluid level and condition. Refer to [AT-12, "Checking A/T Fluid"](#). If fluid is still dirty, repeat steps 2 through 5.

# OVERALL SYSTEM

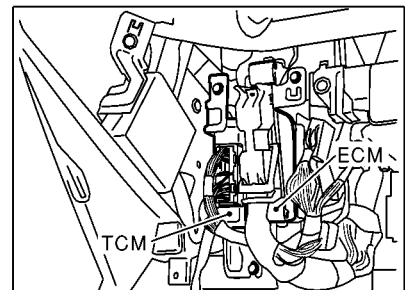
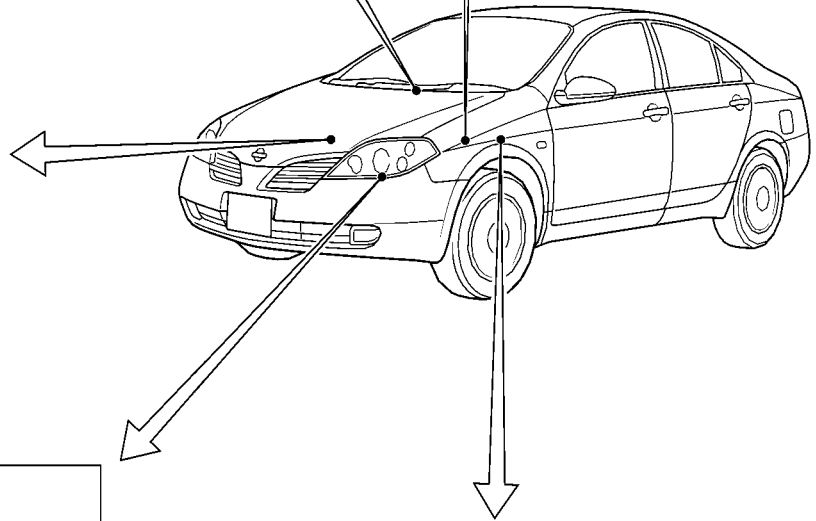
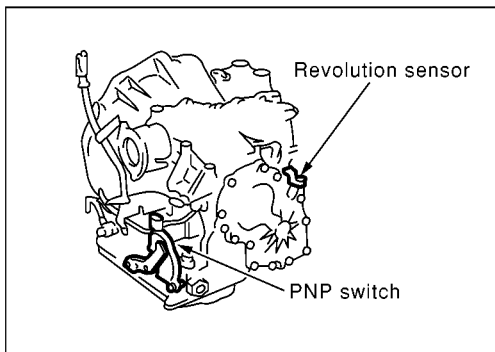
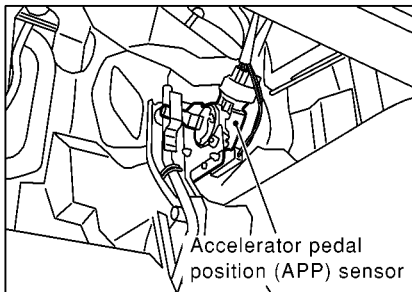
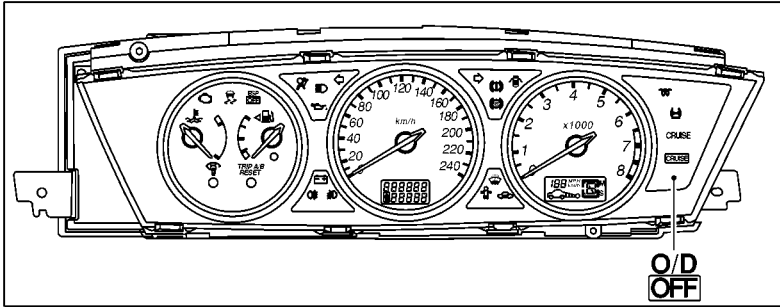
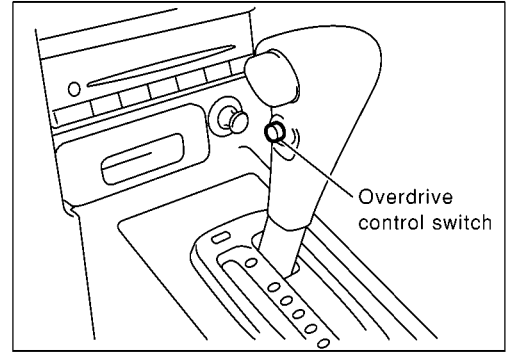
## OVERALL SYSTEM

### A/T Electrical Parts Location

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ECS005UK

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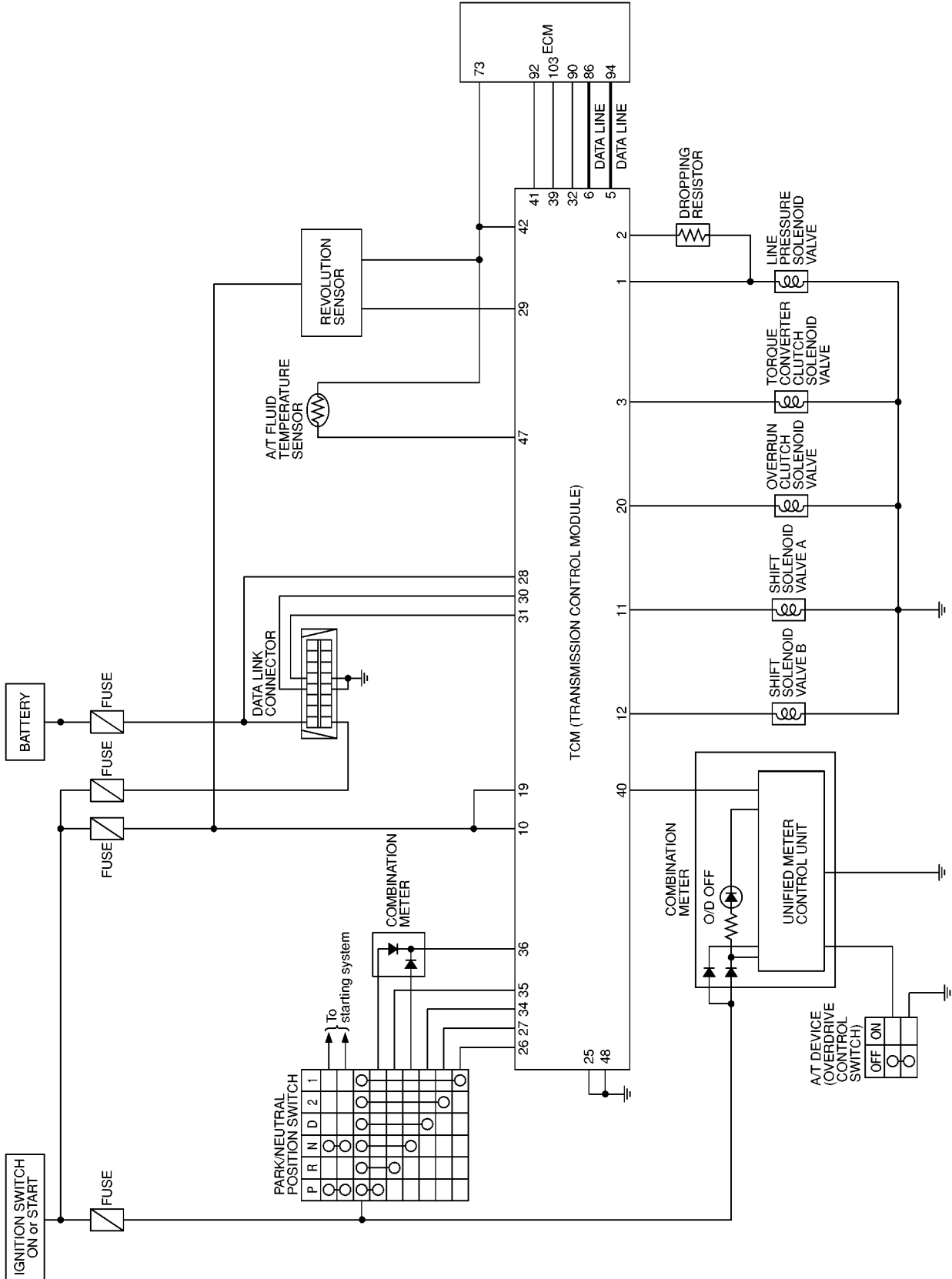


MCIA3102E

# OVERALL SYSTEM

## Circuit Diagram

ECS005UL



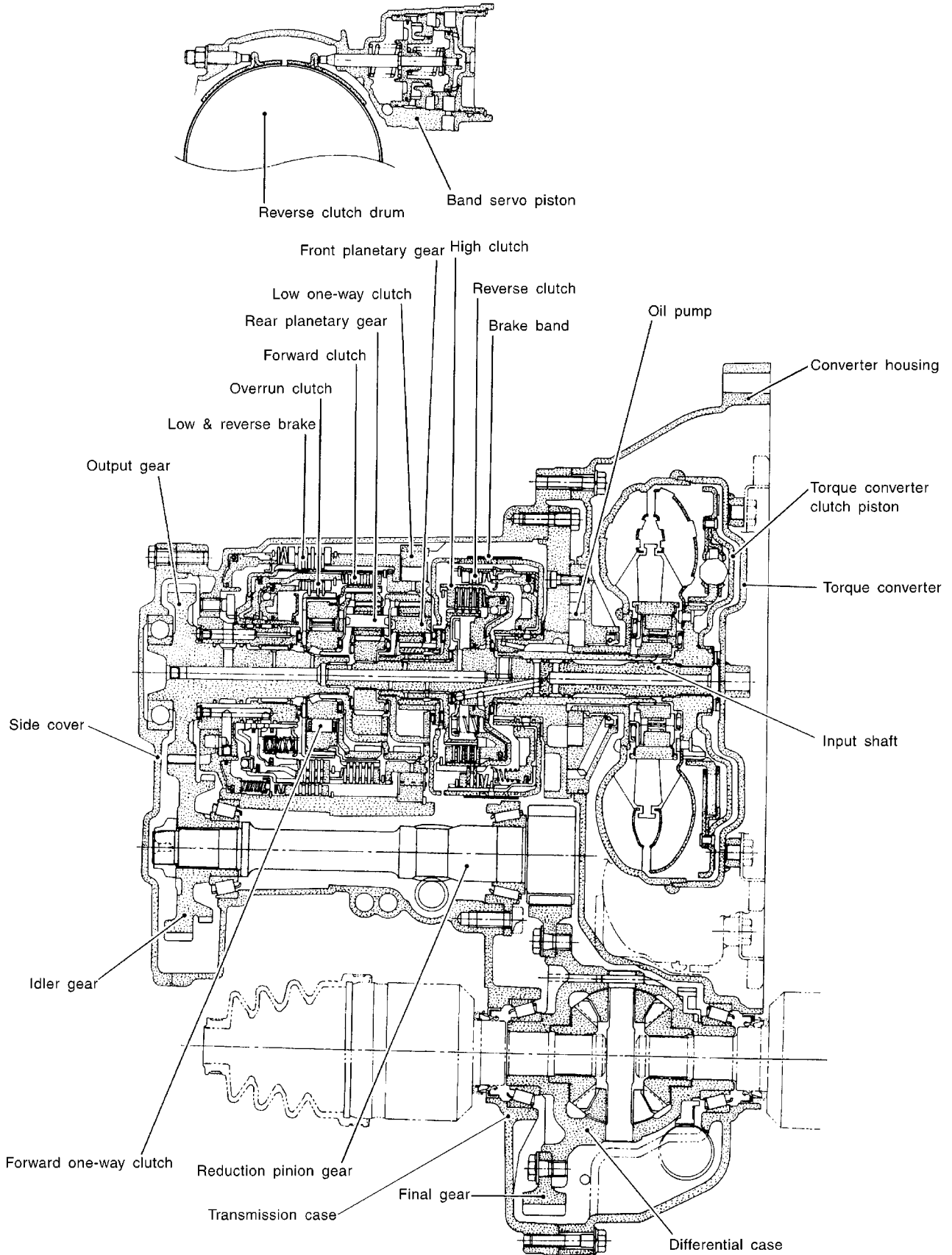
MCWA0001E

# OVERALL SYSTEM

## Cross-Sectional View

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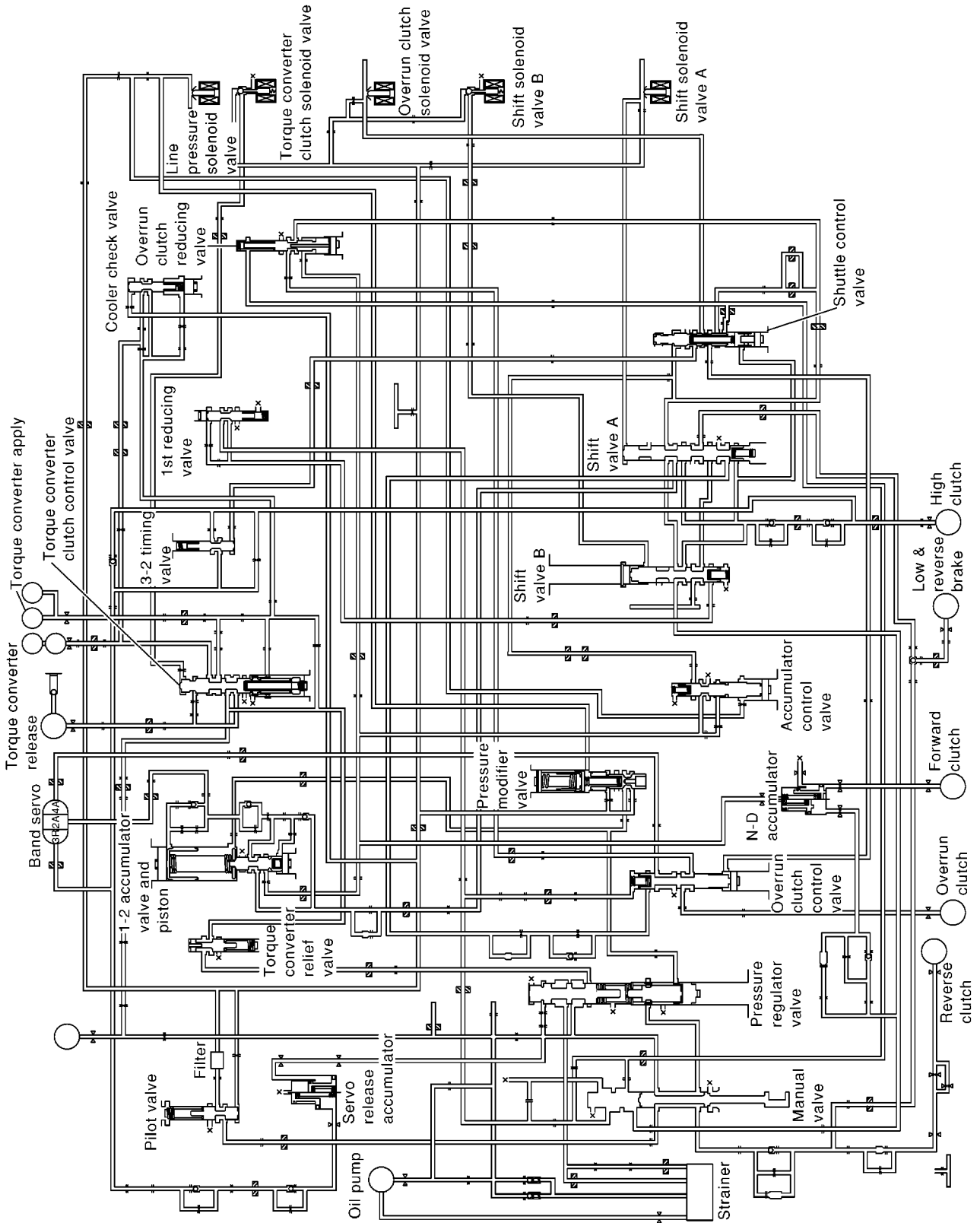


SAT842J

# OVERALL SYSTEM

## Hydraulic Control Circuit

ECS005UN



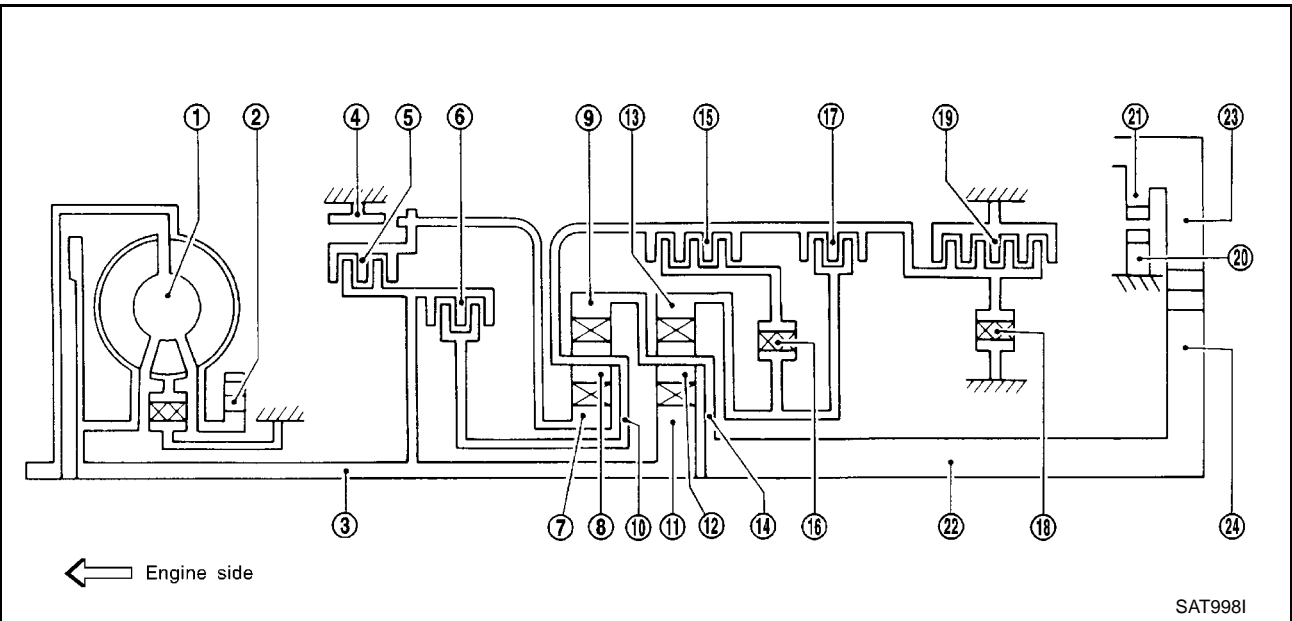
SAT844J



# OVERALL SYSTEM

## Shift Mechanism CONSTRUCTION

ECS005UO



- |                             |                            |                        |
|-----------------------------|----------------------------|------------------------|
| 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 .

## CLUTCH AND BAND CHART

Shift position	Reverse clutch 5	High clutch 6	Forward clutch 15	Over-run clutch 17	Band servo			Forward one-way clutch 16	Low one-way clutch 18	Low & reverse brake 19	Lock-up	Remarks
					2nd apply	3rd release	4th apply					
P												PARK POSITION
R	○									○		REVERSE POSITION

# OVERALL SYSTEM

Shift position	Reverse clutch 5	High clutch 6	Forward clutch 15	Over-run clutch 17	Band servo			Forward one-way clutch 16	Low one-way clutch 18	Low & reverse brake 19	Lock-up	Remarks
					2nd apply	3rd release	4th apply					
N												NEUTRAL POSITION
D*4	1st		○	*1D				B	B			Automatic shift 1 ↔ 2 ↔ 3 ↔ 4
	2nd		○	*1A	○			B				
	3rd		○	○	*1A	*2C	C				*5○	
	4th		○	C		*3C	C	○			○	
2	1st		○	D				B	B			Automatic shift 1 ↔ 2
	2nd		○	A	○			B				
1	1st		○	○				B		○		Locks (held stationary) in 1st speed 1 ↔ 2
	2nd		○	○	○			B				

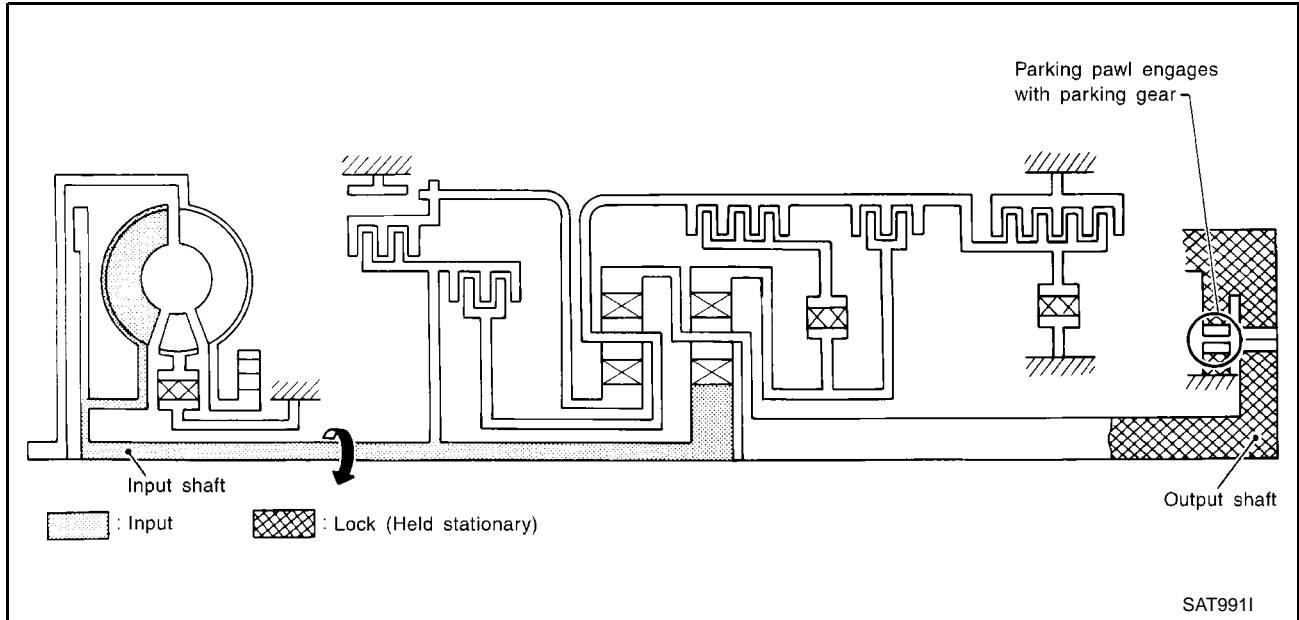
- \*1: Operates when overdrive control switch is set in "OFF" position.
- \*2: Oil pressure is applied to both 2nd "apply" side and 3rd "release" side of band servo piston. However, brake band does not contract because oil pressure area on the "release" side is greater than that on the "apply" side.
- \*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.
- \*5: Operates when overdrive control switch is "OFF".
- ○: 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

## 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 power train is locked.

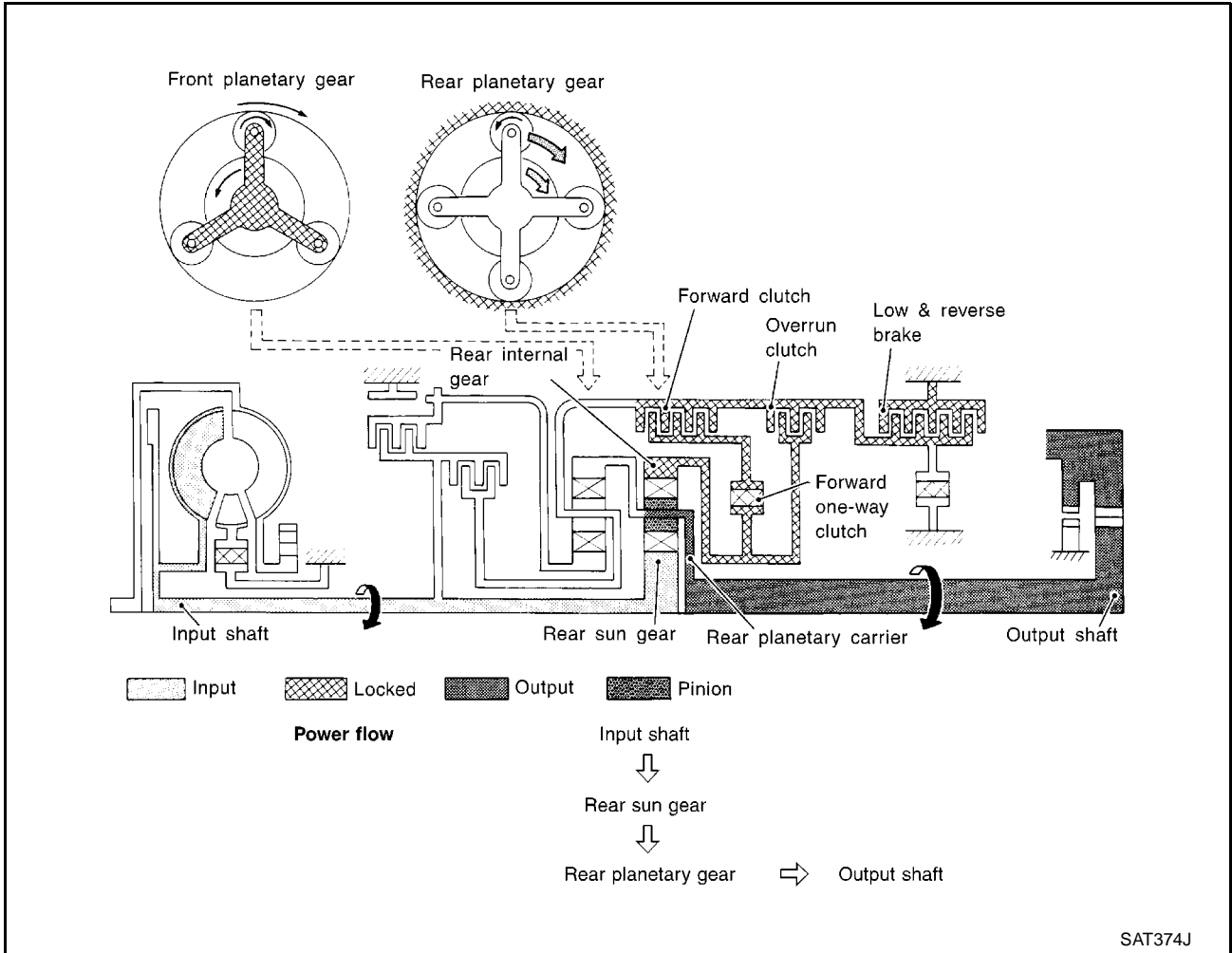


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# OVERALL SYSTEM

## "11" Position

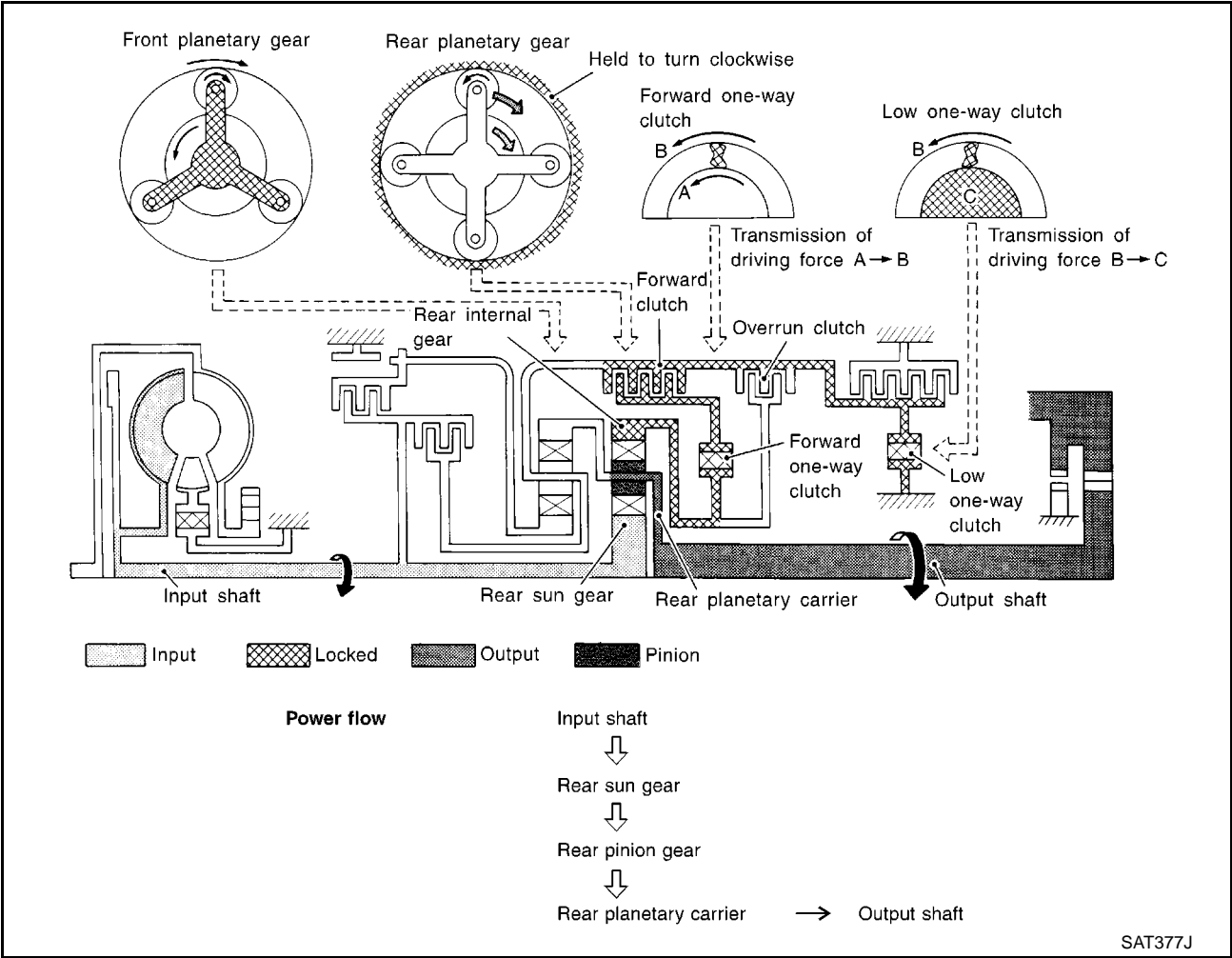
<ul style="list-style-type: none"> <li>● Forward clutch</li> <li>● Forward one-way clutch</li> <li>● Overrun clutch</li> <li>● Low and reverse brake</li> </ul>	<p>As overrun clutch engages, rear internal gear is locked by the operation of low and reverse brake. This is different from that of D1 and 21 .</p>
<p>Engine brake</p>	<p>Overrun clutch always engages, therefore engine brake can be obtained when decelerating.</p>



# OVERALL SYSTEM

## “D1 ” and “21 ” Positions

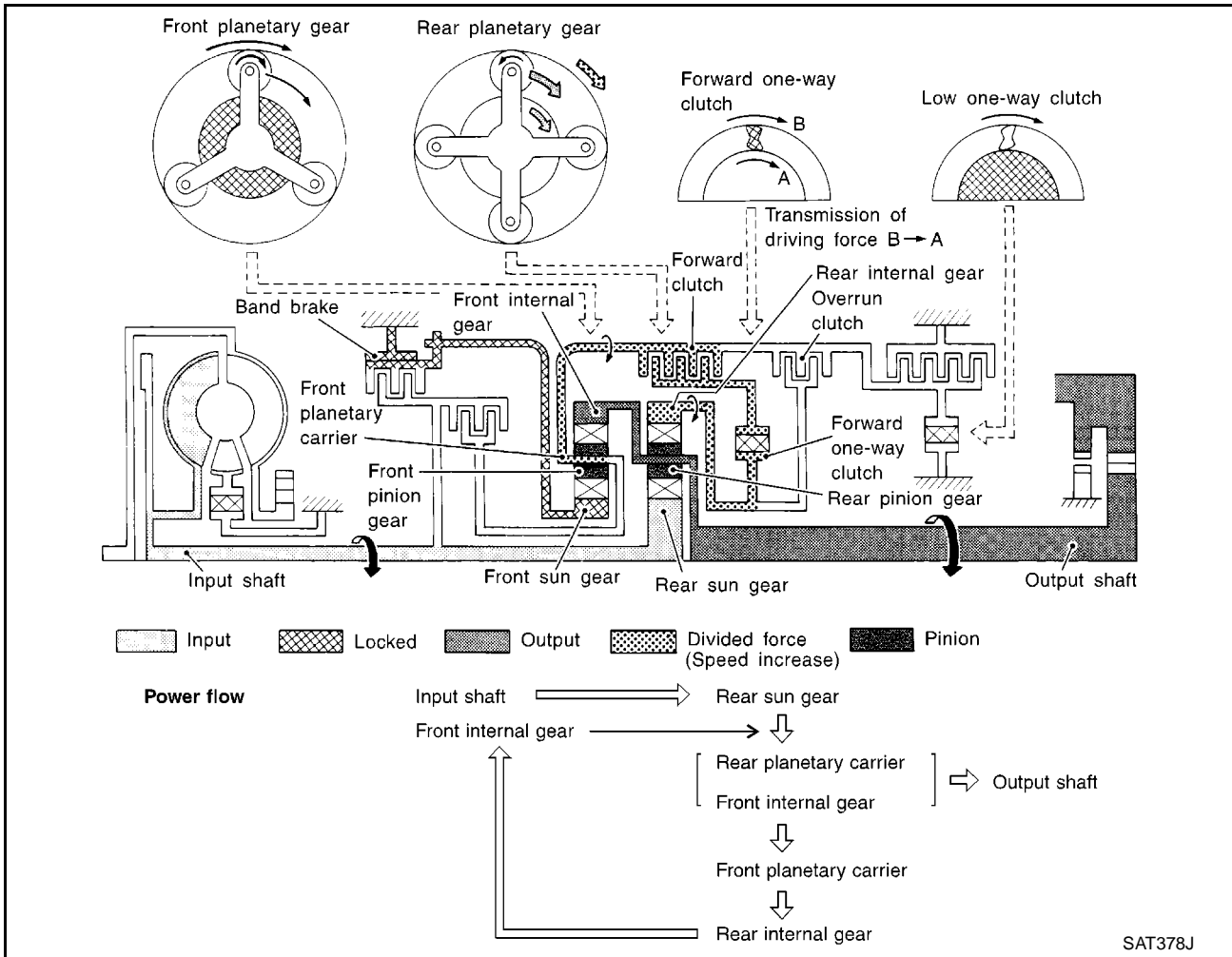
<ul style="list-style-type: none"> <li>● Forward one-way clutch</li> <li>● Forward clutch</li> <li>● Low one-way clutch</li> </ul>	Rear internal gear is locked to rotate counterclockwise because of the functioning of these three clutches.
<b>Overrun clutch</b> engagement conditions (Engine brake)	D1 : 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.



# OVERALL SYSTEM

## “D2”, “22” and “12” Positions

<ul style="list-style-type: none"> <li>● <b>Forward clutch</b></li> <li>● <b>Forward one-way clutch</b></li> <li>● <b>Brake band</b></li> </ul>	<p>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.</p> <p>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.</p>
<p><b>Overrun clutch</b> engagement conditions</p>	<p>D2 : Overdrive control switch “OFF” and throttle opening is less than 3/16</p> <p>22 and 12 : Always engaged</p>

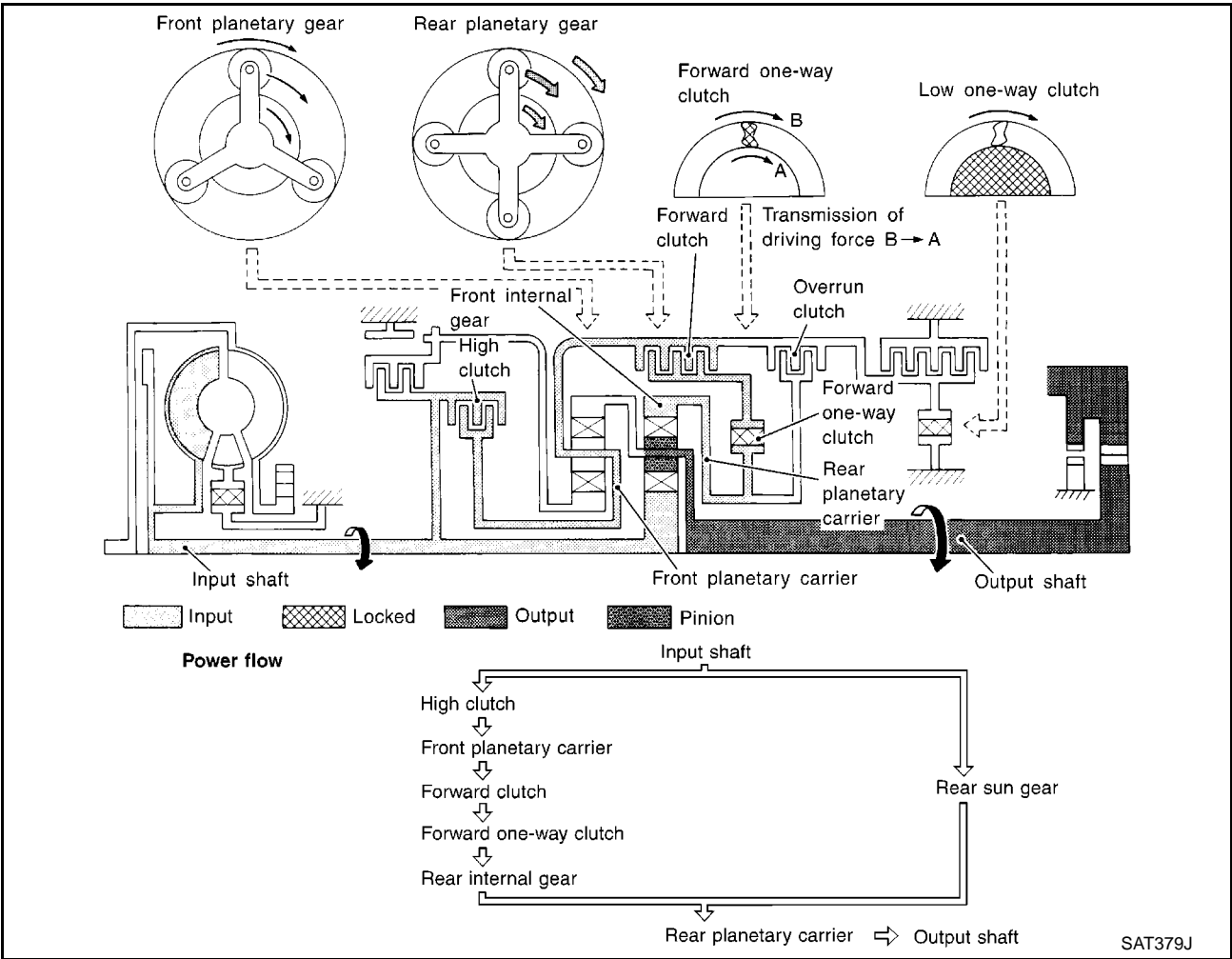


SAT378J

# OVERALL SYSTEM

## "D3" Position

<ul style="list-style-type: none"> <li>● High clutch</li> <li>● Forward clutch</li> <li>● Forward one-way clutch</li> </ul>	<p>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.</p>
<p><b>Overrun clutch engagement conditions</b></p>	<p>D3 : Overdrive control switch "OFF" and throttle opening is less than 3/16</p>

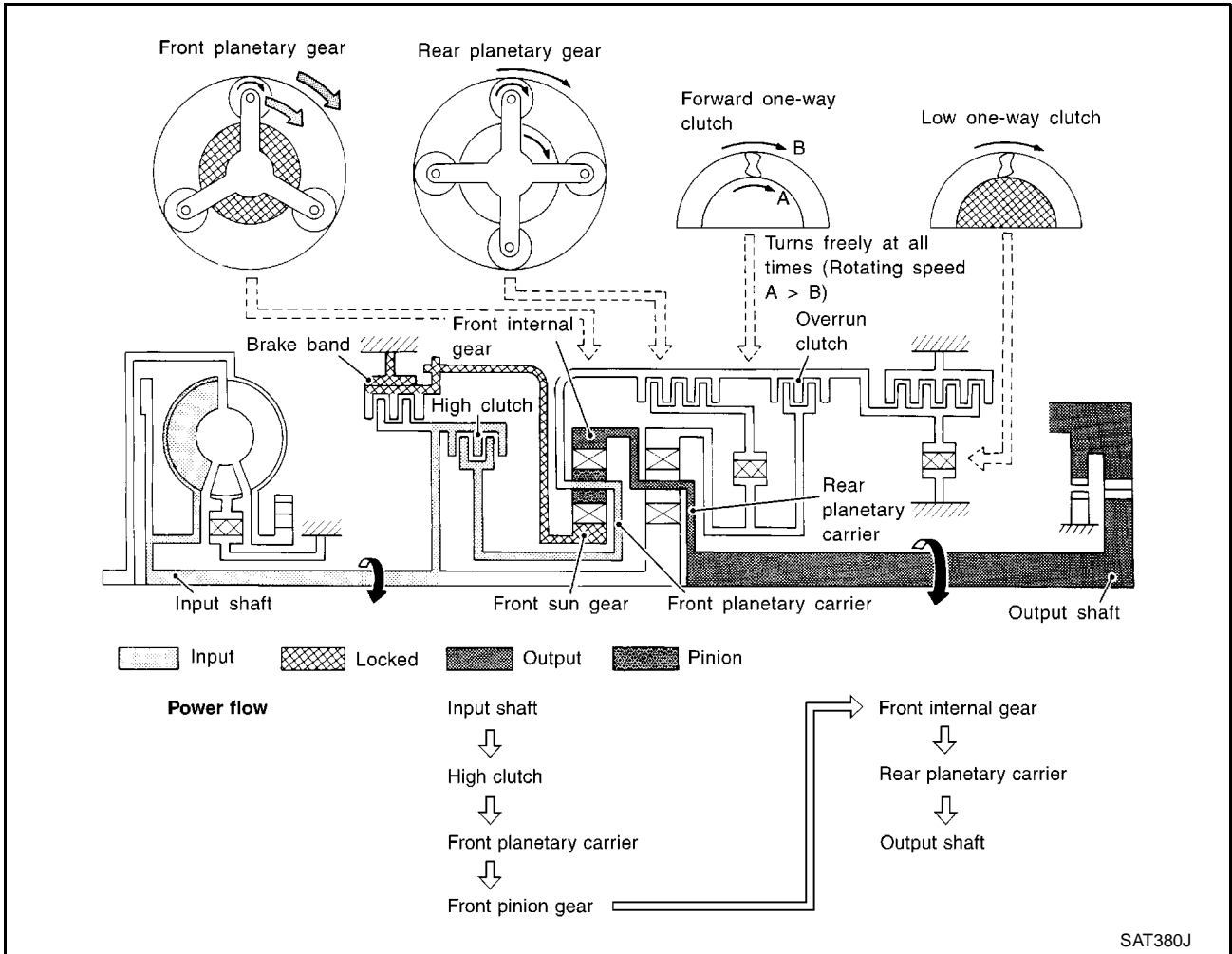


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# OVERALL SYSTEM

## "D4" (OD) Position

<ul style="list-style-type: none"> <li>● <b>High clutch</b></li> <li>● <b>Brake band</b></li> <li>● <b>Forward clutch</b> (Does not affect power transmission)</li> </ul>	<p>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.</p>
<p>Engine brake</p>	<p>At D4 position, there is no one-way clutch in the power transmission line and engine brake can be obtained when decelerating.</p>

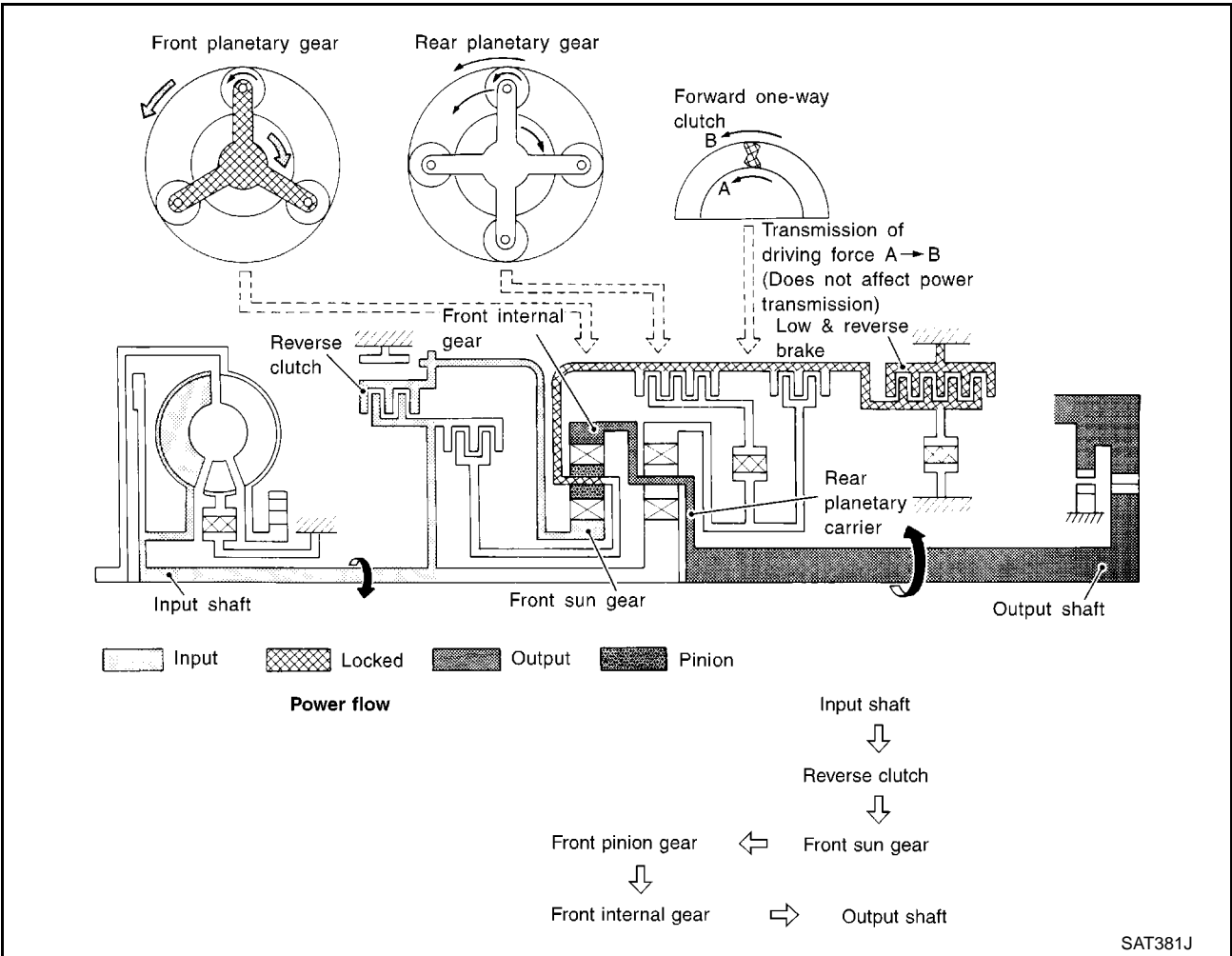




# OVERALL SYSTEM

## "R" Position

<ul style="list-style-type: none"> <li>● Reverse clutch</li> <li>● Low and reverse brake</li> </ul>	<p>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.</p>
<p>Engine brake</p>	<p>As there is no one-way clutch in the power transmission line, engine brake can be obtained when decelerating.</p>



SAT381J

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# OVERALL SYSTEM

## Control System OUTLINE

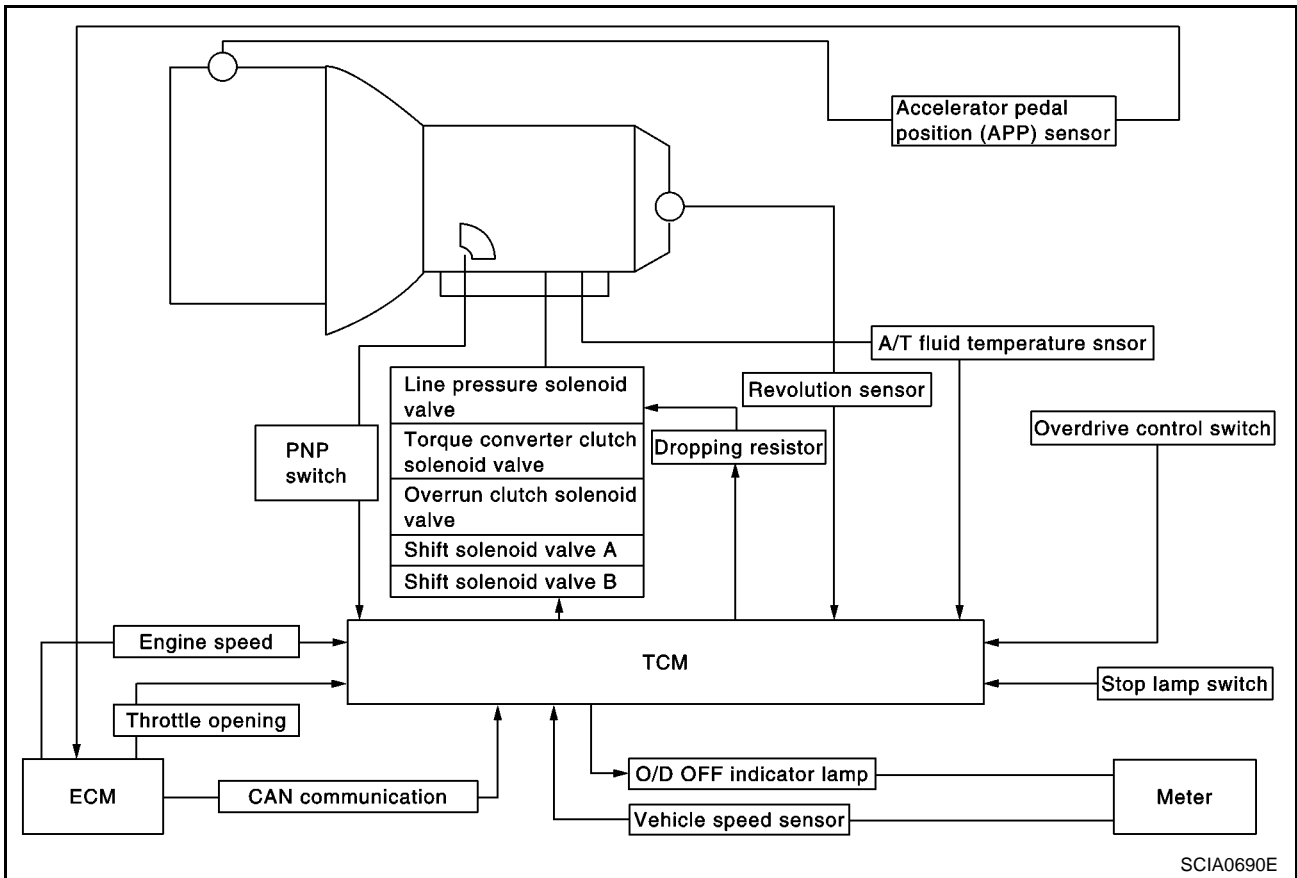
ECS005UP

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
PNP switch Throttle position sensor* Engine speed signal A/T fluid temperature sensor Revolution sensor Vehicle speed sensor Overdrive control switch Stop lamp switch	▶	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

\*: This sensor means Accelerator pedal position (APP) sensor.

## CONTROL SYSTEM



SCIA0690E

## 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.

# OVERALL SYSTEM

## INPUT/OUTPUT SIGNAL OF TCM

	Sensors, switches and solenoid valves	Function
Input	PNP switch	Detects select lever position and sends a signal to TCM.
	Throttle position sensor (accelerator pedal position (app) sensor)	Detects throttle valve position 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.
	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.
	Stop lamp switch	Releases lock-up system when depressing pedal in lock-up condition.
Output	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.
	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.

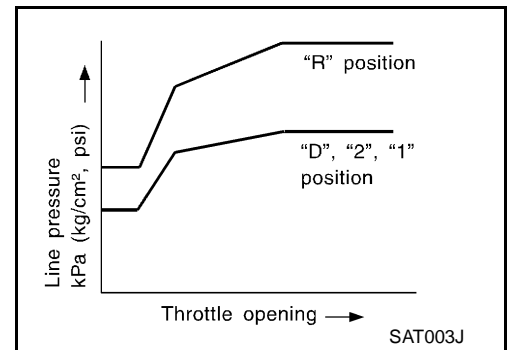
## Control Mechanism LINE PRESSURE CONTROL

ECS005UQ

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.

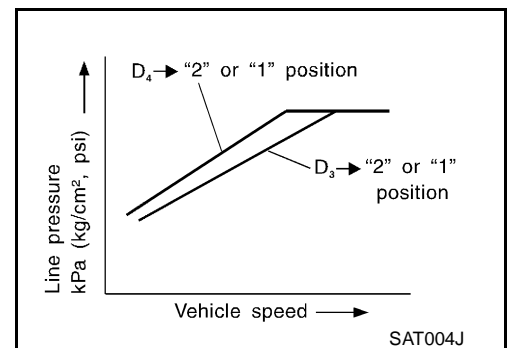
### Normal Control

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



### Back-up Control (Engine Brake)

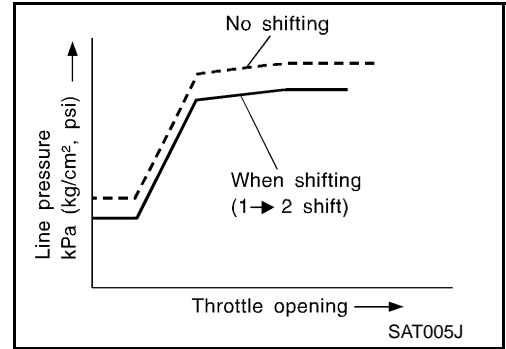
If the selector lever is shifted to "2" position while driving in D4 (OD) or D3, great driving force is applied to the clutch inside the transmission. Clutch operating pressure (line pressure) must be increased to deal with this driving force.



# OVERALL SYSTEM

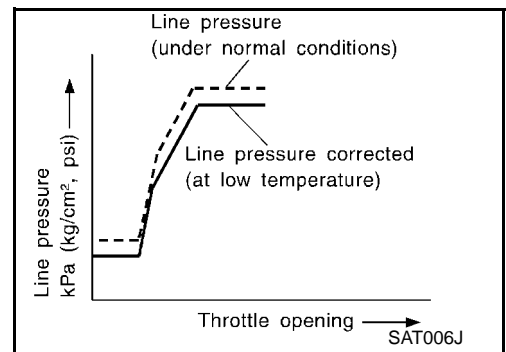
## During Shift Change

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.

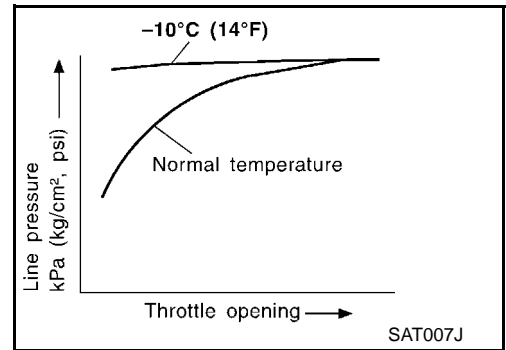


## At Low Fluid Temperature

- 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.



- 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.



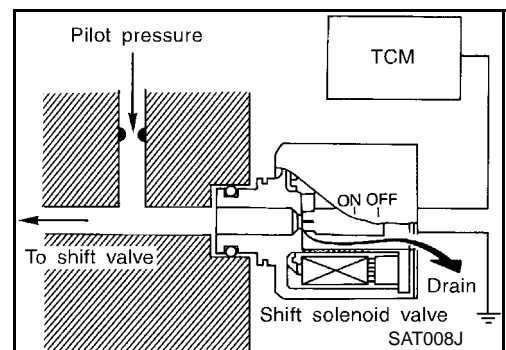
## SHIFT CONTROL

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. 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 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.

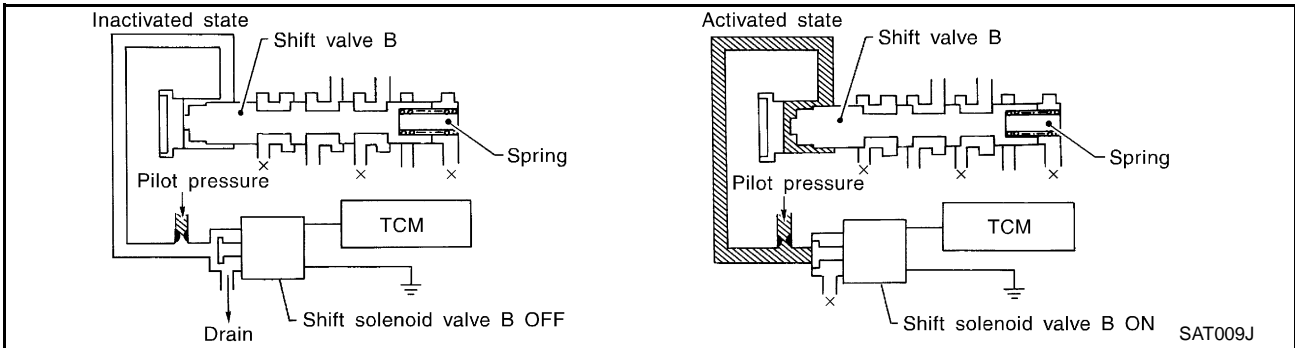


# OVERALL SYSTEM

## Relation Between Shift Solenoid Valves A and B and Gear Positions

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

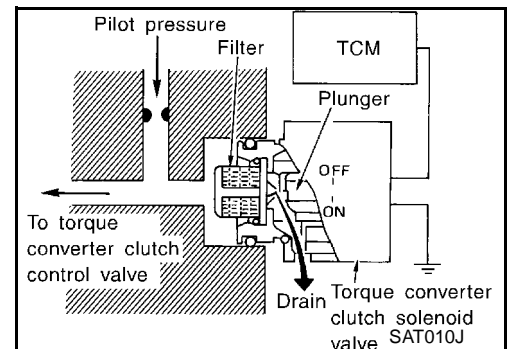
## Conditions for Lock-Up Operation

When vehicle is driven in 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	Less than set opening	
Closed throttle position switch	OFF	
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.



# OVERALL SYSTEM

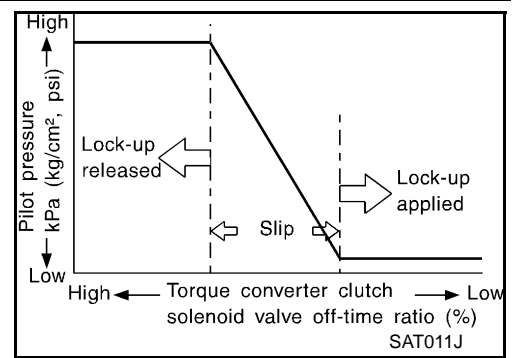
The torque converter clutch piston is designed to slip to adjust the ratio of ON-OFF, thereby reducing lock-up shock.

OFF-time INCREASING

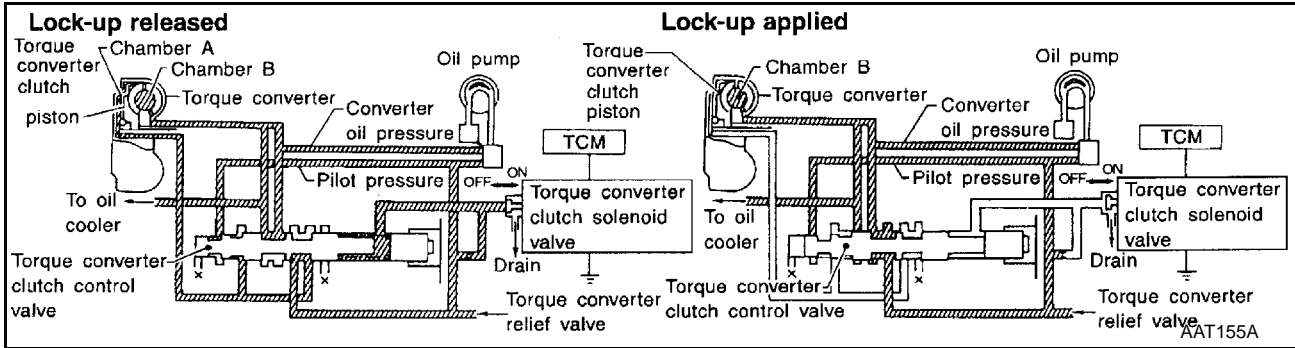
↓  
Amount of drain DECREASING

↓  
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)

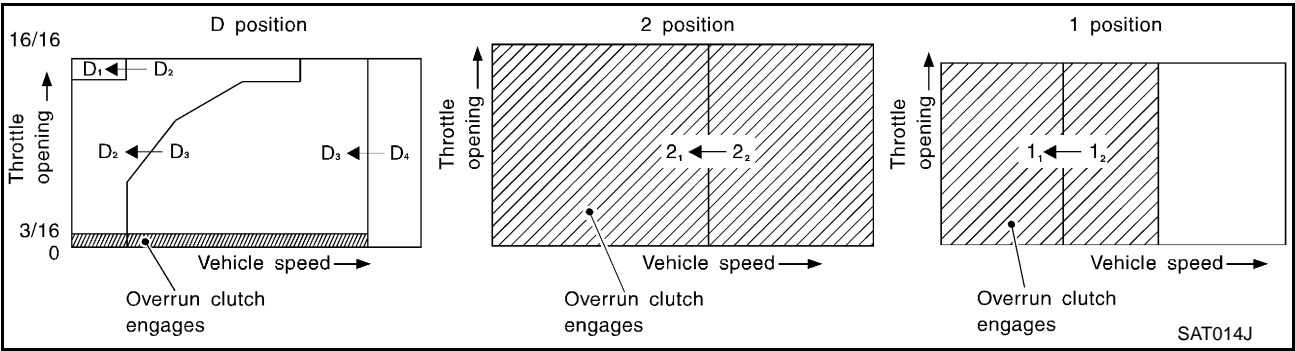
Forward one-way clutch is used to reduce shifting shocks in downshifting operations. This clutch transmits engine torque to the wheels. However, drive force from the wheels is not transmitted to the engine because the one-way clutch rotates idle. This means the engine brake is not effective.

The overrun clutch operates when the engine brake is needed.

### Overrun Clutch Operating Conditions

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

# OVERALL SYSTEM

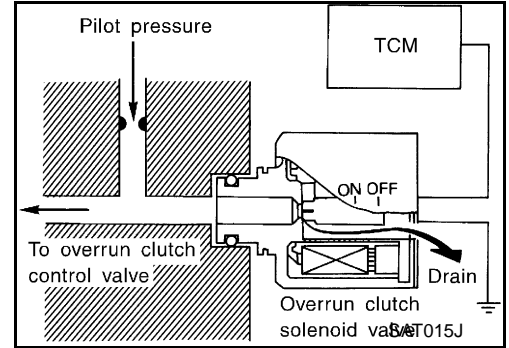


## Overrun Clutch Solenoid Valve Control

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.

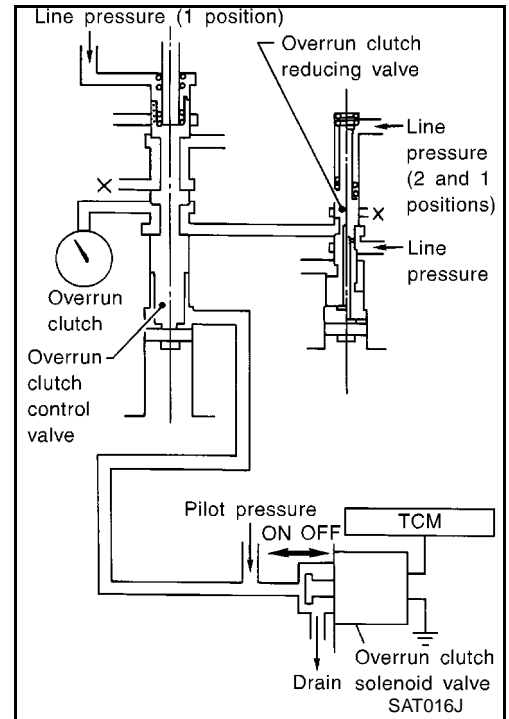


## Overrun Clutch Control Valve Operation

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

ECS005UR

## OVERALL SYSTEM

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-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 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 → 2nd → 3rd → 4th gears/4th → 3rd → 2nd → 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.
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.



## TROUBLE DIAGNOSIS — INDEX

PFP:00000

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

ECS005US

Check if the vehicle is a model with Euro-OBD system or not by the "Type approval number" on the identification plate. Refer to [GI-46, "IDENTIFICATION PLATE"](#).

Type approval number	Model
Available	With Euro-OBD system
Not available (blank)	Without Euro-OBD system

Items (CONSULT-II screen terms)	DTC	Reference page
	CONSULT-II GST*1	
A/T 1ST GR FNCTN	P0731	<a href="#">AT-131, "DTC P0731 A/T 1ST GEAR FUNCTION"</a>
A/T 2ND GR FNCTN	P0732	<a href="#">AT-138, "DTC P0732 A/T 2ND GEAR FUNCTION"</a>
A/T 3RD GR FNCTN	P0733	<a href="#">AT-144, "DTC P0733 A/T 3RD GEAR FUNCTION"</a>
A/T 4TH GR FNCTN	P0734	<a href="#">AT-150, "DTC P0734 A/T 4TH GEAR FUNCTION"</a>
ATF TEMP SEN/CIRC	P0710	<a href="#">AT-116, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT"</a>
ENGINE SPEED SIG	P0725	<a href="#">AT-127, "DTC P0725 ENGINE SPEED SIGNAL"</a>
L/PRESS SOL/CIRC	P0745	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
O/R CLTCH SOL/CIRC	P1760	<a href="#">AT-185, "DTC P1760 OVER-RUN CLUTCH SOLENOID VALVE"</a>
PNP SW/CIRC	P0705	<a href="#">AT-110, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH"</a>
SFT SOL A/CIRC*2	P0750	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
SFT SOL B/CIRC*2	P0755	<a href="#">AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"</a>
TCC SOLENOID/CIRC	P0740	<a href="#">AT-158, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
TP SEN/CIRC A/T*2	P1705	<a href="#">AT-180, "DTC P1705 ACCELERATOR PEDAL POSITION (APP) SENSOR"</a>
VEH SPD SEN/CIR AT*3	P0720	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)"</a>
CAN COMM CIRCUIT	U1000	<a href="#">AT-190, "DTC U1000 CAN COMMUNICATION LINE"</a>

● \*1: These numbers are prescribed by ISO 15031-5.

● \*2: When the fail-safe operation occurs, the MI illuminates.

● \*3: The MI illuminates when both the "Revolution sensor signal" and the "Vehicle speed sensor signal" meet the fail-safe condition at the same time.

## P NO. INDEX FOR DTC

Check if the vehicle is a model with Euro-OBD system or not by the “Type approval number” on the identification plate. Refer to [GI-46, "IDENTIFICATION PLATE"](#) .

Type approval number	Model
Available	With Euro-OBD system
Not available (blank)	Without Euro-OBD system

DTC	Items (CONSULT-II screen terms)	Reference page
CONSULT-II GST*1		
P0705	PNP SW/CIRC	<a href="#">AT-110, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH"</a>
P0710	ATF TEMP SEN/CIRC	<a href="#">AT-116, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT"</a>
P0720	VEH SPD SEN/CIR AT*3	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)"</a>
P0725	ENGINE SPEED SIG	<a href="#">AT-127, "DTC P0725 ENGINE SPEED SIGNAL"</a>
P0731	A/T 1ST GR FNCTN	<a href="#">AT-131, "DTC P0731 A/T 1ST GEAR FUNCTION"</a>
P0732	A/T 2ND GR FNCTN	<a href="#">AT-138, "DTC P0732 A/T 2ND GEAR FUNCTION"</a>
P0733	A/T 3RD GR FNCTN	<a href="#">AT-144, "DTC P0733 A/T 3RD GEAR FUNCTION"</a>
P0734	A/T 4TH GR FNCTN	<a href="#">AT-150, "DTC P0734 A/T 4TH GEAR FUNCTION"</a>
P0740	TCC SOLENOID/CIRC	<a href="#">AT-158, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
P0745	L/PRESS SOL/CIRC	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
P0750	SFT SOL A/CIRC*2	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
P0755	SFT SOL B/CIRC*2	<a href="#">AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"</a>
P1705	TP SEN/CIRC A/T*2	<a href="#">AT-180, "DTC P1705 ACCELERATOR PEDAL POSITION (APP) SENSOR"</a>
P1760	O/R CLTCH SOL/CIRC	<a href="#">AT-185, "DTC P1760 OVER-RUN CLUTCH SOLENOID VALVE"</a>
U1000	CAN COMM CIRCUIT	<a href="#">AT-190, "DTC U1000 CAN COMMUNICATION LINE"</a>

- \*1: These numbers are prescribed by ISO 15031-5.
- \*2: When the fail-safe operation occurs, the MI illuminates.
- \*3: The MI illuminates when both the “Revolution sensor signal” and the “Vehicle speed sensor signal” meet the fail-safe condition at the same time.

## ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

PFP:00000

## Introduction

ECS005UT

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

The first is the emission-related on board diagnostic system (EURO-OBD) performed by the TCM in combination with the ECM. The malfunction is indicated by the MI (malfunction indicator) 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 EURO-OBD self-diagnostic items. For detail, refer to [AT-35, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"](#).

## EURO-OBD Function for A/T System

ECS005UU

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

The MI 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 EURO-OBD

ECS005UV

## ONE TRIP DETECTION LOGIC

If a malfunction is sensed during the first test drive, the MI 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 MI 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 MI will illuminate. — Second Trip

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

Items	MI	
	One trip detection	Two trip detection
Shift solenoid valve A — DTC: P0750	X	
Shift solenoid valve B — DTC: P0755	X	
Throttle position 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.

## EURO-OBD Diagnostic Trouble Code (DTC)

ECS005UW

## HOW TO READ DTC AND 1ST TRIP DTC

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

( With CONSULT-II or ( GST)

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

These DTCs are prescribed by ISO 15031-5.

(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.

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

A sample of CONSULT-II display for 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.

SELECT SYSTEM
A/T
ENGINE

SAT014K

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

SELF-DIAG RESULTS	
DTC RESULTS	TIME
PNP SW/CIRC [P0705]	0

SAT015K

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

SELF-DIAG RESULTS	
DTC RESULTS	TIME
PNP SW/CIRC [P0705]	1 t

SAT016K

## 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-121, "CONSULT-II Function" \(QG\)](#), [EC-1054, "CONSULT-II Function" \(QR\)](#).

Only one set of freeze frame data (either 1st trip freeze frame data or freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MI 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 - P0306 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.

**HOW TO ERASE DTC**

The diagnostic trouble code can be erased by CONSULT-II, GST or ECM DIAGNOSTIC TEST MODE as described 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 EURO-OBD. For details, refer to [EC-73, "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**

**Ⓟ HOW TO ERASE DTC (WITH CONSULT-II)**

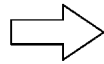
- **If a DTC is displayed for both ECM and TCM, it needs to be erased for both ECM and TCM.**
1. If the ignition switch stays "ON" after repair work, be sure to turn ignition switch "OFF" once. Wait at least 5 seconds and then turn it "ON" (engine stopped) again.
  2. Turn CONSULT-II "ON" and touch "A/T".
  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.)

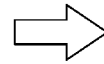
### How to erase DTC (With CONSULT-II)

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.

SELECT SYSTEM
A/T
ENGINE



SELECT DIAG MODE
SELF-DIAG RESULTS
DATA MONITOR
DTC WORK SUPPORT
TCM PART NUMBER

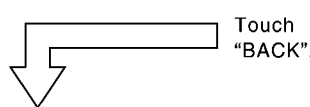


SELF-DIAG RESULTS
DTC RESULTS
T/C CLUTCH SOL/V

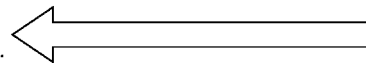
2. Turn CONSULT-II "ON", and touch "A/T".

3. Turn "SELF-DIAG RESULTS".

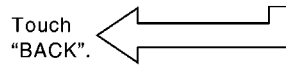
4. Touch "ERASE". (The DTC in the TCM will be erased.)



SELECT SYSTEM
A/T
ENGINE



SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER



SELF-DIAG RESULTS	
DTC RESULTS	TIME
TCC SOLENOID/CIRC [P0740]	0

5. Touch "ENGINE".

6. Touch "SELF-DIAG RESULTS".

7. Touch "ERASE". (The DTC in the ECM will be erased.)

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### HOW TO ERASE DTC (WITH GST)

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.
2. Perform "EURO-OBDD SELF-DIAGNOSTIC PROCEDURE (No Tools)". Refer to [AT-48](#) . (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-132, "Generic Scan Tool \(GST\) Function"](#) .

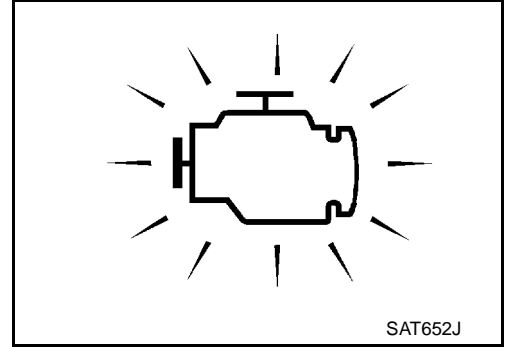
### HOW TO ERASE DTC (NO TOOLS)

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.
2. Perform "TCM SELF-DIAGNOSTIC PROCEDURE (No Tools)". Refer to [AT-48](#) . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)

**Malfunction Indicator (MI)**

ECS005UX

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 does not light up, refer to [EC-552, "MI & DATA LINK CONNECTORS"](#).  
(Or see MI & CONSULT-II in EC section. Refer to [EC-75, "Malfunction Indicator \(MI\)"](#), [EC-121, "CONSULT-II Function"](#)
2. When the engine is started, the malfunction indicator should go off.  
If the lamp remains on, the on board diagnostic system has detected an emission-related (EURO-OBD) malfunction. For detail, refer to [EC-60, "ON BOARD DIAGNOSTIC \(OBD\) SYSTEM"](#).



**CONSULT-II**

ECS005UY

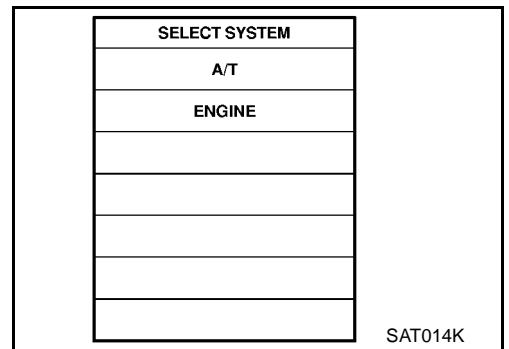
After performing "SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)" [AT-55](#), place check marks for results on the "DIAGNOSTIC WORKSHEET", [AT-54](#). Reference pages are provided following the items.

**NOTICE:**

1. The CONSULT-II electrically displays shift timing and lock-up timing (that is, operation timing of each solenoid).  
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.

**Ⓟ SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)**

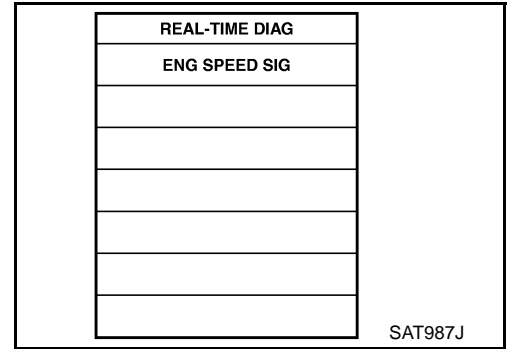
1. Turn on CONSULT-II and touch "ENGINE" for EURO-OBD detected items or touch "A/T" for TCM self-diagnosis.  
If A/T is not displayed, check TCM power supply and ground circuit. Refer to [AT-103, "TCM Terminals and Reference Value"](#). If result is NG, refer to [PG-3, "POWER SUPPLY ROUTING"](#).




# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

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.




## SELF-DIAGNOSTIC RESULT TEST MODE

Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode)		Malfunction is detected when...	TCM self-diagnosis	EURO-OBD (DTC)
"A/T"	"ENGINE"		Available by O/D OFF indicator lamp or "A/T" on CONSULT-II	 Available by malfunction indicator*2, "ENGINE" on CONSULT-II or GST
—	PNP SW/CIRC	● TCM does not receive the correct voltage signal (based on the gear position) from the switch.	—	P0705
Park/neutral position (PNP) switch circuit				
—	VEH SPD SEN/CIR AT	● TCM does not receive the proper voltage signal from the sensor.	X	P0720
Revolution sensor				
—	—	● TCM does not receive the proper voltage signal from the sensor.	X	—
Vehicle speed sensor (Meter)				
—	A/T 1ST GR FNCTN	● A/T cannot be shifted to the 1st gear position even if electrical circuit is good.	—	P0731*1
A/T 1st gear function				
—	A/T 2ND GR FNCTN	● A/T cannot be shifted to the 2nd gear position even if electrical circuit is good.	—	P0732*1
A/T 2nd gear function				
—	A/T 3RD GR FNCTN	● A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.	—	P0733*1
A/T 3rd gear function				
—	A/T 4TH GR FNCTN	● A/T cannot be shifted to the 4th gear position even if electrical circuit is good.	—	P0734*1
A/T 4th gear function				
—	SFT SOL A/CIRC A	● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	P0750
Shift solenoid valve A				
—	SFT SOL B/CIRC B	● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	P0755
Shift solenoid valve B				
—	O/R CLUCH SOL/ CIRC	● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	P1760
Overrun clutch solenoid valve				
—	TCC SOLENOID/ CIRC	● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	P0740
T/C clutch solenoid valve				



# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

**[EURO-OBD]**

Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode)		Malfunction is detected when...	TCM self-diagnosis	EURO-OBD (DTC)	A
"A/T"	"ENGINE"		Available by O/D OFF indicator lamp or "A/T" on CONSULT-II	 Available by malfunction indicator*2, "ENGINE" on CONSULT-II or GST	B
Line pressure solenoid valve		<ul style="list-style-type: none"> <li>● TCM detects an improper voltage drop when it tries to operate the solenoid valve.</li> </ul>	X	P0745	AT
LINE PRESSURE S/V	L/PRESS SOL/CIRC				
Throttle position sensor (Accelerator Pedal Position (APP) sensor)		<ul style="list-style-type: none"> <li>● TCM receives an excessively low or high voltage from the sensor.</li> </ul>	X	P1705	E
THROTTLE POSI SEN	TP SEN/CIRC A/T				
Engine speed signal		<ul style="list-style-type: none"> <li>● TCM does not receive the proper voltage signal from the ECM.</li> </ul>	X	P0725	G
ENGINE SPEED SIG					
A/T fluid temperature sensor		<ul style="list-style-type: none"> <li>● TCM receives an excessively low or high voltage from the sensor.</li> </ul>	X	P0710	I
BATT/FLUID TEMP SEN	ATF TEMP SEN/CIRC				
Engine control		<ul style="list-style-type: none"> <li>● The ECM-A/T communication line is open or shorted.</li> </ul>	X	U1000	K
A/T COMM LINE*3	—				
TCM (RAM)		<ul style="list-style-type: none"> <li>● TCM memory (RAM) is malfunctioning.</li> </ul>	—	—	M
CONTROL UNIT (RAM)	—				
TCM (ROM)		<ul style="list-style-type: none"> <li>● TCM memory (ROM) is malfunctioning.</li> </ul>	—	—	
CONTROL UNIT (ROM)	—				
TCM (EEP ROM)		<ul style="list-style-type: none"> <li>● TCM memory (EEP ROM) is malfunctioning.</li> </ul>	—	—	
CONT UNIT (EEP ROM)	—				
Initial start		<ul style="list-style-type: none"> <li>● This is not a malfunction message (Whenever shutting off a power supply to the TCM, this message appears on the screen.)</li> </ul>	X	—	
INITIAL START	—				
No failure (NO SELF DIAGNOSTIC FAILURE INDICATED FURTHER TESTING MAY BE REQUIRED**)		<ul style="list-style-type: none"> <li>● No failure has been detected.</li> </ul>	X	X	

X: Applicable

—: Not applicable

\*1: These malfunctions cannot be displayed by MI if another malfunction is assigned to lamp MI.

\*2: Refer to [AT-39. "Malfunction Indicator \(MI\)"](#).

\*3: A/T COMM LINE means CAN COMM LINE in this model.

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

## DATA MONITOR MODE (A/T)

Item	Display	Mover to center Monitor items				Description	Remarks
		TCM Input signals	CAN comm signals	Main signals	Selection from menu		
Vehicle speed sensor 1 (A/T) (Revolution sensor)	VHCL/S SE-A/T [km/h] or [mph]	X	—	—	▼	<ul style="list-style-type: none"> <li>Vehicle speed computed from signal of revolution sensor is displayed.</li> </ul>	When racing engine in N or P 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]	X	—	—	▼	<ul style="list-style-type: none"> <li>Vehicle speed computed from signal of vehicle speed sensor is displayed.</li> </ul>	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	THRTL POS SEN [V]	X	—	—	▼	<ul style="list-style-type: none"> <li>Throttle position sensor signal voltage is displayed.</li> </ul>	This sensor means accelerator pedal position(app)sensor.
A/T fluid temperature sensor	FLUID TEMP SE [V]	X	—	—	▼	<ul style="list-style-type: none"> <li>A/T fluid temperature sensor signal voltage is displayed.</li> <li>Signal voltage lowers as fluid temperature rises.</li> </ul>	
Battery voltage	BATTERY VOLT [V]	X	—	—	▼	<ul style="list-style-type: none"> <li>Source voltage of TCM is displayed.</li> </ul>	
Engine speed	ENGINE SPEED [rpm]	X	—	X	▼	<ul style="list-style-type: none"> <li>Engine speed, computed from engine speed signal, is displayed.</li> </ul>	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]	X	—	—	▼	<ul style="list-style-type: none"> <li>ON/OFF state computed from signal of overdrive control SW is displayed.</li> </ul>	
PN position (PNP) switch	PN POSI SW [ON/OFF]	X	—	—	▼	<ul style="list-style-type: none"> <li>ON/OFF state computed from signal of PN position SW is displayed.</li> </ul>	
R position switch	R POSITION SW [ON/OFF]	X	—	—	▼	<ul style="list-style-type: none"> <li>ON/OFF state computed from signal of R position SW is displayed.</li> </ul>	
D position switch	D POSITION SW [ON/OFF]	X	—	—	▼	<ul style="list-style-type: none"> <li>ON/OFF state computed from signal of D position SW is displayed.</li> </ul>	
2 position switch	2 POSITION SW [ON/OFF]	X	—	—	▼	<ul style="list-style-type: none"> <li>ON/OFF status, computed from signal of 2 position SW, is displayed.</li> </ul>	

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

Item	Display	Mover to center Monitor items				Description	Remarks
		TCM Input signals	CAN comm signals	Main signals	Selection from menu		
1 position switch	1 POSITION SW [ON/OFF]	X	—	—	▼	● ON/OFF status, computed from signal of 1 position SW, is displayed.	
Kickdown switch	KICKDOWN SW [ON/OFF]	X	—	—	▼	● ON/OFF status, computed from signal of kick down SW, is displayed.	● This is displayed even when no kick down switch is equipped.
Gear position	GEAR	—	—	X	▼	● Gear position data used for computation by TCM, is displayed.	
Selector lever position	SLCT LVR POSI	—	—	X	▼	● Selector lever 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.
Vehicle speed	VEHICLE SPEED [km/h] or [mph]	—	—	X	▼	● Vehicle speed data, used for computation by TCM, is displayed.	
Torque converter slip ratio	TC SLIP RATIO [0.000]	—	—	—	▼	● Ratio of engine revolution to input shaft revolution of torque converter	
Torque converter slip speed	TC SLIP SPEED [rpm]	—	—	—	▼	Difference in revolution between input shaft revolution and input shaft revolution of torque converter	Display doesn't indicate 0 rpm even if engine is stopped. But this isn't malfunction.
can communication	CAN COMM [OK/UNKWN]	—	X	—	▼		
CAN circuit 1	CAN CIRC 1 [OK/UNKWN]	—	X	—	▼		
CAN circuit 2	CAN CIRC 2 [OK/UNKWN]	—	X	—	▼		
CAN circuit 3	CAN CIRC 3 [OK/UNKWN]	—	X	—	▼		
CAN circuit 4	CAN CIRC 4 [OK/UNKWN]	—	X	—	▼		
CAN circuit 5	CAN CIRC 5 [OK/UNKWN]	—	X	—	▼		
Throttle position	THROTTLE POSI [8]	—	—	X	▼	● 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]	X	—	—	▼	● ON/OFF status is displayed. ON... Brake pedal is depressed. OFF... Brake pedal is released.	

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

Item	Display	Mover to center Monitor items				Description	Remarks
		TCM Input signals	CAN comm signals	Main signals	Selection from menu		
Line pressure duty	LINE PRES DTY [%]	—	—	X	▼	● 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 [%]	—	—	X	▼	● 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]	—	—	X	▼	● Control value of shift solenoid 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 if solenoid circuit is shorted.
Shift solenoid valve B	SHIFT S/V B [ON/OFF]	—	—	X	▼	● Control value of shift solenoid valve B, computed by TCM from each input signal, is displayed.	
Overrun clutch solenoid valve	OVERRUN/C S/V [ON/OFF]	—	—	X	▼	● Control value of overrun clutch solenoid valve computed by TCM from each input signal is displayed.	
Self-diagnosis display lamp (O/D OFF indicator lamp)	SELF-D DP LMP [ON/OFF]	—	—	X	▼	● Control status of O/D OFF indicator lamp is displayed.	
Voltage [V]		—	—	—	▼	Value measured by voltage probe is displayed.	
Frequency [Hz]		—	—	—	▼	Value measured by pulse probe is displayed. If measurement is impossible, “#” sign is displayed. “#” sign is also displayed at the final data value until the measurement result is obtained.	
DUTY-HI		—	—	—	▼	Duty cycle value for measurement probe is displayed.	
DUTY-LOW		—	—	—	▼		
PLS WIDTH-HI		—	—	—	▼	Measured pulse width of measurement probe is displayed.	
PLS WIDTH-LOW		—	—	—	▼		

X: Applicable    —: Not applicable    ▼: Option

## DTC WORK SUPPORT MODE WITH CONSULT-II

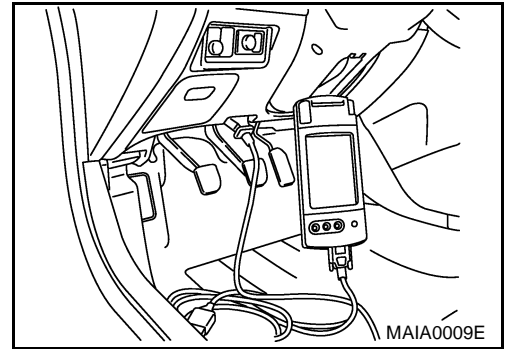
### CONSULT-II Setting Procedure

1. Turn ignition switch “OFF”.

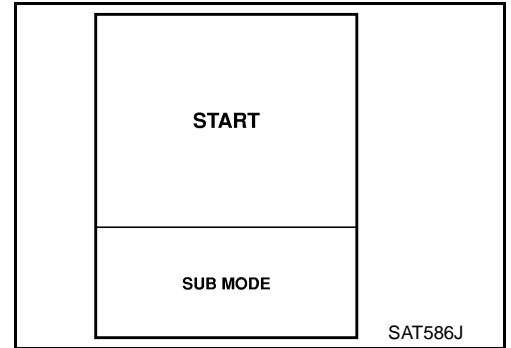
# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

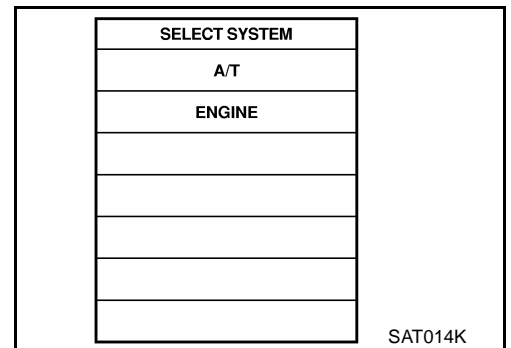
2. Connect CONSULT-II to data link connector which is located in left or right side lower dash panel.



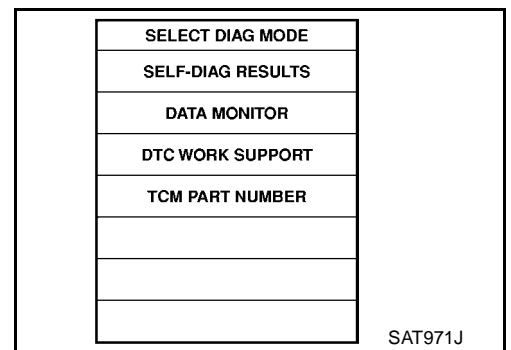
3. Turn ignition switch "ON".
4. Touch "START".



5. Touch "A/T".



6. Touch "DTC WORK SUPPORT".



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBDD]

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

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8. Touch "START".

1ST GR FNCTN P0731
THIS SUPPORT FUNCTION IS FOR DTC P0731. SEE THE SERVICE MANUAL ABOUT THE OPERATING CONDITION FOR THIS DIAGNOSIS.

SAT589J

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

1ST GR FNCTN P0731	
OUT OF CONDITION	
MONITOR	
GEAR	XXX
VEHICLE SPEED	XXXkm/h
THROTTLE POSI	XXX
TCC S/V DUTY	XXX %

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

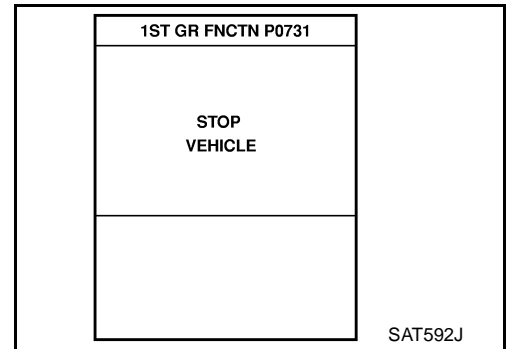
1ST GR FNCTN P0731	
TESTING	
MONITOR	
GEAR	XXX
VEHICLE SPEED	XXXkm/h
THROTTLE POSI	XXX
TCC S/V DUTY	XXX %

SAT591J

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

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

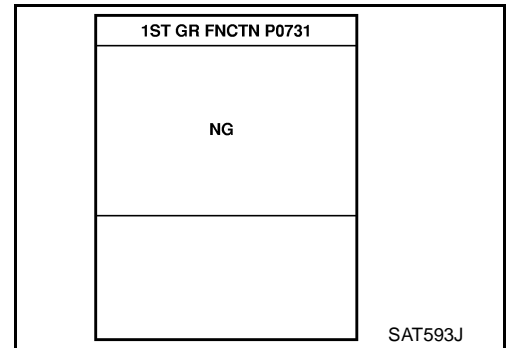


A

B

AT

D

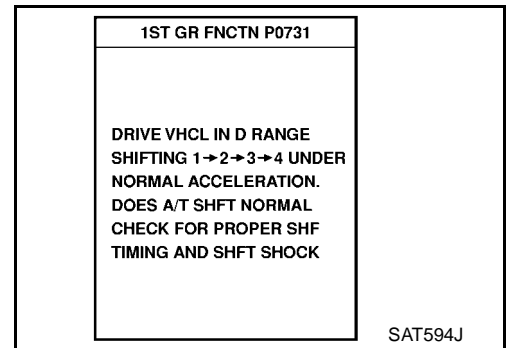


E

F

G

11. Perform test drive to check gear shift feeling in accordance with instructions displayed.



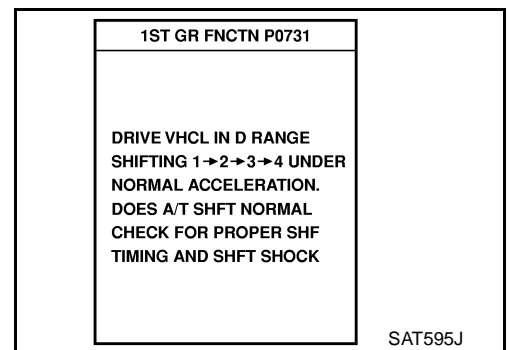
H

I

J

K

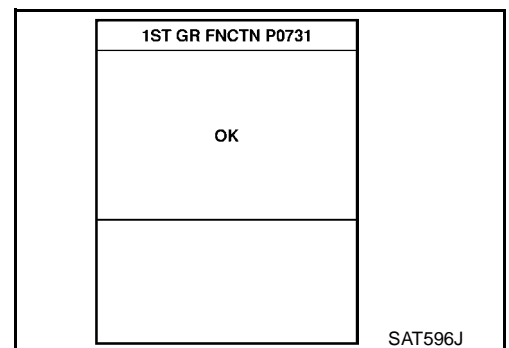
12. Touch "YES" or "NO".



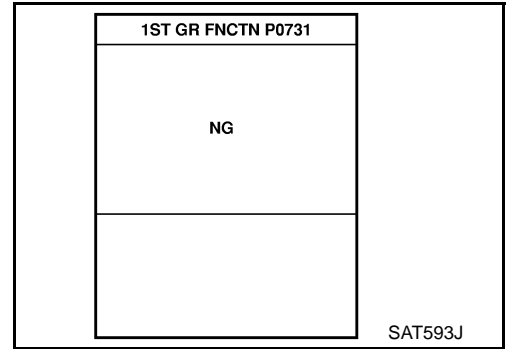
L

M

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)	<ul style="list-style-type: none"> <li>● Shift solenoid valve A</li> <li>● Shift solenoid valve B</li> <li>● Each clutch</li> <li>● Hydraulic control circuit</li> </ul>
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)	<ul style="list-style-type: none"> <li>● Shift solenoid valve B</li> <li>● Each clutch</li> <li>● Hydraulic control circuit</li> </ul>
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)	<ul style="list-style-type: none"> <li>● Shift solenoid valve A</li> <li>● Each clutch</li> <li>● Hydraulic control circuit</li> </ul>
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)	<ul style="list-style-type: none"> <li>● Shift solenoid valve A</li> <li>● Shift solenoid valve B</li> <li>● Overrun clutch solenoid valve</li> <li>● Line pressure solenoid valve</li> <li>● Each clutch</li> <li>● Hydraulic control circuit</li> </ul>

### Diagnostic Procedure Without CONSULT-II

ECS005UZ

#### EURO-OBD SELF-DIAGNOSTIC PROCEDURE (WITH GST)

Refer to [EC-132, "Generic Scan Tool \(GST\) Function"](#) .

#### EURO-OBD SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer to [EC-75, "Malfunction Indicator \(MI\)"](#) .

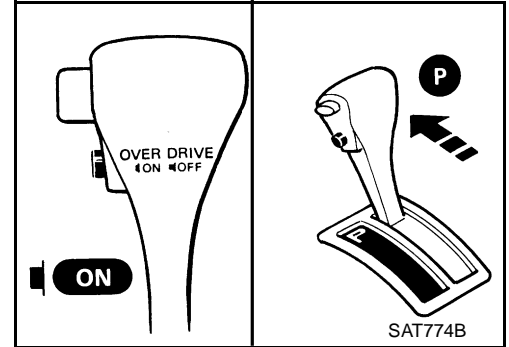




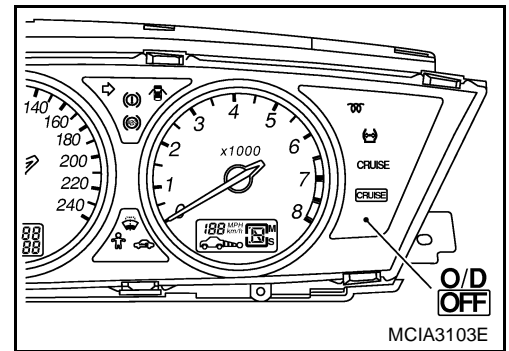
## TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

### 1. CHECK O/D OFF INDICATOR LAMP

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch to "OFF" position.  
Wait 5 seconds.
3. Turn ignition switch to "ACC" position.
4. Set overdrive control switch to "ON" position.
5. Move selector lever to "P" position.
6. Turn ignition switch to "ON" position. (Do not start engine.)



7. Does O/D OFF indicator lamp come on for about 2 seconds?



#### Yes or No

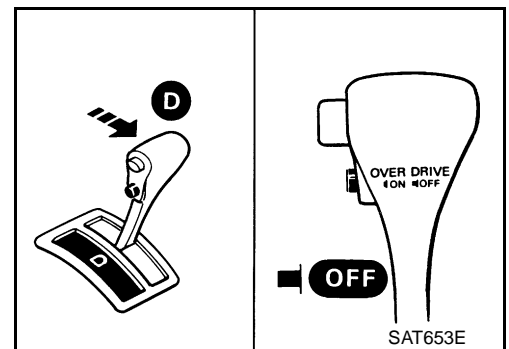
Yes >> GO TO 2

No >> Go to [AT-209, "1. O/D OFF Indicator Lamp Does Not Come On"](#) .

### 2. JUDGEMENT PROCEDURE STEP 1

1. Turn ignition switch to "OFF" position.
2. Turn ignition switch to "ACC" position.
3. Move selector lever to "D" position.
4. Set overdrive control switch to "OFF" position.
5. Turn ignition switch to "ON" position. (Do not start engine.)
- Wait more than 2 seconds after turning ignition switch "ON".

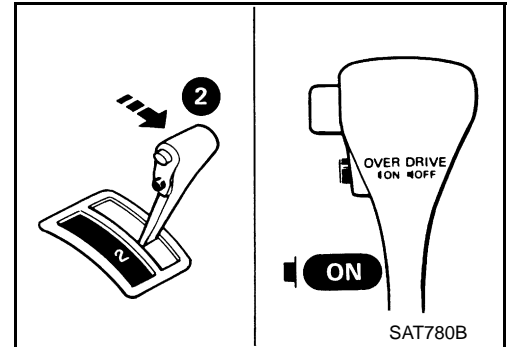
>> GO TO 3



## 3. JUDGEMENT PROCEDURE STEP 2

1. Move selector lever to "2" position.
2. Set overdrive control switch to "ON" position.

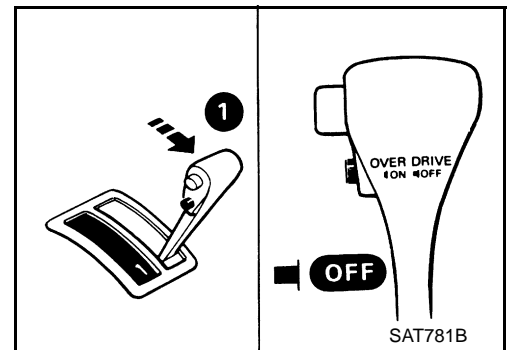
>> GO TO 4



## 4. JUDGEMENT PROCEDURE STEP 3

1. Move selector lever to "1" position.
2. Set overdrive control switch to "OFF" position.

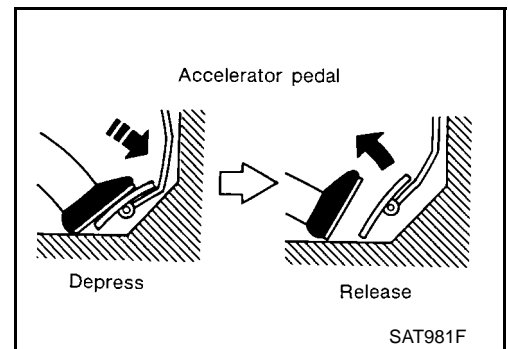
>> GO TO 5



## 5. JUDGEMENT PROCEDURE STEP 4

1. Depress accelerator pedal fully and release it.

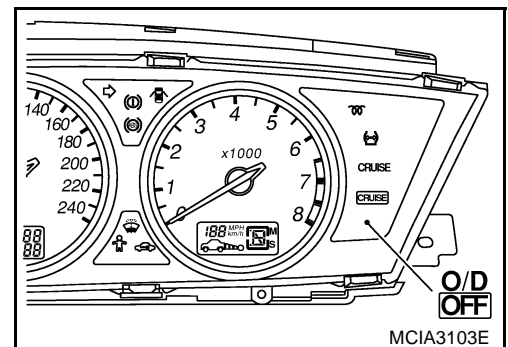
>> GO TO 6



## 6. CHECK SELF-DIAGNOSIS CODE

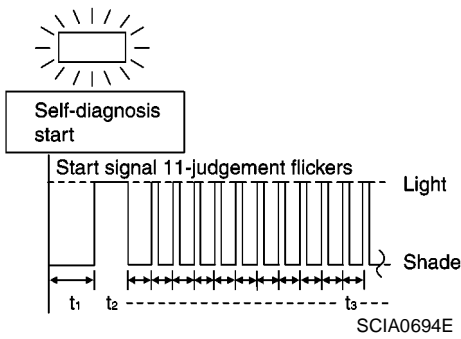
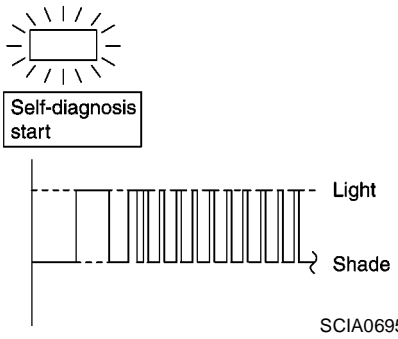
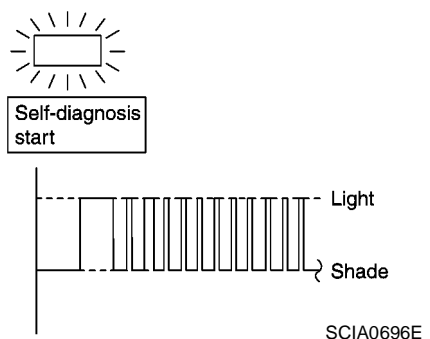
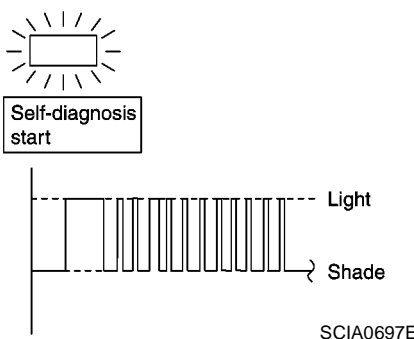
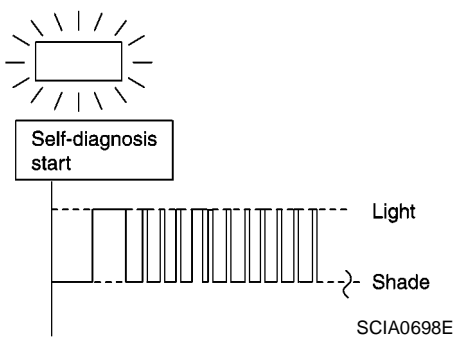
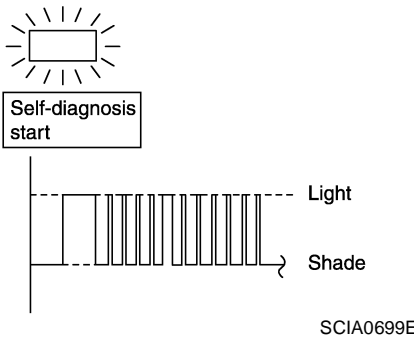
Check O/D OFF indicator lamp. Refer to [AT-35, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"](#).

>> DIAGNOSIS END



## JUDGEMENT OF SELF-DIAGNOSIS CODE

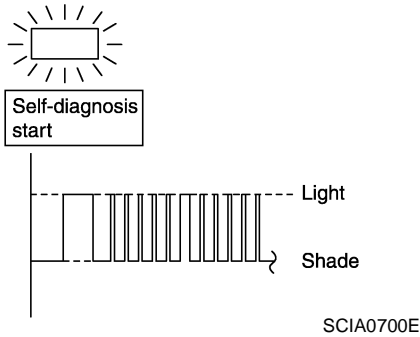
O/D OFF indicator lamp:

<p>All judgement flickers are the same.</p> <div style="text-align: center;">  <p style="text-align: center;">SCIA0694E</p> </div> <p>All circuits that can be confirmed by self-diagnosis are OK.</p>	<p>1st judgement flicker is longer than others.</p> <div style="text-align: center;">  <p style="text-align: center;">SCIA0695E</p> </div> <p>Revolution sensor circuit is short-circuited or disconnected.                  ⇒ <b>Go to DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR).</b>                  Refer to <a href="#">AT-122</a></p>
<p>2nd judgement flicker is longer than others.</p> <div style="text-align: center;">  <p style="text-align: center;">SCIA0696E</p> </div> <p>Vehicle speed sensor circuit is short-circuited or disconnected.                  ⇒ <b>Go to VEHICLE SPEED SENSOR-MTR.</b>                  Refer to <a href="#">AT-122</a></p>	<p>3rd judgement flicker is longer than others.</p> <div style="text-align: center;">  <p style="text-align: center;">SCIA0697E</p> </div> <p>Throttle position sensor circuit is short-circuited or disconnected.                  ⇒ <b>Go to DTC P1705 ACCELEPATOR PEDAL POSITION(APP)SENSOR</b>                  Refer to <a href="#">AT-180</a></p>
<p>4th judgement flicker is longer than others.</p> <div style="text-align: center;">  <p style="text-align: center;">SCIA0698E</p> </div> <p>Shift solenoid valve A circuit is short-circuited or disconnected.                  ⇒ <b>Go to DTC P0750 SHIFT SOLENOID VALVE A.</b>                  Refer to <a href="#">AT-170</a></p>	<p>5th judgement flicker is longer than others.</p> <div style="text-align: center;">  <p style="text-align: center;">SCIA0699E</p> </div> <p>Shift solenoid valve B circuit is short-circuited or disconnected.                  ⇒ <b>Go to DTC P0755 SHIFT SOLENOID VALVE B.</b>                  Refer to <a href="#">AT-175</a></p>

A  
 B  
**AT**  
 D  
 E  
 F  
 G  
 H  
 I  
 J  
 K  
 L  
 M

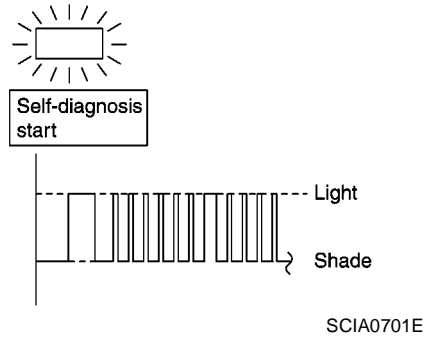
O/D OFF indicator lamp:

6th judgement flicker is longer than others.



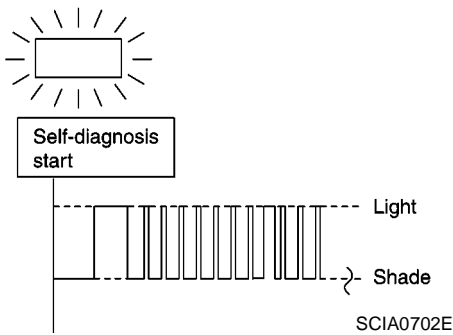
Overrun clutch solenoid valve circuit is short-circuited or disconnected.  
 ⇒ **Go to DTC P1760 OVERRUN CLUTCH SOLENOID VALVE.**  
 Refer to [AT-185](#)

7th judgement flicker is longer than others.



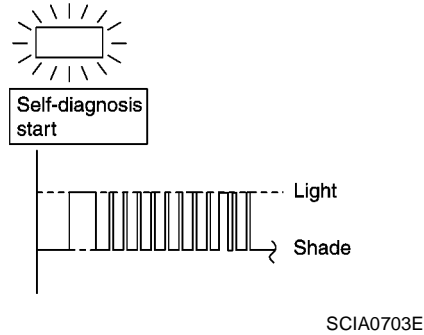
Torque converter clutch solenoid valve circuit is short-circuited or disconnected.  
 ⇒ **Go to DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE.**  
 Refer to [AT-158](#)

8th judgement flicker is longer than others.



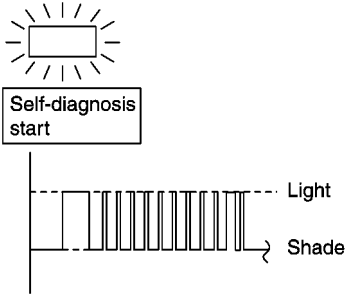
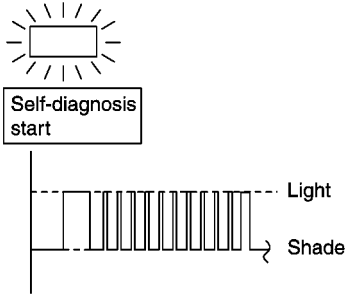
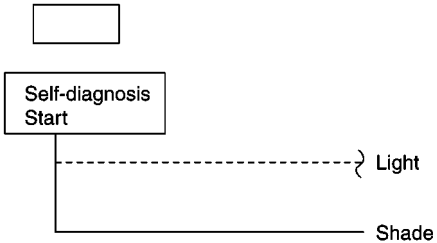
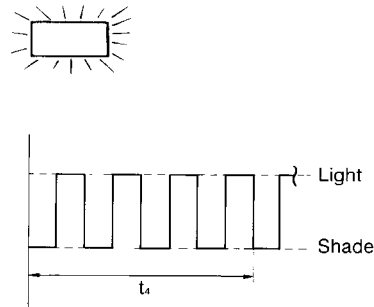
A/T fluid temperature sensor is disconnected or TCM power source circuit is damaged.  
 ⇒ **Go to DTC BATT/FLUID TEMP SEN A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE.**  
 Refer to [AT-193](#)

9th judgement flicker is longer than others.



Engine speed signal circuit is short-circuited or disconnected.  
 ⇒ **Go to DTC P0725 ENGINE SPEED SIGNAL.**  
 Refer to [AT-127](#)

O/D OFF indicator lamp:

<p>10th judgement flicker is longer than others.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">SCIA0704E</p> <p>Line pressure solenoid valve circuit is short-circuited or disconnected.                  ⇒ <b>Go to DTC P0745 LINE PRESSURE SOLENOID VALVE.</b>                  Refer to <a href="#">AT-163</a></p>	<p>11th judgement flicker is longer than others.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">SCIA0705E</p> <p>The ECM-AT communication line is open or shorted.                  ⇒ Go to DTC U1000 CAN COMMUNICATION LINE.                  Refer to <a href="#">AT-190</a></p>
<p>Lamp comes off.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">SCIA0706E</p> <p>PNP switch, overdrive control switch or throttle position switch circuit is disconnected or TCM is damaged.                  ⇒ <b>Go to 21. TCM Self-diagnosis Does Not Activate (PNP and OVERDRIVE CONTROL switches).</b>                  Refer to <a href="#">AT-236</a></p>	<p>Flickers as shown below.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">SAT804H</p> <p>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).</p>

t1 = 2.5 seconds   t2 = 2.0 seconds   t3 = 1.0 second   t4 = 1.0 second

A  
B  
**AT**  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

**TROUBLE DIAGNOSIS — INTRODUCTION**

PF P:00000

**Introduction**

ECS005V0

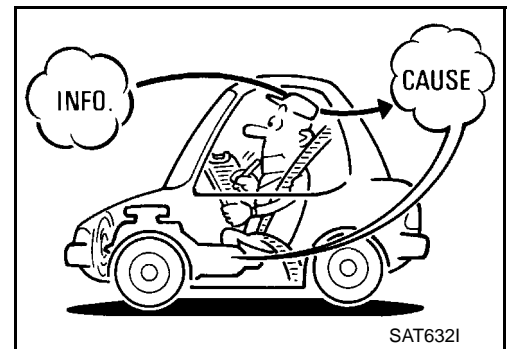
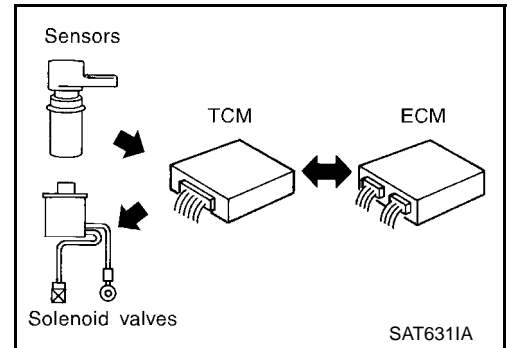
The TCM receives a signal from the vehicle speed sensor, throttle position sensor or PNP switch and provides shift control or lock-up control via A/T solenoid valves.

The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the EURO-OB D 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.

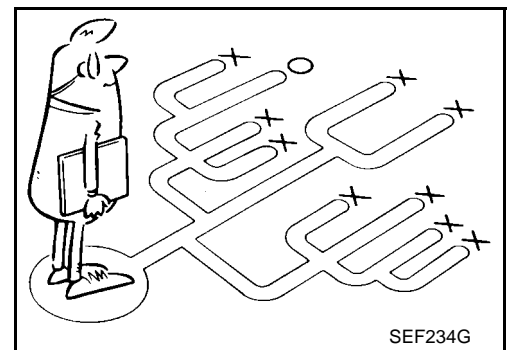
A visual check only, may not find the cause of the problems. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the "Work Flow". Refer to [AT-58, "Work Flow"](#).



Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a drive ability 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-54, "DIAGNOSTIC WORKSHEET"](#)) should be used.

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

**Also check related Service bulletins for information.**



**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		<input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent (    times a day)	

# TROUBLE DIAGNOSIS — INTRODUCTION

[EURO-OBD]

Symptoms	<input type="checkbox"/> Vehicle does not move. ( <input type="checkbox"/> Any position <input type="checkbox"/> Particular position)		A
	<input type="checkbox"/> No up-shift ( <input type="checkbox"/> 1st → 2nd <input type="checkbox"/> 2nd → 3rd <input type="checkbox"/> 3rd → O/D)		B
	<input type="checkbox"/> No down-shift ( <input type="checkbox"/> O/D → 3rd <input type="checkbox"/> 3rd → 2nd <input type="checkbox"/> 2nd → 1st)		AT
	<input type="checkbox"/> Lockup malfunction		D
	<input type="checkbox"/> Shift point too high or too low.		E
	<input type="checkbox"/> Shift shock or slip ( <input type="checkbox"/> N → D <input type="checkbox"/> Lockup <input type="checkbox"/> Any drive position)		F
	<input type="checkbox"/> Noise or vibration		G
	<input type="checkbox"/> No kick down		H
	<input type="checkbox"/> No pattern select		I
<input type="checkbox"/> Others ( )		J	
O/D OFF indicator lamp	Blinks for about 8 seconds.		K
	<input type="checkbox"/> Continuously lit	<input type="checkbox"/> Not lit	L
Malfunction indicator (MI)	<input type="checkbox"/> Continuously lit	<input type="checkbox"/> Not lit	M

## Diagnostic Worksheet

1.	<input type="checkbox"/> Read the Fail-safe and listen to customer complaints.	<a href="#">AT-54, "Information from Customer"</a>	
2.	<input type="checkbox"/> CHECK A/T FLUID	<a href="#">AT-61, "A/T Fluid Check"</a>	
	<input type="checkbox"/> Leakage (Follow specified procedure) <input type="checkbox"/> Fluid condition <input type="checkbox"/> Fluid level		
3.	<input type="checkbox"/> Perform STALL TEST and LINE PRESSURE TEST.	<a href="#">AT-62, "Stall Test", AT-65, "Fluid Pressure Test"</a>	
	<input type="checkbox"/> Stall test — Mark possible damaged components/others.		
	<table style="width: 100%; border: none;"> <tr> <td style="border: none; width: 50%; vertical-align: top;"> <input type="checkbox"/> Torque converter one-way clutch  <input type="checkbox"/> Reverse clutch  <input type="checkbox"/> Forward clutch  <input type="checkbox"/> Overrun clutch  <input type="checkbox"/> Forward one-way clutch                 </td> <td style="border: none; width: 50%; vertical-align: top;"> <input type="checkbox"/> Low &amp; reverse brake  <input type="checkbox"/> Low one-way clutch  <input type="checkbox"/> Engine  <input type="checkbox"/> Line pressure is low  <input type="checkbox"/> Clutches and brakes except high clutch and brake band are OK                 </td> </tr> </table>		<input type="checkbox"/> Torque converter one-way clutch <input type="checkbox"/> Reverse clutch <input type="checkbox"/> Forward clutch <input type="checkbox"/> Overrun clutch <input type="checkbox"/> Forward one-way clutch
<input type="checkbox"/> Torque converter one-way clutch <input type="checkbox"/> Reverse clutch <input type="checkbox"/> Forward clutch <input type="checkbox"/> Overrun clutch <input type="checkbox"/> Forward one-way clutch	<input type="checkbox"/> Low & reverse brake <input type="checkbox"/> Low one-way clutch <input type="checkbox"/> Engine <input type="checkbox"/> Line pressure is low <input type="checkbox"/> Clutches and brakes except high clutch and brake band are OK		
	<input type="checkbox"/> Line Pressure test — Suspected parts:		

# TROUBLE DIAGNOSIS — INTRODUCTION

**[EURO-OBD]**

4.	<input type="checkbox"/> Perform all ROAD TEST and mark required procedures.		<a href="#">AT-66. "Road Test"</a>
4-1.	Check before engine is started. <input type="checkbox"/> SELF-DIAGNOSTIC PROCEDURE/DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE. — Mark detected items.	<input type="checkbox"/> PNP switch, <a href="#">AT-110</a> . <input type="checkbox"/> A/T fluid temperature sensor, <a href="#">AT-116</a> . <input type="checkbox"/> Vehicle speed sensor-A/T (Revolution sensor), <a href="#">AT-122</a> . <input type="checkbox"/> Engine speed signal, <a href="#">AT-127</a> . <input type="checkbox"/> Torque converter clutch solenoid valve, <a href="#">AT-158</a> . <input type="checkbox"/> Line pressure solenoid valve, <a href="#">AT-163</a> . <input type="checkbox"/> Shift solenoid valve A, <a href="#">AT-170</a> . <input type="checkbox"/> Shift solenoid valve B, <a href="#">AT-175</a> . <input type="checkbox"/> Accelerator pedal position (App) sensor, <a href="#">AT-180</a> . <input type="checkbox"/> Overrun clutch solenoid valve, <a href="#">AT-185</a> . <input type="checkbox"/> PNP & overdrive control switches, and throttle position sensor, <a href="#">AT-236</a> . <input type="checkbox"/> Batt/fluid temp sen (A/T fluid temperature sensor and TCM power source), <a href="#">AT-193</a> . <input type="checkbox"/> Vehicle speed sensor-MTR, <a href="#">AT-122</a> . <input type="checkbox"/> CAN communication line, <a href="#">AT-106</a> . <input type="checkbox"/> Control unit (RAM), control unit (ROM), <a href="#">AT-203</a> . <input type="checkbox"/> Control unit (EEP ROM), <a href="#">AT-205</a> . <input type="checkbox"/> Battery <input type="checkbox"/> Others	<a href="#">AT-67. "1. CHECK BEFORE ENGINE IS STARTED"</a>
4-2.	Check at idle <input type="checkbox"/> 1. O/D OFF Indicator Lamp Does Not Come On, <a href="#">AT-209</a> . <input type="checkbox"/> 2. Engine Cannot Be Started In "P" And "N" Position, <a href="#">AT-210</a> . <input type="checkbox"/> 3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed, <a href="#">AT-211</a> . <input type="checkbox"/> 4. In "N" Position, Vehicle Moves, <a href="#">AT-211</a> . <input type="checkbox"/> 5. Large Shock. "N" → "R" Position, <a href="#">AT-212</a> . <input type="checkbox"/> 6. Vehicle Does Not Creep Backward In "R" Position, <a href="#">AT-213</a> . <input type="checkbox"/> 7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position, <a href="#">AT-216</a> .	<a href="#">AT-68. "2. CHECK AT IDLE"</a>	



# TROUBLE DIAGNOSIS — INTRODUCTION

[EURO-OBD]

4.	4-3.	Cruise test	<a href="#">AT-71. "3. CRUISE TEST"</a>	A
		<b>Part-1</b> <input type="checkbox"/> 8. Vehicle Cannot Be Started From D1 , <a href="#">AT-218</a> . <input type="checkbox"/> 9. A/T Does Not Shift: D1 → D2 Or Does Not Kickdown: D4 → D2 , <a href="#">AT-221</a> . <input type="checkbox"/> 10. A/T Does Not Shift: D2 → D3 , <a href="#">AT-223</a> . <input type="checkbox"/> 11. A/T Does Not Shift: D3 → D4 , <a href="#">AT-225</a> . <input type="checkbox"/> 12. A/T Does Not Perform Lock-up, <a href="#">AT-228</a> . <input type="checkbox"/> 13. A/T Does Not Hold Lock-up Condition, <a href="#">AT-229</a> . <input type="checkbox"/> 14. Lock-up Is Not Released, <a href="#">AT-231</a> . <input type="checkbox"/> 15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3 ) , <a href="#">AT-231</a> .	<a href="#">AT-75. "Cruise Test — Part 1"</a>	B
		<b>Part-2</b> <input type="checkbox"/> 16. Vehicle Does Not Start From D1 , <a href="#">AT-233</a> . <input type="checkbox"/> 9. A/T Does Not Shift: D1 → D2 Or Does Not Kickdown: D4 → D2 , <a href="#">AT-221</a> . <input type="checkbox"/> 10. A/T Does Not Shift: D2 → D3 , <a href="#">AT-223</a> . <input type="checkbox"/> 11. A/T Does Not Shift: D3 → D4 , <a href="#">AT-225</a> .	<a href="#">AT-78. "Cruise Test — Part 2"</a>	D
		<b>Part-3</b> <input type="checkbox"/> 17. A/T Does Not Shift: D4 → D3 When Overdrive Control Switch "ON" → "OFF", <a href="#">AT-233</a> . <input type="checkbox"/> 15. Engine Speed Does Not Return To Idle (Engine Brake In D3 ) , <a href="#">AT-231</a> . <input type="checkbox"/> 18. A/T Does Not Shift: D3 → 22 , When Selector Lever "D" → "2" Position, <a href="#">AT-234</a> . <input type="checkbox"/> 15. Engine Speed Does Not Return To Idle (Engine Brake In 22 ) , <a href="#">AT-231</a> . <input type="checkbox"/> 19. A/T Does Not Shift: 22 → 11 , When Selector Lever "2" → "1" Position, <a href="#">AT-235</a> . <input type="checkbox"/> 20. Vehicle Does Not Decelerate By Engine Brake, <a href="#">AT-235</a> . <input type="checkbox"/> 21. TCM Self-diagnosis Does Not Activate (PNP & Overdrive control switches, and throttle position sensor circuit checks), <a href="#">AT-236</a> . <input type="checkbox"/> SELF-DIAGNOSTIC PROCEDURE/DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE — Mark detected items.	<a href="#">AT-80. "Cruise Test — Part 3"</a>	F
		<input type="checkbox"/> PNP switch, <a href="#">AT-110</a> . <input type="checkbox"/> A/T fluid temperature sensor, <a href="#">AT-116</a> . <input type="checkbox"/> Vehicle speed sensor-A/T (Revolution sensor), <a href="#">AT-122</a> . <input type="checkbox"/> Engine speed signal, <a href="#">AT-127</a> . <input type="checkbox"/> Torque converter clutch solenoid valve, <a href="#">AT-158</a> . <input type="checkbox"/> Line pressure solenoid valve, <a href="#">AT-163</a> . <input type="checkbox"/> Shift solenoid valve A, <a href="#">AT-170</a> . <input type="checkbox"/> Shift solenoid valve B, <a href="#">AT-175</a> . <input type="checkbox"/> Accelerator pedal position (App) sensor, <a href="#">AT-180</a> . <input type="checkbox"/> Overrun clutch solenoid valve, <a href="#">AT-185</a> . <input type="checkbox"/> PNP & overdrive control switches, and throttle position sensor, <a href="#">AT-236</a> . <input type="checkbox"/> A/T fluid temperature sensor and TCM power source, <a href="#">AT-193</a> . <input type="checkbox"/> Vehicle speed sensor-MTR, <a href="#">AT-122</a> . <input type="checkbox"/> CAN communication line, <a href="#">AT-106</a> . <input type="checkbox"/> Control unit (RAM), control unit (ROM), <a href="#">AT-203</a> . <input type="checkbox"/> Control unit (EEP ROM), <a href="#">AT-205</a> . <input type="checkbox"/> Battery <input type="checkbox"/> Others		I
5.		<input type="checkbox"/> For self-diagnosis NG items, inspect each component. Repair or replace the damaged parts.	<a href="#">AT-48. "Diagnostic Procedure Without CONSULT-II"</a>	M
6.		<input type="checkbox"/> Perform all ROAD TEST and re-mark required procedures.	<a href="#">AT-66. "Road Test"</a>	
7.		<input type="checkbox"/> Perform DTC CONFIRMATION PROCEDURE for following MI indicating items and check out NG items. Refer to "EC-XX", "Emission-related Diagnostic Information".  <input type="checkbox"/> DTC (P0731) A/T 1st gear function, <a href="#">AT-131</a> . <input type="checkbox"/> DTC (P0732) A/T 2nd gear function, <a href="#">AT-138</a> . <input type="checkbox"/> DTC (P0733) A/T 3rd gear function, <a href="#">AT-144</a> . <input type="checkbox"/> DTC (P0734) A/T 4th gear function, <a href="#">AT-150</a> .	EC section	

# TROUBLE DIAGNOSIS — INTRODUCTION

[EURO-OBD]

8.	<input type="checkbox"/> 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.)	<a href="#">AT-7. "Service Notice or Precautions"</a>
9.	<input type="checkbox"/> Erase DTC from TCM and ECM memories.	<a href="#">AT-37. "HOW TO ERASE DTC"</a>

## Work Flow

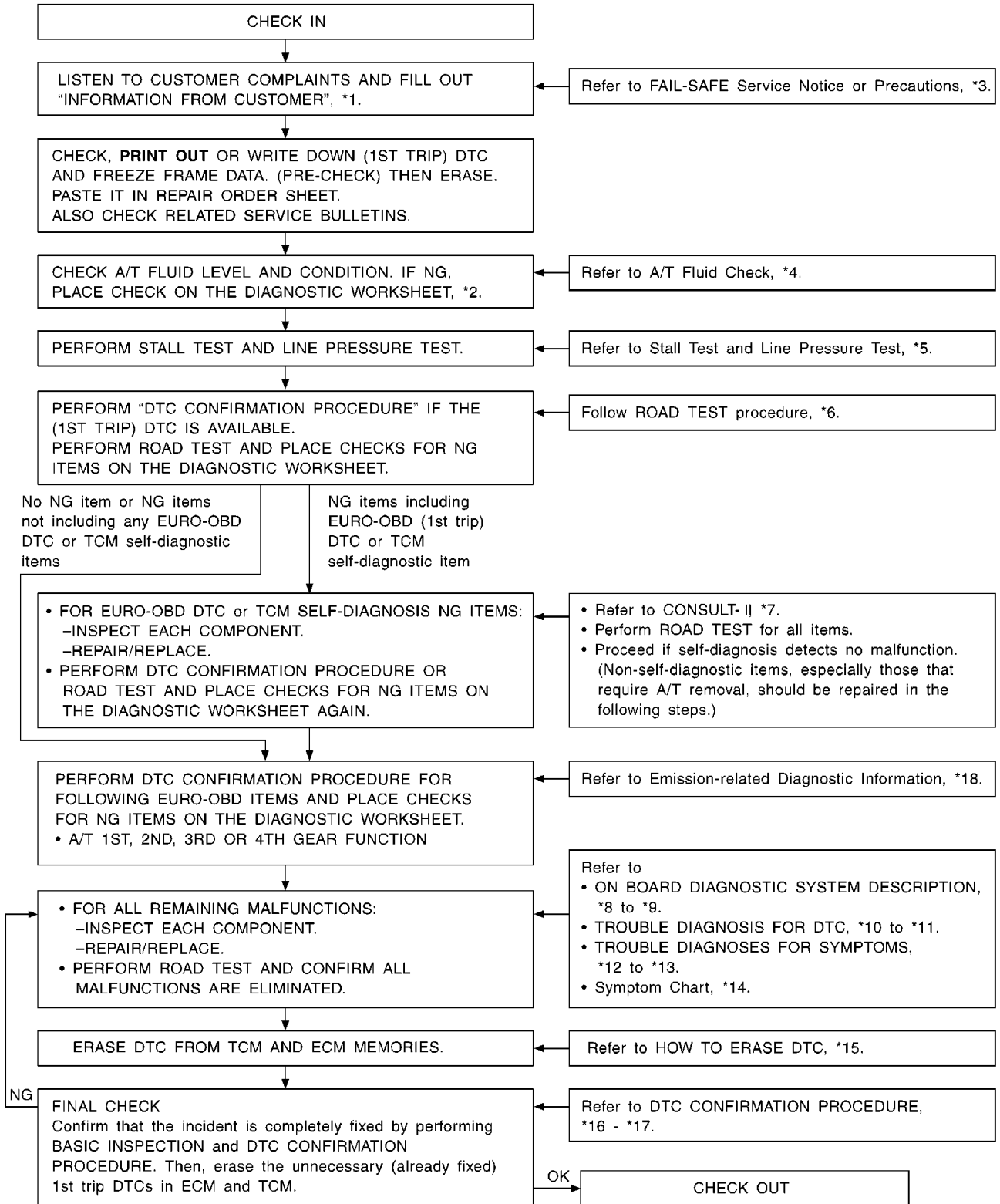
ECS005V1

### HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

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-54](#)) and "DIAGNOSTIC WORKSHEET" ([AT-55](#)), to perform the best troubleshooting possible.

## WORK FLOW CHART



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# TROUBLE DIAGNOSIS — INTRODUCTION

[EURO-OBD]

- 
- \*1: [AT-54, "Information from Customer"](#)   \*2: [AT-55, "Diagnostic Worksheet"](#)   \*3: [AT-7, "Service Notice or Precautions"](#)
- \*4: [AT-61, "A/T Fluid Check"](#)   \*5: [AT-62, "Stall Test"](#) and [AT-65, "Fluid Pressure Test"](#)   \*6: [AT-66, "Road Test"](#)
- \*7: [AT-39, "CONSULT-II"](#)   \*8: [AT-35, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"](#)   \*9: [AT-48, "Diagnostic Procedure Without CONSULT-II"](#)
- \*10: [AT-110, "DTC P0705 PARK/NEUTRAL POSITION \(PNP\) SWITCH"](#)   \*11: [AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T \(REVOLUTION SENSOR\)"](#) and [AT-203, "DTC CONTROL UNIT \(RAM\), CONTROL UNIT \(ROM\)"](#) to [AT-205, "DTC CONTROL UNIT\(EEPROM\)"](#)   \*12: [AT-209, "1. O/D OFF Indicator Lamp Does Not Come On"](#)
- \*13: [AT-235, "20. Vehicle Does Not Decelerate By Engine Brake"](#)   \*14: [AT-7, "Service Notice or Precautions"](#)   \*15: [AT-37, "HOW TO ERASE DTC"](#)
- \*16: [AT-110, "DTC P0705 PARK/NEUTRAL POSITION \(PNP\) SWITCH"](#)   \*17: [AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T \(REVOLUTION SENSOR\)"](#) and [AT-203, "DTC CONTROL UNIT \(RAM\), CONTROL UNIT \(ROM\)"](#) to [AT-205, "DTC CONTROL UNIT\(EEPROM\)"](#)   \*18: [EC-593, "Emission-related Diagnostic Information"](#)

TRUBLE DIAGNOSIS — BASIC INSPECTION

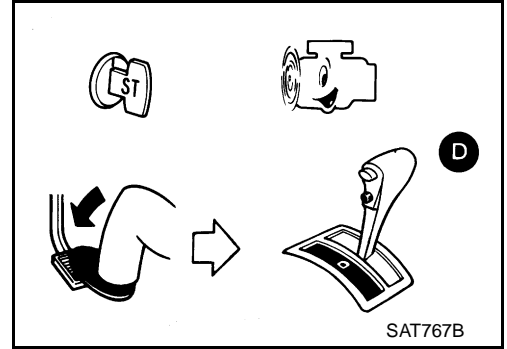
PFP:00000

A/T Fluid Check

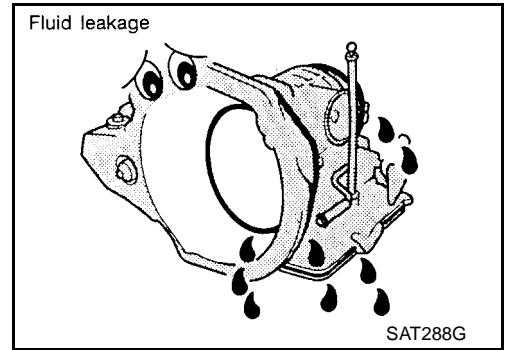
ECS005V2

FLUID LEAKAGE CHECK

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.

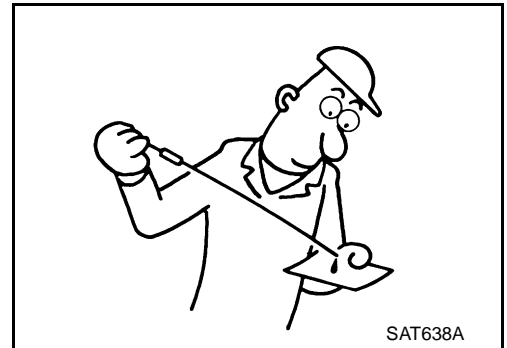


FLUID CONDITION CHECK

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 [AT-12, "Checking A/T Fluid"](#) .



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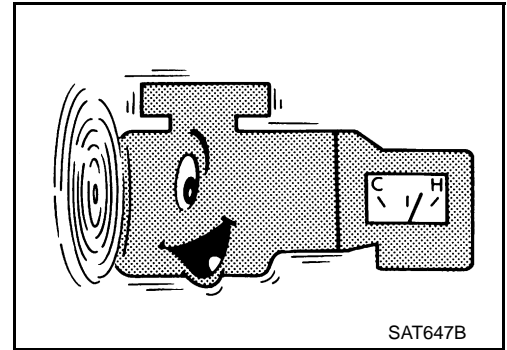
## Stall Test

### STALL TEST PROCEDURE

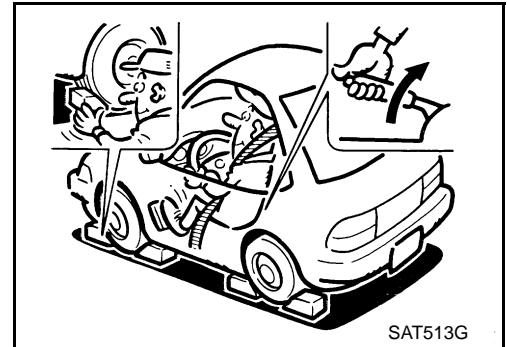
1. Check A/T fluid and engine oil levels. If necessary, add.
2. Drive vehicle for approx. 10 minutes or until fluid and oil reach operating temperature.

**ATF operating temperature:**

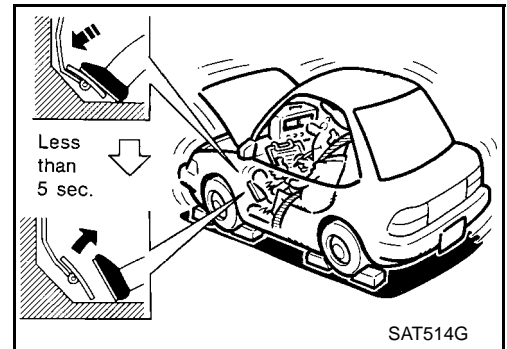
**50 - 80°C (122 - 176°F)**



3. 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.**



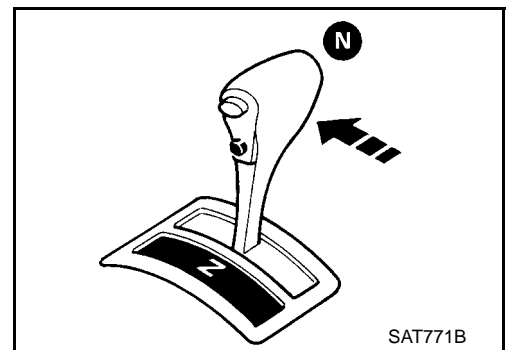
5. Start engine, apply foot brake, and place selector lever in D position.
6. Accelerate to wide open throttle gradually while applying foot brake.
7. Quickly note the engine stall revolution and immediately release throttle.
  - **During test, never hold throttle wide open for less than 5 seconds.**



#### Stall revolution:

QG18DE	2,300 - 2,750 rpm
--------	-------------------

8. Move selector lever to "N" position.
9. Cool off ATF.
  - **Run engine at idle for at least one minute.**
10. 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 WORK FLOW shown in [AT-58, "Work Flow"](#) (EURO-OBD).

**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
- 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".

**Stall revolution less than specifications:**

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

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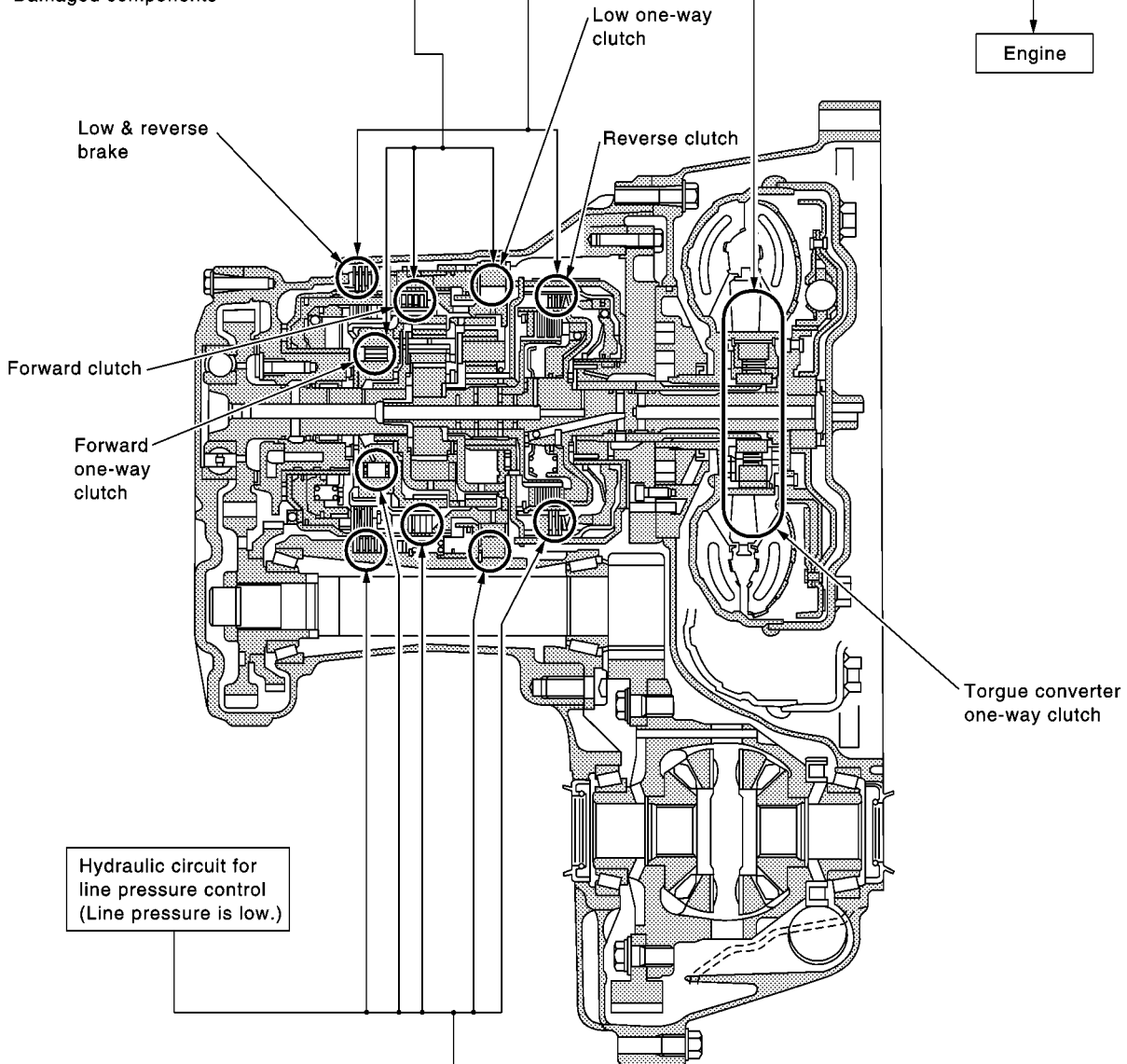
# TROUBLE DIAGNOSIS — BASIC INSPECTION

[EURO-OBD]

Selector lever position	Judgement		
D	H	O	L
2	H	O	L
1	H	O	L
R	O	H	L

O : Stall revolution is normal.  
 H : Stall revolution is higher than specified.  
 L : Stall revolution is lower than specified.

Damaged components



Hydraulic circuit for line pressure control  
(Line pressure is low.)

Clutches and brakes except high clutch, brake band and overrun clutch are OK.  
(Condition of high clutch, brake band and overrun clutch cannot be confirmed by stall test.)

D	H	O
2	H	O
1	H	O
R	H	O
Selector lever position	Judgement	

SCIA0707E

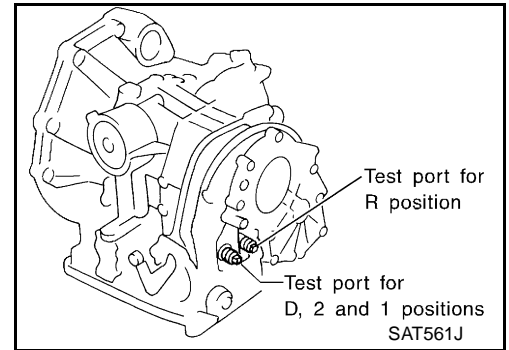


## Fluid Pressure Test

### LINE PRESSURE TEST PORTS

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

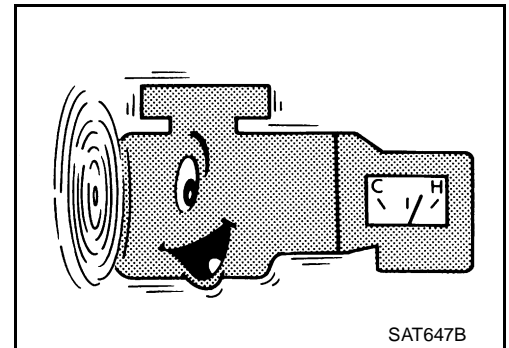
- Always replace pressure plugs as they are self-sealing bolts.



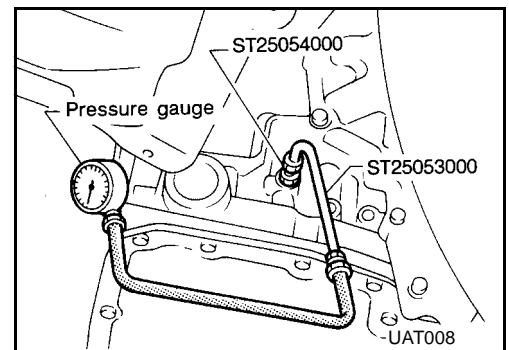
### LINE PRESSURE TEST PROCEDURE

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

**ATF operating temperature: 50 - 80°C (122 -176°F)**

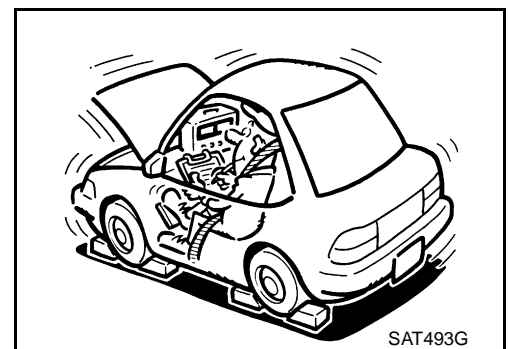


3. Install pressure gauge to corresponding line pressure port.



4. Set parking brake and block wheels.
  - Continue to depress brake pedal fully while line pressure test is being performed at stall speed.
5. Start engine and measure line pressure at idle and stall speed.
  - When measuring line pressure at stall speed, follow the stall test procedure.

Line pressure: Refer to [AT-517. "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).



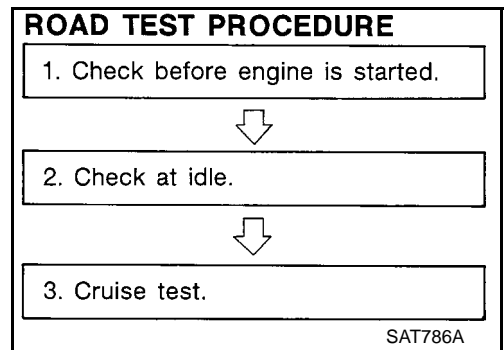
## JUDGEMENT OF LINE PRESSURE TEST

	Judgement	Suspected parts
At idle	Line pressure is low in all positions.	<ul style="list-style-type: none"> <li>● Oil pump wear</li> <li>● Control piston damage</li> <li>● Pressure regulator valve or plug sticking</li> <li>● Spring for pressure regulator valve damaged</li> <li>● Fluid pressure leakage between oil strainer and pressure regulator valve</li> <li>● Clogged strainer</li> </ul>
	Line pressure is low in particular position.	<ul style="list-style-type: none"> <li>● Fluid pressure leakage between manual valve and particular clutch</li> <li>● For example, line pressure is:                             <ul style="list-style-type: none"> <li>– Low in “R” and “1” positions, but</li> <li>– Normal in “D” and “2” positions.</li> </ul>                             Therefore, fluid leakage exists at or around low and reverse brake circuit.                         </li> </ul> Refer to <a href="#">AT-17, "Shift Mechanism"</a> .
	Line pressure is high.	<ul style="list-style-type: none"> <li>● Maladjustment of throttle position sensor</li> <li>● A/T fluid temperature sensor damaged</li> <li>● Line pressure solenoid valve sticking</li> <li>● Short circuit of line pressure solenoid valve circuit</li> <li>● Pressure modifier valve sticking</li> <li>● Pressure regulator valve or plug sticking</li> <li>● Open in dropping resistor circuit</li> </ul>
At stall speed	Line pressure is low.	<ul style="list-style-type: none"> <li>● Maladjustment of throttle position sensor</li> <li>● Line pressure solenoid valve sticking</li> <li>● Short circuit of line pressure solenoid valve circuit</li> <li>● Pressure regulator valve or plug sticking</li> <li>● Pressure modifier valve sticking</li> <li>● Pilot valve sticking</li> </ul>

### Road Test DESCRIPTION

ECS005V5

- 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
  - 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 the following items.



	ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION	TROUBLE DIAGNOSES FOR SYMPTOMS
EURO-OBD	<a href="#">AT-35, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"</a> to <a href="#">AT-48, "Diagnostic Procedure Without CONSULT-II"</a>	<a href="#">AT-209, "1. O/D OFF Indicator Lamp Does Not Come On"</a> to <a href="#">AT-236, "21. TCM Self-diagnosis Does Not Activate (PNP &amp; Overdrive Control Switches, and Throttle Position Sensor Circuit Checks)"</a>

## 1. CHECK BEFORE ENGINE IS STARTED

### 1. CHECK O/D OFF INDICATOR LAMP

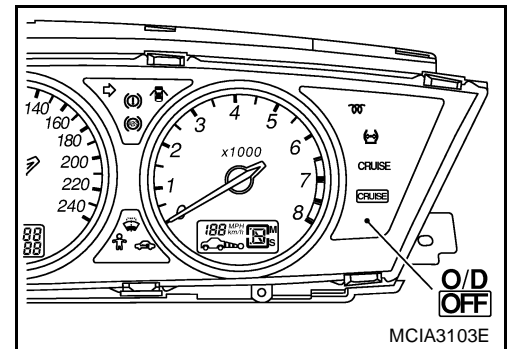
1. Park vehicle on flat surface.
2. Turn ignition switch to "OFF" position.
3. Move selector lever to "P" position.
4. Set overdrive control switch to "ON" position.
5. Turn ignition switch to "ON" position. (Do not start engine.)



6. 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 "1. O/D OFF Indicator Lamp Does Not Come On", [AT-209](#) .

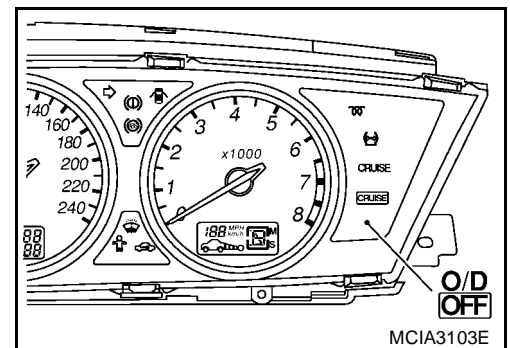


### 2. CHECK O/D OFF INDICATOR LAMP

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

Yes or No

- Yes >> Perform self-diagnosis and check NG items on the [AT-54, "DIAGNOSTIC WORKSHEET"](#) . Refer to [AT-49, "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-49, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) .  
 3. Go to "2. CHECK AT IDLE", [AT-68](#) .



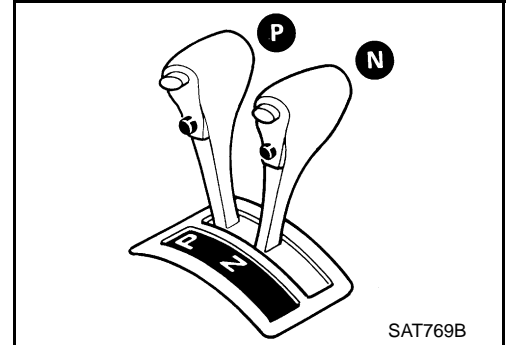
2. CHECK AT IDLE

1. CHECK ENGINE START

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

Yes or No

- Yes >> GO TO 2  
 No >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to "2 Engine Cannot Be Started In "P" and "N" Position", [AT-210](#) . Continue ROAD TEST.

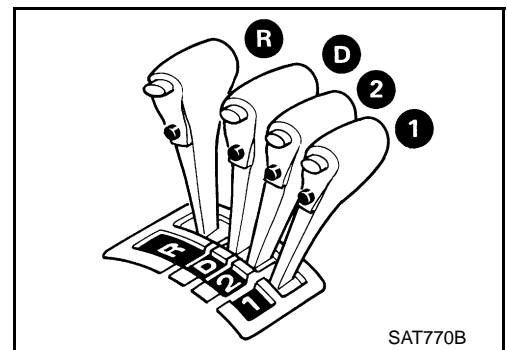


2. CHECK ENGINE START

1. Turn ignition switch to "OFF" position.
2. Move selector lever to "D", "1", "2" or "R" position.
3. Turn ignition switch to "START" position.
4. Is engine started?

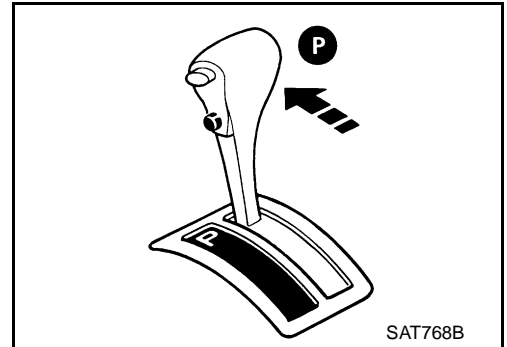
Yes or No

- Yes >> Mark the box on the DIAGNOSTIC WORKSHEET. Go To "2. Engine Cannot Be Started In "P" and "N" Position", [AT-210](#) . Continue ROAD TEST.  
 No >> GO TO 3



**3. CHECK VEHICLE MOVE**

1. Turn ignition switch to "OFF" position.
2. Move selector lever to "P" position.
3. Release parking brake.
4. Push vehicle forward or backward.



5. Does vehicle move when it is pushed forward or backward?

Yes or No

- Yes >> Mark the box on the DIAGNOSTIC WORKSHEET. Go To "3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed", [AT-211](#) . Continue ROAD TEST.
- No >> GO TO 4

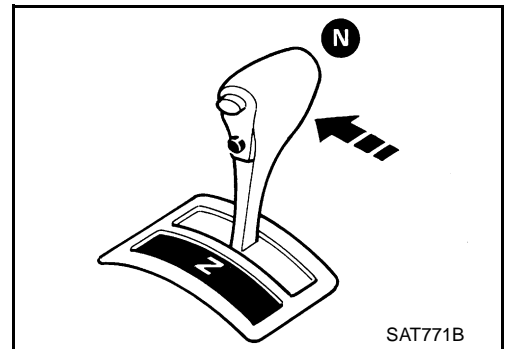


**4. CHECK VEHICLE MOVE**

1. Apply parking brake.
2. Move selector lever to "N" position.
3. Turn ignition switch to "START" position and start engine.
4. Release parking brake.
5. Does vehicle move forward or backward?

Yes or No

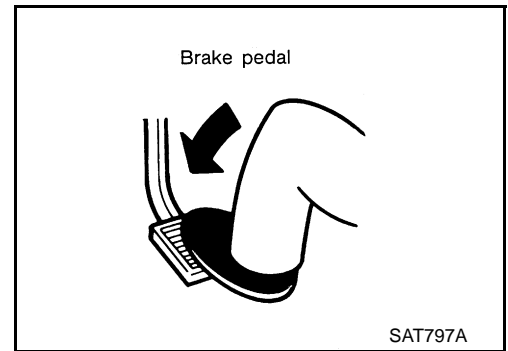
- Yes >> Mark the box on the DIAGNOSTIC WORKSHEET. Go To "4. In "N" Position, Vehicle Moves", [AT-211](#) . Continue ROAD TEST.
- No >> GO TO 5



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## 5. CHECK SHIFT SHOCK

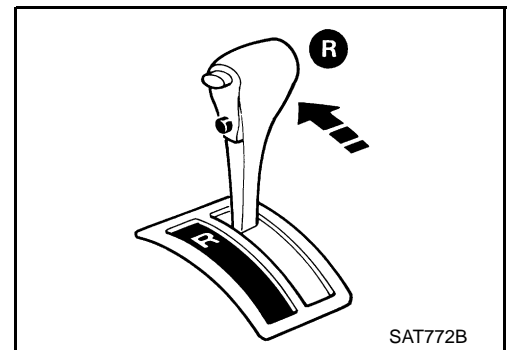
1. Apply foot brake.



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 "5. Large Shock "N" → "R" Position", [AT-212](#) . Continue ROAD TEST.
- No >> GO TO 6

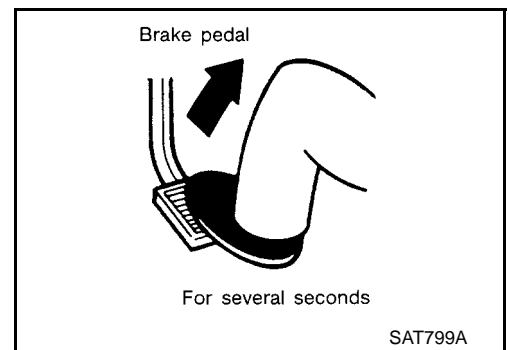


## 6. CHECK VEHICLE MOVE

1. 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 "6. Vehicle Does Not Creep Backward In "R" Position", [AT-213](#) . Continue ROAD TEST.

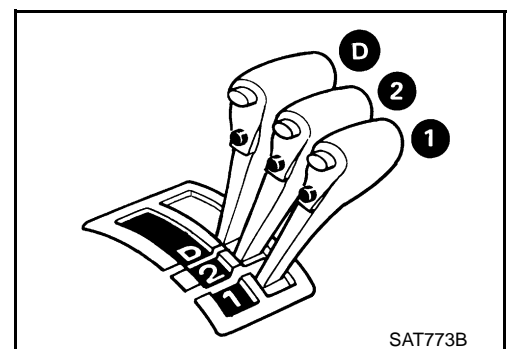


## 7. CHECK VEHICLE MOVE

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?

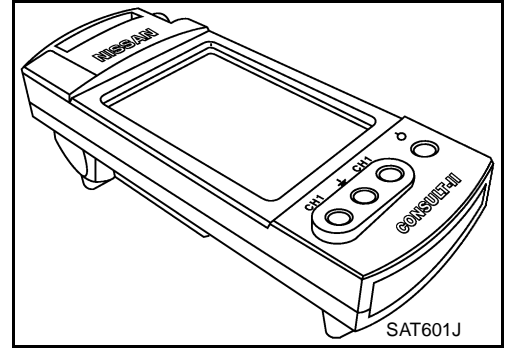
Yes or No

- Yes >> Go To "3. CRUISE TEST", [AT-71](#) .
- No >> Mark the box on the DIAGNOSTIC WORKSHEET. Go To "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position", [AT-216](#) . Continue ROAD TEST.



**3. CRUISE TEST**

- Check all items listed in Parts 1 through 3.



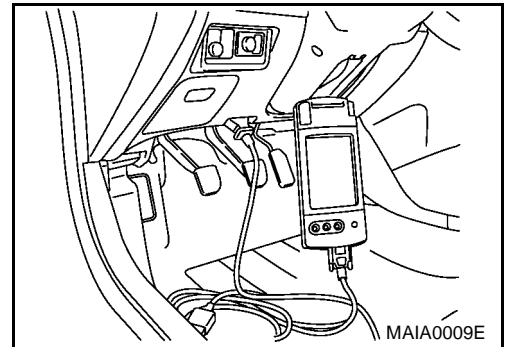
A  
B  
AT

**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.

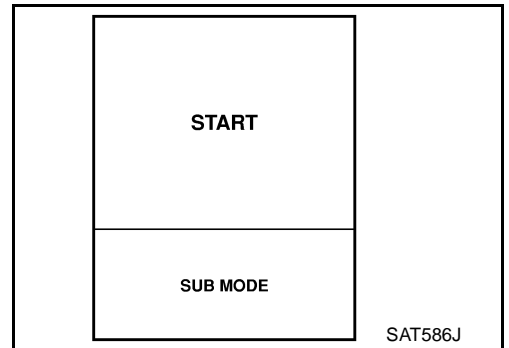
**CONSULT-II Setting Procedure**

1. 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".



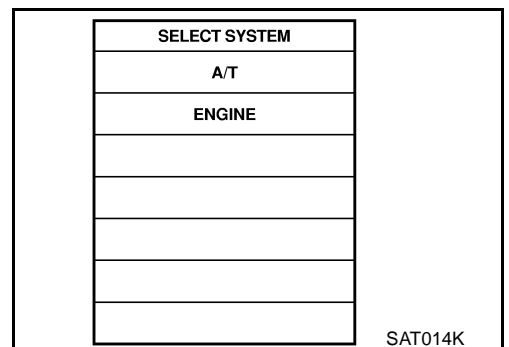
D  
E  
F  
G  
H  
I

4. Touch "START".



J  
K  
L  
M

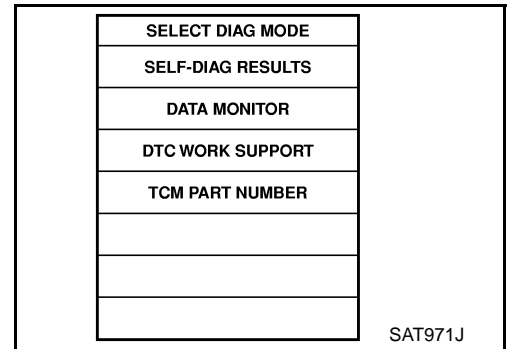
5. Touch "A/T".



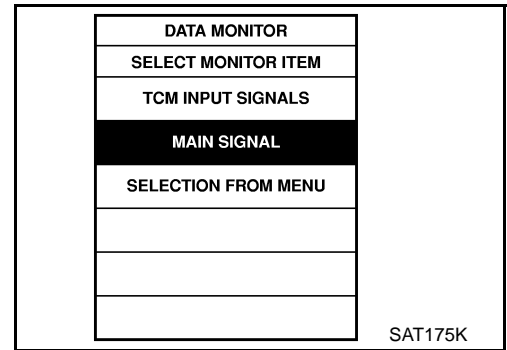
# TROUBLE DIAGNOSIS — BASIC INSPECTION

[EURO-OBD]

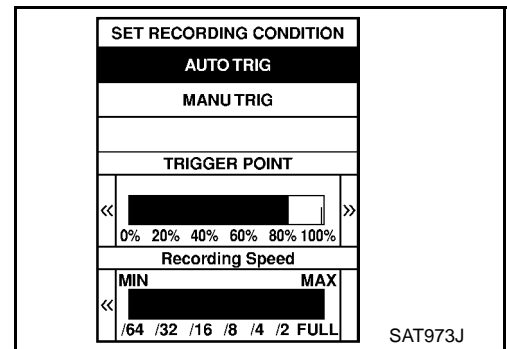
6. Touch "DATA MONITOR".



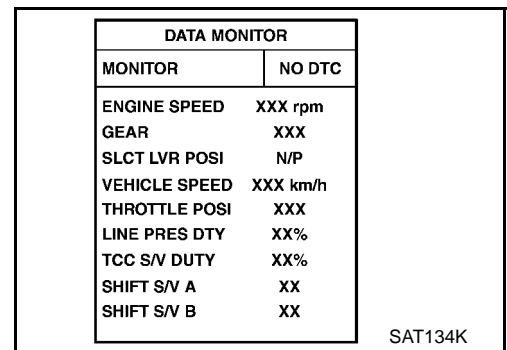
7. Touch "MAIN SIGNALS" or "TCM INPUT SIGNALS".  
 8. Select "Numerical Display", "Barchart Display" or "Line Graph Display".



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



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





# TROUBLE DIAGNOSIS — BASIC INSPECTION

[EURO-OBD]

12. After finishing cruise test part 1, touch “STOP”.

DATA MONITOR		
Recording Data	X%	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	

SAT135K

A  
B  
AT

13. Touch “STORE” and touch “BACK”.

REAL-TIME DIAG	
ENG SPEED SIG	

SAT987J

D  
E  
F  
G

14. Touch “DISPLAY”.

15. Touch “PRINT”.

16. Check the monitor data printed out.

17. Continue cruise test part 2 and 3.

STORE	
SYSTEM	SAVE REC DATA

SAT974J

H  
I  
J  
K

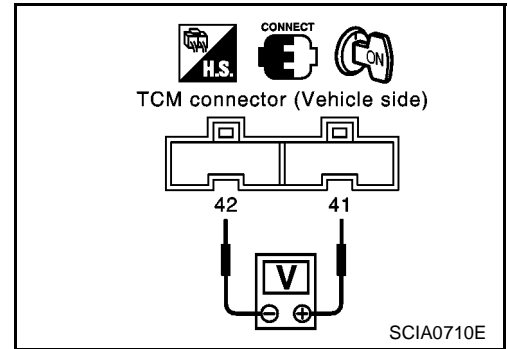
Trigger	VHCL S/SEN A/T	VHCL S/SEN MTR	THRTL POSI SEN
	km/h	km/h	v

SAT975J

L  
M

⊗ **Without CONSULT-II**

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



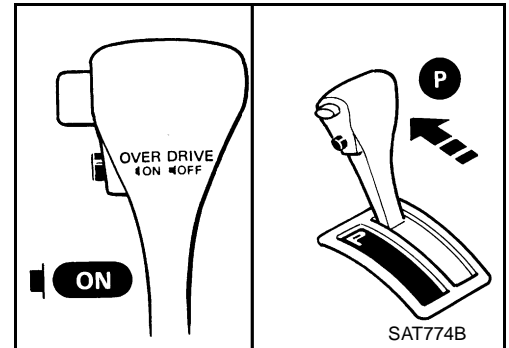
## Cruise Test — Part 1

### 1. CHECK STARTING GEAR (D1 ) POSITION

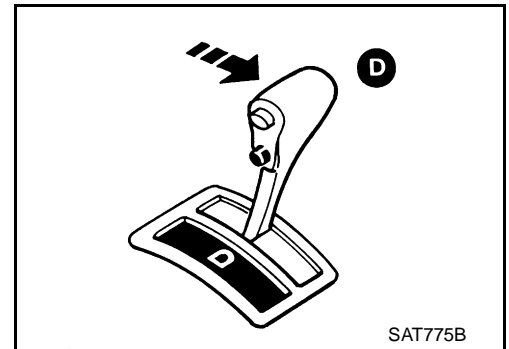
1. Drive vehicle for approx. 10 minutes to warm engine oil and ATF up to operating temperature.

**ATF operating temperature: 50 - 80°C (122 - 176°F)**

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



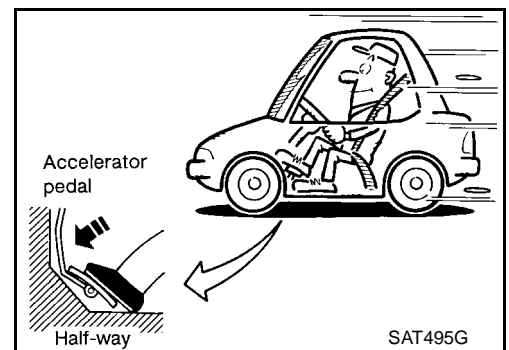
6. Move selector lever to "D" position.



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  
 No >> Go To "8. Vehicle Cannot Be Started From D1 ", [AT-218](#) .  
 Continue ROAD TEST.



**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.**

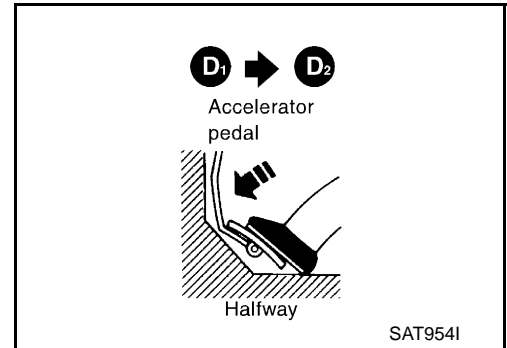
**Specified speed when shifting from D1 to D2 :**

**Refer to [AT-517](#), "Shift Schedule" .**

Yes or No

Yes >> GO TO 3

No >> Go To "9. A/T Does Not Shift: D1 → D2 Or Does Not Kickdown: D4 → D2 ", [AT-221](#) . 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.**

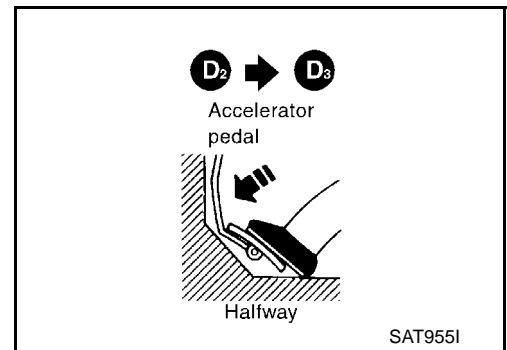
**Specified speed when shifting from D2 to D3 :**

**Refer to [AT-517](#), "Shift Schedule" .**

Yes or No

Yes >> GO TO 4

No >> Go To "10. A/T Does Not Shift: D2 → D3 ", [AT-223](#) . Continue 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 position and vehicle speed.**

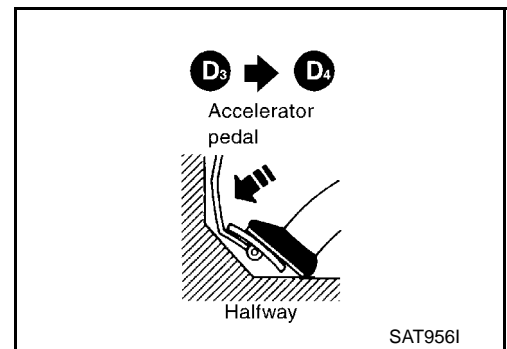
**Specified speed when shifting from D3 to D4 :**

**Refer to [AT-517](#), "Shift Schedule" .**

Yes or No

Yes >> GO TO 5

No >> Go To "11. A/T Does Not Shift: D3 → D4 ", [AT-225](#) . Continue ROAD TEST.



**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%.**

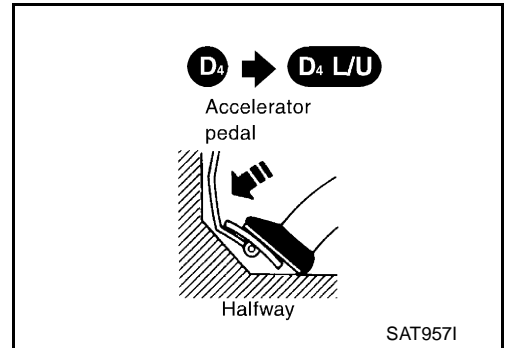
**Specified speed when lock-up occurs:**

Refer to [AT-517, "Shift Schedule"](#) .

Yes or No

Yes >> GO TO 6

No >> Go To "12. A/T Does Not Perform Lock-up", [AT-228](#) .  
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 "13. A/T Does Not Hold Lock-up Condition", [AT-229](#) .

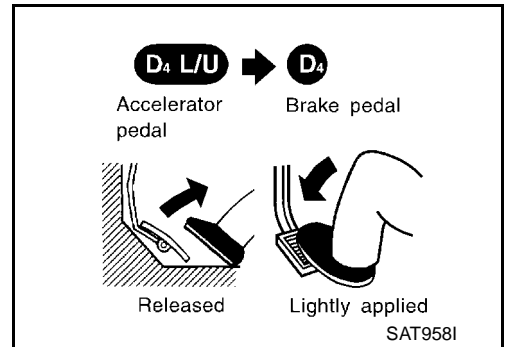
**7. CHECK SHIFT DOWN (D4 L/U TO D4 )**

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

Yes or No

Yes >> GO TO 8

No >> Go To "14. Lock-up Is Not Released", [AT-231](#) . Continue ROAD TEST.



**8. CHECK SHIFT DOWN (D4 TO D3 )**

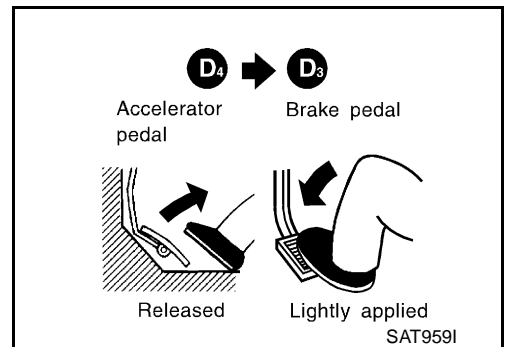
1. Decelerate vehicle by applying foot brake lightly.
2. Does engine speed return to idle smoothly when A/T is shifted from D4 to D3 ?

Ⓟ **Read gear position and engine speed.**

Yes or No

Yes >> 1. Stop vehicle.  
2. Go To "Cruise test — Part 2", [AT-78](#) .

No >> Go To "15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3 )", [AT-231](#) . Continue ROAD TEST.



Cruise Test — Part 2

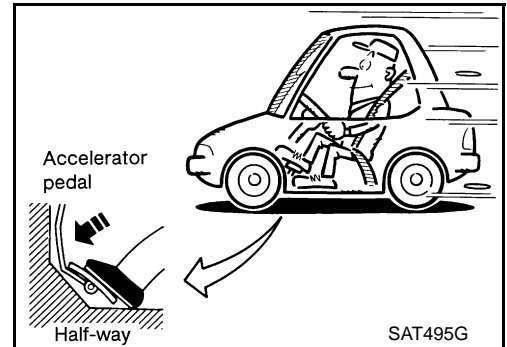
**1. CHECK STARTING GEAR (D1 ) POSITION**

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 "16. Vehicle Does Not Start From D1 ", [AT-233](#) .  
 Continue ROAD TEST.



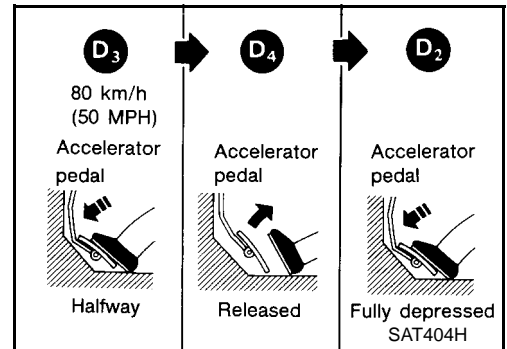
**2. CHECK SHIFT UP AND SHIFT DOWN (D3 TO D4 TO D2 )**

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 position.**

Yes or No

- Yes >> GO TO 3  
 No >> Go To "9. A/T Does Not Shift: D1 → D2 Or Does Not Kickdown: D4 → D2 ", [AT-221](#) . Continue ROAD TEST.



**3. CHECK SHIFT UP (D2 TO D3 )**

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

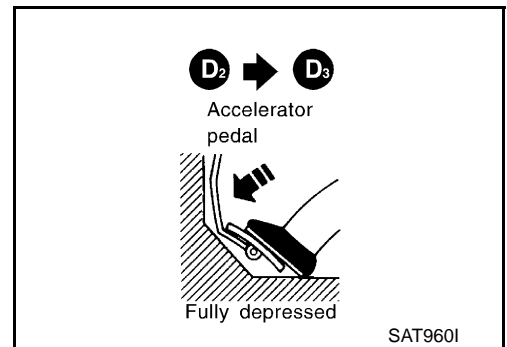
Ⓟ **Read gear position, throttle position and vehicle speed.**

**Specified speed when shifting from D2 to D3 :**

**Refer to [AT-517, "Shift Schedule"](#) .**

Yes or No

- Yes >> GO TO 4  
 No >> Go To "10. A/T Does Not Shift: D2 → D3 ", [AT-223](#) .  
 Continue ROAD TEST.



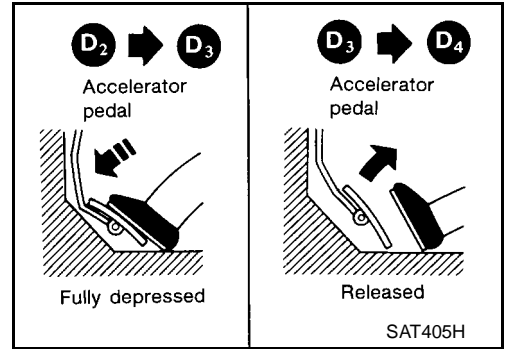
**4. CHECK SHIFT UP (D3 TO D4 ) AND ENGINE BRAKE**

Release accelerator pedal after shifting from D2 to D3 .  
 Does A/T shift from D3 to D4 and does vehicle decelerate by engine brake?

④ **Read gear position, throttle position and vehicle speed.**

Yes or No

- Yes >> 1. Stop vehicle.  
 2. Go To “Cruise test — Part 3”, [AT-80](#) .
- No >> Go To “11. A/T Does Not Shift: D3 → D4 ”, [AT-225](#) .  
 Continue ROAD TEST.

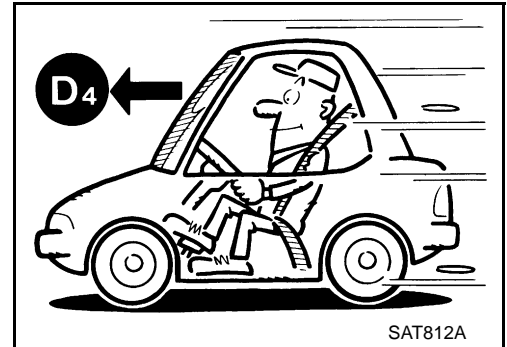


A  
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 I  
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 L  
 M

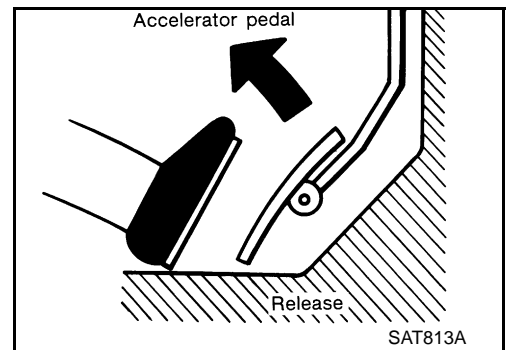
Cruise Test — Part 3

1. CHECK SHIFT DOWN (D4 TO D3)

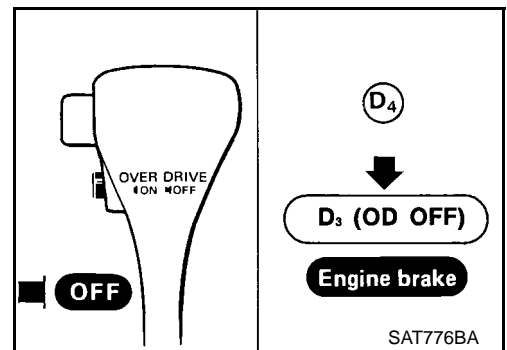
1. Confirm overdrive control switch is in "ON" position.
2. Confirm selector lever is in "D" position.
3. Accelerate vehicle using half-throttle to D4 .



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)?

Ⓟ **Read gear position and vehicle speed.**

Yes or No

Yes >> GO TO 2

No >> Go To "17. A/T Does Not Shift: D4 → D3 , When Overdrive Control Switch "ON" → "OFF", [AT-233](#)  
 . Continue ROAD TEST.

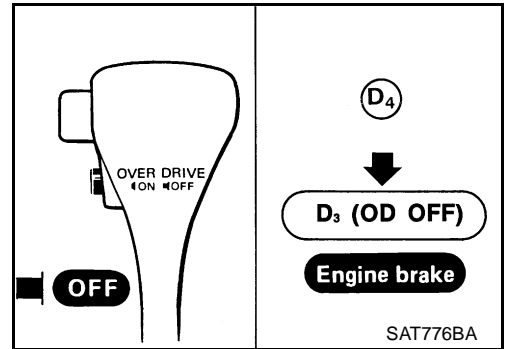


## 2. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

- Yes >> GO TO 3
- No >> Go To "15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3)", [AT-231](#) . Continue ROAD TEST.



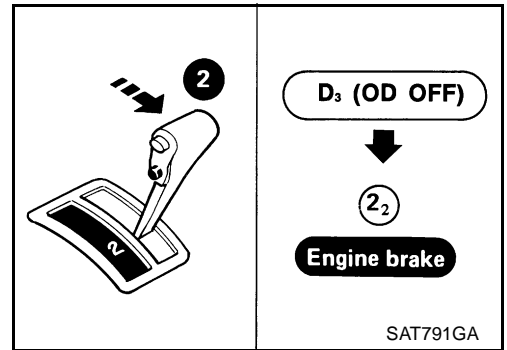
## 3. CHECK SHIFT DOWN (D3 TO D2)

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 2?

**Read gear position.**

Yes or No

- Yes >> GO TO 4
- No >> Go To "18. A/T Does Not Shift: D3 → D2 , When Selector Lever "D" → "2" Position", [AT-234](#) . Continue ROAD TEST.

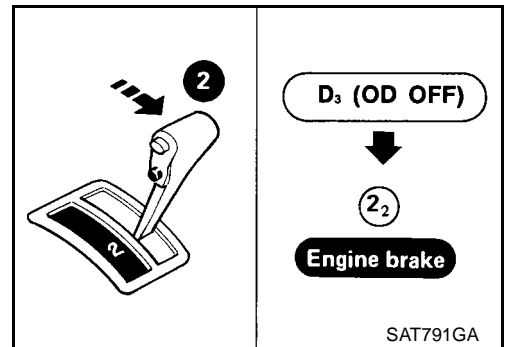


## 4. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

- Yes >> GO TO 5
- No >> Go To "15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3)", [AT-231](#) . Continue ROAD TEST.



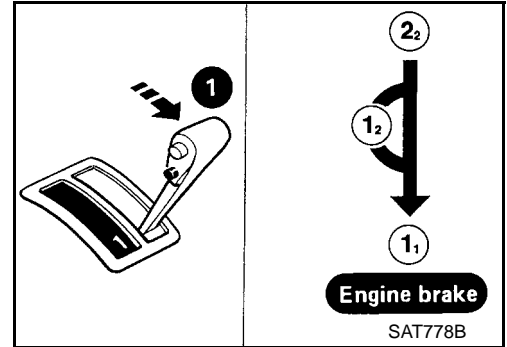
## 5. CHECK SHIFT DOWN

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 “19. A/T Does Not Shift: 22 → 11 , When Selector lever “2” → “1” Position”, [AT-235](#) . Continue ROAD TEST.

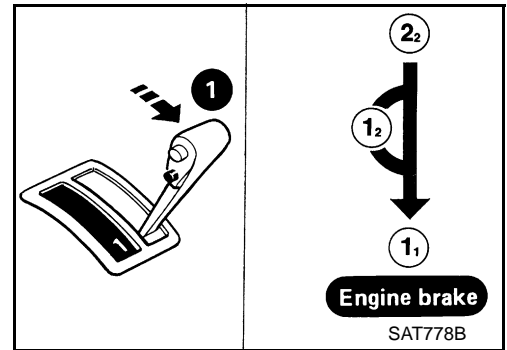


## 6. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

- Yes >> 1. Stop vehicle.  
 2. Perform self-diagnosis.  
 EURO-OBD: Refer to [AT-49, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) .
- No >> Go To “20. Vehicle Does Not Decelerate By Engine Brake”, [AT-235](#) . Continue ROAD TEST.



# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

## TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

PPF:00000

### Symptom Chart

EC5005V6

Numbers are arranged in order of inspection.  
Perform inspections starting with number one and work up.

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Engine cannot start in "P" and "N" positions. <a href="#">AT-210, "2. Engine Cannot Be Started In "P" and "N" Position"</a>	ON vehicle	1. Ignition switch and starter	<a href="#">PG-3, "POWER SUPPLY ROUTING", SC-22, "STARTING SYSTEM"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
Engine starts in position other than "N" and "P" positions. <a href="#">AT-210, "2. Engine Cannot Be Started In "P" and "N" Position"</a>	ON vehicle	1. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		2. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
Transaxle noise in "P" and "N" positions.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		3. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		4. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", <a href="#">AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a></a>
		5. Engine speed signal	<a href="#">AT-127, "DTC P0725 ENGINE SPEED SIGNAL"</a>
	OFF vehicle	6. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		7. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Vehicle moves when changing into "P" position, or parking gear does not disengage when shifted out of "P" position. <a href="#">AT-211, "3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed"</a>	ON vehicle	1. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
	OFF vehicle	2. Parking components	<a href="#">AT-411, "Output Shaft, Idler Gear, Reduction Pinion Gear and Bearing Retainer", AT-432, "REPAIR FOR COMPONENT PARTS"</a>
Vehicle runs in "N" position. <a href="#">AT-211, "4. In "N" Position, Vehicle Moves"</a>	ON vehicle	1. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
	OFF vehicle	2. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		3. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		4. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Vehicle will not run in "R" position (but runs in "D", "2" and "1" positions). Clutch slips. Very poor acceleration. <a href="#">AT-213, "6. Vehicle Does Not Creep Backward In "R" Position"</a>	ON vehicle	1. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		2. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		3. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
Vehicle will not run in "R" position (but runs in "D", "2" and "1" positions). Clutch slips. Very poor acceleration. <a href="#">AT-213, "6. Vehicle Does Not Creep Backward In "R" Position"</a>	OFF vehicle	5. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		8. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
Vehicle braked when shifting into "R" position.	ON vehicle	1. Fluid level	<a href="#">AT-61, "A/T Fluid Check"</a>
		2. Control cable adjustment	<a href="#">AT-65, "Fluid Pressure Test"</a>
		3. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		8. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Sharp shock in shifting from "N" to "D" position.	ON vehicle	1. Engine idling rpm	<a href="#">EC-54, "Idle Speed and Ignition Timing Check"</a> (With EURO-OBD), <a href="#">EC-588, "Idle Speed and Ignition Timing Check"</a> (Without EURO-OBD)
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		4. A/T fluid temp sen circ and TCM pow sour	<a href="#">AT-193, "DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
		5. Engine speed signal	<a href="#">AT-127, "DTC P0725 ENGINE SPEED SIGNAL"</a>
		6. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		7. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		8. Accumulator N-D	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	9. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
Vehicle will not run in "D" and "2" positions (but runs in "1" and "R" positions).	ON vehicle	1. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
	OFF vehicle	2. Low one-way clutch	<a href="#">AT-411, "OVERHAUL", AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Vehicle will not run in "D", "1", "2" positions (but runs in "R" position). Clutch slips. Very poor acceleration. <a href="#">AT-216, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"</a>	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		3. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. Accumulator N-D	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Vehicle will not run in "D", "1", "2" positions (but runs in "R" position). Clutch slips. Very poor acceleration. <a href="#">AT-216, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"</a>	OFF vehicle	6. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		7. High clutch	<a href="#">AT-457, "High Clutch"</a>
		8. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Forward one-way clutch	<a href="#">AT-411, "OVERHAUL"</a>
		10. Low one-way clutch	<a href="#">AT-411, "OVERHAUL", AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Clutches or brakes slip somewhat in starting.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		4. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		5. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		7. Accumulator N-D	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	8. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		10. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		11. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		12. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Excessive creep.	ON vehicle	1. Engine idling rpm	<a href="#">EC-54, "Idle Speed and Ignition Timing Check"</a> (With EURO-OBD), <a href="#">EC-588, "Idle Speed and Ignition Timing Check"</a> (Without EURO-OBD)

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
No creep at all. <a href="#">AT-213, "6. Vehicle Does Not Creep Backward In "R" Position"</a> and <a href="#">AT-216, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"</a>	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Line pressure test	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		3. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	4. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		5. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		6. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Failure to change gear from "D1 " to "D2 ".	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Shift solenoid valve A	<a href="#">AT-174, "SHIFT SOLENOID VALVE A"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
	OFF vehicle	6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>

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# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Failure to change gear from "D2" to "D3".	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Shift solenoid valve B	<a href="#">AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
	OFF vehicle	6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Failure to change gear from "D3" to "D4".	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		4. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
		5. A/T fluid temp sen circ and TCM pow sour	<a href="#">AT-193, "DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
	OFF vehicle	6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Too high a gear change point from "D1" to "D2", from "D2" to "D3", from "D3" to "D4". <a href="#">AT-221, "9. A/T Does Not Shift: D1 → D2 Or Does Not Kickdown: D4 → D2", AT-223, "10. A/T Does Not Shift: D2 → D3" and AT-225, "11. A/T Does Not Shift: D3 → D4"</a>	ON vehicle	1. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
		3. Shift solenoid valve A	<a href="#">AT-174, "SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"</a>



# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Gear change directly from "D1" to "D3" occurs.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Accumulator servo release	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	3. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Engine stops when shifting lever into "R", "D", "2" and "1".	ON vehicle	1. Engine idling rpm	<a href="#">EC-54, "Idle Speed and Ignition Timing Check"</a> (With EURO-OBD), <a href="#">EC-588, "Idle Speed and Ignition Timing Check"</a> (Without EURO-OBD)
		2. Torque converter clutch solenoid valve	<a href="#">AT-158, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
		3. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	4. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Too sharp a shock in change from "D1" to "D2".	ON vehicle	1. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		2. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		3. Accumulator servo release	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. A/T fluid temp sen circ and TCM pow sour	<a href="#">AT-193, "DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
	OFF vehicle	6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Too sharp a shock in change from "D2" to "D3".	ON vehicle	1. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		2. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		3. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	4. High clutch	<a href="#">AT-457, "High Clutch"</a>
		5. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Too sharp a shock in change from "D3" to "D4".	ON vehicle	1. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		2. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		3. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	4. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		5. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
Almost no shock or clutches slipping in change from "D1" to "D2".	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		4. Accumulator servo release	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Almost no shock or slipping in change from "D2" to "D3".	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	5. High clutch	<a href="#">AT-457, "High Clutch"</a>
		6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Almost no shock or slipping in change from "D3" to "D4".	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	5. High clutch	<a href="#">AT-457, "High Clutch"</a>
		6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Vehicle braked by gear change from "D1" to "D2".	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		3. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		4. High clutch	<a href="#">AT-457, "High Clutch"</a>
		5. Low one-way clutch	<a href="#">AT-411, "OVERHAUL", AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Vehicle braked by gear change from "D2" to "D3".	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Vehicle braked by gear change from "D3" to "D4".	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Overrun clutch	<a href="#">AT-366, "OVERRUN CLUTCH SOLENOID VALVE"</a>
		3. Forward one-way clutch	<a href="#">AT-411, "OVERHAUL"</a>
		4. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>

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# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Maximum speed not attained. Acceleration poor.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		3. Shift solenoid valve A	<a href="#">AT-174, "SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		7. High clutch	<a href="#">AT-457, "High Clutch"</a>
		8. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		9. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		10. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		11. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Failure to change gear from "D4" to "D3".	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Overrun clutch solenoid valve	<a href="#">AT-185, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"</a>
		4. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		5. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	7. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		8. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Failure to change gear from "D3" to "D2" or from "D4" to "D2".	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Failure to change gear from "D2" to "D1" or from "D3" to "D1".	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. Low one-way clutch	<a href="#">AT-411, "OVERHAUL", AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
		7. High clutch	<a href="#">AT-457, "High Clutch"</a>
		8. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Gear change shock felt during deceleration by releasing accelerator pedal.	ON vehicle	1. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		2. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		3. Overrun clutch solenoid valve	<a href="#">AT-185, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Too high a change point from "D4" to "D3", from "D3" to "D2", from "D2" to "D1".	ON vehicle	1. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
Kickdown does not operate when depressing pedal in "D4" within kick down vehicle speed.	ON vehicle	1. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
		3. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"</a>
Kickdown operates or engine overruns when depressing pedal in "D4" beyond kick down vehicle speed limit.	ON vehicle	1. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"</a>
Races extremely fast or slips in changing from "D4" to "D3" when depressing pedal.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Races extremely fast or slips in changing from "D4" to "D2" when depressing pedal.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		5. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		8. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
Races extremely fast or slips in changing from "D3" to "D2" when depressing pedal.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		6. A/T fluid temp sen circ and TCM pow sour	<a href="#">AT-193, "DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
	OFF vehicle	7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		8. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. High clutch	<a href="#">AT-457, "High Clutch"</a>

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# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Races extremely fast or slips in changing from "D4" or "D3" to "D1" when depressing pedal.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		7. Forward one-way clutch	<a href="#">AT-411, "OVERHAUL"</a>
		8. Low one-way clutch	<a href="#">AT-411, "OVERHAUL", AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Vehicle will not run in any position.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
	OFF vehicle	5. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		8. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		9. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
		10. Parking components	<a href="#">AT-411, "Output Shaft, Idler Gear, Reduction Pinion Gear and Bearing Retainer"</a>
Transmission noise in "D", "2", "1" and "R" positions.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>



# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Failure to change from "D3" to "22" when changing lever into "2" position. <a href="#">AT-234, "18. A/T Does Not Shift: D3 → 22, When Selector Lever "D" → "2" Position"</a>	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Overrun clutch solenoid valve	<a href="#">AT-185, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"</a>
		4. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		5. Shift solenoid valve B	<a href="#">AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		7. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
Failure to change from "D3" to "22" when changing lever into "2" position. <a href="#">AT-234, "18. A/T Does Not Shift: D3 → 22, When Selector Lever "D" → "2" Position"</a>	OFF vehicle	8. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		9. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
Gear change from "22" to "23" in "2" position.	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>

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# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Engine brake does not operate in "1" position. <a href="#">AT-233, "16. Vehicle Does Not Start From D1"</a>	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		4. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
		5. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		7. Overrun clutch solenoid valve	<a href="#">AT-185, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"</a>
	OFF vehicle	8. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
Gear change from "11" to "12" in "1" position.	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
Does not change from "12" to "11" in "1" position.	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
		3. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. Overrun clutch solenoid valve	<a href="#">AT-185, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"</a>
	OFF vehicle	6. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		7. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Large shock changing from "12" to "11" in "1" position.	ON vehicle	1. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	2. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
Transmission overheats.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Engine idling rpm	<a href="#">EC-54, "Idle Speed and Ignition Timing Check"</a> (With EURO-OBD), <a href="#">EC-588, "Idle Speed and Ignition Timing Check"</a> (Without EURO-OBD)
		3. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		4. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		5. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
Transmission overheats.	OFF vehicle	7. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		8. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		9. High clutch	<a href="#">AT-457, "High Clutch"</a>
		10. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		11. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		12. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		13. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		14. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
ATF shoots out during operation. White smoke emitted from exhaust pipe during operation.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		3. High clutch	<a href="#">AT-457, "High Clutch"</a>
		4. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		5. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		6. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		7. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Offensive smell at fluid charging pipe.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
		3. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		4. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		5. High clutch	<a href="#">AT-457, "High Clutch"</a>
		6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		7. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		8. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
Torque converter is not locked up.	ON vehicle	1. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
		3. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		4. Engine speed signal	<a href="#">AT-127, "DTC P0725 ENGINE SPEED SIGNAL"</a>
		5. A/T fluid temp sen circ and TCM pow sour	<a href="#">AT-193, "DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
		6. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		7. Torque converter clutch solenoid valve	<a href="#">AT-158, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
		8. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
Torque converter is not locked up.	OFF vehicle	9. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
Torque converter clutch piston slip.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
		4. Torque converter clutch solenoid valve	<a href="#">AT-158, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
		5. Line pressure solenoid valve	<a href="#">AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	7. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Lock-up point is extremely high or low. <a href="#">AT-228, "12. A/T Does Not Perform Lock-up"</a>	ON vehicle	1. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
		3. Torque converter clutch solenoid valve	<a href="#">AT-158, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>

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# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

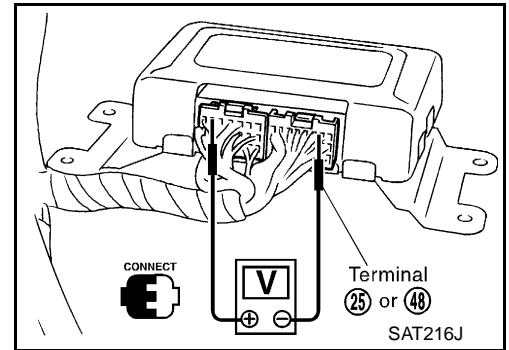
**[EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
			EURO-OBD
A/T does not shift to "D4" when driving with overdrive control switch "ON".	ON vehicle	1. Throttle position sensor [Accelerator pedal position (APP) sensor]	<a href="#">EC-55, "Accelerator Pedal Released Position Learning"</a>
		2. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		3. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)", AT-199, "DTC VEHICLE SPEED SENSOR MTR"</a>
		4. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		5. Overrun clutch solenoid valve	<a href="#">AT-185, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		7. A/T fluid temp sen circ and TCM pow sour	<a href="#">AT-193, "DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
		8. Line pressure test	<a href="#">AT-65, "Fluid Pressure Test"</a>
A/T does not shift to "D4" when driving with overdrive control switch "ON".	OFF vehicle	9. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		10. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
Engine is stopped at "R", "D", "2" and "1" positions.	ON vehicle	1. Fluid level	<a href="#">AT-61, "FLUID LEVEL CHECK"</a>
		2. Torque converter clutch solenoid valve	<a href="#">AT-158, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
		3. Shift solenoid valve A	<a href="#">AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>

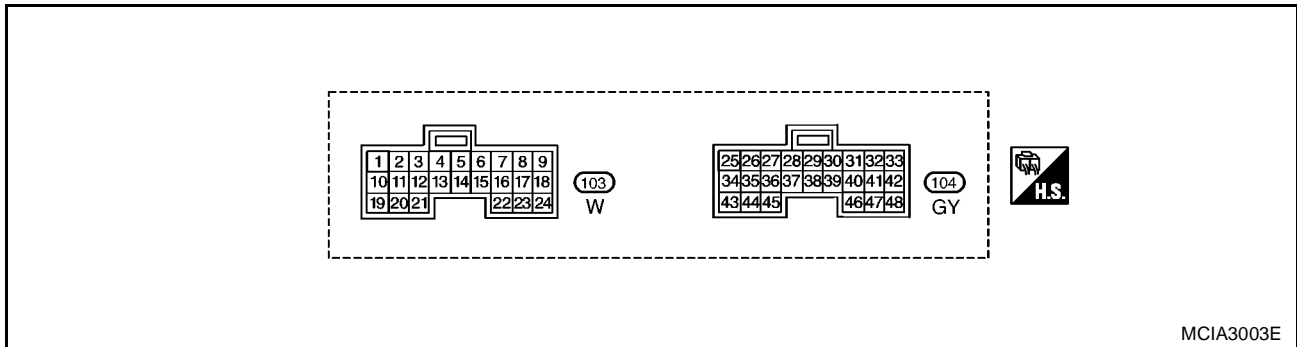
## TCM Terminals and Reference Value

### PREPARATION

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



### TCM HARNESS CONNECTOR TERMINAL LAYOUT



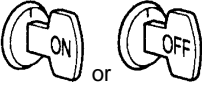

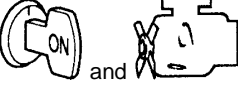
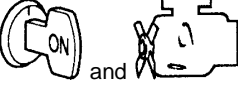
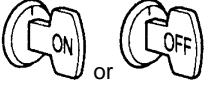

### TCM INSPECTION TABLE

(Data are reference values.)

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
1	R/W	Line pressure solenoid valve	When releasing accelerator pedal after warming up engine.	1.5 - 3.0V
			When depressing accelerator pedal fully after warming up engine.	0V
2	P/B	Line pressure solenoid valve (with dropping resistor)	When releasing accelerator pedal after warming up engine.	5 - 14V
			When depressing accelerator pedal fully after warming up engine.	0V
3	GY/R	Torque converter clutch solenoid valve	When A/T performs lock-up.	8 - 15V
			When A/T does not perform lock-up.	0V
5	B/W	CAN (H)	—	—
6	L/R	CAN (L)	—	—
10	BR/W	Power source	When turning ignition switch to "ON".	Battery voltage
			When turning ignition switch to "OFF".	0V

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

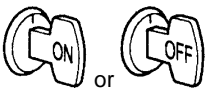




[EURO-OBD]

Terminal No.	Wire color	Item	Condition		Judgement standard(Approx.)
11	L/W	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in "D1 " or "D4 ".)	Battery voltage
				When shift solenoid valve A does not operate. (When driving in "D2 " or "D3 ".)	0V
12	L/Y	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in "D1 " or "D2 ".)	Battery voltage
				When shift solenoid valve B does not operate. (When driving in "D3 " or "D4 ".)	0V
13	R/L	O/D OFF indicator lamp		When setting overdrive control or A/T check switch in "OFF" position.	0V
				When setting overdrive control or A/T check switch in "ON" position.	Battery voltage
19	BR/W	Power source		Same as No. 10	
20	L/B	Overrun clutch solenoid valve		When overrun clutch solenoid valve operates.	Battery voltage
				When overrun clutch solenoid valve does not operate.	0V
22	L/OR	Overdrive control switch		When setting overdrive control switch in "ON" position	Battery voltage
				When setting overdrive control switch in "OFF" position	0V
25	B/W	Ground	—	—	0V
26	BR/Y	PNP switch "1" position		When setting selector lever to "1" position.	Battery voltage
				When setting selector lever to other positions.	0V
27	L	PNP switch "2" position		When setting selector lever to "2" position.	Battery voltage
				When setting selector lever to other positions.	0V
28	R/B	Power source (Memory back-up)		When turning ignition switch to "OFF".	Battery voltage
				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.* <sup>1</sup> <b>CAUTION:</b> <b>Connect the diagnosis data link cable to the vehicle diagnosis connector.</b>	450 Hz
				When vehicle parks.	Under 1.3V or over 4.5V
30 * <sup>2</sup>	G/B	CONSULT- II (RX)		—	—
31 * <sup>2</sup>	GY/L	CONSULT- II (TX)		—	—



# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

Terminal No.	Wire color	Item	Condition	Judgement standard(Approx.)	
32	R	Throttle position sensor (Power source)		When turning ignition switch to "ON".	4.5 - 5.5V
				When turning ignition switch to "OFF".	0V
34	W/G	PNP switch "D" position		When setting selector lever to "D" position.	Battery voltage
				When setting selector lever to other positions.	0V
35	L/W	PNP switch "R" position		When setting selector lever to "R" position.	Battery voltage
				When setting selector lever to other positions.	0V
36	G	PNP switch "N" or "P" position		When setting selector lever to "N" or "P" position.	Battery voltage
				When setting selector lever to other positions.	0V
39	L/OR	Engine speed signal		<a href="#">EC-107, "ECM INSPECTION TABLE".</a>	—
40	L/B	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 0V and more than 4.5V
41	W/R	Throttle position sensor		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	Throttle position sensor (Ground)	—	—	—
45	P	Stop lamp switch		When depressing brake pedal.	Battery voltage
				When releasing brake pedal.	0V
47	BR	A/T fluid temperature sensor		When ATF temperature is 20°C (68°F).	1.5V
				When ATF temperature is 80°C (176°F).	0.5V
48	B/W	Ground	—	—	0V

\*1: A circuit tester cannot be used to test this item.

\*2: These terminals are connected to the data link connector.

## CAN COMMUNICATION

PFP:23710

### System Description

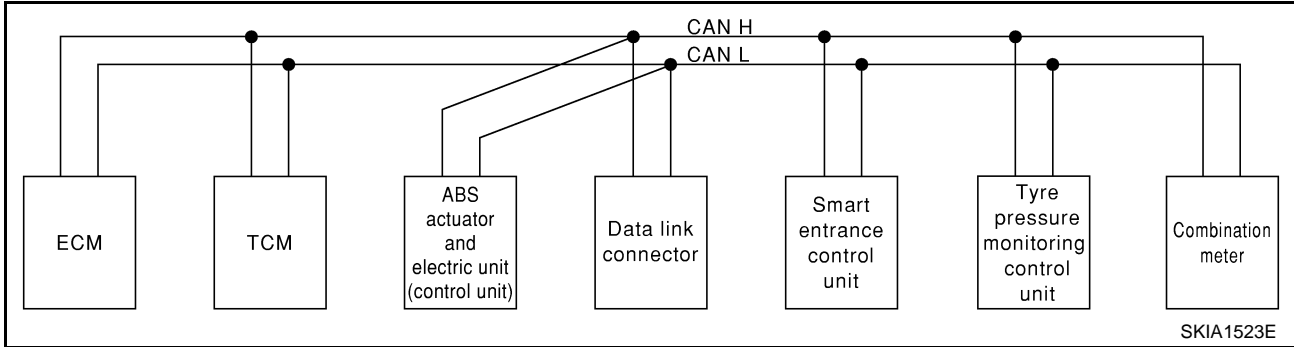
*ECS006LT*

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.

### CAN Communication Unit For LHD Models with Tyre Pressure Monitoring System

*ECS006LU*

#### SYSTEM DESCRIPTION



#### INPUT/OUTPUT SIGNAL CHART

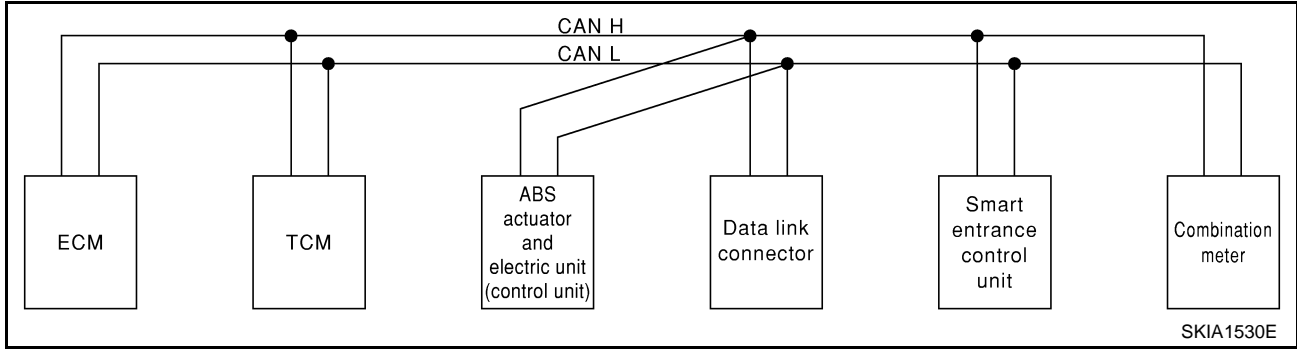
T: Transmit R: Receive

Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Smart entrance control unit	Tyre pressure monitoring control unit	Combination meter
Engine speed signal	T	R				R
Stop lamp switch signal		R	T			
Rear window defogger signal	R			T		
Heater fan switch signal	R					T
Air conditioner switch signal	R					T
MI signal	T					R
Current gear position signal		T				R
Engine coolant temperature signal	T					R
Fuel consumption signal	T					R
Vehicle speed signal			T			R
	R					T
Seat belt reminder signal				R		T
Headlamp switch signal				T		R
Flashing indicator signal				T		R
Engine cooling fan speed signal	T			R		
Child lock indicator signal				T		R
Door switches state signal				T		R
Key ID signal	R			T		
	T			R		
A/C compressor signal	T			R		
Tire pressure signal					T	R

## CAN Communication Unit For LHD Models without Tyre Pressure Monitoring System

ECS006LV

### SYSTEM DESCRIPTION



### INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Smart entrance control unit	Combination meter
Engine speed signal	T	R			R
Stop lamp switch signal		R	T		
Rear window defogger signal	R			T	
Heater fan switch signal	R				T
Air conditioner switch signal	R				T
MI signal	T				R
Current gear position signal		T			R
Engine coolant temperature signal	T				R
Fuel consumption signal	T				R
Vehicle speed signal			T		R
	R				T
Seat belt reminder signal				R	T
Headlamp switch signal				T	R
Flashing indicator signal				T	R
Engine cooling fan speed signal	T			R	
Child lock indicator signal				T	R
Door switches state signal				T	R
Key ID signal	R			T	
	T			R	
A/C compressor signal	T			R	

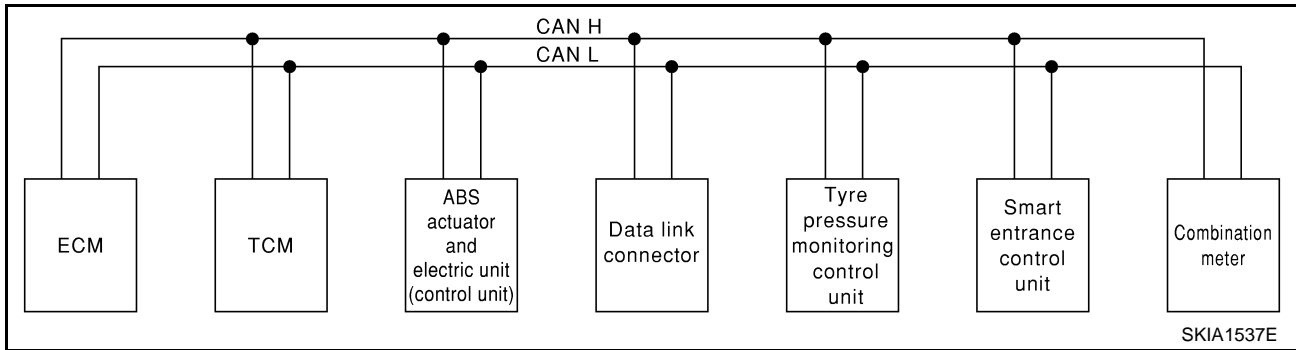
# CAN COMMUNICATION

[EURO-OBD]

## CAN Communication Unit For RHD Models with Tyre Pressure Monitoring System

ECS006LW

### SYSTEM DESCRIPTION



### INPUT/OUTPUT SIGNAL CHART

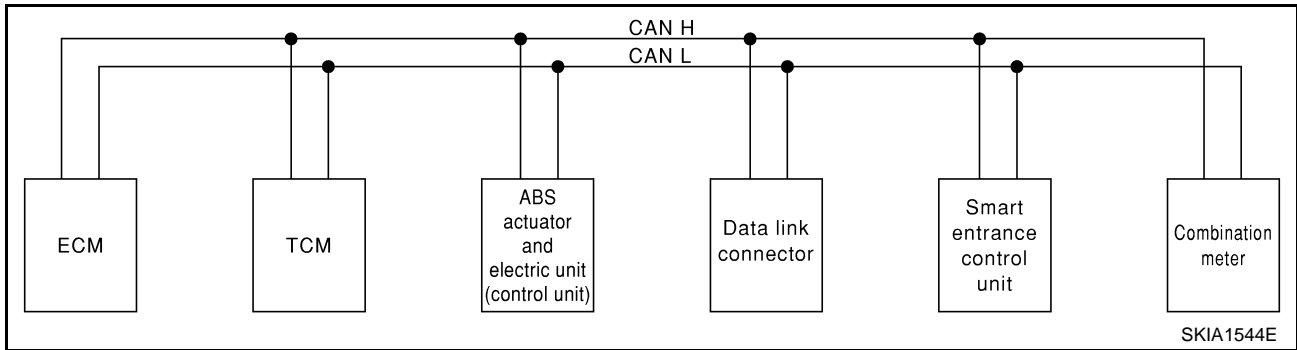
T: Transmit R: Receive

Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Tyre pressure monitoring control unit	Smart entrance control unit	Combination meter
Engine speed signal	T	R				R
Stop lamp switch signal		R	T			
Rear window defogger signal	R				T	
Heater fan switch signal	R					T
Air conditioner switch signal	R					T
MI signal	T					R
Current gear position signal		T				R
Engine coolant temperature signal	T					R
Fuel consumption signal	T					R
Vehicle speed signal			T			R
	R					T
Seat belt reminder signal					R	T
Headlamp switch signal					T	R
Flashing indicator signal					T	R
Engine cooling fan speed signal	T				R	
Child lock indicator signal					T	R
Door switches state signal					T	R
Key ID signal	R				T	
	T				R	
A/C compressor signal	T				R	
Tire pressure signal				T		R

## CAN Communication Unit For RHD Models without Tyre Pressure Monitoring System

ECS006LX

### SYSTEM DESCRIPTION



### INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Smart entrance control unit	Combination meter
Engine speed signal	T	R			R
Stop lamp switch signal		R	T		
Rear window defogger signal	R			T	
Heater fan switch signal	R				T
Air conditioner switch signal	R				T
MI signal	T				R
Current gear position signal		T			R
Engine coolant temperature signal	T				R
Fuel consumption signal	T				R
Vehicle speed signal			T		R
	R				T
Seat belt reminder signal				R	T
Headlamp switch signal				T	R
Flashing indicator signal				T	R
Engine cooling fan speed signal	T			R	
Child lock indicator signal				T	R
Door switches state signal				T	R
Key ID signal	R			T	
	T			R	
A/C compressor signal	T			R	

# DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

[EURO-OBD]

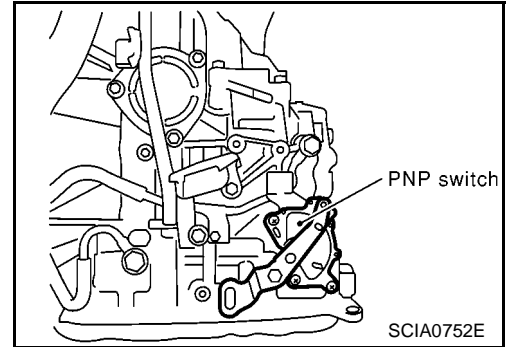
## DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

PFP:32006

### Description

ECS005V9

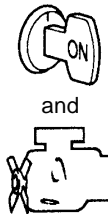
- The PNP switch assembly includes a transmission range switch.
- The transmission range switch detects the selector lever position and sends a signal to the TCM.



### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
26	BR/Y	PNP switch "1" position	When setting selector lever to "1" position.	Battery voltage
			When setting selector lever to other positions.	0V
27	L	PNP switch "2" position	When setting selector lever to "2" position.	Battery voltage
			When setting selector lever to other positions.	0V
34	W/G	PNP switch "D" position	When setting selector lever to "D" position.	Battery voltage
			When setting selector lever to other positions.	0V
35	L/W	PNP switch "R" position	When setting selector lever to "R" position.	Battery voltage
			When setting selector lever to other positions.	0V
36	G	PNP switch "N" or "P" position	When setting selector lever to "N" or "P" position.	Battery voltage
			When setting selector lever to other positions.	0V



### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
(P) : PNP SW/CIRC (G) : P0705	TCM does not receive the correct voltage signal from the switch based on the gear position.	<ul style="list-style-type: none"> <li>● Harness or connectors (The PNP switch circuit is open or shorted.)</li> <li>● PNP switch</li> </ul>

# DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

[EURO-OBD]

## DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

### 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 5 seconds before conducting the next test.

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

SELECT SYSTEM
A/T
ENGINE

SAT014K

### Ⓟ 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")**

4. If DTC is detected, go to [AT-113, "Diagnostic Procedure"](#).

### Ⓢ With GST

Follow the procedure "With CONSULT-II".

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT020K

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

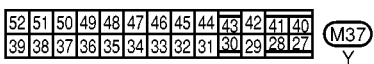
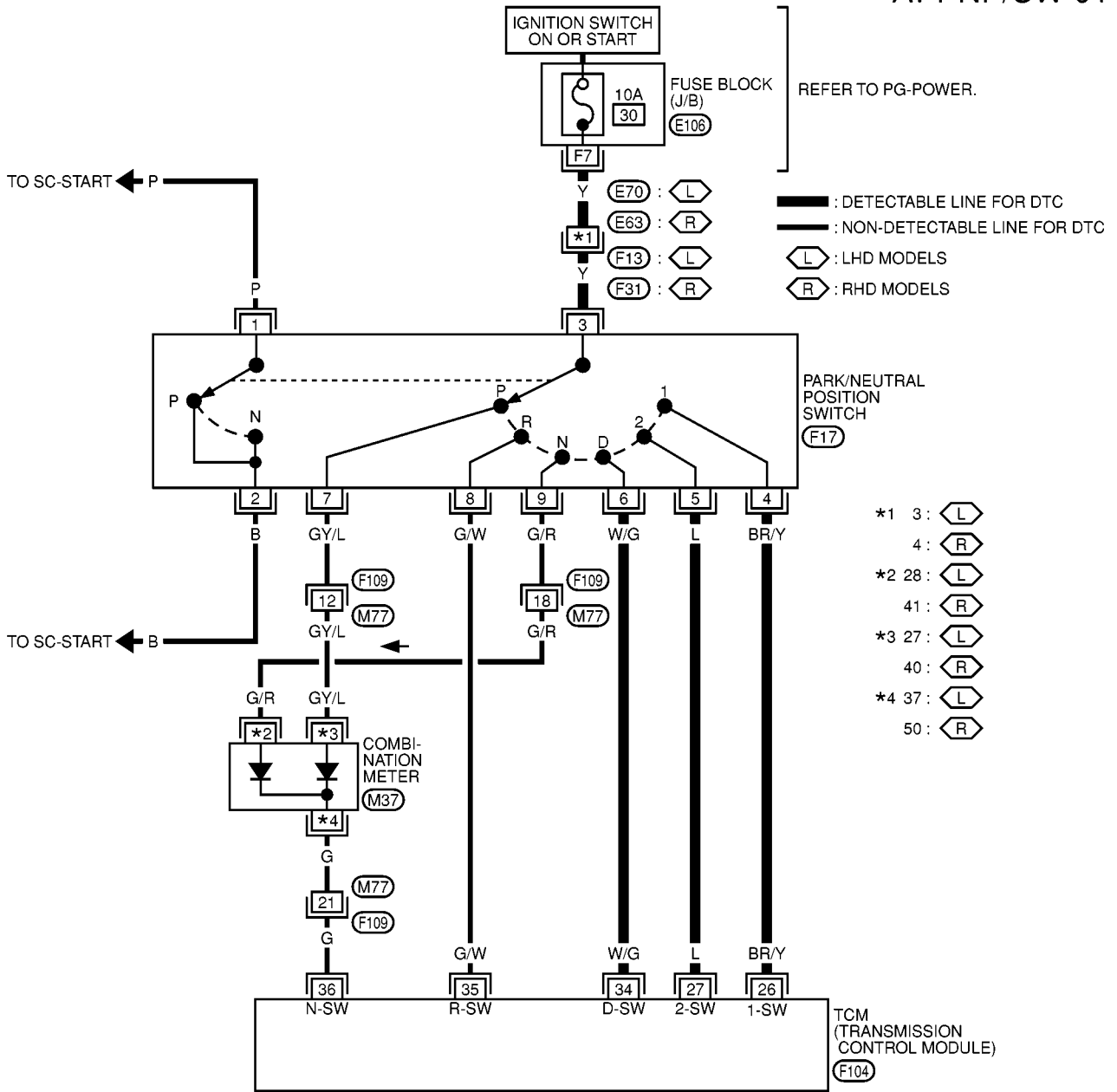
# DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

[EURO-OBD]

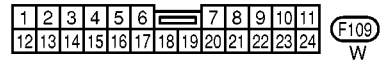
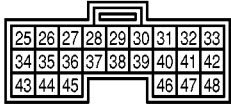
## Wiring Diagram — AT — PNP/SW

ECS005VA

### AT-PNP/SW-01



REFER TO THE FOLLOWING.  
(E106) - FUSE BLOCK-JUNCTION BOX (J/B)





## Diagnostic Procedure

EC5005VB

### 1. CHECK PNP SWITCH CIRCUIT (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 "P/N", "R", "D", "2" and "1" position switches moving selector lever to each position.

SELECT SYSTEM	
A/T	
ENGINE	

SAT014K

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-115, "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 [PG-3, "POWER SUPPLY ROUTING"](#) .
- Diode (P, N positions)

DATA MONITOR	
MONITORING	
PN POSI SW	OFF
R POSITION SW	OFF
D POSITION SW	OFF
2 POSITION SW	ON
1 POSITION SW	OFF

SAT701J

# DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

[EURO-OBD]

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

### ⊗ Without CONSULT-II

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

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

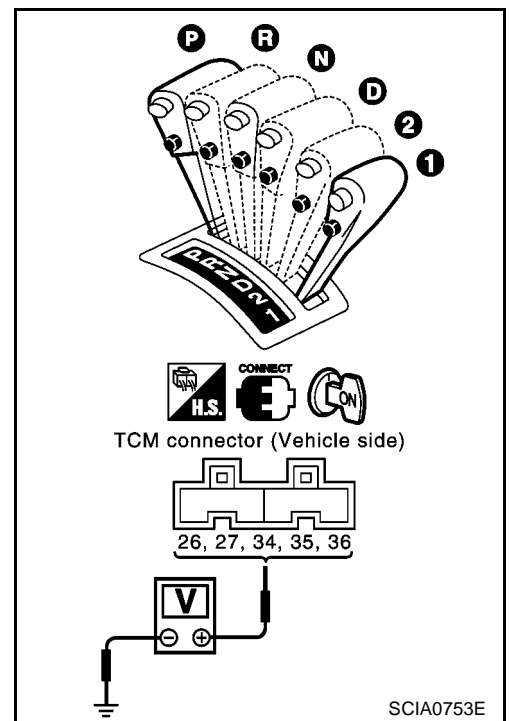
MTBL0136

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

**Voltage:**

**B: Battery voltage**

**0: 0V**



### OK or NG

OK >> GO TO 3

NG >> Check the following items:

- PNP switch  
Refer to [AT-115, "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 [PG-3, "POWER SUPPLY ROUTING"](#) .
- Diode (P, N positions)

## 3. CHECK DTC

Perform [AT-111, "DIAGNOSTIC TROUBLE CODE \(DTC\) CONFIRMATION PROCEDURE"](#) .

OK or NG

OK >> **INSPECTION END**

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

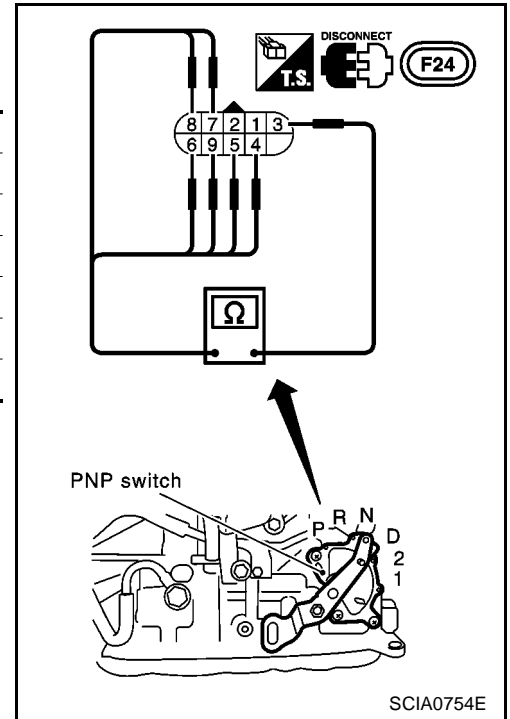
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

### Component Inspection PARK/NEUTRAL POSITION SWITCH

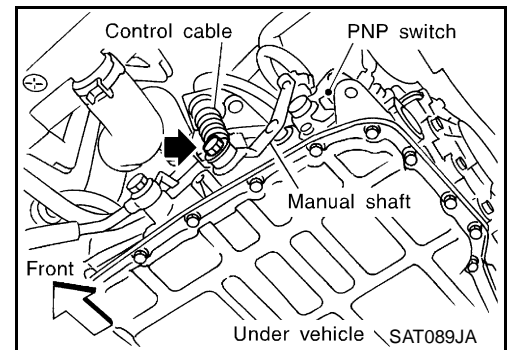
ECS005VC

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

Lever position	Terminal No.	
P	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-49, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) .
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 [AT-404, "Control Valve Assembly and Accumulators"](#) .
6. If NG on step 4, replace PNP switch.



# DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

[EURO-OBD]

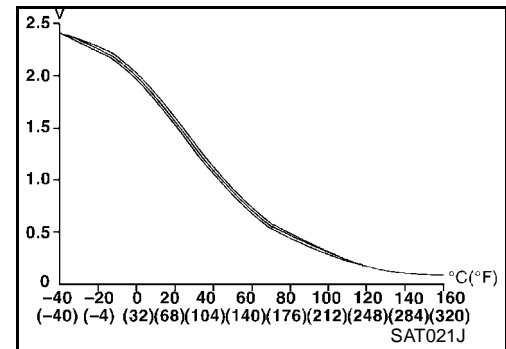
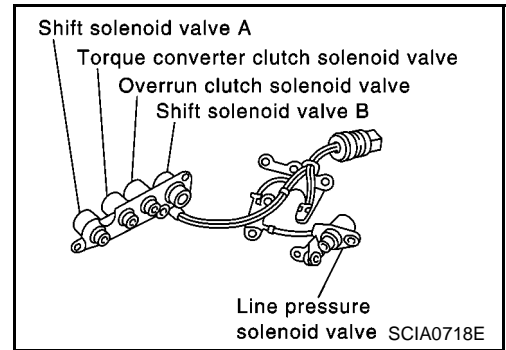
## DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

PF0:31940

### Description

ECS005VD

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

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
42	B	Throttle position sensor (Ground)	—	—
47	BR	A/T fluid temperature sensor	When ATF temperature is 20°C (68°F).	1.5V
			When ATF temperature is 80°C (176°F).	0.5V

### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
(P) : ATF TEMP SEN/CIRC (G) : P0710	TCM receives an excessively low or high voltage from the sensor.	<ul style="list-style-type: none"> <li>Harness or connectors (The sensor circuit is open or shorted.)</li> <li>A/T fluid temperature sensor</li> </ul>

# DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

[EURO-OBD]

## DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

### 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 5 seconds before conducting the next test.

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

SELECT SYSTEM
A/T
ENGINE

SAT014K

### Ⓟ 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")**
3. If DTC is detected, go to [AT-119, "Diagnostic Procedure"](#).

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT020K

### Ⓢ With GST

Follow the procedure "With CONSULT-II".

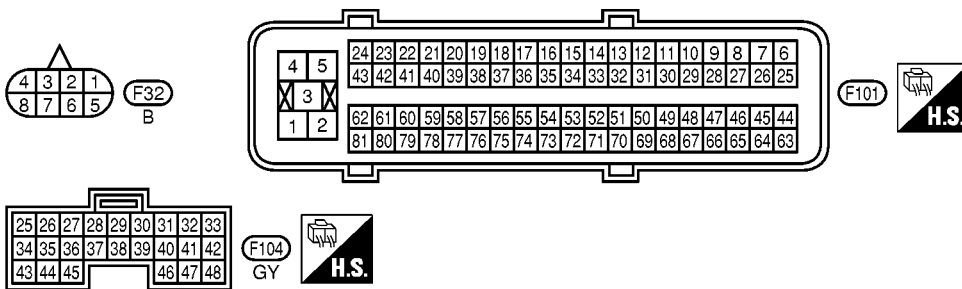
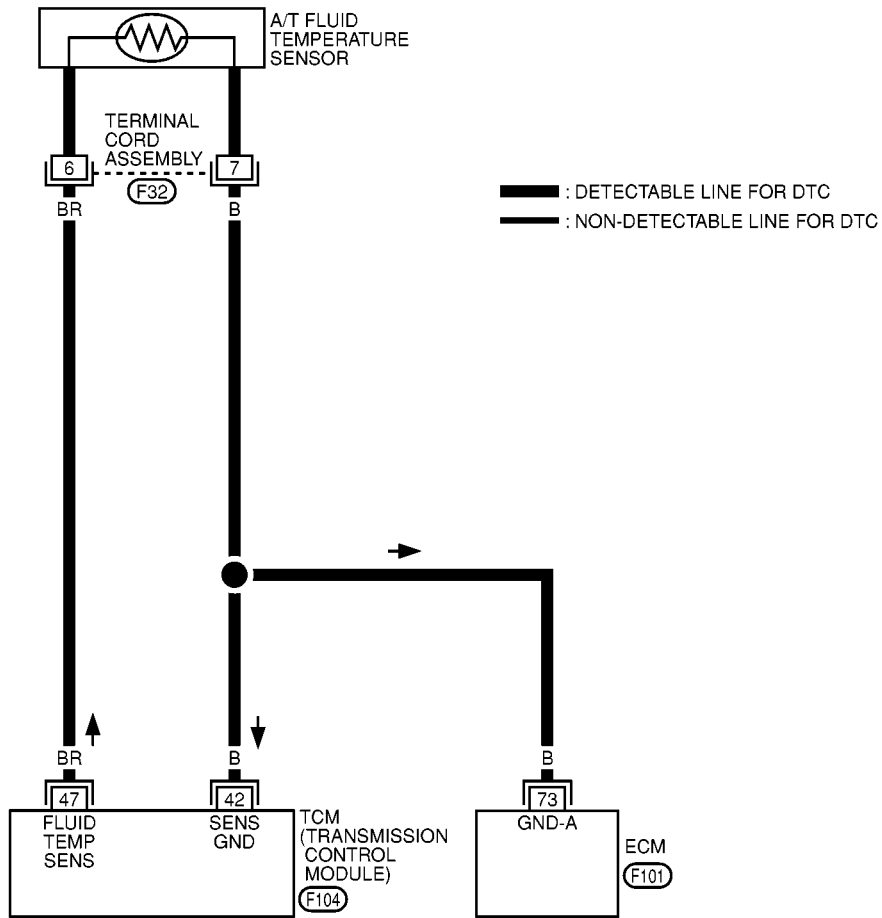
# DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

[EURO-OBD]

## Wiring Diagram — AT — FTS

ECS005VE

AT-FTS-01



MCWA0014E

## Diagnostic Procedure

### 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)

 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".

SELECT SYSTEM	
A/T	
ENGINE	

SAT014K

**Voltage:**

**Cold [20°C (68°F)] → Hot [80°C (176°F)]**

**Approximately 1.5V → 0.5V**

OK or NG

- OK >> GO TO 4
- NG >> GO TO 5

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

# DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

[EURO-OBD]

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

### ⊗ Without CONSULT-II

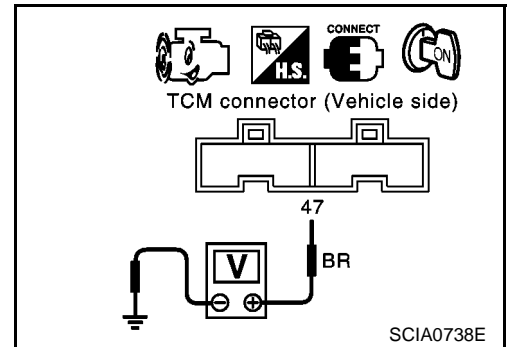
1. Start engine.
2. Check voltage between TCM terminal 47 and ground while warming up A/T.

#### Voltage:

**Cold [20°C (68°F)] → Hot [80°C (176°F)]**

**Approximately 1.5V → 0.5V**

3. Turn ignition switch to "OFF" position.
4. Disconnect TCM harness connector.
5. Check continuity between terminal 42 and ground.

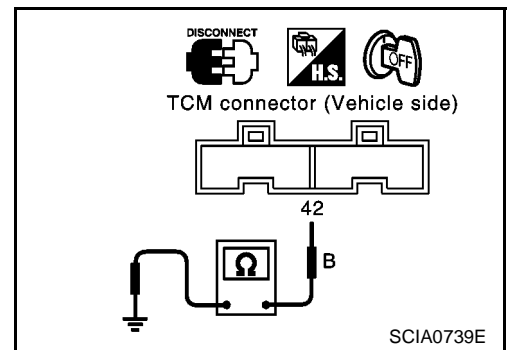


#### Continuity should exist.

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 Diagnostic Trouble Code (DTC) confirmation procedure, [AT-117, "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 P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

[EURO-OBD]

## 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.

### Resistance:

**Cold [20°C (68°F)]**

**Approximately 2.5 kΩ**

4. Reinstall any part removed.

### OK or NG

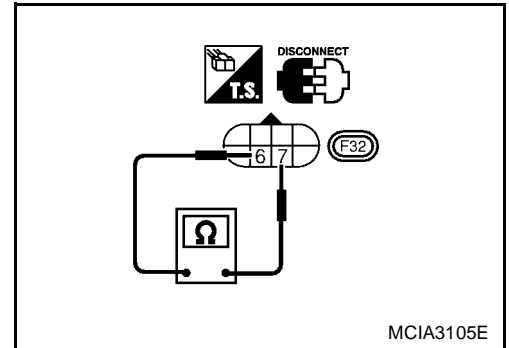
OK (With CONSULT-II)>>GOTO2

OK (Without CONSULT-II)>>GOTO3

NG >> 1. Remove oil pan.

2. Check the following items:

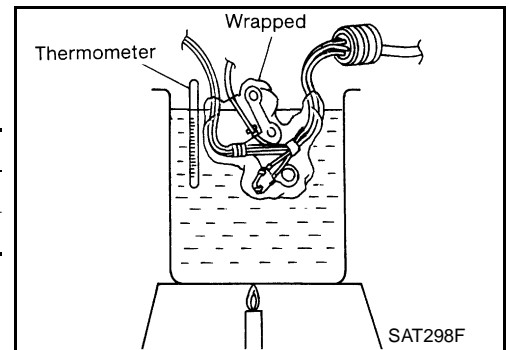
- A/T fluid temperature sensor  
Refer to [AT-121, "Component Inspection"](#) .
- Harness of terminal cord assembly for short or open



## Component Inspection A/T FLUID TEMPERATURE SENSOR

- For removal, refer to [AT-403, "Installation"](#) .
- Check resistance between two terminals while changing temperature as shown at left.

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



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

[EURO-OBD]

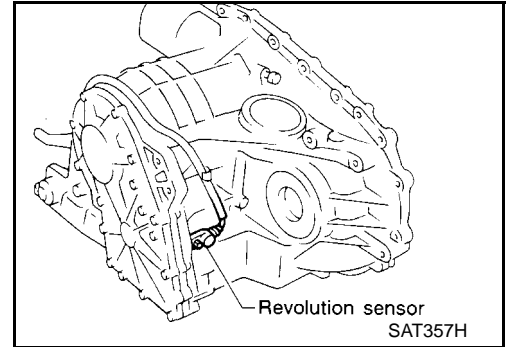
## DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)

PFPP:32702

### Description

ECS005VH

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.



### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal 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 <b>CAUTION:</b> <b>Connect the diagnosis data link cable to the vehicle diagnosis connector.</b> *1: A circuit tester cannot be used to test this item.	450 Hz
				When vehicle parks.	Under 1.3V or over 4.5V
42	B	Throttle position sensor (Ground)	—	—	—

### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
(P) : VEH SPD SEN/CIR AT (P) : P0720	TCM does not receive the proper voltage signal from the sensor.	<ul style="list-style-type: none"> <li>● Harness or connectors (The sensor circuit is open or shorted.)</li> <li>● Revolution sensor</li> </ul>

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

[EURO-OBID]

## 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 PROCEDURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

SELECT SYSTEM
A/T
ENGINE

SAT014K

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 "A/T" with CONSULT-II.
2. Drive vehicle and check for an increase of "VHCL/S SE-MTR" value increase.  
If the check result is NG, go to [AT-125, "Diagnostic Procedure"](#) .  
If the check result is OK, go to following step.
3. 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-125, "Diagnostic Procedure"](#) .

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

SELECT DIAG MODE
SELF-DIAG RESULTS
DATA MONITOR
DTC WORK SUPPORT
TCM PART NUMBER

SAT971J

SELECT SYSTEM
A/T
ENGINE

SAT014K

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 (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".

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT020K

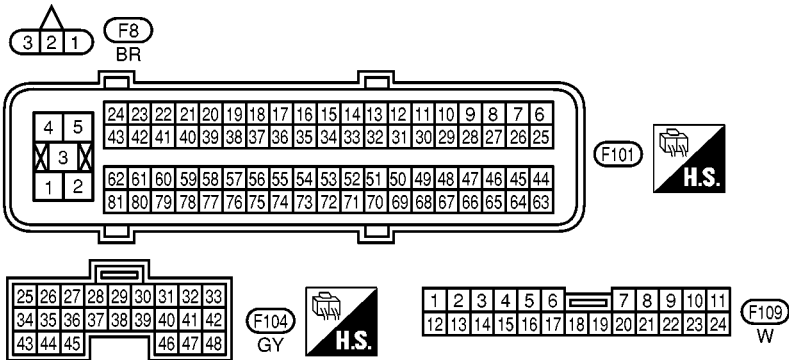
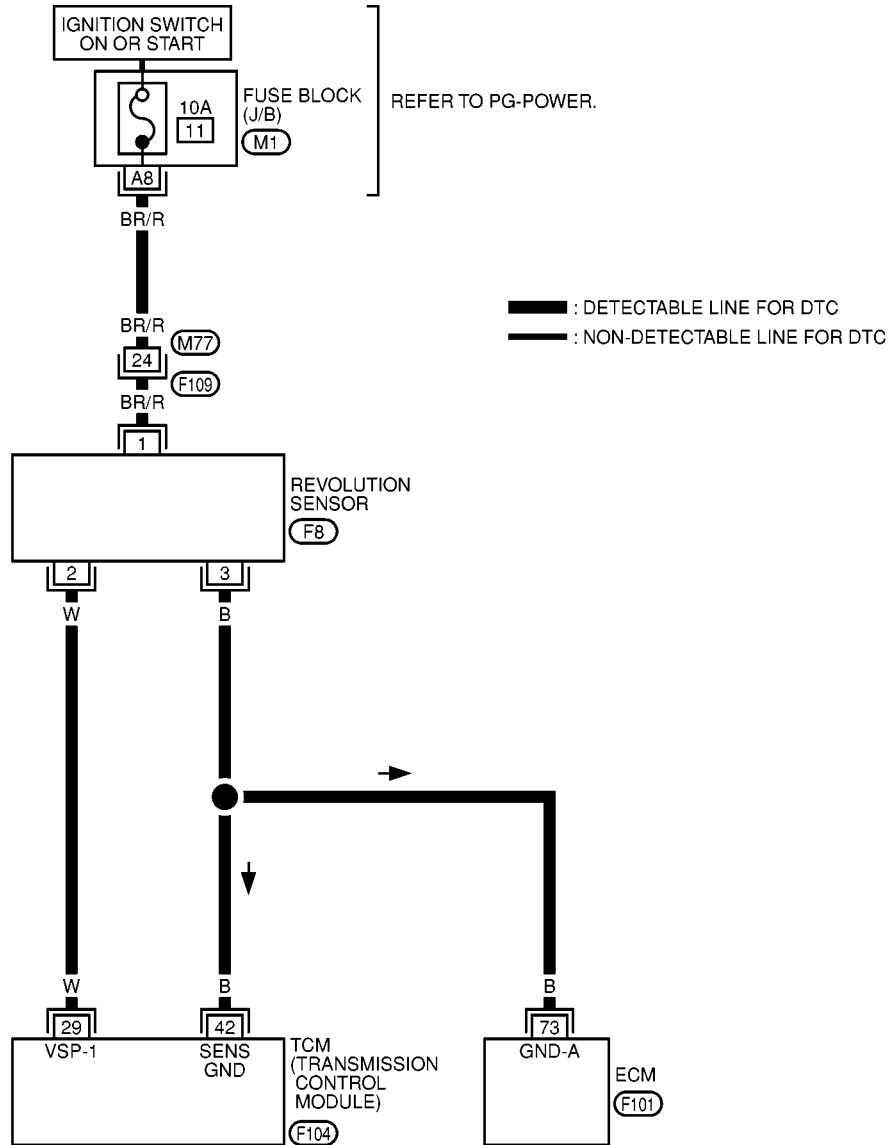
# DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)

[EURO-OBD]

## Wiring Diagram — AT — VSSA/T

ECS005VI

AT-VSSAT-01



REFER TO THE FOLLOWING.  
 (M1) - FUSE BLOCK-JUNCTION BOX (J/B)

MCWA0003E

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

[EURO-OBD]

## Diagnostic Procedure

ECS005VJ

A

### 1. CHECK INPUT SIGNAL (WITH CONSULT-II)

B

#### 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.

AT

SELECT SYSTEM	
A/T	
ENGINE	

SAT014K

D

E

F

Check the value changes according to driving speed.

#### OK or NG

- OK >> GO TO 3  
 NG >> GO TO 2

G

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

H

I

J

### 2. CHECK REVOLUTION SENSOR (WITH CONSULT-II)

#### With CONSULT-II

1. Start engine.

K

L

M

Condition	Judgement standard (Approx.)
When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function. *1 <b>CAUTION:</b> 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 parks.	Under 1.3V or 4.5V

MTBL0581

- Harness for short or open between TCM, ECM and revolution sensor (Main harness)

#### OK or NG

- OK >> GO TO 3  
 NG >> Repair or replace damaged parts.

### 3. CHECK DTC

---

Perform [AT-123, "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

PFP:24825



### Description

ECS005VK

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

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
39	L/OR	Engine speed signal	 and 	—
Refer to <a href="#">EC-107, "ECM INSPECTION TABLE"</a>				

### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check item (Possible cause)
ⓘ : ENGINE SPEED SIG ⓘ : P0725	TCM does not receive the proper voltage signal from ECM.	● Harness or connectors (The sensor circuit is open or shorted.)

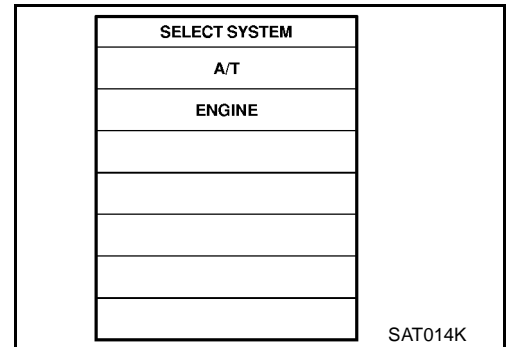
### DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

**CAUTION:**

Always drive vehicle at a safe speed.

**NOTE:**

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



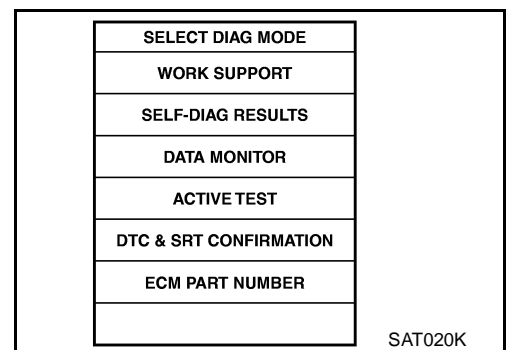
After the repair, perform the following procedure to confirm the malfunction is eliminated.

ⓘ **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")**
3. If DTC is detected, go to [AT-129, "Diagnostic Procedure"](#).

ⓘ **With GST**

Follow the procedure "With CONSULT-II".



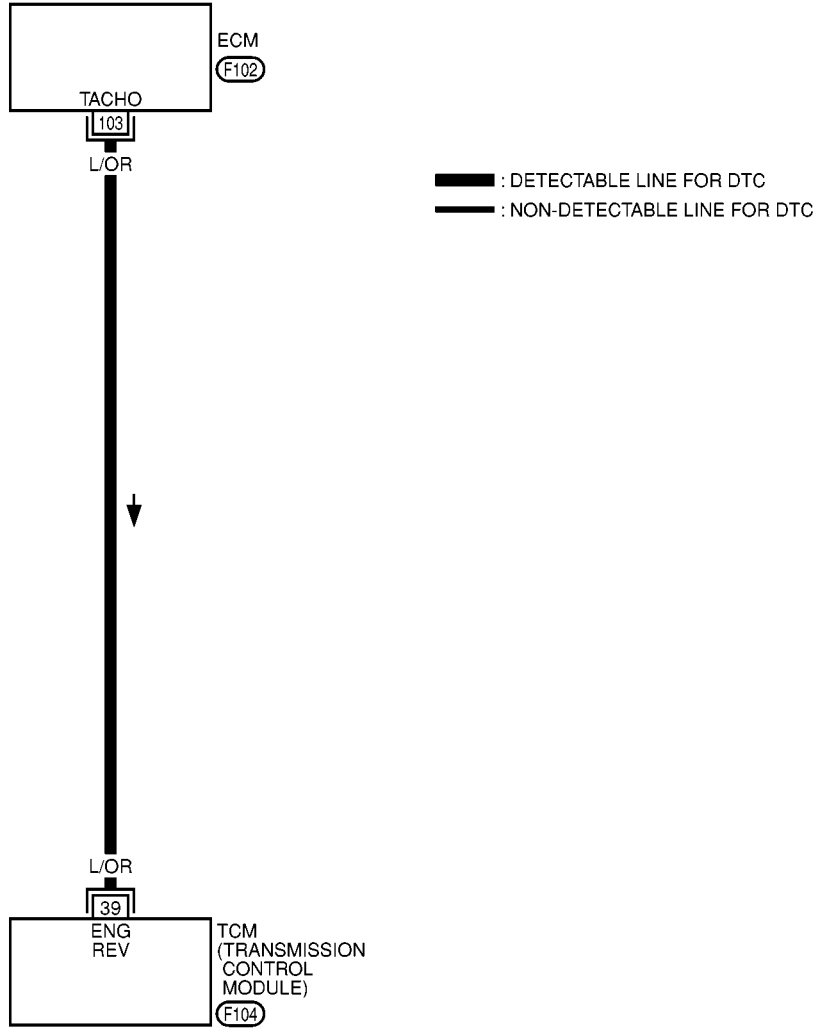
# DTC P0725 ENGINE SPEED SIGNAL

[EURO-OBD]

## Wiring Diagram — AT — ENGSS

EC5005VL

AT-ENGSS-01



MCWA0011E



## Diagnostic Procedure

### 1. CHECK DTC WITH ECM

Perform "Overall function check" for ignition signal. Refer to [EC-524, "Diagnostic Procedure"](#).

OK or NG

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

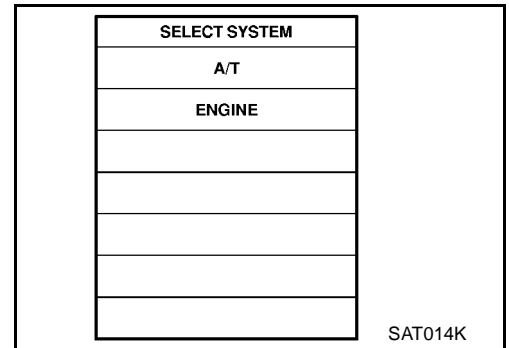
OK (Without CONSULT-II) >> GO TO 3

NG >> Follow the construction of [EC-524, "Diagnostic Procedure"](#).

### 2. 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 "ENGINE SPEED".



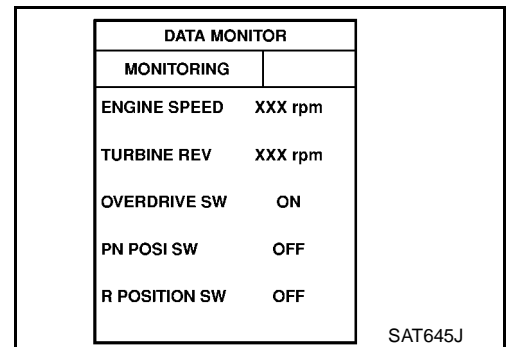
Check engine speed changes according to throttle position.

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 [EC-520, "IGNITION SIGNAL"](#).



### 3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

#### Without CONSULT-II

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

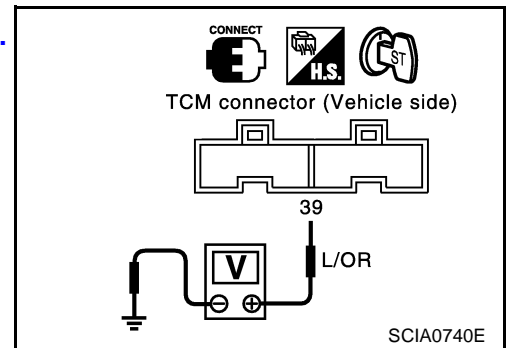
**Voltage (Idle speed):** Refer to [EC-92, "Basic Inspection"](#).

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 [EC-520, "IGNITION SIGNAL"](#).



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## 4. CHECK DTC

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Perform [AT-127, "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 P0731 A/T 1ST GEAR FUNCTION

PFP:31940

### Description

ECS005VN

- 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 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)

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
11	L/W	Shift solenoid valve A	When shift solenoid valve A operates. (When driving in "D1" or "D4".)	Battery voltage
			When shift solenoid valve A does not operate. (When driving in "D2" or "D3".)	0V
12	L/Y	Shift solenoid valve B	When shift solenoid valve B operates. (When driving in "D1" or "D2".)	Battery voltage
			When shift solenoid valve B does not operate. (When driving in "D3" or "D4".)	0V

### ON BOARD DIAGNOSTIC LOGIC

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

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

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 : P0731	A/T cannot be shifted to the 1st gear position even if electrical circuit is good.	<ul style="list-style-type: none"> <li>● Shift solenoid valve A</li> <li>● Shift solenoid valve B</li> <li>● Each clutch</li> <li>● Hydraulic control circuit</li> </ul>

# DTC P0731 A/T 1ST GEAR FUNCTION

[EURO-OBD]

## DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

SELECT SYSTEM
A/T
ENGINE

SAT014K

### 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 PROCEDURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

SELECT DIAG MODE
SELF-DIAG RESULTS
DATA MONITOR
DTC WORK SUPPORT
TCM PART NUMBER

SAT971J

### 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.

### ④ 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 "1ST GR FNCTN P0731" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".

4. Accelerate vehicle to 15 to 20 km/h (9 to 12 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")**

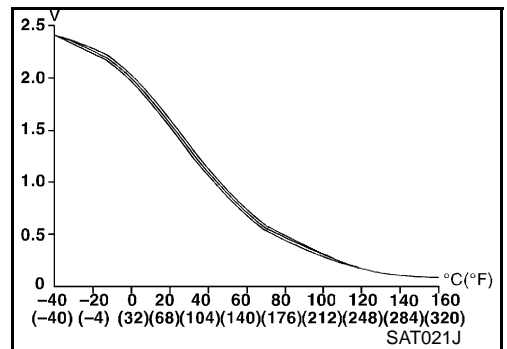
- Check that "GEAR" shows "2" after releasing pedal.

5. Depress accelerator pedal to WOT (more than 7.0/8 of "THROTTLE POSI") quickly from a speed of 15 to 20 km/h (9 to 12 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 [AT-135, "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-DIAGNOSIS" for "ENGINE". In case a 1st trip DTC other than P0731 is shown, refer to applicable "TROUBLE DIAGNOSIS FOR DTC".



# DTC P0731 A/T 1ST GEAR FUNCTION

[EURO-OBD]

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 → 2 → 3 → 4
No malfunction exists	1 → 2 → 3 → 4
Malfunction for P0731 exists.	2 → 2 → 3 → 3
	4 → 3 → 3 → 4

8. Make sure that "OK" is displayed. (If "NG" is displayed, refer to [AT-135, "Diagnostic Procedure"](#) .) Refer to [AT-517, "Shift Schedule"](#) .

 **With GST**

Follow the procedure "With CONSULT-II".

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

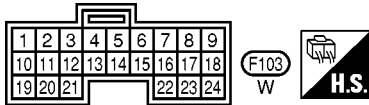
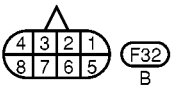
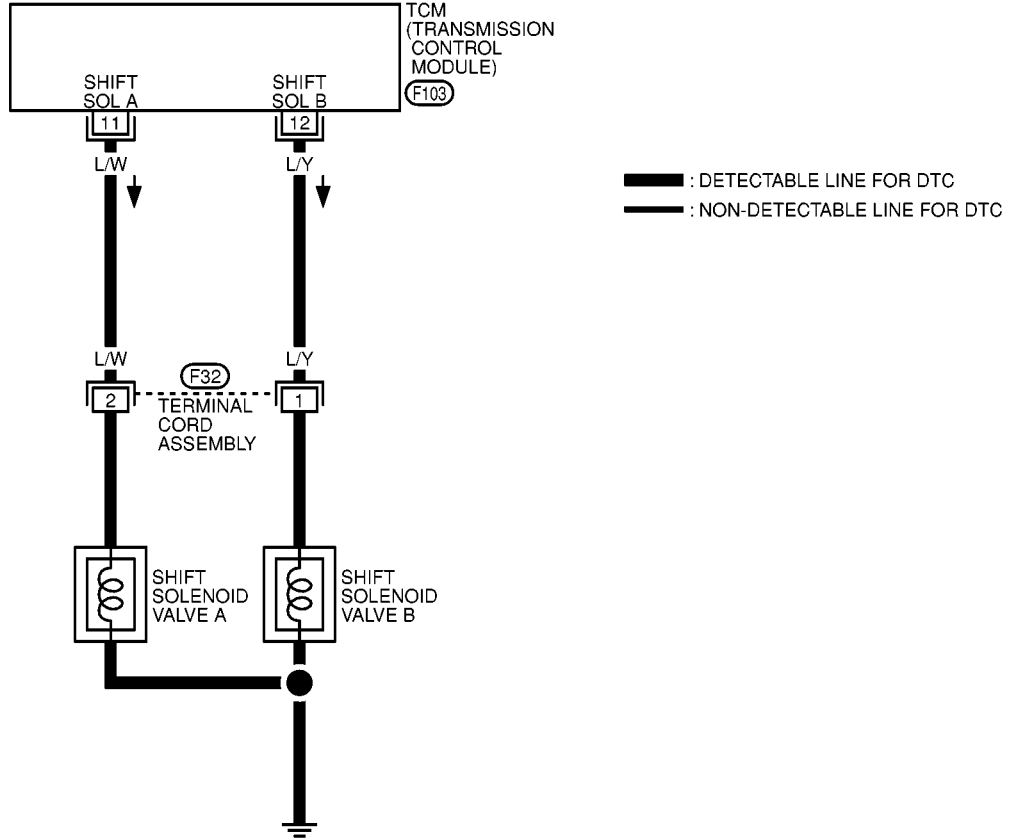
# DTC P0731 A/T 1ST GEAR FUNCTION

[EURO-OBD]

## Wiring Diagram — AT — 1ST

ECS005V0

AT-1STSIG-01



MCWA0015E

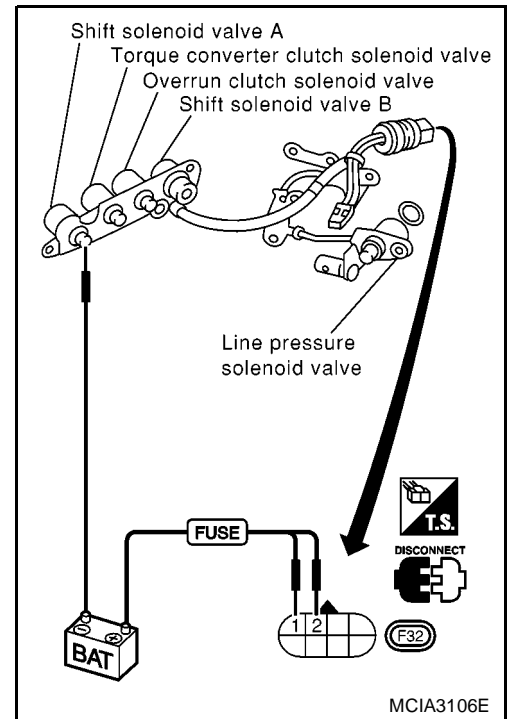
**Diagnostic Procedure****1. CHECK SHIFT SOLENOID VALVE**

1. Remove control valve assembly. Refer to [AT-404, "Control Valve Assembly and Accumulators"](#)
2. Check shift solenoid valve operation.
  - Shift solenoid valve A
  - Shift solenoid valve B

Refer to [AT-136, "Component Inspection"](#) .

**OK or NG**

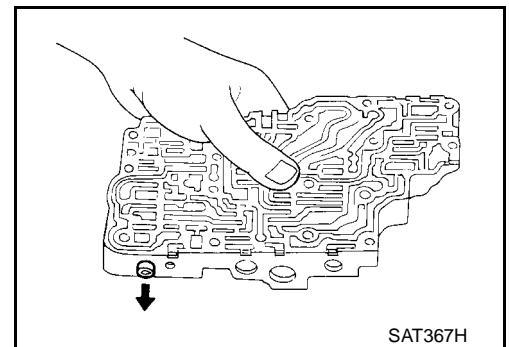
- OK >> GO TO 2  
 NG >> Repair or replace shift solenoid valve assembly.

**2. CHECK CONTROL VALVE**

1. Disassemble control valve assembly. Refer to [AT-439, "Control Valve Assembly"](#) .
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**

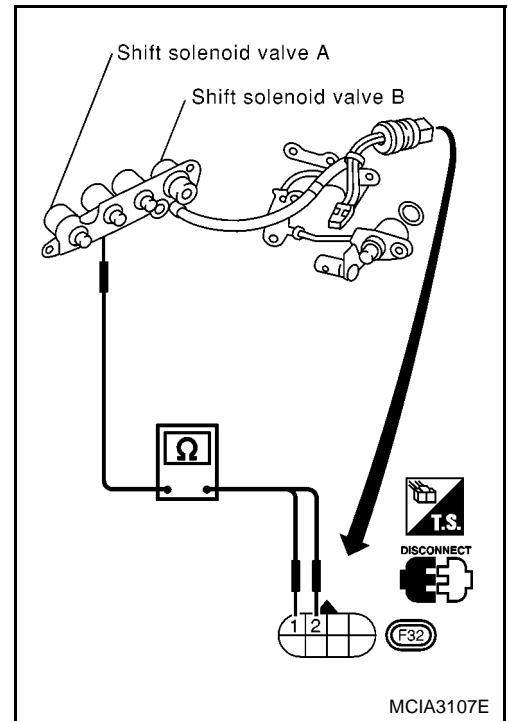
Perform [AT-132, "DIAGNOSTIC TROUBLE CODE \(DTC\) CONFIRMATION PROCEDURE"](#) .

**OK or NG**

- OK >> **INSPECTION END**  
 NG >> Check control valve again. Repair or replace control valve assembly.

**Component Inspection**  
**SHIFT SOLENOID VALVE A AND B**

- For removal, refer to [AT-404, "REMOVAL"](#) .



**Resistance Check**

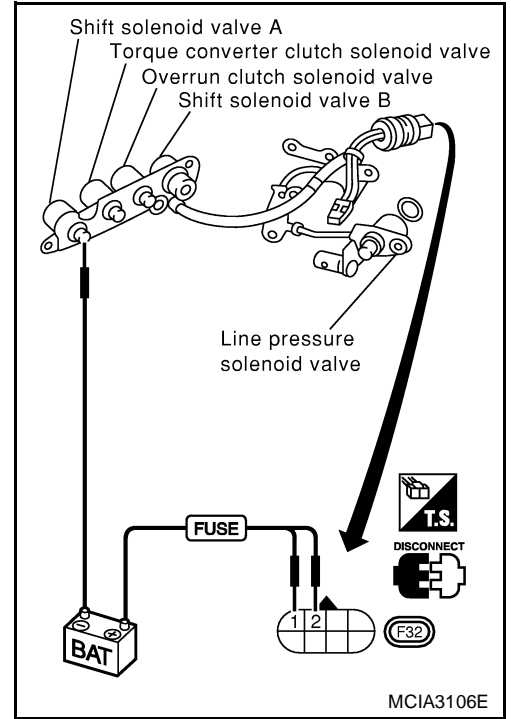
- Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Shift solenoid valve A	2	Ground	20 - 30Ω
Shift solenoid valve B	1		5 - 20Ω



### Operation Check

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



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# DTC P0732 A/T 2ND GEAR FUNCTION

[EURO-OBD]

## DTC P0732 A/T 2ND GEAR FUNCTION

PFP:31940

### Description

ECS005VR

- 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 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)

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
12	L/Y	Shift solenoid valve B	When shift solenoid valve B operates. (When driving in "D1" or "D2".)	Battery voltage
			When shift solenoid valve B does not operate. (When driving in "D3" or "D4".)	0V

### 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 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 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)
 : A/T 2ND GR FNCTN	A/T cannot be shifted to the 2nd gear position even if electrical circuit is good.	<ul style="list-style-type: none"> <li>● Shift solenoid valve B</li> <li>● Each clutch</li> <li>● Hydraulic control circuit</li> </ul>
 : P0732		

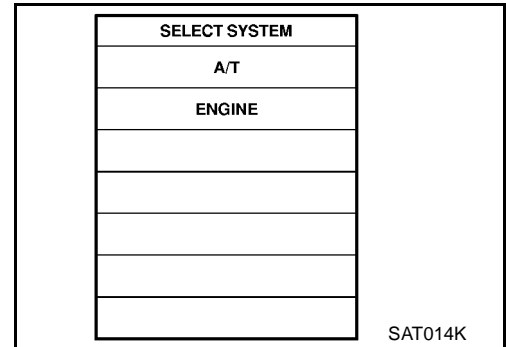
## DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

**CAUTION:**

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

**NOTE:**

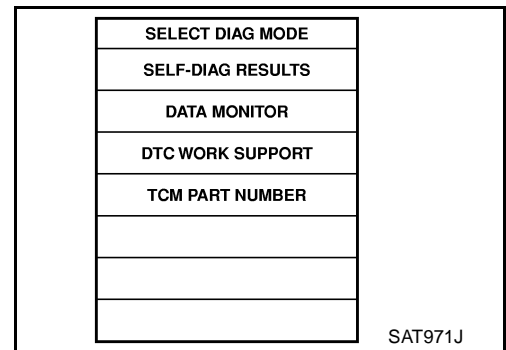
If “DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE” has been previously conducted, always turn ignition switch “OFF” and wait at least 5 seconds before conducting the next test.



**TESTING CONDITION:**

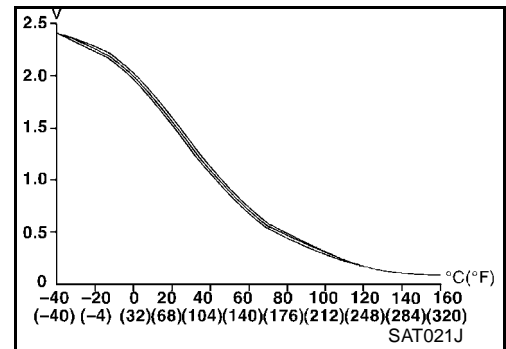
Always drive vehicle on a level road to improve the accuracy of test.

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



**ⓑ With CONSULT-II**

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 “2ND GR FNCTN P0732” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.
4. Accelerate vehicle to 35 to 40 km/h (22 to 25 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 “3” or “4” after releasing pedal.
5. Depress accelerator pedal to WOT (more than 7.0/8 of “THROTTLE POSI”) quickly from a speed of 35 to 40 km/h (22 to 25 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 [AT-142, "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-DIAGNOSIS” 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.)



# DTC P0732 A/T 2ND GEAR FUNCTION

[EURO-OBD]

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

8. Make sure that "OK" is displayed. (If "NG" is displayed, go to [AT-142, "Diagnostic Procedure"](#) .)  
Refer to [AT-517, "Shift Schedule"](#) .

 **With GST**

Follow the procedure "With CONSULT-II".

# DTC P0732 A/T 2ND GEAR FUNCTION

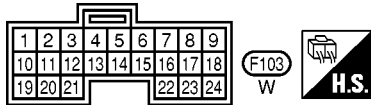
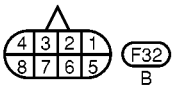
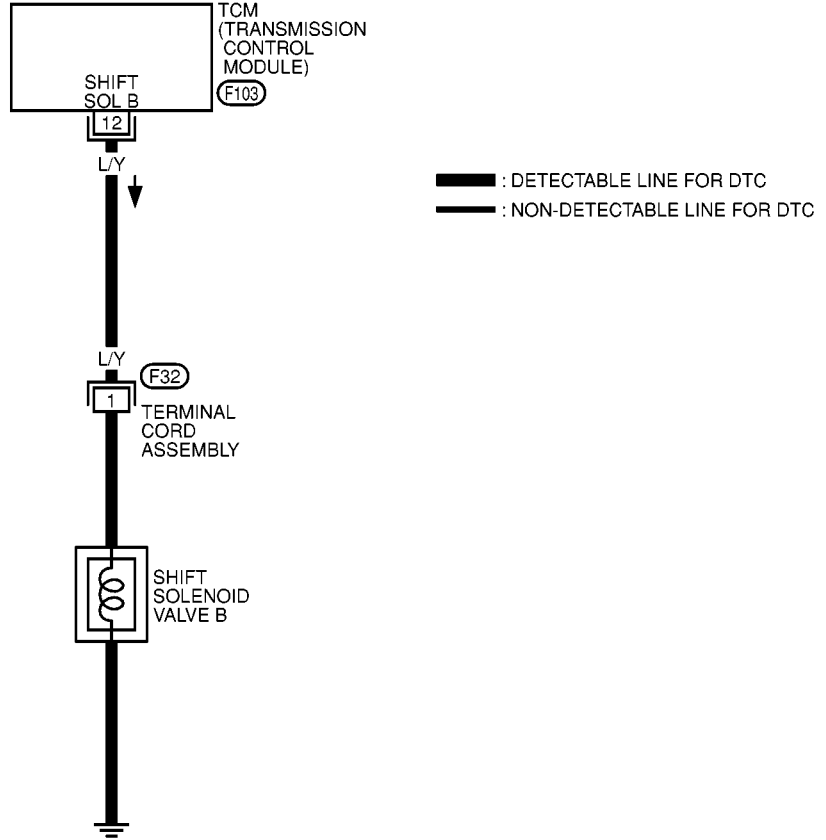
[EURO-OBD]

## Wiring Diagram — AT — 2ND

ECS005VS

AT-2NDSIG-01

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



MCWA0016E

## Diagnostic Procedure

### 1. CHECK SHIFT SOLENOID VALVE

1. Remove control valve assembly. Refer to [AT-404, "REMOVAL"](#) .
2. Check shift solenoid valve operation.

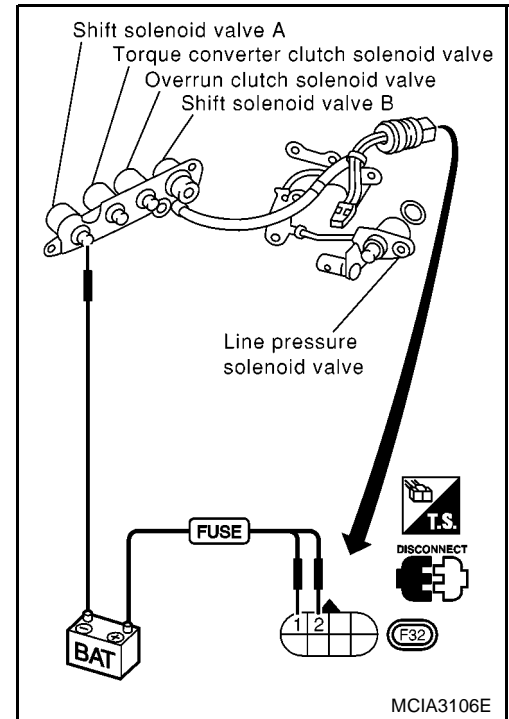
- Shift solenoid valve B

Refer to [AT-143, "Component Inspection"](#) .

OK or NG

OK >> GO TO 2

NG >> Repair or replace shift solenoid valve assembly.



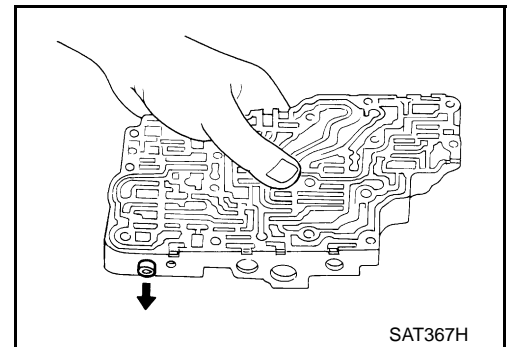
### 2. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to [AT-439, "Control Valve Assembly"](#) .
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-139, "DIAGNOSTIC TROUBLE CODE \(DTC\) CONFIRMATION PROCEDURE"](#) .

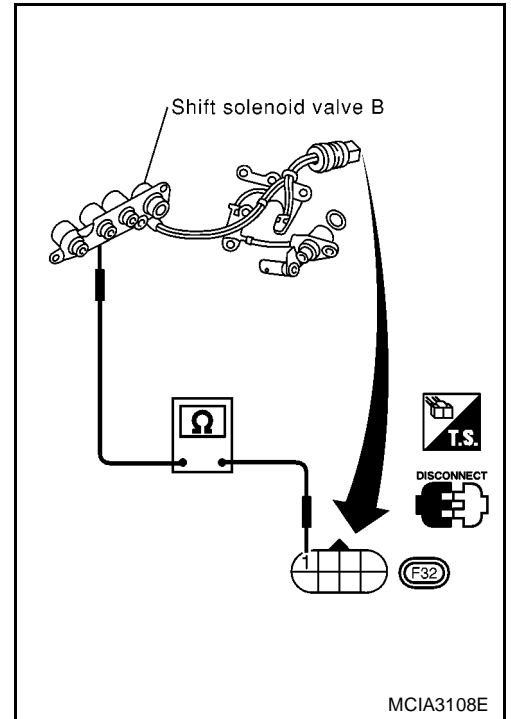
OK or NG

OK >> **INSPECTION END**

NG >> Check control valve again. Repair or replace control valve assembly.

**Component Inspection**  
**SHIFT SOLENOID VALVE B**

- For removal, refer to [AT-404, "REMOVAL"](#) .



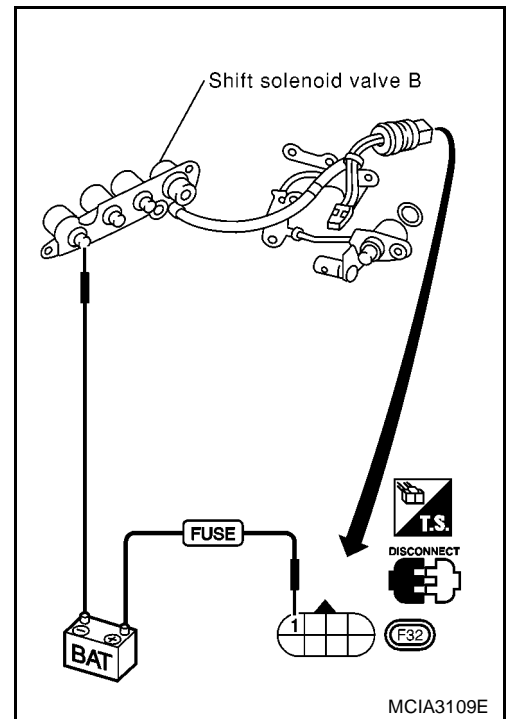
**Resistance Check**

- 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.



# DTC P0733 A/T 3RD GEAR FUNCTION

[EURO-OBD]

## DTC P0733 A/T 3RD GEAR FUNCTION

PFP:31940

### Description

ECS005VV

- 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 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)

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
11	L/W	Shift solenoid valve A	When shift solenoid valve A operates. (When driving in "D1" or "D4".)	Battery voltage
			When shift solenoid valve A does not operate. (When driving in "D2" or "D3".)	0V

### ON BOARD DIAGNOSTIC LOGIC

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

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

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 : P0733	A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.	<ul style="list-style-type: none"> <li>● Shift solenoid valve A</li> <li>● Each clutch</li> <li>● Hydraulic control circuit</li> </ul>



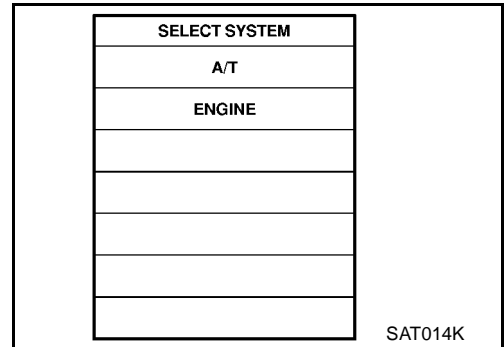
## DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

**CAUTION:**

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

**NOTE:**

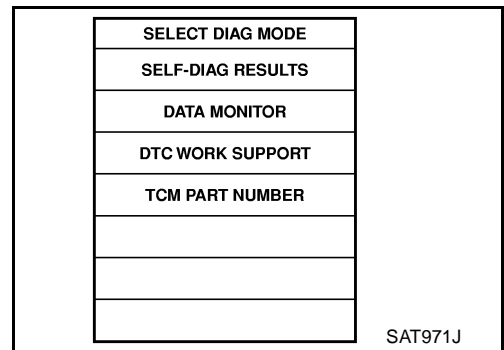
If “DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE” has been previously conducted, always turn ignition switch “OFF” and wait at least 5 seconds before conducting the next test.



**TESTING CONDITION:**

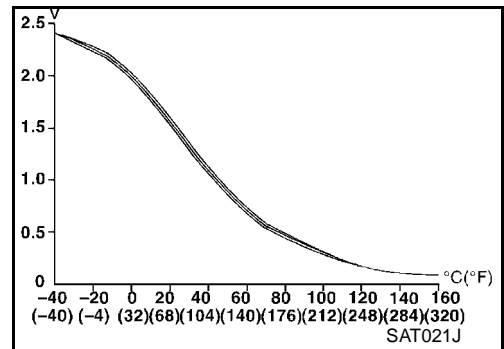
Always drive vehicle on a level road to improve the accuracy of test.

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



**ⓑ With CONSULT-II**

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 “3RD GR FNCTN P0733” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.
4. Accelerate vehicle to 55 to 70 km/h (34 to 44 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 “THROTTLE POSI” from a speed of 55 to 70 km/h (34 to 44 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 [AT-142, "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-DIAGNOSIS” for “ENGINE”. In case a 1st trip DTC other than P0733 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.)



# DTC P0733 A/T 3RD GEAR FUNCTION

[EURO-OBD]

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

8. Make sure that "OK" is displayed. (If "NG" is displayed, refer to [AT-142, "Diagnostic Procedure"](#) .)  
Refer to [AT-517, "Shift Schedule"](#) .

 **With GST**

Follow the procedure "With CONSULT-II".

# DTC P0733 A/T 3RD GEAR FUNCTION

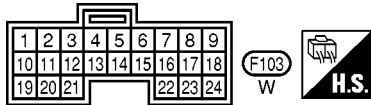
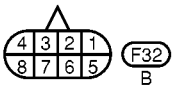
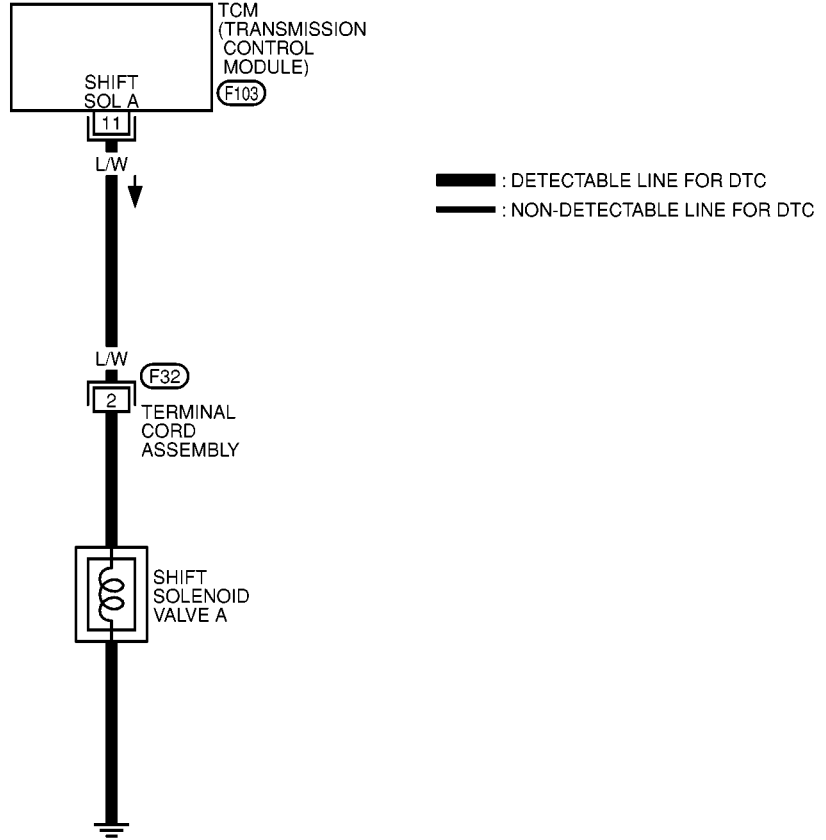
[EURO-OBD]

## Wiring Diagram — AT — 3RD

ECS005VW

AT-3RDSIG-01

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



MCWA0017E

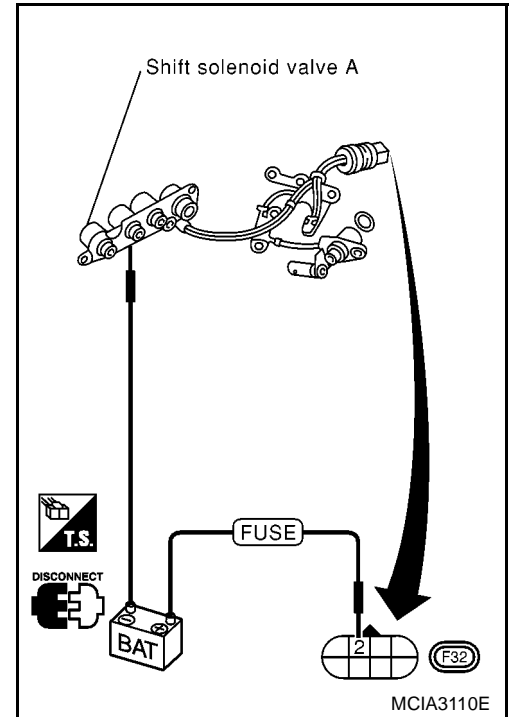
## Diagnostic Procedure

### 1. CHECK SHIFT SOLENOID VALVE

1. Remove control valve assembly. Refer to [AT-404, "REMOVAL"](#) .
2. Check shift solenoid valve operation.
  - Shift solenoid valve A  
Refer to [AT-149, "Component Inspection"](#) .

#### OK or NG

- OK >> GO TO 2  
 NG >> Repair or replace shift solenoid valve assembly.

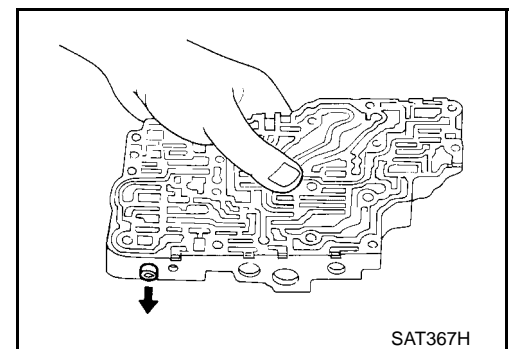


### 2. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to [AT-439, "Control Valve Assembly"](#) .
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-145, "DIAGNOSTIC TROUBLE CODE \(DTC\) CONFIRMATION PROCEDURE"](#) .

#### OK or NG

- OK >> **INSPECTION END**  
 NG >> Check control valve again. Repair or replace control valve assembly.

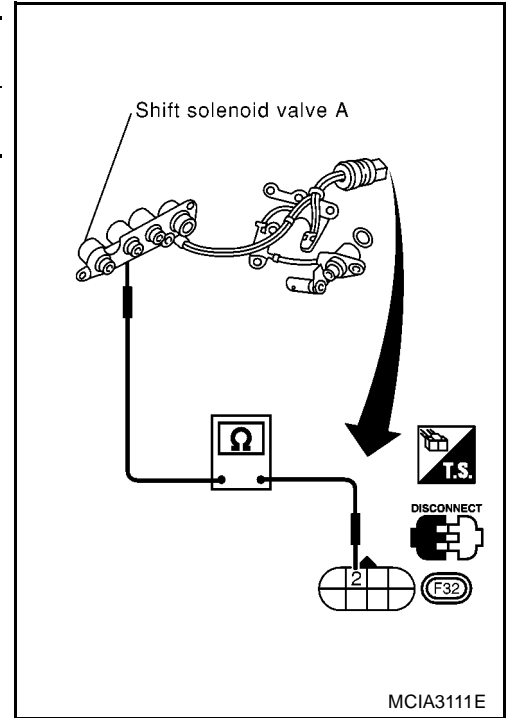
## Component Inspection SHIFT SOLENOID VALVE A

- For removal, refer to [AT-404, "Control Valve Assembly and Accumulators"](#) .

### Resistance Check

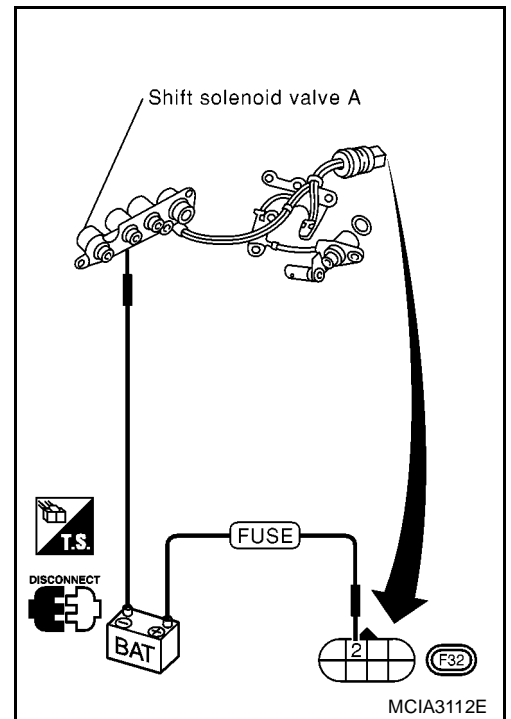
- Check resistance between two terminals.

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 P0734 A/T 4TH GEAR FUNCTION

[EURO-OBD]

## DTC P0734 A/T 4TH GEAR FUNCTION

PF3:31940

### Description

ECS005VZ

- 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.

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
Line pressure solenoid valve duty	Small throttle opening (Low line pressure)	Approximately 24%
	↓ Large throttle opening (High line pressure)	↓ Approximately 95%

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
1	R/W	Line pressure solenoid valve	When releasing accelerator pedal after warming up engine.	1.5 - 3.0V
			When depressing accelerator pedal fully after warming up engine.	0V
2	P/B	Line pressure solenoid valve (with dropping resistor)	When releasing accelerator pedal after warming up engine.	5 - 14V
			When depressing accelerator pedal fully after warming up engine.	0V
11	L/W	Shift solenoid valve A	When shift solenoid valve A operates. (When driving in "D1" or "D4".)	Battery voltage
			When shift solenoid valve A does not operate. (When driving in "D2" or "D3".)	0V
12	L/Y	Shift solenoid valve B	When shift solenoid valve B operates. (When driving in "D1" or "D2".)	Battery voltage
			When shift solenoid valve B does not operate. (When driving in "D3" or "D4".)	0V

### ON BOARD DIAGNOSTIC LOGIC

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

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

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

# DTC P0734 A/T 4TH GEAR FUNCTION

[EURO-OBD]

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*

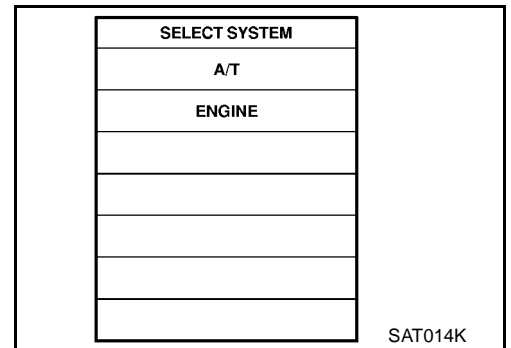
\*: P0734 is detected.

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
(P) : A/T 4TH GR FNCTN (G) : P0734	A/T cannot be shifted to the 4th gear position even if electrical circuit is good.	<ul style="list-style-type: none"> <li>Shift solenoid valve A</li> <li>Shift solenoid valve B</li> <li>Line pressure solenoid valve</li> <li>Each clutch</li> <li>Hydraulic control circuit</li> </ul>

## 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.



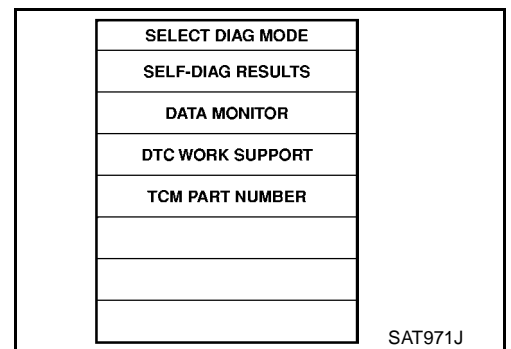
### NOTE:

If “DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE” 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.



### (P) 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).

# DTC P0734 A/T 4TH GEAR FUNCTION

[EURO-OBD]

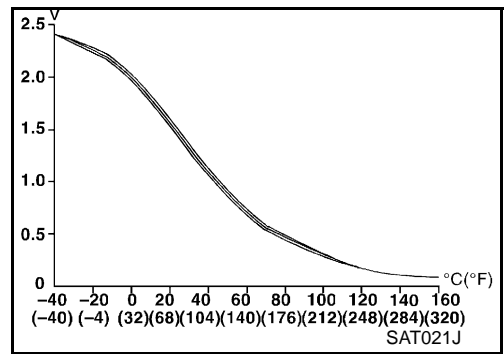
3. Select "4TH GR FNCTN P0734" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".
4. Accelerate vehicle to 55 to 65 km/h (34 to 40 MPH) under the following condition and release the accelerator pedal completely.

**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.
5. Depress accelerator pedal steadily with 1.0/8 - 2.0/8 of "THROTTLE POSI" from a speed of 55 to 65 km/h (34 to 40 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-154, "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-DIAGNOSIS" 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 → 2 → 3 → 4
No malfunction exists	1 → 2 → 3 → 4
Malfunction for P0734 exists.	1 → 2 → 2 → 1

8. Make sure that "OK" is displayed. (If "NG" is displayed, go to [AT-154, "Diagnostic Procedure"](#).)  
 Refer to [AT-517, "Shift Schedule"](#).

 **With GST**

Follow the procedure "With CONSULT-II".





## Diagnostic Procedure

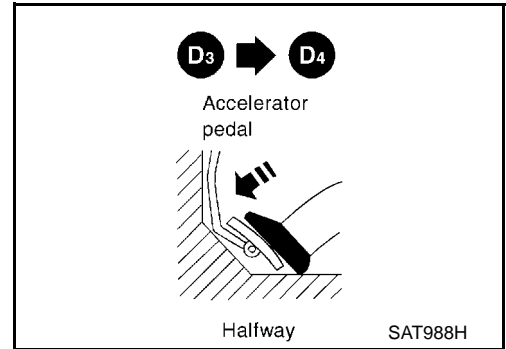
### 1. CHECK SHIFT UP (D3 TO D4)

During "Cruise test — Part 1" ([AT-75](#)), 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.

Engine speed rpm	Line pressure kPa (bar, kg/cm <sup>2</sup> , psi)	
	D, 2 and 1 positions	R position
Idle	500 (0.50, 5.1, 73)	778 (7.78, 7.9, 113)
Stall	1,233 (12.33, 12.6, 179)	1,918 (19.18, 19.6, 278)

Refer to [AT-65, "Fluid Pressure Test"](#).

OK or NG

OK >> GO TO 3

NG >> GO TO 6

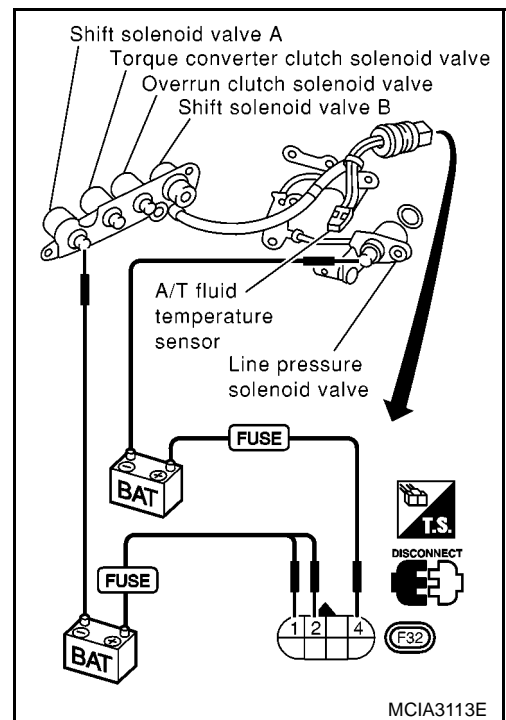
### 3. CHECK SOLENOID VALVES

1. Remove control valve assembly.  
Refer to [AT-404, "REMOVAL"](#).
2. Refer to [AT-149, "Component Inspection"](#).

OK or NG

OK >> GO TO 4

NG >> Replace solenoid valve assembly.



#### 4. CHECK CONTROL VALVE

1. Disassemble control valve assembly.  
Refer to [AT-439, "Control Valve Assembly"](#) .
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

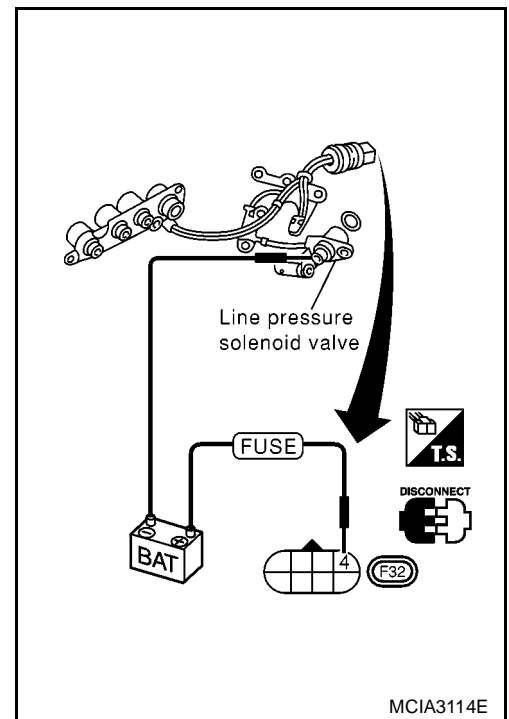
- OK >> GO TO 9  
NG >> Check control valve again. Repair or replace control valve assembly.

#### 6. CHECK LINE PRESSURE SOLENOID VALVE

1. Remove control valve assembly.  
Refer to [AT-404, "REMOVAL"](#) .
2. Refer to [AT-149, "Component Inspection"](#) .

##### OK or NG

- OK >> GO TO 7  
NG >> Replace solenoid valve assembly.



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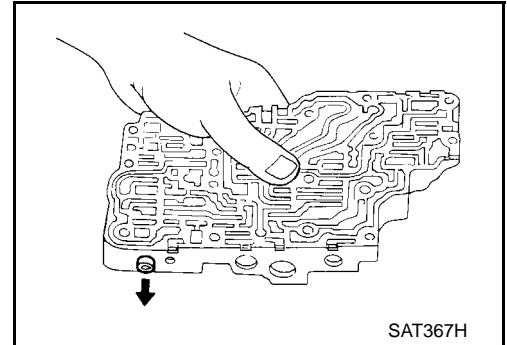
## 7. CHECK CONTROL VALVE

---

1. Disassemble control valve assembly.  
Refer to [AT-439, "Control Valve Assembly"](#) .
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 control valve again. Repair or replace control valve assembly.

---

## 9. CHECK DTC

---

Perform [AT-151, "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.

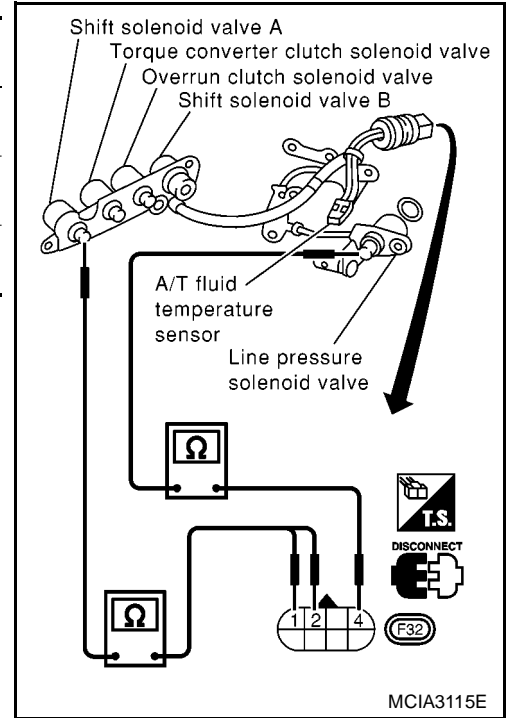
## Component Inspection SOLENOID VALVES

- For removal, refer to [AT-404, "REMOVAL"](#).

### Resistance Check

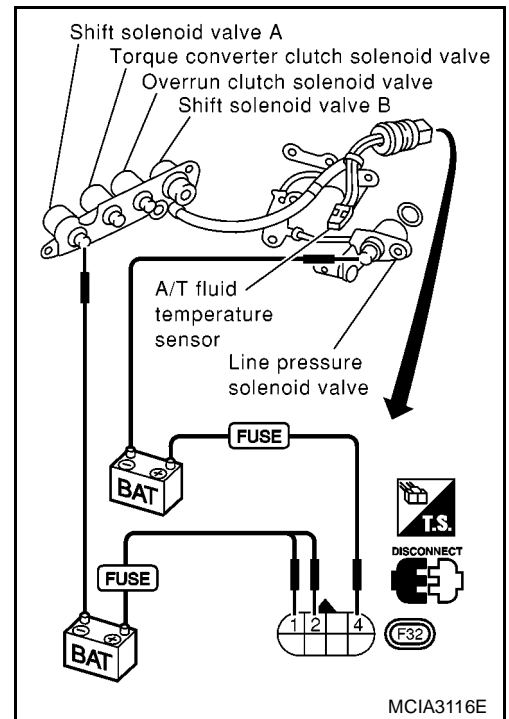
- Check resistance between two terminals.

Solenoid valve	Terminal No.	Resistance (Approx.)	
Shift solenoid valve A	2	Ground	20 - 30Ω
Shift solenoid valve B	1		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.



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[EURO-OBD]

## DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

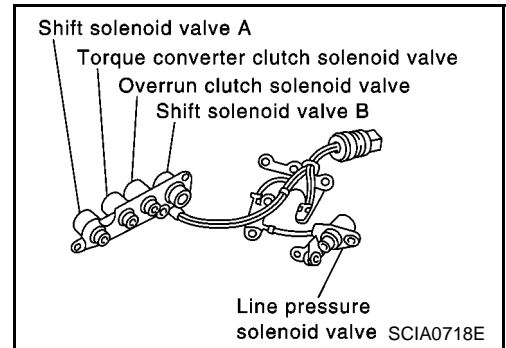
### Description

ECS005W3

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 throttle position sensors. 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"	Approximately 4%
	↓ Lock-up "ON"	↓ Approximately 94%

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
3	GY/R	Torque converter clutch solenoid valve	When A/T performs lock-up.	8 - 15V
			When A/T does not perform lock-up.	0V

### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
Ⓟ : TCC SOLENOID/CIRC	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	<ul style="list-style-type: none"> <li>● Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>● T/C clutch solenoid valve</li> </ul>
Ⓢ : P0740		

### DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

#### NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE" 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.

SELECT SYSTEM
A/T
ENGINE

SAT014K

# DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[EURO-OBD]

## 📱 With CONSULT-II

1. Turn ignition switch "ON".
2. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II and wait at least 1 second.
3. If DTC is detected, go to [AT-161, "Diagnostic Procedure"](#).

## 📺 With GST

Follow the procedure "With CONSULT-II".

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT020K

A

B

AT

D

E

F

G

H

I

J

K

L

M

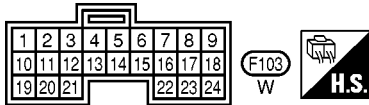
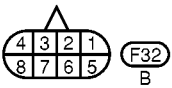
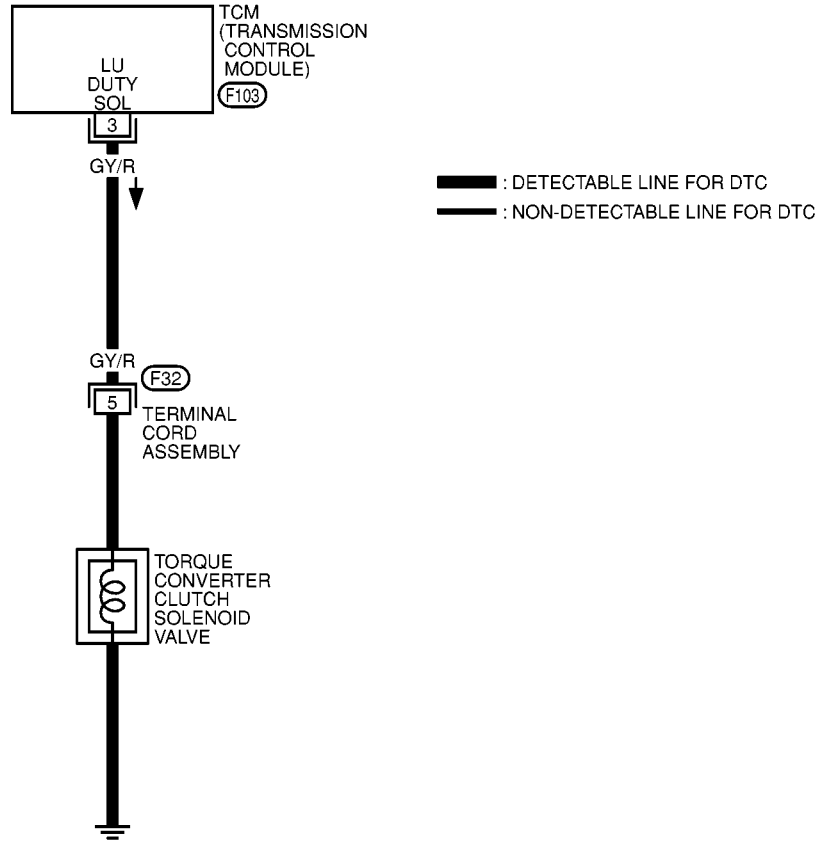
# DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[EURO-OBD]

## Wiring Diagram — AT — TCV

ECS005W4

AT-TCV-01



MCWA0009E



### Diagnostic Procedure

#### 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 5 and ground.

**Resistance: 5 - 20Ω**

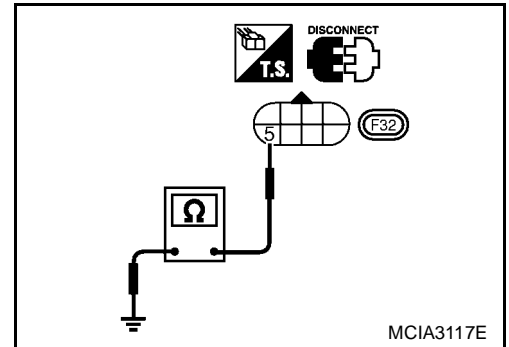
OK or NG

OK >> GO TO 2

NG >> 1. Remove oil pan. Refer to [AT-404, "ON-VEHICLE SERVICE"](#).

2. Check the following items:

- Torque converter clutch solenoid valve  
Refer to [AT-162, "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.
3. Check continuity between terminal 5 and TCM harness connector terminal 3.

**Continuity should exist.**

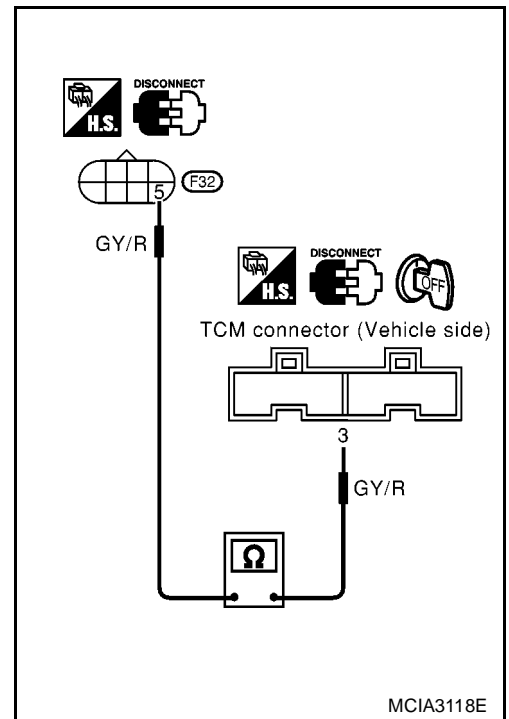
If OK, check harness for short to ground and short to power.

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.



#### 3. CHECK DTC

Perform [AT-158, "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 P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[EURO-OBD]

## Component Inspection

### TORQUE CONVERTER CLUTCH SOLENOID VALVE

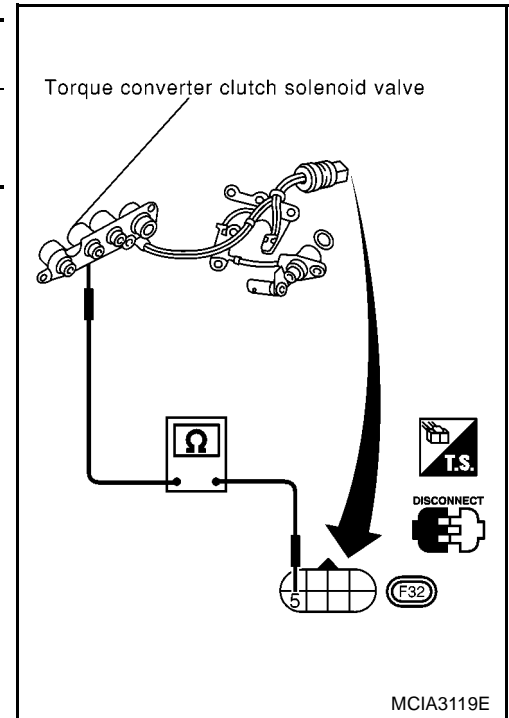
ECS005W6

- For removal, refer to [AT-404, "REMOVAL"](#).

### Resistance Check

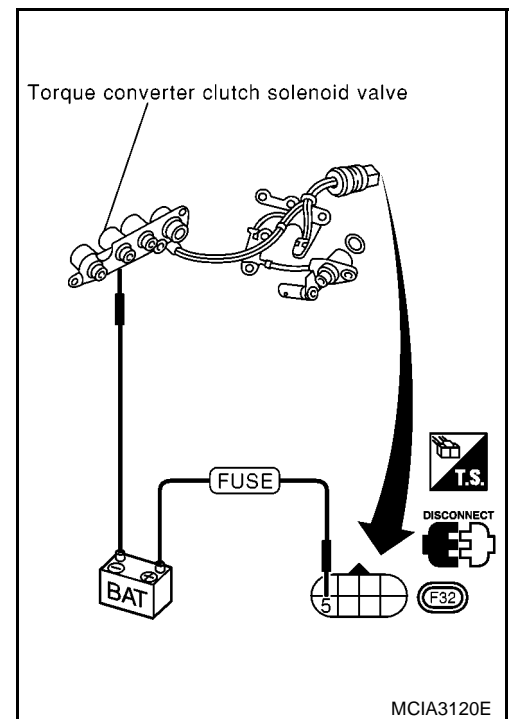
- Check resistance between two terminals.

Solenoid valve	Terminal 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.



DTC P0745 LINE PRESSURE SOLENOID VALVE

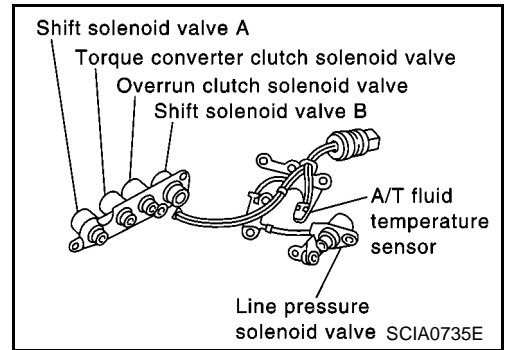
PFP:31940

Description

ECS006MG

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
Line pressure solenoid valve duty	Small throttle opening (Low line pressure)	Approximately 24%
	Large throttle opening (High line pressure)	Approximately 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".

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
1	R/W	Line pressure solenoid valve	When releasing accelerator pedal after warming up engine.	1.5 - 2.5V
			When depressing accelerator pedal fully after warming up engine.	0V
2	P/B	Line pressure solenoid valve (with dropping resistor)	When releasing accelerator pedal after warming up engine.	5 - 14V
			When depressing accelerator pedal fully after warming up engine.	0V

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
(P) : L/PRESS SOL/CIRC (EST) : P0745	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	<ul style="list-style-type: none"> <li>● Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>● Line pressure solenoid valve</li> </ul>

## DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

**NOTE:**

If “DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE” 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.

SELECT SYSTEM
A/T
ENGINE

SAT014K

 **With CONSULT-II**

1. Turn ignition switch “ON” and select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
2. Depress accelerator pedal completely and wait at least 1 second.
3. If DTC is detected, go to [AT-166, "Diagnostic Procedure"](#) .

 **With GST**

Follow the procedure “With CONSULT-II”.

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT020K

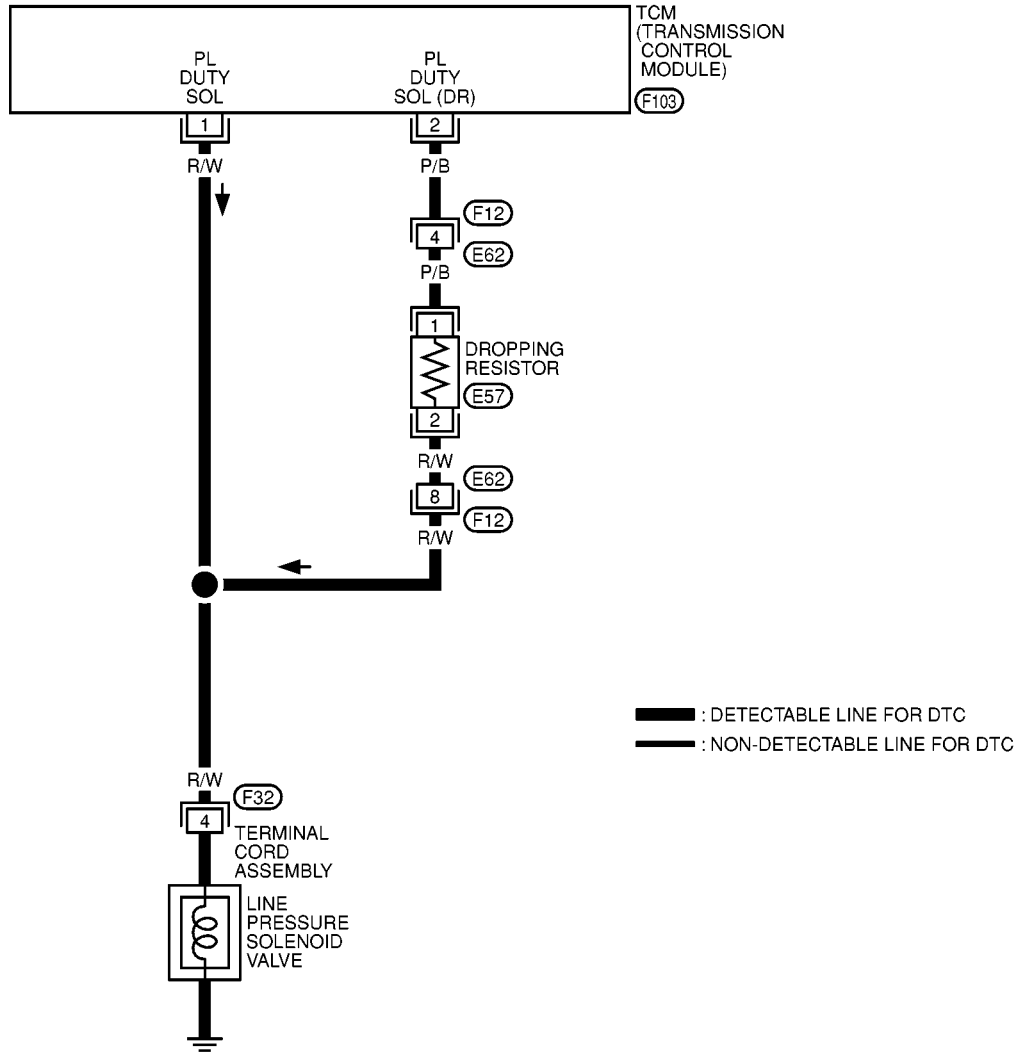
# DTC P0745 LINE PRESSURE SOLENOID VALVE

[EURO-OBD]

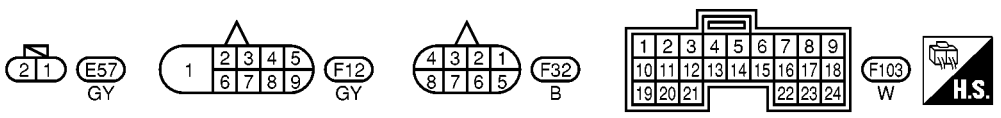
## Wiring Diagram — AT — LPSV

ECS006MH

AT-LPSV-01



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



## Diagnostic Procedure

### 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 4 and ground.

**Resistance: 2.5 - 5Ω**

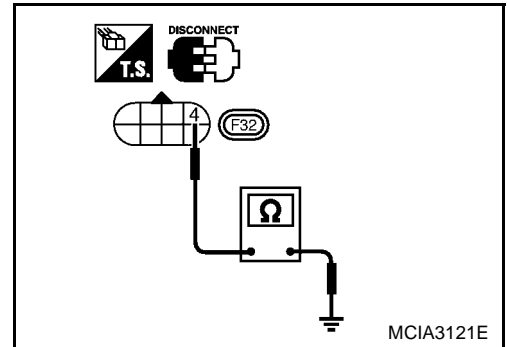
OK or NG

OK >> GO TO 2

NG >> 1. Remove control valve assembly. Refer to [AT-404](#), "REMOVAL".

2. Check the following items:

- Line pressure solenoid valve  
Refer to [AT-167](#), "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.
3. Check resistance between terminal 4 and TCM harness connector terminal 2.

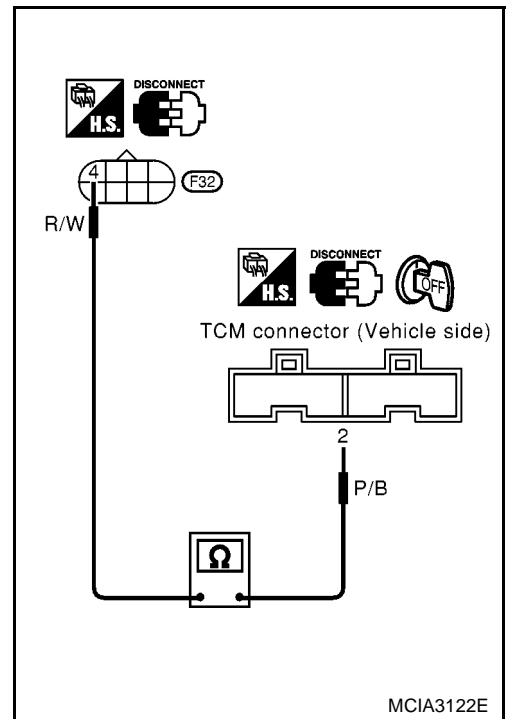
**Resistance: 10 - 15Ω**

OK or NG

OK >> GO TO 3

NG >> Check the following items:

- Dropping resistor  
Refer to [AT-167](#), "Component Inspection".
- 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.

**Resistance: Approx. 0Ω**

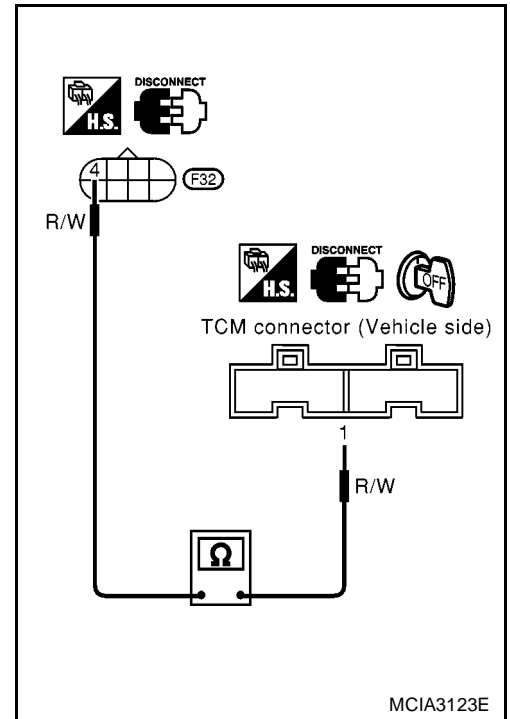
If OK, check harness for short to ground and short to power.

3. 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-164, "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.

### Component Inspection LINE PRESSURE SOLENOID VALVE

ECS006MJ

- For removal, refer to [AT-404, "REMOVAL"](#) .

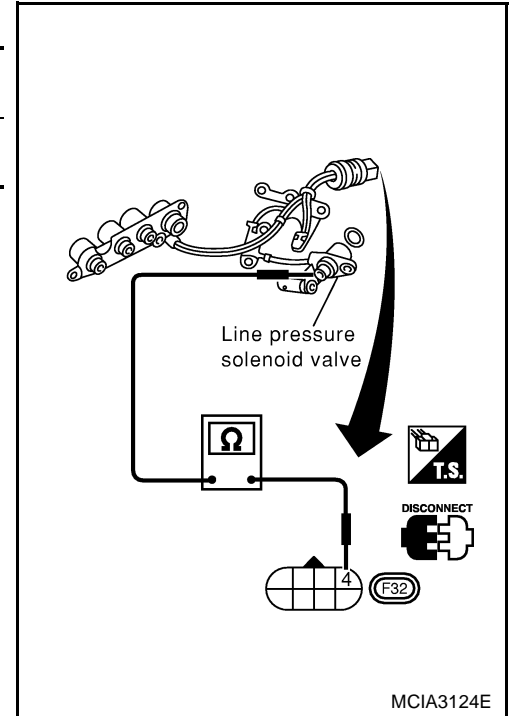
# DTC P0745 LINE PRESSURE SOLENOID VALVE

[EURO-OBD]

## Resistance Check

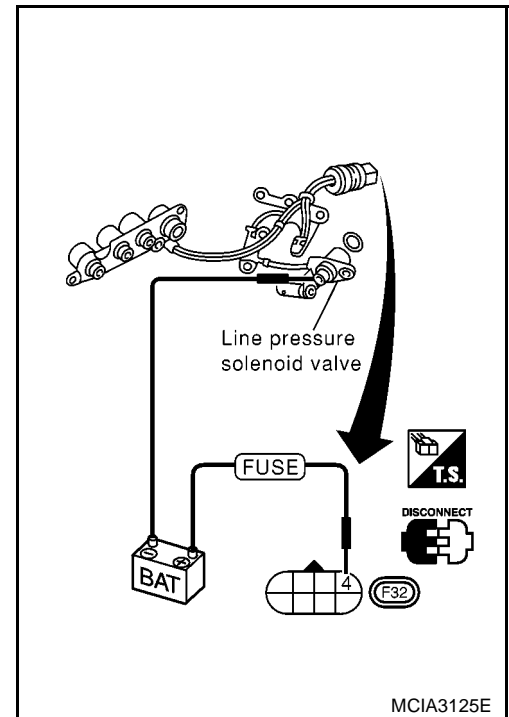
- Check resistance between two terminals.

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.





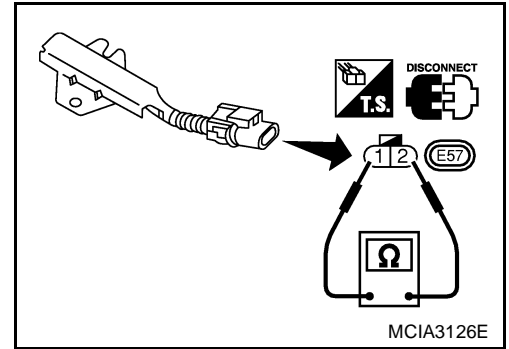
# DTC P0745 LINE PRESSURE SOLENOID VALVE

[EURO-OBD]

## DROPPING RESISTOR

- Check resistance between two terminals.

**Resistance: 10 - 15Ω**



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# DTC P0750 SHIFT SOLENOID VALVE A

[EURO-OBD]

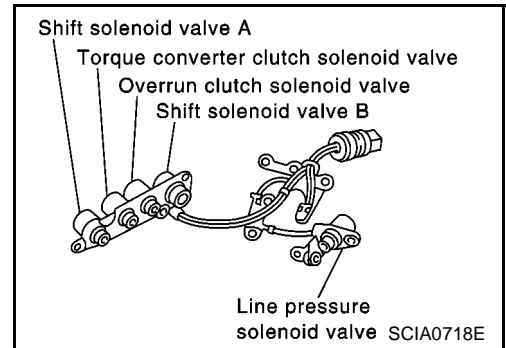
## DTC P0750 SHIFT SOLENOID VALVE A

PFP:31940

### Description

ECS005WB

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)

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
11	L/W	Shift solenoid valve A	When shift solenoid valve A operates. (When driving in "D1" or "D4".)	Battery voltage
			When shift solenoid valve A does not operate. (When driving in "D2" or "D3".)	0V

### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
(P) : SFT SOL A/CIRC (P) : P0750	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	<ul style="list-style-type: none"> <li>● Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>● Shift solenoid valve A</li> </ul>

## DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

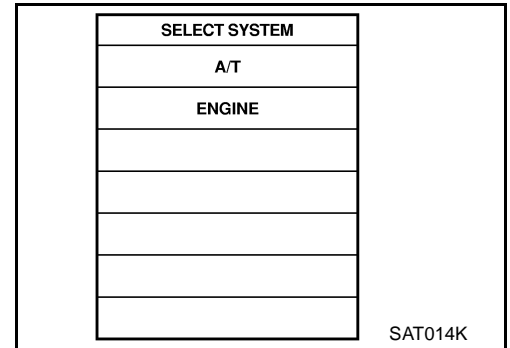
**CAUTION:**

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 5 seconds before conducting the next test.

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

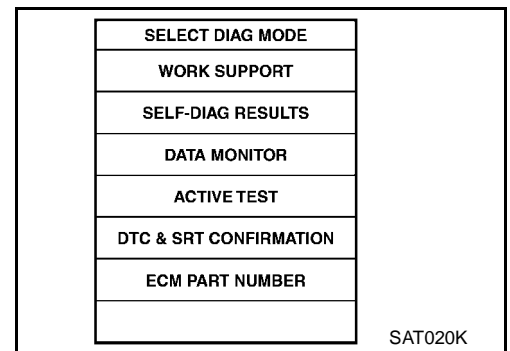


**With CONSULT-II**

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
2. Start engine.
3. Drive vehicle in D position and allow the transmission to shift "1" → "2" ("GEAR").
4. If DTC is detected, go to [AT-173, "Diagnostic Procedure"](#).

**With GST**

Follow the procedure "With CONSULT-II".



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

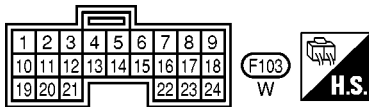
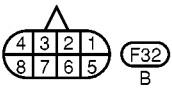
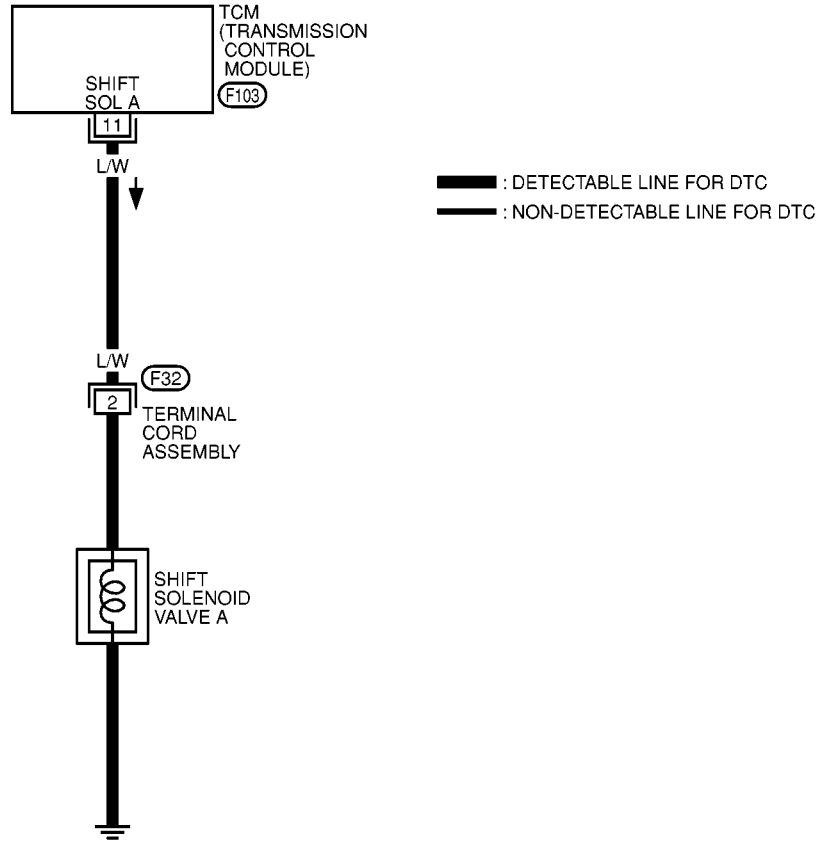
# DTC P0750 SHIFT SOLENOID VALVE A

[EURO-OBD]

## Wiring Diagram — AT — SSV/A

ECS005WC

AT-SSV/A-01



MCWA0006E

## Diagnostic Procedure

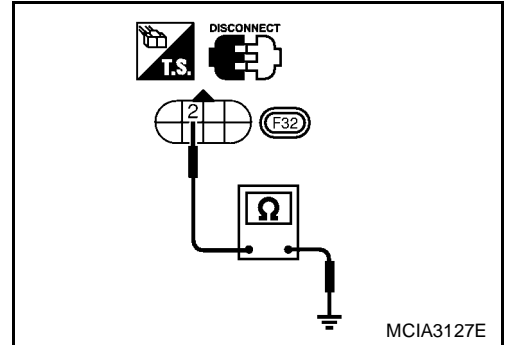
### 1. CHECK VALVE RESISTANCE

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

**Resistance: 20 - 30Ω**

OK or NG

- OK >> GO TO 2
- NG >> 1. Remove control valve assembly. Refer to [AT-404, "REMOVAL"](#).
2. Check the following items:
- Shift solenoid valve A  
Refer to [AT-174, "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.
3. Check continuity between terminal 2 and TCM harness connector terminal 11.

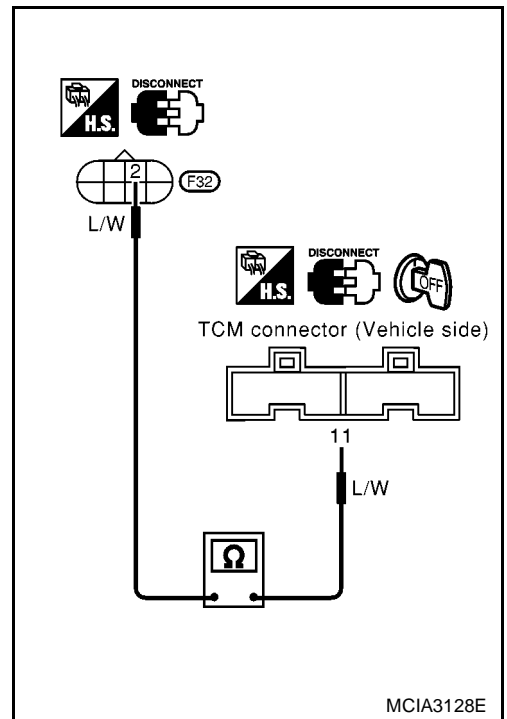
**Continuity should exist.**

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.



### 3. CHECK DTC

Perform [AT-171, "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.

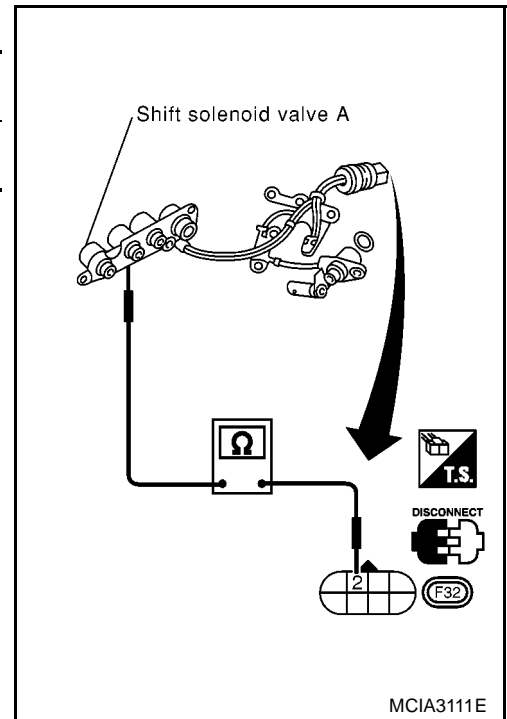
## Component Inspection SHIFT SOLENOID VALVE A

- For removal, refer to [AT-404, "REMOVAL"](#).

### Resistance Check

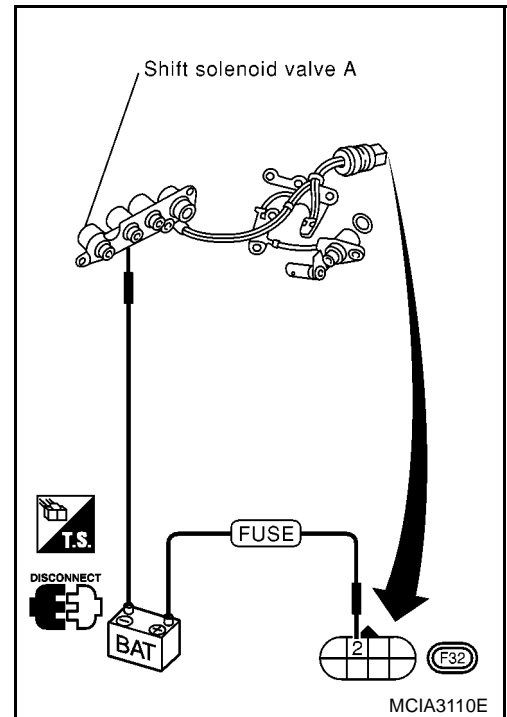
- Check resistance between two terminals.

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

[EURO-OBD]

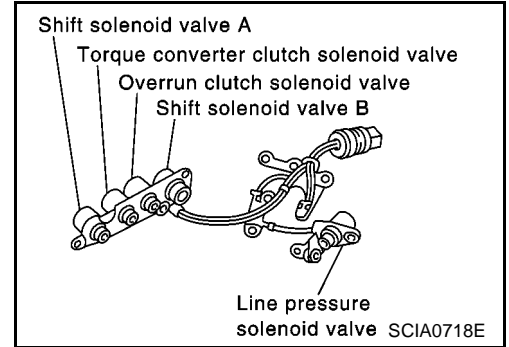
## DTC P0755 SHIFT SOLENOID VALVE B

PFP:31940

### Description

ECS005WF

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)

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
12	L/Y	Shift solenoid valve B	When shift solenoid valve B operates. (When driving in "D1" or "D2".)	Battery voltage
			When shift solenoid valve B does not operate. (When driving in "D3" or "D4".)	0V

### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
(P) : SFT SOL B/CIRC (P) : P0755	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	<ul style="list-style-type: none"> <li>● Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>● Shift solenoid valve B</li> </ul>

## DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

**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 5 seconds before conducting the next test.

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

SELECT SYSTEM
A/T
ENGINE

SAT014K

**With CONSULT-II**

1. 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 → 2 → 3 ("GEAR").
4. If DTC is detected, go to [AT-178. "Diagnostic Procedure"](#) .

**With GST**

Follow the procedure "With CONSULT-II".

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT020K



# DTC P0755 SHIFT SOLENOID VALVE B

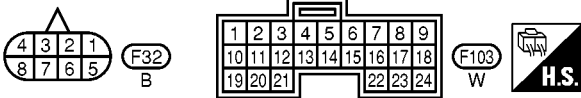
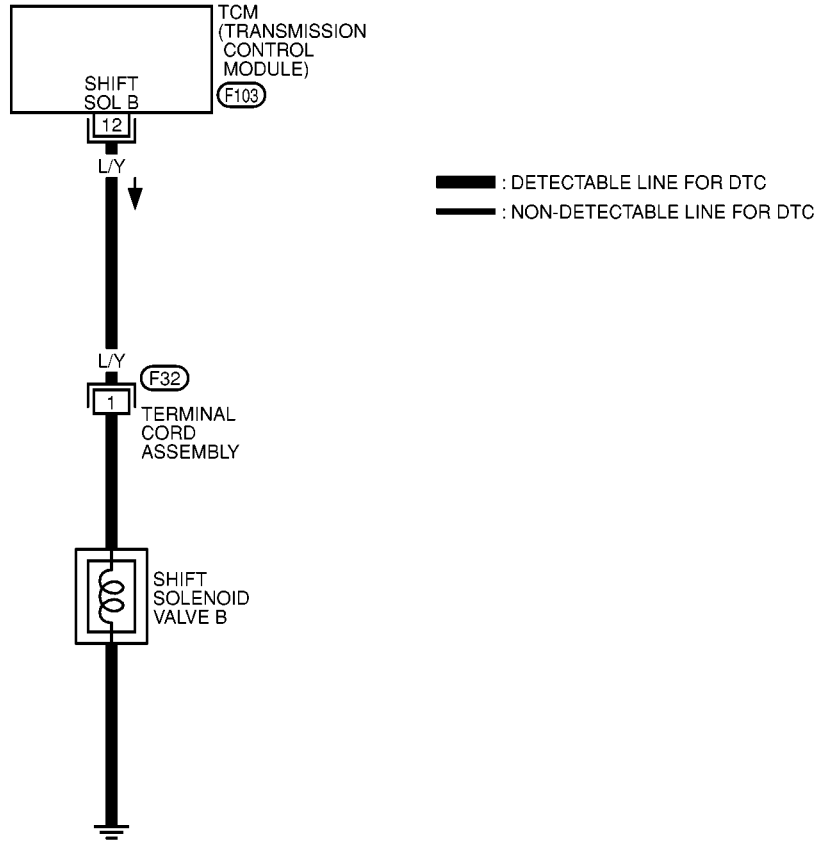
[EURO-OBD]

## Wiring Diagram — AT — SSV/B

ECS005WG

AT-SSV/B-01

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



MCWA0007E

## Diagnostic Procedure

### 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.

**Resistance: 5 - 20Ω**

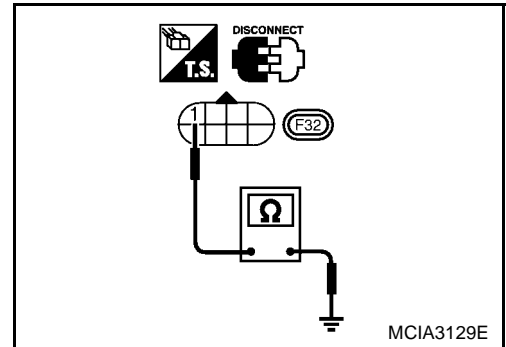
OK or NG

OK >> GO TO 2

NG >> 1. Remove control valve assembly. Refer to [AT-404, "REMOVAL"](#)

2. Check the following items:

- Shift solenoid valve B  
Refer to [AT-179, "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.
3. Check continuity between terminal 12 and TCM harness connector terminal 1.

**Continuity should exist.**

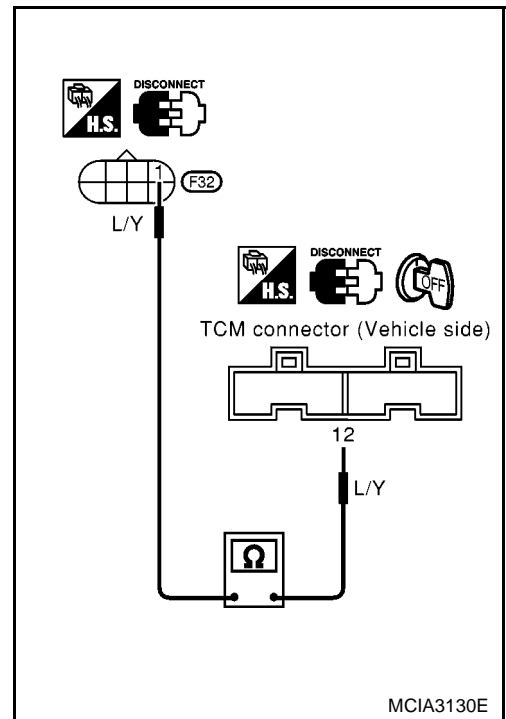
If OK, check harness for short to ground and short to power.

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.



### 3. CHECK DTC

Perform [AT-176, "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 P0755 SHIFT SOLENOID VALVE B

[EURO-OBD]

ECS005W1

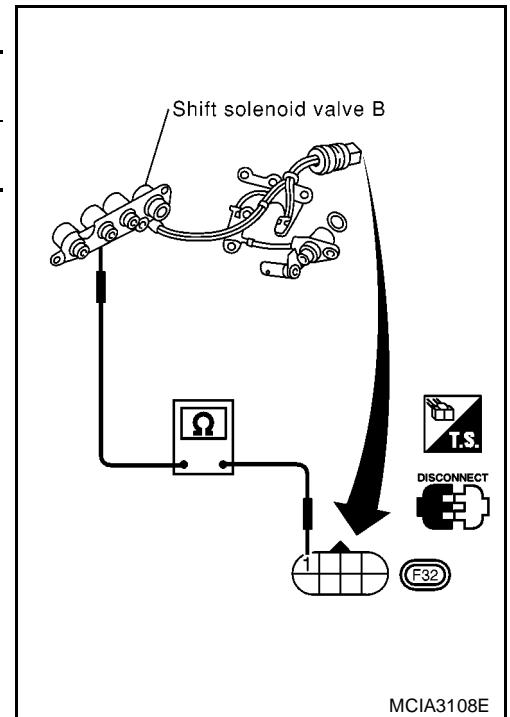
## Component Inspection SHIFT SOLENOID VALVE B

- For removal, refer to [AT-404, "REMOVAL"](#) .

## Resistance Check

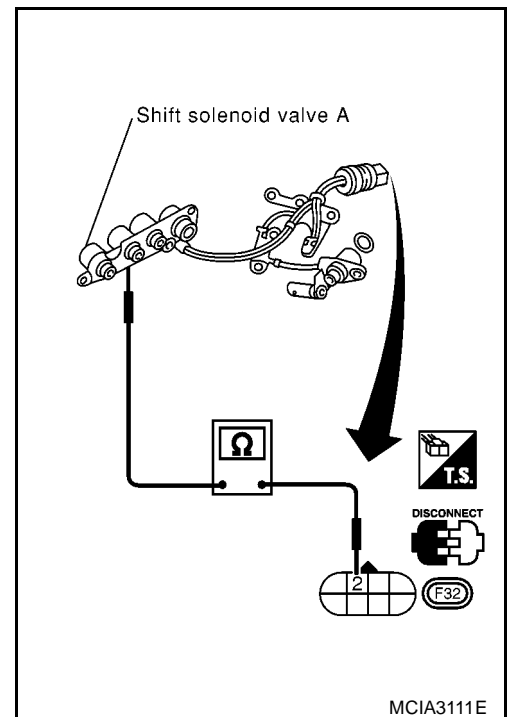
- Check resistance between two terminals.

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.



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# DTC P1705 ACCELERATOR PEDAL POSITION (APP) SENSOR

[EURO-OBD]

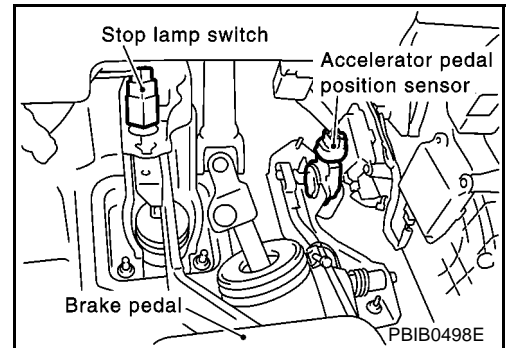
## DTC P1705 ACCELERATOR PEDAL POSITION (APP) SENSOR

PFP:22620

### Description

ECS005WJ

- Accelerator pedal position (APP) sensor throttle position sensor
- Electric throttle control actuator consists of throttle control motor, acceleration pedal position sensor, throttle position sensor, etc. The actuator sends a signal to the TCM.






### CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.



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

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)	
32	R	Throttle position sensor (Power source)		When turning ignition switch "ON"	4.5 - 5.5V
				When turning ignition switch "OFF"	0V
41	W/R	Throttle position sensor		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	Ground (Throttle position sensor)	—	—	—

### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : TP SEN/CIRC A/T  : P1705	TCM receives an excessively low or high voltage from the sensor.	<ul style="list-style-type: none"> <li>Harness or connectors (The sensor circuit is open or shorted.)</li> <li>Accelerator pedal position (APP) sensor</li> <li>Throttle position sensor</li> </ul>

# DTC P1705 ACCELERATOR PEDAL POSITION (APP) SENSOR

[EURO-OBD]

## DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

### 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 5 seconds before conducting the next test.

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

SELECT SYSTEM
A/T
ENGINE

SAT014K

### With CONSULT-II

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

Accelerator pedal condition	THRTL POS SEN
Fully released	Less than 4.7V
Partially depressed	0.1 - 4.6V
Fully depressed	1.9 - 4.6V

SELECT DIAG MODE
SELF-DIAG RESULTS
DATA MONITOR
DTC WORK SUPPORT
TCM PART NUMBER

SAT971J

If the check result is NG, go to [AT-183, "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 (OD "ON")**

If the check result is NG, go to [AT-183, "Diagnostic Procedure"](#) .  
If the check result is OK, go to following step.

SELECT SYSTEM
A/T
ENGINE

SAT014K

- 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 (OD "ON")**

### With GST

Follow the procedure "With CONSULT-II".

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT020K

# DTC P1705 ACCELERATOR PEDAL POSITION (APP) SENSOR

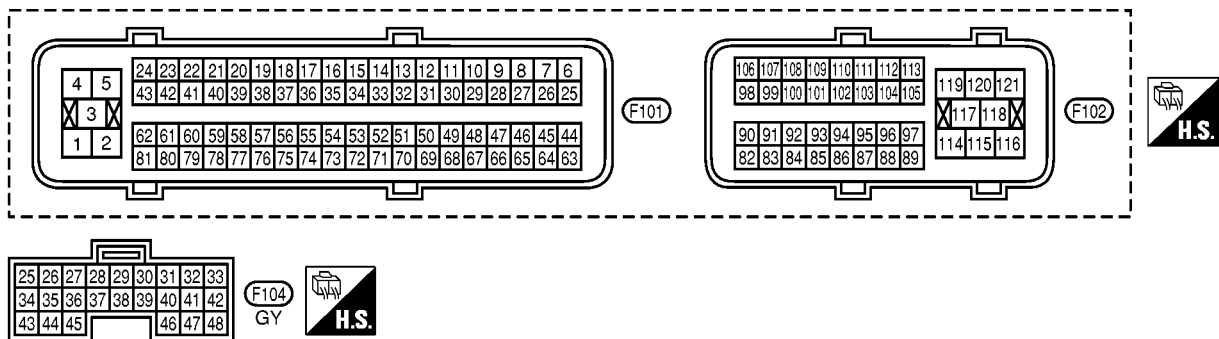
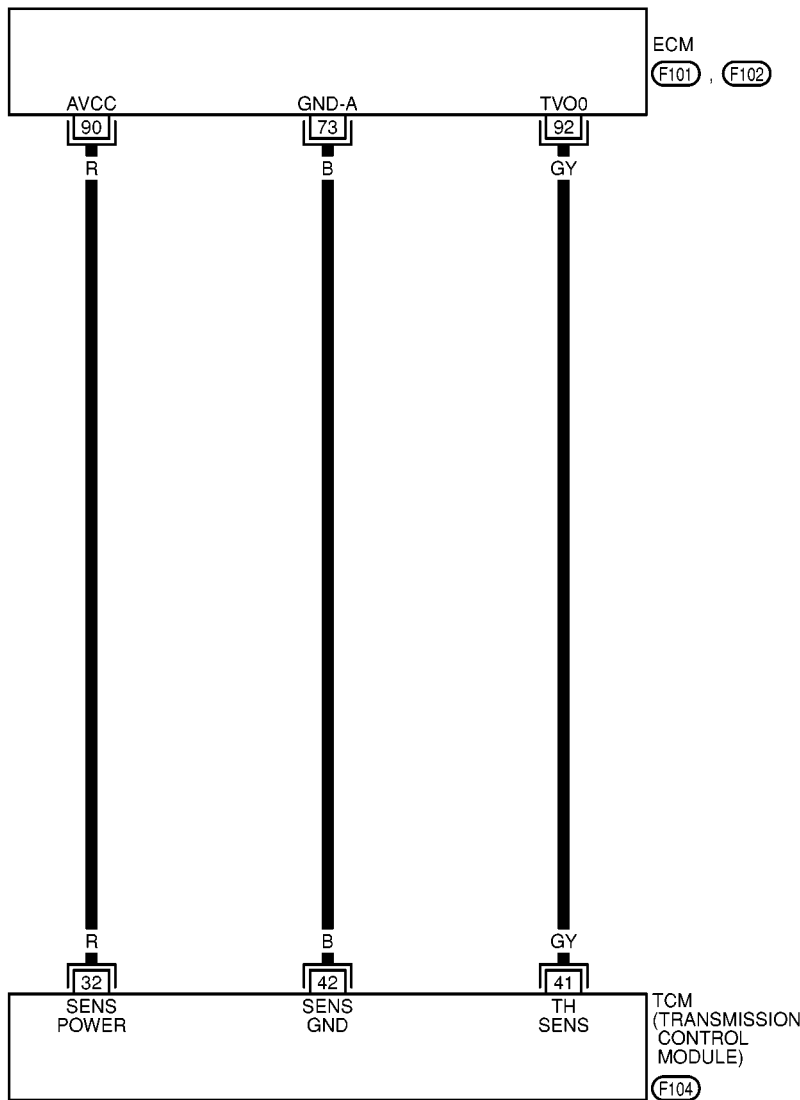
[EURO-OBD]

## Wiring Diagram — AT — TPS

ECS005WK

AT-TPS-01

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



MCWA0005E

# DTC P1705 ACCELERATOR PEDAL POSITION (APP) SENSOR

[EURO-OBD]

## Diagnostic Procedure

ECS005WL

A

### 1. CHECK DTC WITH ECM

B

Refer to [EC-593, "Emission-related Diagnostic Information"](#) .

OK or NG

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

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

NG >> Check accelerator pedal position sensor circuit for engine control. Refer to [EC-84, "TROUBLE DIAGNOSIS"](#) .

AT

### 2. CHECK INPUT SIGNAL (WITH CONSULT-II)

D

 With CONSULT-II

E

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".

F

G

H

I

SELECT SYSTEM	
A/T	
ENGINE	

SAT014K

**Voltage:**

**Fully-closed throttle:      Approximately 0.5V**

**Fully-open throttle:        Approximately 4V**

J

K

L

M

OK or NG

OK >> GO TO 4

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

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

# DTC P1705 ACCELERATOR PEDAL POSITION (APP) SENSOR

[EURO-OBD]

## 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 and 42 while accelerator pedal is depressed slowly.

#### Voltage:

Fully-closed throttle valve:      **Approximately 0.5V**

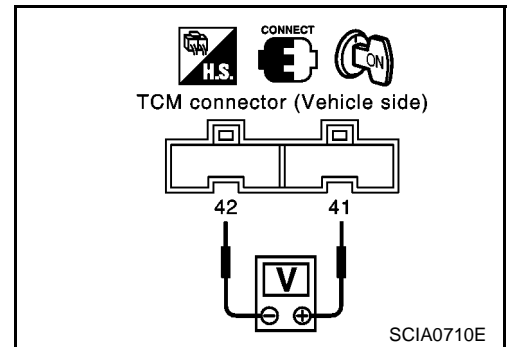
Fully-open throttle valve:        **Approximately 4V**

(Voltage rises gradually in response to throttle position)

#### OK or NG

OK    >> GO TO 4

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



## 4. CHECK DTC

Perform [AT-181, "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 P1760 OVERRUN CLUTCH SOLENOID VALVE

[EURO-OBD]

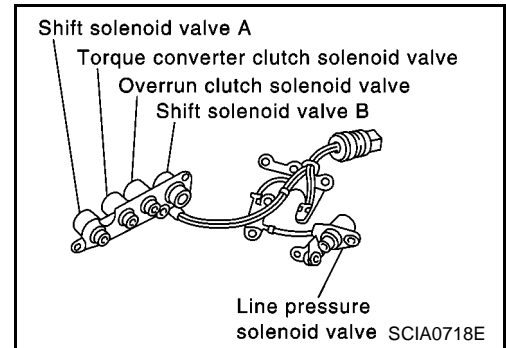
## DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

PFP:31940

### Description

ECS005WM

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.



### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
20	L/B	Overrun clutch solenoid valve	When overrun clutch solenoid valve operates.	Battery voltage
			When overrun clutch solenoid valve does not operate.	0V

### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
Ⓟ : O/R CLTCH SOL/CIRC Ⓢ : P1760	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	<ul style="list-style-type: none"> <li>● Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>● Overrun clutch solenoid valve</li> </ul>

## DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

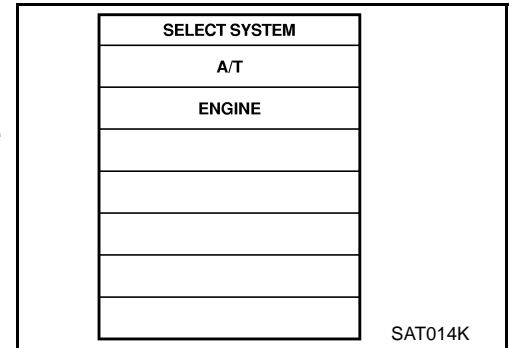
**CAUTION:**

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 5 seconds before conducting the next test.

**TESTING CONDITION:**

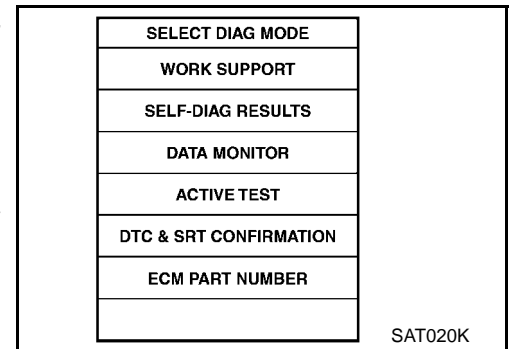


Always drive vehicle on a level road to improve accuracy of test.

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

**With CONSULT-II**

1. 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").
4. Release accelerator pedal completely with "D" position (OD "OFF").
5. If DTC is detected, go to [AT-188, "Diagnostic Procedure"](#).



**With GST**

Follow the procedure "With CONSULT-II".

# DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

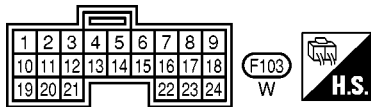
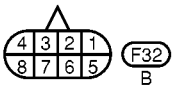
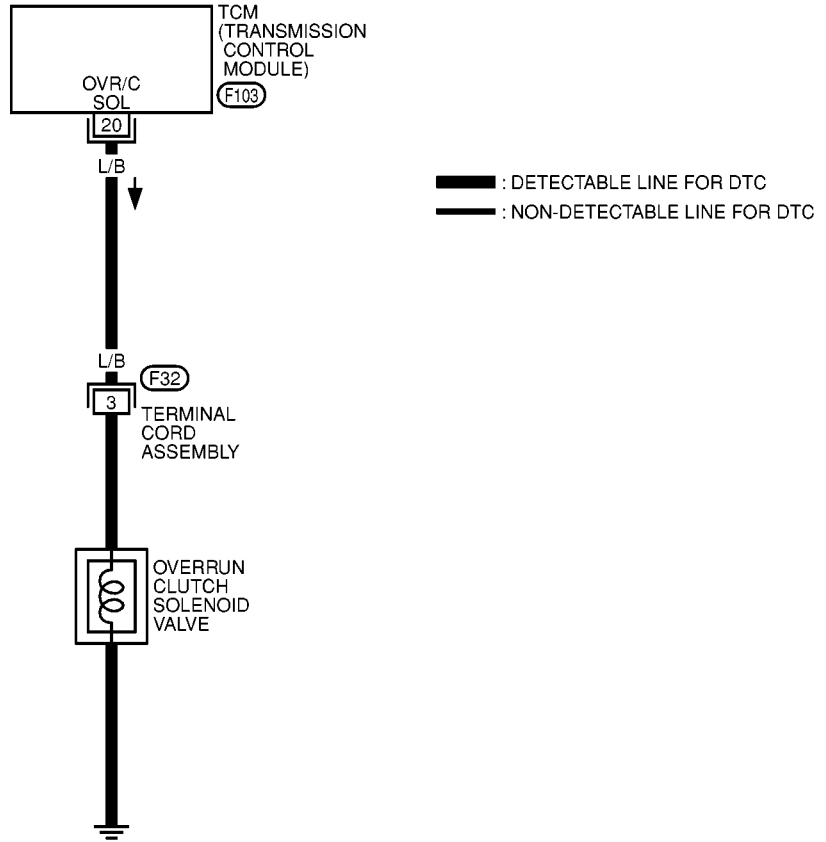
[EURO-OBD]

## Wiring Diagram — AT — OVRCSV

ECS005WN

AT-OVRCSV-01

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



MCWA0008E

## Diagnostic Procedure

### 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.

**Resistance: 20 - 30Ω**

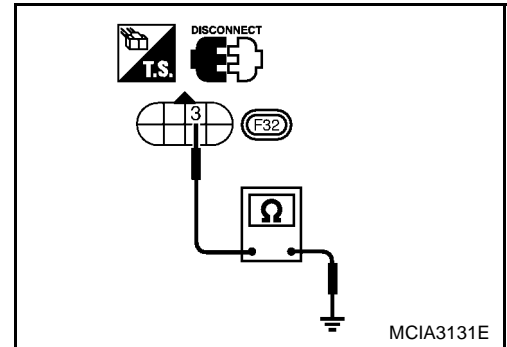
OK or NG

OK >> GO TO 2

NG >> 1. Remove control valve assembly. Refer to [AT-404, "REMOVAL"](#).

2. Check the following items:

- Overrun clutch solenoid valve  
Refer to [AT-189, "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.
3. Check continuity between terminal 3 and TCM harness connector terminal 20.

**Continuity should exist.**

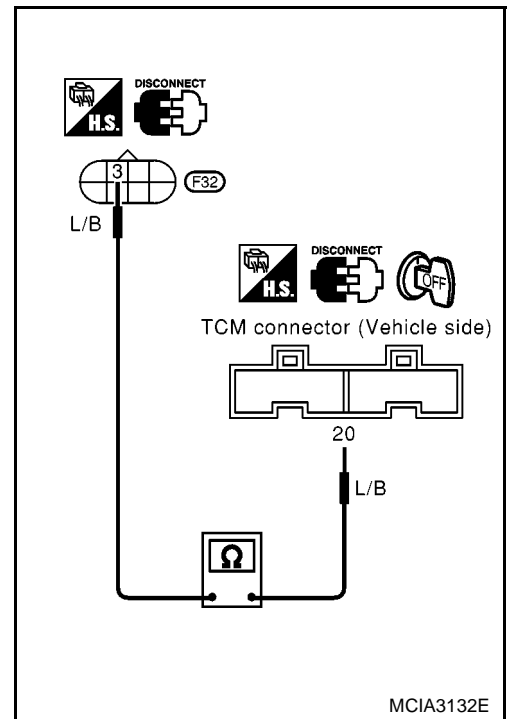
If OK, check harness for short to ground and short to power.

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.



### 3. CHECK DTC

Perform [AT-186, "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 P1760 OVERRUN CLUTCH SOLENOID VALVE

[EURO-OBD]

ECS005WP

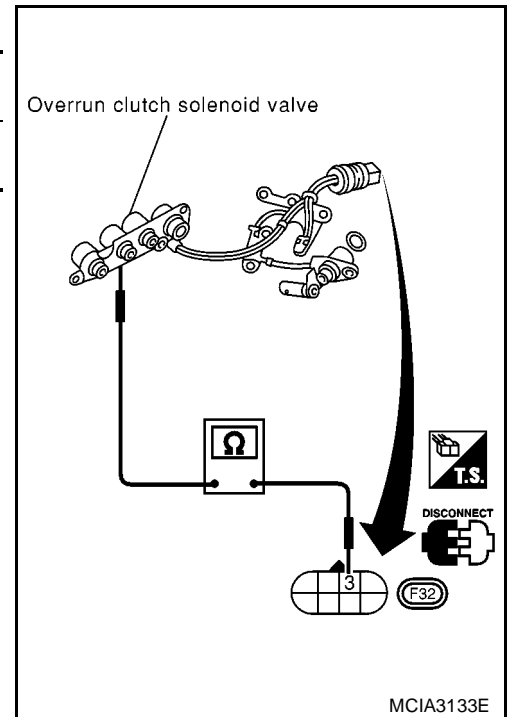
## Component Inspection OVERRUN CLUTCH SOLENOID VALVE

- For removal, refer to [AT-404, "REMOVAL"](#) .

## Resistance Check

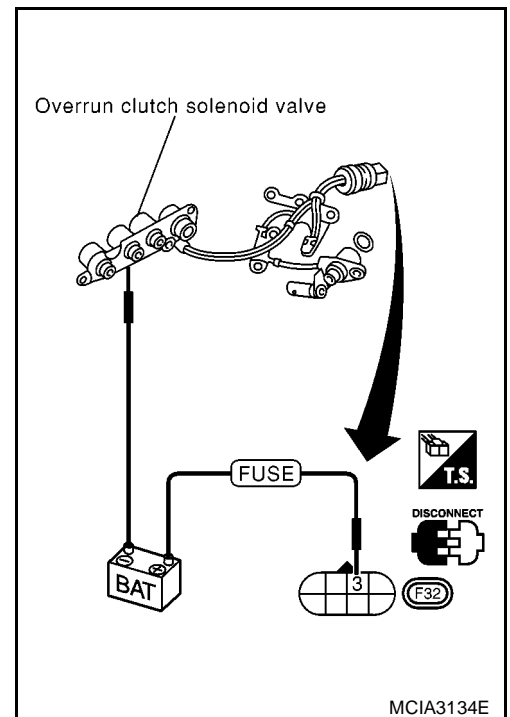
- Check resistance between two terminals.

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.



## DTC U1000 CAN COMMUNICATION LINE

PFP:31940

### Description

*ECS005WQ*

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.

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Condition	Judgement standard (Approx.)
5	B/W	CAN(high)	—	—	—
6	L/R	CAN(low)	—	—	—

\*: This terminal is connected to the ECM.

### On Board Diagnosis Logic

*ECS005WR*

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
<input type="checkbox"/> :A/T COMM LINE**  <input checked="" type="checkbox"/> :Judgement flicker	The ECM-AT communication line is open or shorted.	<ul style="list-style-type: none"> <li>● Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>● Overrun clutch solenoid valve</li> </ul>

\*\* :A/T COMMLINE means DTE U1000 CAN communication line.

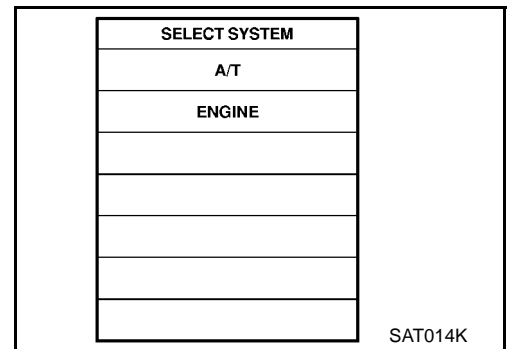
### DTC Confirmation Procedure

*ECS005WS*

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

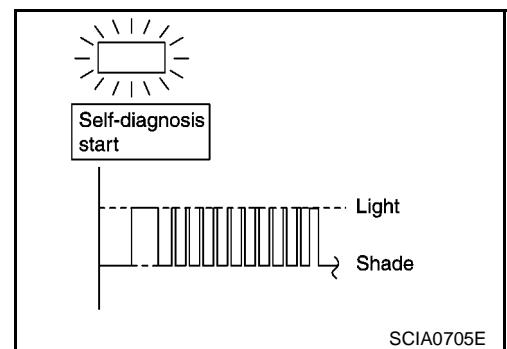
#### WITH CONSULT-II

1. Turn ignition switch "ON".
2. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
3. Wait at least 6 seconds or start engine and wait for at least 6 seconds.
4. If DTC is detected, go to [AT-192, "Diagnostic Procedure"](#) .



#### WITHOUT CONSULT-II

1. Turn ignition switch "ON".
2. Wait at least 6 seconds or start engine and wait at least 6 seconds.
3. Perform self-diagnosis. Refer to [AT-49, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) .
4. If DTC is detected, go to [AT-192, "Diagnostic Procedure"](#) .



# DTC U1000 CAN COMMUNICATION LINE

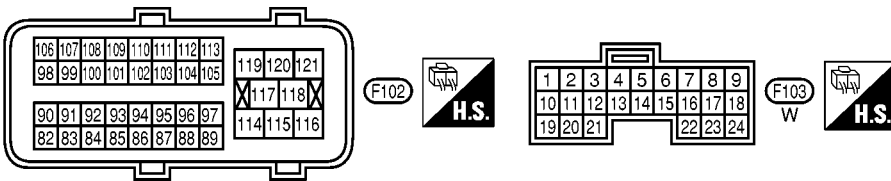
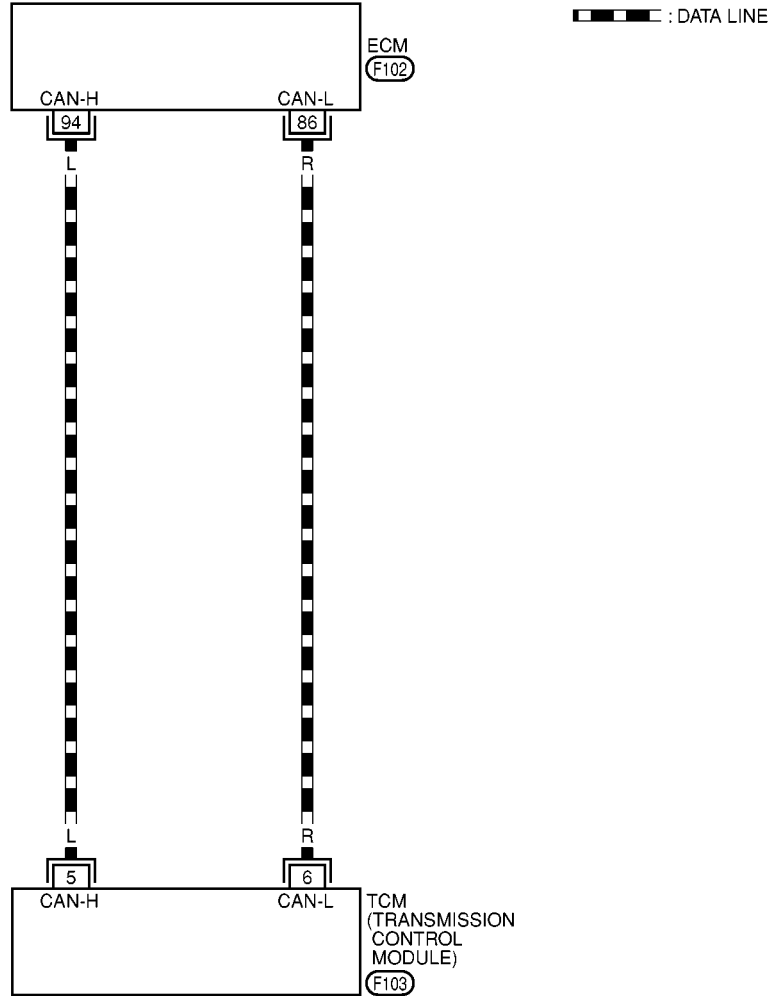
[EURO-OBD]

## Wiring Diagram — AT

ECS005WT

AT-CAN-01

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



MCWA0022E

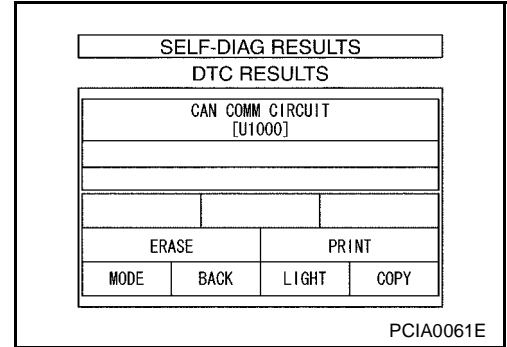
**Diagnostic Procedure**

**1. CHECK CAN COMMUNICATION CIRCUIT**

- ① With CONSULT-II
- 1. Turn ignition switch to "ON" position. (Do not start engine.)
- 2. Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 3. The "CAN COMM CIRCUIT" is detected.

**Yes or No?**

- Yes >> Print out CONSULT-II screen, GO TO 2.
- No >> INSPECTION END



**2. CHECK CAN COMMUNICATION SIGNALS**

- ① With CONSULT-II
- 1. Turn ignition switch to "ON" position. (Do not start engine.)
- 2. Select "CAN COMM SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.

**CAN Communication Signals**

Normal conditions	Abnormal conditions (examples)
CAN COMM: OK	CAN COMM: OK
CAN CIRC 1: OK	CAN CIRC 1: UNKWN
CAN CIRC 2: OK	CAN CIRC 2: UNKWN
CAN CIRC 3: UNKWN	CAN CIRC 3: UNKWN
CAN CIRC 4: OK	CAN CIRC 4: UNKWN
CAN CIRC 5: UNKWN	CAN CIRC 5: UNKWN

>> Print out CONSULT-II screen, go to [LAN-8, "CAN COMMUNICATION"](#) .



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

[EURO-OBD]

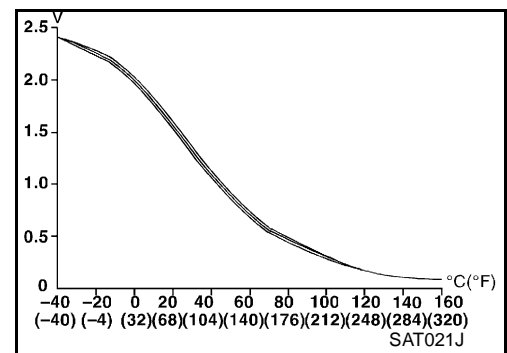
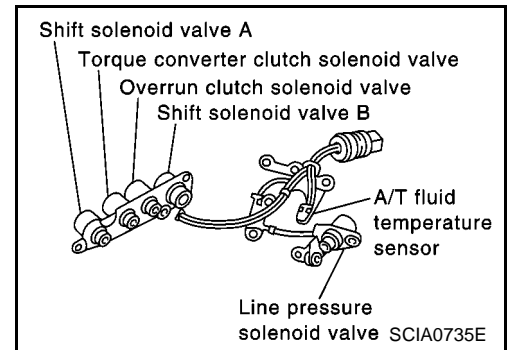
## DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)

PF1:31940

### Description

ECS005WV

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

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)	
10	BR/W	Power source		When turning ignition switch to "ON".	Battery voltage
				When turning ignition switch to "OFF".	0V
19	BR/R	Power source		Same as No. 10	
28	R/B	Power source (Memory back-up)		When turning ignition switch to "OFF".	Battery voltage
			When turning ignition switch to "ON".	Battery voltage	
42	B	Ground (A/T fluid temperature sensor)	—	—	
47	BR	A/T fluid temperature sensor		When ATF temperature is 20°C (68°F).	1.5V
				When ATF temperature is 80°C (176°F).	0.5V

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

[EURO-OBD]

## ON BOARD DIAGNOSIS LOGIC

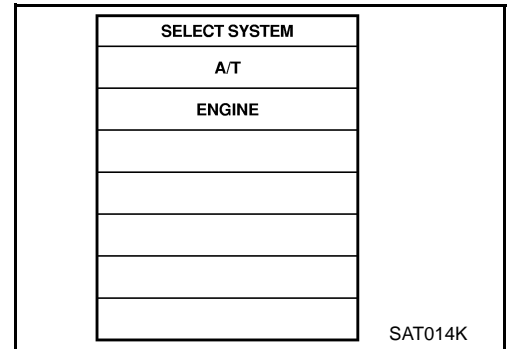
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
(P) : BATT/FLUID TEMP SEN (X) : 8th judgement flicker	TCM receives an excessively low or high voltage from the sensor.	<ul style="list-style-type: none"> <li>● Harness or connectors (The sensor circuit is open or shorted.)</li> <li>● A/T fluid temperature sensor</li> </ul>

## DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

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

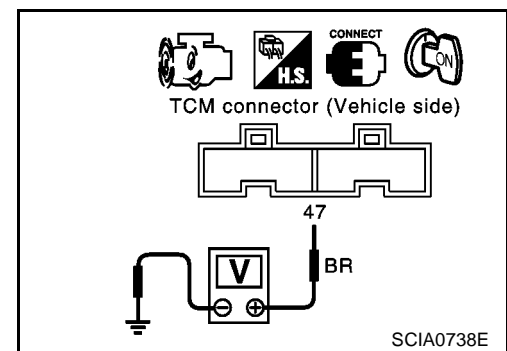
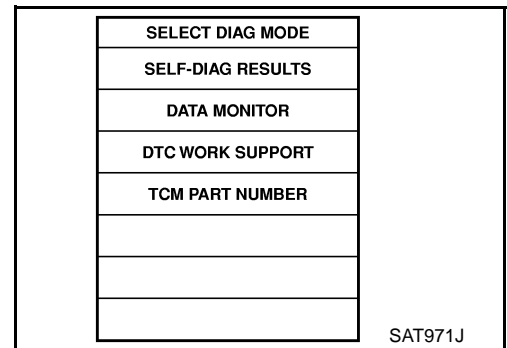
### (P) With CONSULT-II

1. Start engine.
2. Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
3. Drive vehicle under the following conditions:  
Selector lever in "D", vehicle speed higher than 20 km/h (12 MPH).
4. If DTC is detected, go to [AT-196, "Diagnostic Procedure"](#).



### (X) Without CONSULT-II

1. Start engine.
2. 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 [AT-49, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#).
4. If DTC is detected, go to [AT-196, "Diagnostic Procedure"](#).



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

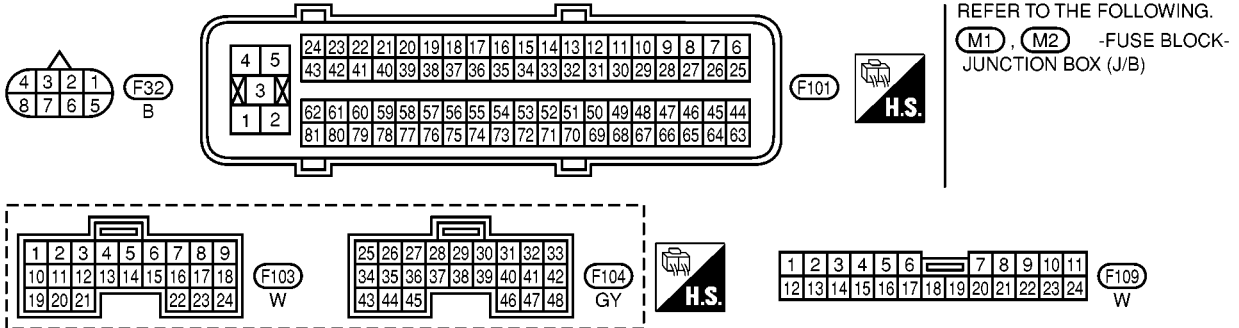
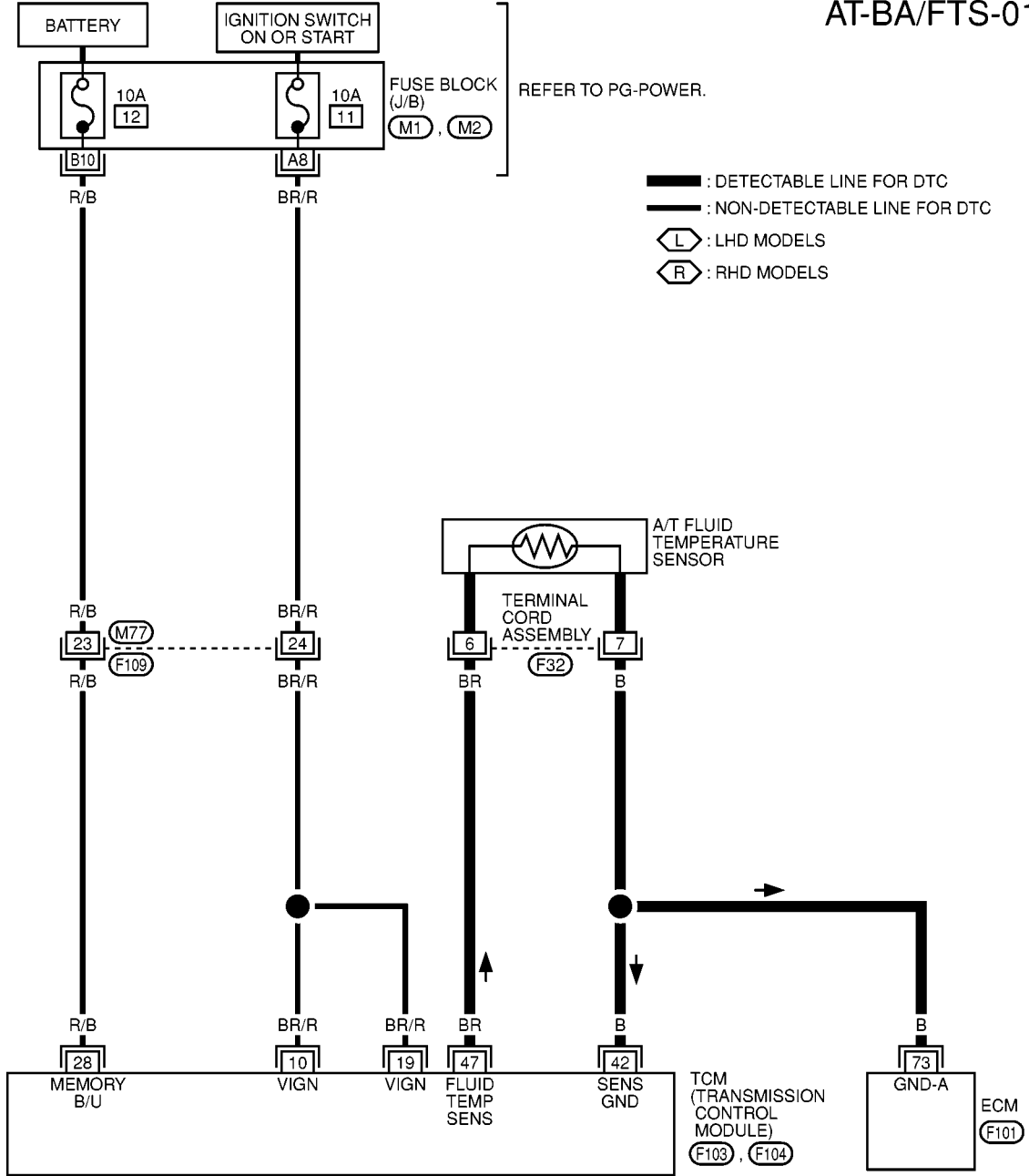
[EURO-OBD]

## Wiring Diagram — AT — BA/FTS

ECS005WW

AT-BA/FTS-01

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



MCWA0010E

## Diagnostic Procedure

### 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.

**Voltage: Battery voltage**

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

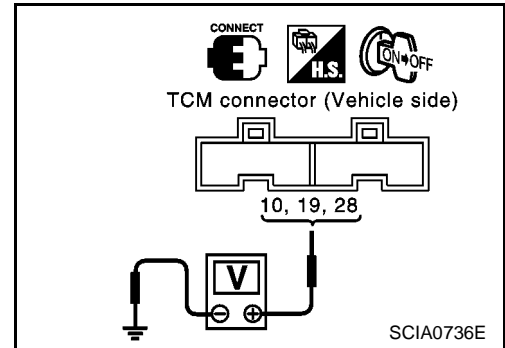
**Voltage: Battery voltage**

OK or NG

OK >> GO TO 2

NG >> Check the following items:

- Harness for short or open between ignition switch and TCM (Main harness)
- Ignition switch and fuse  
Refer to [PG-3, "POWER SUPPLY ROUTING"](#) .



### 2. 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.

**Resistance: Cold [20°C (68°F)]**  
**Approximately 2.5 kΩ**

4. Reinstall any part removed.

OK or NG

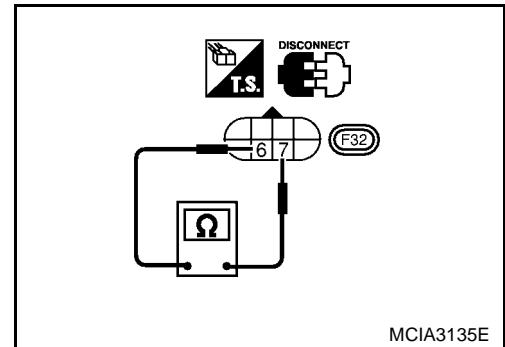
OK (With CONSULT-II)>>GO TO 3

OK (Without CONSULT-II)>>GOTO4

NG >> 1. Remove oil pan.

2. Check the following items:

- A/T fluid temperature sensor  
Refer to [AT-198, "Component Inspection"](#) .
- Harness of terminal cord assembly for short or open



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

[EURO-OBD]

## 3. CHECK INPUT SIGNAL OF A/T FLUID TEMPERATURE SENSOR (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 "FLUID TEMP SE".

#### Voltage:

Cold [20°C (68°F)] → Hot [80°C (176°F)]

Approximately 1.5V → 0.5V

#### OK or NG

OK >> GO TO 5

NG >> Check the following item:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM  
Refer to [EC-144, "POWER SUPPLY CIRCUIT FOR ECM"](#).

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

## 4. 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)] → Hot [80°C (176°F)]

Approximately 1.5V → 0.5V

3. Turn ignition switch to "OFF" position.
4. Disconnect TCM harness connector.
5. Check resistance between terminal 42 and ground.

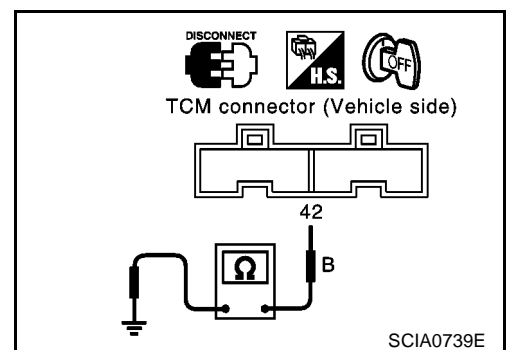
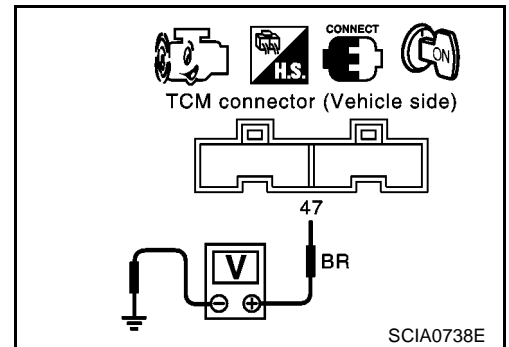
#### Continuity should exist.

#### OK or NG

OK >> GO TO 5

NG >> Check the following item:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM  
Refer to [EC-144, "POWER SUPPLY CIRCUIT FOR ECM"](#).



## 5. CHECK DTC

Perform [AT-194, "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 BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)

[EURO-OBD]

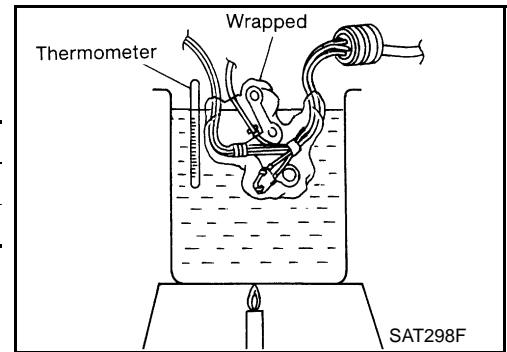
## Component Inspection

### A/T FLUID TEMPERATURE SENSOR

ECS005WY

- For removal, refer to [AT-404, "REMOVAL"](#) .
- Check resistance between two terminals while changing temperature as shown at right.

Temperature °C (°F)	Resistance
20 (68)	Approximately 2.5 k $\Omega$
80 (176)	Approximately 0.3 k $\Omega$



## DTC VEHICLE SPEED SENSOR MTR

PFP:24814

### Description

ECS005WZ

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.

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
40	L/B	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

### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
<ul style="list-style-type: none"> <li> : VHCL SPEED SEN-MTR</li> </ul>	TCM does not receive the proper voltage signal from the sensor.	<ul style="list-style-type: none"> <li>● Harness or connectors (The sensor circuit is open or shorted.)</li> <li>● Vehicle speed sensor</li> </ul>
<ul style="list-style-type: none"> <li> : 2nd judgement flicker</li> </ul>		

### DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

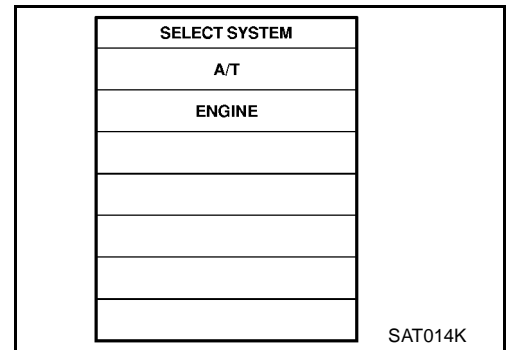
#### CAUTION:

- 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

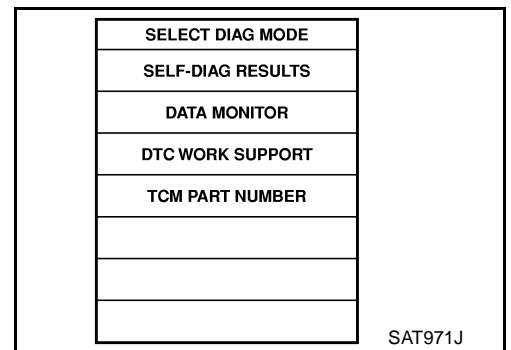
1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "A/T" with CONSULT-II.



2. Start engine and accelerate vehicle from 0 to 25 km/h (0 to 16 MPH).
3. If DTC is detected, go to [AT-202, "Diagnostic Procedure"](#).

#### Without CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:  
Selector lever in "D" and vehicle speed higher than 25 km/h (16 MPH).
3. Perform self-diagnosis.

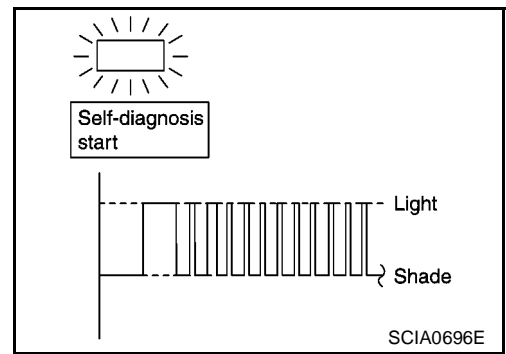


# DTC VEHICLE SPEED SENSOR MTR

[EURO-OBD]

Refer to [AT-49, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#).

4. If DTC is detected, go to [AT-202, "Diagnostic Procedure"](#).

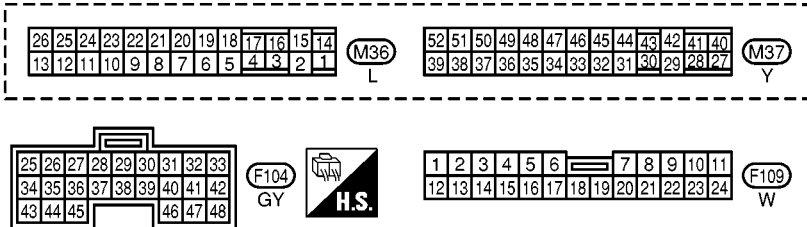
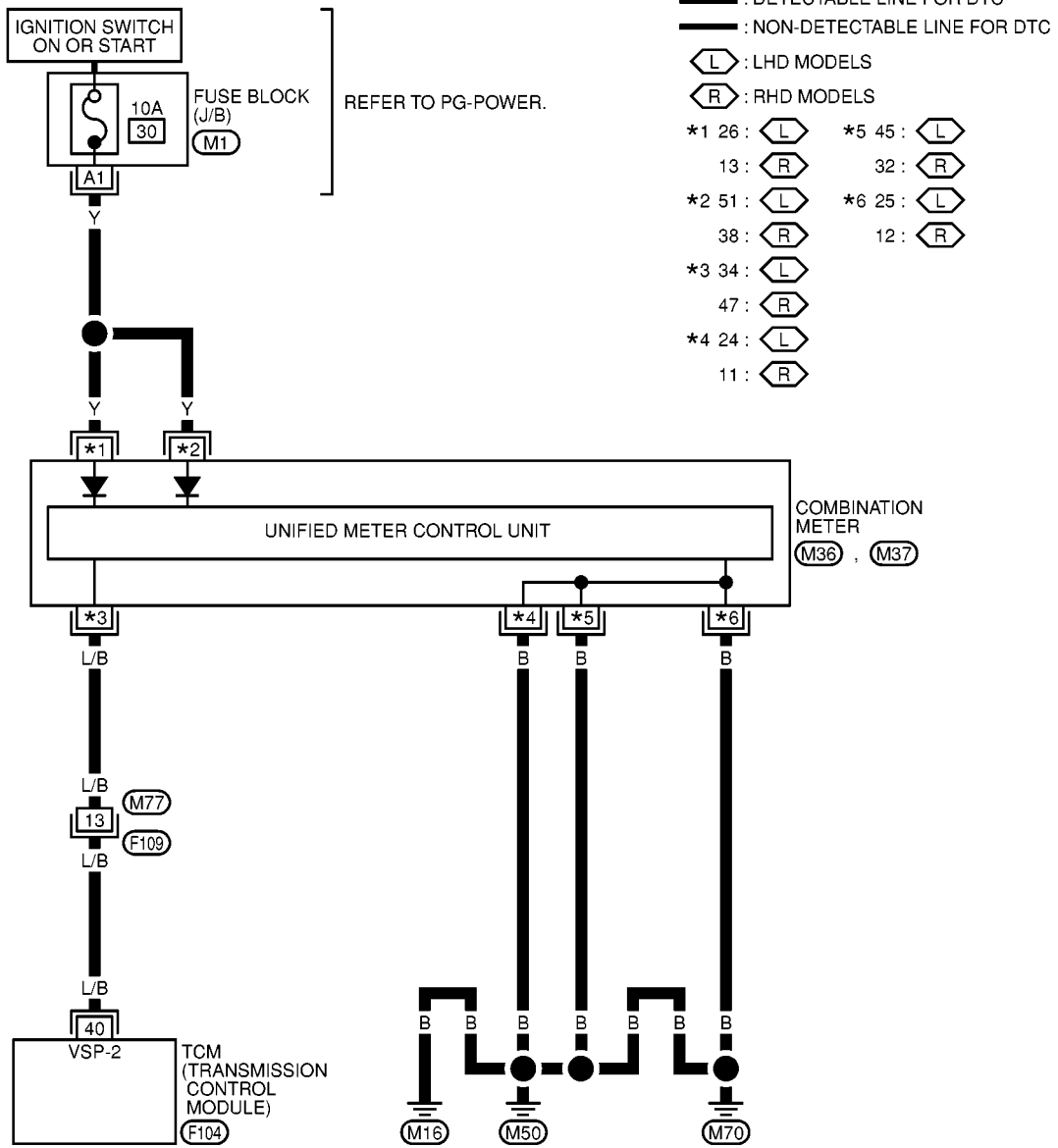




Wiring Diagram — AT — VSSMTR

ECS005X0

AT-VSSMTR-01



REFER TO THE FOLLOWING.  
 (M1) - FUSE BLOCK-JUNCTION BOX (J/B)

## Diagnostic Procedure

### 1. CHECK INPUT SIGNAL

#### ④ 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-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.

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

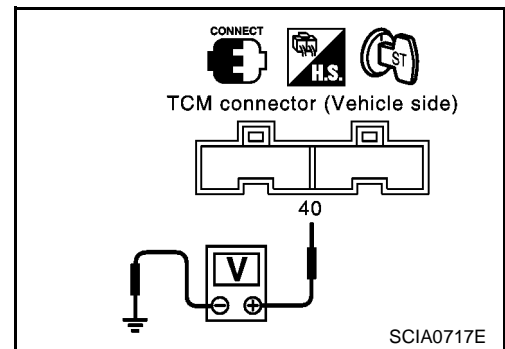
**Voltage:** Voltage varies between less than 1V and more than 4.5V.

#### OK or NG

OK >> GO TO 2

NG >> Check the following items:

- Vehicle speed sensor and ground circuit for vehicle speed sensor  
Refer to [DI-24, "Combination Meter Self-Diagnosis"](#) (LHD models) or [DI-53, "Combination Meter Self-Diagnosis"](#) (RHD models).
- Harness for short or open between TCM and vehicle speed sensor (Main harness)



### 2. CHECK DTC

Perform [AT-199, "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.

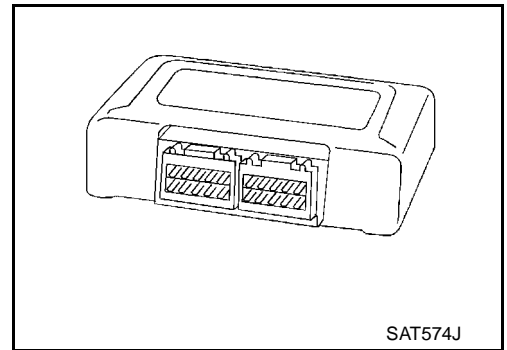
DTC CONTROL UNIT (RAM), CONTROL UNIT (ROM)

PDF:31036

Description

ECS005X2

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

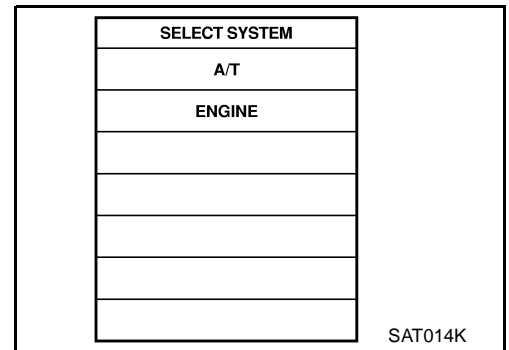
DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NOTE:

If “DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE” has been previously conducted, always turn ignition switch “OFF” and wait at least 5 seconds before conducting the next test.

Ⓟ With CONSULT-II

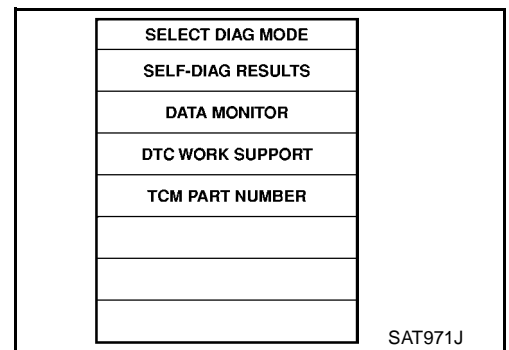
1. Turn ignition switch “ON” and select “DATA MONITOR” mode for A/T with CONSULT-II.



2. Start engine.
3. Run engine for at least 2 seconds at idle speed.
4. If DTC is detected, go to [AT-204, "Diagnostic Procedure"](#).

ⓧ Without CONSULT-II

Follow the procedure “With CONSULT-II”.



## Diagnostic Procedure

ECS005X3

### 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

### 2. CHECK DTC

---

Perform [AT-203, "DIAGNOSTIC TROUBLE CODE \(DTC\) CONFIRMATION PROCEDURE"](#) .  
See above.

>> 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  | >> <b>INSPECTION END</b> |

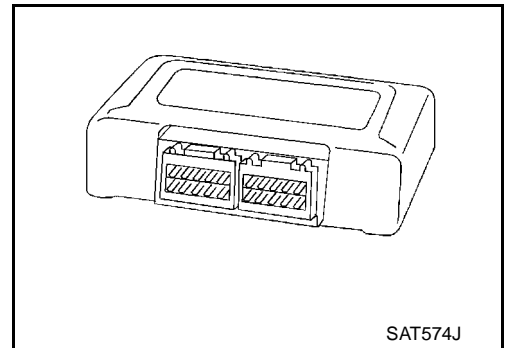
## DTC CONTROL UNIT(EEPROM)

PFP:31036

### Description

ECS005X4

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

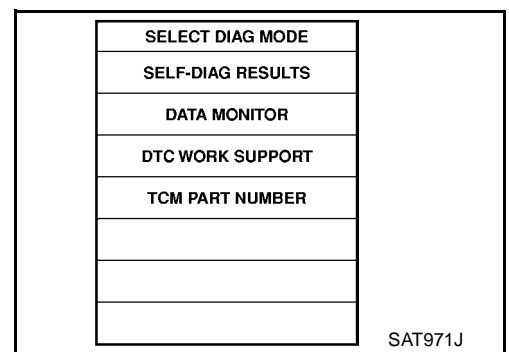
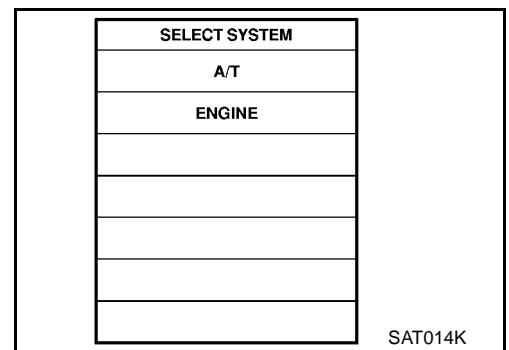
### DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

**NOTE:**

If “DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE” has been previously conducted, always turn ignition switch “OFF” and wait at least 5 seconds before conducting the next test.

Ⓟ **With CONSULT-II**

1. 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.
4. If DTC is detected, go to [AT-206, "Diagnostic Procedure"](#).

ⓧ **Without CONSULT-II**

Follow the procedure “With CONSULT-II”.

---

**Diagnostic Procedure**

ECS005X5

**1. CHECK DTC**

---

**④ 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-205. "DIAGNOSTIC TROUBLE CODE \(DTC\) CONFIRMATION PROCEDURE"](#) .

Is the "CONT UNIT (EEP ROM)" displayed again?

Yes >> Replace TCM.

No >> **INSPECTION END**

# TROUBLE DIAGNOSES FOR SYMPTOMS

[EURO-OBD]

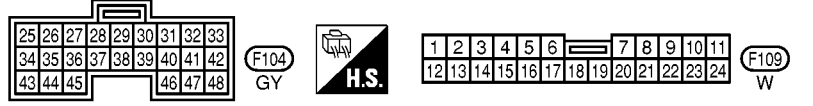
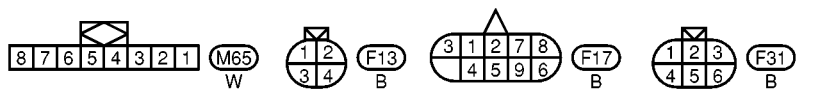
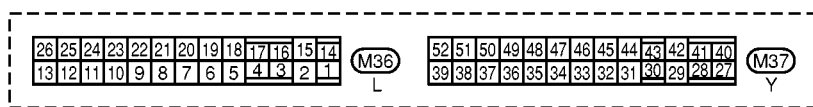
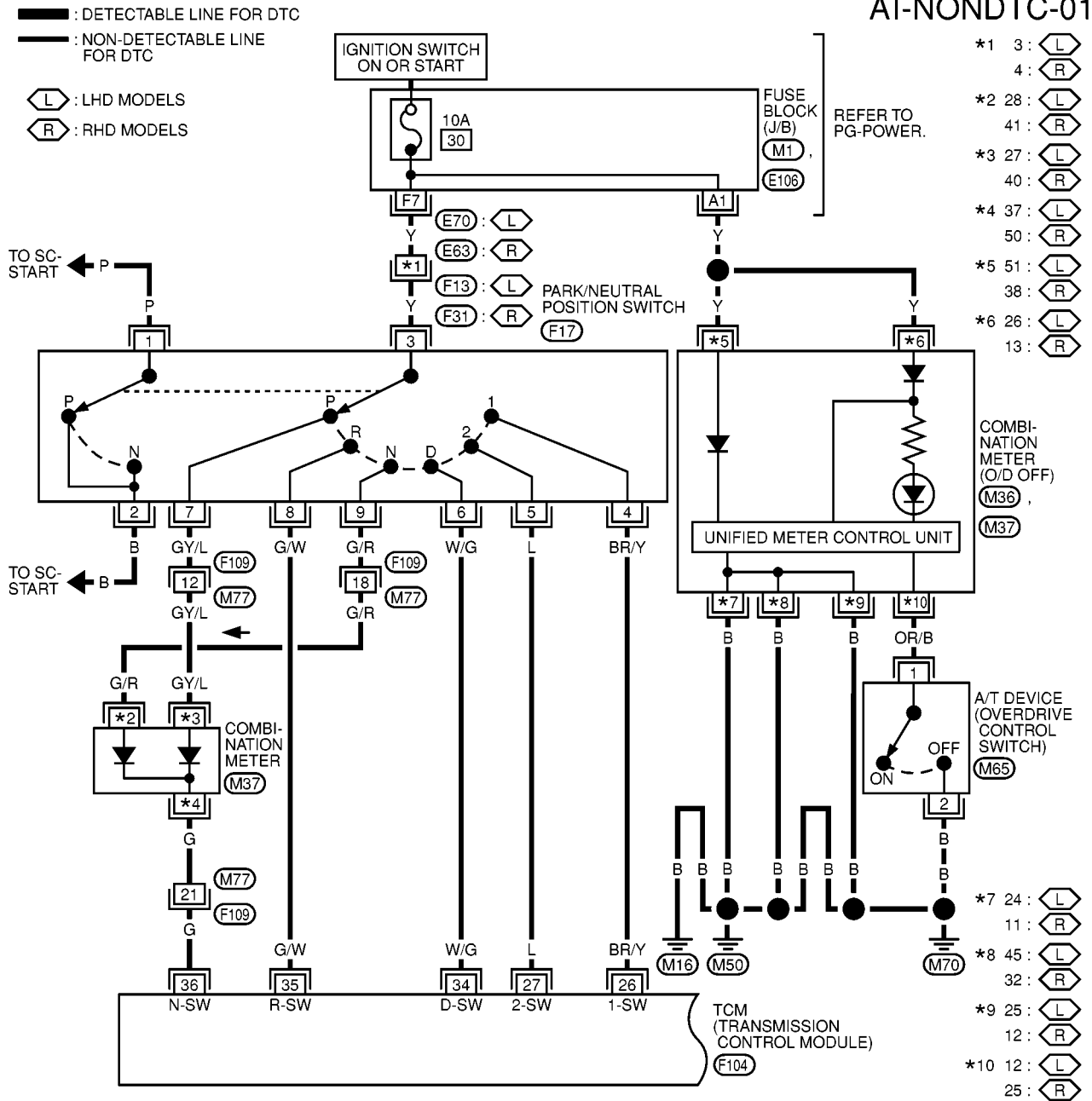
## TROUBLE DIAGNOSES FOR SYMPTOMS

PF0:00100

### Wiring Diagram — AT — NONDTC

ECS005X6

#### AT-NONDTC-01

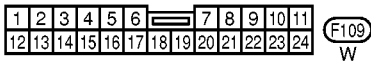
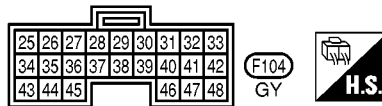
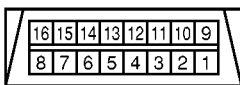
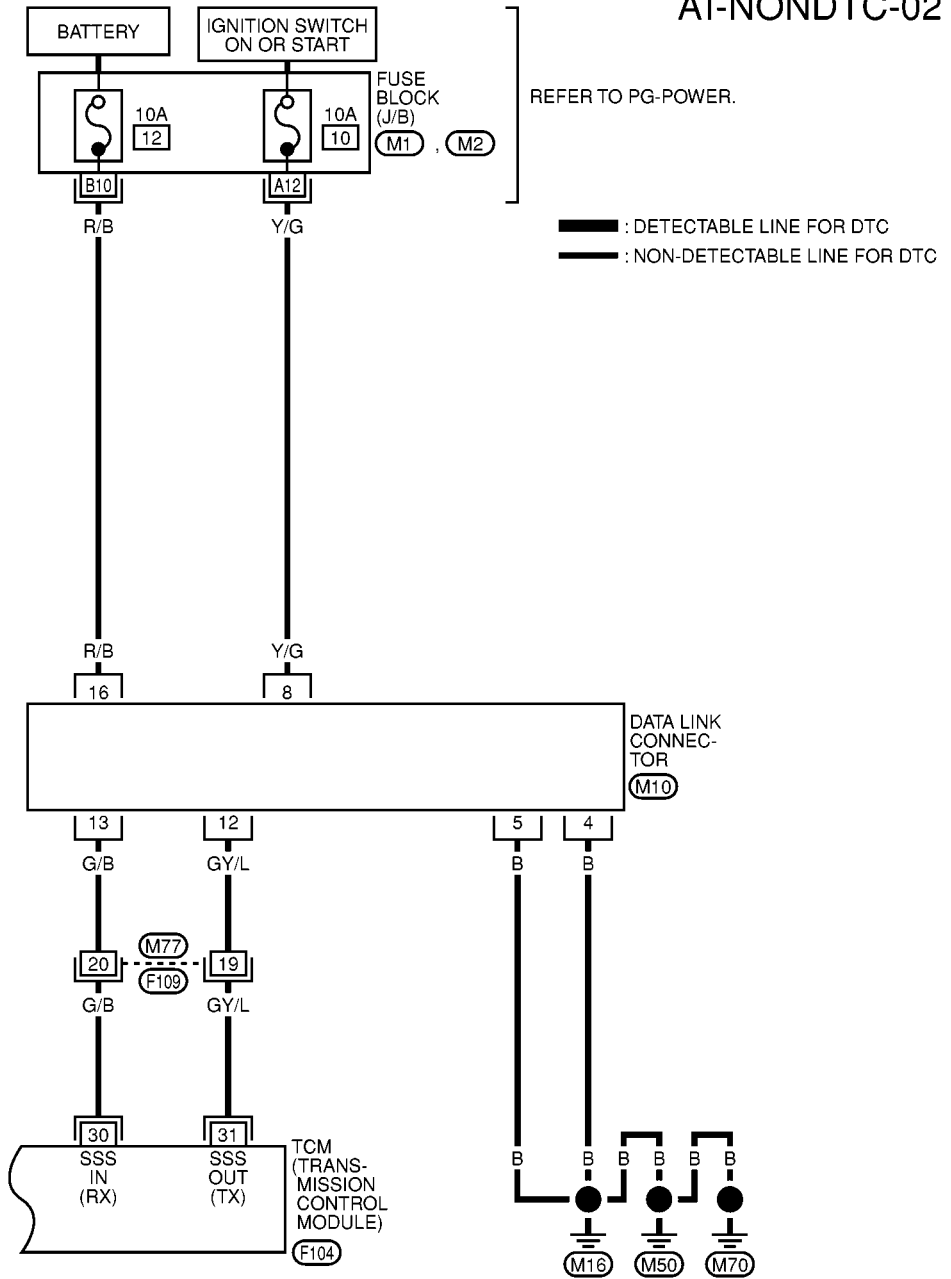


REFER TO THE FOLLOWING.  
 (M1, E106) - FUSE BLOCK-JUNCTION BOX (J/B)

# TROUBLE DIAGNOSES FOR SYMPTOMS

[EURO-OBD]

## AT-NONDTC-02



REFER TO THE FOLLOWING.

(M1), (M2) - FUSE BLOCK-JUNCTION BOX (J/B)

MCWA0020E



## 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.)
- Check voltage between TCM terminals 10, 19, 28 and ground.

**Voltage:** Battery voltage

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

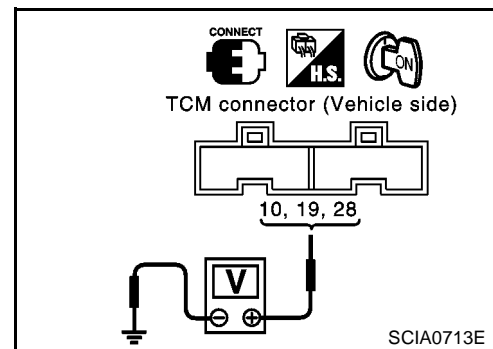
**Voltage:** Battery voltage

#### OK or NG

OK >> GO TO 2

NG >> Check the following items:

- Harness for short or open between ignition switch and TCM terminals 10, 19 and 28 (Main harness).
- Refer to [AT-340, "Wiring Diagram — AT — MAIN"](#).
- Ignition switch and fuse Refer to [PG-3, "POWER SUPPLY ROUTING"](#).



### 2. CHECK TCM GROUND CIRCUIT

- Turn ignition switch to "OFF" position.
- Disconnect TCM harness connector.
- Check continuity between TCM terminals 25, 48 and ground.

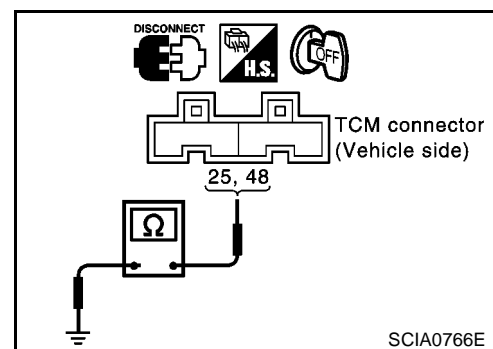
**Continuity should exist.**

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

#### OK or NG

OK >> GO TO 3

NG >> Repair open circuit or short to ground or short to power in harness or connectors. Refer to [AT-340, "Wiring Diagram — AT — MAIN"](#).



### 3. CHECK LAMP CIRCUIT

- Turn ignition switch to "OFF" position.
- Check resistance between TCM terminals 13 and 10, 19.

**Resistance:** 50 - 100Ω

- Reinstall any part removed.

#### OK or NG

OK >> GO TO 4

NG >> Check the following items:

- O/D OFF indicator lamp.  
Refer to [DI-24, "Combination Meter Self-Diagnosis"](#) (LHD models) or [DI-53, "Combination Meter Self-Diagnosis"](#) (RHD models).
- 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.

## 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.

## 2. Engine Cannot Be Started In “P” and “N” Position

ECS005X8

**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

**With CONSULT-II**

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

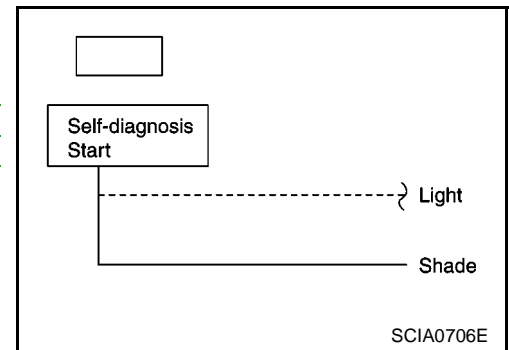
**Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to [AT-236, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#).

No >> GO TO 2



### 2. CHECK PNP SWITCH INSPECTION

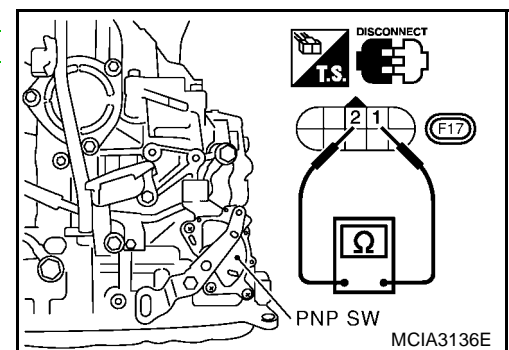
Check for short or open of PNP switch harness connector terminals 1 and 2.

Refer to [AT-236, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#).

OK or NG

OK >> GO TO 3

NG >> Repair or replace PNP switch.



### 3. CHECK STARTING SYSTEM

Check starting system. Refer to [SC-22, "STARTING SYSTEM"](#).

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

**3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed**

ECS005X9

**SYMPTOM:**

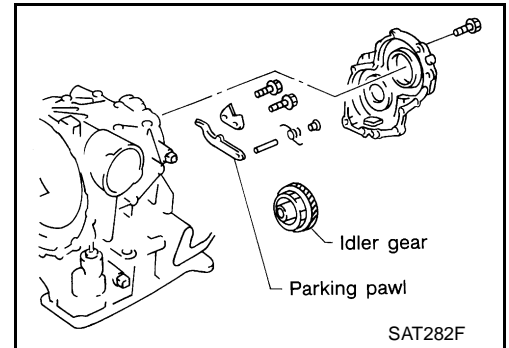
Vehicle moves when it is pushed forward or backward with selector lever in "P" position.

**1. CHECK PARKING COMPONENTS**

Check parking components. Refer to [AT-411, "OVERHAUL"](#) .

**OK or NG**

- OK >> **INSPECTION END**
- NG >> Repair or replace damaged parts.



**4. In "N" Position, Vehicle Moves**

ECS005XA

**SYMPTOM:**

Vehicle moves forward or backward when selecting "N" position.

**1. CHECK PNP SWITCH CIRCUIT**

**Ⓟ With CONSULT-II**

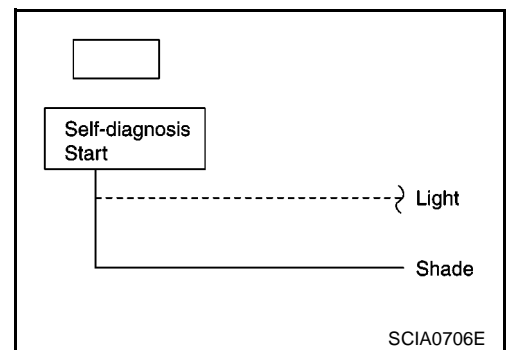
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

**ⓧ Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

**Yes or No**

- Yes >> Check PNP switch circuit. Refer to [AT-236, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#) .
- No >> GO TO 2



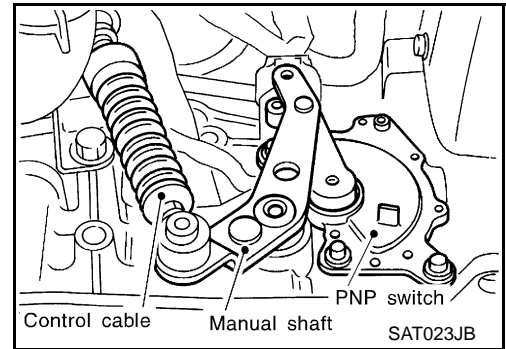
## 2. CHECK CONTROL CABLE

Check control cable. Refer to [AT-406, "Control Cable Adjustment"](#) .

OK or NG

OK >> GO TO 3

NG >> Adjust control cable. Refer to [AT-406, "Control Cable Adjustment"](#) .



## 3. CHECK A/T FLUID LEVEL

Check A/T fluid level again.

OK or NG

OK >> GO TO 4

NG >> Refill ATF.



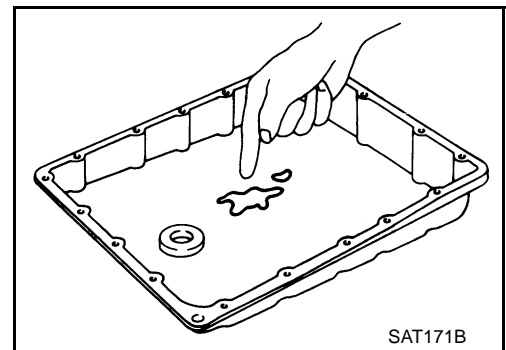
## 4. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.

OK or NG

OK >> GO TO 5

- NG >> 1. Disassemble A/T.
2. Check the following items:
    - Forward clutch assembly
    - Overrun clutch assembly
    - Reverse clutch assembly



## 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.

## 5. Large Shock. "N" → "R" Position

**SYMPTOM:**

There is large shock when changing from "N" to "R" position.

ECS005XB

## 1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to A/T fluid temperature sensor, line pressure solenoid valve or throttle position sensor circuit?

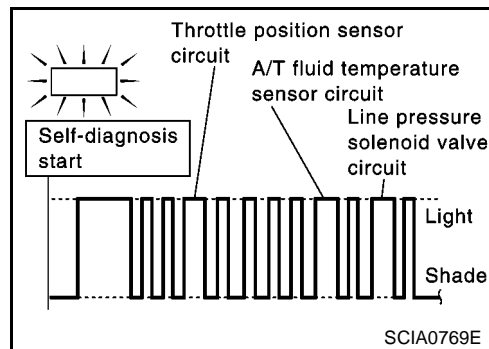
Yes or No

Yes >> ● Check damaged circuit. Refer to the following items.

Euro-OBD

- [AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"](#)
- [AT-180, "DTC P1705 ACCELERATOR PEDAL POSITION \(APP\) SENSOR"](#)
- [AT-193, "DTC BATT/FLUID TEMP SEN \(A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE\)"](#)

No >> GO TO 2



## 2. CHECK THROTTLE POSITION SENSOR\*

\*: This sensor means accelerator pedal position (APP) sensor.

Refer to [EC-61, "Emission-related Diagnostic Information"](#).

OK or NG

OK >> GO TO 3

NG >> Repair or replace Accelerator pedal position (APP) sensor.

## 3. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "D" position. Refer to [AT-65, "Fluid Pressure Test"](#).

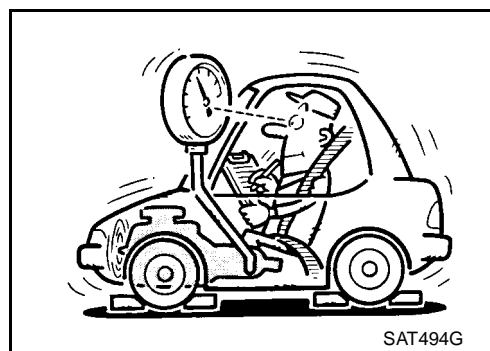
OK or NG

OK >> GO TO 4

NG >> 1. Remove control valve assembly. Refer to [AT-403, "Installation"](#).

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



## 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.

## 6. Vehicle Does Not Creep Backward In "R" Position

ECS005XC

**SYMPTOM:**

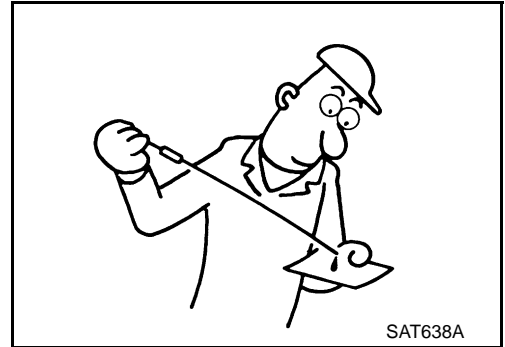
Vehicle does not creep backward when selecting "R" position.

## 1. CHECK A/T FLUID LEVEL

Check A/T fluid level again.

OK or NG

OK >> GO TO 2  
 NG >> Refill ATF.



## 2. CHECK STALL TEST

Check stall revolution with selector lever in "1" and "R" positions.  
 Refer to [AT-62, "Stall Test"](#) .

OK or NG

OK >> GO TO 3

OK in "1" position, NG in "R" position>>1.Remove control valve assembly. Refer to [AT-403, "Installation"](#) .

2. Check the following items:

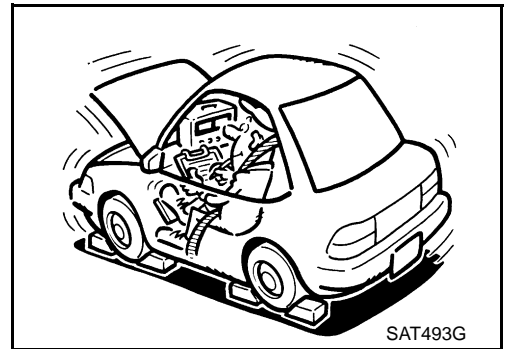
- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve ([AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"](#) : Euro-OBD)

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

NG in both "1" and "R" positions>>GO TO 6



### 3. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "R" position. Refer to [AT-65, "Fluid Pressure Test"](#) .

#### OK or NG

OK >> GO TO 4

NG >> 1. Remove control valve assembly. Refer to [AT-403, "Installation"](#) .

2. Check the following items:

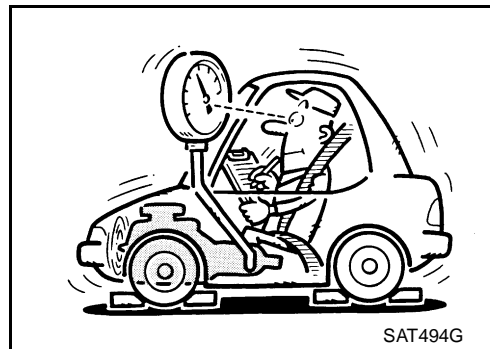
- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)

- Line pressure solenoid valve ([AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"](#) )

3. Disassemble A/T.

4. Check the following item:

- Oil pump assembly



### 4. CHECK A/T FLUID CONDITION

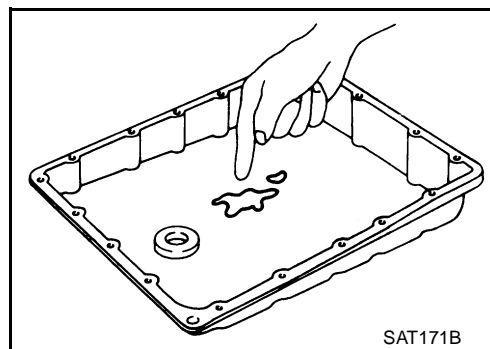
1. Remove oil pan.

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. Remove control valve assembly. Refer to [AT-403, "Installation"](#) .
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 ([AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"](#) : Euro-OBD)
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.

**7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position**

ECS005XD

**SYMPTOM:**

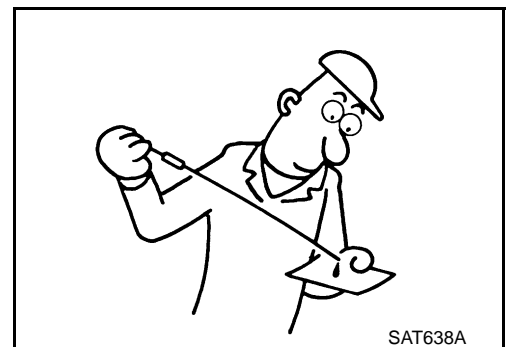
Vehicle does not creep forward when selecting "D", "2" or "1" position.

**1. CHECK A/T FLUID LEVEL**

Check A/T fluid level again.

**OK or NG**

- OK >> GO TO 2  
 NG >> Refill ATF.



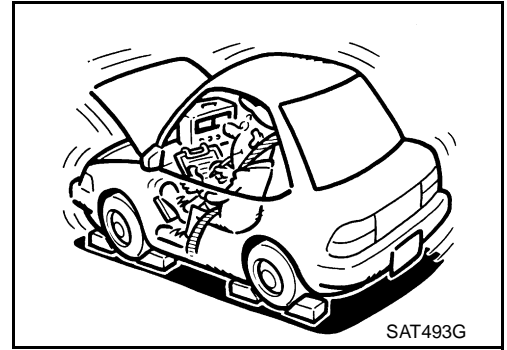


## 2. CHECK STALL TEST

Check stall revolution with selector lever in "D" position. Refer to [AT-62, "Stall Test"](#).

OK or NG

- OK >> GO TO 3  
NG >> GO TO 6

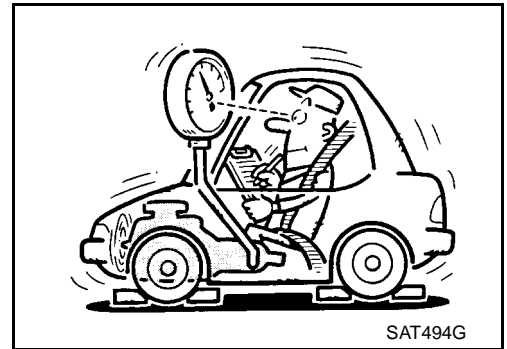


## 3. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "D" position. Refer to [AT-65, "Fluid Pressure Test"](#).

OK or NG

- OK >> GO TO 4  
NG >> 1. Remove control valve assembly. Refer to [AT-403, "Installation"](#).
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 ([AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"](#))
3. Disassemble A/T.
4. Check the following item:
- Oil pump assembly

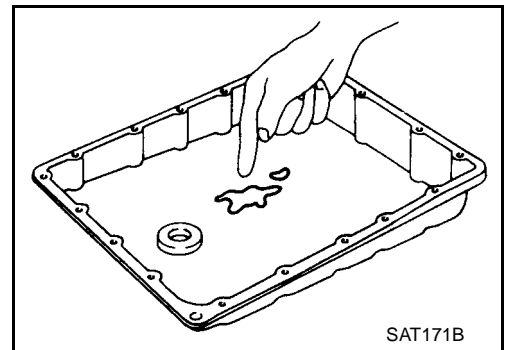


## 4. CHECK A/T FLUID CONDITION

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. Remove control valve assembly. Refer to [AT-403, "Installation"](#) .
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 ([AT-163, "DTC P0745 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 5  
 NG >> Repair or replace damaged parts.

**8. Vehicle Cannot Be Started From D1**

ECS005XE

**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-213, "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?

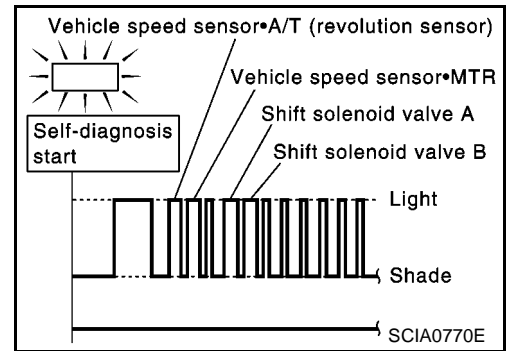
Yes or No

Yes >> ● Check damaged circuit. Refer to the following items.

Euro-OBD

- [AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T \(REVOLUTION SENSOR\)"](#)
- [AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"](#)
- [AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"](#)
- [AT-348, "DTC VEHICLE SPEED SENSOR MTR"](#)

No >> GO TO 3



## 3. CHECK THROTTLE POSITION SENSOR\*

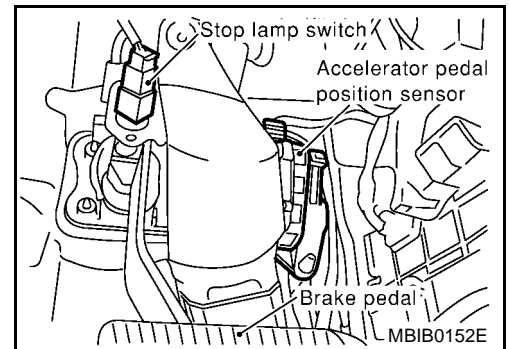
\*: This sensor means accelerator pedal position (APP) sensor.

Refer to [EC-61, "Emission-related Diagnostic Information"](#).

OK or NG

OK >> GO TO 4

NG >> Repair or replace accelerator pedal position (app) sensor.



## 4. CHECK LINE PRESSURE

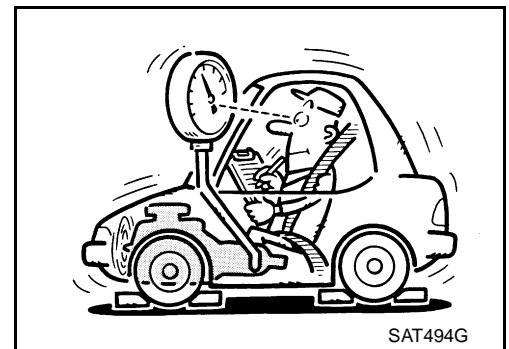
Check line pressure at stall point with selector lever in "D" position.

Refer to [AT-65, "Fluid Pressure Test"](#).

OK or NG

OK >> GO TO 5

NG >> GO TO 8

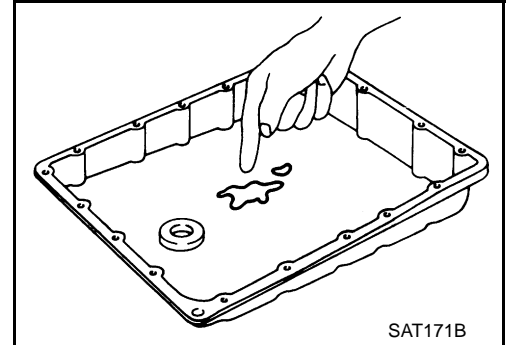


## 5. CHECK A/T FLUID CONDITION

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 assembly. Refer to [AT-439, "Control Valve Assembly"](#).
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 assembly. Refer to [AT-404, "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:
  - 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 7
- NG >> Repair or replace damaged parts.

**9. A/T Does Not Shift: D1 → D2 Or Does Not Kickdown: D4 → D2**

ECS005XF

**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-216, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"](#) , [AT-218, "8. Vehicle Cannot Be Started From D1"](#) .

**2. CHECK PNP SWITCH CIRCUIT**

**Ⓟ With CONSULT-II**

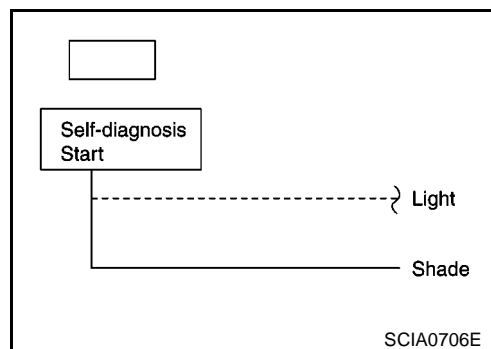
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

**ⓧ Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

- Yes >> Check PNP switch circuit. Refer to [AT-236, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#) .
- No >> GO TO 3



### 3. CHECK VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR) AND CHECK VEHICLE SPEED SENSOR-MTR CIRCUIT

Check vehicle speed sensor-A/T (revolution sensor) and vehicle speed sensor-MTR circuit. Refer to [AT-343, "VEHICLE SPEED SENSOR - A/T \(REVOLUTION SENSOR\)"](#) , [AT-348, "DTC VEHICLE SPEED SENSOR MTR"](#) and [AT-199, "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.

### 4. CHECK THROTTLE POSITION SENSOR\*

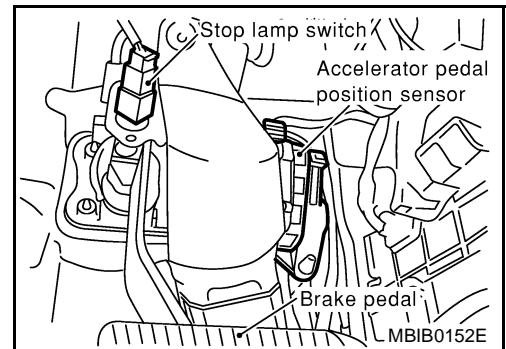
\*: This sensor means accelerator pedal position (APP) sensor.

Refer to [EC-61, "Emission-related Diagnostic Information"](#) .

OK or NG

OK >> GO TO 5

NG >> Repair or replace accelerator pedal position (app) sensor.



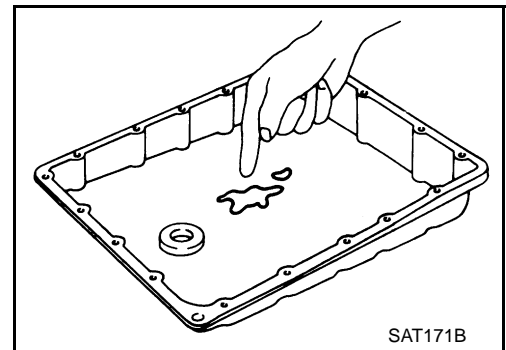
### 5. CHECK A/T FLUID CONIDITION

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-404, "REMOVAL"](#) .
2. Check the following items:
  - Shift valve A
  - Shift solenoid valve A ([AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"](#) )
  - 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-404, "REMOVAL"](#).

2. Check the following items:

- Shift valve A
- Shift solenoid valve A ([AT-170, "DTC P0750 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 7

NG >> Repair or replace damaged parts.

**10. A/T Does Not Shift: D2 → D3**

ECS005XG

**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-216, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"](#), [AT-218, "8. Vehicle Cannot Be Started From D1"](#).

## 2. CHECK PNP SWITCH CIRCUIT

**④ With CONSULT-II**

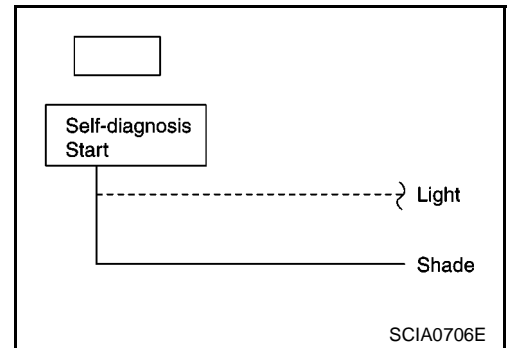
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

**⊗ Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

- Yes >> Check PNP switch circuit. Refer to [AT-236, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#).
- No >> GO TO 3

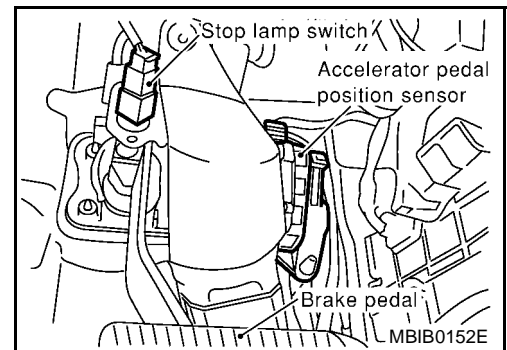


## 3. CHECK THROTTLE POSITION SENSOR\*

\*: This sensor means accelerator pedal position (APP) sensor. Refer to [EC-61, "Emission-related Diagnostic Information"](#).

OK or NG

- OK >> GO TO 4
- NG >> Repair or replace throttle position sensor.

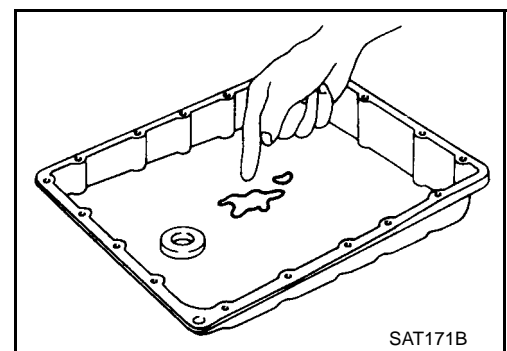


## 4. CHECK A/T FLUID CONDITION

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-404, "REMOVAL"](#) .
2. Check the following items:
  - Shift valve B
  - Shift solenoid valve B ([AT-175, "DTC P0755 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-404, "REMOVAL"](#) .
2. Check the following items:
  - Shift valve B
  - Shift solenoid valve B ([AT-175, "DTC P0755 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 6  
 NG >> Repair or replace damaged parts.

**11. A/T Does Not Shift: D3 → D4**

ECS005XH

**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**

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-216, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"](#) , [AT-218, "8. Vehicle Cannot Be Started From D1"](#) .

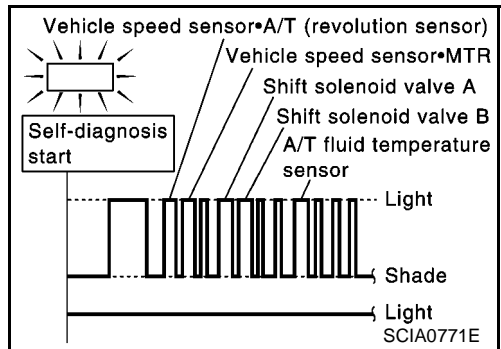
2. CHECK SELF-DIAGNOSTIC RESULTS

Ⓜ 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 the following items.

Euro-OBD

- VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR): [AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T \(REVOLUTION SENSOR\)"](#)
- SHIFT SOLENOID VALVE A: [AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"](#)
- SHIFT SOLENOID VALVE B: [AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"](#)
- BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE): [AT-193, "DTC BATT/FLUID TEMP SEN \(A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE\)"](#)
- VHCL SPEED SEN-MTR VEHICLE SPEED SENSOR-MTR: [AT-199, "DTC VEHICLE SPEED SENSOR MTR"](#)
- 21. TCM Self-diagnosis Does Not Activate (PNP & Overdrive Control Switches, and Throttle Position sensor Circuit Checks): [AT-236, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#)

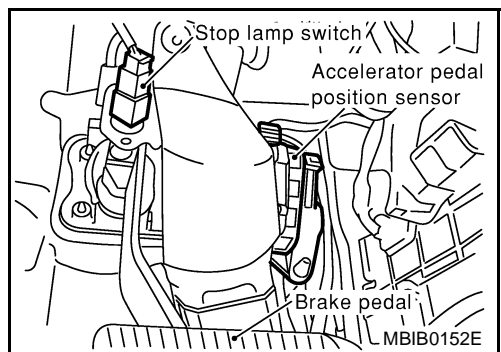
No >> GO TO 3

3. CHECK THROTTLE POSITION SENSOR\*

\*: This sensor means accelerator pedal position (APP) sensor.

Refer to [EC-61, "Emission-related Diagnostic Information"](#) .

OK or NG



OK >> GO TO 4

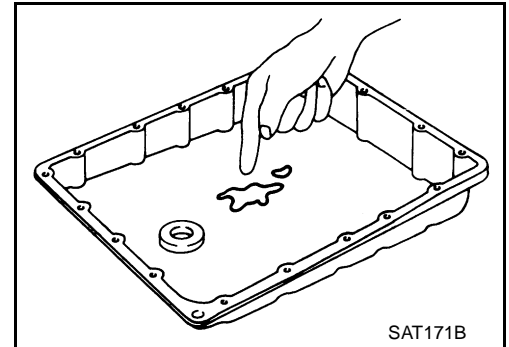
NG >> Repair or replace throttle position sensor.

**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-404, "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 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-404, "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 6
- NG >> Repair or replace damaged parts.

**12. A/T Does Not Perform Lock-up**

ECS005X1

**SYMPTOM:**

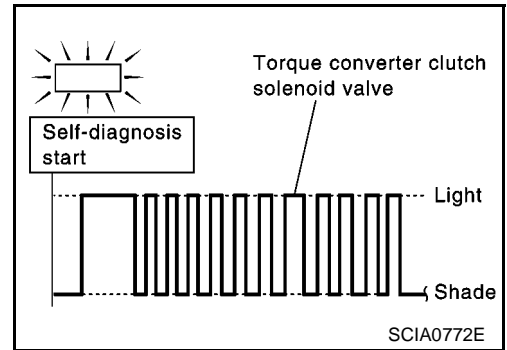
**A/T does not perform lock-up at the specified speed.**

**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-375, "TORQUE CONVERTER CLUTCH SOLENOID VALVE"](#) (Except for Euro-OBD)/ [AT-158, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"](#) .
- No >> GO TO 2

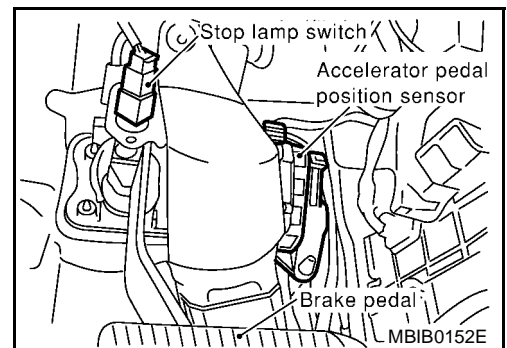


**2. CHECK THROTTLE POSITION SENSOR\***

\*: This sensor means accelerator pedal position (APP) sensor. Refer to [EC-61, "Emission-related Diagnostic Information"](#) .

OK or NG

- OK >> GO TO 3
- NG >> Repair or replace throttle position sensor.



### 3. DETECT MALFUNCTIONING ITEM

1. Remove control valve. Refer to [AT-404, "REMOVAL"](#).
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 >> 1. Perform TCM input/output signal inspection.  
 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

## 13. A/T Does Not Hold Lock-up Condition

EC5005XJ

### SYMPTOM:

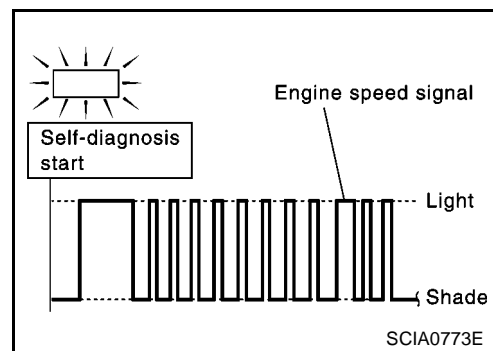
A/T does not hold lock-up condition for more than 30 seconds.

### 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 [AT-127, "DTC P0725 ENGINE SPEED SIGNAL"](#).  
 No >> GO TO 2

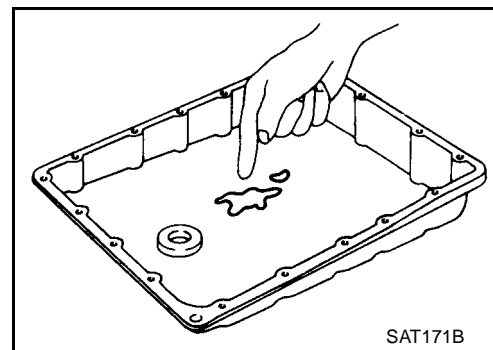


### 2. CHECK A/T FLUID CONDITION

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-404, "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.

---

## 5. DETECT MALFUNCTIONING ITEM

---

1. Remove control valve assembly. Refer to [AT-404, "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.

**14. Lock-up Is Not Released**

ECS005XK

**SYMPTOM:**

Lock-up is not released when accelerator pedal is released.

**1. CHECK THROTTLE POSITION SENSOR\* CIRCUIT**

\*: This sensor means accelerator pedal position (app) sensor.

**With CONSULT-II**

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage throttle position sensor circuit?

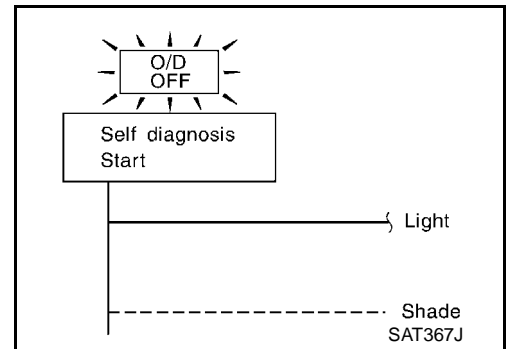
**Without CONSULT-II**

Does self-diagnosis show damage to throttle position sensor circuit?

**Yes or No**

Yes >> Check throttle position sensor circuit. Refer to [AT-236, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#).

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.

**15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3 )**

ECS005XL

**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.

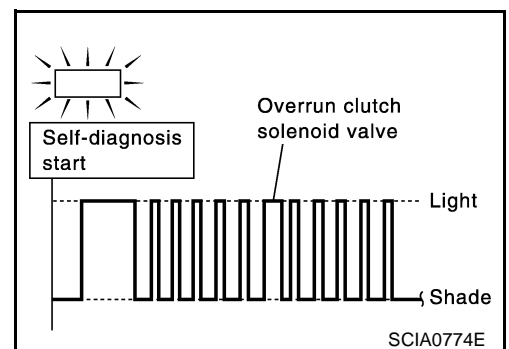
**1. CHECK SELF-DIAGNOSTIC RESULTS**

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-185, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"](#).

No >> GO TO 2



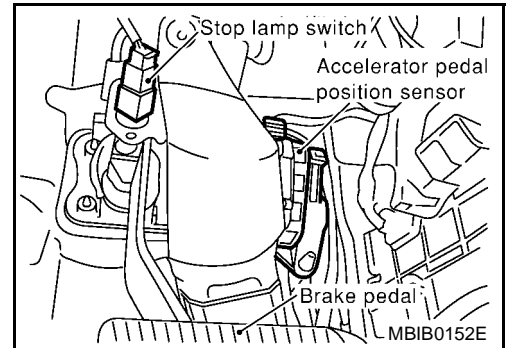
## 2. CHECK THROTTLE POSITION SENSOR\*

\*: This sensor means accelerator pedal position (APP) sensor.  
Refer to [EC-61, "Emission-related Diagnostic Information"](#) .

OK or NG

OK >> GO TO 3

NG >> Repair or replace accelerator pedal position (app) sensor. ([AT-180, "DTC P1705 ACCELERATOR PEDAL POSITION \(APP\) SENSOR"](#) )



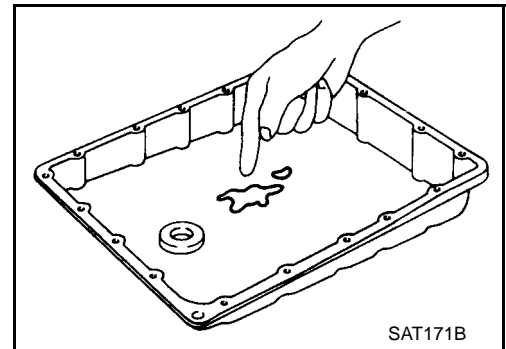
## 3. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.

OK or NG

OK >> GO TO 4

NG >> GO TO 6



## 4. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-404, "REMOVAL"](#) .
2. Check the following items:
  - Overrun clutch control valve
  - Overrun clutch reducing valve
  - Overrun clutch solenoid valve ([AT-185, "DTC P1760 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**

1. Remove control valve assembly. Refer to [AT-404, "REMOVAL"](#) .
2. Check the following items:
  - Overrun clutch control valve
  - Overrun clutch reducing valve
  - Overrun clutch solenoid valve ([AT-185, "DTC P1760 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 5  
 NG >> Repair or replace damaged parts.

**16. Vehicle Does Not Start From D1**

ECS005XM

**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?

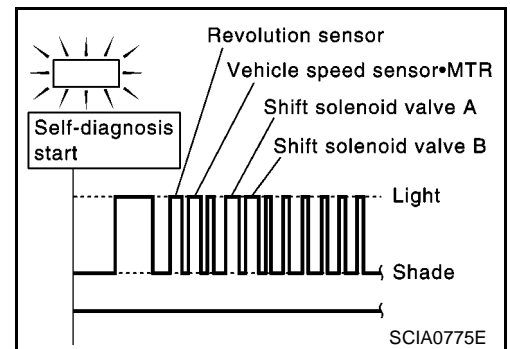
**Yes or No**

- Yes >> ● Check damaged circuit. Refer to the following items.

**Euro-OBD**

- [AT-122, "DTC P0720 VEHICLE SPEED SENSOR A/T \(REVOLUTION SENSOR\)"](#)
- [AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"](#)
- [AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"](#)
- [AT-199, "DTC VEHICLE SPEED SENSOR MTR"](#)

- No >> GO TO 2

**2. CHECK SYMPTOM**

Check again.

**OK or NG**

- OK >> Go to [AT-218, "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.

**17. A/T Does Not Shift: D4 → D3 , When Overdrive Control Switch "ON" → "OFF"**

ECS005XM

**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**

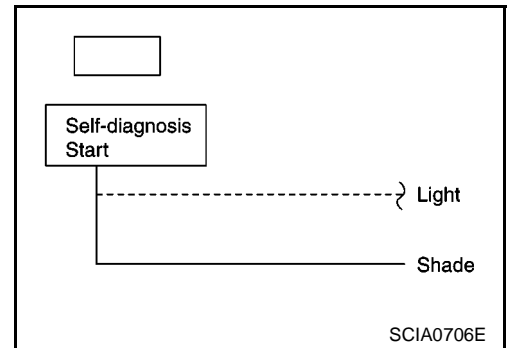
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to overdrive control switch circuit?

 **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-237, "DIAGNOSTIC PROCEDURE"](#).
- No >> Go to 10. A/T Does Not Shift: D2 → D3, [AT-223, "10. A/T Does Not Shift: D2 → D3"](#).



18. A/T Does Not Shift: D3 → 22, When Selector Lever "D" → "2" Position ECS005X0

**SYMPTOM:**

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**

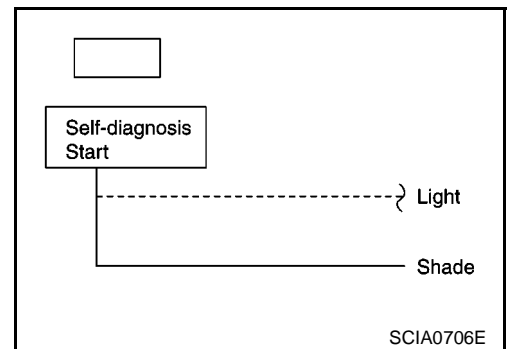
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

 **Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

- Yes >> Check PNP switch circuit. Refer to [AT-236, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#).
- No >> Go to [AT-221, "9. A/T Does Not Shift: D1 → D2 Or Does Not Kickdown: D4 → D2"](#).



**19. A/T Does Not Shift: 22 → 11 , When Selector Lever “2” → “1” Position**

ECS005XP

**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?

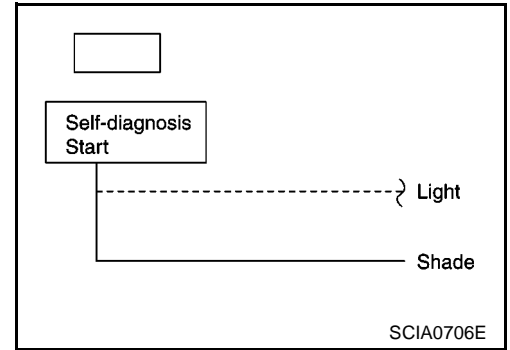
**Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to [AT-236, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#) .

No >> GO TO 2



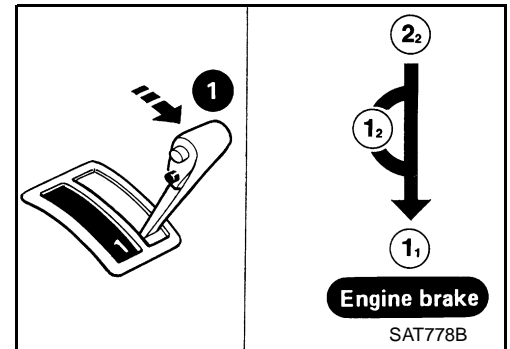
**2. CHECK SYMPTOM**

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.



**20. Vehicle Does Not Decelerate By Engine Brake**

ECS005XQ

**SYMPTOM:**

Vehicle does not decelerate by engine brake when shifting from 22 (12) to 11 .

**1. CHECK SYMPTOM**

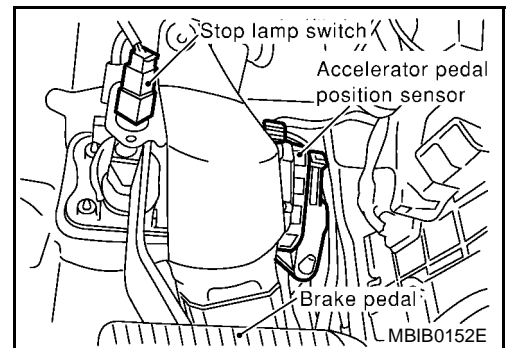
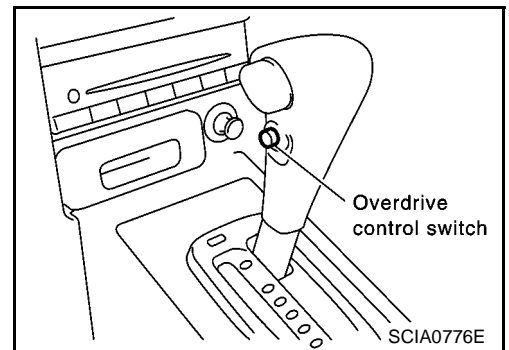
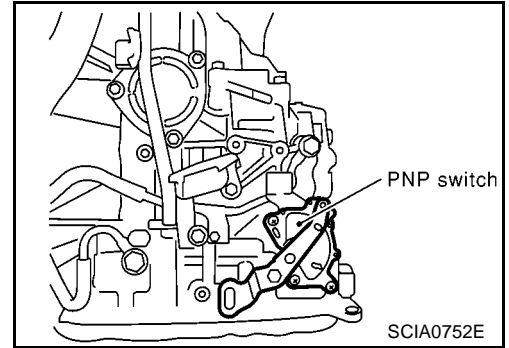
Is 6. Vehicle Does Not Creep Backward In “R” Position OK?

Yes or No

Yes >> Go to [AT-231, "15. Engine Speed Does Not Return To Idle \(Light Braking D4 → D3\)"](#) .

No >> Go to [AT-213, "6. Vehicle Does Not Creep Backward In “R” Position"](#) .

## 21. TCM Self-diagnosis Does Not Activate (PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks) ECS005XR



### SYMPTOM:

O/D OFF indicator lamp does not come on in TCM self-diagnostic procedure even if the lamp circuit is good.

### DESCRIPTION

- PNP switch  
The PNP switch assembly includes a transmission position switch. The transmission position 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\*  
\*: This sensor means accelerator pedal position (APP) sensor.

Electric throttle control actuator consists of throttle control motor, acceleration pedal position sensor, throttle position sensor, etc. The actuator sends a signal to the TCM.

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT (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 "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 3

NG >> Check the following items:

- PNP switch (Refer to [AT-241, "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)
- Diode (P, N positions)

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

1. 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.

**Voltage:**

**B: Battery voltage**

**0: 0V**

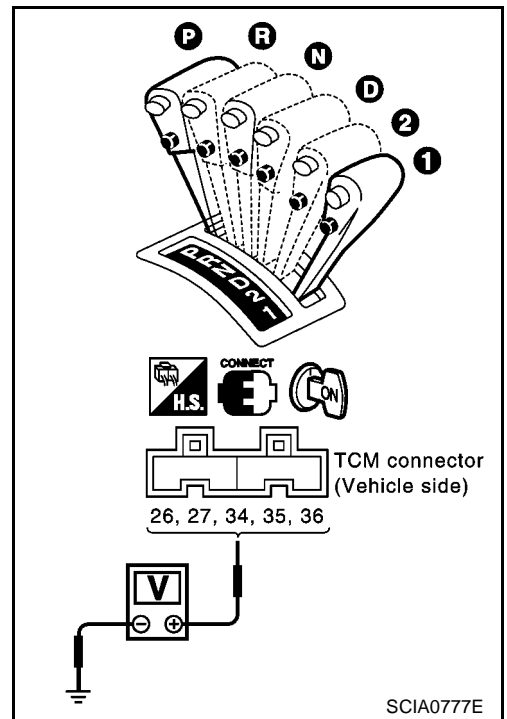
Lever position	Terminal No.				
	36	35	34	27	26
P, N	B	0	0	0	0
R	0	B	0	0	0
D	0	0	B	0	0
2	0	0	0	B	0
1	0	0	0	0	B

OK or NG

OK >> GO TO 4

NG >> Check the following items:

- PNP switch (Refer to [AT-241, "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)
- Diode (P, N positions)



**3. CHECK OVERDRIVE CONTROL SWITCH CIRCUIT (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 "OVERDRIVE SWITCH".  
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 5

NG >> Check the following items:

- Overdrive control switch (Refer to [AT-241, "COMPONENT INSPECTION"](#) .)
- 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

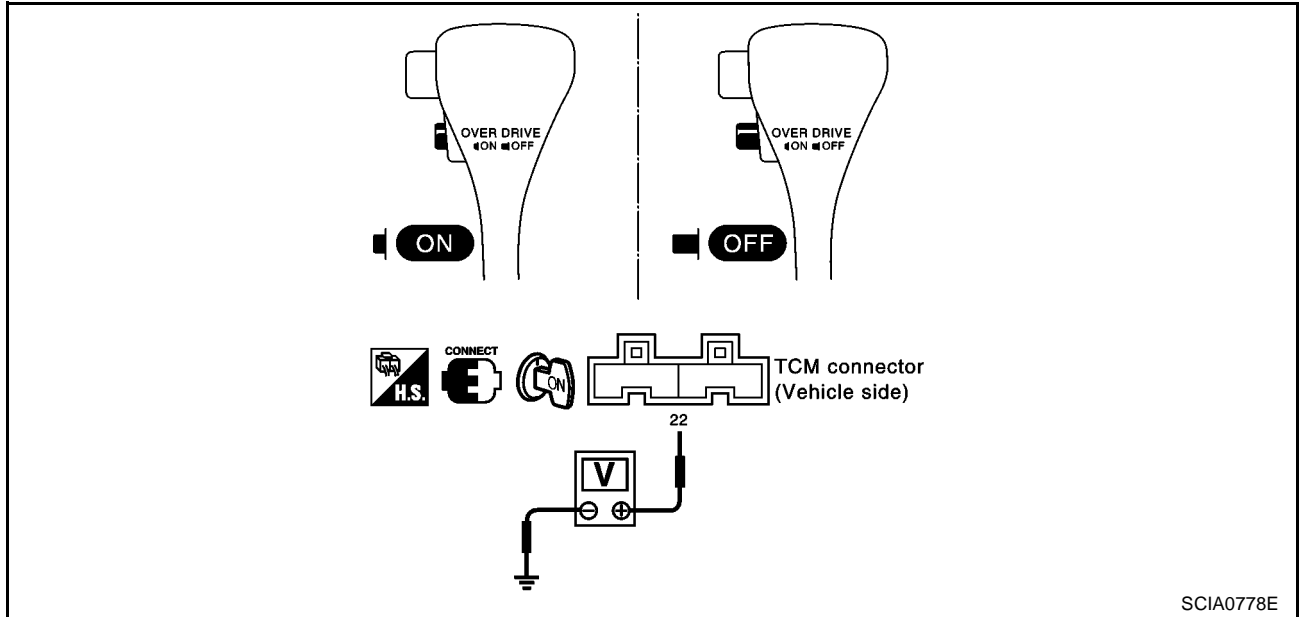
DATA MONITOR	
MONITORING	
ENGINE SPEED	XXX rpm
TURBINE REV	XXX rpm
OVERDRIVE SW	ON
PN POSI SW	OFF
R POSITION SW	OFF

SAT645J

#### 4. CHECK OVERDRIVE CONTROL SWITCH CIRCUIT (WITHOUT CONSULT-II)

##### ⊗ Without CONSULT-II

1. Turn ignition switch to "ON" position.  
(Do not start engine.)
2. Check voltage between TCM terminal 22 and ground when overdrive control switch is "ON" and "OFF".



##### Voltage:

Switch position "ON":

Battery voltage

Switch position "OFF":

1V or less

##### OK or NG

OK >> GO TO 6

NG >> Check the following items:

- Overdrive control switch (Refer to [AT-241, "COMPONENT INSPECTION"](#) .)
- 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

## 5. CHECK THROTTLE POSITION SENSOR\* CIRCUIT (WITH CONSULT-II)

\*:This sensor means accelerator pedal position (app) sensor.

Ⓟ **With CONSULT-II**

1. Refer to [AT-49, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) — Euro-OBD
2. Turn ignition switch to “ON” position.  
(Do not start engine.)
3. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
4. Read out “THRTL POS SEN” depressing and releasing accelerator pedal.  
Check the signal of throttle position sensor is indicated properly.

SELECT SYSTEM
A/T
ENGINE

SAT014K

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 7

NG >> Check the following items:

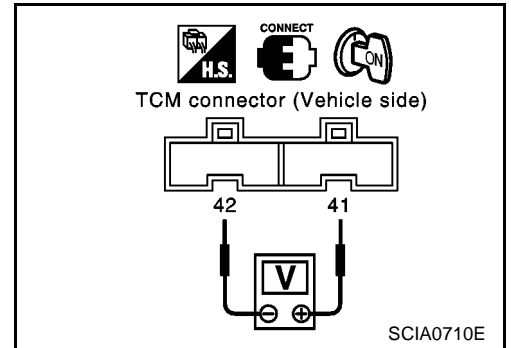
- Throttle position sensor — Refer to [AT-403, "Installation"](#) .
- Harness for short or open between ignition switch and throttle position sensor (Main harness)
- Harness for short or open between throttle position sensor and TCM (Main harness)



6. CHECK THROTTLE POSITION SENSOR CIRCUIT (WITHOUT CONSULT-II)

⊗ Without CONSULT-II

1. Refer to [AT-49, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#)
2. Turn ignition switch to "ON" position.  
(Do not start engine.)
3. Check voltage between TCM terminals 41 and ground while depressing, and releasing accelerator pedal slowly. (After warming up engine)



OK or NG

OK >> GO TO 7

NG >> Check the following items:

- Throttle position sensor — Refer to [AT-241, "COMPONENT INSPECTION"](#) .
- Harness for short or open between ignition switch and throttle position sensor (Main harness)
- Harness for short or open between throttle position sensor and TCM (Main harness)

7. CHECK DTC

Perform "DIAGNOSTIC PROCEDURE". Refer to [AT-237](#) .

OK or NG

OK >> **INSPECTION END**

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

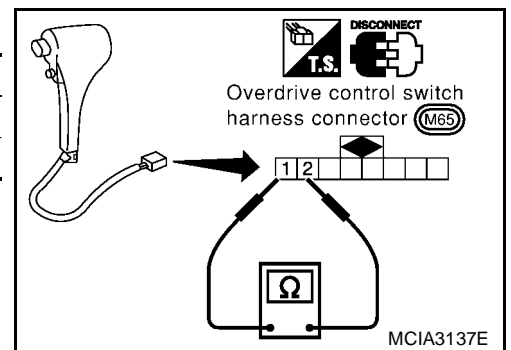
- If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

**COMPONENT INSPECTION**

**Overdrive Control Switch**

- Check continuity between two terminals 7 and 8.

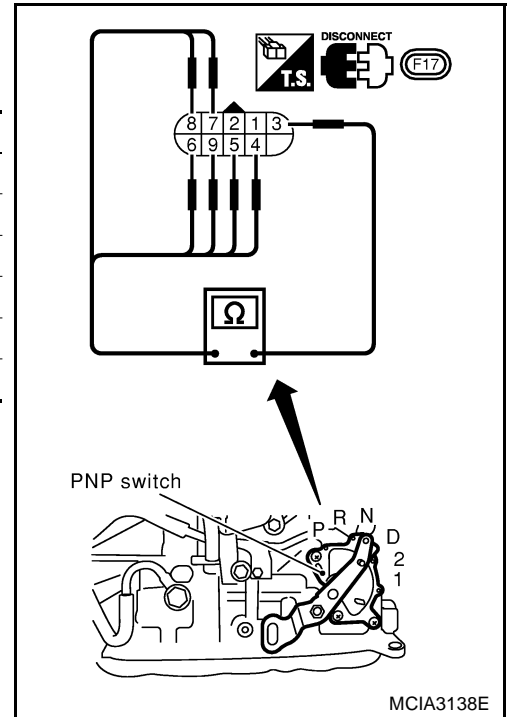
Switch position	Continuity
ON	No
OFF	Yes



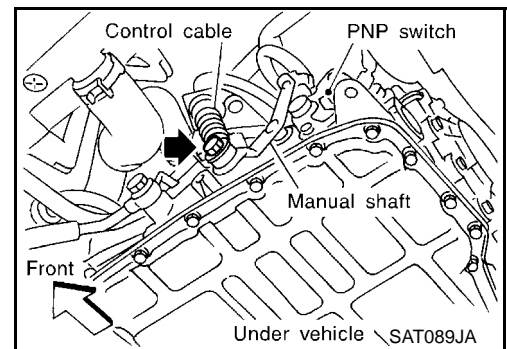
## PNP Switch

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

Lever position	Terminal No.	
P	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 [AT-406, "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 [AT-406, "Control Cable Adjustment"](#).
6. If NG on step 4, replace PNP switch.



## Throttle Position Sensor\*

\*: This sensor means accelerator pedal position (APP) sensor.

Refer to [AT-180, "DTC P1705 ACCELERATOR PEDAL POSITION \(APP\) SENSOR"](#).

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

PFP:00000

CONSULT-II

ECS005XS

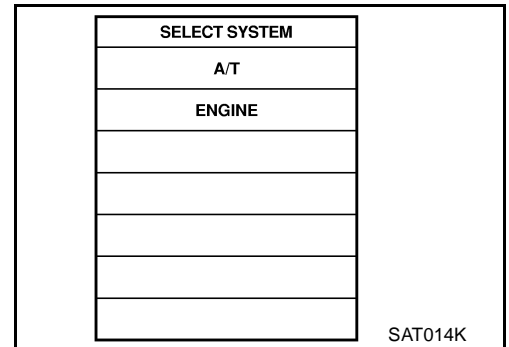
After performing [AT-243, "SELF-DIAGNOSTIC PROCEDURE \(WITH CONSULT-II\)"](#) , place check marks for results on the [AT-254, "DIAGNOSTIC WORKSHEET"](#) . Reference pages are provided following the items.

**NOTICE:**

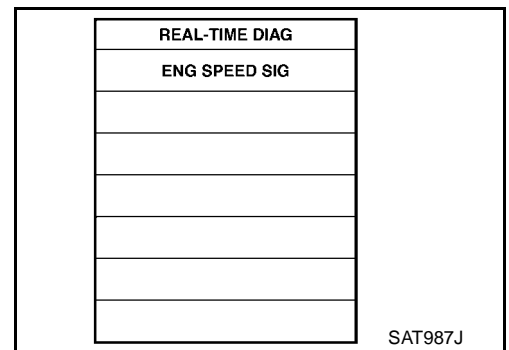
1. The CONSULT-II electrically displays shift timing and lock-up timing (that is, operation timing of each solenoid).  
Check for time difference between actual shift timing and the CONSULT-II display. If the difference is noticeable, mechanical parts (except solenoids, sensors, etc.) may be malfunctioning. 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.

**Ⓟ SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)**

1. Turn on CONSULT-II and touch "A/T" for TCM self-diagnosis.  
If A/T is not displayed, check TCM power supply and ground circuit. Refer to [AT-301, "TCM Terminals and Reference Value"](#) . If result is NG, refer to [PG-3, "POWER SUPPLY ROUTING"](#) .



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.



# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

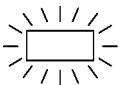
[EXC.F/EURO-OBD]

## SELF-DIAGNOSTIC RESULT TEST MODE

Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode)		Malfunction is detected when...	TCM self-diagnosis	Remarks
"A/T"	"ENGINE"		Available by O/D OFF  Self-diagnosis indicator lamp or "A/T" on CONSULT-II	
Revolution sensor		● TCM does not receive the proper voltage signal from the sensor.	X	—
VHCL SPEED SEN-A/T	VEH SPD SEN/ CIR AT			
Vehicle speed sensor (Meter)		● TCM does not receive the proper voltage signal from the sensor.	X	—
VHCL SPEED SEN-MTR	—			
Shift solenoid valve A		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	
SHIFT SOLENOID/V A	SFT SOL A/CIRC			
Shift solenoid valve B		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	
SHIFT SOLENOID/V B	SFT SOL B/CIRC			
Overrun clutch solenoid valve		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	
OVERRUN CLUTCH S/ V	O/R CLUCH SOL/ CIRC			
T/C clutch solenoid valve		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	
T/C CLUTCH SOL/V	TCC SOLENOID/ CIRC			
Line pressure solenoid valve		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	
LINE PRESSURE S/V	L/PRESS SOL/ CIRC			
Throttle position sensor (Accelerator Pedal Position (APP) sensor)		● TCM receives an excessively low or high voltage from the sensor.	X	
THROTTLE POSI SEN	TP SEN/CIRC A/T			
Engine speed signal		● TCM does not receive the proper voltage signal from the ECM.	X	
ENGINE SPEED SIG				
A/T fluid temperature sensor		● TCM receives an excessively low or high voltage from the sensor.	X	To be displayed in case of abnormality and when no recording is made.
BATT/FLUID TEMP SEN	ATF TEMP SEN/ CIRC			
Engine control		● The ECM-A/T communication line is open or shorted.	X	
A/T COMM LINE*1	—			
TCM (RAM)		● TCM memory (RAM) is malfunctioning	—	Refer to <a href="#">AT-343</a> , " <a href="#">TCM TERMINALS AND REFERENCE VALUE</a> "
CONTROL UNIT (RAM)	—			
TCM (ROM)		● TCM memory (ROM) is malfunctioning	—	Refer to <a href="#">AT-343</a> , " <a href="#">TCM TERMINALS AND REFERENCE VALUE</a> "
CONTROL UNIT (ROM)	—			
TCM (EEP ROM)		● TCM memory (EEP ROM) is malfunctioning.	—	Refer to <a href="#">AT-343</a> , " <a href="#">TCM TERMINALS AND REFERENCE VALUE</a> "
CONT UNIT(EEP ROM)	—			

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXC.F/EURO-OBD]

Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode)		Malfunction is detected when...	TCM self-diagnosis	Remarks
"A/T"	"ENGINE"		Available by O/D OFF	
			 Self-diagnosis indicator lamp or "A/T" on CONSULT-II	
Initial start		<ul style="list-style-type: none"> <li>This is not a malfunction message (Whenever shutting off a power supply to the TCM, this message appears on the screen.)</li> </ul>	X	
INITIAL START	—			
No failure (NO SELF DIAGNOSTIC FAILURE INDICATED FURTHER TESTING MAY BE REQUIRED**)		<ul style="list-style-type: none"> <li>No failure has been detected.</li> </ul>	X	

X: Applicable

—: Not applicable

\*1: A/T COMM LINE means CAN COMM LINE in this model.

## DATA MONITOR MODE (A/T)

Item	Display	move to center Monitor items				Description	Remarks
		TCM Input signals	CAN comm signals	Main signals	Selection from menu		
Vehicle speed sensor 1 (A/T) (Revolution sensor)	VHCL/S SE-A/T [km/h] or [mph]	X	—	—	▼	<ul style="list-style-type: none"> <li>Vehicle speed computed from signal of revolution sensor is displayed.</li> </ul>	When racing engine in N or P 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]	X	—	—	▼	<ul style="list-style-type: none"> <li>Vehicle speed computed from signal of vehicle speed sensor is displayed.</li> </ul>	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	THRTL POS SEN [V]	X	—	—	▼	<ul style="list-style-type: none"> <li>Throttle position sensor signal voltage is displayed.</li> </ul>	
A/T fluid temperature sensor	FLUID TEMP SE [V]	X	—	—	▼	<ul style="list-style-type: none"> <li>A/T fluid temperature sensor signal voltage is displayed.</li> <li>Signal voltage lowers as fluid temperature rises.</li> </ul>	
Battery voltage	BATTERY VOLT [V]	X	—	—	▼	<ul style="list-style-type: none"> <li>Source voltage of TCM is displayed.</li> </ul>	
Engine speed	ENGINE SPEED [rpm]	X	—	X	▼	<ul style="list-style-type: none"> <li>Engine speed, computed from engine speed signal, is displayed.</li> </ul>	Engine speed display may not be accurate under approx. 800 rpm. It may not indicate 0 rpm even when engine is not running.

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXC.F/EURO-OBD]

Item	Display	move to center Monitor items				Description	Remarks
		TCM Input signals	CAN comm signals	Main signals	Selection from menu		
Overdrive control switch	OVERDRIVE SW [ON/OFF]	X	—	—	▼	● ON/OFF state computed from signal of overdrive control SW is displayed.	
PN position (PNP) switch	PN POSI SW [ON/OFF]	X	—	—	▼	● ON/OFF state computed from signal of PN position SW is displayed.	
R position switch	R POSITION SW [ON/OFF]	X	—	—	▼	● ON/OFF state computed from signal of R position SW is displayed.	
D position switch	D POSITION SW [ON/OFF]	X	—	—	▼	● ON/OFF state computed from signal of D position SW is displayed.	
2 position switch	2 POSITION SW [ON/OFF]	X	—	—	▼	● ON/OFF status, computed from signal of 2 position SW, is displayed.	
1 position switch	1 POSITION SW [ON/OFF]	X	—	—	▼	● ON/OFF status, computed from signal of 1 position SW, is displayed.	
Kickdown switch	KICKDOWN SW [ON/OFF]	X	—	—	▼	● ON/OFF status, computed from signal of kick down SW, is displayed.	● This is displayed even when no kick down switch is equipped.
Gear position	GEAR	—	—	X	▼	● Gear position data used for computation by TCM, is displayed.	
Selector lever position	SLCT LVR POSI	—	—	X	▼	● Selector lever 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.
Vehicle speed	VEHICLE SPEED [km/h] or [mph]	—	—	X	▼	● Vehicle speed data, used for computation by TCM, is displayed.	
Torque converter slip ratio	TC SLIP RATIO [0.000]	—	—	—	▼	● Ratio of engine revolution to input shaft revolution of torque converter	
Torque converter slip speed	TC SLIP SPEED [rpm]	—	—	—	▼	Difference in revolution between input shaft revolution and input shaft revolution of torque converter	Display doesn't indicate 0 rpm even if engine is stopped. But this isn't malfunction.
can communication	CAN COMM [OK/UNKWN]	—	X	—	▼		
can circuit 1	CAN CIRC 1 [OK/UNKWN]	—	X	—	▼		

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXC.F/EURO-OBD]

Item	Display	move to center Monitor items				Description	Remarks
		TCM Input signals	CAN comm sig- nals	Main signals	Selection from menu		
can circuit 2	CAN CIRC 2 [OK/UNKWN]	—	X	—	▼		
can circuit 3	CAN CIRC 3 [OK/UNKWN]	—	X	—	▼		
can circuit 4	CAN CIRC 4 [OK/UNKWN]	—	X	—	▼		
can circuit 5	CAN CIRC 5 [OK/UNKWN]	—	X	—	▼		
Throttle position	THROTTLE POSI [8]	—	—	X	▼	<ul style="list-style-type: none"> <li>Throttle position data, used for computation by TCM, is displayed.</li> </ul>	<ul style="list-style-type: none"> <li>A specific value used for control is displayed if fail-safe is activated due to error.</li> </ul>
Stop lamp switch	BRAKE SW [ON/OFF]	X	—	—	▼	<ul style="list-style-type: none"> <li>ON/OFF status is displayed.</li> <li>ON... Brake pedal is depressed.</li> <li>OFF... Brake pedal is released.</li> </ul>	
Line pressure duty	LINE PRES DTY [%]	—	—	X	▼	<ul style="list-style-type: none"> <li>Control value of line pressure solenoid valve, computed by TCM from each input signal, is displayed.</li> </ul>	
Torque converter clutch solenoid valve duty	TCC S/V DUTY [%]	—	—	X	▼	<ul style="list-style-type: none"> <li>Control value of torque converter clutch solenoid valve, computed by TCM from each input signal, is displayed.</li> </ul>	
Shift solenoid valve A	SHIFT S/V A [ON/OFF]	—	—	X	▼	<ul style="list-style-type: none"> <li>Control value of shift solenoid valve A, computed by TCM from each input signal, is displayed.</li> </ul>	Control value of solenoid is displayed even if solenoid circuit is disconnected. The OFF signal is displayed if solenoid circuit is shorted.
Shift solenoid valve B	SHIFT S/V B [ON/OFF]	—	—	X	▼	<ul style="list-style-type: none"> <li>Control value of shift solenoid valve B, computed by TCM from each input signal, is displayed.</li> </ul>	
Overrun clutch solenoid valve	OVERRUN/C S/ V [ON/OFF]	—	—	X	▼	<ul style="list-style-type: none"> <li>Control value of overrun clutch solenoid valve computed by TCM from each input signal is displayed.</li> </ul>	
Self-diagnosis display lamp (O/D OFF indicator lamp)	SELF-D DP LMP [ON/OFF]	—	—	X	▼	<ul style="list-style-type: none"> <li>Control status of O/D OFF indicator lamp is displayed.</li> </ul>	
Voltage [V]		—	—	—	▼	Value measured by voltage probe is displayed.	

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

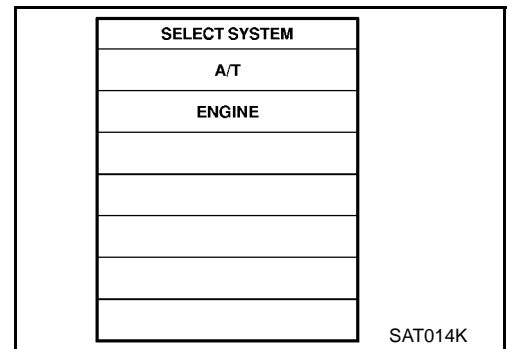
[EXC.F/EURO-OBD]

Item	Display	move to center Monitor items				Description	Remarks
		TCM Input signals	CAN comm signals	Main signals	Selection from menu		
Frequency [Hz]		—	—	—	▼	Value measured by pulse probe is displayed. If measurement is impossible, “#” sign is displayed. “#” sign is also displayed at the final data value until the measurement result is obtained.	
DUTY-HI		—	—	—	▼	Duty cycle value for measurement probe is displayed.	
DUTY-LOW		—	—	—	▼		
PLS WIDTH-HI		—	—	—	▼	Measured pulse width of measurement probe is displayed.	
PLS WIDTH-LOW		—	—	—	▼		

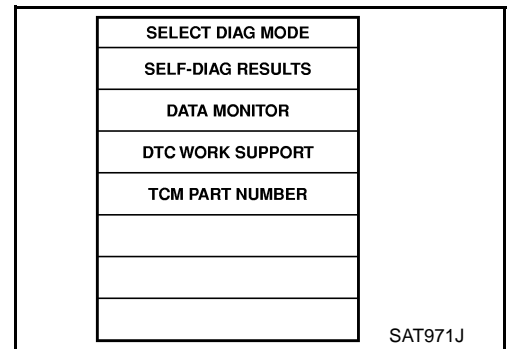
X: Applicable    —: Not applicable    ▼: Option

## Ⓟ HOW TO ERASE SELF-DIAGNOSTIC RESULTS (WITH CONSULT-II)

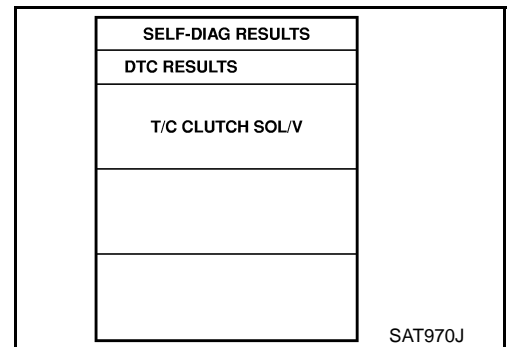
1. If the ignition switch stays “ON” after repair work, be sure to turn ignition switch “OFF” once. Wait for at least 3 seconds and then turn it “ON” again.
2. Turn CONSULT-II “ON”, and touch “A/T”.



3. Touch “SELF-DIAG RESULTS”.



4. Touch “ERASE”. (The self-diagnostic results will be erased.)





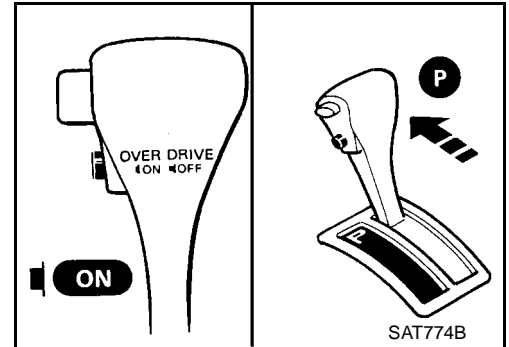
## Diagnostic Procedure Without CONSULT-II

ECS005XT

### ⊗ SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)

#### 1. CHECK O/D OFF INDICATOR LAMP

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch to "OFF" position.  
Wait 5 seconds.
3. Turn ignition switch to "ACC" position.
4. Set overdrive control switch to "ON" position.
5. Move selector lever to "P" position.
6. Turn ignition switch to "ON" position. (Do not start engine.)

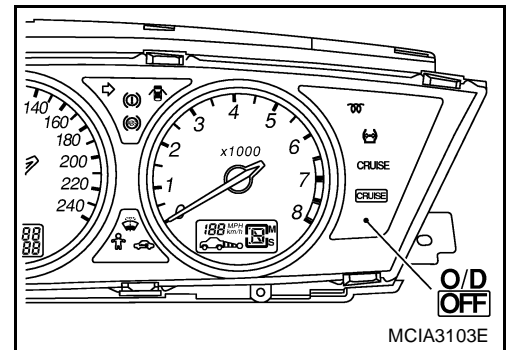


7. Does O/D OFF indicator lamp come on for about 2 seconds?

Yes or No

Yes >> GO TO 2.

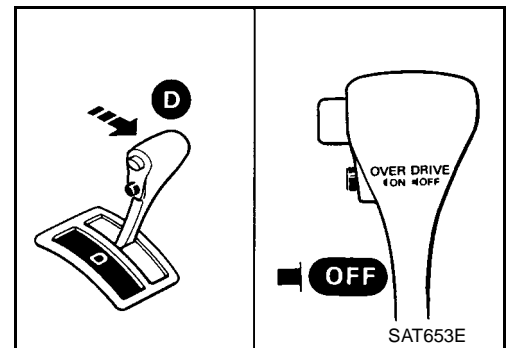
No >> GO TO [AT-310, "1. O/D OFF Indicator Lamp Does Not Come On"](#).



#### 2. JUDGEMENT PROCEDURE STEP 1

1. Turn ignition switch to "OFF" position.
2. Turn ignition switch to "ACC" position.
3. Move selector lever to "D" position.
4. Set overdrive control switch to "OFF" position.
5. Turn ignition switch to "ON" position. (Do not start engine.)  
Wait more than 2 seconds after turning ignition switch "ON".

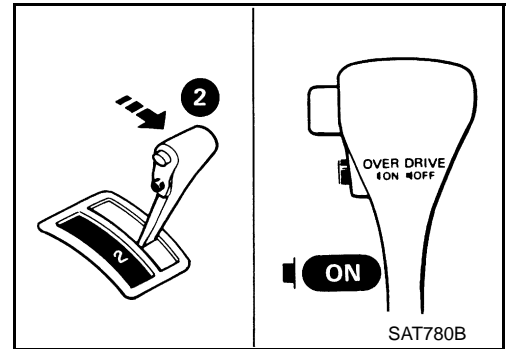
>> GO TO 3



## 3. JUDGEMENT PROCEDURE STEP 2

1. Move selector lever to "2" position.
2. Set overdrive control switch to "ON" position.

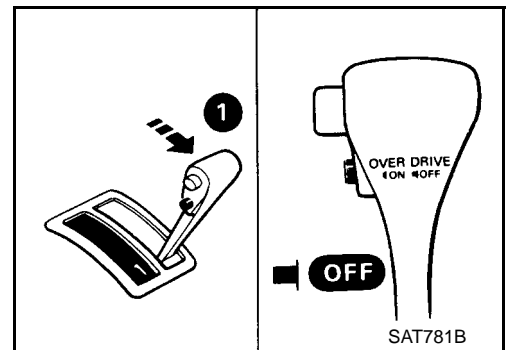
>> GO TO 4



## 4. JUDGEMENT PROCEDURE STEP 3

1. Move selector lever to "1" position.
2. Set overdrive control switch to "OFF" position.

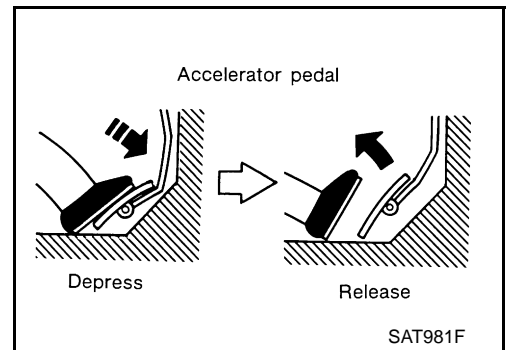
>> GO TO 5



## 5. JUDGEMENT PROCEDURE STEP 4

1. Depress accelerator pedal fully and release it.

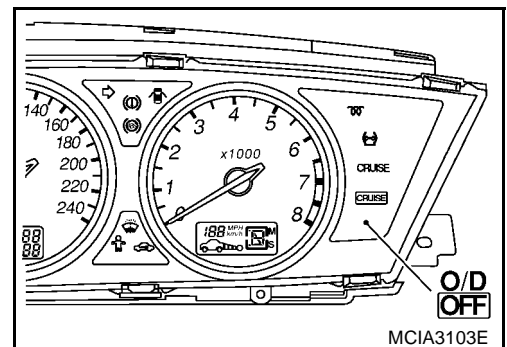
>> GO TO 6



## 6. CHECK SELF-DIAGNOSIS CODE

Check O/D OFF indicator lamp. Refer to [AT-251, "JUDGEMENT OF SELF-DIAGNOSIS CODE"](#).

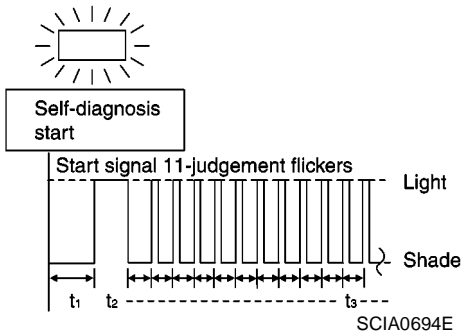
>> DIAGNOSIS END



## JUDGEMENT OF SELF-DIAGNOSIS CODE

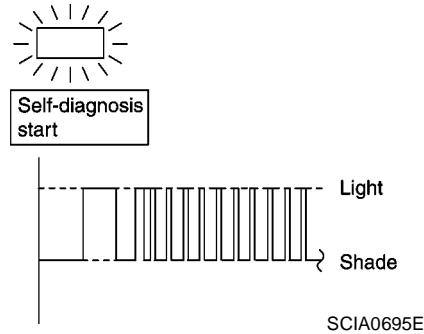
O/D OFF indicator lamp:

All judgement flickers are the same.



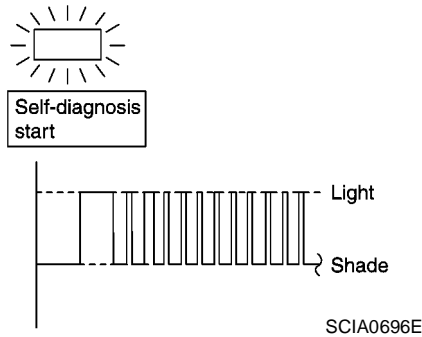
All circuits that can be confirmed by self-diagnosis are OK.

1st judgement flicker is longer than others.



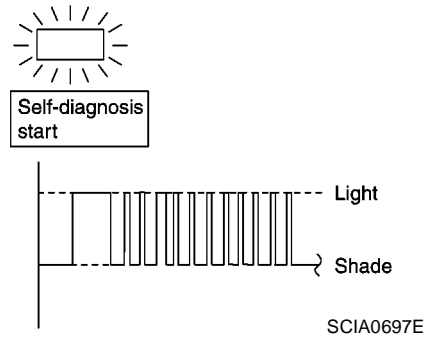
Revolution sensor circuit is short-circuited or disconnected.  
 ⇒ **Go to VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR).**  
 Refer to [AT-343](#)

2nd judgement flicker is longer than others.



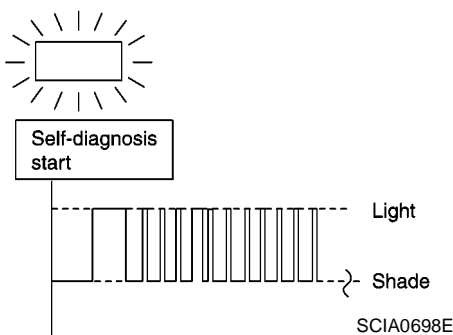
Vehicle speed sensor circuit is short-circuited or disconnected.  
 ⇒ **Go to VEHICLE SPEED SENSOR-MTR.**  
 Refer to [AT-348](#)

3rd judgement flicker is longer than others.



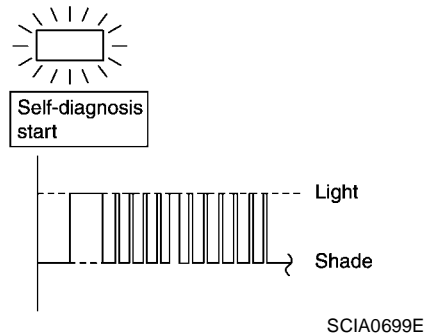
⇒ **Go to (ACCELERATOR PEDAL POSITION (APP) SENSOR).**  
 Refer to [AT-351](#)

4th judgement flicker is longer than others.



Shift solenoid valve A circuit is short-circuited or disconnected.  
 ⇒ **Go to SHIFT SOLENOID VALVE A.**  
 Refer to [AT-356](#)

5th judgement flicker is longer than others.



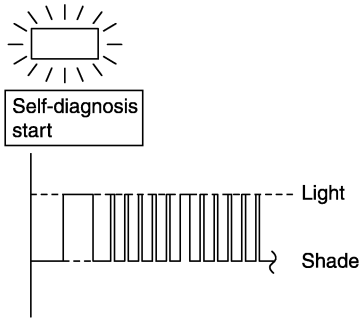
Shift solenoid valve B circuit is short-circuited or disconnected.  
 ⇒ **Go to SHIFT SOLENOID VALVE B.**  
 Refer to [AT-361](#)

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXC.F/EURO-OBD]

O/D OFF indicator lamp:

6th judgement flicker is longer than others.

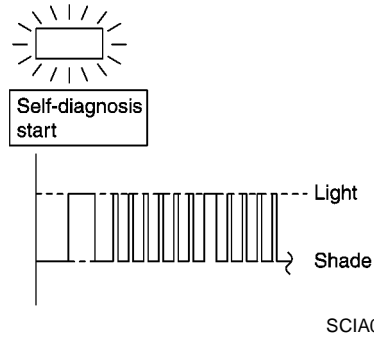


Overrun clutch solenoid valve circuit is short-circuited or disconnected.

⇒ **Go to OVERRUN CLUTCH SOLENOID VALVE.**

Refer to [AT-366](#)

7th judgement flicker is longer than others.

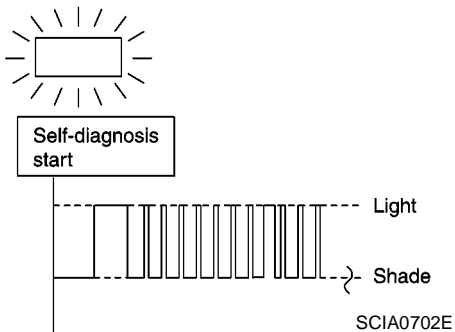


Torque converter clutch solenoid valve circuit is short-circuited or disconnected.

⇒ **Go to TORQUE CONVERTER CLUTCH SOLENOID VALVE.**

Refer to [AT-371](#)

8th judgement flicker is longer than others.

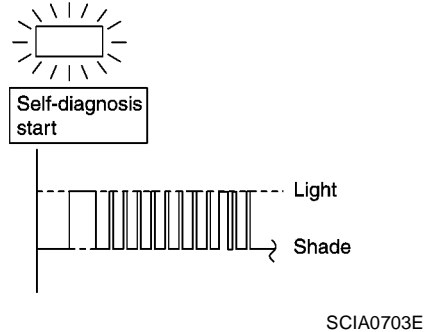


A/T fluid temperature sensor is disconnected or TCM power source circuit is damaged.

⇒ **Go to BATT/FLUID TEMP SEN(A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE).**

Refer to [AT-376](#)

9th judgement flicker is longer than others.



Engine speed signal circuit is short-circuited or disconnected.

⇒ **Go to ENGINE SPEED SIGNAL.**

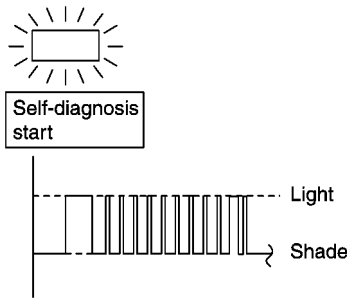
Refer to [AT-382](#)

# ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXC.F/EURO-OBD]

O/D OFF indicator lamp:

10th judgement flicker is longer than others.



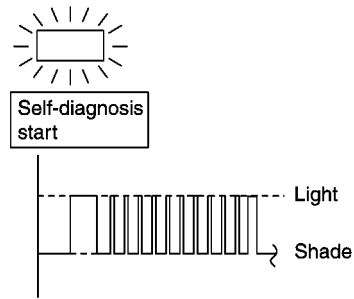
SCIA0704E

Line pressure solenoid valve circuit is short-circuited or disconnected.

⇒ **Go to LINE PRESSURE SOLENOID VALVE.**

Refer to [AT-386](#)

11th judgement flicker is longer than others.



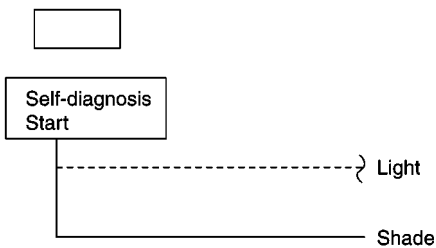
SCIA0705E

The ECM-A/T communication line is open or shorted.

⇒Go to CAN COMMUNICATION LINE.

Refer to [AT-393](#)

Lamp comes OFF.



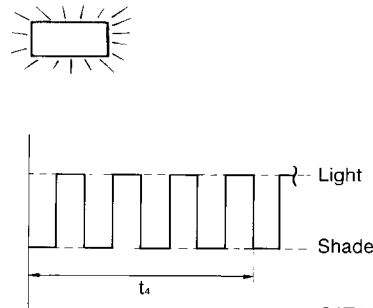
SCIA0706E

PNP switch, overdrive control switch or throttle position switch circuit is disconnected or TCM is damaged.

⇒ **Go to 21. TCM Self-diagnosis Does Not Activate (PNP & OVERDRIVE CONTROL SWITCHES, AND THROTTLE POSITION SENSOR).**

Refer to [AT-333](#)

Flickers as shown below.



SAT804H

Battery power is low.

Battery has been disconnected for a long time.

Battery is connected conversely.

(When reconnecting TCM connectors.—This is a problem.)

t1 = 2.5 seconds t2 = 2.0 seconds t3 = 1.0 second t4 = 1.0 second

## ⊗ HOW TO ERASE SELF-DIAGNOSTIC RESULTS (WITHOUT CONSULT-II)

1. If the ignition switch stays "ON" after repair work, be sure to turn ignition switch "OFF" once. Wait for at least 3 seconds and then turn it "ON" again.
2. Perform "SELF-DIAGNOSTIC PROCEDURE (Without CONSULT-II)". Refer to [AT-249](#) .
3. Turn ignition switch "OFF". (The self-diagnostic results will be erased.)

TROUBLE DIAGNOSIS — INTRODUCTION

PFP:00000

Introduction

ECS005XU

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

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.

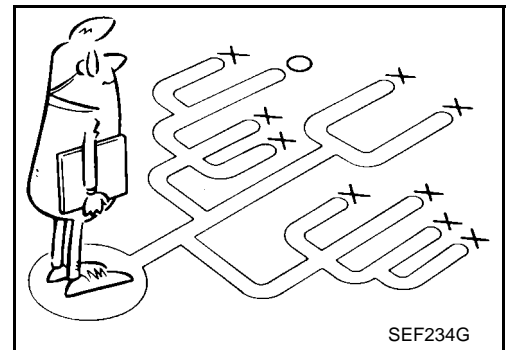
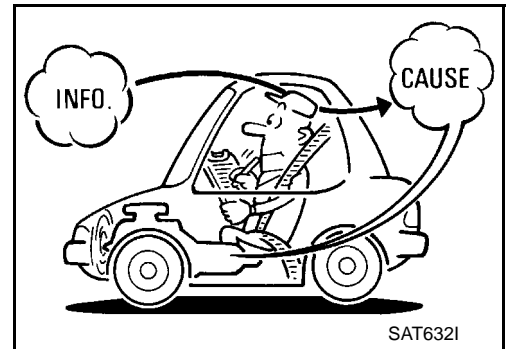
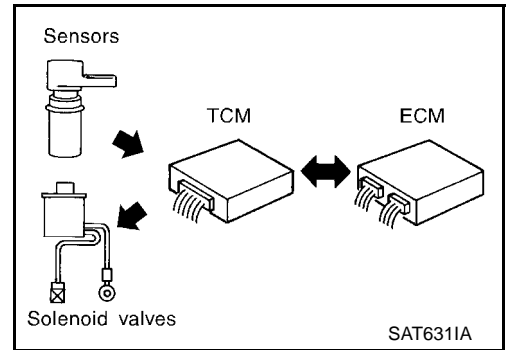
It is much more difficult to diagnose a problem that occurs intermittently rather than continuously. Most intermittent problems are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.

A visual check only, may not find the cause of the problems. A road test with CONSULT-II or a circuit tester connected should be performed. Follow the "Work Flow". Refer to [AT-258](#).

Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a drive ability 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-254](#)) should be used.

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

**Also check related Service bulletins for information.**



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	<input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent (    times a day)		

# TROUBLE DIAGNOSIS — INTRODUCTION

[EXC.F/EURO-OBDD]

Symptoms	<input type="checkbox"/> Vehicle does not move. ( <input type="checkbox"/> Any position <input type="checkbox"/> Particular position)	
	<input type="checkbox"/> No up-shift ( <input type="checkbox"/> 1st → 2nd <input type="checkbox"/> 2nd → 3rd <input type="checkbox"/> 3rd → O/D)	
	<input type="checkbox"/> No down-shift ( <input type="checkbox"/> O/D → 3rd <input type="checkbox"/> 3rd → 2nd <input type="checkbox"/> 2nd → 1st)	
	<input type="checkbox"/> Lockup malfunction	
	<input type="checkbox"/> Shift point too high or too low.	
	<input type="checkbox"/> Shift shock or slip ( <input type="checkbox"/> N → D <input type="checkbox"/> Lockup <input type="checkbox"/> Any drive position)	
	<input type="checkbox"/> Noise or vibration	
	<input type="checkbox"/> No kick down	
	<input type="checkbox"/> No pattern select	
	<input type="checkbox"/> Others ( )	
O/D OFF indicator lamp	Blinks for about 8 seconds.	
	<input type="checkbox"/> Continuously lit	<input type="checkbox"/> Not lit

## Diagnostic Worksheet

1.	<input type="checkbox"/> Read the Fail-safe and listen to customer complaints.	<a href="#">AT-8, "Wiring Diagrams and Trouble Diagnosis", AT-254, "DIAGNOSTIC WORKSHEET"</a>
2.	<input type="checkbox"/> CHECK A/T FLUID	<a href="#">AT-260, "A/T Fluid Check"</a>
3.	<input type="checkbox"/> Perform STALL TEST and LINE PRESSURE TEST.	
	<input type="checkbox"/> Stall test — Mark possible damaged components/others.	
	<input type="checkbox"/> Torque converter one-way clutch <input type="checkbox"/> Reverse clutch <input type="checkbox"/> Forward clutch <input type="checkbox"/> Overrun clutch <input type="checkbox"/> Forward one-way clutch	<input type="checkbox"/> Low & reverse brake <input type="checkbox"/> Low one-way clutch <input type="checkbox"/> Engine <input type="checkbox"/> Line pressure is low <input type="checkbox"/> Clutches and brakes except high clutch and brake band are OK
	<input type="checkbox"/> Line Pressure test — Suspected parts:	

# TROUBLE DIAGNOSIS — INTRODUCTION

[EXC.F/EURO-OBD]

4.	<input type="checkbox"/> Perform all ROAD TEST and mark required procedures.	<a href="#">AT-265.</a> <a href="#">"Road Test"</a>
4- 1.	Check before engine is started. <input type="checkbox"/> SELF-DIAGNOSTIC CONFIRMATION PROCEDURE — Mark detected items.	<a href="#">AT-266. "1.</a> <a href="#">CHECK</a> <a href="#">BEFORE</a> <a href="#">ENGINE IS</a> <a href="#">STARTED"</a>
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Vehicle speed sensor-A/T (Revolution sensor), <a href="#">AT-343</a> .</li> <li><input type="checkbox"/> Vehicle speed sensor-MTR, <a href="#">AT-348</a> .</li> <li><input type="checkbox"/> Accelerator pedal position (APP) sensor, <a href="#">AT-351</a> .</li> <li><input type="checkbox"/> Shift solenoid valve A, <a href="#">AT-356</a> .</li> <li><input type="checkbox"/> Shift solenoid valve B, <a href="#">AT-361</a> .</li> <li><input type="checkbox"/> Overrun clutch solenoid valve, <a href="#">AT-366</a> .</li> <li><input type="checkbox"/> Torque converter clutch solenoid valve, <a href="#">AT-371</a> .</li> <li><input type="checkbox"/> A/T fluid temperature sensor and TCM power source, <a href="#">AT-376</a> .</li> <li><input type="checkbox"/> Engine speed signal, <a href="#">AT-382</a> .</li> <li><input type="checkbox"/> Line pressure solenoid valve, <a href="#">AT-386</a> .</li> <li><input type="checkbox"/> CAN communication line, <a href="#">AT-393</a> .</li> <li><input type="checkbox"/> Control unit (RAM), control unit (ROM), <a href="#">AT-203</a> .</li> <li><input type="checkbox"/> Control unit (EEP ROM), <a href="#">AT-205</a> .</li> <li><input type="checkbox"/> PNP &amp; overdrive control switches, and throttle position sensor, <a href="#">AT-333</a> .</li> <li><input type="checkbox"/> Battery</li> <li><input type="checkbox"/> Others</li> </ul>	
4- 2.	Check at idle	<a href="#">AT-267. "2.</a> <a href="#">CHECK AT</a> <a href="#">IDLE"</a>
	<ul style="list-style-type: none"> <li><input type="checkbox"/> 1. O/D OFF Indicator Lamp Does Not Come On, <a href="#">AT-310</a> .</li> <li><input type="checkbox"/> 2. Engine Cannot Be Started In "P" And "N" Position, <a href="#">AT-311</a> .</li> <li><input type="checkbox"/> 3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed, <a href="#">AT-312</a> .</li> <li><input type="checkbox"/> 4. In "N" Position, Vehicle Moves, <a href="#">AT-312</a> .</li> <li><input type="checkbox"/> 5. Large Shock. "N" → "R" Position, <a href="#">AT-313</a> .</li> <li><input type="checkbox"/> 6. Vehicle Does Not Creep Backward In "R" Position, <a href="#">AT-314</a> .</li> <li><input type="checkbox"/> 7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position, <a href="#">AT-316</a> .</li> </ul>	



# TROUBLE DIAGNOSIS — INTRODUCTION

[EXC.F/EURO-OBD]

4.	4-3.	<p>Cruise test</p> <hr/> <p>Part-1</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 8. Vehicle Cannot Be Started From D1 , <a href="#">AT-318</a> .</li> <li><input type="checkbox"/> 9. A/T Does Not Shift: D1 → D2 Or Does Not Kickdown: D4 → D2 , <a href="#">AT-320</a> .</li> <li><input type="checkbox"/> 10. A/T Does Not Shift: D2 → D3 , <a href="#">AT-322</a> .</li> <li><input type="checkbox"/> 11. A/T Does Not Shift: D3 → D4 , <a href="#">AT-324</a> .</li> <li><input type="checkbox"/> 12. A/T Does Not Perform Lock-up, <a href="#">AT-326</a> .</li> <li><input type="checkbox"/> 13. A/T Does Not Hold Lock-up Condition, <a href="#">AT-327</a> .</li> <li><input type="checkbox"/> 14. Lock-up Is Not Released, <a href="#">AT-329</a> .</li> <li><input type="checkbox"/> 15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3) , <a href="#">AT-329</a> .</li> </ul> <hr/> <p>Part-2</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 16. Vehicle Does Not Start From D1 , <a href="#">AT-331</a> .</li> <li><input type="checkbox"/> 9. A/T Does Not Shift: D1 → D2 Or Does Not Kickdown: D4 → D2 , <a href="#">AT-320</a> .</li> <li><input type="checkbox"/> 10. A/T Does Not Shift: D2 → D3 , <a href="#">AT-322</a> .</li> <li><input type="checkbox"/> 11. A/T Does Not Shift: D3 → D4 , <a href="#">AT-324</a> .</li> </ul> <hr/> <p>Part-3</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> 17. A/T Does Not Shift: D4 → D3 When Overdrive Control Switch "ON" → "OFF", <a href="#">AT-331</a> .</li> <li><input type="checkbox"/> 15. Engine Speed Does Not Return To Idle (Engine Brake In D3 ) , <a href="#">AT-329</a> .</li> <li><input type="checkbox"/> 18. A/T Does Not Shift: D3 → 22 , When Selector Lever "D" → "2" Position, <a href="#">AT-332</a> .</li> <li><input type="checkbox"/> 15. Engine Speed Does Not Return To Idle (Engine Brake In 22 ) , <a href="#">AT-329</a> .</li> <li><input type="checkbox"/> 19. A/T Does Not Shift: 22 → 11 , When Selector Lever "2" → "1" Position, <a href="#">AT-332</a> .</li> <li><input type="checkbox"/> 20. Vehicle Does Not Decelerate By Engine Brake, <a href="#">AT-333</a> .</li> <li><input type="checkbox"/> 21. TCM Self-diagnosis Does Not Activate (PNP &amp; Overdrive Control Switches, and throttle position sensor Circuit Checks), <a href="#">AT-333</a> .</li> <li><input type="checkbox"/> SELF-DIAGNOSTIC PROCEDURE — Mark detected items.</li> </ul> <hr/> <ul style="list-style-type: none"> <li><input type="checkbox"/> Vehicle speed sensor-A/T (Revolution sensor), <a href="#">AT-343</a> .</li> <li><input type="checkbox"/> Vehicle speed sensor-MTR, <a href="#">AT-348</a> .</li> <li><input type="checkbox"/> Accelerator pedal position (APP) sensor, <a href="#">AT-351</a> .</li> <li><input type="checkbox"/> Shift solenoid valve A, <a href="#">AT-356</a> .</li> <li><input type="checkbox"/> Shift solenoid valve B, <a href="#">AT-361</a> .</li> <li><input type="checkbox"/> Overrun clutch solenoid valve, <a href="#">AT-366</a> .</li> <li><input type="checkbox"/> Torque converter clutch solenoid valve, <a href="#">AT-371</a> .</li> <li><input type="checkbox"/> Batt/fluid temp sen (A/T fluid temperature sensor and TCM power source), <a href="#">AT-376</a> .</li> <li><input type="checkbox"/> Engine speed signal, <a href="#">AT-382</a> .</li> <li><input type="checkbox"/> Line pressure solenoid valve, <a href="#">AT-386</a> .</li> <li><input type="checkbox"/> CAN communication line, <a href="#">AT-393</a> .</li> <li><input type="checkbox"/> Control unit (RAM), control unit (ROM), <a href="#">AT-203</a> .</li> <li><input type="checkbox"/> Control unit (EEP ROM), <a href="#">AT-205</a> .</li> <li><input type="checkbox"/> PNP &amp; overdrive control switches, and throttle position sensor, <a href="#">AT-339</a> .</li> <li><input type="checkbox"/> Battery</li> <li><input type="checkbox"/> Others</li> </ul>	<p><a href="#">AT-270</a>. "3. CRUISE TEST", <a href="#">AT-274</a>. "Cruise Test — Part 1"</p> <hr/> <p><a href="#">AT-277</a>. "Cruise Test — Part 2"</p> <hr/> <p><a href="#">AT-279</a>. "Cruise Test — Part 3"</p>
5.		<p><input type="checkbox"/> For self-diagnosis NG items, inspect each component. Repair or replace the damaged parts.</p>	<p><a href="#">AT-249</a>. "SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)"</p>
6.		<p><input type="checkbox"/> Perform all ROAD TEST and re-mark required procedures.</p>	<p><a href="#">AT-265</a>. "Road Test"</p>

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# TROUBLE DIAGNOSIS — INTRODUCTION

[EXC.F/EURO-OBID]

7.	<input type="checkbox"/> 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.)	<a href="#">AT-282.</a> <a href="#">"TROUBLE DIAGNOSIS — GENERAL DESCRIPTION"</a>
8.	<input type="checkbox"/> Erase self-diagnosis code from TCM memories.	<a href="#">AT-248.</a> <a href="#">"HOW TO ERASE SELF-DIAGNOSTIC RESULTS (WITH CONSULT-II)",</a> <a href="#">AT-253.</a> <a href="#">"HOW TO ERASE SELF-DIAGNOSTIC RESULTS (WITHOUT CONSULT-II)"</a>

## Work Flow

### HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

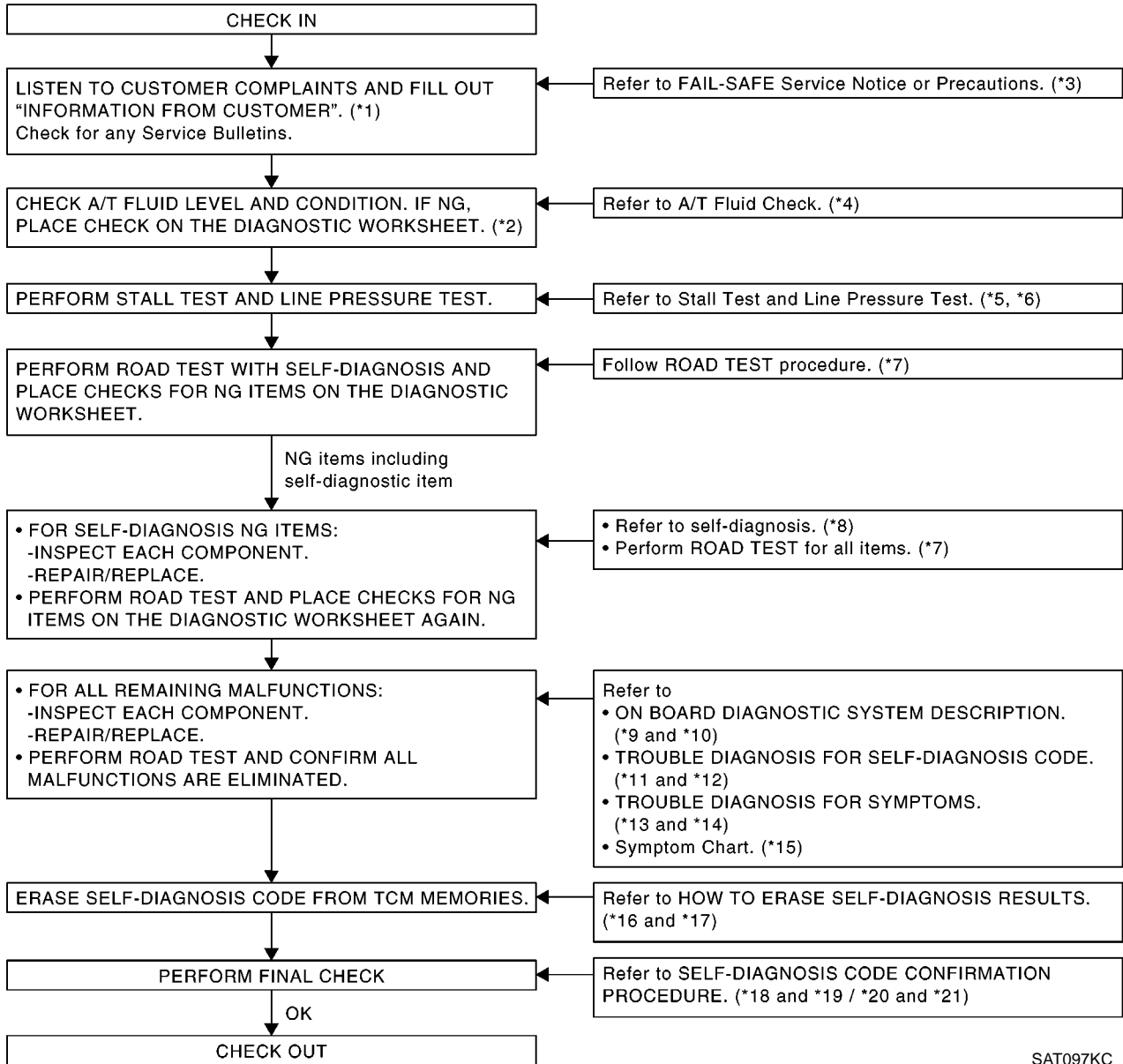
ECS005XV

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-254](#)) and "Diagnostic Worksheet" ([AT-255](#)), to perform the best troubleshooting possible.

## WORK FLOW CHART

A  
B  
AT  
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M



SAT097KC

- \*1 [AT-254](#)
- \*4 [AT-260](#)
- \*7 [AT-265](#)
- \*10 [AT-243](#)
- \*13 [AT-308](#)
- \*16 [AT-248](#)
- \*19 [AT-393](#)

- \*2 [AT-255](#)
- \*5 [AT-261](#)
- \*8 [AT-249](#)
- \*11 [AT-344](#)
- \*14 [AT-308](#)
- \*17 [AT-253](#)

- \*3 [AT-7](#)
- \*6 [AT-264](#)
- \*9 [AT-243](#)
- \*12 [AT-393](#)
- \*15 [AT-282](#)
- \*18 [AT-344](#)

TRUBLE DIAGNOSIS — BASIC INSPECTION

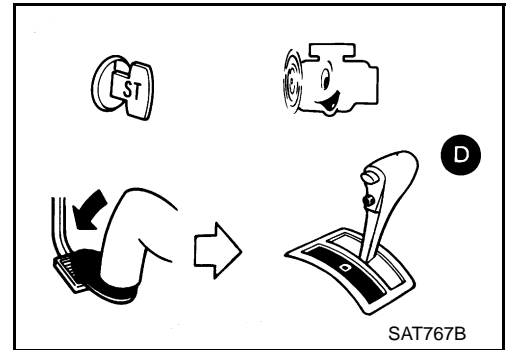
PFID:00000

A/T Fluid Check

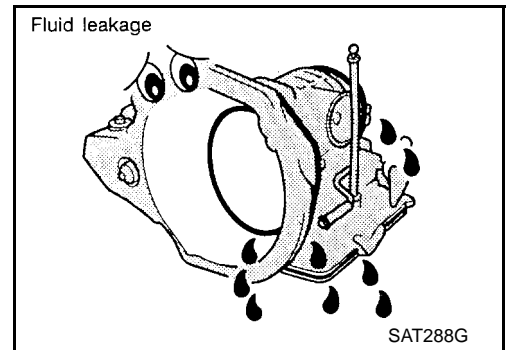
ECS005XW

FLUID LEAKAGE CHECK

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.

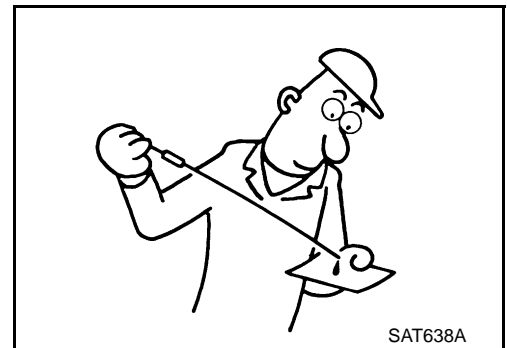


FLUID CONDITION CHECK

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 [AT-260, "A/T Fluid Check"](#) .



## Stall Test

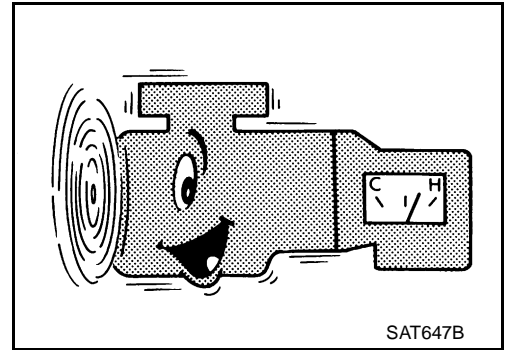
### STALL TEST PROCEDURE

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

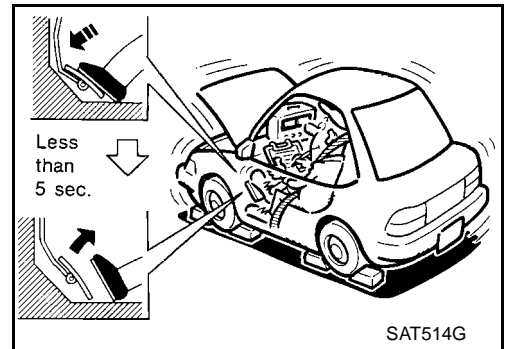
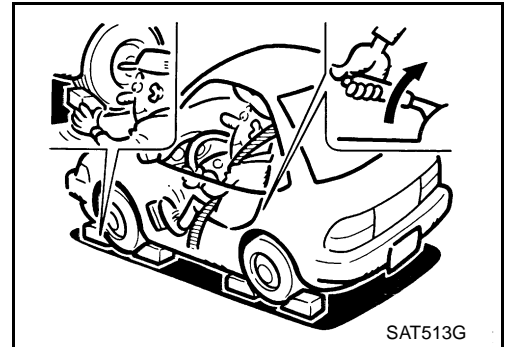
**ATF operating temperature:**

**50 - 80°C (122 - 176°F)**

3. 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.**



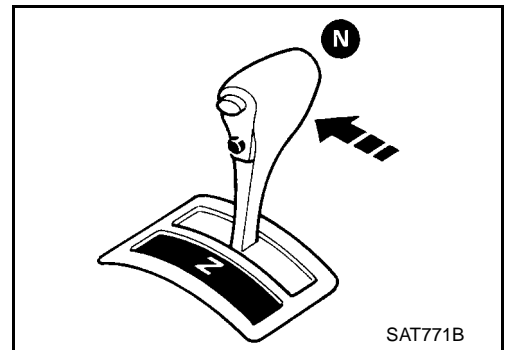
5. Start engine, apply foot brake, and place selector lever in D position.
6. Accelerate to wide open throttle gradually while applying foot brake.
7. Quickly note the engine stall revolution and immediately release throttle.
  - **During test, never hold throttle wide open for less than 5 seconds.**



**Stall revolution:**

QG18DE	2,300 - 2,750 rpm
--------	-------------------

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



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## 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 WORK FLOW shown in [AT-258](#) .

### 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
- 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”.

**Stall revolution less than specifications:**

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

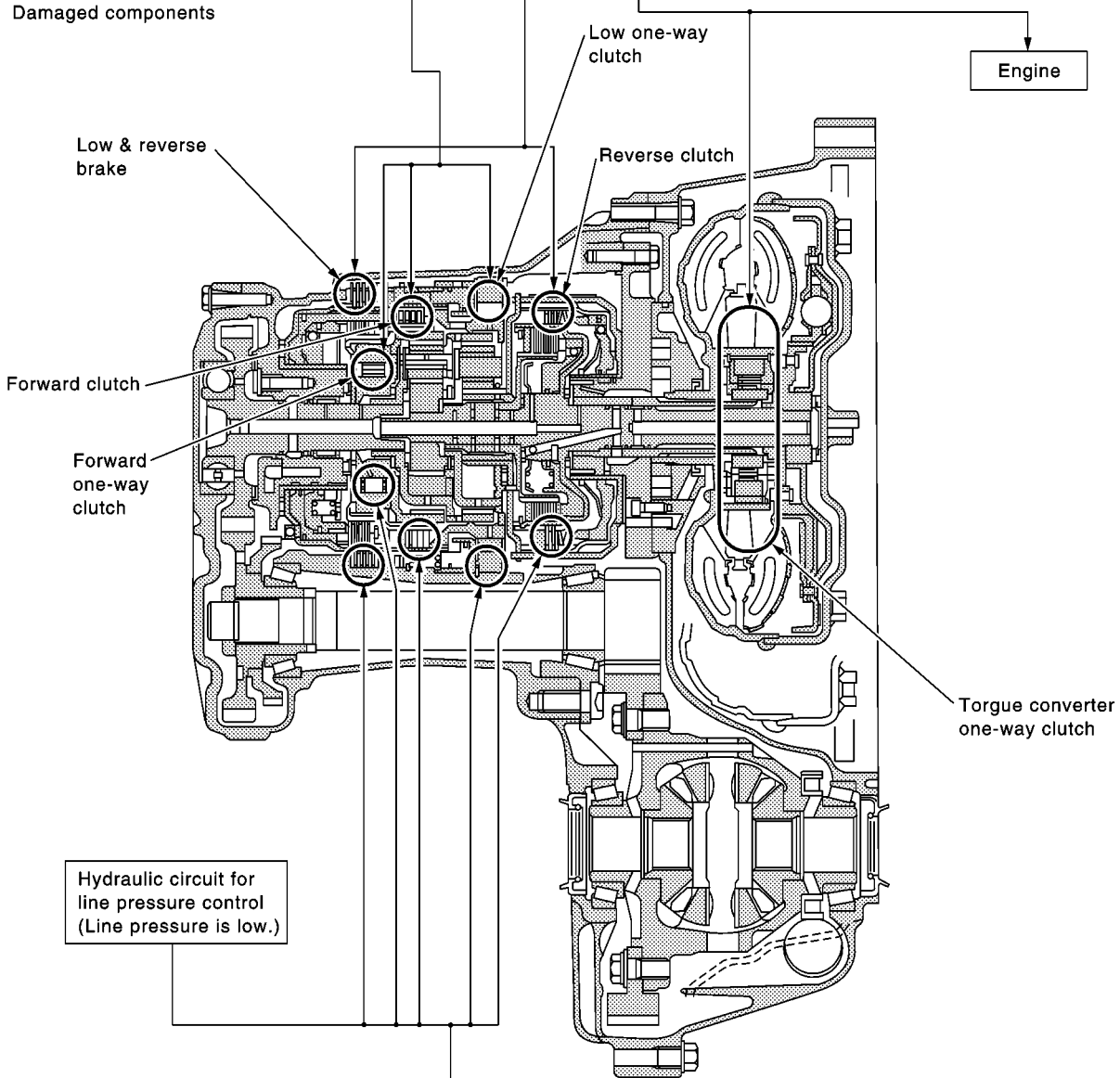
# TROUBLE DIAGNOSIS — BASIC INSPECTION

[EXC.F/EURO-OBD]

Selector lever position	Judgement		
D	H	O	L
2	H	O	L
1	H	O	L
R	O	H	L

O : Stall revolution is normal.  
 H : Stall revolution is higher than specified.  
 L : Stall revolution is lower than specified.

Damaged components



Hydraulic circuit for line pressure control (Line pressure is low.)

Clutches and brakes except high clutch, brake band and overrun clutch are OK. (Condition of high clutch, brake band and overrun clutch cannot be confirmed by stall test.)

D	H	O
2	H	O
1	H	O
R	H	O
Selector lever position	Judgement	

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

SCIA0707E

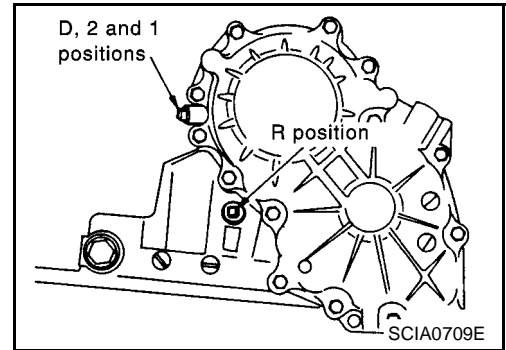
## Line Pressure Test

### LINE PRESSURE TEST PORTS

ECS005XY

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

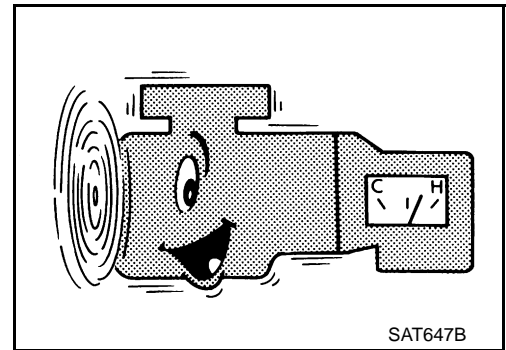
- **Always replace pressure plugs as they are self-sealing bolts.**



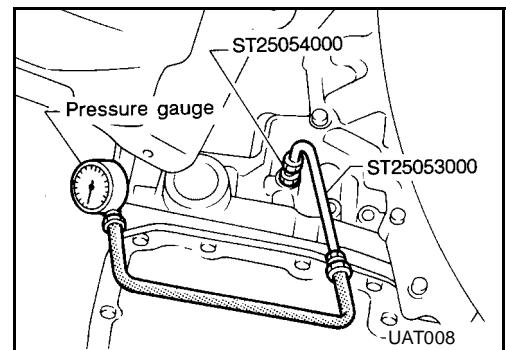
### LINE PRESSURE TEST PROCEDURE

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

**ATF operating temperature: 50 - 80°C (122 -176°F)**

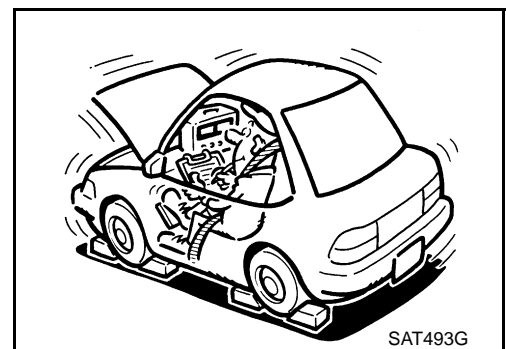


3. Install pressure gauge to corresponding line pressure port.



4. Set parking brake and block wheels.
  - **Continue to depress brake pedal fully while line pressure test is being performed at stall speed.**
5. Start engine and measure line pressure at idle and stall speed.
  - **When measuring line pressure at stall speed, follow the stall test procedure.**

Line pressure: Refer to [AT-517, "Line Pressure"](#) .





# TROUBLE DIAGNOSIS — BASIC INSPECTION

[EXC.F/EURO-OBD]

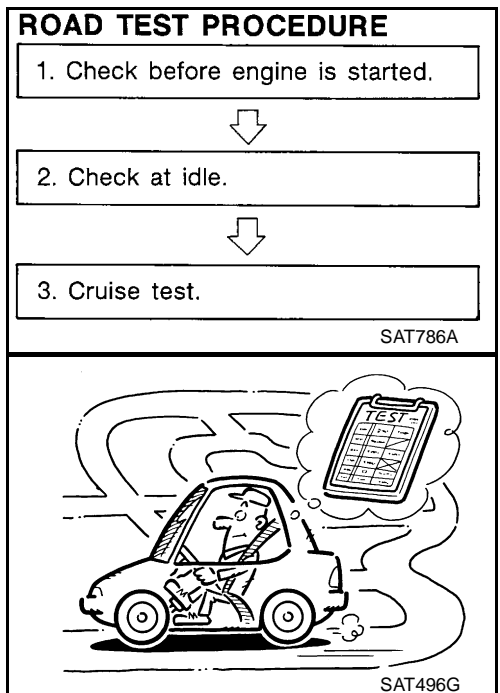
## JUDGEMENT OF LINE PRESSURE TEST

	Judgement	Suspected parts
At idle	Line pressure is low in all positions.	<ul style="list-style-type: none"> <li>● Oil pump wear</li> <li>● Control piston damage</li> <li>● Pressure regulator valve or plug sticking</li> <li>● Spring for pressure regulator valve damaged</li> <li>● Fluid pressure leakage between oil strainer and pressure regulator valve</li> <li>● Clogged strainer</li> </ul>
	Line pressure is low in particular position.	<ul style="list-style-type: none"> <li>● Fluid pressure leakage between manual valve and particular clutch</li> <li>● For example, line pressure is:                             <ul style="list-style-type: none"> <li>– Low in “R” and “1” positions, but</li> <li>– Normal in “D” and “2” positions.</li> </ul>                             Therefore, fluid leakage exists at or around low and reverse brake circuit. Refer to <a href="#">AT-17, "CLUTCH AND BAND CHART"</a> .                         </li> </ul>
	Line pressure is high.	<ul style="list-style-type: none"> <li>● Maladjustment of throttle position sensor</li> <li>● A/T fluid temperature sensor damaged</li> <li>● Line pressure solenoid valve sticking</li> <li>● Short circuit of line pressure solenoid valve circuit</li> <li>● Pressure modifier valve sticking</li> <li>● Pressure regulator valve or plug sticking</li> <li>● Open in dropping resistor circuit</li> </ul>
At stall speed	Line pressure is low.	<ul style="list-style-type: none"> <li>● Maladjustment of throttle position sensor</li> <li>● Line pressure solenoid valve sticking</li> <li>● Short circuit of line pressure solenoid valve circuit</li> <li>● Pressure regulator valve or plug sticking</li> <li>● Pressure modifier valve sticking</li> <li>● Pilot valve sticking</li> </ul>

## Road Test DESCRIPTION

ECS005XZ

- 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
- 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 the following items.



# TROUBLE DIAGNOSIS — BASIC INSPECTION

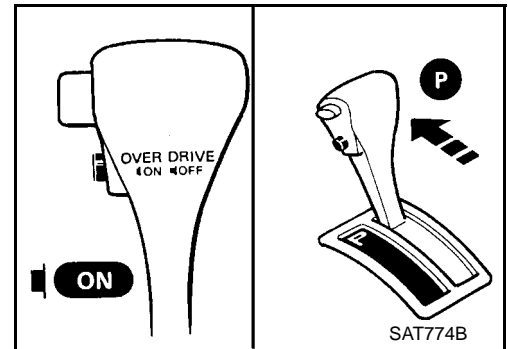
[EXC.F/EURO-OBD]

	ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION	TROUBLE DIAGNOSES FOR SYMPTOMS
Except for Euro-OBD	<a href="#">AT-243, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"</a> to <a href="#">AT-249, "Diagnostic Procedure Without CONSULT-II"</a>	<a href="#">AT-310, "1. O/D OFF Indicator Lamp Does Not Come On"</a> to <a href="#">AT-333, "21. TCM Self-diagnosis Does Not Activate (PNP &amp; Overdrive Control Switches, and Throttle Position Sensor Circuit Checks)"</a>

## 1. CHECK BEFORE ENGINE IS STARTED

### 1. CHECK O/D OFF INDICATOR LAMP

1. Park vehicle on flat surface.
2. Turn ignition switch to "OFF" position.
3. Move selector lever to "P" position.
4. Set overdrive control switch to "ON" position.
5. Turn ignition switch to "ON" position. (Do not start engine.)

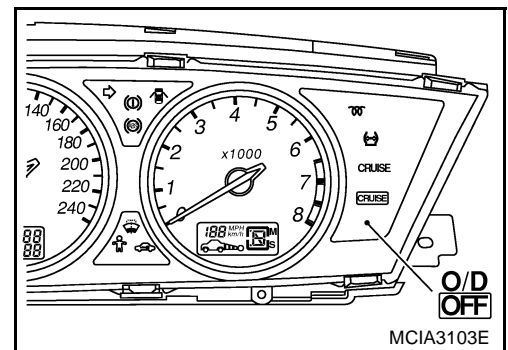


6. Does O/D OFF indicator lamp come on for about 2 seconds?

Yes or No

Yes >> GO TO 2

No >> Stop ROAD TEST. GO TO [AT-310, "1. O/D OFF Indicator Lamp Does Not Come On"](#) .



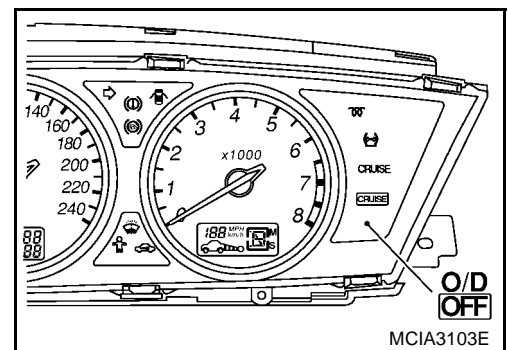
### 2. CHECK O/D OFF INDICATOR LAMP

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

Yes or No

Yes >> Perform self-diagnosis and check NG items on the DIAGNOSTIC WORKSHEET. Refer to [AT-254](#) and [AT-249, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#) .

- No >> 1. Turn ignition switch to "OFF" position.  
 2. Perform self-diagnosis and note NG items. Refer to [AT-249, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#) .  
 3. GO TO [AT-267, "2. CHECK AT IDLE"](#) .



## 2. CHECK AT IDLE

### 1. CHECK ENGINE START

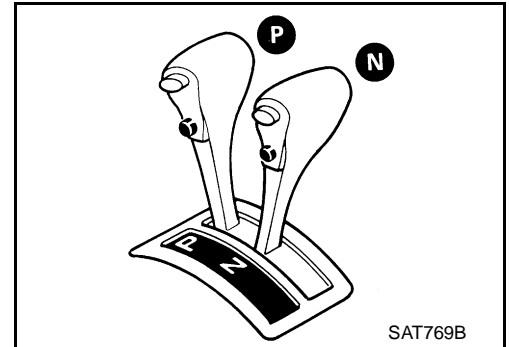
1. Park vehicle on flat surface.
2. Turn ignition switch to "OFF" position.
3. Move selector lever to "P" or "N" position.
4. Turn ignition switch to "START" position.
5. Is engine started?

Yes or No

Yes >> GO TO 2

No >> ● Mark the box on the DIAGNOSTIC WORKSHEET.

- GO TO [AT-311, "2. Engine Cannot Be Started In "P" and "N" Position"](#).
- Continue ROAD TEST. Refer to [AT-265, "Road Test"](#).



### 2. CHECK ENGINE START

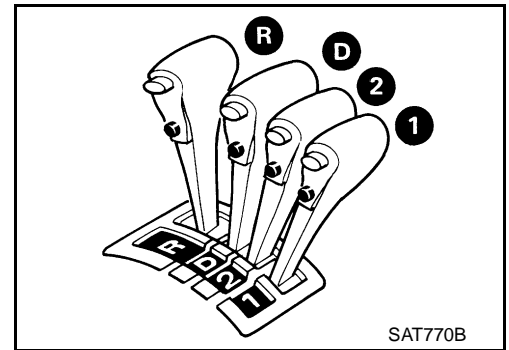
1. Turn ignition switch to "OFF" position.
2. Move selector lever to "D", "1", "2" or "R" position.
3. Turn ignition switch to "START" position.
4. Is engine started?

Yes or No

Yes >> ● Mark the box on the DIAGNOSTIC WORKSHEET.

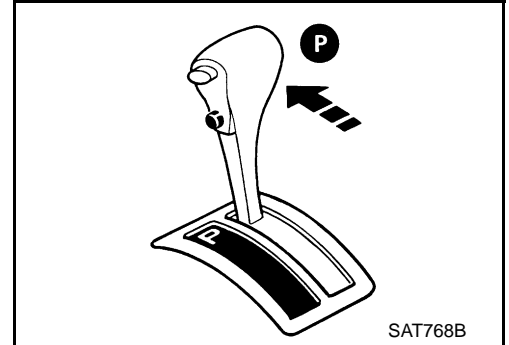
- GO TO [AT-311, "2. Engine Cannot Be Started In "P" and "N" Position"](#).
- Continue ROAD TEST. Refer to [AT-265, "Road Test"](#).

No >> GO TO 3



### 3. CHECK VEHICLE MOVE

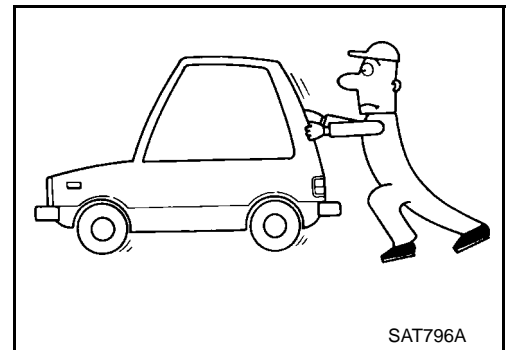
1. Turn ignition switch to "OFF" position.
2. Move selector lever to "P" position.
3. Release parking brake.
4. Push vehicle forward or backward.



5. Does vehicle move when it is pushed forward or backward?

Yes or No

- Yes >> ● Mark the box on the DIAGNOSTIC WORKSHEET.
- GO TO [AT-312, "3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed"](#) .
  - Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .
- No >> GO TO 4

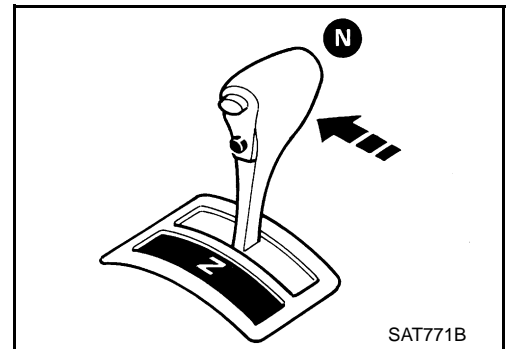


### 4. CHECK VEHICLE MOVE

1. Apply parking brake.
2. Move selector lever to "N" position.
3. Turn ignition switch to "START" position and start engine.
4. Release parking brake.
5. Does vehicle move forward or backward?

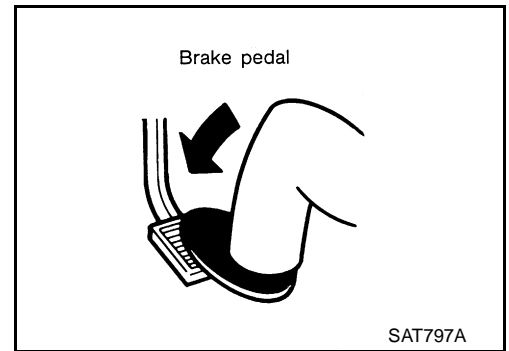
Yes or No

- Yes >> ● Mark the box on the DIAGNOSTIC WORKSHEET.
- GO TO [AT-312, "4. In "N" Position, Vehicle Moves"](#) .
  - Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .
- No >> GO TO 5



## 5. CHECK SHIFT SHOCK

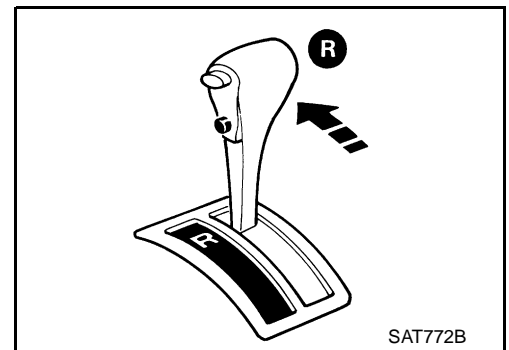
1. Apply foot brake.



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-313, "5. Large Shock. "N" → "R" Position"](#).
  - Continue ROAD TEST. Refer to [AT-265, "Road Test"](#).
- No >> GO TO 6

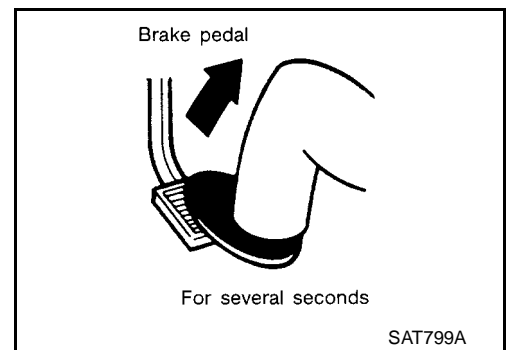


## 6. CHECK VEHICLE MOVE

1. 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-314, "6. Vehicle Does Not Creep Backward In "R" Position"](#).
  - Continue ROAD TEST. Refer to [AT-265, "Road Test"](#).

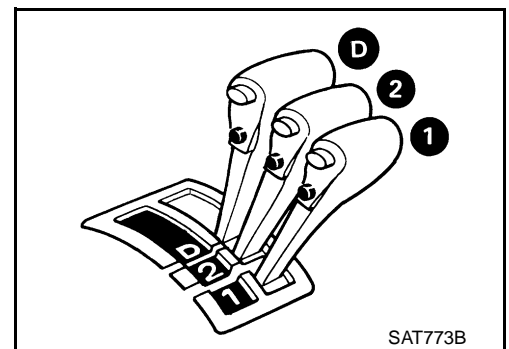


## 7. CHECK VEHICLE MOVE

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?

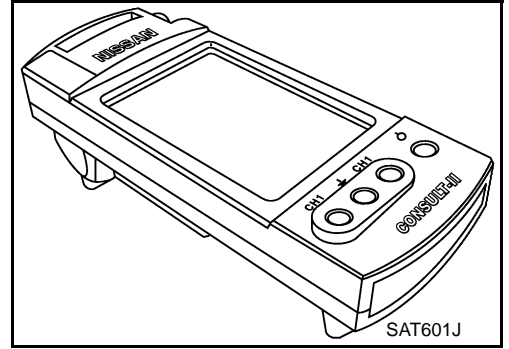
Yes or No

- Yes >> GO TO [AT-270, "3. CRUISE TEST"](#).
- No >> ● Mark the box on the DIAGNOSTIC WORKSHEET.
- GO TO [AT-316, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"](#).
  - Continue ROAD TEST. Refer to [AT-265, "Road Test"](#).



## 3. CRUISE TEST

- Check all items listed in Parts 1 through 3.

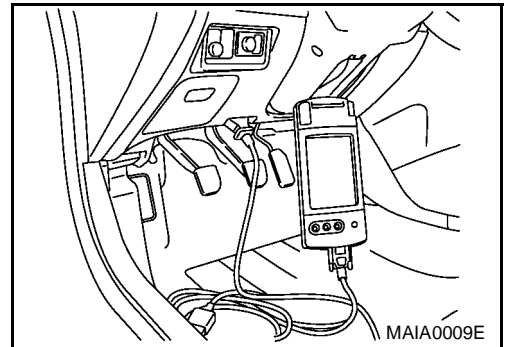


### Ⓜ With CONSULT-II

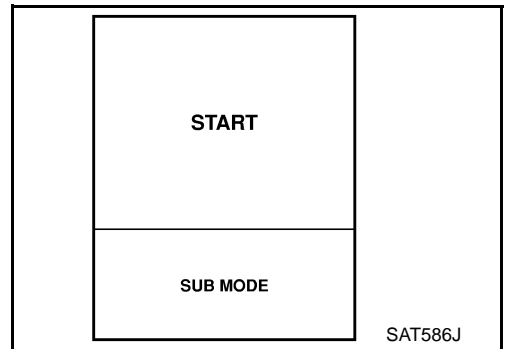
- Using CONSULT-II, conduct a cruise test and record the result.
- Print the result and ensure that shifts and lock-ups take place as per Shift Schedule.

### CONSULT-II Setting Procedure

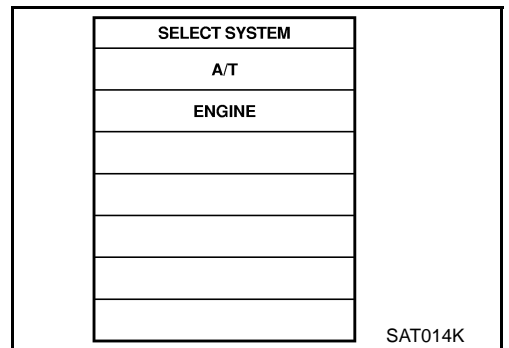
1. Turn ignition switch "OFF".
2. Connect CONSULT-II to data link connector, which is located in left side lower dash panel.



3. Turn ignition switch "ON".
4. Touch "START".



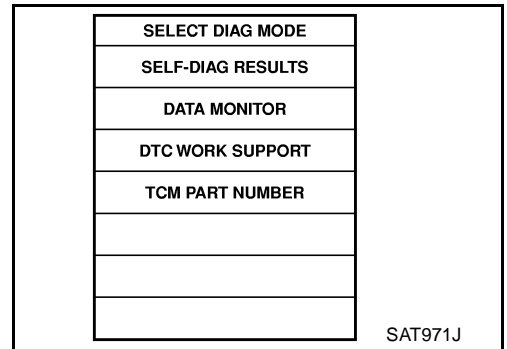
5. Touch "A/T".



# TROUBLE DIAGNOSIS — BASIC INSPECTION

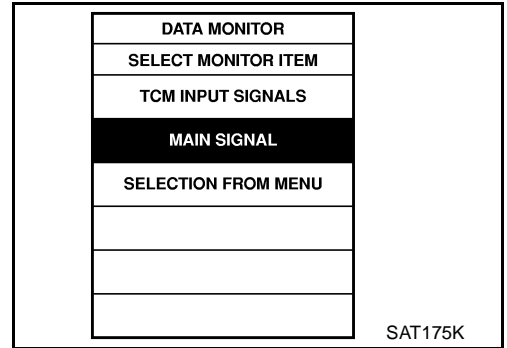
[EXC.F/EURO-OBID]

6. Touch "DATA MONITOR".



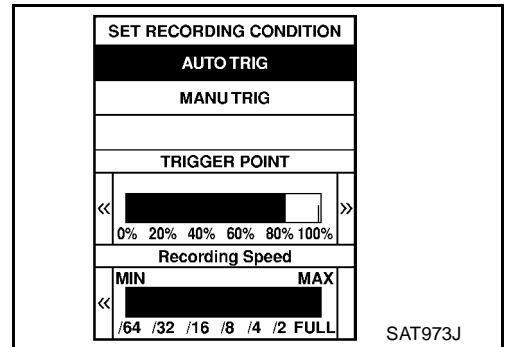
A  
B  
AT

7. Touch "MAIN SIGNALS" or "TCM INPUT SIGNALS".  
8. Select "Numerical Display", "Barchart Display" or "Line Graph Display".



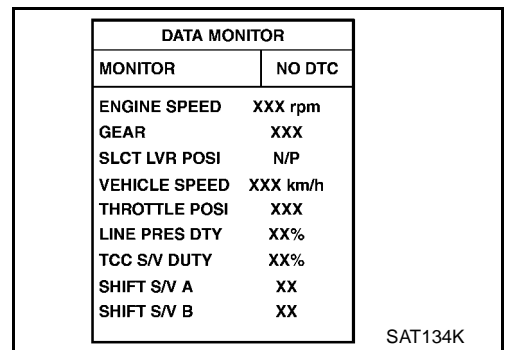
D  
E  
F  
G

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



H  
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11. When performing cruise test, touch "RECORD".



L  
M



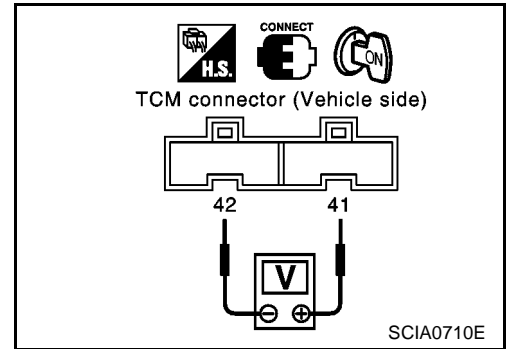


# TROUBLE DIAGNOSIS — BASIC INSPECTION

[EXC.F/EURO-OBD]

## ⊗ Without CONSULT-II

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



A

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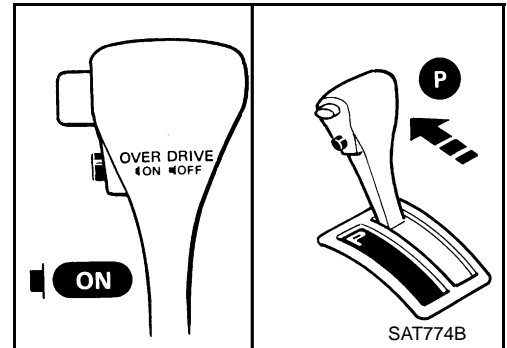
## Cruise Test — Part 1

### 1. CHECK STARTING GEAR (D1 ) POSITION

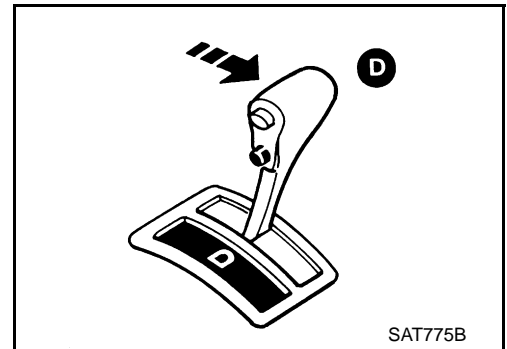
1. Drive vehicle for approx. 10 minutes to warm engine oil and ATF up to operating temperature.

**ATF operating temperature: 50 - 80°C (122 - 176°F)**

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



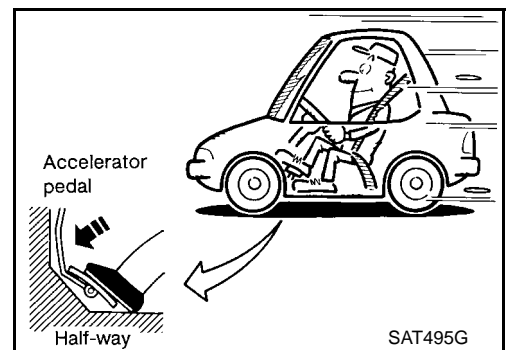
6. Move selector lever to "D" position.



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
- No >> ● GO TO [AT-318, "8. Vehicle Cannot Be Started From D1"](#) .
- Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .



**2. CHECK SHIFT UP (D1 TO D2 )**

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

① Read gear position, throttle opening and vehicle speed.

**Specified speed when shifting from D1 to D2 :**

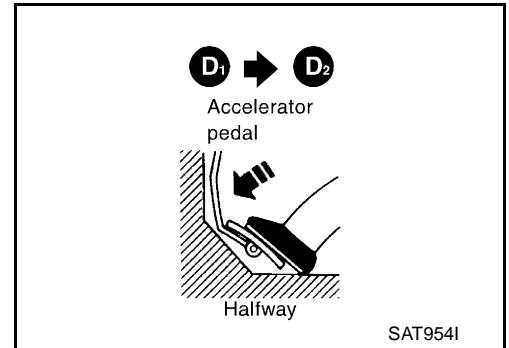
Refer to [AT-517, "Shift Schedule"](#) .

Yes or No

Yes >> GO TO 3

No >> ● GO TO [AT-320, "9. A/T Does Not Shift: D1 → D2 Or Does Not Kick down: D4 → D2"](#) .

● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .



**3. CHECK SHIFT UP (D2 TO D3 )**

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

① Read gear position, throttle position and vehicle speed.

**Specified speed when shifting from D2 to D3 :**

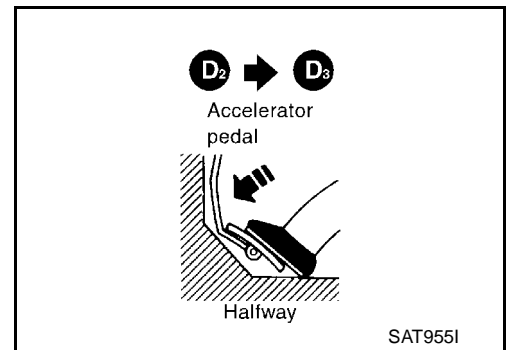
Refer to [AT-517, "Shift Schedule"](#) .

Yes or No

Yes >> GO TO 4

No >> ● GO TO [AT-322, "10. A/T Does Not Shift: D2 → D3"](#) .

● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .



**4. CHECK SHIFT UP (D3 TO D4 )**

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

① Read gear position, throttle position and vehicle speed.

**Specified speed when shifting from D3 to D4 :**

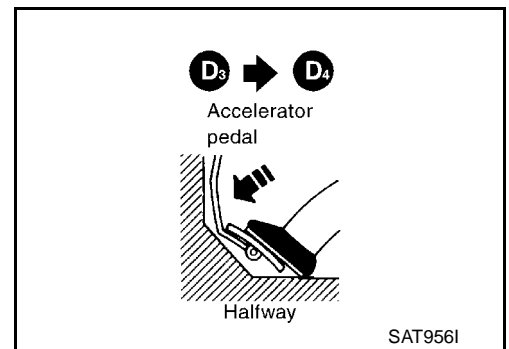
Refer to [AT-517, "Shift Schedule"](#) .

Yes or No

Yes >> GO TO 5

No >> ● GO TO [AT-324, "11. A/T Does Not Shift: D3 → D4"](#) .

● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .



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

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

① Read vehicle speed, throttle position when lock-up duty becomes 94%.

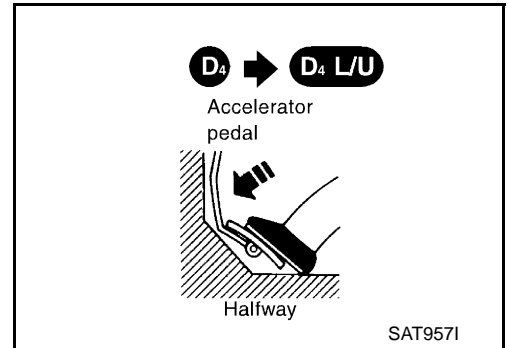
**Specified speed when lock-up occurs:**

Refer to [AT-517, "Shift Schedule"](#) .

Yes or No

Yes >> GO TO 6

No >> ● GO TO [AT-326, "12. A/T Does Not Perform Lock-up"](#) .  
 ● Continue ROAD TEST. Refer to [AT-265, "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-327, "13. A/T Does Not Hold Lock-up Condition"](#) .  
 ● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .

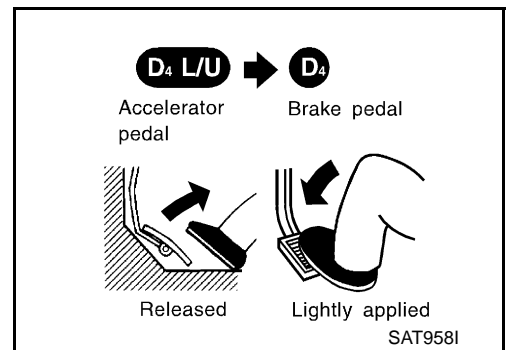
## 7. CHECK SHIFT DOWN (D4 L/U TO D4 )

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

Yes or No

Yes >> GO TO 8

No >> ● GO TO [AT-329, "14. Lock-up Is Not Released"](#) .  
 ● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .



## 8. CHECK SHIFT DOWN (D4 TO D3 )

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

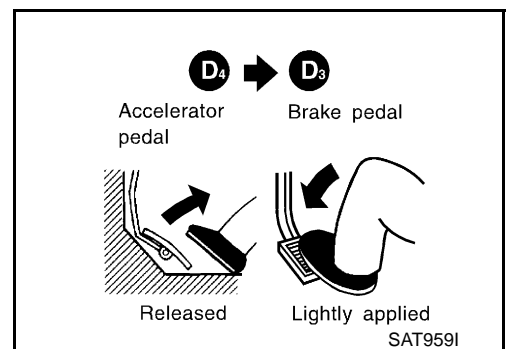
① Read gear position and engine speed.

Yes or No

Yes >> 1. Stop vehicle.

2. GO TO [AT-277, "Cruise Test — Part 2"](#) .

No >> ● GO TO [AT-329, "15. Engine Speed Does Not Return To Idle \(Light Braking D4 → D3\)"](#) .  
 ● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .



Cruise Test — Part 2

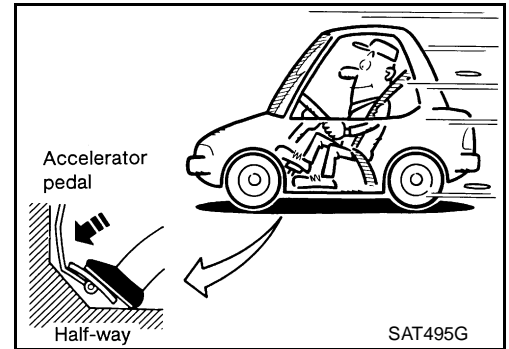
1. CHECK STARTING GEAR (D<sub>1</sub>) POSITION

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 D<sub>1</sub> ?

Ⓟ Read gear position.

Yes or No

- Yes >> GO TO 2  
 No >> ● GO TO [AT-331, "16. Vehicle Does Not Start From D<sub>1</sub>"](#)  
 ● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .



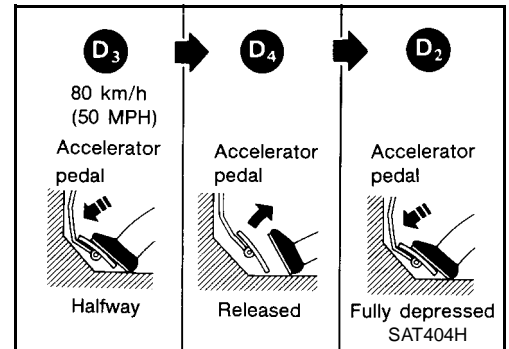
2. CHECK SHIFT UP AND SHIFT DOWN (D<sub>3</sub> TO D<sub>4</sub> TO D<sub>2</sub>)

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 D<sub>4</sub> to D<sub>2</sub> as soon as accelerator pedal is depressed fully?

Ⓟ Read gear position and throttle position.

Yes or No

- Yes >> GO TO 3  
 No >> ● GO TO [AT-320, "9. A/T Does Not Shift: D<sub>1</sub> → D<sub>2</sub> Or Does Not Kick down: D<sub>4</sub> → D<sub>2</sub>"](#) .  
 ● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .



3. CHECK SHIFT UP (D<sub>2</sub> TO D<sub>3</sub>)

Does A/T shift from D<sub>2</sub> to D<sub>3</sub> at the specified speed?

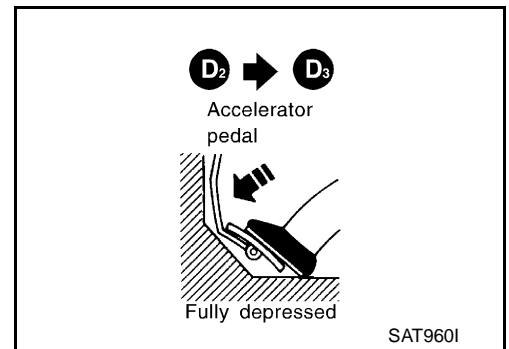
Ⓟ Read gear position, throttle position and vehicle speed.

Specified speed when shifting from D<sub>2</sub> to D<sub>3</sub> :

Refer to [AT-517, "Shift Schedule"](#) .

Yes or No

- Yes >> GO TO 4  
 No >> ● GO TO [AT-322, "10. A/T Does Not Shift: D<sub>2</sub> → D<sub>3</sub>"](#) .  
 ● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .



**4. CHECK SHIFT UP (D<sub>3</sub> TO D<sub>4</sub>) AND ENGINE BRAKE**

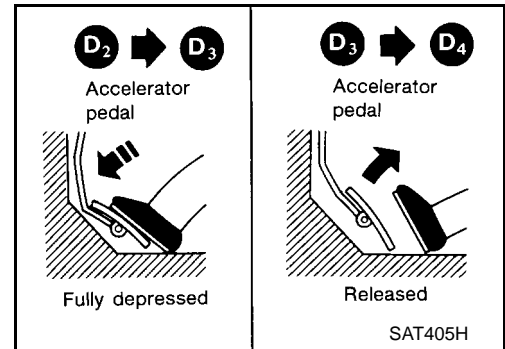
Release accelerator pedal after shifting from D<sub>2</sub> to D<sub>3</sub>.

Does A/T shift from D<sub>3</sub> to D<sub>4</sub> and does vehicle decelerate by engine brake?

④ **Read gear position, throttle position and vehicle speed.**

Yes or No

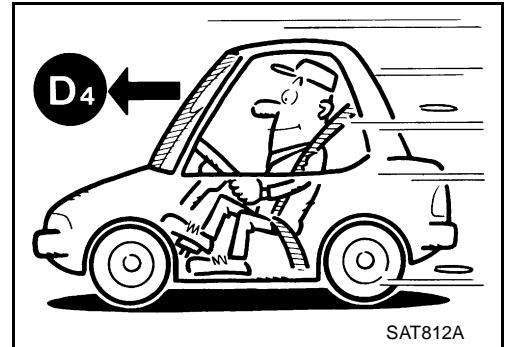
- Yes >> 1. Stop vehicle.  
 2. GO TO [AT-279, "Cruise Test — Part 3"](#).
- No >> ● GO TO [AT-324, "11. A/T Does Not Shift: D<sub>3</sub> → D<sub>4</sub>"](#).  
 ● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#).



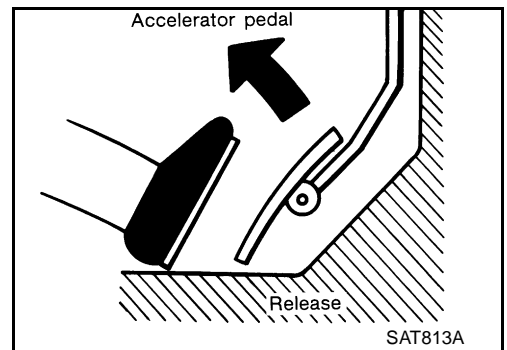
Cruise Test — Part 3

1. CHECK SHIFT DOWN (D4 TO D3)

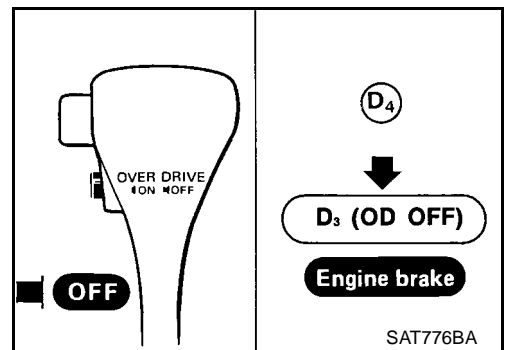
1. Confirm overdrive control switch is in "ON" position.
2. Confirm selector lever is in "D" position.
3. Accelerate vehicle using half-throttle to D4 .



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)?

Ⓟ Read gear position and vehicle speed.

Yes or No

Yes >> GO TO 2

No >> ● GO TO [AT-331, "17. A/T Does Not Shift: D4 → D3, When Overdrive Control Switch "ON" → "OFF"](#) .

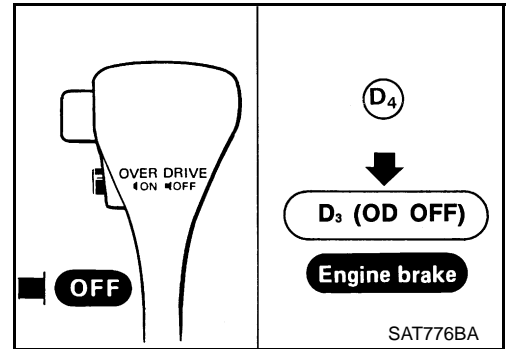
- Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .

## 2. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

- Yes >> GO TO 3  
 No >> ● GO TO [AT-329, "15. Engine Speed Does Not Return To Idle \(Light Braking D4 → D3\)"](#) .  
 ● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .



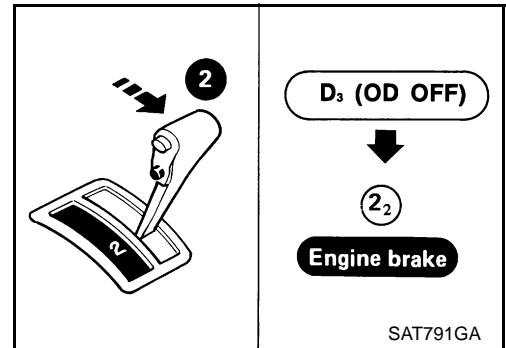
## 3. CHECK SHIFT DOWN (D3 TO D2)

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 2?

**Read gear position.**

Yes or No

- Yes >> GO TO 4  
 No >> ● GO TO [AT-332, "18. A/T Does Not Shift: D3 → 2, When Selector Lever "D" → "2" Position"](#) .  
 ● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .

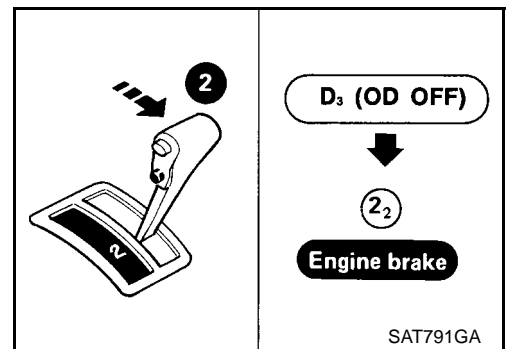


## 4. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

- Yes >> GO TO 5  
 No >> ● GO TO [AT-329, "15. Engine Speed Does Not Return To Idle \(Light Braking D4 → D3\)"](#) .  
 ● Continue ROAD TEST. Refer to [AT-265, "Road Test"](#) .





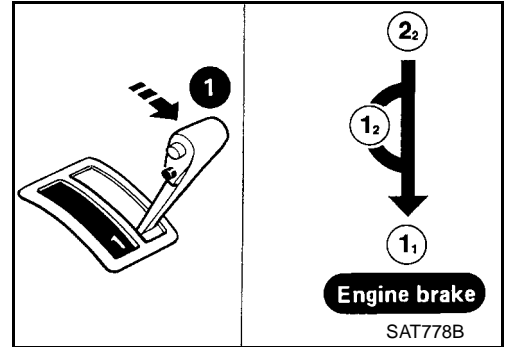
**5. CHECK SHIFT DOWN**

1. Move selector lever from "2" to "1" position while driving in 2<sub>2</sub>.
2. Does A/T shift from 2<sub>2</sub> to 1<sub>1</sub> position?

**Ⓟ Read gear position.**

Yes or No

- Yes >> GO TO 6
- No >> ● GO TO [AT-332, "19. A/T Does Not Shift: 2<sub>2</sub> → 1<sub>1</sub> When Selector Lever "2" → "1" Position"](#).
- Continue ROAD TEST. Refer to [AT-265, "Road Test"](#).

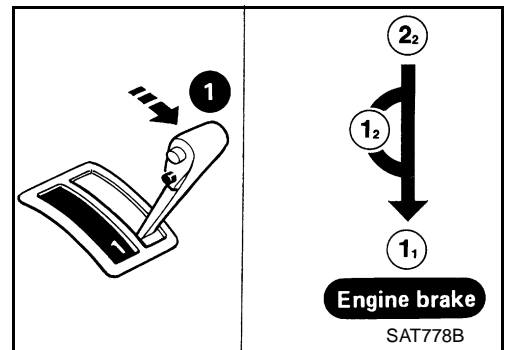


**6. CHECK ENGINE BRAKE**

Does vehicle decelerate by engine brake?

Yes or No

- Yes >> 1. Stop vehicle.
2. Perform self-diagnosis.  
Refer to [AT-249, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#),
- No >> ● GO TO [AT-333, "20. Vehicle Does Not Decelerate By Engine Brake"](#).
- Continue ROAD TEST. Refer to [AT-265, "Road Test"](#).



# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXC.F/EURO-OBD]

## TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

PFP:00000

### Symptom Chart

ECS005Y0

Numbers are arranged in order of inspection.  
Perform inspections starting with number one and work up.

Symptom	Condition	Diagnostic Item	Reference Page
Engine cannot start in "P" and "N" positions. <a href="#">AT-311, "2. Engine Cannot Be Started In "P" and "N" Position"</a>	ON vehicle	1. Ignition switch and starter	<a href="#">PG-3, "POWER SUPPLY ROUTING", SC-22, "STARTING SYSTEM"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
Engine starts in position other than "N" and "P" positions. <a href="#">AT-312, "3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed"</a>	ON vehicle	1. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		2. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
Transaxle noise in "P" and "N" positions.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		3. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		4. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)"</a> <a href="#">AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
		5. Engine speed signal	<a href="#">AT-382, "ENGINE SPEED SIGNAL"</a>
	OFF vehicle	6. Oil pump	<a href="#">AT-411, "Output Shaft, Idler Gear, Reduction Pinion Gear and Bearing Retainer"</a>
		7. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Vehicle moves when changing into "P" position, or parking gear does not disengage when shifted out of "P" position. <a href="#">AT-312, "3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed"</a>	ON vehicle	1. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
	OFF vehicle	2. Parking components	<a href="#">AT-435, "Oil Pump", AT-432, "REPAIR FOR COMPONENT PARTS"</a>
Vehicle runs in "N" position. <a href="#">AT-314, "6. Vehicle Does Not Creep Backward In "R" Position"</a> <a href="#">AT-312, "4. In "N" Position, Vehicle Moves"</a>	ON vehicle	1. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
	OFF vehicle	2. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		3. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		4. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXC.F/EURO-OBID]

Symptom	Condition	Diagnostic Item	Reference Page
Vehicle will not run in "R" position (but runs in "D", "2" and "1" positions). Clutch slips. Very poor acceleration. <a href="#">AT-314, "6. Vehicle Does Not Creep Backward In "R" Position"</a>	ON vehicle	1. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		2. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		3. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRES-SURE SOLENOID VALVE"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
Vehicle will not run in "R" position (but runs in "D", "2" and "1" positions). Clutch slips. Very poor acceleration. <a href="#">AT-314, "6. Vehicle Does Not Creep Backward In "R" Position"</a>	OFF vehicle	5. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		8. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
Vehicle braked when shifting into "R" position.	ON vehicle	1. Fluid level	<a href="#">AT-260, "A/T Fluid Check"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRES-SURE SOLENOID VALVE"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		8. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>

A  
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# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EXC.F/EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
Sharp shock in shifting from "N" to "D" position.	ON vehicle	1. Engine idling rpm	<a href="#">EC-957, "Idle Speed and Ignition Timing"</a>
		2. Throttle position sensor Accelerator pedal position (App) sensor Adjustment	<a href="#">AT-351, "ACCELERATOR PEDAL POSITION (APP) SENSOR"</a>
		3. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		4. A/T fluid temp sen circ and TCM power source	<a href="#">AT-376, "BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
		5. Engine speed signal	<a href="#">AT-382, "ENGINE SPEED SIGNAL"</a>
		6. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		7. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		8. Accumulator N-D	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	9. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
Vehicle will not run in "D" and "2" positions (but runs in "1" and "R" positions).	ON vehicle	1. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
	OFF vehicle	2. Low one-way clutch	<a href="#">AT-411, "OVERHAUL", AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Vehicle will not run in "D", "1", "2" positions (but runs in "R" position). Clutch slips. Very poor acceleration. <a href="#">AT-316, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"</a>	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		3. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. Accumulator N-D	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
Vehicle will not run in "D", "1", "2" positions (but runs in "R" position). Clutch slips. Very poor acceleration. <a href="#">AT-316, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"</a>	OFF vehicle	6. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		7. High clutch	<a href="#">AT-457, "High Clutch"</a>
		8. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Forward one-way clutch	<a href="#">AT-411, "OVERHAUL"</a>
		10. Low one-way clutch	<a href="#">AT-411, "OVERHAUL", AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXC.F/EURO-OBID]

Symptom	Condition	Diagnostic Item	Reference Page
Clutches or brakes slip somewhat in starting.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		4. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		5. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		7. Accumulator N-D	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	8. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		10. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		11. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		12. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Excessive creep.	ON vehicle	1. Engine idling rpm	<a href="#">EC-957, "Idle Speed and Ignition Timing"</a>
No creep at all. <a href="#">AT-314, "6. Vehicle Does Not Creep Backward In "R" Position"</a> and <a href="#">AT-316, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"</a>	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Line pressure test	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		3. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	4. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		5. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		6. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EXC.F/EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
Failure to change gear from "D1 " to "D2 ".	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
	OFF vehicle	6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Failure to change gear from "D2 " to "D3 ".	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Shift solenoid valve B	<a href="#">AT-361, "SHIFT SOLENOID VALVE B"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
	OFF vehicle	6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXC.F/EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
Failure to change gear from "D3" to "D4".	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		4. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
		5. A/T fluid temp sen circ and TCM power source	<a href="#">AT-376, "BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
	OFF vehicle	6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Too high a gear change point from "D1" to "D2", from "D2" to "D3", from "D3" to "D4". <a href="#">AT-320, "9. A/T Does Not Shift: D1 → D2 Or Does Not Kick down: D4 → D2"</a> and <a href="#">AT-324, "11. A/T Does Not Shift: D3 → D4"</a>	ON vehicle	1. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
		3. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-361, "SHIFT SOLENOID VALVE B"</a>
Gear change directly from "D1" to "D3" occurs.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Accumulator servo release	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	3. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Engine stops when shifting lever into "R", "D", "2" and "1".	ON vehicle	1. Engine idling rpm	<a href="#">EC-957, "Idle Speed and Ignition Timing"</a>
		2. Torque converter clutch solenoid valve	<a href="#">AT-371, "TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
		3. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	4. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EXC.F/EURO-OBID]**

Symptom	Condition	Diagnostic Item	Reference Page
Too sharp a shock in change from "D1" to "D2".	ON vehicle	1. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		2. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		3. Accumulator servo release	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. A/T fluid temp sen circ and TCM power source	<a href="#">AT-376, "BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
	OFF vehicle	6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Too sharp a shock in change from "D2" to "D3".	ON vehicle	1. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		2. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		3. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	4. High clutch	<a href="#">AT-457, "High Clutch"</a>
		5. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Too sharp a shock in change from "D3" to "D4".	ON vehicle	1. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-735, "DTC P0226 APP SENSOR"</a>
		2. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		3. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	4. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		5. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>



# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXC.F/EURO-OBID]

Symptom	Condition	Diagnostic Item	Reference Page
Almost no shock or clutches slipping in change from "D1 " to "D2 ".	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		4. Accumulator servo release	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Almost no shock or slipping in change from "D2 " to "D3 ".	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor) Adjustment	<a href="#">EC-735, "DTC P0226 APP SENSOR"</a>
		3. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	5. High clutch	<a href="#">AT-457, "High Clutch"</a>
		6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Almost no shock or slipping in change from "D3 " to "D4 ".	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	5. High clutch	<a href="#">AT-457, "High Clutch"</a>
		6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Vehicle braked by gear change from "D1 " to "D2 ".	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		3. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		4. High clutch	<a href="#">AT-457, "High Clutch"</a>
		5. Low one-way clutch	<a href="#">AT-411, "OVERHAUL", AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EXC.F/EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
Vehicle braked by gear change from "D2" to "D3".	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Vehicle braked by gear change from "D3" to "D4".	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Overrun clutch	<a href="#">AT-366, "OVERRUN CLUTCH SOLENOID VALVE"</a>
		3. Forward one-way clutch	<a href="#">AT-411, "OVERHAUL"</a>
		4. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
Maximum speed not attained. Acceleration poor.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		3. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-361, "SHIFT SOLENOID VALVE B"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		7. High clutch	<a href="#">AT-457, "High Clutch"</a>
		8. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		9. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		10. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		11. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EXC.F/EURO-OBID]**

Symptom	Condition	Diagnostic Item	Reference Page
Failure to change gear from "D4" to "D3".	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		3. Overrun clutch solenoid valve	<a href="#">AT-366, "OVERRUN CLUTCH SOLENOID VALVE"</a>
		4. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		5. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	7. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		8. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
Failure to change gear from "D3" to "D2" or from "D4" to "D2".	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		3. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-361, "SHIFT SOLENOID VALVE B"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>

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# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EXC.F/EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
Failure to change gear from "D2" to "D1" or from "D3" to "D1".	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		3. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-361, "SHIFT SOLENOID VALVE B"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. Low one-way clutch	<a href="#">AT-411, "OVERHAUL", AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
		7. High clutch	<a href="#">AT-457, "High Clutch"</a>
		8. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
Gear change shock felt during deceleration by releasing accelerator pedal.	ON vehicle	1. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		2. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		3. Overrun clutch solenoid valve	<a href="#">AT-366, "OVERRUN CLUTCH SOLENOID VALVE"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
Too high a change point from "D4" to "D3", from "D3" to "D2", from "D2" to "D1".	ON vehicle	1. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
Kickdown does not operate when depressing pedal in "D4" within kick down vehicle speed.	ON vehicle	1. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
		3. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-361, "SHIFT SOLENOID VALVE B"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXC.F/EURO-OBID]

Symptom	Condition	Diagnostic Item	Reference Page
Kickdown operates or engine over-runs when depressing pedal in "D4" beyond kick down vehicle speed limit.	ON vehicle	1. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		3. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-361, "SHIFT SOLENOID VALVE B"</a>
Races extremely fast or slips in changing from "D4" to "D3" when depressing pedal.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor) Adjustment	<a href="#">EC-735, "DTC P0226 APP SENSOR"</a>
		3. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
Races extremely fast or slips in changing from "D4" to "D2" when depressing pedal.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		5. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		8. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EXC.F/EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
Races extremely fast or slips in changing from "D3" to "D2" when depressing pedal.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		6. A/T fluid temp sen circ and TCM power source	<a href="#">AT-376, "BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
	OFF vehicle	7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		8. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. High clutch	<a href="#">AT-457, "High Clutch"</a>
Races extremely fast or slips in changing from "D4" or "D3" to "D1" when depressing pedal.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	6. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		7. Forward one-way clutch	<a href="#">AT-411, "OVERHAUL"</a>
		8. Low one-way clutch	<a href="#">AT-411, "OVERHAUL", AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXC.F/EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
Vehicle will not run in any position.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		4. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRES-SURE SOLENOID VALVE"</a>
	OFF vehicle	5. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		6. High clutch	<a href="#">AT-457, "High Clutch"</a>
		7. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		8. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		9. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
		10. Parking components	<a href="#">AT-475, "Output Shaft, Idler Gear, Reduction Pinion Gear and Bearing Retainer"</a>
Transmission noise in "D", "2", "1" and "R" positions.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Failure to change from "D3" to "2" when changing lever into "2" position. <a href="#">AT-332, "18. A/T Does Not Shift: D3 → 2, When Selector Lever "D" → "2" Position"</a>	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		3. Overrun clutch solenoid valve	<a href="#">AT-366, "OVERRUN CLUTCH SOLENOID VALVE"</a>
		4. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		5. Shift solenoid valve B	<a href="#">AT-361, "SHIFT SOLENOID VALVE B"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		7. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
Failure to change from "D3" to "2" when changing lever into "2" position. <a href="#">AT-332, "18. A/T Does Not Shift: D3 → 2, When Selector Lever "D" → "2" Position"</a>	OFF vehicle	8. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		9. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
Gear change from "22" to "23" in "2" position.	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXC.F/EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
Engine brake does not operate in "1" position. <a href="#">AT-331, "16. Vehicle Does Not Start From D1"</a>	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
		3. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		4. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
		5. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		7. Overrun clutch solenoid valve	<a href="#">AT-366, "OVERRUN CLUTCH SOLENOID VALVE"</a>
	OFF vehicle	8. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
Gear change from "11" to "12" in "1" position.	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Control cable adjustment	<a href="#">AT-406, "Control Cable Adjustment"</a>
Does not change from "12" to "11" in "1" position.	ON vehicle	1. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
		3. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		5. Overrun clutch solenoid valve	<a href="#">AT-366, "OVERRUN CLUTCH SOLENOID VALVE"</a>
	OFF vehicle	6. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		7. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>



# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EXC.F/EURO-OBID]**

Symptom	Condition	Diagnostic Item	Reference Page
Large shock changing from "12" to "11" in "1" position.	ON vehicle	1. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	2. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
Transmission overheats.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Engine idling rpm	<a href="#">EC-957, "Idle Speed and Ignition Timing"</a>
		3. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		4. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		5. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
Transmission overheats.	OFF vehicle	7. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		8. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		9. High clutch	<a href="#">AT-457, "High Clutch"</a>
		10. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		11. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		12. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		13. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
		14. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
ATF shoots out during operation. White smoke emitted from exhaust pipe during operation.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		3. High clutch	<a href="#">AT-457, "High Clutch"</a>
		4. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		5. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		6. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		7. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>

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# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EXC.F/EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
Offensive smell at fluid charging pipe.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
	OFF vehicle	2. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
		3. Oil pump	<a href="#">AT-435, "Oil Pump"</a>
		4. Reverse clutch	<a href="#">AT-454, "Reverse Clutch"</a>
		5. High clutch	<a href="#">AT-457, "High Clutch"</a>
		6. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		7. Forward clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		8. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
		9. Low & reverse brake	<a href="#">AT-468, "Low &amp; Reverse Brake"</a>
Torque converter is not locked up.	ON vehicle	1. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
		3. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		4. Engine speed signal	<a href="#">AT-382, "ENGINE SPEED SIGNAL"</a>
		5. A/T fluid temp sen circ and TCM power source	<a href="#">AT-376, "BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
		6. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		7. Torque converter clutch solenoid valve	<a href="#">AT-371, "TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
		8. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
Torque converter is not locked up.	OFF vehicle	9. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXC.F/EURO-OBD]

Symptom	Condition	Diagnostic Item	Reference Page
Torque converter clutch piston slip.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		3. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
		4. Torque converter clutch solenoid valve	<a href="#">AT-371, "TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
		5. Line pressure solenoid valve	<a href="#">AT-386, "LINE PRESSURE SOLENOID VALVE"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
	OFF vehicle	7. Torque converter	<a href="#">AT-415, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"</a>
Lock-up point is extremely high or low. <a href="#">AT-326, "12. A/T Does Not Perform Lock-up"</a>	ON vehicle	1. Throttle position sensor (Accelerator pedal position (App) sensor) Adjustment	<a href="#">EC-735, "DTC P0226 APP SENSOR"</a>
		2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
		3. Torque converter clutch solenoid valve	<a href="#">AT-371, "TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
		4. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>

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# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

**[EXC.F/EURO-OBD]**

Symptom	Condition	Diagnostic Item	Reference Page
A/T does not shift to "D4 " when driving with overdrive control switch "ON".	ON vehicle	1. Throttle position sensor (Accelerator pedal position (App) sensor)	<a href="#">EC-589, "Accelerator Pedal Released Position Learning"</a>
		2. PNP switch adjustment	<a href="#">AT-406, "Park/Neutral Position (PNP) Switch Adjustment"</a>
		3. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR	<a href="#">AT-343, "VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)", AT-348, "DTC VEHICLE SPEED SENSOR MTR"</a>
		4. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		5. Overrun clutch solenoid valve	<a href="#">AT-366, "OVERRUN CLUTCH SOLENOID VALVE"</a>
		6. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>
		7. A/T fluid temp sen circ and TCM power source	<a href="#">AT-376, "BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)"</a>
		8. Line pressure test	<a href="#">AT-264, "Line Pressure Test"</a>
A/T does not shift to "D4 " when driving with overdrive control switch "ON".	OFF vehicle	9. Brake band	<a href="#">AT-480, "Band Servo Piston Assembly"</a>
		10. Overrun clutch	<a href="#">AT-462, "Forward and Overrun Clutches"</a>
Engine is stopped at "R", "D", "2" and "1" positions.	ON vehicle	1. Fluid level	<a href="#">AT-260, "FLUID LEVEL CHECK"</a>
		2. Torque converter clutch solenoid valve	<a href="#">AT-371, "TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a>
		3. Shift solenoid valve A	<a href="#">AT-356, "SHIFT SOLENOID VALVE A"</a>
		4. Shift solenoid valve B	<a href="#">AT-361, "SHIFT SOLENOID VALVE B"</a>
		5. Control valve assembly	<a href="#">AT-404, "Control Valve Assembly and Accumulators"</a>

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

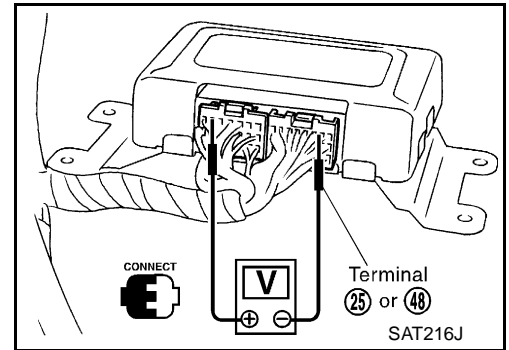
[EXC.F/EURO-OBID]

ECS005Y1

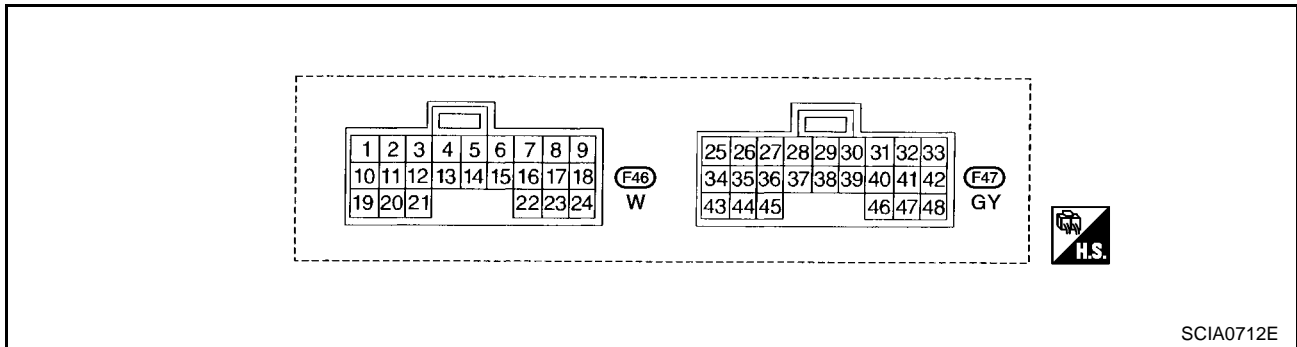
## TCM Terminals and Reference Value

### PREPARATION

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



### TCM HARNESS CONNECTOR TERMINAL LAYOUT



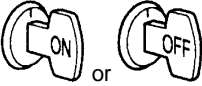

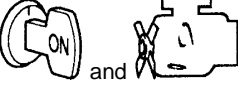
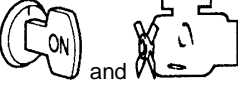
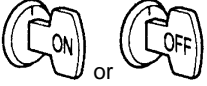

### TCM INSPECTION TABLE

(Data are reference values.)

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
1	R/W	Line pressure solenoid valve	When releasing accelerator pedal after warming up engine.	1.5 - 3.0V
			When depressing accelerator pedal fully after warming up engine.	0V
2	P/B	Line pressure solenoid valve (with dropping resistor)	When releasing accelerator pedal after warming up engine.	5 - 14V
			When depressing accelerator pedal fully after warming up engine.	0V
3	GY/R	Torque converter clutch solenoid valve	When A/T performs lock-up.	8 - 15V
			When A/T does not perform lock-up.	0V
5	B/W	CAN (H)	—	—
6	L/R	CAN (L)	—	—
10	BR/W	Power source	When turning ignition switch to "ON".	Battery voltage
			When turning ignition switch to "OFF".	0V

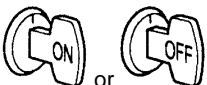




# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXC.F/EURO-OBD]

Terminal No.	Wire color	Item	Condition		Judgement standard(Approx.)
11	L/W	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in "D1 " or "D4 ".)	Battery voltage
				When shift solenoid valve A does not operate. (When driving in "D2 " or "D3 ".)	0V
12	L/Y	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in "D1 " or "D2 ".)	Battery voltage
				When shift solenoid valve B does not operate. (When driving in "D3 " or "D4 ".)	0V
13	R/L	O/D OFF indicator lamp		When setting overdrive control or A/T check switch in "OFF" position.	0V
				When setting overdrive control or A/T check switch in "ON" position.	Battery voltage
19	BR/W	Power source		Same as No. 10	
20	L/B	Overrun clutch solenoid valve		When overrun clutch solenoid valve operates.	Battery voltage
				When overrun clutch solenoid valve does not operate.	0V
22	L/OR	Overdrive control switch		When setting overdrive control switch in "ON" position	Battery voltage
				When setting overdrive control switch in "OFF" position	0V
25	B/W	Ground	—	—	0V
26	BR/Y	PNP switch "1" position		When setting selector lever to "1" position.	Battery voltage
				When setting selector lever to other positions.	0V
27	L	PNP switch "2" position		When setting selector lever to "2" position.	Battery voltage
				When setting selector lever to other positions.	0V
28	R/B	Power source (Memory back-up)		When turning ignition switch to "OFF".	Battery voltage
				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.* <sup>1</sup> <b>CAUTION:</b> <b>Connect the diagnosis data link cable to the vehicle diagnosis connector.</b>	450 Hz
				When vehicle parks.	Under 1.3V or over 4.5V
30 * <sup>3</sup>	G/B	CONSULT- II (RX)		—	—
31 * <sup>3</sup>	GY/L	CONSULT- II (TX)		—	—

# TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXC.F/EURO-OBD]

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)	
32 *2	R	Throttle position sensor (Power source)	 or	When turning ignition switch to "ON".	4.5 - 5.5V
				When turning ignition switch to "OFF".	0V
34	W/G	PNP switch "D" position		When setting selector lever to "D" position.	Battery voltage
				When setting selector lever to other positions.	0V
35	L/W	PNP switch "R" position	 and	When setting selector lever to "R" position.	Battery voltage
				When setting selector lever to other positions.	0V
36	G	PNP switch "N" or "P" position		When setting selector lever to "N" or "P" position.	Battery voltage
				When setting selector lever to other positions.	0V
39 *2	L/OR	Engine speed signal	 and	EC-XX, "ECM INSPECTION TABLE".	—
40	L/B	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 0V and more than 4.5V
41	W/R	Throttle position sensor		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	Throttle position sensor (Ground)	—	—	—
45	P	Stop lamp switch		When depressing brake pedal.	Battery voltage
				When releasing brake pedal.	0V
47	BR	A/T fluid temperature sensor		When ATF temperature is 20°C (68°F).	1.5V
				When ATF temperature is 80°C (176°F).	0.5V
48	B/W	Ground	—	—	—

\*1: A circuit tester cannot be used to test this item.

\*2: These terminals are connected to the ECM.

\*3: These terminals are connected to the data link connector.

## CAN COMMUNICATION

PFP:23710

### System Description

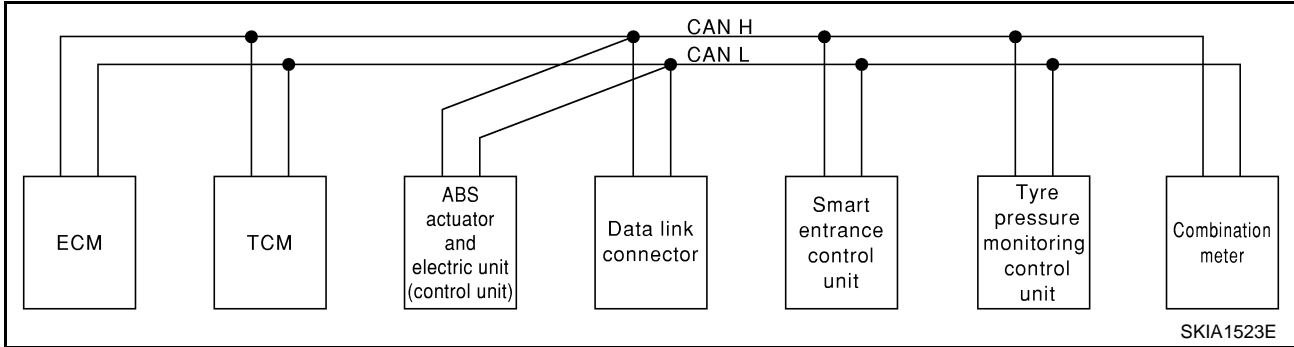
ECS006LY

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.

### CAN Communication Unit For LHD Models with Tyre Pressure Monitoring System

ECS006LZ

#### SYSTEM DESCRIPTION



#### INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

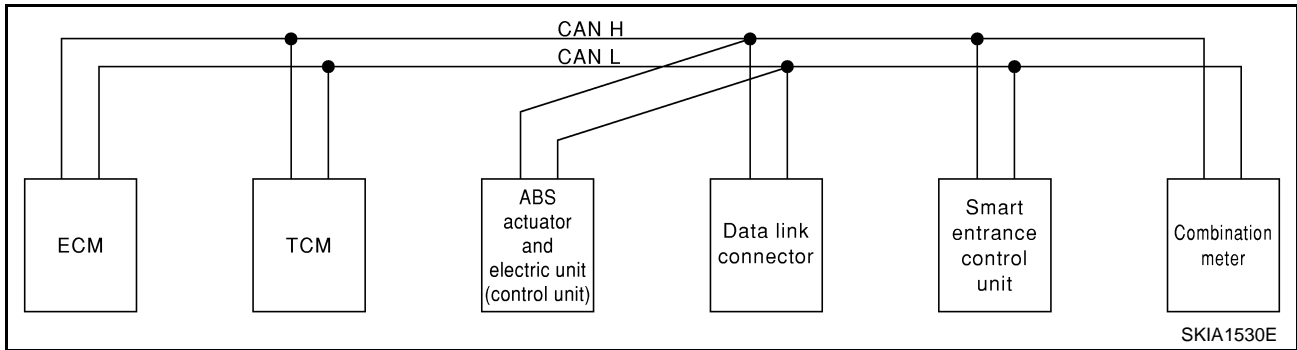
Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Smart entrance control unit	Tyre pressure monitoring control unit	Combination meter
Engine speed signal	T	R				R
Stop lamp switch signal		R	T			
Rear window defogger signal	R			T		
Heater fan switch signal	R					T
Air conditioner switch signal	R					T
MI signal	T					R
Current gear position signal		T				R
Engine coolant temperature signal	T					R
Fuel consumption signal	T					R
Vehicle speed signal			T			R
	R					T
Seat belt reminder signal				R		T
Headlamp switch signal				T		R
Flashing indicator signal				T		R
Engine cooling fan speed signal	T			R		
Child lock indicator signal				T		R
Door switches state signal				T		R
Key ID signal	R			T		
	T			R		
A/C compressor signal	T			R		
Tire pressure signal					T	R



## CAN Communication Unit For LHD Models without Tyre Pressure Monitoring System

ECS006M0

### SYSTEM DESCRIPTION



### INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Smart entrance control unit	Combination meter
Engine speed signal	T	R			R
Stop lamp switch signal		R	T		
Rear window defogger signal	R			T	
Heater fan switch signal	R				T
Air conditioner switch signal	R				T
MI signal	T				R
Current gear position signal		T			R
Engine coolant temperature signal	T				R
Fuel consumption signal	T				R
Vehicle speed signal			T		R
	R				T
Seat belt reminder signal				R	T
Headlamp switch signal				T	R
Flashing indicator signal				T	R
Engine cooling fan speed signal	T			R	
Child lock indicator signal				T	R
Door switches state signal				T	R
Key ID signal	R			T	
	T			R	
A/C compressor signal	T			R	

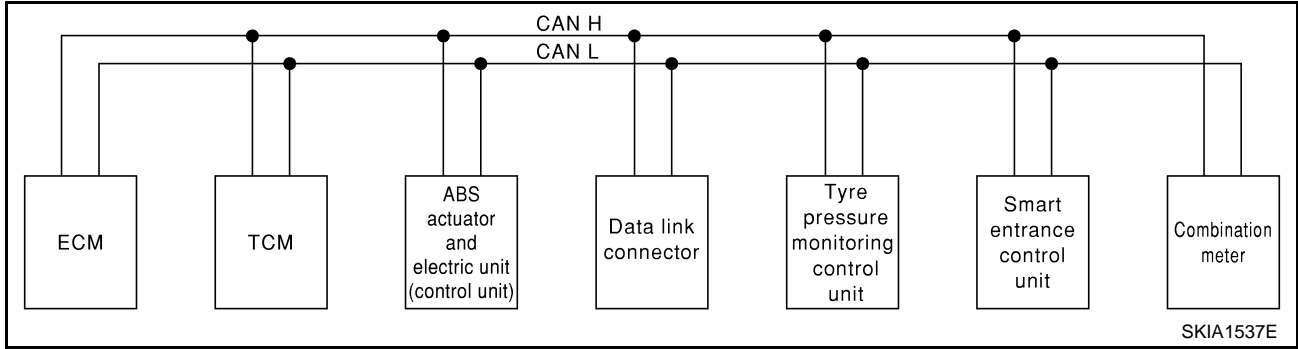
# CAN COMMUNICATION

[EXC.F/EURO-OBD]

## CAN Communication Unit For RHD Models with Tyre Pressure Monitoring System

ECS006M1

### SYSTEM DESCRIPTION



### INPUT/OUTPUT SIGNAL CHART

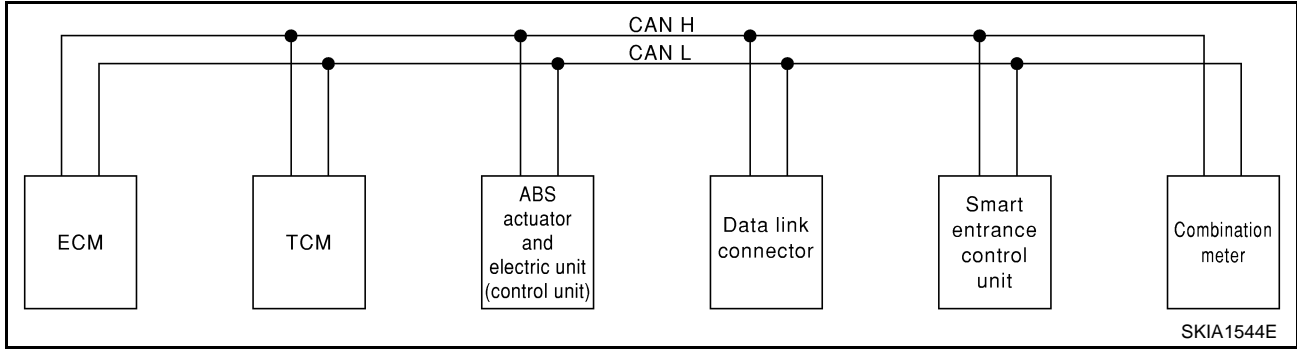
T: Transmit R: Receive

Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Tyre pressure monitoring control unit	Smart entrance control unit	Combination meter
Engine speed signal	T	R				R
Stop lamp switch signal		R	T			
Rear window defogger signal	R				T	
Heater fan switch signal	R					T
Air conditioner switch signal	R					T
MI signal	T					R
Current gear position signal		T				R
Engine coolant temperature signal	T					R
Fuel consumption signal	T					R
Vehicle speed signal			T			R
	R					T
Seat belt reminder signal					R	T
Headlamp switch signal					T	R
Flashing indicator signal					T	R
Engine cooling fan speed signal	T				R	
Child lock indicator signal					T	R
Door switches state signal					T	R
Key ID signal	R				T	
	T				R	
A/C compressor signal	T				R	
Tire pressure signal				T		R

**CAN Communication Unit For RHD Models without Tyre Pressure Monitoring System**

ECS006M2

**SYSTEM DESCRIPTION**



**INPUT/OUTPUT SIGNAL CHART**

T: Transmit R: Receive

Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Smart entrance control unit	Combination meter
Engine speed signal	T	R			R
Stop lamp switch signal		R	T		
Rear window defogger signal	R			T	
Heater fan switch signal	R				T
Air conditioner switch signal	R				T
MI signal	T				R
Current gear position signal		T			R
Engine coolant temperature signal	T				R
Fuel consumption signal	T				R
Vehicle speed signal			T		R
	R				T
Seat belt reminder signal				R	T
Headlamp switch signal				T	R
Flashing indicator signal				T	R
Engine cooling fan speed signal	T			R	
Child lock indicator signal				T	R
Door switches state signal				T	R
Key ID signal	R			T	
	T			R	
A/C compressor signal	T			R	

# TROUBLE DIAGNOSES FOR SYMPTOMS

[EXC.F/EURO-OBD]

## TROUBLE DIAGNOSES FOR SYMPTOMS

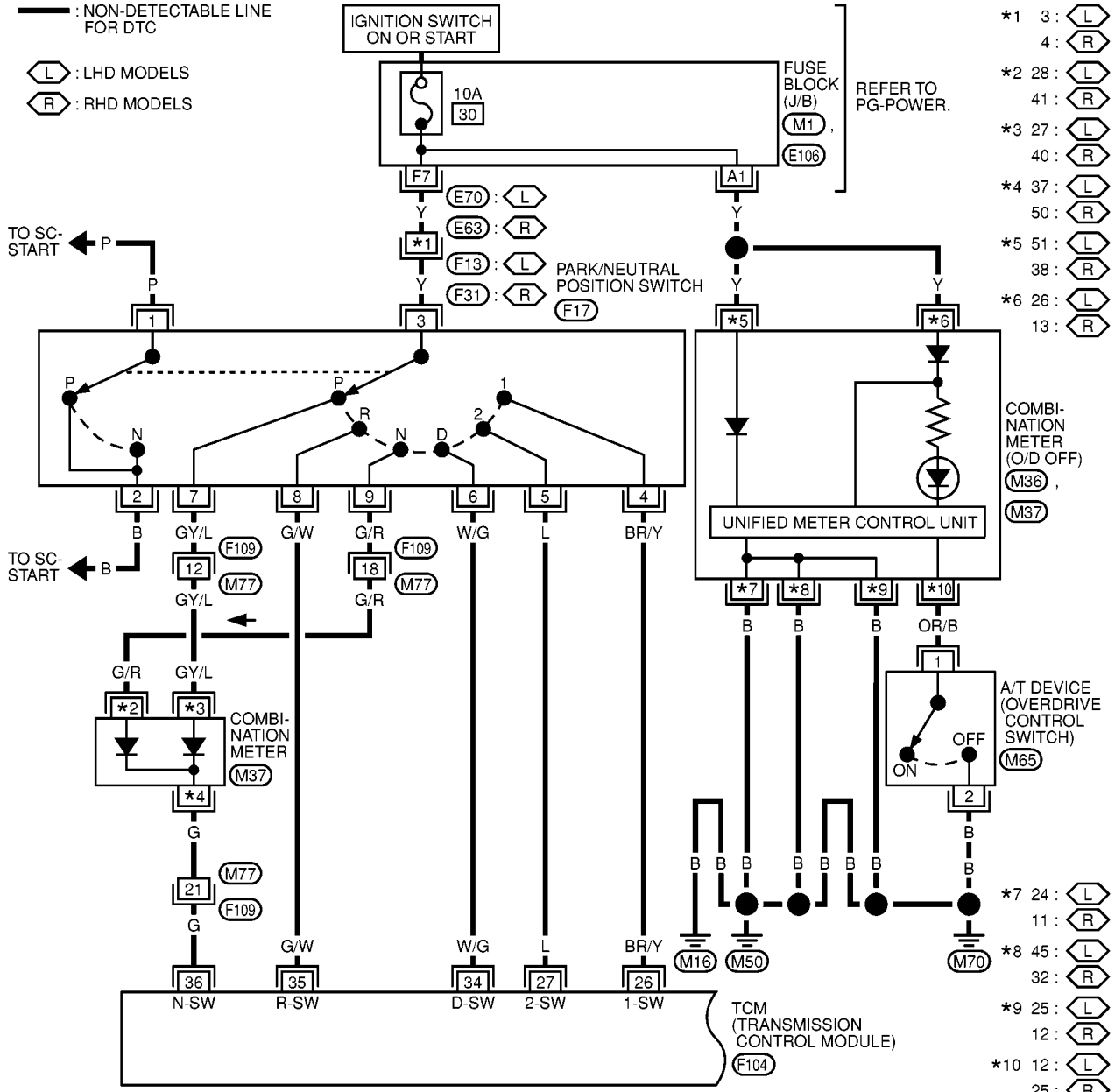
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### Wiring Diagram — AT — NONDTC

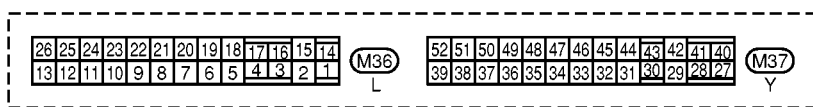
ECS005Y3

#### AT-NONDTC-01

- : DETECTABLE LINE FOR DTC
- - -** : NON-DETECTABLE LINE FOR DTC
- L** : LHD MODELS
- R** : RHD MODELS



- \*1 3: **L**
- 4: **R**
- \*2 28: **L**
- 41: **R**
- \*3 27: **L**
- 40: **R**
- \*4 37: **L**
- 50: **R**
- \*5 51: **L**
- 38: **R**
- \*6 26: **L**
- 13: **R**
- \*7 24: **L**
- 11: **R**
- \*8 45: **L**
- 32: **R**
- \*9 25: **L**
- 12: **R**
- \*10 12: **L**
- 25: **R**

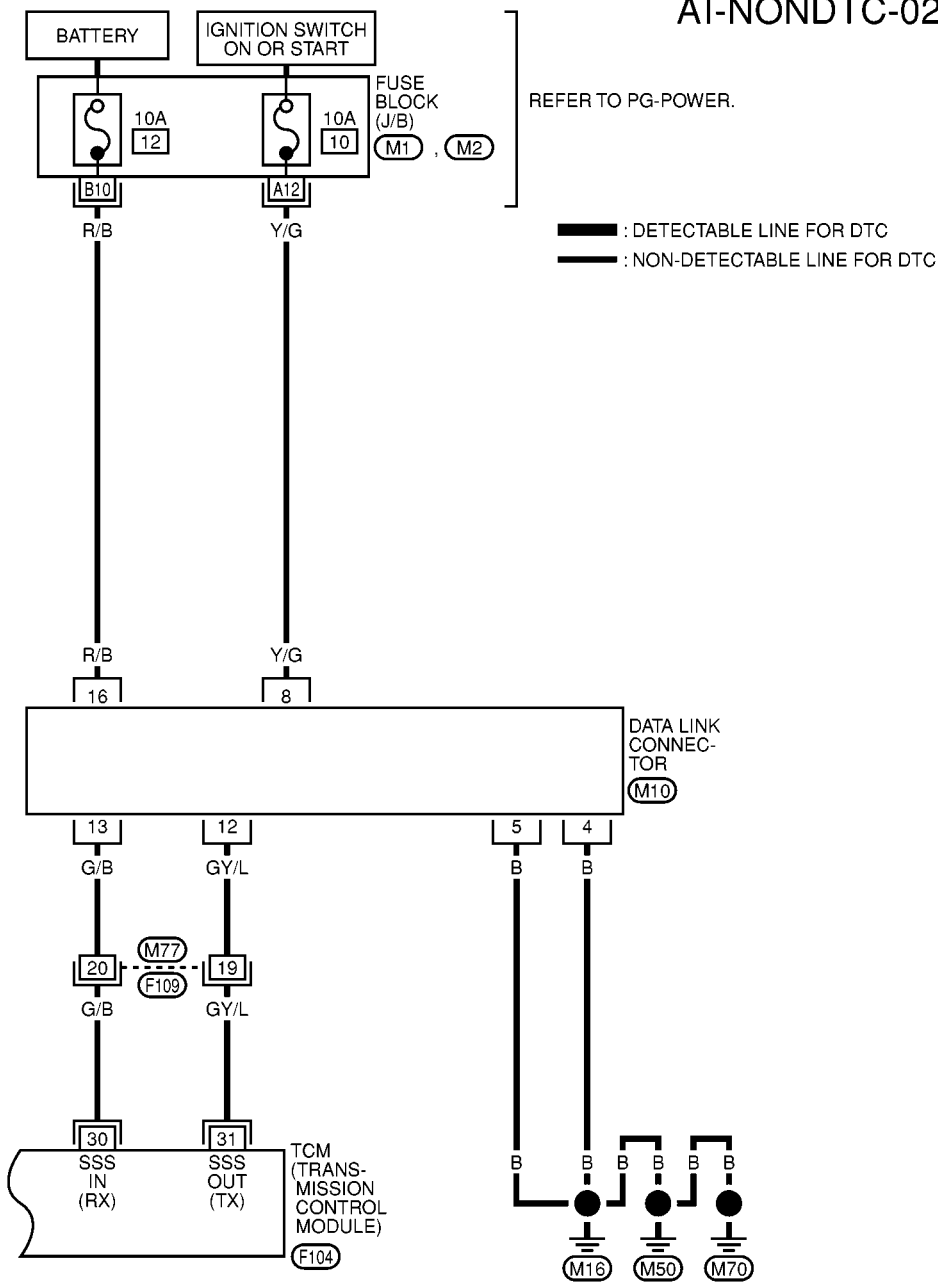


REFER TO THE FOLLOWING.  
**(M1)**, **(E106)** -FUSE BLOCK-JUNCTION BOX (J/B)

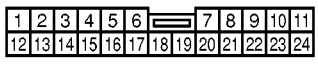
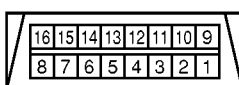
# TROUBLE DIAGNOSES FOR SYMPTOMS

[EXC.F/EURO-OBD]

AT-NONDTC-02



A  
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REFER TO THE FOLLOWING.  
 (M1), (M2) - FUSE BLOCK-JUNCTION BOX (J/B)

## 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

1. 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.

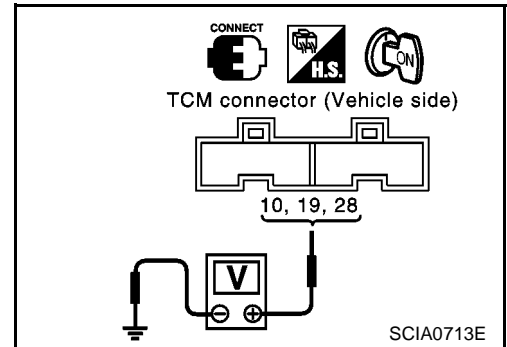
**Voltage: Battery voltage**

#### OK or NG

OK >> GO TO 2

NG >> Check the following items:

- Harness for short or open between ignition switch and TCM terminals 10, 19 and 28 (Main harness).
- Refer to [AT-340, "Wiring Diagram — AT — MAIN"](#) .
- Ignition switch and fuse. Refer to [PG-3, "POWER SUPPLY ROUTING"](#) .



## 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.

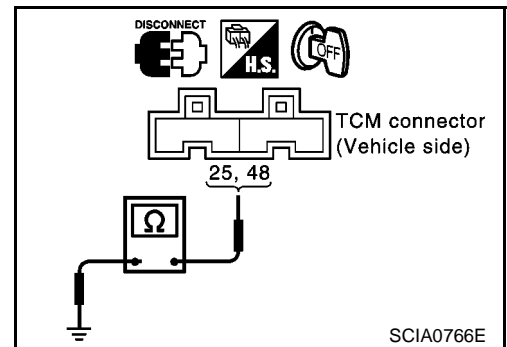
**Continuity should exist.**

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

#### OK or NG

OK >> GO TO 3

NG >> Repair open circuit or short to ground or short to power in harness or connectors. Refer to [AT-340, "Wiring Diagram — AT — MAIN"](#) .



## 3. CHECK LAMP CIRCUIT

1. Turn ignition switch to "OFF" position.
2. Check resistance between TCM terminals 13 and 10, 19.

**Resistance: 50 - 100Ω**

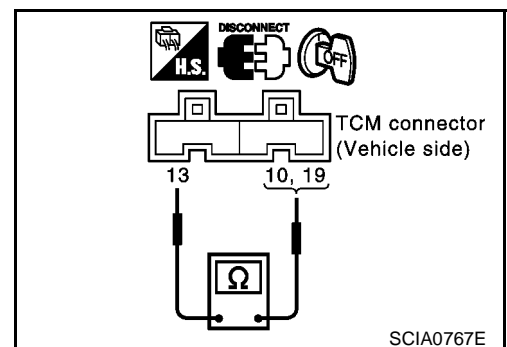
3. Reinstall any part removed.

#### OK or NG

OK >> GO TO 4

NG >> Check the following items:

- O/D OFF indicator lamp.  
Refer to [DI-24, "Combination Meter Self-Diagnosis"](#) (LHD models) or [DI-53, "Combination Meter Self-Diagnosis"](#) (RHD models).
- 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.



## 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.

## 2. Engine Cannot Be Started In “P” and “N” Position

ECS005Y5

**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

 **With CONSULT-II**

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

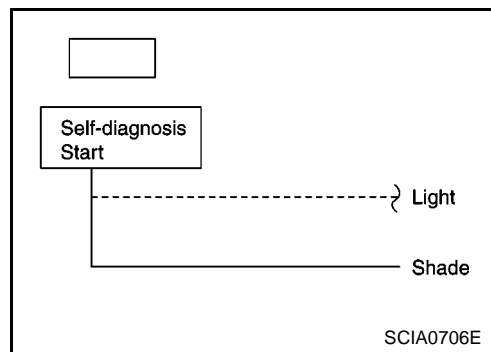
 **Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to [AT-333, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#).

No >> GO TO 2



### 2. CHECK PNP SWITCH INSPECTION

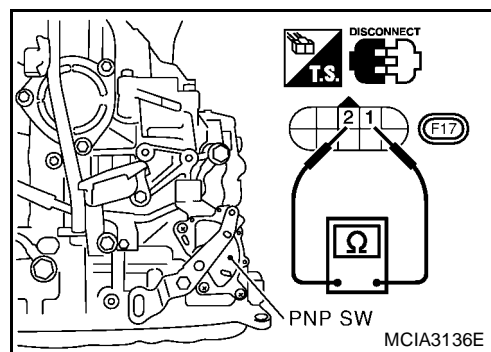
Check for short or open of PNP switch harness connector terminals 1 and 2.

Refer to [AT-333, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#).

OK or NG

OK >> GO TO 3

NG >> Repair or replace PNP switch.



### 3. CHECK STARTING SYSTEM

Check starting system. Refer to [SC-22, "STARTING SYSTEM"](#).

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

**3. In "P" Position, Vehicle Moves Forward Or Backward When Pushed**

ECS005Y6

**SYMPTOM:**

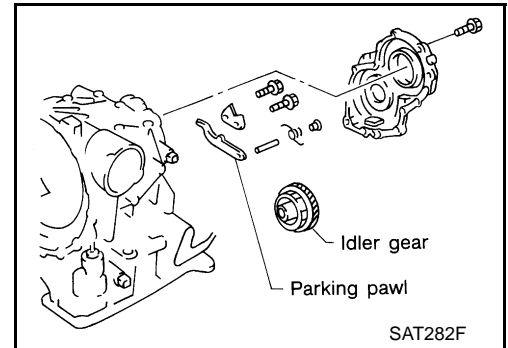
Vehicle moves when it is pushed forward or backward with selector lever in "P" position.

**1. CHECK PARKING COMPONENTS**

Check parking components. Refer to [AT-411, "OVERHAUL"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> Repair or replace damaged parts.



**4. In "N" Position, Vehicle Moves**

ECS005Y7

**SYMPTOM:**

Vehicle moves forward or backward when selecting "N" position.

**1. CHECK PNP SWITCH CIRCUIT**

**Ⓟ With CONSULT-II**

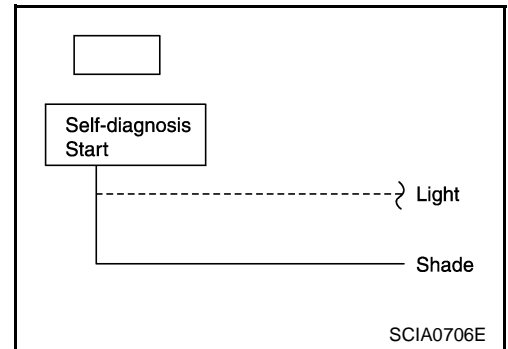
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

**ⓧ Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

- Yes >> Check PNP switch circuit. Refer to [AT-333, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#) .
- No >> GO TO 2

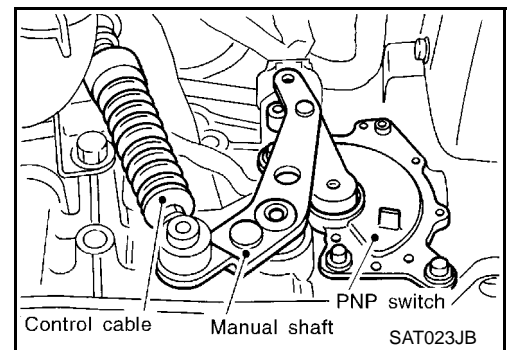


**2. CHECK CONTROL CABLE**

Check control cable. Refer to [AT-406, "Control Cable Adjustment"](#) .

OK or NG

- OK >> GO TO 3
- NG >> Adjust control cable. Refer to [AT-406, "Control Cable Adjustment"](#) .





### 3. CHECK A/T FLUID LEVEL

Check A/T fluid level again.

OK or NG

- OK >> GO TO 4
- NG >> Refill ATF.

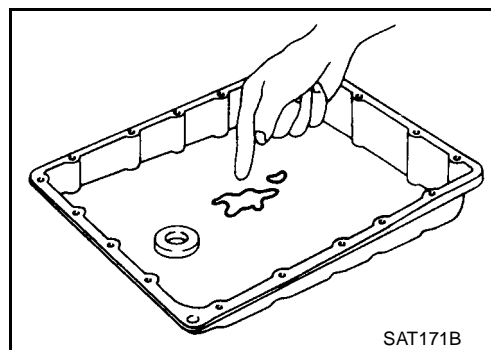


### 4. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.

OK or NG

- OK >> GO TO 5
- NG >> 1. Disassemble A/T.
  2. Check the following items:
    - Forward clutch assembly
    - Overrun clutch assembly
    - Reverse clutch assembly



### 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.

### 5. Large Shock. "N" → "R" Position

ECS005Y8

**SYMPTOM:**

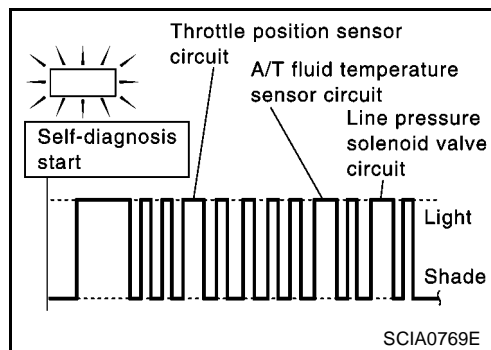
There is large shock when changing from "N" to "R" position.

#### 1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to A/T fluid temperature sensor, line pressure solenoid valve or throttle position sensor circuit?

Yes or No

- Yes >> ● Check damaged circuit. Refer to the following items.
  - [AT-386, "LINE PRESSURE SOLENOID VALVE"](#)
  - THROTTLE POSITION SENSOR: [AT-351, "ACCELERATOR PEDAL POSITION \(APP\) SENSOR"](#)
  - [AT-376, "BATT/FLUID TEMP SEN \(A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE\)"](#)
- No >> GO TO 2

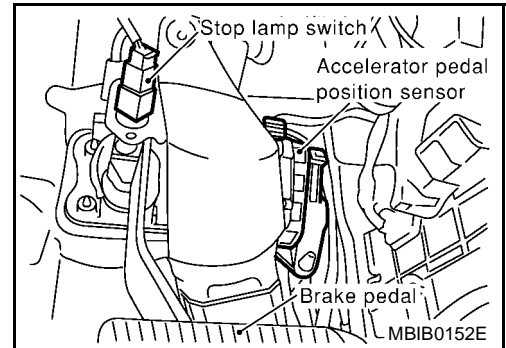


## 2. CHECK THROTTLE POSITION SENSOR\*

\*: This sensor means accelerator pedal position (APP) sensor.  
Refer to [EC-593, "Emission-related Diagnostic Information"](#) .

OK or NG

- OK >> GO TO 3
- NG >> Repair or replace Accelerator pedal position(APP) sensor.

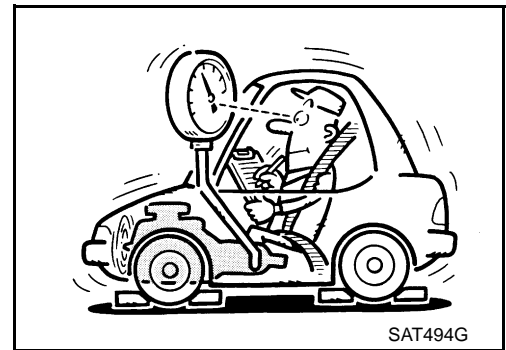


## 3. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "D" position. Refer to [AT-264, "Line Pressure Test"](#) .

OK or NG

- OK >> GO TO 4
- NG >> 1. Remove control valve assembly. Refer to [AT-404, "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



## 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.

## 6. Vehicle Does Not Creep Backward In "R" Position

ECS005Y9

**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 STALL TEST

Check stall revolution with selector lever in "1" and "R" positions.  
Refer to [AT-261, "Stall Test"](#) .

OK or NG

OK >> GO TO 3

NG in "1" position, NG in "R" position>>1.Remove control valve assembly. Refer to [AT-404, "ON-VEHICLE SERVICE"](#)

2. Check the following items:

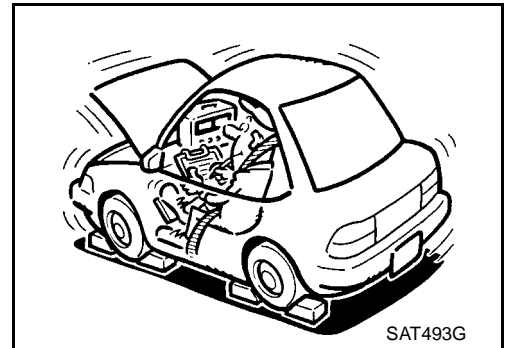
- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve ([AT-386, "LINE PRESSURE SOLENOID VALVE"](#) )

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

NG in both "1" and "R" positions>>GO TO 6



## 3. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "R" position. Refer to [AT-264, "Line Pressure Test"](#) .

OK or NG

OK >> GO TO 4

NG >> 1. Remove control valve assembly. Refer to [AT-404, "Control Valve Assembly and Accumulators"](#) .

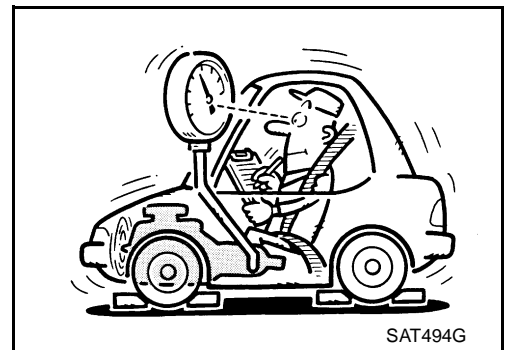
2. Check the following items:

- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve ([AT-386, "LINE PRESSURE SOLENOID VALVE"](#) )

3. Disassemble A/T.

4. Check the following item:

- Oil pump assembly

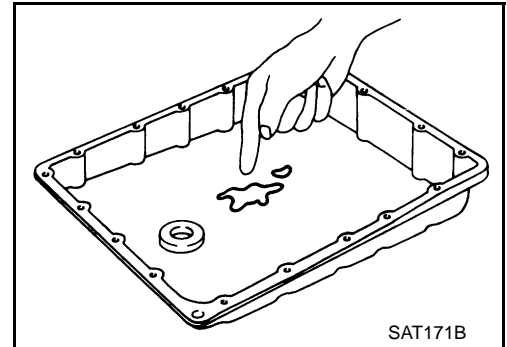


#### 4. CHECK A/T FLUID CONDITION

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. Remove control valve assembly. Refer to [AT-404, "Control Valve Assembly and Accumulators"](#) .
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 ([AT-264, "Line Pressure Test"](#) )
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.

#### 7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position

EC5005YA

##### 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.

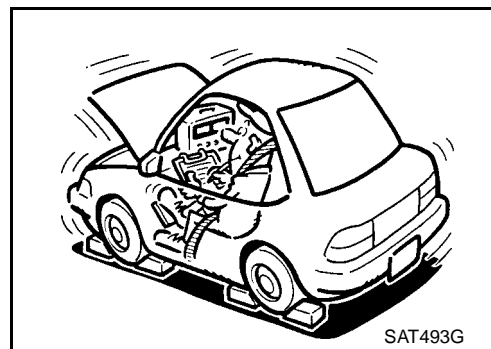


### 2. CHECK STALL TEST

Check stall revolution with selector lever in "D" position. Refer to [AT-261, "Stall Test"](#).

OK or NG

- OK >> GO TO 3
- NG >> GO TO 6

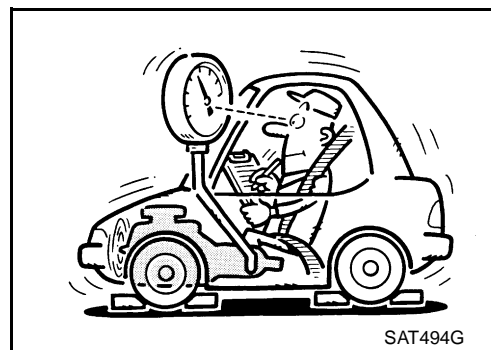


### 3. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "D" position. Refer to [AT-264, "Line Pressure Test"](#).

OK or NG

- OK >> GO TO 4
- NG >> 1. Remove control valve assembly. Refer to [AT-404, "Control Valve Assembly and Accumulators"](#).
  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 ([AT-386, "LINE PRESSURE SOLENOID VALVE"](#))
  3. Disassemble A/T.
  4. Check the following item:
    - Oil pump assembly



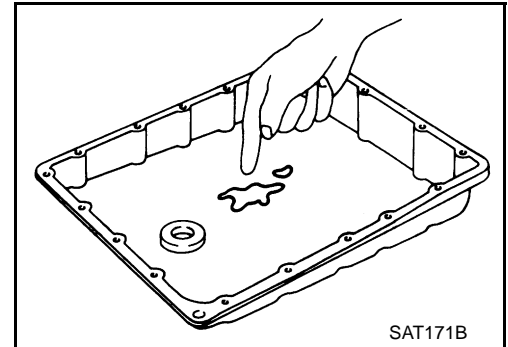
A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

#### 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. Remove control valve assembly. Refer to [AT-404, "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 ([AT-386, "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 5  
 NG >> Repair or replace damaged parts.

#### 8. Vehicle Cannot Be Started From D1

ECS005YB

**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 6. Vehicle Does Not Creep Backward In "R" Position, [AT-314, "6. Vehicle Does Not Creep Backward In "R" Position"](#) .

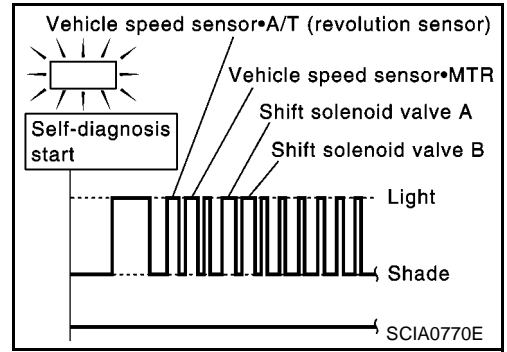
**2. CHECK SELF-DIAGNOSTIC RESULTS**

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 the following items.
- [AT-343, "VEHICLE SPEED SENSOR - A/T \(REVOLUTION SENSOR\)"](#)
  - [AT-356, "SHIFT SOLENOID VALVE A"](#)
  - [AT-361, "SHIFT SOLENOID VALVE B"](#)
  - [AT-348, "DTC VEHICLE SPEED SENSOR MTR"](#)

No >> GO TO 3

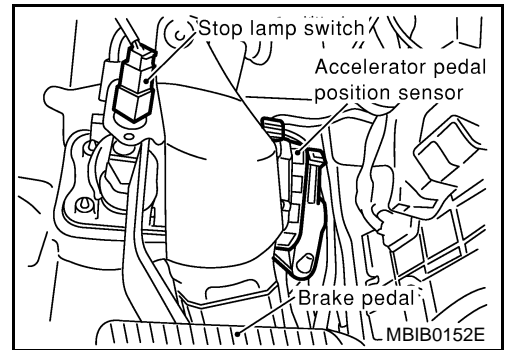


**3. CHECK THROTTLE POSITION SENSOR\***

\*: This sensor means accelerator pedal position (APP) sensor. Refer to [EC-593, "Emission-related Diagnostic Information"](#).

OK or NG

- OK >> GO TO 4  
 NG >> Repair or replace accelerator pedal position (app) sensor.

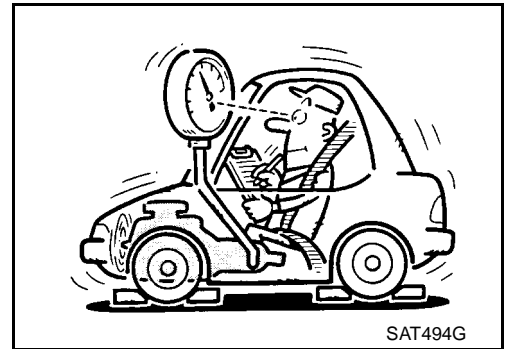


**4. CHECK LINE PRESSURE**

Check line pressure at stall point with selector lever in "D" position. Refer to [AT-264, "Line Pressure Test"](#).

OK or NG

- OK >> GO TO 5  
 NG >> GO TO 8

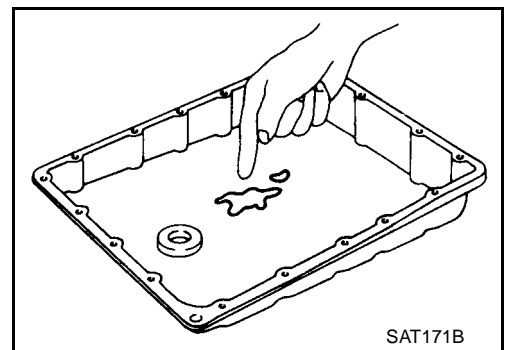


**5. CHECK A/T FLUID CONDITION**

1. Remove oil pan.
2. Check A/T fluid condition.

OK or NG

- OK >> GO TO 6  
 NG >> GO TO 8



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

**6. DETECT MALFUNCTIONING ITEM**

1. Remove control valve assembly. Refer to [AT-404, "Control Valve Assembly and Accumulators"](#) .
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 assembly. Refer to [AT-404, "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:
  - 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 7  
 NG >> Repair or replace damaged parts.

**9. A/T Does Not Shift: D1 → D2 Or Does Not Kick down: D4 → D2**

ECS005YC

**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-316, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"](#) , [AT-318, "8. Vehicle Cannot Be Started From D1"](#) .

## 2. CHECK PNP SWITCH CIRCUIT

 **With CONSULT-II**

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

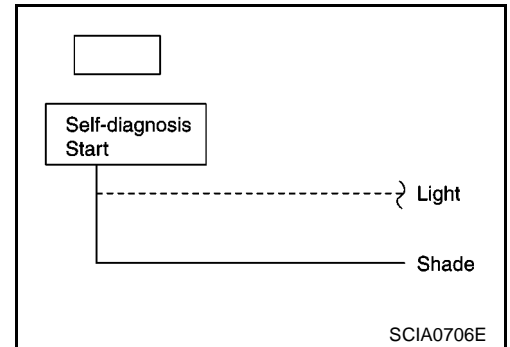
 **Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to [AT-333, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#) .

No >> GO TO 3



## 3. CHECK VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR) AND CHECK VEHICLE SPEED SENSOR-MTR CIRCUIT

Check vehicle speed sensor-A/T (revolution sensor) and vehicle speed sensor-MTR circuit. Refer to [AT-343, "VEHICLE SPEED SENSOR - A/T \(REVOLUTION SENSOR\)"](#) and [AT-348, "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.

## 4. CHECK THROTTLE POSITION SENSOR\*

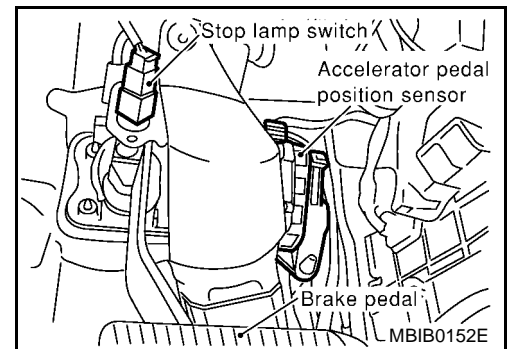
\*: This sensor means accelerator pedal position (APP) sensor.

Refer to [EC-593, "Emission-related Diagnostic Information"](#) .

OK or NG

OK >> GO TO 5

NG >> Repair or replace accelerator pedal position (app) sensor.

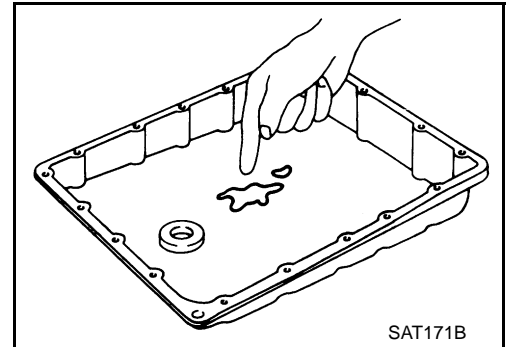


## 5. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.

OK or NG

- OK >> GO TO 6  
 NG >> GO TO 8



## 6. DETECT MALFUNCTIONING ITEM

1. Remove control valve. Refer to [AT-404, "REMOVAL"](#) .
2. Check the following items:
  - Shift valve A
  - Shift solenoid valve A ([AT-356, "SHIFT SOLENOID VALVE A"](#) )
  - 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-404, "REMOVAL"](#) .
2. Check the following items:
  - Shift valve A
  - Shift solenoid valve A ([AT-356, "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 7  
 NG >> Repair or replace damaged parts.

## 10. A/T Does Not Shift: D2 → D3

SYMPTOM:

# TROUBLE DIAGNOSES FOR SYMPTOMS

[EXC.F/EURO-OBID]

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-316, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"](#) , [AT-318, "8. Vehicle Cannot Be Started From D1"](#) .

## 2. CHECK PNP SWITCH CIRCUIT

 **With CONSULT-II**

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

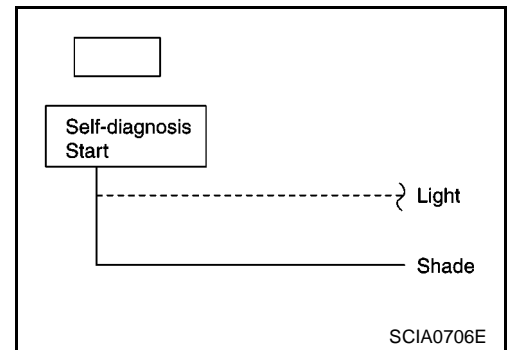
 **Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to [AT-333, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#) .

No >> GO TO 3



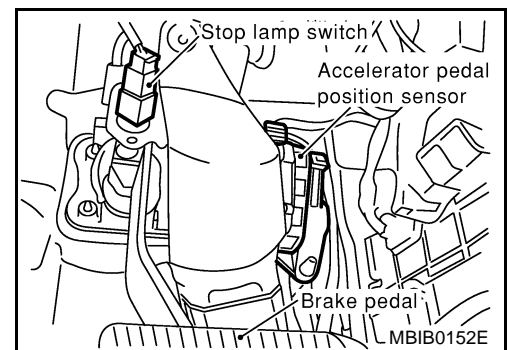
## 3. CHECK THROTTLE POSITION SENSOR\*

\*: This sensor means accelerator pedal position (APP) sensor. Refer to [EC-593, "Emission-related Diagnostic Information"](#) .

OK or NG

OK >> GO TO 4

NG >> Repair or replace throttle position sensor.



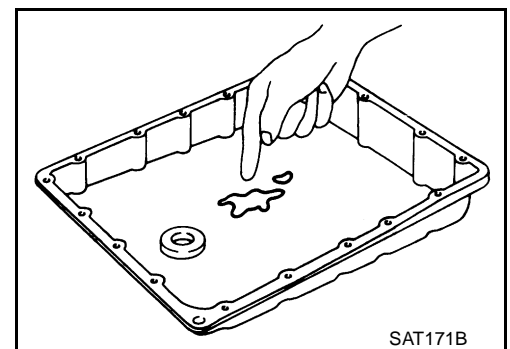
## 4. CHECK A/T FLUID CONDITION

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-404, "REMOVAL"](#) .
2. Check the following items:
  - Shift valve B
  - Shift solenoid valve B ([AT-361, "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-404, "REMOVAL"](#) .
2. Check the following items:
  - Shift valve B
  - Shift solenoid valve B ([AT-361, "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 6  
 NG >> Repair or replace damaged parts.

**11. A/T Does Not Shift: D3 → D4**

ECS005YE

**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**

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-316, "7. Vehicle Does Not Creep Forward In "D", "2" Or "1" Position"](#) .

## 2. CHECK SELF-DIAGNOSTIC RESULTS

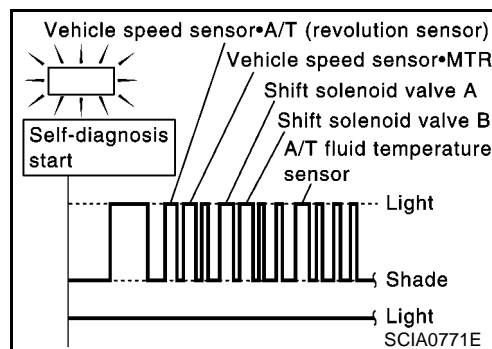
### With CONSULT-II

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 the following items.
- [AT-343, "VEHICLE SPEED SENSOR - A/T \(REVOLUTION SENSOR\)"](#)
  - [AT-356, "SHIFT SOLENOID VALVE A"](#)
  - [AT-361, "SHIFT SOLENOID VALVE B"](#)
  - [AT-376, "BATT/FLUID TEMP SEN \(A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE\)"](#)
  - [AT-348, "DTC VEHICLE SPEED SENSOR MTR"](#)
  - [AT-333, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#)



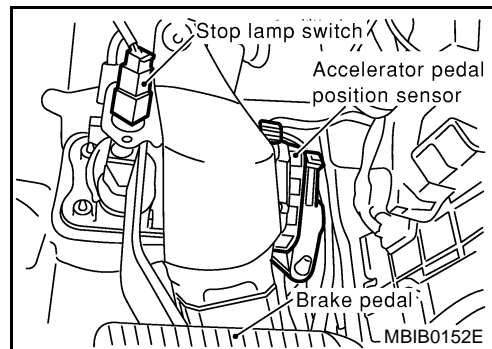
No >> GO TO 3

## 3. CHECK THROTTLE POSITION SENSOR\*

\*: This sensor means accelerator pedal position (APP) sensor.  
Refer to [EC-593, "Emission-related Diagnostic Information"](#) .

OK or NG

- OK >> GO TO 4  
NG >> Repair or replace throttle position sensor.

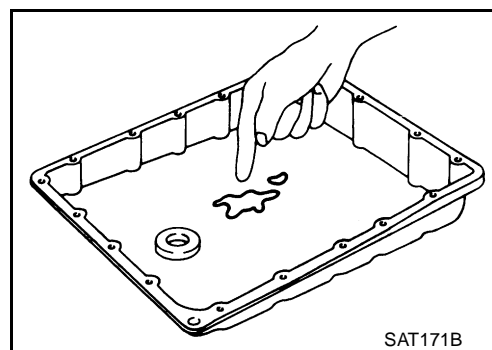


## 4. CHECK A/T FLUID CONDITION

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-404, "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 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-404, "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 6  
 NG >> Repair or replace damaged parts.

**12. A/T Does Not Perform Lock-up**

ECS005YF

**SYMPTOM:**

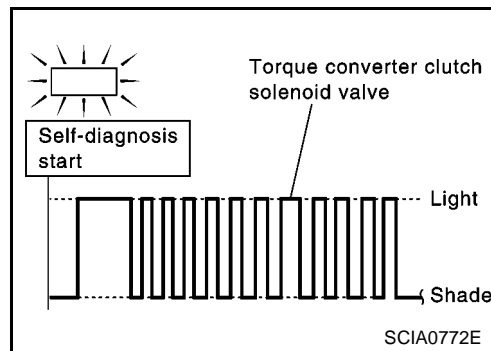
**A/T does not perform lock-up at the specified speed.**

## 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-371, "TORQUE CONVERTER CLUTCH SOLENOID VALVE"](#).
- No >> GO TO 2

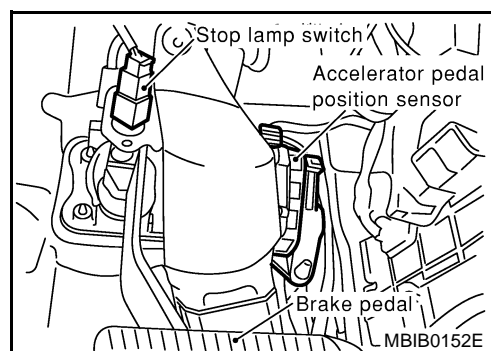


## 2. CHECK THROTTLE POSITION SENSOR\*

\*: This sensor means accelerator pedal position (APP) sensor. Refer to [EC-593, "Emission-related Diagnostic Information"](#).

OK or NG

- OK >> GO TO 3
- NG >> Repair or replace throttle position sensor.



## 3. DETECT MALFUNCTIONING ITEM

1. Remove control valve. Refer to [AT-404, "REMOVAL"](#).
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 >> 1. Perform TCM input/output signal inspection.  
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

## 13. A/T Does Not Hold Lock-up Condition

ECS005YG

**SYMPTOM:**

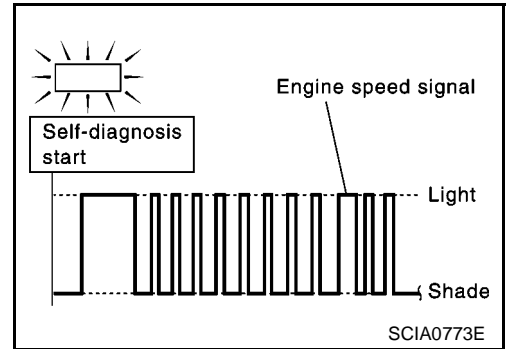
A/T does not hold lock-up condition for more than 30 seconds.

## 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 [AT-382](#), "[ENGINE SPEED SIGNAL](#)".
- No >> GO TO 2

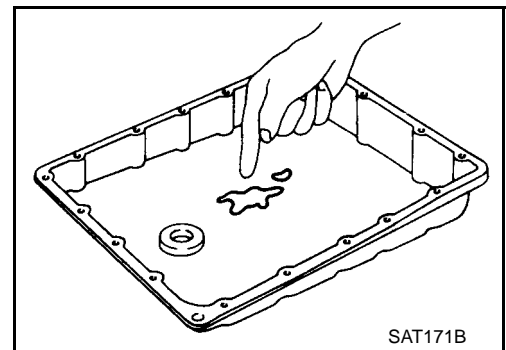


## 2. CHECK A/T FLUID CONDITION

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-404](#), "[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.



**5. DETECT MALFUNCTIONING ITEM**

1. Remove control valve assembly. Refer to [AT-404, "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.

**14. Lock-up Is Not Released**

ECS005YH

**SYMPTOM:**

Lock-up is not released when accelerator pedal is released.

**1. CHECK THROTTLE POSITION SENSOR\* CIRCUIT**

\*: This sensor means accelerator pedal position (app) sensor.

**Ⓟ With CONSULT-II**

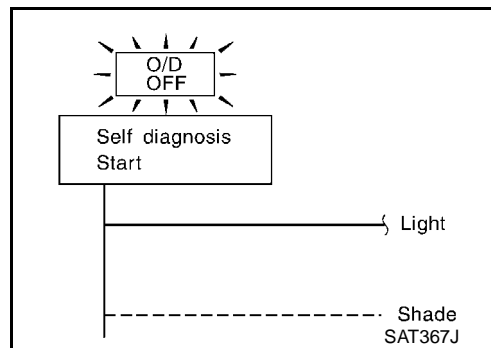
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage throttle position sensor circuit?

**ⓧ Without CONSULT-II**

Does self-diagnosis show damage to throttle position sensor circuit?

**Yes or No**

- Yes >> Check throttle position sensor circuit. Refer to [AT-333, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#) .
- 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.

**15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3 )**

ECS005YI

**SYMPTOM:**

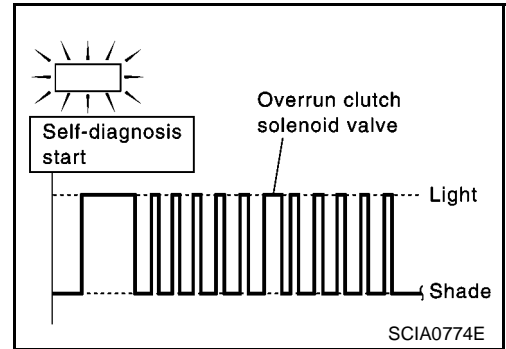
- Engine speed does not smoothly return to idle when A/T shifts from D4 to D3 .
- Vehicle does not decelerate by engine brake when turning overdrive control switch OFF.
- Vehicle does not decelerate by engine brake when shifting A/T from "D" to "2" position.

## 1. CHECK SELF-DIAGNOSTIC RESULTS

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-366, "OVERRUN CLUTCH SOLENOID VALVE"](#).
- No >> GO TO 2

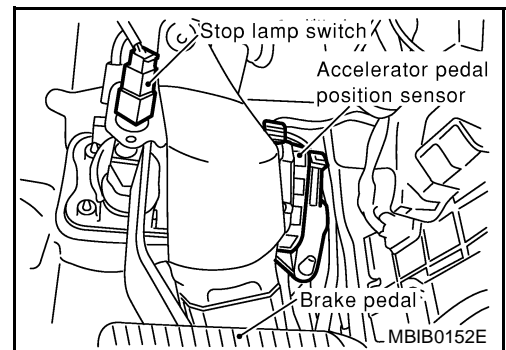


## 2. CHECK THROTTLE POSITION SENSOR\*

\*: This sensor means accelerator pedal position (APP) sensor. Refer to [EC-593, "Emission-related Diagnostic Information"](#).

OK or NG

- OK >> GO TO 3
- NG >> Repair or replace accelerator pedal position (app) sensor. ([AT-351, "ACCELERATOR PEDAL POSITION \(APP\) SENSOR"](#))

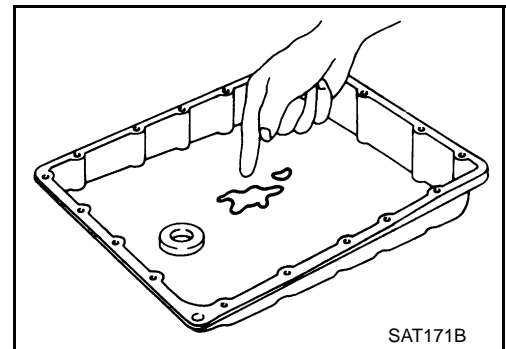


## 3. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.

OK or NG

- OK >> GO TO 4
- NG >> GO TO 6



## 4. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-404, "REMOVAL"](#).
2. Check the following items:
  - Overrun clutch control valve
  - Overrun clutch reducing valve
  - Overrun clutch solenoid valve ([AT-366, "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

1. Remove control valve assembly. Refer to [AT-404, "REMOVAL"](#) .
2. Check the following items:
  - Overrun clutch control valve
  - Overrun clutch reducing valve
  - Overrun clutch solenoid valve ([AT-366, "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 5

NG >> Repair or replace damaged parts.

## 16. Vehicle Does Not Start From D1

EC5005YJ

**SYMPTOM:**

Vehicle does not start from D1 on Cruise test — Part 2.

### 1. CHECK SELF-DIAGNOSTIC RESULTS

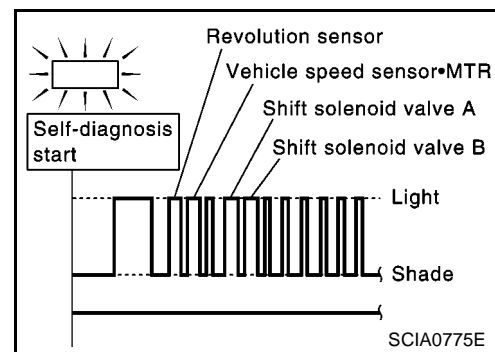
Does self-diagnosis show damage to vehicle speed sensor-A/T (revolution sensor), shift solenoid valve A, B or vehicle speed sensor-MTR after cruise test?

Yes or No

Yes >> ● Check damaged circuit. Refer to the following items.

- [AT-343, "VEHICLE SPEED SENSOR - A/T \(REVOLUTION SENSOR\)"](#)
- [AT-356, "SHIFT SOLENOID VALVE A"](#)
- [AT-361, "SHIFT SOLENOID VALVE B"](#)
- [AT-348, "DTC VEHICLE SPEED SENSOR MTR"](#)

No >> GO TO 2



### 2. CHECK SYMPTOM

Check again.

OK or NG

OK >> Go to [AT-318, "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.

## 17. A/T Does Not Shift: D4 → D3 , When Overdrive Control Switch “ON” → “OFF”

EC5005YK

**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?

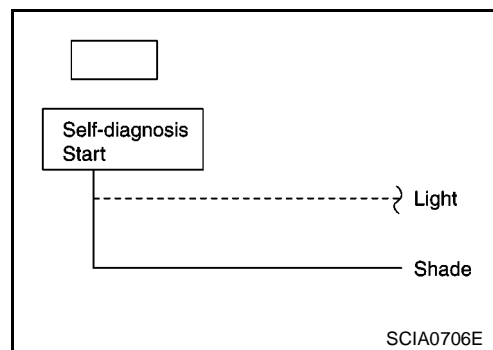
**Without CONSULT-II**

Does self-diagnosis show damage to overdrive control switch circuit?

Yes or No

Yes >> Check overdrive control switch circuit. Refer to [AT-334, "DIAGNOSTIC PROCEDURE"](#).

No >> Go to [AT-322, "10. A/T Does Not Shift: D<sub>2</sub> → D<sub>3</sub>"](#).



**18. A/T Does Not Shift: D<sub>3</sub> → 2<sub>2</sub>, When Selector Lever "D" → "2" Position**

ECS005YL

**SYMPTOM:**

A/T does not shift from D<sub>3</sub> to 2<sub>2</sub> 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?

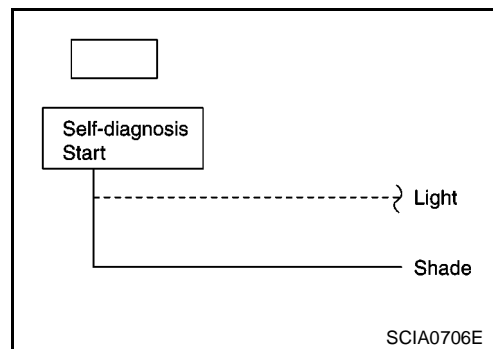
**Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to [AT-333, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#).

No >> Go to [AT-320, "9. A/T Does Not Shift: D<sub>1</sub> → D<sub>2</sub> Or Does Not Kick down: D<sub>4</sub> → D<sub>2</sub>"](#).



**19. A/T Does Not Shift: 2<sub>2</sub> → 1<sub>1</sub>, When Selector Lever "2" → "1" Position**

ECS005YM

**SYMPTOM:**

A/T does not shift from 2<sub>2</sub> to 1<sub>1</sub> 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?

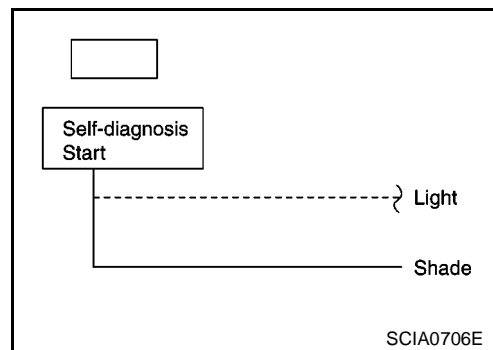
**Without CONSULT-II**

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to [AT-333, "21. TCM Self-diagnosis Does Not Activate \(PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks\)"](#).

No >> GO TO 2



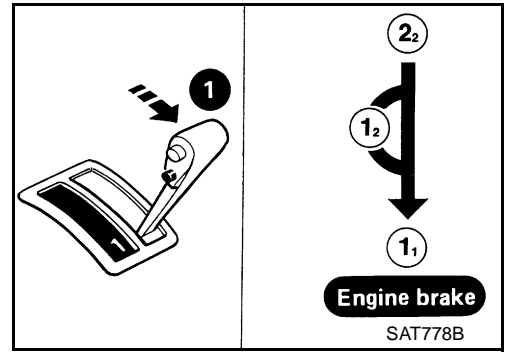
**2. CHECK SYMPTOM**

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.



**20. Vehicle Does Not Decelerate By Engine Brake**

ECS005YN

**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?

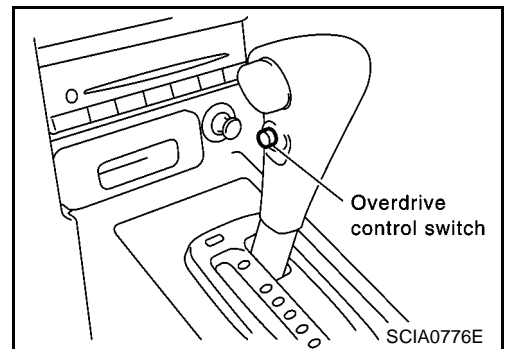
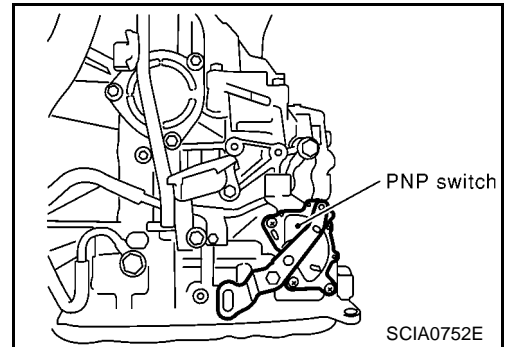
Yes or No

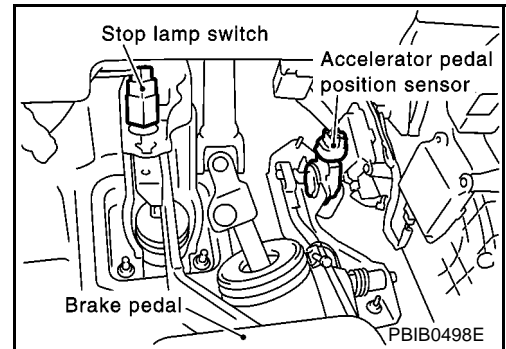
Yes >> Go to [AT-329, "15. Engine Speed Does Not Return To Idle \(Light Braking D4 → D3\)"](#) .

No >> Go to [AT-314, "6. Vehicle Does Not Creep Backward In "R" Position"](#) .

**21. TCM Self-diagnosis Does Not Activate (PNP & Overdrive Control Switches, and Throttle Position Sensor Circuit Checks)**

ECS005YO





**SYMPTOM:**

O/D OFF indicator lamp does not come on in TCM self-diagnostic procedure even if the lamp circuit is good.

**DESCRIPTION**

- PNP switch  
The PNP switch assembly includes a transmission position switch. The transmission position 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 \*  
\*: This sensor means accelerator pedal position (APP) sensor.

Electric throttle control actuator consists of throttle control motor, acceleration pedal position sensor, throttle position sensor, etc. The actuator sends a signal to the TCM.

**DIAGNOSTIC PROCEDURE**

**1. CHECK PNP SWITCH CIRCUIT (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 "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 3

NG >> Check the following items:

- PNP switch (Refer to [AT-338, "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)
- Diode (P, N positions)

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

1. 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.

**Voltage:**

**B: Battery voltage**

**0: 0V**

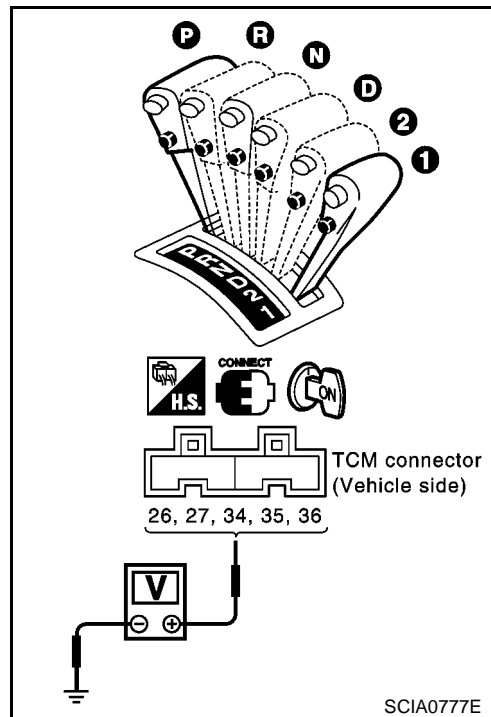
Lever position	Terminal No.				
	36	35	34	27	26
P, N	B	0	0	0	0
R	0	B	0	0	0
D	0	0	B	0	0
2	0	0	0	B	0
1	0	0	0	0	B

**OK or NG**

OK >> GO TO 4

NG >> Check the following items:

- PNP switch (Refer to [AT-338, "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)
- Diode (P, N positions)



## 3. CHECK OVERDRIVE CONTROL SWITCH CIRCUIT (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 "OVERDRIVE SWITCH".  
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 >> GOTO5

NG >> Check the following items:

- Overdrive control switch (Refer to [AT-338, "COMPONENT INSPECTION"](#) .)
- 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

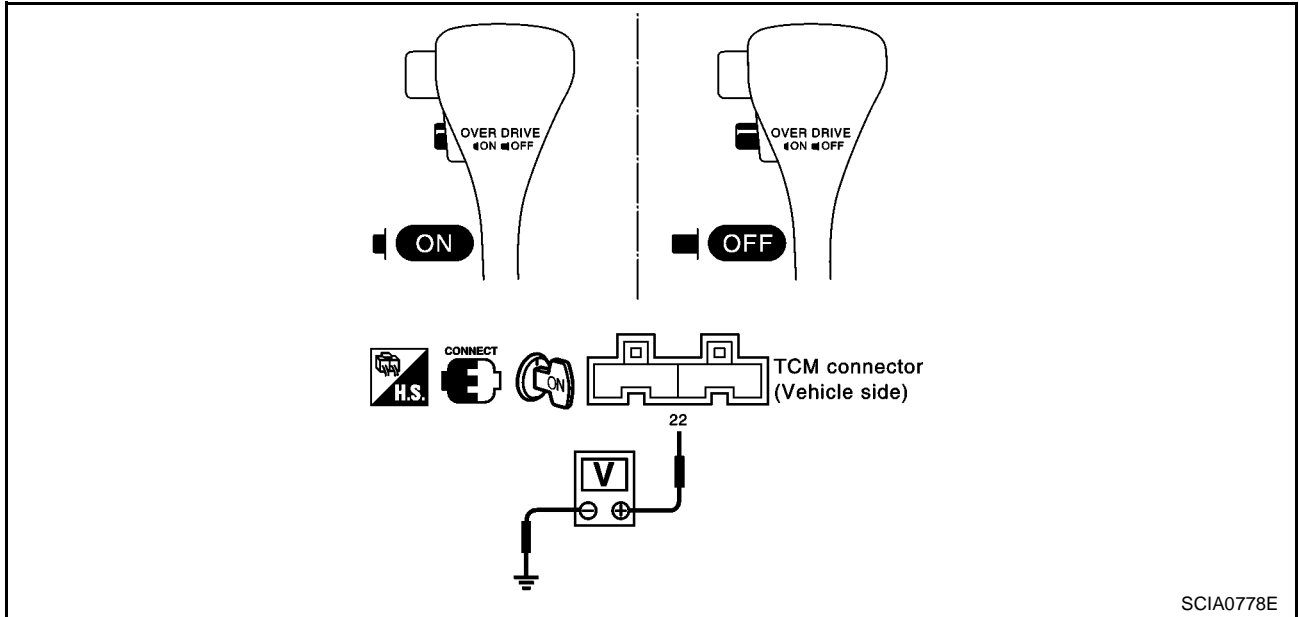
DATA MONITOR	
MONITORING	
ENGINE SPEED	XXX rpm
TURBINE REV	XXX rpm
OVERDRIVE SW	ON
PN POSI SW	OFF
R POSITION SW	OFF

SAT645J

#### 4. CHECK OVERDRIVE CONTROL SWITCH CIRCUIT (WITHOUT CONSULT-II)

##### ⊗ Without CONSULT-II

1. Turn ignition switch to "ON" position.  
(Do not start engine.)
2. Check voltage between TCM terminal 22 and ground when overdrive control switch is "ON" and "OFF".



**Voltage:**

**Switch position "ON":**

**Battery voltage**

**Switch position "OFF":**

**1V or less**

OK or NG

OK >> GO TO 6

NG >> Check the following items:

- Overdrive control switch (Refer to "Component Inspection", [AT-338, "COMPONENT INSPECTION"](#) .)
- 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



## 5. CHECK THROTTLE POSITION SENSOR\* CIRCUIT (WITH CONSULT-II)

\*:This sensor means accelerator pedal position (app) sensor.

**With CONSULT-II**

1. Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#) .
2. Turn ignition switch to "ON" position.  
(Do not start engine.)
3. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for A/T with CONSULT-II.
4. Read out "THRTL POS SEN" sensor depressing and releasing accelerator pedal.  
Check the signal of throttle position sensor is indicated properly.

SELECT SYSTEM	
A/T	
ENGINE	

SAT014K

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 7

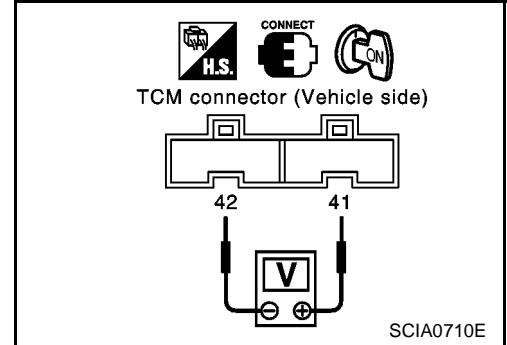
NG >> Check the following items:

- Throttle position sensor — Refer to [AT-338, "COMPONENT INSPECTION"](#) .
- Harness for short or open between ignition switch and throttle position sensor (Main harness)
- Harness for short or open between throttle position sensor and TCM (Main harness)

## 6. CHECK THROTTLE POSITION SENSOR CIRCUIT (WITHOUT CONSULT-II)

⊗ **Without CONSULT-II**

1. Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#) .
2. Turn ignition switch to "ON" position.  
(Do not start engine.)
3. Check voltage between TCM terminals 41 and ground while depressing, and releasing accelerator pedal slowly. (After warming up engine)



OK or NG

OK >> GO TO 7

NG >> Check the following items:

- Throttle position sensor — Refer to [AT-338, "COMPONENT INSPECTION"](#) .
- Harness for short or open between ignition switch and throttle position sensor (Main harness)
- Harness for short or open between throttle position sensor and TCM (Main harness)

## 7. CHECK DTC

Perform "DIAGNOSTIC PROCEDURE". Refer to [AT-334, "DIAGNOSTIC PROCEDURE"](#) .

OK or NG

OK >> **INSPECTION END**

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

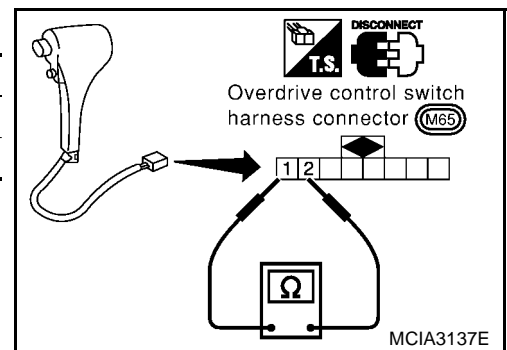
- If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

### COMPONENT INSPECTION

#### Overdrive Control Switch

- Check continuity between two terminals 7 and 8.

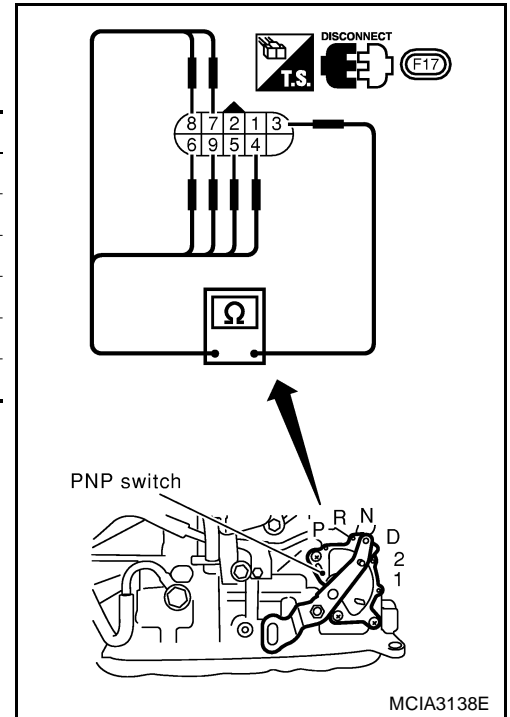
Switch position	Continuity
ON	No
OFF	Yes



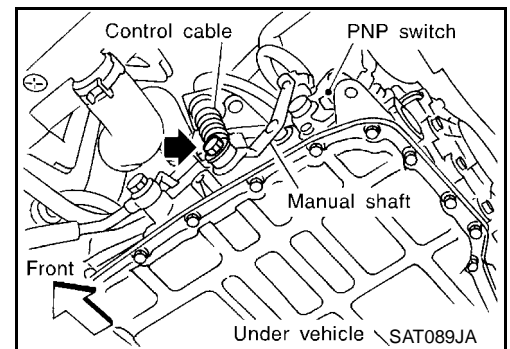
## PNP Switch

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

Lever position	Terminal No.	
P	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 [AT-406, "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 [AT-406, "Control Cable Adjustment"](#).
6. If NG on step 4, replace PNP switch.



## Throttle Position Sensor\*

- \*: This sensor means accelerator pedal position (APP) sensor.  
 Refer to [AT-351, "ACCELERATOR PEDAL POSITION \(APP\) SENSOR"](#).

# MAIN POWER SUPPLY AND GROUND CIRCUIT

[ALL]

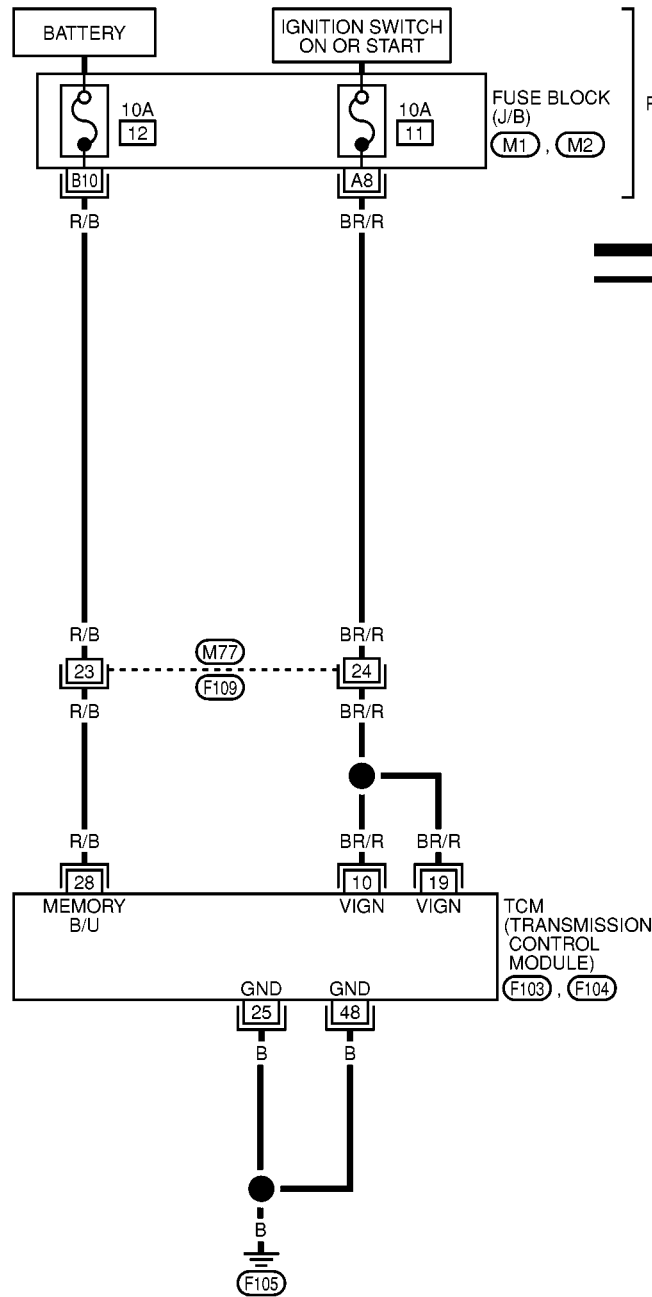
## MAIN POWER SUPPLY AND GROUND CIRCUIT

PFP:00100

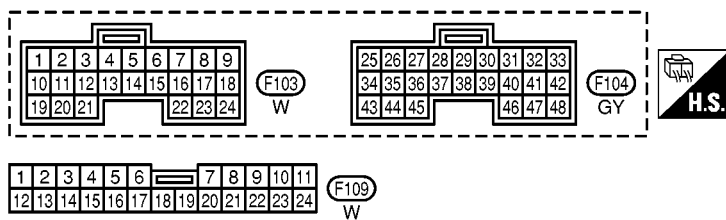
### Wiring Diagram — AT — MAIN

ECS005YP

AT-MAIN-01



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



REFER TO THE FOLLOWING.  
 (M1), (M2) - FUSE BLOCK-  
 JUNCTION BOX (J/B)

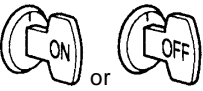
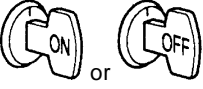
MCWA0002E

# MAIN POWER SUPPLY AND GROUND CIRCUIT

[ALL]

## TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)	
10	BR/W	Power source		When turning ignition switch to "ON".	Battery voltage
				When turning ignition switch to "OFF".	0V
19	BR/W	Power source	Same as No. 10		
25	B/W	Ground	—	—	
28	R/B	Power source (Memory back-up)		When turning ignition switch to "OFF".	Battery voltage
				When turning ignition switch to "ON".	Battery voltage
48	B/W	Ground	—	—	

## Diagnostic Procedure

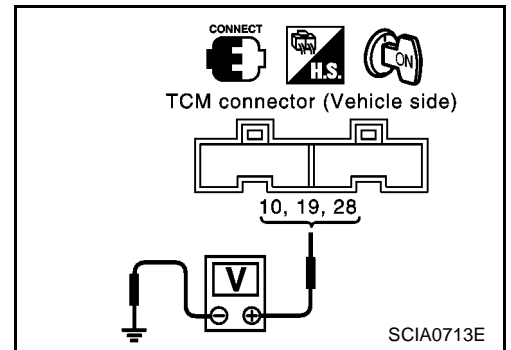
ECS005YQ

### 1. CHECK TCM POWER SOURCE STEP 1

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

OK or NG

- OK >> GO TO 2  
NG >> GO TO 3

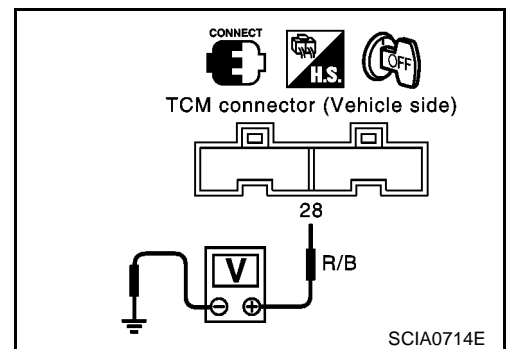


### 2. CHECK TCM POWER SOURCE STEP 2

- Turn ignition switch to OFF position.
- 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 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 [AT-340, "Wiring Diagram — AT — MAIN"](#) .

**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 or connectors.

# VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)

[ALL]

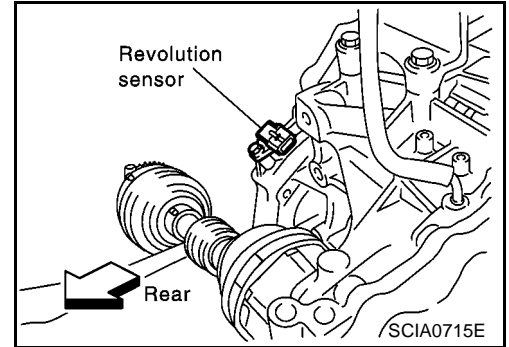
## VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)

PFP:32702

### Description

ECS005YR

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.



### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal 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 <b>CAUTION:</b> <b>Connect the diagnosis data link cable to the vehicle diagnosis connector.</b> *1: A circuit tester cannot be used to test this item.	450 Hz
				When vehicle parks.	Under 1.3V or over 4.5V
42	B	Throttle position sensor (Ground)	—	—	—

### ON BOARD DIAGNOSIS LOGIC

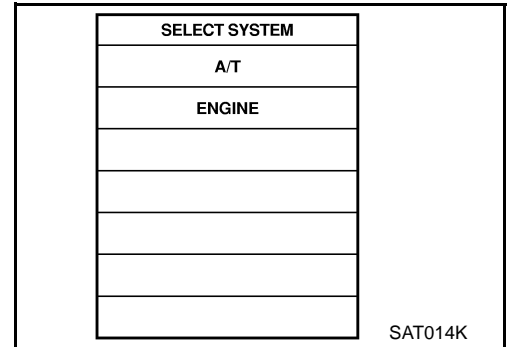
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
Ⓟ : VHCL SPEED SEN·AT	TCM does not receive the proper voltage signal from the sensor.	<ul style="list-style-type: none"> <li>● Harness or connectors (The sensor circuit is open or shorted.)</li> <li>● Revolution sensor</li> </ul>
ⓧ : 1st judgement flicker		

## SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

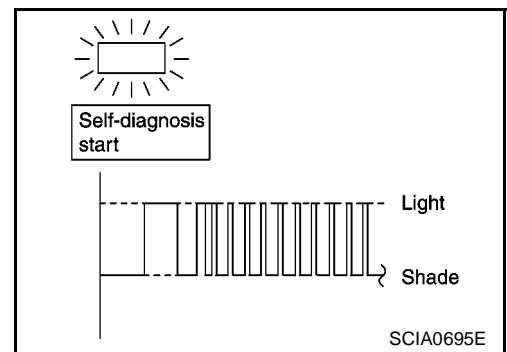
### ④ With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for A/T with CONSULT-II.
3. Drive vehicle under the following conditions:  
Selector lever in "D" position, vehicle speed higher than 30 km/h (19 MPH), throttle opening greater than 1/8 of the full throttle position and driving for more than 5 seconds.
4. If DTC is detected, go to [AT-346, "Diagnostic Procedure"](#) .



### ⊗ Without CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:  
Selector lever in "D" position, vehicle speed higher than 30 km/h (19 MPH), throttle opening greater than 1/8 of the full throttle position and driving for more than 5 seconds.
3. Perform self-diagnosis.  
Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#) .
4. If DTC is detected, go to [AT-346, "Diagnostic Procedure"](#) .





# VEHICLE SPEED SENSOR - A/T (REVOLUTION SENSOR)

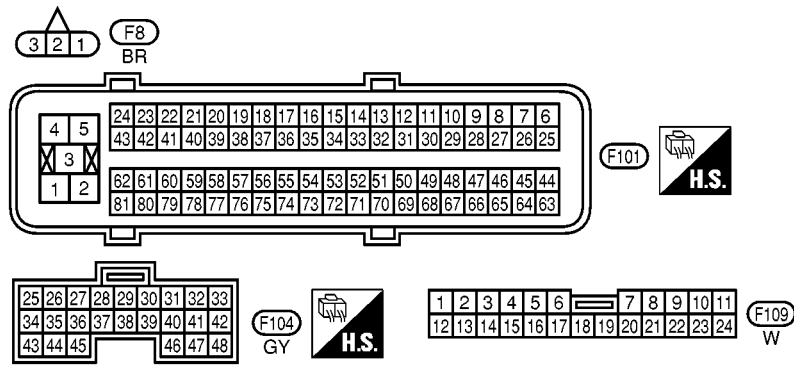
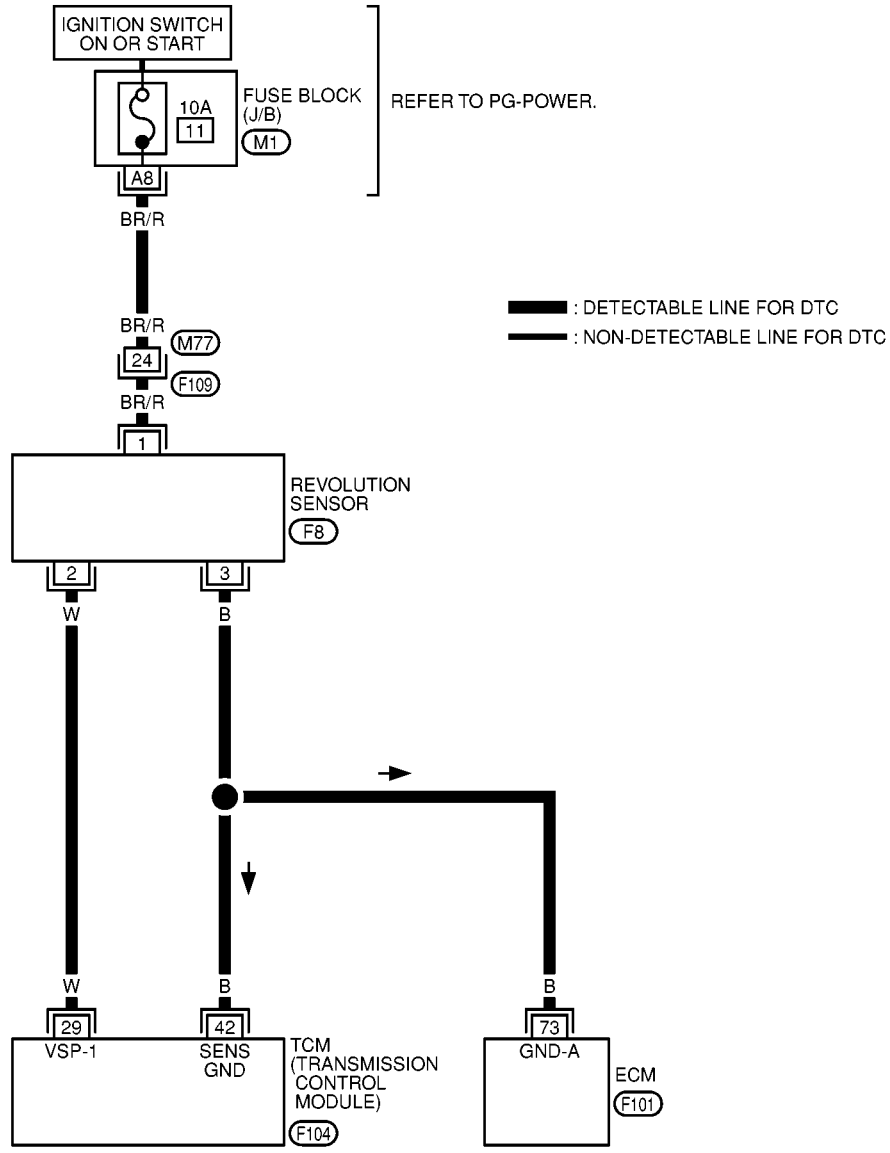
[ALL]

## Wiring Diagram — AT — VSSAT

ECS005YS

AT-VSSAT-01

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



REFER TO THE FOLLOWING.  
 (M1) - FUSE BLOCK-JUNCTION BOX (J/B)

## Diagnostic Procedure

ECS005YT

### 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.

SELECT SYSTEM
A/T
ENGINE

SAT014K

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)

Ⓟ **With CONSULT-II**

Condition	Judgement standard (Approx.)
When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function. *1 <b>CAUTION:</b> 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 parks.	Under 1.3V or over 4.5V

MTBL0575

1. Start engine.  
 Harness for short or open between TCM, ECM and revolution sensor (Main harness)

OK or NG

- OK     >> GO TO 3  
 NG     >> Repair or replace damaged parts.

## 3. CHECK DTC

Perform [AT-344, "SELF-DIAGNOSIS CODE 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.

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

## DTC VEHICLE SPEED SENSOR MTR

PFP:24814

### Description

ECS005YU

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.

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
40	L/B	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 0V and more than 4.5V

### ON BOARD DIAGNOSIS LOGIC

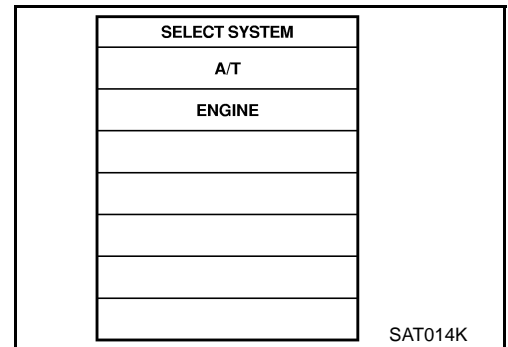
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
(P) : VHCL SPEED SEN-MTR (X) : 2nd judgement flicker	TCM does not receive the proper voltage signal from the sensor.	<ul style="list-style-type: none"> <li>• Harness or connectors (The sensor circuit is open or shorted.)</li> <li>• Vehicle speed sensor</li> </ul>

### SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

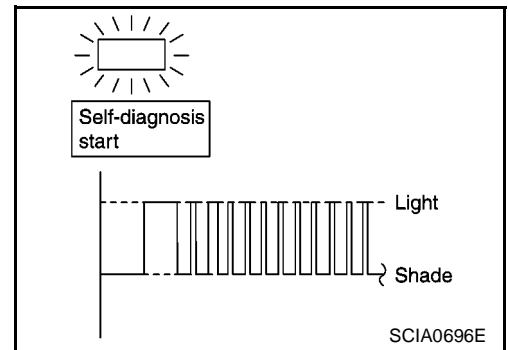
#### (P) With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for A/T with CONSULT-II.
3. Drive vehicle under the following conditions:  
Selector lever in "D" position and vehicle speed higher than 20 km/h (12 MPH).
4. If DTC is detected, go to [AT-350, "Diagnostic Procedure"](#) .



#### (X) Without CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:  
Selector lever in "D" position and vehicle speed higher than 20 km/h (12 MPH).
3. Perform self-diagnosis.  
Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#) .
4. If DTC is detected, go to [AT-350, "Diagnostic Procedure"](#) .



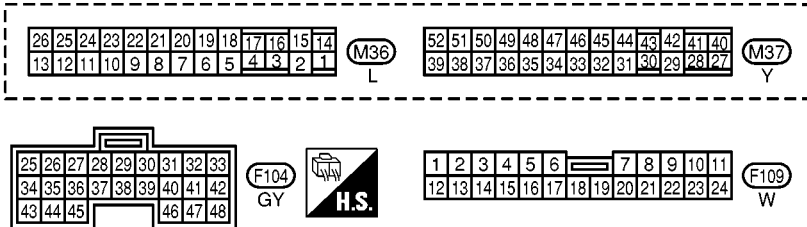
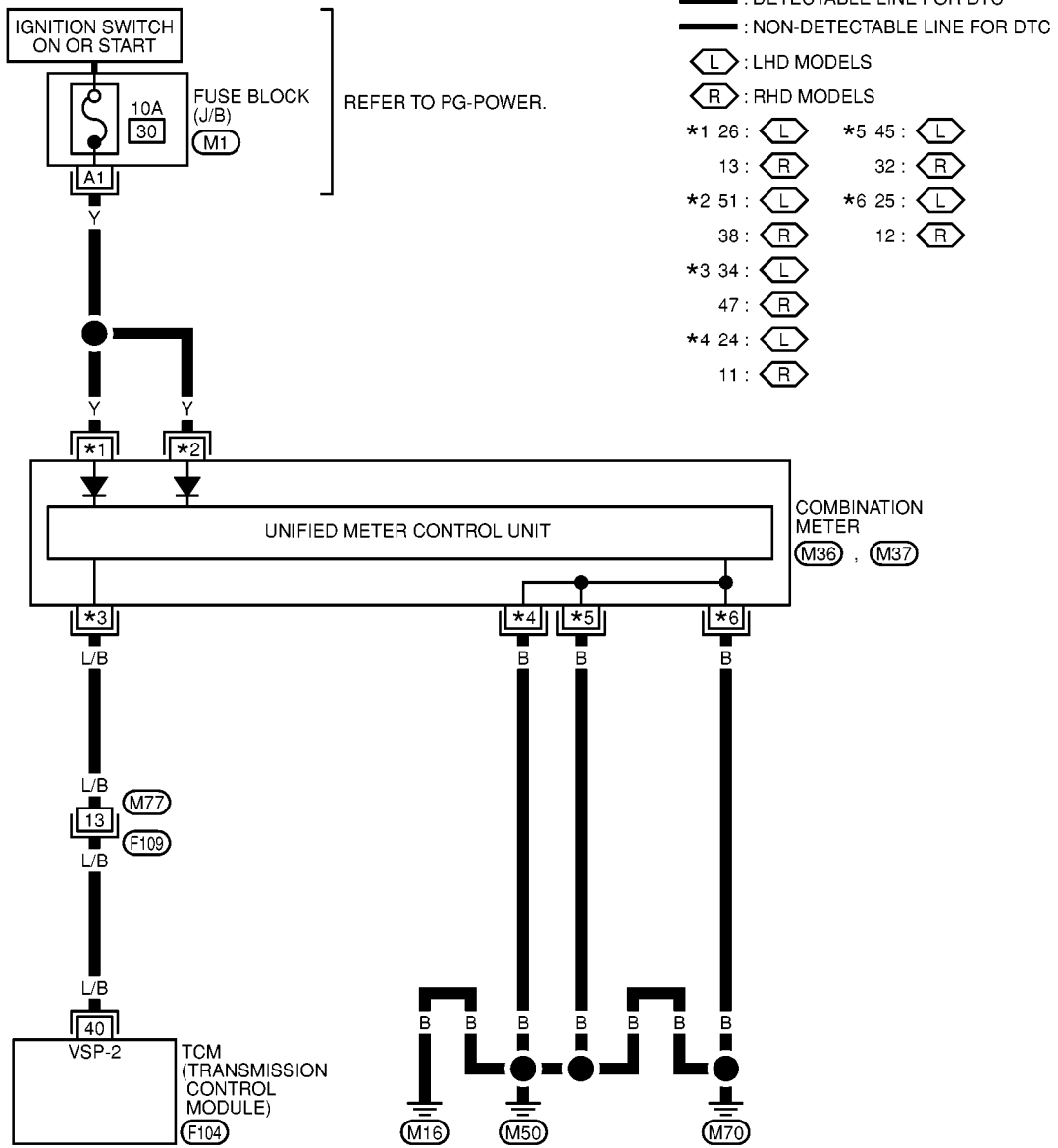
# DTC VEHICLE SPEED SENSOR MTR

[ALL]

## Wiring Diagram — AT — VSSMTR

ECS005YV

### AT-VSSMTR-01



REFER TO THE FOLLOWING.  
 (M1) - FUSE BLOCK-JUNCTION BOX (J/B)

MCWA0004E

**Diagnostic Procedure**

**1. CHECK INPUT SIGNAL**

**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-MTR" while driving.  
Check the value changes according to driving speed.

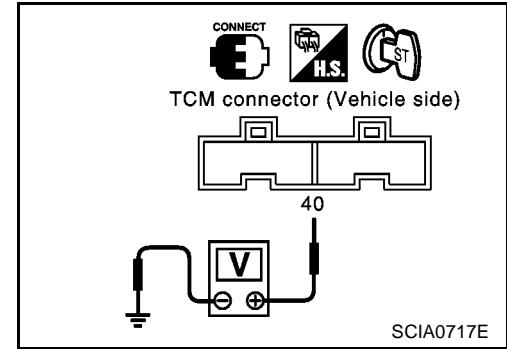
**Without CONSULT-II**

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.**

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 2

NG >> Check the following items:

- Vehicle speed sensor and ground circuit for vehicle speed sensor  
Refer to [DI-5, "COMBINATION METERS \(LHD MODELS\)"](#) or [DI-34, "COMBINATION METERS \(RHD MODELS\)"](#).
- Harness for short or open between TCM and vehicle speed sensor (Main harness)

**2. CHECK DTC**

Perform [AT-348, "SELF-DIAGNOSIS CODE 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.

# ACCELE RATOR PEDAL POSITION (APP) SENSOR

[ALL]

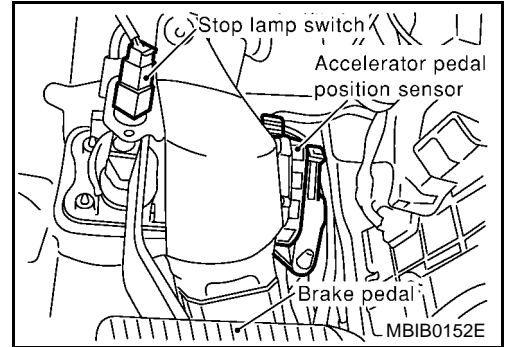
## ACCELE RATOR PEDAL POSITION (APP) SENSOR

PF2:22620

### Description

ECS005YX

Accelerator pedal position (APP) sensor (Throttle position sensor)  
Electric throttle control actuator consists of throttle control motor, acceleration pedal position sensor, throttle position sensor, etc. The actuator sends a signal to the TCM.



### CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

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

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)	
32	R	Throttle position sensor (Power source)	or	When turning ignition switch "ON".	4.5 - 5.5V
				When turning ignition switch "OFF".	0V
41	W/R	Throttle position sensor		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	Ground (Throttle position sensor)	—	—	—

### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
: THROTTLE POSI SEN*	TCM receives an excessively low or high voltage from the sensor.	<ul style="list-style-type: none"> <li>Harness or connectors (The sensor circuit is open or shorted.)</li> <li>Accelerator pedal position (APP) sensor (Throttle position sensor)</li> </ul>
: 3rd judgement flicker		

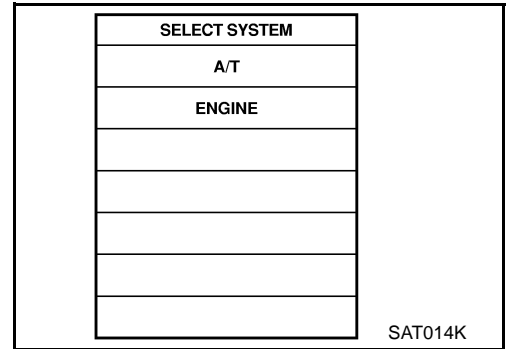
\*:This code means Accelerator pedal position (APP) sensor in reality.

## SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

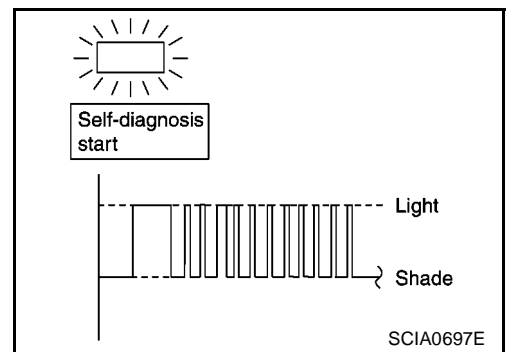
### ④ With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for A/T with CONSULT-II.
3. Drive vehicle under the following conditions:  
Selector lever in "D" position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/2 of the full throttle position and driving for more than 3 seconds.
4. If DTC is detected, go to [AT-354, "Diagnostic Procedure"](#).



### ⊗ Without CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:  
Selector lever in "D" position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/2 of the full throttle position and driving for more than 3 seconds.
3. Perform self-diagnosis.  
Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#).
4. If DTC is detected, go to [AT-354, "Diagnostic Procedure"](#).





# ACCELERATOR PEDAL POSITION (APP) SENSOR

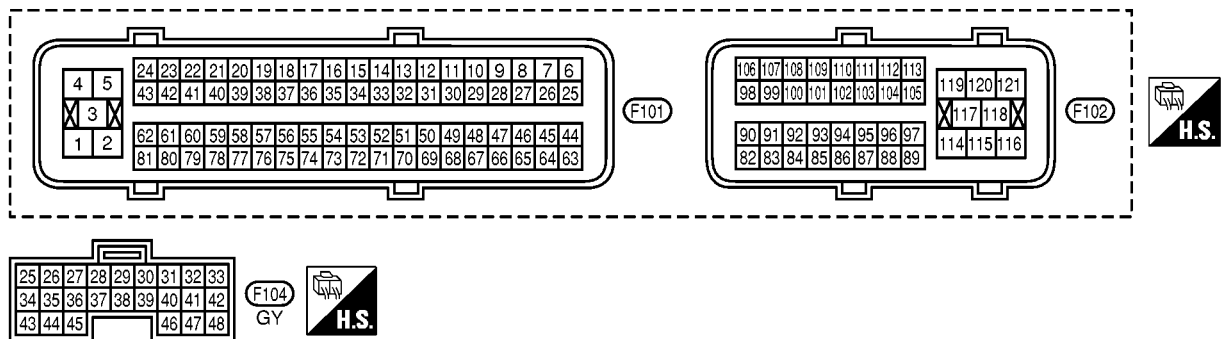
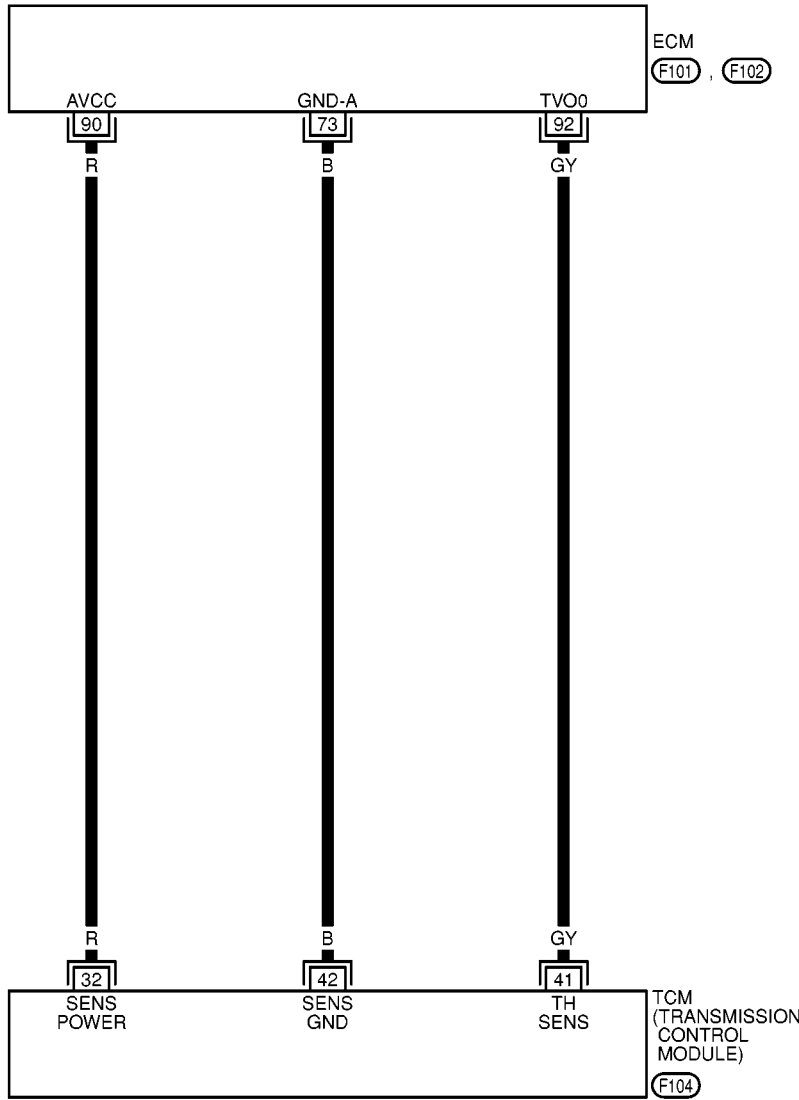
[ALL]

## Wiring Diagram — AT — TPS

ECS005YY

AT-TPS-01

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



MCWA0005E

## Diagnostic Procedure

EC5005YZ

### 1. CHECK DTC WITH ECM

- Check DTC with CONSULT-II "ENGINE".

Turn ignition switch ON and select "SELF DIAGNOSTIC RESULTS" mode for "ENGINE" with CONSULT-II. Refer to [EC-61, "Emission-related Diagnostic Information"](#) (Euro OBD) or [EC-593, "Emission-related Diagnostic Information"](#) (Except Euro OBD).

OK or NG

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

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

NG >> Perform trouble diagnosis for the DTC for engine control.

### 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.

SELECT SYSTEM	
A/T	
ENGINE	

SAT014K

3. Read out the value of "THRTL POS SEN".

**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 circuit. (Main harness)

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

# ACCELERATOR PEDAL POSITION (APP) SENSOR

[ALL]

## 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 and 42 while accelerator pedal is depressed slowly.

#### Voltage:

**Fully-closed throttle valve :Approximately 0.5V**

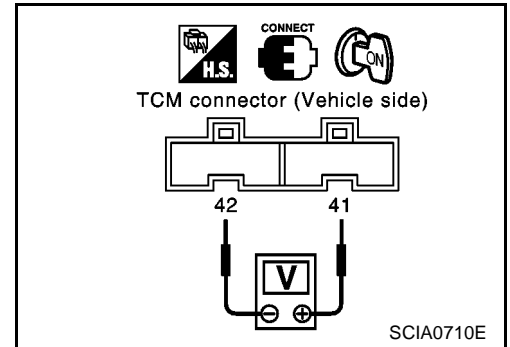
**Fully-open throttle valve :Approximately 4V**

**(Voltage rises gradually in response to throttle position.)**

#### OK or NG

OK >> GO TO 4

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



## 4. CHECK DTC

Perform [AT-352, "SELF-DIAGNOSIS CODE 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.

# SHIFT SOLENOID VALVE A

[ALL]

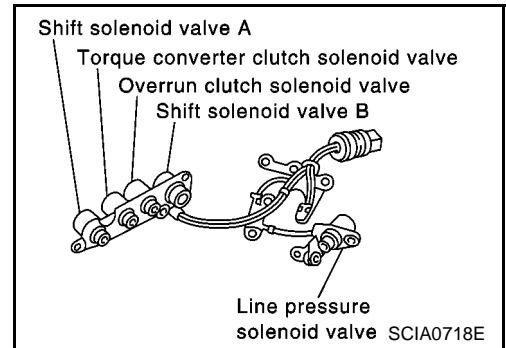
## SHIFT SOLENOID VALVE A

PFP:31940

### Description

ECS00520

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)

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
11	L/W	Shift solenoid valve A	When shift solenoid valve A operates. (When driving in “D1 ” or “D4 ”.)	Battery voltage
			When shift solenoid valve A does not operate. (When driving in “D2 ” or “D3 ”.)	0V

### ON BOARD DIAGNOSIS LOGIC

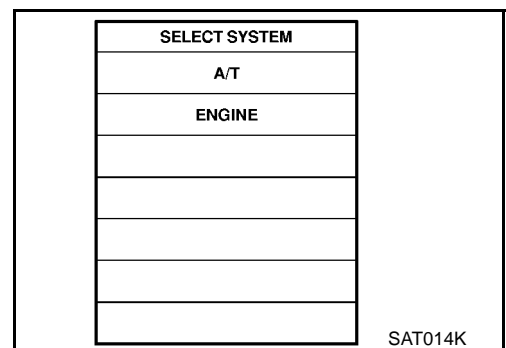
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
P0750 : SHIFT SOLENOID/VA P0751 : 4th judgement flicker	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	<ul style="list-style-type: none"> <li>● Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>● Shift solenoid valve A</li> </ul>

### SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

#### With CONSULT-II

1. Start engine.
2. Select “SELF-DIAG RESULTS” mode for A/T with CONSULT-II.
3. Drive vehicle in D1 → D2 position.
4. IF DTC is detected, go to [AT-359, "Diagnostic Procedure"](#) .

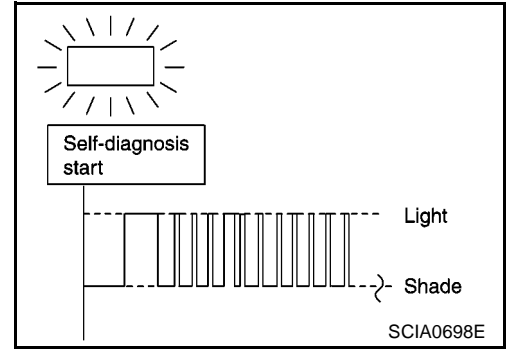


# SHIFT SOLENOID VALVE A

[ALL]

## ⊗ Without CONSULT-II

1. Start engine.
2. Drive vehicle in D1 → D2 position.
3. Perform self-diagnosis.  
Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#) .
4. If DTC is detected, go to [AT-359, "Diagnostic Procedure"](#) .



A

B

AT

D

E

F

G

H

I

J

K

L

M

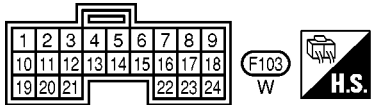
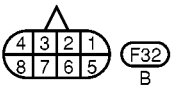
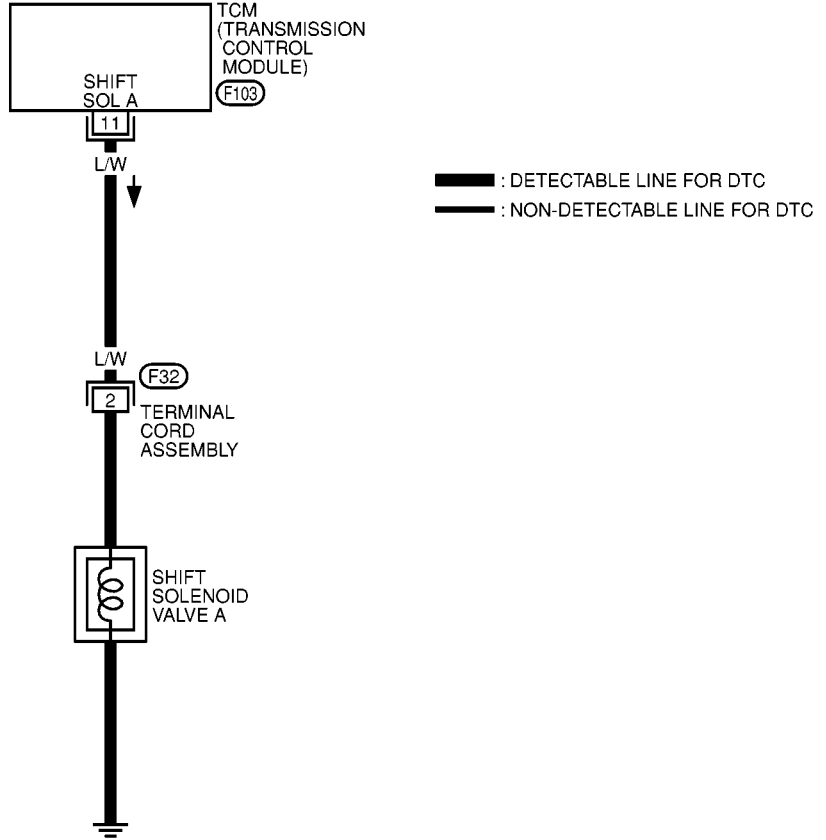
# SHIFT SOLENOID VALVE A

[ALL]

## Wiring Diagram — AT — SSV/A

ECS005Z1

AT-SSV/A-01



MCWA0006E

## Diagnostic Procedure

### 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 2 and ground.

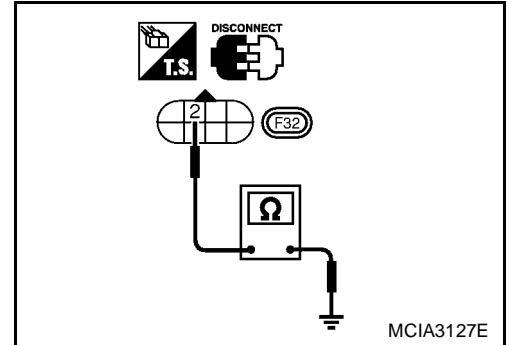
**Resistance : 20 - 30Ω**

OK or NG

OK >> GO TO 2

NG >> 1. Remove control valve assembly. Refer to [AT-404, "REMOVAL"](#).

2. Check the following items:  
Shift solenoid valve A  
Refer to [AT-360, "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.
3. Check continuity between terminal 2 and TCM harness connector terminal 11.

**Continuity should exist.**

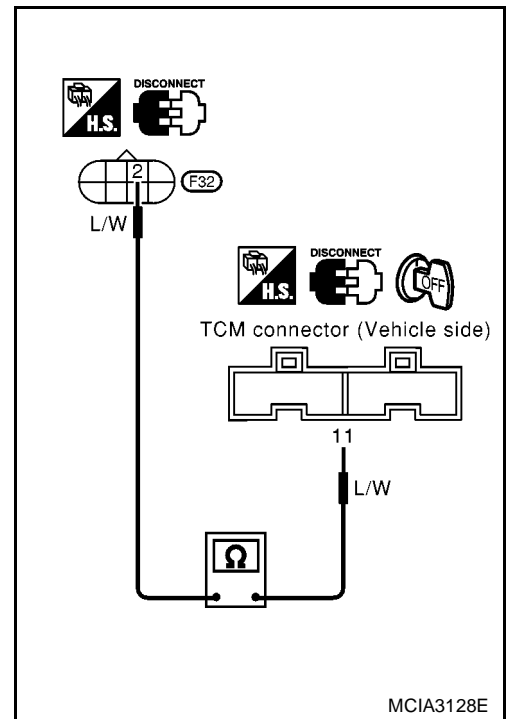
If OK, check harness for short to ground and short to power.

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.



### 3. CHECK DTC

Perform [AT-356, "SELF-DIAGNOSIS CODE 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.

# SHIFT SOLENOID VALVE A

[ALL]

ECS005Z3

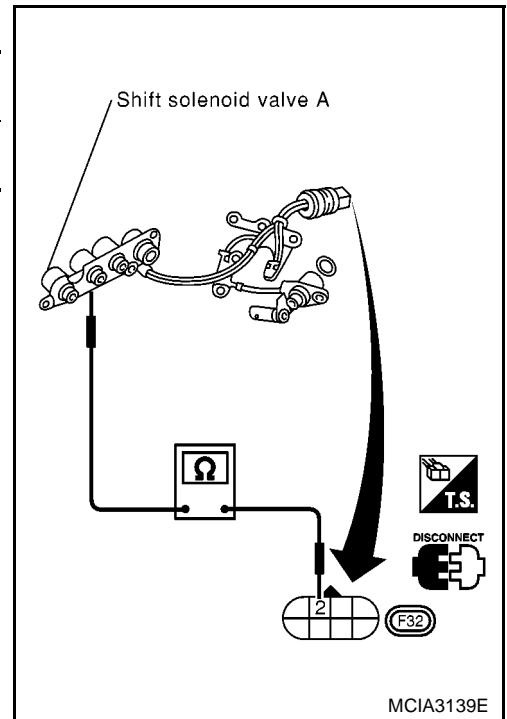
## Component Inspection SHIFT SOLENOID VALVE A

- For removal, refer to [AT-404, "REMOVAL"](#).

### Resistance Check

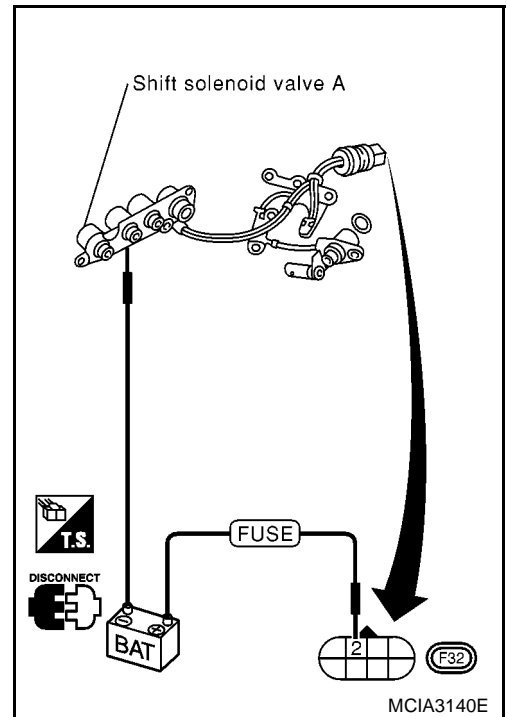
- Check resistance between two terminals.

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.





# SHIFT SOLENOID VALVE B

[ALL]

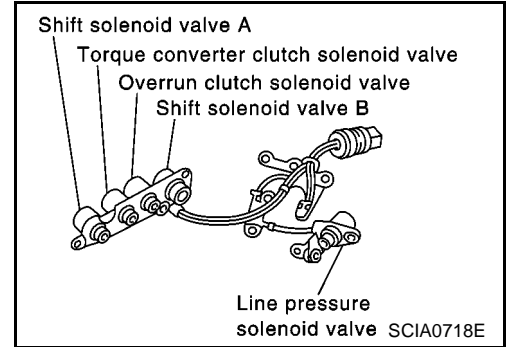
## SHIFT SOLENOID VALVE B

PF3:31940

### Description

ECS005Z4

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)

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
12	L/Y	Shift solenoid valve B	When shift solenoid valve B operates. (When driving in "D1" or "D2".)	Battery voltage
			When shift solenoid valve B does not operate. (When driving in "D3" or "D4".)	0V

### ON BOARD DIAGNOSIS LOGIC

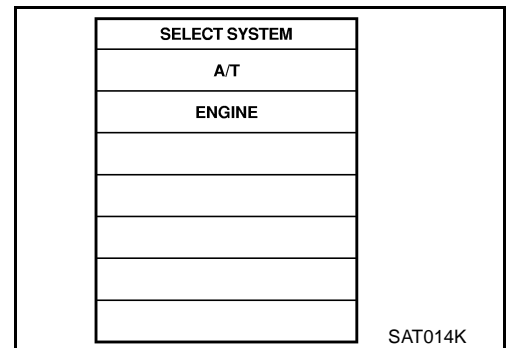
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
P0563 : SHIFT SOLENOID/VB P0564 : 5th judgement flicker	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	<ul style="list-style-type: none"> <li>● Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>● Shift solenoid valve B</li> </ul>

### SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

#### With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for A/T with CONSULT-II.
3. Drive vehicle in D1 → D2 → D3 position.
4. IF DTC is detected, go to [AT-364, "Diagnostic Procedure"](#) .

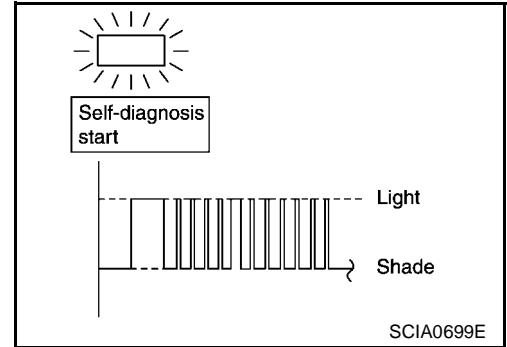


## SHIFT SOLENOID VALVE B

[ALL]

### ⊗ Without CONSULT-II

1. Start engine.
2. Drive vehicle in D1 → D2 → D3 position.
3. Perform self-diagnosis.  
Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#) .
4. If DTC is detected, go to [AT-364, "Diagnostic Procedure"](#) .



# SHIFT SOLENOID VALVE B

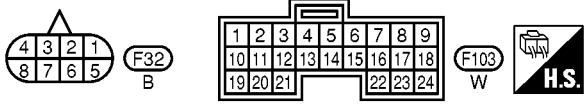
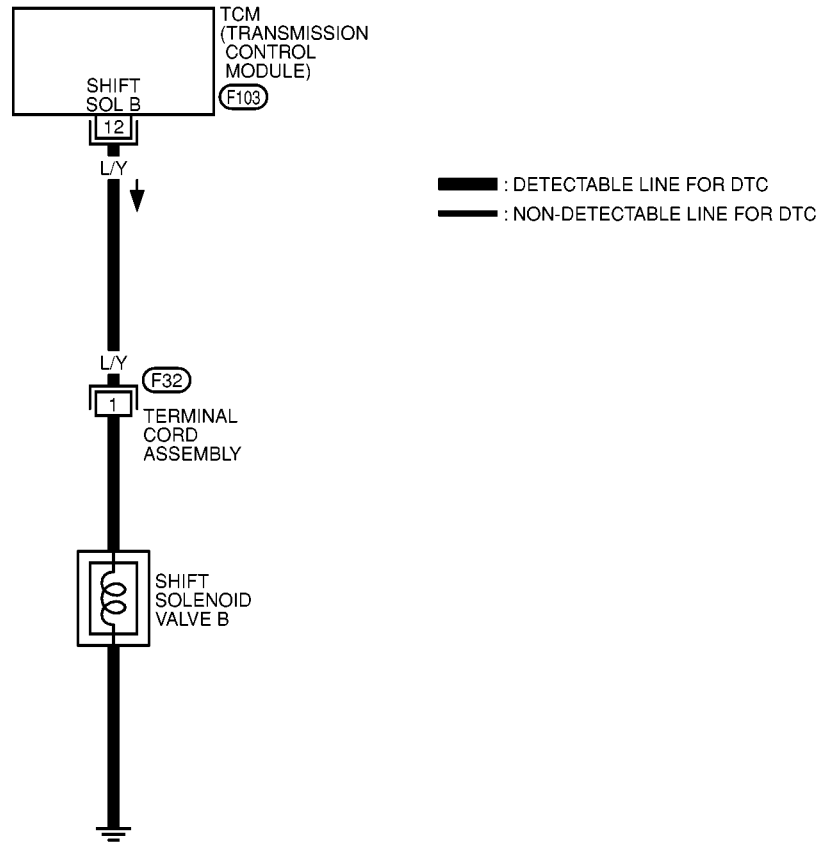
[ALL]

## Wiring Diagram — AT — SSV/B

ECS005Z5

AT-SSV/B-01

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



## Diagnostic Procedure

### 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.

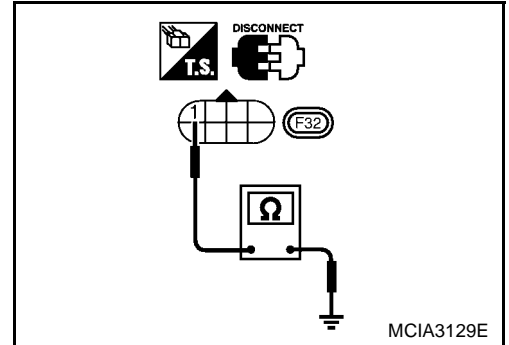
**Resistance : 5 - 20Ω**

OK or NG

OK >> GO TO 2

NG >> 1. Remove control valve assembly. Refer to [AT-404](#), "REMOVAL" .

2. Check the following items:  
Shift solenoid valve B  
Refer to [AT-365](#), "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.
3. Check continuity between terminal 12 and TCM harness connector terminal 1.

**Continuity should exist.**

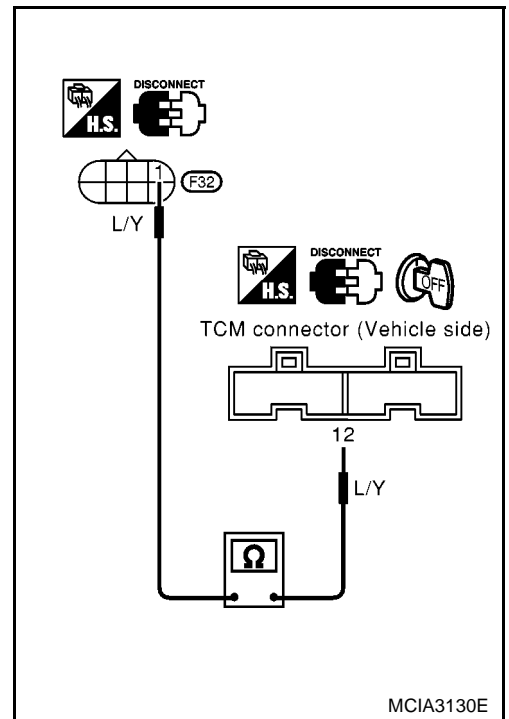
If OK, check harness for short to ground and short to power.

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.



### 3. CHECK DTC

Perform [AT-361](#), "SELF-DIAGNOSIS CODE 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.

# SHIFT SOLENOID VALVE B

[ALL]

ECS00527

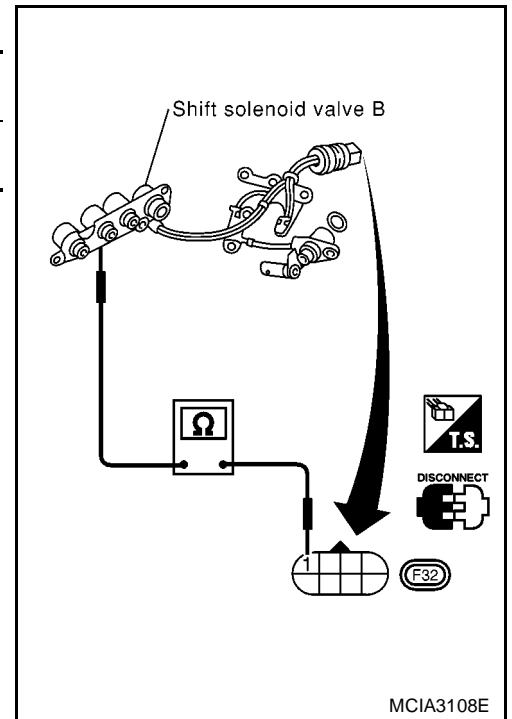
## Component Inspection SHIFT SOLENOID VALVE B

- For removal, refer to [AT-404, "REMOVAL"](#) .

### Resistance Check

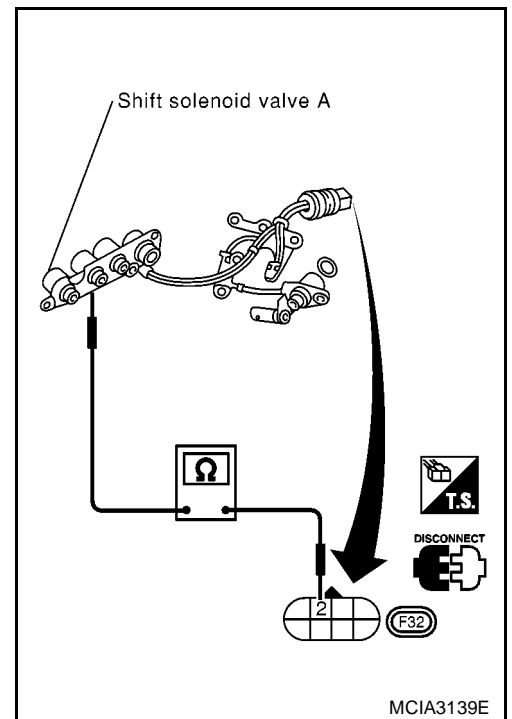
- Check resistance between two terminals.

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.



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# OVERRUN CLUTCH SOLENOID VALVE

[ALL]

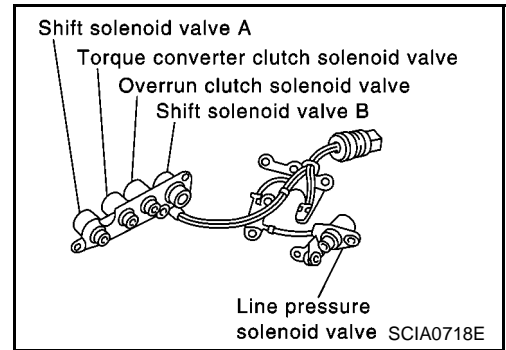
## OVERRUN CLUTCH SOLENOID VALVE

PFP:31940

### Description

ECS005Z8

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.



### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
20	L/B	Overrun clutch solenoid valve	When overrun clutch solenoid valve operates.	Battery voltage
			When overrun clutch solenoid valve does not operate.	0V

### ON BOARD DIAGNOSIS LOGIC

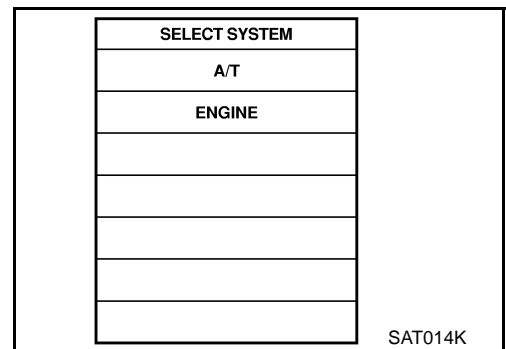
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
P0750 : OVERRUN CLUTCH S/V P0751 : 6th judgement flicker	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	<ul style="list-style-type: none"> <li>● Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>● Overrun clutch solenoid valve</li> </ul>

### SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

#### With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for A/T with CONSULT-II.
3. Drive vehicle under the following conditions:  
Selector lever in "D" position, overdrive control switch in "OFF" position and vehicle speed higher than 10 km/h (6 MPH).
4. If DTC is detected, go to [AT-369, "Diagnostic Procedure"](#).

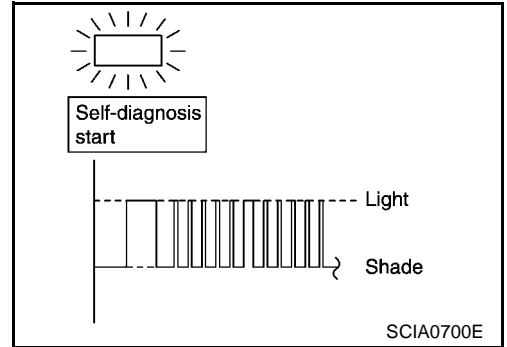


# OVERRUN CLUTCH SOLENOID VALVE

[ALL]

## ⊗ Without CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:  
Selector lever in "D" position, overdrive control switch in "OFF" position and vehicle speed higher than 10 km/h (6 MPH).
3. Perform self-diagnosis.  
Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#) for EXC. F/EURO-OBD, [AT-48, "Diagnostic Procedure Without CONSULT-II"](#) for EURO-OBD.
4. If DTC is detected, go to [AT-369, "Diagnostic Procedure"](#) .



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

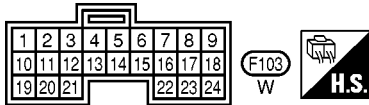
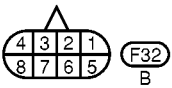
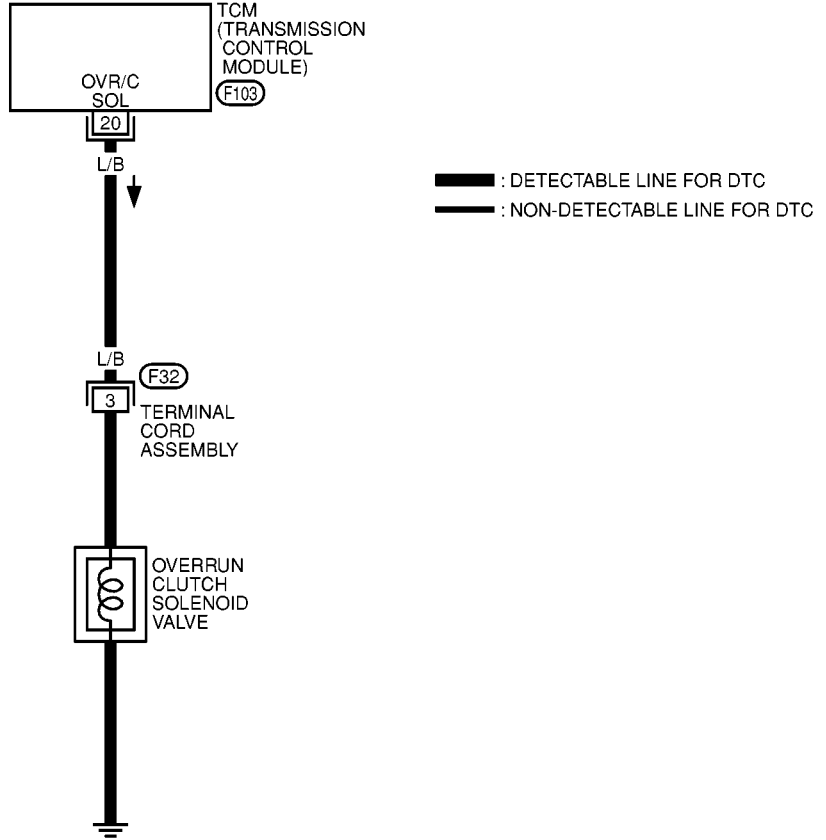
# OVERRUN CLUTCH SOLENOID VALVE

[ALL]

## Wiring Diagram — AT — OVRCSV

ECS005Z9

AT-OVRCSV-01



MCWA0008E



# OVERRUN CLUTCH SOLENOID VALVE

[ALL]

ECS005ZA

## Diagnostic Procedure

### 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.

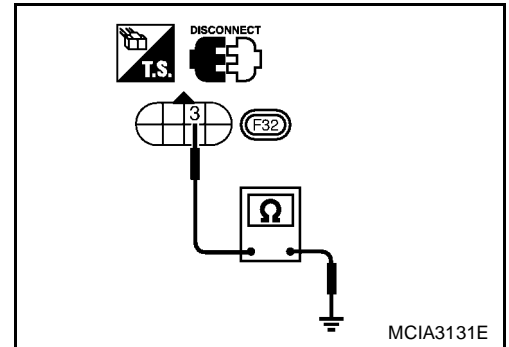
**Resistance : 20 - 30Ω**

OK or NG

OK >> GO TO 2

NG >> 1. Remove control valve assembly. Refer to [AT-439, "Control Valve Assembly"](#).

2. Check the following items:  
Overrun clutch solenoid valve  
Refer to [AT-369, "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.
3. Check continuity between terminal 3 and TCM harness connector terminal 20.

**Continuity should exist.**

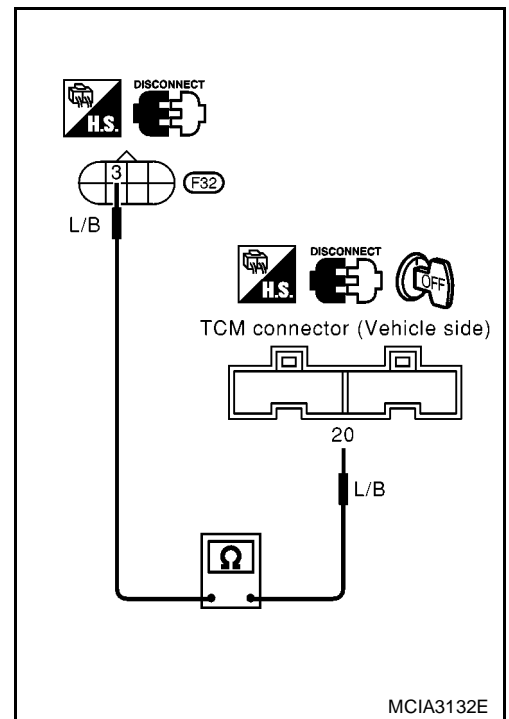
If OK, check harness for short to ground and short to power.

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.



### 3. CHECK DTC

Perform [AT-366, "SELF-DIAGNOSIS CODE 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.

## Component Inspection OVERRUN CLUTCH SOLENOID VALVE

ECS005ZB

- For removal, refer to [AT-404, "REMOVAL"](#).

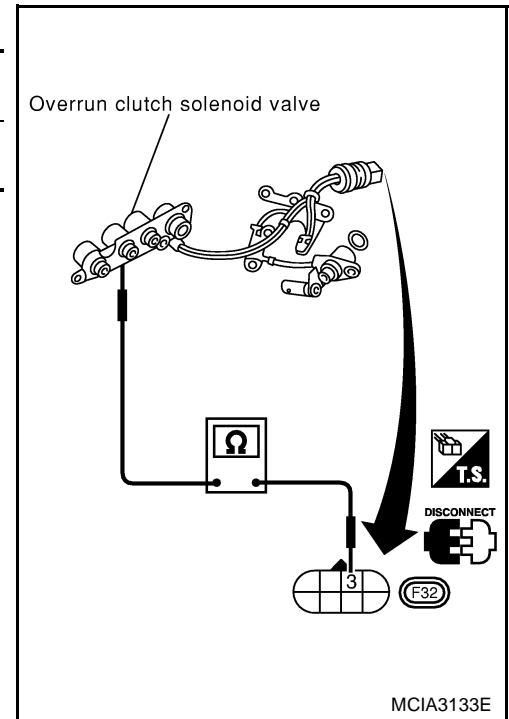
# OVERRUN CLUTCH SOLENOID VALVE

[ALL]

## Resistance Check

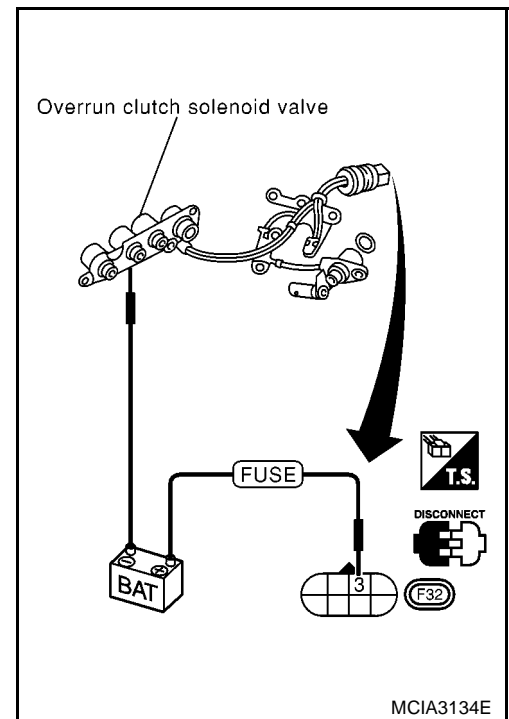
- Check resistance between two terminals.

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.



# TORQUE CONVERTER CLUTCH SOLENOID VALVE

[ALL]

## TORQUE CONVERTER CLUTCH SOLENOID VALVE

PF3:31940

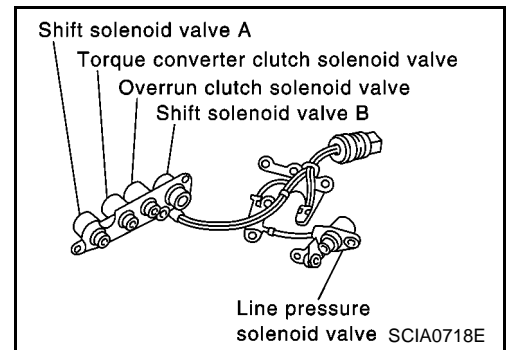
### Description

ECS005ZC

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 throttle position sensors. 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"	Approximately 4%
	↓ Lock-up "ON"	↓ Approximately 94%

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
3	GY/R	Torque converter clutch solenoid valve	When A/T performs lock-up.	8 - 15V
			When A/T does not perform lock-up.	0V

### ON BOARD DIAGNOSIS LOGIC

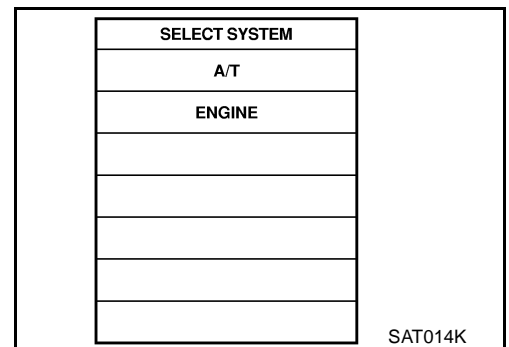
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
Ⓟ : T/C CLUTCH SOL/V	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	<ul style="list-style-type: none"> <li>● Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>● T/C clutch solenoid valve</li> </ul>
ⓧ : 7th judgement flicker		

### SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

#### Ⓟ With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for A/T with CONSULT-II.
3. Drive vehicle in D1 → D2 → D3 → D4 → D4 lock-up position.
4. If DTC is detected, go to [AT-374, "Diagnostic Procedure"](#).

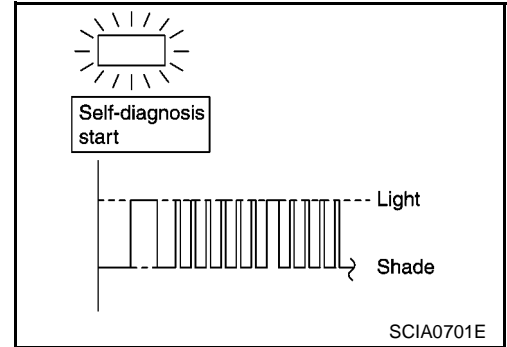


# TORQUE CONVERTER CLUTCH SOLENOID VALVE

[ALL]

## ⊗ Without CONSULT-II

1. Start engine.
2. Drive vehicle in D1 → D2 → D3 → D4 → D4 lock-up position.
3. Perform self-diagnosis.  
Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#) .
4. If DTC is detected, go to [AT-374, "Diagnostic Procedure"](#) .



# TORQUE CONVERTER CLUTCH SOLENOID VALVE

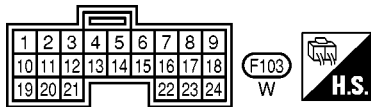
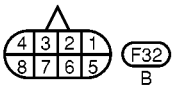
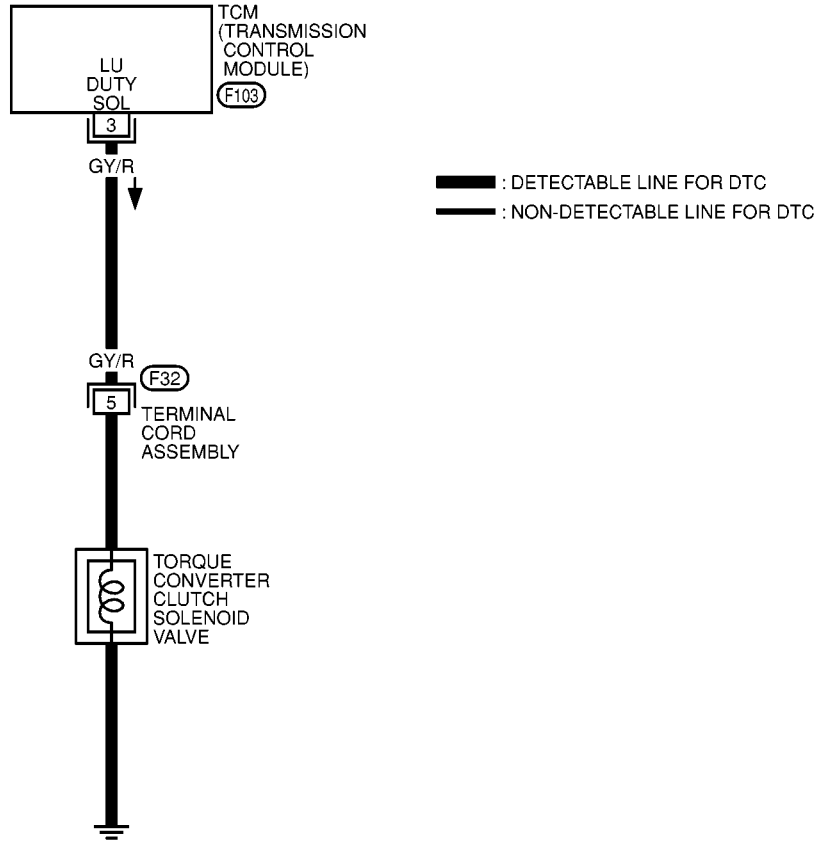
[ALL]

## Wiring Diagram — AT — TCV

ECS005ZD

AT-TCV-01

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



MCWA0009E

## Diagnostic Procedure

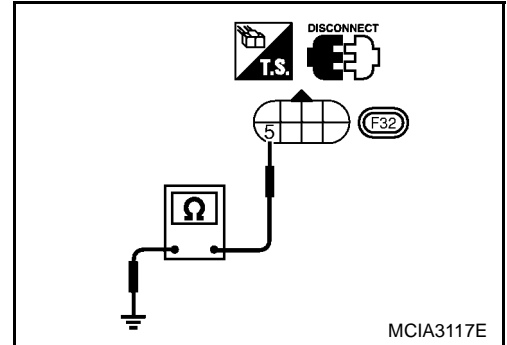
### 1. CHECK VALVE RESISTANCE

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

**Resistance: 5 - 20Ω**

OK or NG

- OK >> GO TO 2  
 NG >> 1. Remove oil pan. Refer to [AT-404, "REMOVAL"](#) .  
 2. Check the following items:  
 Torque converter clutch solenoid valve  
 Refer to [AT-375, "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.
3. Check continuity between terminal 5 and TCM harness connector terminal 3.

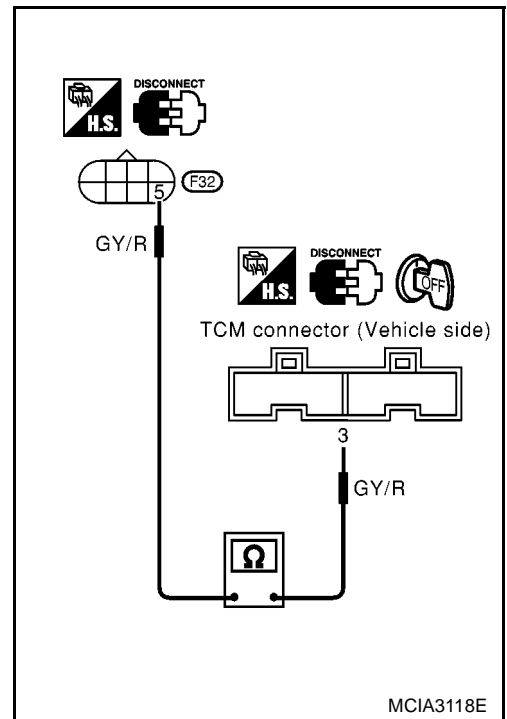
**Continuity should exist.**

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.



### 3. CHECK DTC

Perform [AT-371, "SELF-DIAGNOSIS CODE 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.

# TORQUE CONVERTER CLUTCH SOLENOID VALVE

[ALL]

ECS005ZF

## Component Inspection

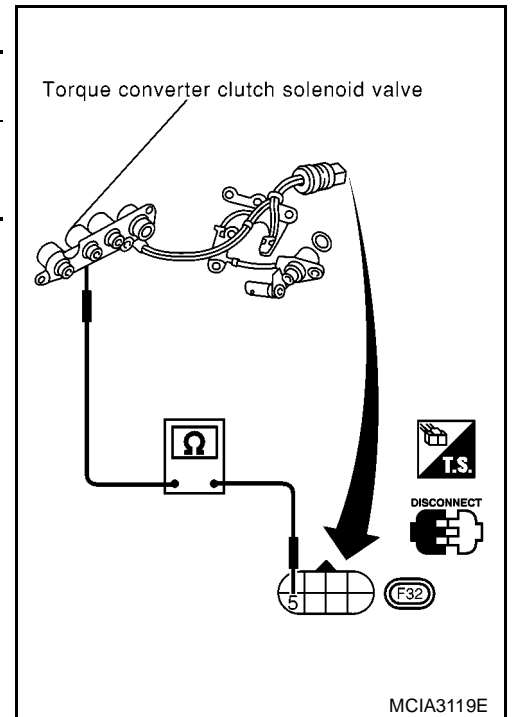
### TORQUE CONVERTER CLUTCH SOLENOID VALVE

- For removal, refer to [AT-404, "REMOVAL"](#) .

### Resistance Check

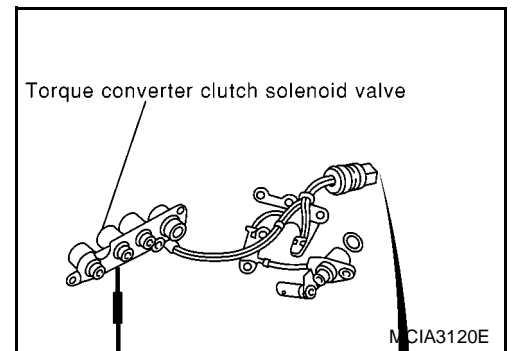
- Check resistance between two terminals.

Solenoid valve	Terminal 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.



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

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

[ALL]

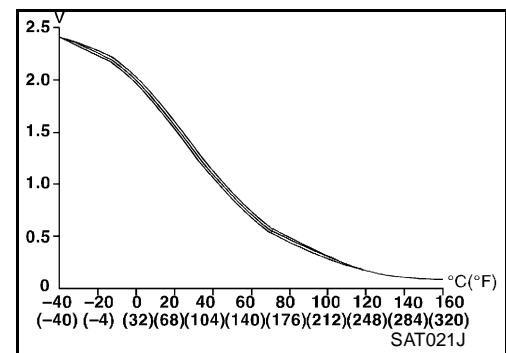
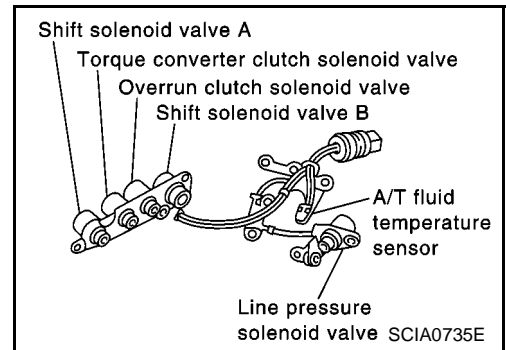
## BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)

PFP:31940

### Description

ECS005ZG

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

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)	
10	BR/W	Power source		When turning ignition switch to "ON".	Battery voltage
				When turning ignition switch to "OFF".	0V
19	BR/W	Power source	Same as No. 10		
28	R/B	Power source (Memory back-up)		When turning ignition switch to "OFF".	Battery voltage
				When turning ignition switch to "ON".	Battery voltage
42	B	Ground (A/T fluid temperature sensor)	—	—	
47	BR	A/T fluid temperature sensor		When ATF temperature is 20°C (68°F).	1.5V
				When ATF temperature is 80°C (176°F).	0.5V



## ON BOARD DIAGNOSIS LOGIC

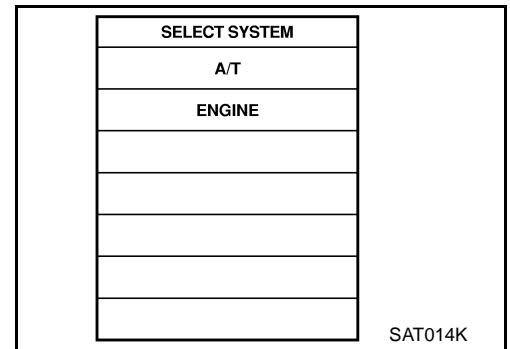
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
P : BATT/FLUID TEMP SEN X : 8th judgement flicker	TCM receives an excessively low or high voltage from the sensor.	<ul style="list-style-type: none"> <li>● Harness or connectors (The sensor circuit is open or shorted.)</li> <li>● A/T fluid temperature sensor</li> </ul>

## SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

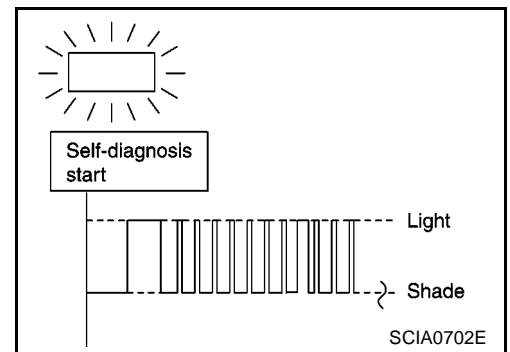
### With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for A/T with CONSULT-II.
3. Drive vehicle under the following conditions:  
Selector lever in "D" position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/8 of the full open position, engine speed higher than 450 rpm and driving for more than 10 minutes.
4. If DTC is detected, go to [AT-379, "Diagnostic Procedure"](#).



### Without CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:  
Selector lever in "D" position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/8 of the full open position, engine speed higher than 450 rpm and driving for more than 10 minutes.
3. Perform self-diagnosis.  
Refer to [AT-48, "Diagnostic Procedure Without CONSULT-II"](#) (Euro OBD) or [AT-249, "Diagnostic Procedure Without CONSULT-II"](#) (Except Euro OBD).
4. If DTC is detected, go to [AT-379, "Diagnostic Procedure"](#).



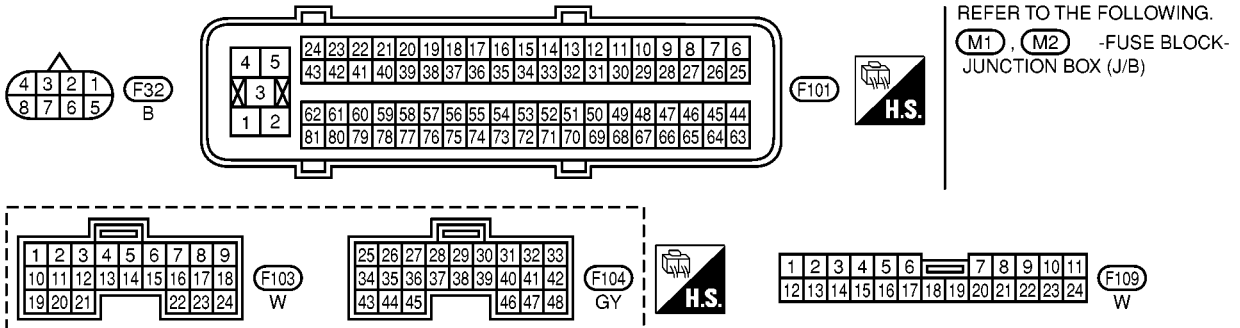
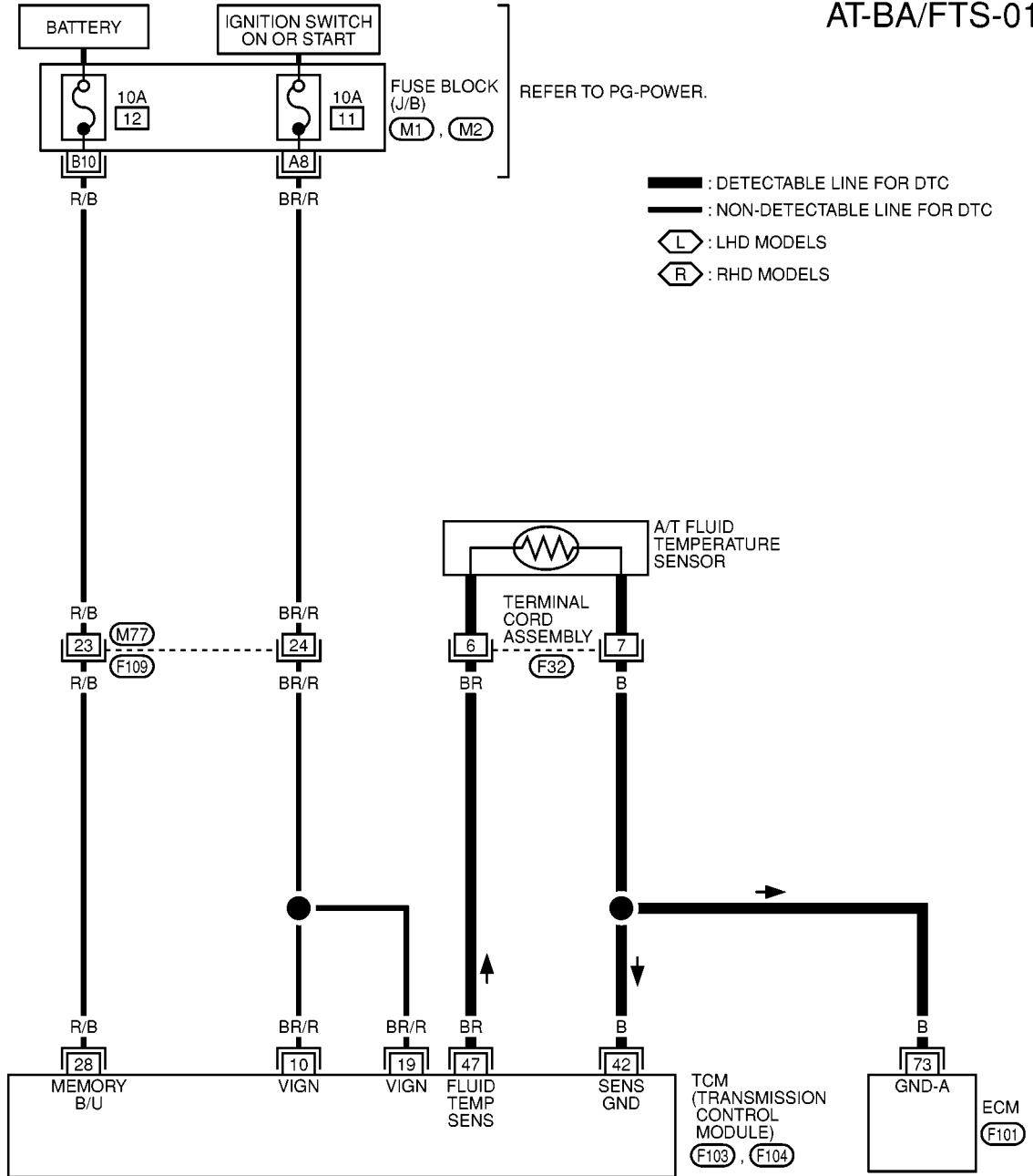
# BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)

[ALL]

## Wiring Diagram — AT — BA/FTS

ECS005ZH

AT-BA/FTS-01



MCWA0010E

## Diagnostic Procedure

### 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.

**Voltage: Battery voltage**

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

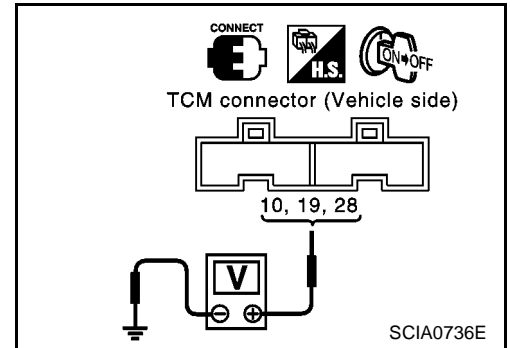
**Voltage: Battery voltage**

OK or NG

OK >> GO TO 2

NG >> Check the following items:

- Harness for short or open between ignition switch and TCM (Main harness)
- Ignition switch and fuse  
Refer to "[PG-3, "POWER SUPPLY ROUTING"](#) .



### 2. 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.

**Resistance Cold[20°C(68°F)]**

**: Approximately 2.5 kΩ**

4. Reinstall any part removed.

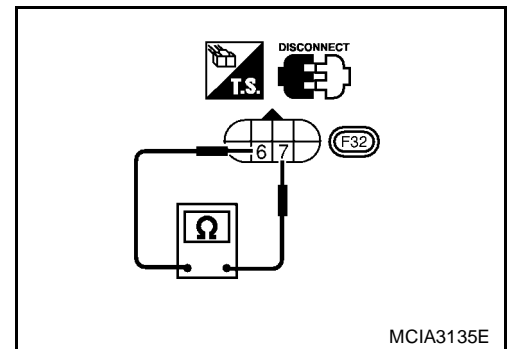
OK or NG

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-381, "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

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)] → Hot [80°C (176°F)]:

Approximately 1.5V→0.5V

#### OK or NG

OK >> GO TO 5

NG >> Check the following item:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM

Refer to [EC-144, "POWER SUPPLY CIRCUIT FOR ECM"](#) (With Euro-OBD) and [EC-657, "POWER SUPPLY CIRCUIT FOR ECM"](#) (Without Euro-OBD).

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

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

### Without CONSULT-II

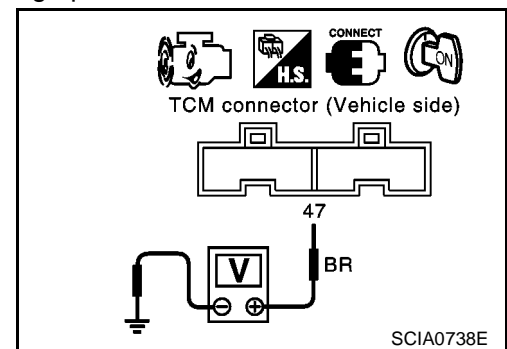
1. Start engine.
2. Check voltage between TCM terminal 47 and ground while warming up A/T.

#### Voltage

Cold [20°C (68°F)] → Hot [80°C (176°F)]:

Approximately 1.5V→0.5V

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



5. Check resistance between terminal 42 and ground.

Continuity should exist.

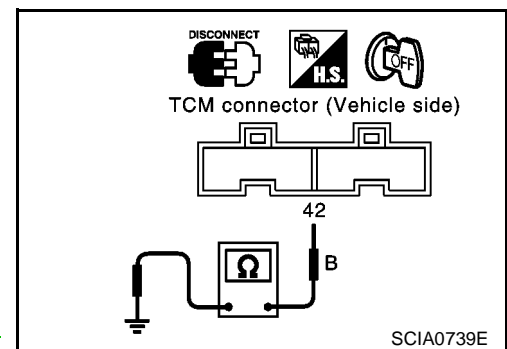
#### OK or NG

OK >> GO TO 5

NG >> Check the following item:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM

Refer to [EC-144, "POWER SUPPLY CIRCUIT FOR ECM"](#) (With Euro-OBD) and [EC-657, "POWER SUPPLY CIRCUIT FOR ECM"](#) (Without Euro-OBD).



## 5. CHECK DTC

Perform [AT-377, "SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE"](#) .

OK or NG

OK >> **INSPECTION END**

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

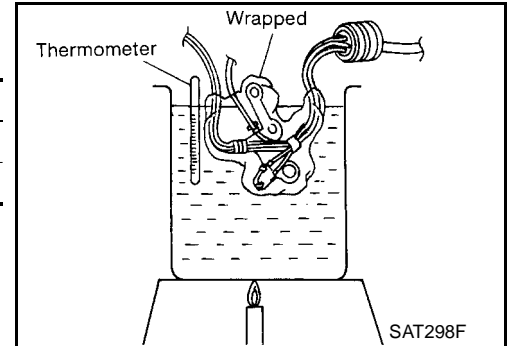
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

### Component Inspection A/T FLUID TEMPERATURE SENSOR

ECS005ZJ

- For removal, refer to [AT-403, "Installation"](#) .
- Check resistance between two terminals while changing temperature as shown at left.

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



# ENGINE SPEED SIGNAL

[ALL]

## ENGINE SPEED SIGNAL

PFP:24825

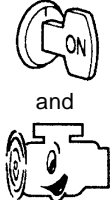
### Description

ECS005ZK

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

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
39	L/OR	Engine speed signal	 <p>Refer to <a href="#">EC-107, "ECM INSPECTION TABLE"</a> (EURO-OBD), <a href="#">EC-622, "ECM INSPECTION TABLE"</a> (EXCEPT FOR EURO-OBD).</p>	—

### ON BOARD DIAGNOSIS LOGIC

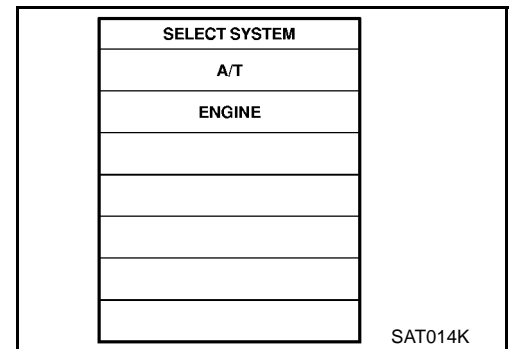
Diagnostic trouble code	Malfunction is detected when...	Check item (Possible cause)
<p>Ⓜ : ENGINE SPEED SIG</p> <p>ⓧ : 9th judgement flicker</p>	TCM does not receive the proper voltage signal from ECM.	<ul style="list-style-type: none"> <li>Harness or connectors (The sensor circuit is open or shorted.)</li> </ul>

### SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

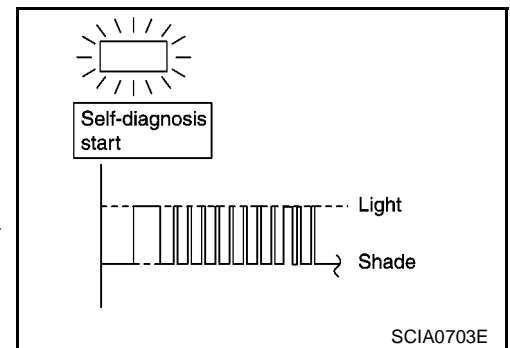
#### Ⓜ With CONSULT-II

- Start engine.
- Select "SELF-DIAG RESULTS" mode for A/T with CONSULT-II.
- Drive vehicle under the following conditions:  
Selector lever in "D" position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/8 of the full throttle position and driving for more than 10 seconds.
- If DTC is detected, go to [AT-384, "Diagnostic Procedure"](#).



#### ⓧ Without CONSULT-II

- Start engine.
- Drive vehicle under the following conditions:  
Selector lever in "D" position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/8 of the full throttle position and driving for more than 10 seconds.
- Perform self-diagnosis.  
Refer to [AT-371, "SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE"](#).
- If DTC is detected, go to [AT-384, "Diagnostic Procedure"](#).



# ENGINE SPEED SIGNAL

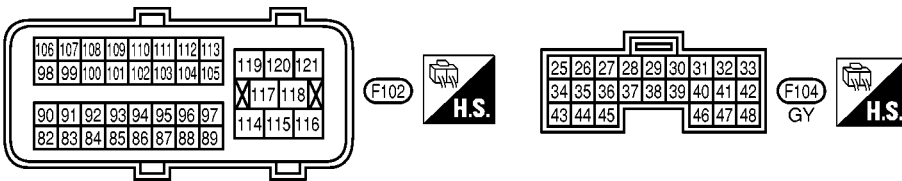
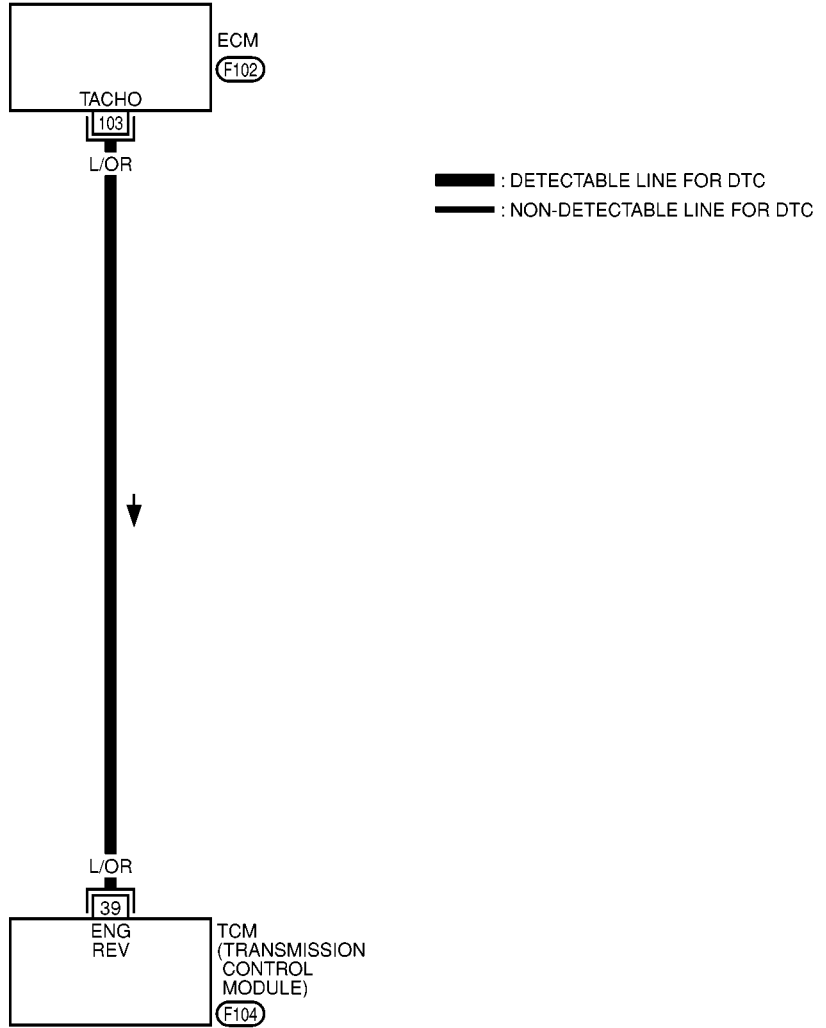
[ALL]

## Wiring Diagram — AT — ENGSS

ECS005ZL

AT-ENGSS-01

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



MCWA0011E

## Diagnostic Procedure

### 1. CHECK DTC WITH ECM

Perform "Overall function check" for ignition signal. Refer to [EC-524, "Diagnostic Procedure"](#) .

OK or NG

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

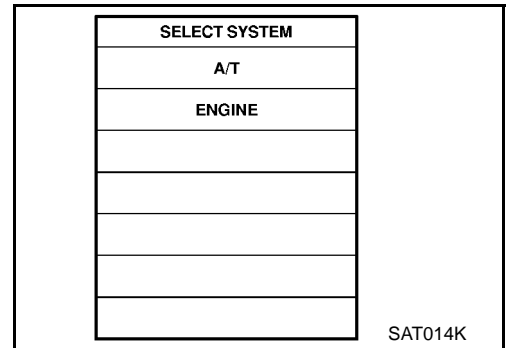
OK (Without CONSULT-II)>>GO TO 3

NG >> Follow the construction of [EC-524, "Diagnostic Procedure"](#) .

### 2. 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.



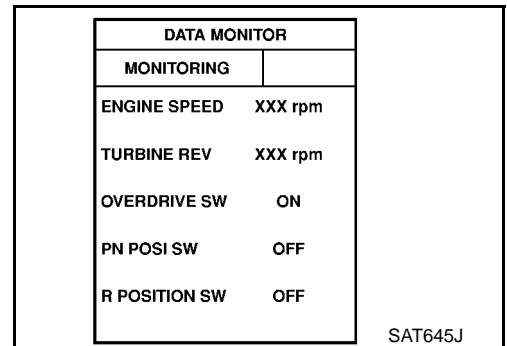
3. Read out the value of "ENGINE SPEED".  
Check engine speed changes according to throttle position.

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 [EC-520, "IGNITION SIGNAL"](#) .



### 3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

#### Without CONSULT-II

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

Voltage (Idle speed):

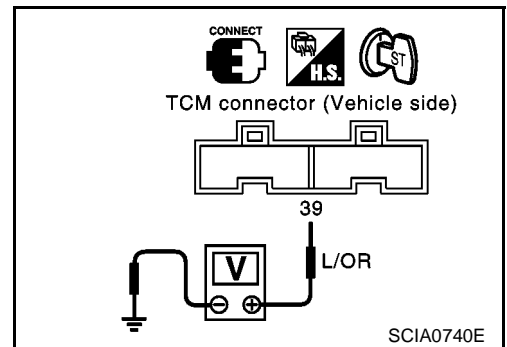
Refer to [EC-520, "IGNITION SIGNAL"](#) .

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 [EC-520, "IGNITION SIGNAL"](#) .





## 4. CHECK DTC

Perform [AT-382, "SELF-DIAGNOSIS CODE 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.

A

B

AT

D

E

F

G

H

I

J

K

L

M

# LINE PRESSURE SOLENOID VALVE

[ALL]

## LINE PRESSURE SOLENOID VALVE

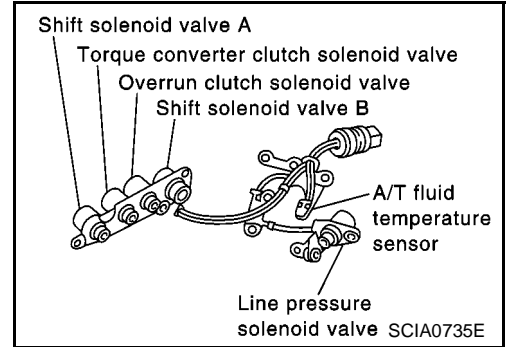
PFP:31940

### Description

ECS0052N

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
Line pressure solenoid valve duty	Small throttle opening (Low line pressure)	Approximately 24%
	Large throttle opening (High line pressure)	Approximately 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".

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
1	R/W	Line pressure solenoid valve	When releasing accelerator pedal after warming up engine.	1.5 - 3.0V
			When depressing accelerator pedal fully after warming up engine.	0V
2	P/B	Line pressure solenoid valve (with dropping resistor)	When releasing accelerator pedal after warming up engine.	5 - 14V
			When depressing accelerator pedal fully after warming up engine.	0V

### ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
P16 : LINE PRESSURE S/V P17 : 10th judgement flicker	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	<ul style="list-style-type: none"> <li>Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>Line pressure solenoid valve</li> </ul>

### SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

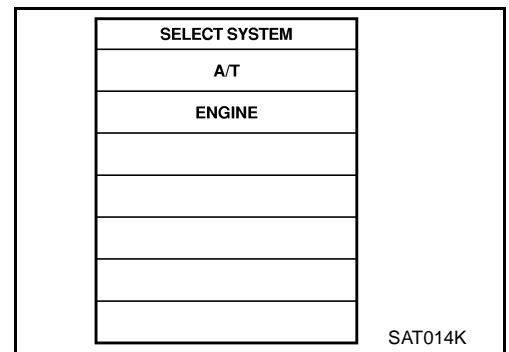
#### With CONSULT-II

1. Start engine.

# LINE PRESSURE SOLENOID VALVE

[ALL]

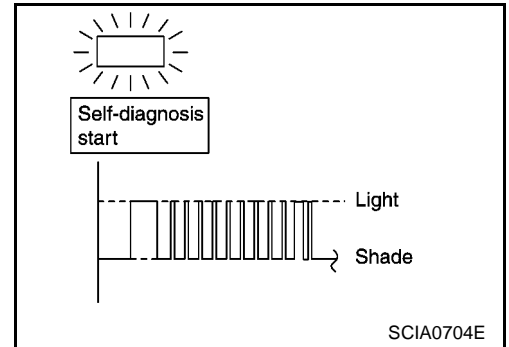
2. Select "SELF-DIAG RESULTS" mode for A/T with CONSULT-II.
3. With brake pedal depressed, shift the lever from "P" → "N" → "D" → "N" → "P" positions.
4. If DTC is detected, go to [AT-389, "Diagnostic Procedure"](#).



A  
B  
AT

## ⊗ Without CONSULT-II

1. Start engine.
2. With brake pedal depressed, shift the lever from "P" → "N" → "D" → "N" → "P" positions.
3. Perform self-diagnosis.  
Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#).
4. If DTC is detected, go to [AT-389, "Diagnostic Procedure"](#).



D  
E  
F  
G  
H  
I  
J  
K  
L  
M

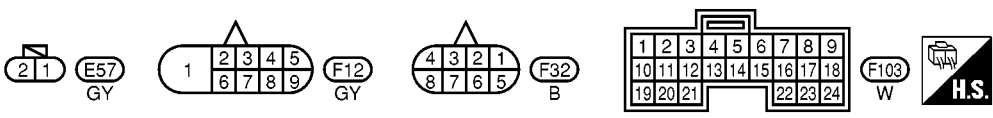
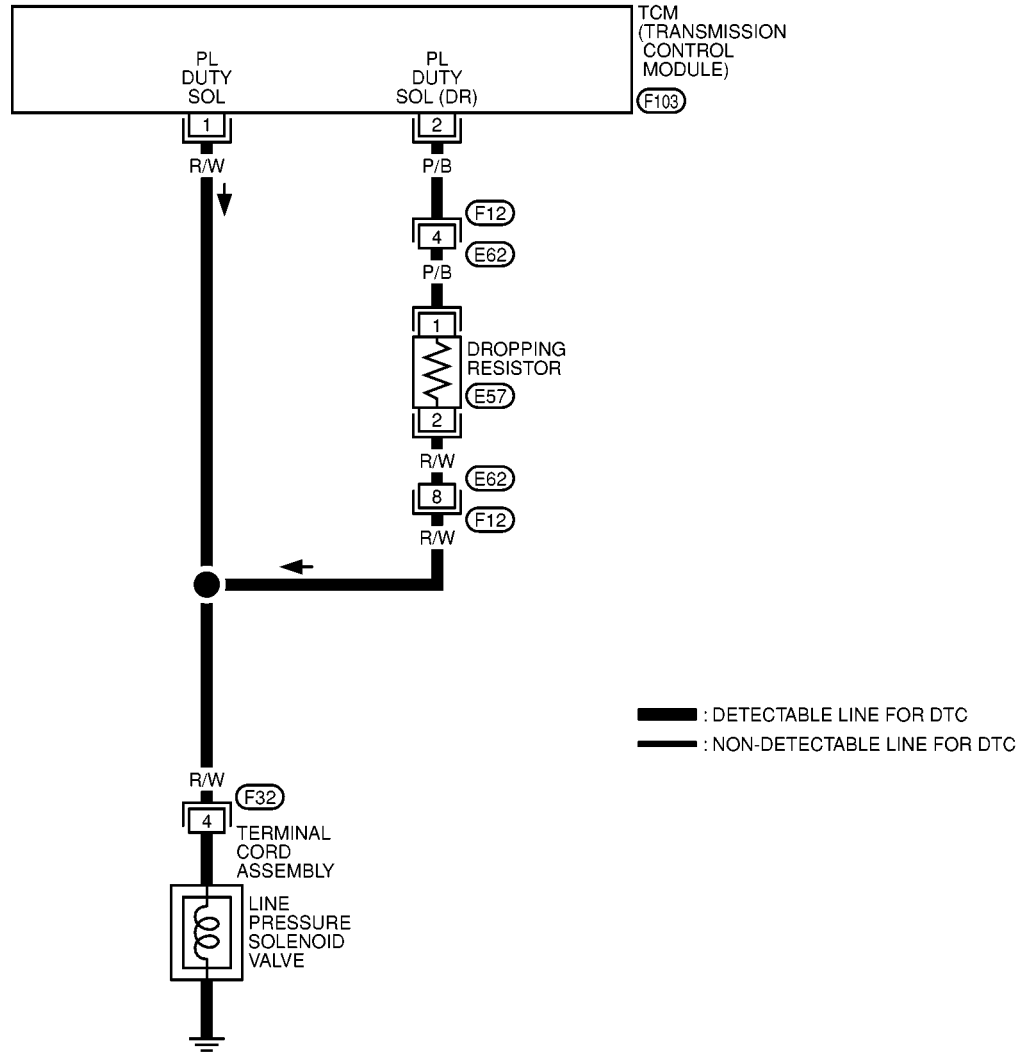
# LINE PRESSURE SOLENOID VALVE

[ALL]

## Wiring Diagram — AT — LPSV

ECS005Z0

AT-LPSV-01



## Diagnostic Procedure

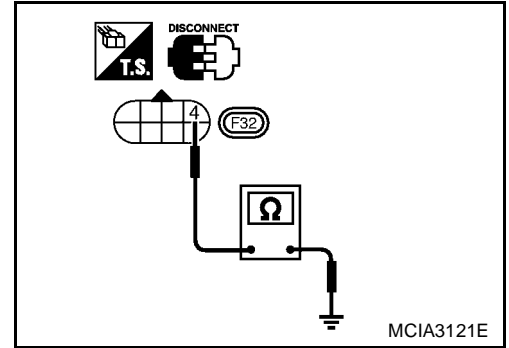
### 1. CHECK VALVE RESISTANCE

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

**Resistance: 2.5 - 5Ω**

OK or NG

- OK >> GO TO 2
- NG >> 1. Remove control valve assembly. Refer to [AT-403, "Installation"](#).
2. Check the following items:
- Line pressure solenoid valve  
Refer to [AT-390, "Component Inspection"](#).
  - Harness of terminal cord assembly for short or open



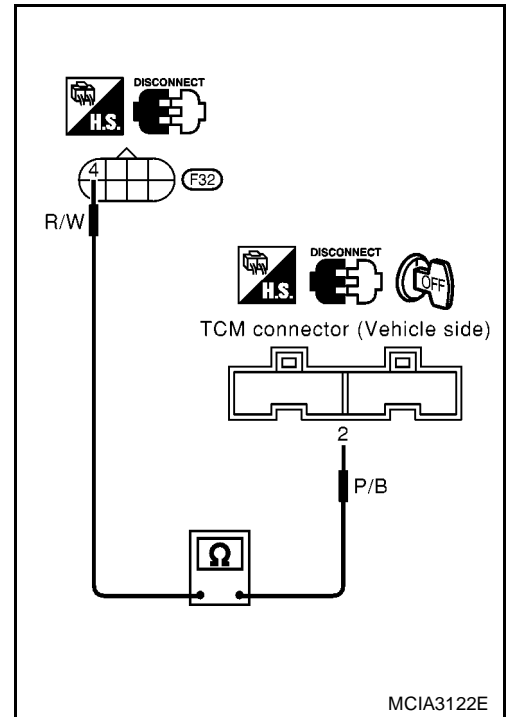
### 2. CHECK POWER SOURCE CIRCUIT

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

**Resistance: 10 - 15Ω**

OK or NG

- OK >> GO TO 3
- NG >> Check the following items:
- Dropping resistor  
Refer to [AT-390, "Component Inspection"](#).
  - 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.

**Resistance: Approx. 0Ω**

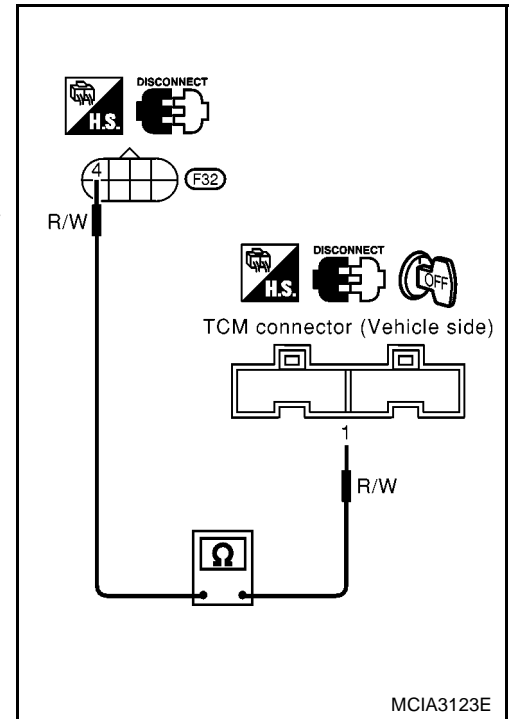
If OK, check harness for short to ground and short to power.

3. 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-386, "SELF-DIAGNOSIS CODE 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.

### Component Inspection LINE PRESSURE SOLENOID VALVE

ECS005ZQ

- For removal, refer to [AT-403, "Installation"](#) .

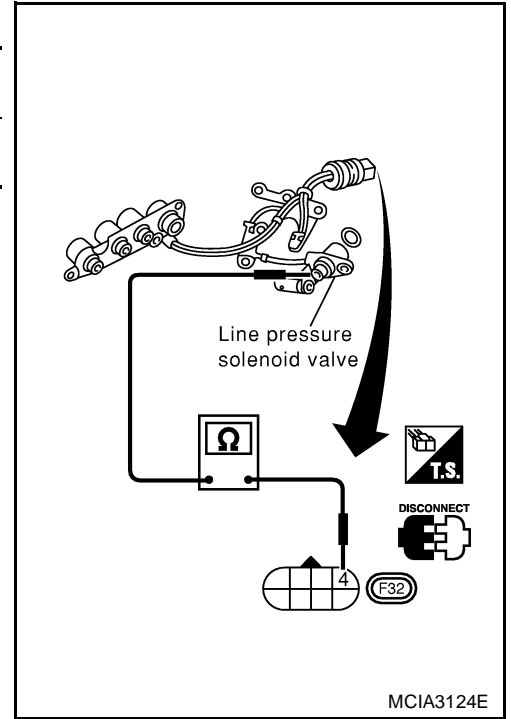
# LINE PRESSURE SOLENOID VALVE

[ALL]

## Resistance Check

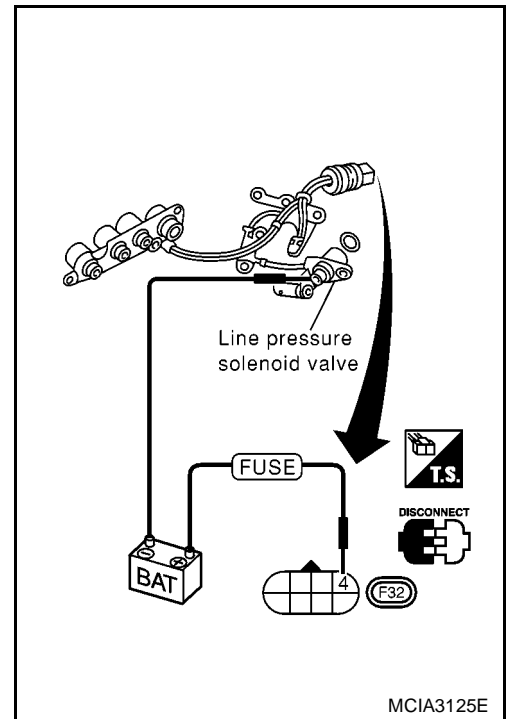
- Check resistance between two terminals.

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.



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

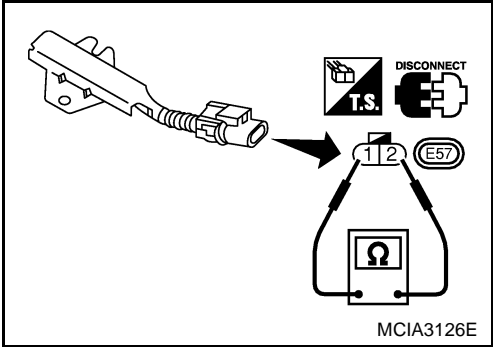
# LINE PRESSURE SOLENOID VALVE

[ALL]

## DROPPING RESISTOR

- Check resistance between two terminals.

Resistance: 10 - 15Ω





## CAN COMMUNICATION LINE

PFP:31940

### Description

ECS005ZR

CAN (Control 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.

### TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
5	B/W	CAN (H)	—	—	—
6	L/R	CAN (L)	—	—	—

\*: This terminal is connected to the ECM.

### On Board Diagnosis Logic

ECS005ZS

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
(P) : A/T COMM LINE** (X) : 11th judgement flicker	The ECM-AT communication line is open or shorted.	<ul style="list-style-type: none"> <li>● Harness or connectors (The solenoid circuit is open or shorted.)</li> <li>● Line pressure solenoid valve</li> </ul>

\*\*: A/T COMM LINE means CAN communication line.

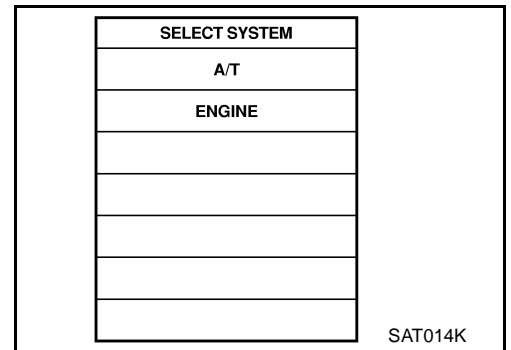
### Self-Diagnosis Code Confirmation Procedure

ECS005ZT

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

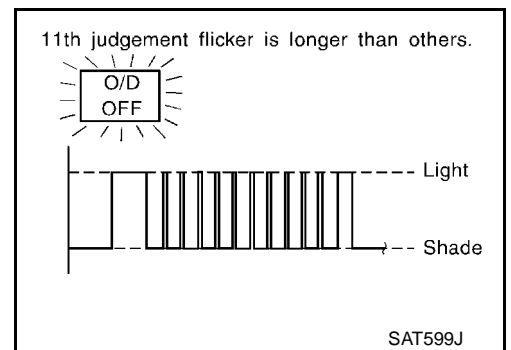
#### WITH CONSULT-II

1. Turn ignition switch "ON".
2. Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
3. Wait at least 6 seconds or start engine and wait for at least 6 seconds.
4. If DTC is detected, go to [AT-395, "Diagnostic Procedure"](#).



#### WITHOUT CONSULT-II

1. Turn ignition switch "ON".
2. Wait at least 6 seconds or start engine and wait at least 6 seconds.
3. Perform self-diagnosis.  
Refer to [AT-249, "Diagnostic Procedure Without CONSULT-II"](#).
4. If DTC is detected, go to [AT-395, "Diagnostic Procedure"](#).



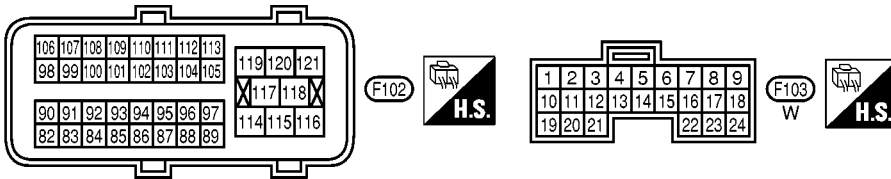
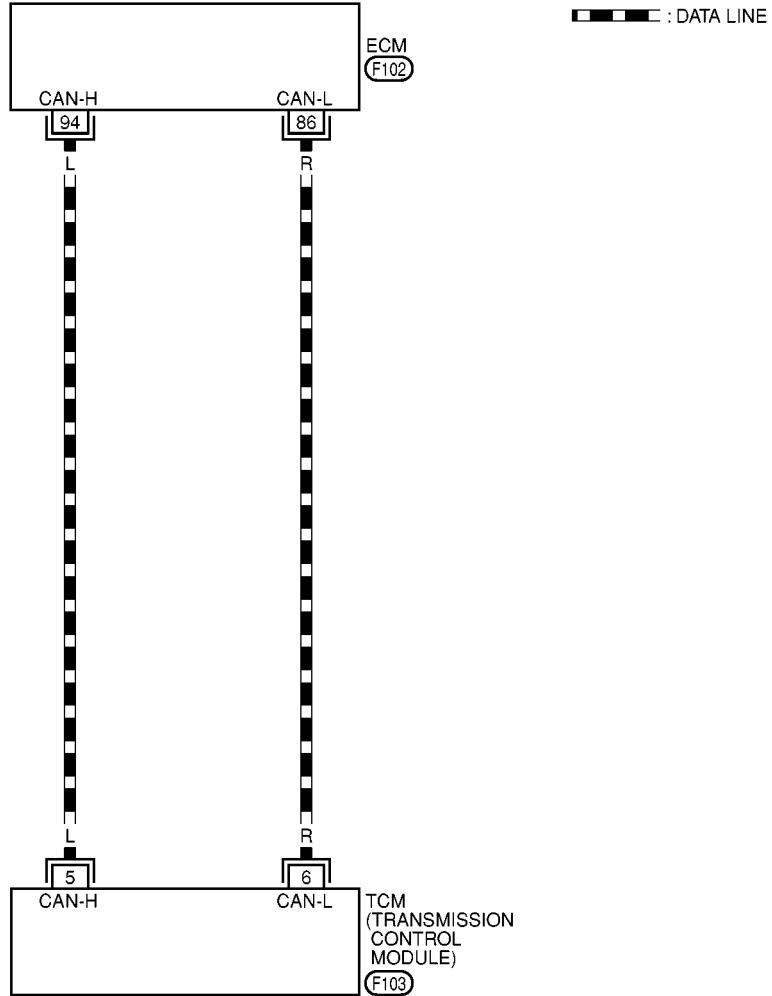
# CAN COMMUNICATION LINE

[ALL]

## Wiring Diagram — AT — CAN

ECS005ZU

AT-CAN-01



MCWA0022E

## Diagnostic Procedure

ECS005ZV

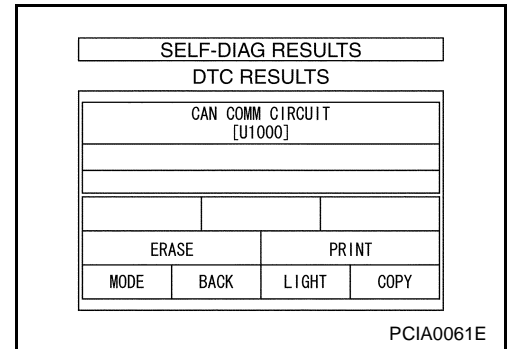
### 1. CHECK CAN COMMUNICATION CIRCUIT

① With CONSULT-II

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
3. The "CON COMM CIRCUIT" is detected.

Yes or No?

- Yes >> Print out CONSULT-II screen, GO TO 2.  
 NG >> INSPECTION END



### 2. CHECK CAN COMMUNICATION SIGNALS

① With CONSULT-II

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Select "CAN COMM SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.

#### CAN Communication Signals

Normal conditions	Abnormal conditions (examples)
CAN COMM: OK	CAN COMM: OK
CAN CIRC 1: OK	CAN CIRC 1: UNKWN
CAN CIRC 2: OK	CAN CIRC 2: UNKWN
CAN CIRC 3: UNKWN	CAN CIRC 3: UNKWN
CAN CIRC 4: OK	CAN CIRC 4: UNKWN
CAN CIRC 5: UNKWN	CAN CIRC 5: UNKWN

>> Print out CONSULT-II screen, go to [LAN-8, "CAN COMMUNICATION"](#) .

## A/T SHIFT LOCK SYSTEM

PFP:34950

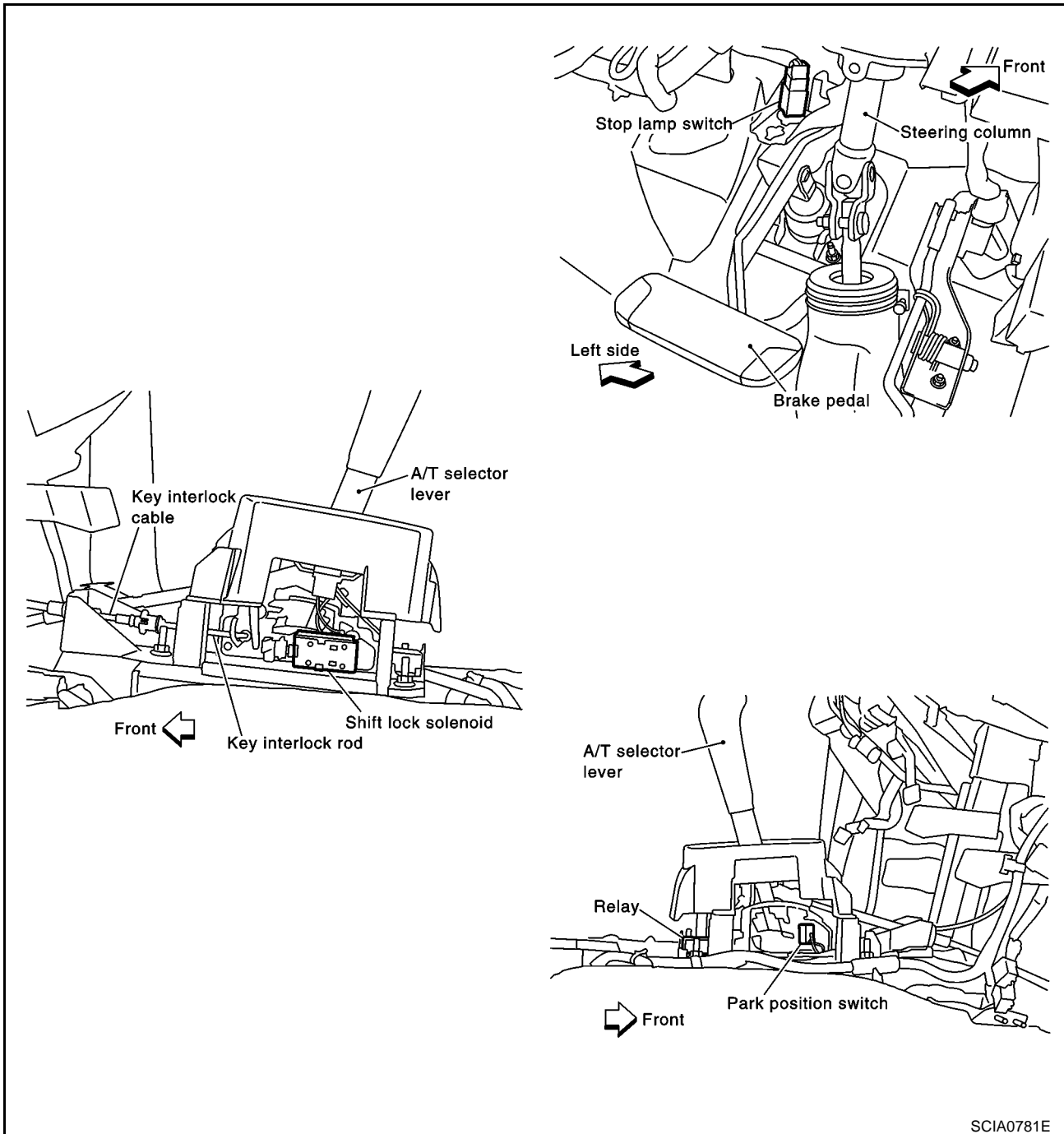
### Description

ECS005ZX

- 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

ECS005ZX



SCIA0781E

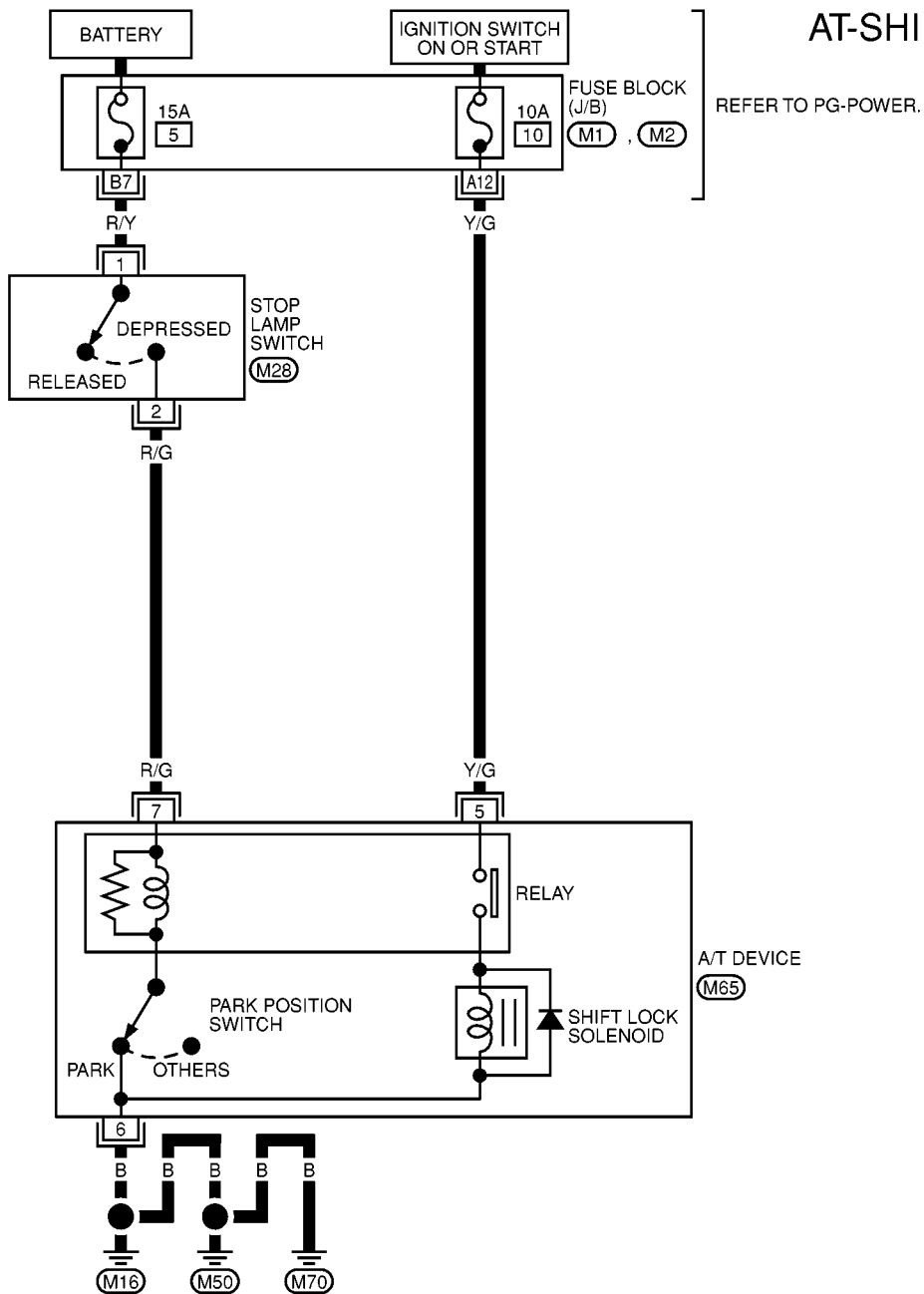
# A/T SHIFT LOCK SYSTEM

[ALL]

## Wiring Diagram — SHIFT —

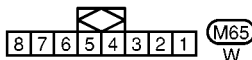
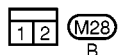
EC5005ZY

AT-SHIFT-01



REFER TO PG-POWER.

A/T DEVICE  
M65



REFER TO THE FOLLOWING.  
M1, M2 - FUSE BLOCK-  
JUNCTION BOX (J/B)

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

MCWA0021E

## Diagnostic Procedure

### 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 [AT-402, "KEY INTERLOCK CABLE"](#) .

## 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-406, "Park/Neutral Position \(PNP\) Switch Adjustment"](#) .

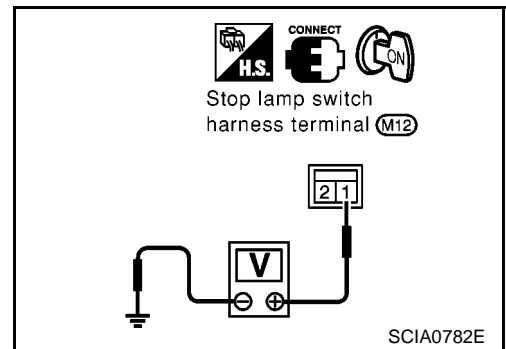
## 3. CHECK POWER SOURCE

1. Turn ignition switch to “ON” position.  
(Do not start engine.)
2. Check voltage between stop lamp switch harness terminal 1 and ground.

**Voltage: Battery voltage**

### OK or NG

- OK >> GO TO 4  
 NG >> Check the following items:
1. Harness for short or open between battery and stop lamp switch harness terminal 1
  2. Fuse
  3. Ignition switch (Refer to [PG-3, "POWER SUPPLY ROUTING"](#) .)



## 4. CHECK INPUT SIGNAL (A/T DEVICE)

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

- Check voltage between A/T device harness terminal 7 and ground.

**Voltage:**

**Brake pedal depressed:**

**Battery voltage**

**Brake pedal released:**

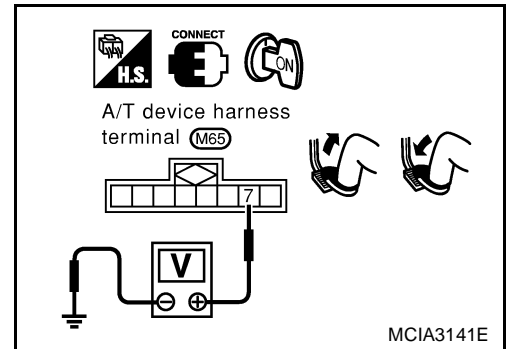
**0V**

OK or NG

OK >> GO TO 5

NG >> Check the following items:

1. Harness for short and open between battery and stop lamp switch harness connector 1.
2. Harness for short or open between stop lamp switch harness connector 2 and A/T device harness connector 7.
3. Fuse
4. Stop lamp switch (Refer to [AT-400, "A/T DEVICE CHECK"](#) .)



## 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 terminal 6 and ground.

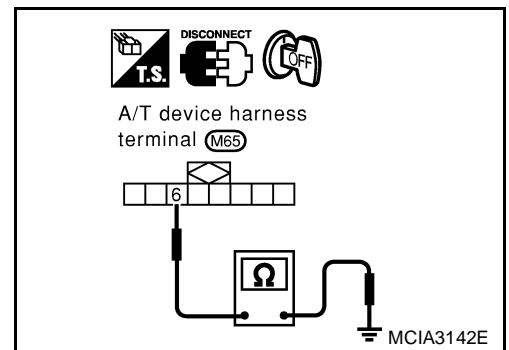
**Continuity should exist.**

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

OK or NG

OK >> GO TO 6

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



## 6. CHECK RELAY CIRCUIT

- Turn ignition switch to ON.  
Check voltage between terminal 7 - 6 and 5 - 6.

A/T device harness terminal (M65)

Condition	Ignition switch	Terminal No.	Voltage
When selector lever is set in "P" position and depressed brake pedal.	ON	7 - 6	Battery voltage
		5 - 6	Battery voltage

MCIA3143E

OK or NG

- OK >> GO TO 7
- NG >> Replace A/T device.

## 7. CHECK PARK POSITION SWITCH

Refer to [AT-400, "A/T DEVICE CHECK"](#) .

OK or NG

- OK >> GO TO 8
- NG >> Replace A/T device.

## 8. CHECK SHIFT LOCK SOLENOID

Refer to [AT-400, "A/T DEVICE CHECK"](#) .

OK or NG

- OK >> GO TO 9
- NG >> Replace A/T device.

## 9. SHIFT LOCK OPERATION

- Reconnect shift lock harness connector.
- Turn ignition switch from "OFF" to "ON" position. (Do not start engine.)
- Recheck shift lock operation.

OK or NG

- OK >> **INSPECTION END**
- NG >> 1. Perform A/T device input/output signal inspection test.  
2. If NG, recheck harness connector connection.

### A/T DEVICE CHECK

#### 1. Shift Lock Solenoid

- Check operation sound.  
When ignition switch is turned to "ON" position and selector lever is set in "P" position.

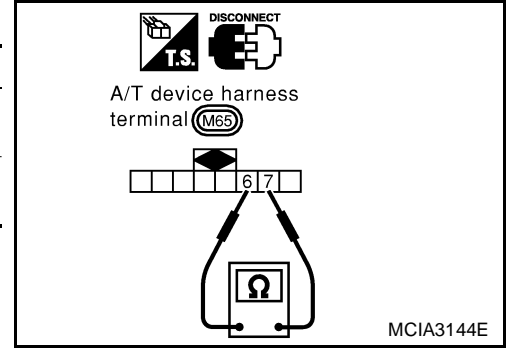
Brake pedal	Operation sound
Depressed	Yes
Released	No



## 2. Park Position Switch

- Check resistance between A/T device harness terminal 6 and 7.

Condition	Resistance
When selector lever is set in "P" position and selector lever button is released	111Ω
When selector lever is not set in "P" position and selector lever button is released	0Ω

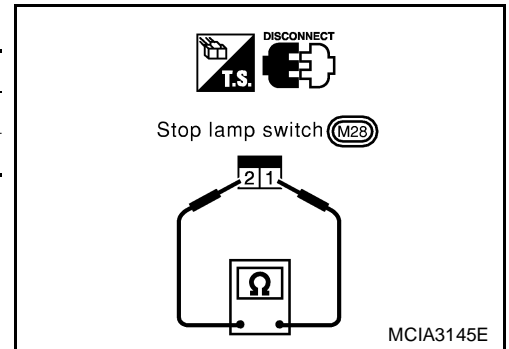


## STOP LAMP SWITCH

- Check continuity between terminals 1 and 2.

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-6, "BRAKE PEDAL"](#) .**



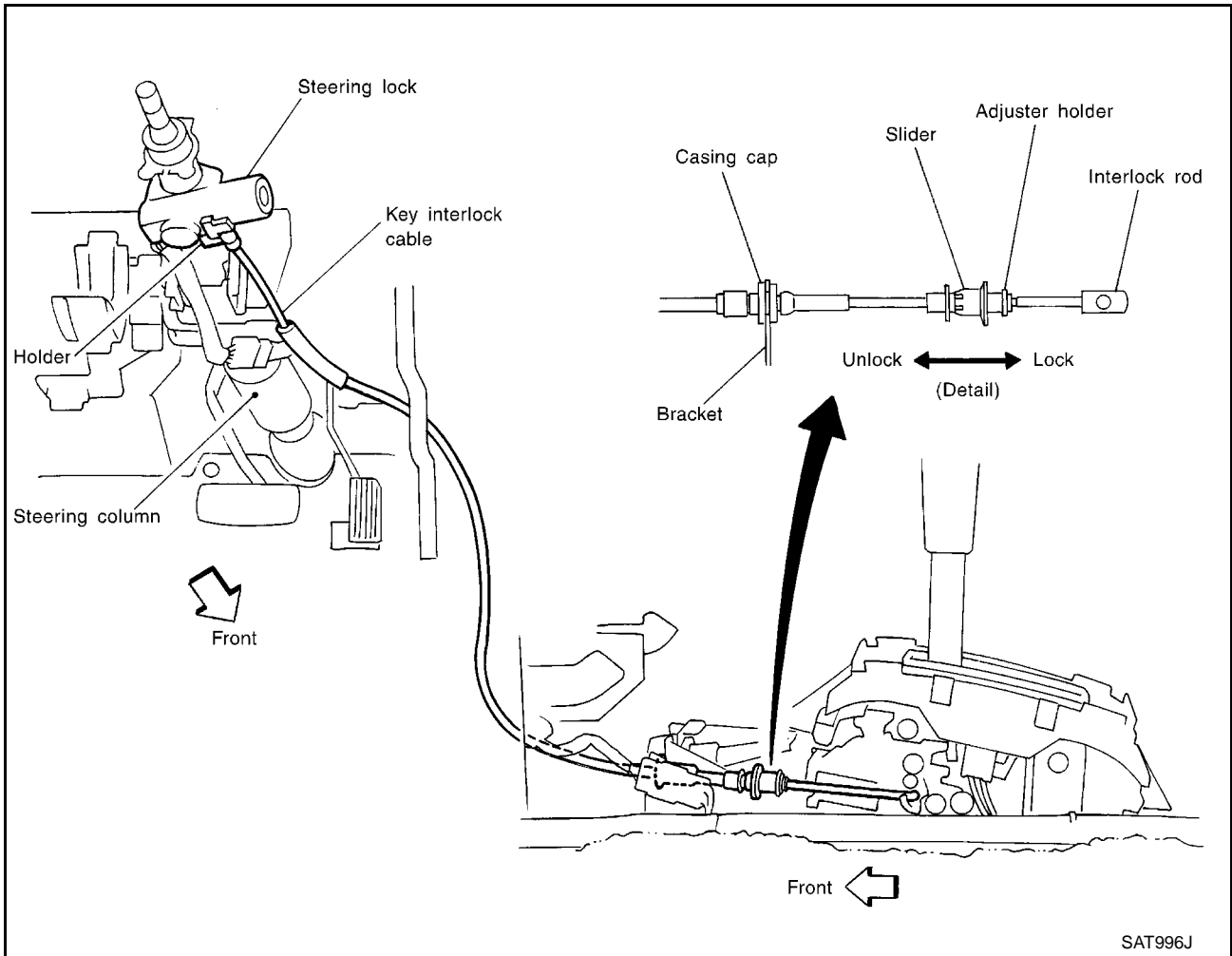
A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

## KEY INTERLOCK CABLE

PFP:34908

### Components

ECS00600



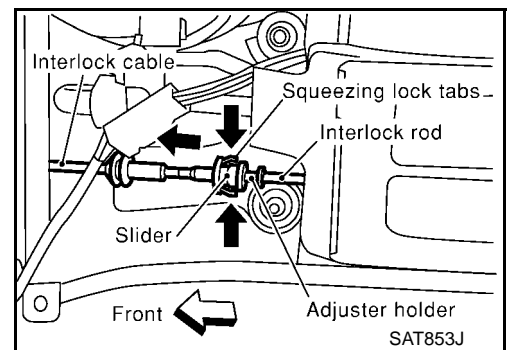
### CAUTION:

- 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

ECS00601

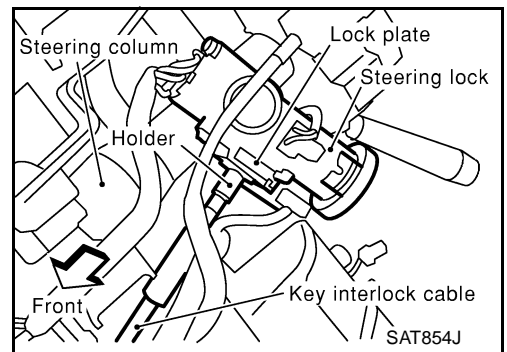
1. Unlock slider by squeezing lock tabs on slider from adjuster holder and remove interlock rod from cable.



# KEY INTERLOCK CABLE

[ALL]

2. Remove lock plate from steering lock assembly and remove key interlock cable.

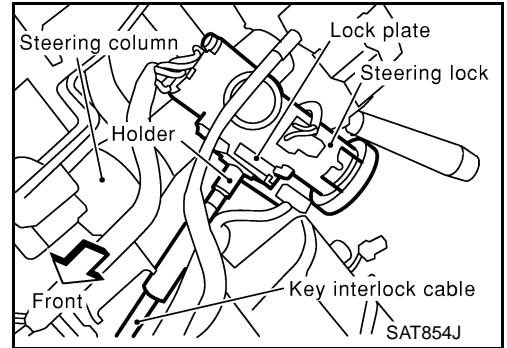


A  
B  
AT

## Installation

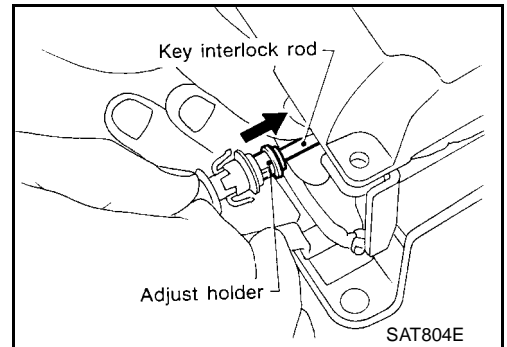
1. Turn ignition key to lock position.
2. Set A/T selector lever to P position.
3. Set key interlock cable to steering lock assembly and install lock plate.
4. Clamp cable to steering column and fix to control cable with band.

ECS00602



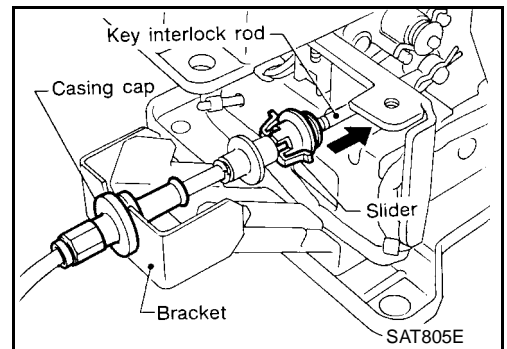
D  
E  
F  
G

5. Insert interlock rod into adjuster holder.



H  
I  
J  
K

6. Install casing cap to bracket.
7. Move slider in order to fix adjuster holder to interlock rod.



L  
M

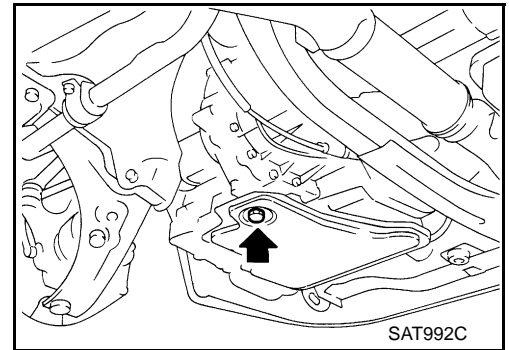
## ON-VEHICLE SERVICE

PFP:00000

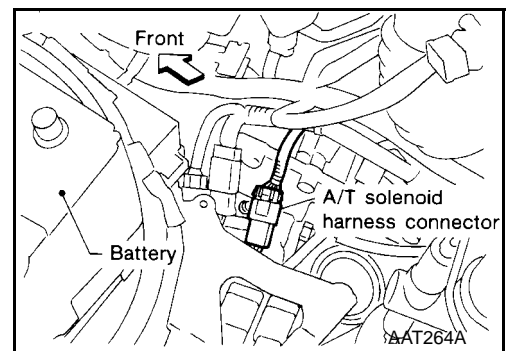
### Control Valve Assembly and Accumulators REMOVAL

ECS00603

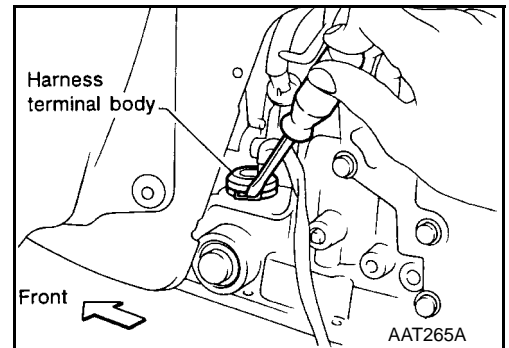
1. Drain ATF from transaxle.
2. Remove oil pan and gasket.



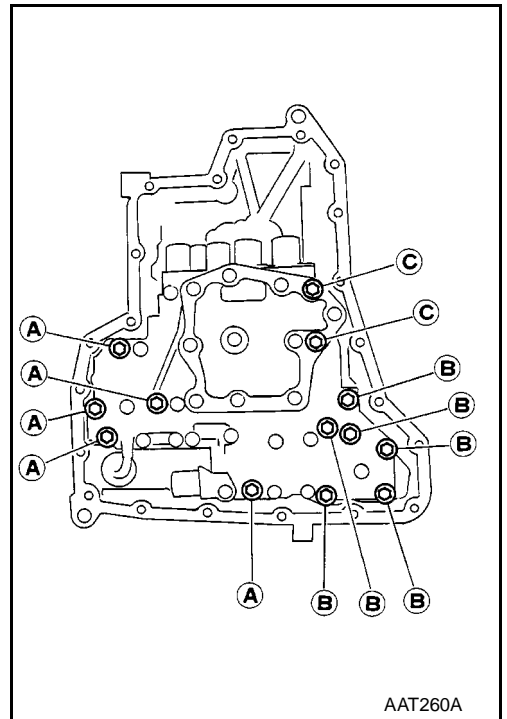
3. Disconnect A/T solenoid valve harness connector.




4. Remove snap ring from A/T solenoid harness terminal body.
5. Remove A/T solenoid harness by pushing terminal body into transmission case.



6. Remove control valve assembly by removing fixing bolts.



**Bolt length, number and location:**

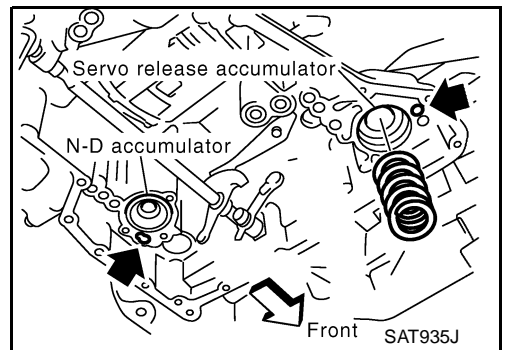
Bolt symbol	A	B	C
Bolt length "ℓ" mm(in) 	40.0 mm (1.575 in)	33.0 mm (1.299 in)	43.5 mm (1.713 in)
Number of bolts	5	6	2

- 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-404, "Control Valve Assembly and Accumulators"](#) .

8. Remove servo release and N-D accumulators by applying compressed air if necessary.

- Hold each piston with a rag.

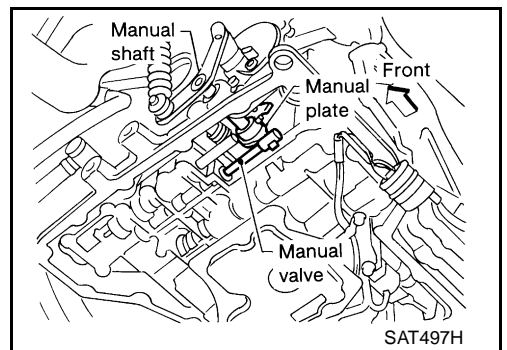


**INSTALLATION**

- Tighten fixing bolts 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.



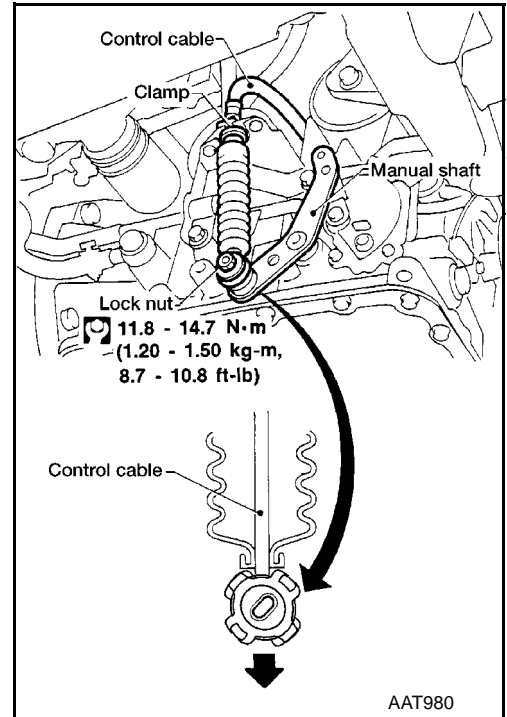
## Control Cable Adjustment

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. Pull control cable, by specified force, in the direction of the arrow shown in the illustration.

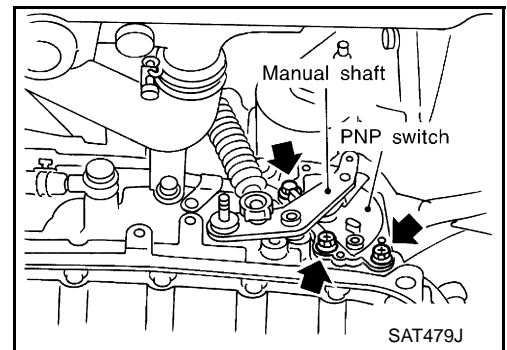
**Specified force: 6.9 N (0.7 kg, 1.5 lb)**

4. Return control cable in the opposite direction of the arrow for 1.0 mm (0.039 in).
5. Tighten control cable lock nut.
6. Move selector lever from “P” to “1” position again. Make sure that selector lever moves smoothly.
7. Apply grease to contacting areas of selector lever and control cable. Install any part removed.

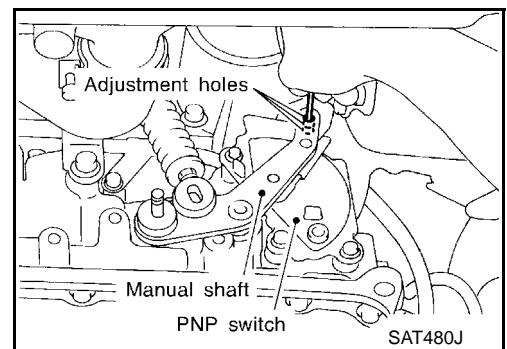


## Park/Neutral Position (PNP) Switch Adjustment

1. Remove control cable end from manual shaft.
2. Set manual shaft in “N” position.
3. Loosen PNP switch fixing bolts.



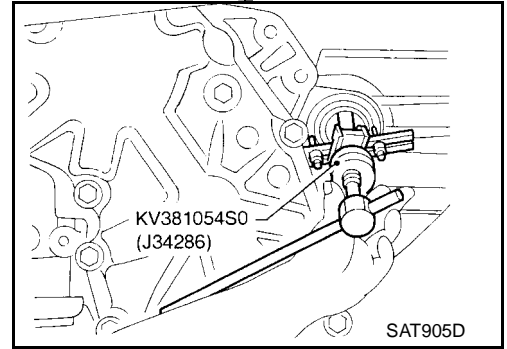
4. Use a 4 mm (0.157 in) pin for this adjustment.
  - a. Insert the pin straight into the manual shaft adjustment hole.
  - b. Rotate PNP switch until the pin can also be inserted straight into hole in PNP switch.
5. Tighten PNP switch fixing bolts.
6. Remove pin from adjustment hole after adjusting PNP switch.
7. Reinstall any part removed.
8. Adjust control cable. Refer to [AT-406, "Control Cable Adjustment"](#) .
9. Check continuity of PNP switch. Refer to [AT-110, "DTC P0705 PARK/NEUTRAL POSITION \(PNP\) SWITCH"](#) .



**Differential Side Oil Seal Replacement**

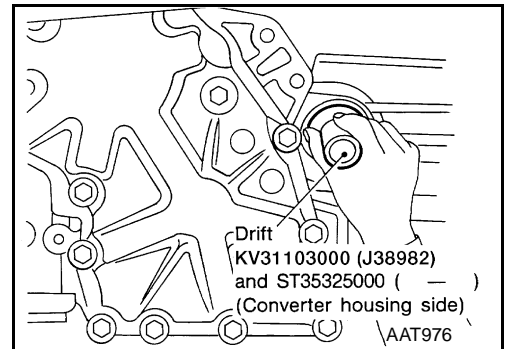
ECS00606

1. Remove left side drive shaft assemblies. Refer to [FAX-11, "FRONT DRIVE SHAFT"](#).



2. Install oil seals.
  - Apply ATF to oil seal surface before installing.
  - Drift for installing

Transaxle case side :ST3340 0001  
 converter housing side :KV4010 0621

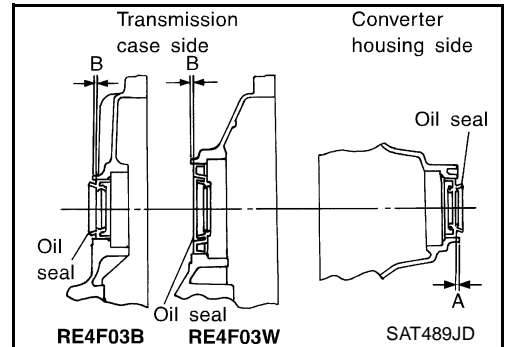


- Install oil seals so that dimensions "A" and "B" are within specifications.

Unit: mm (in)

A	B
-0.5 to 0.5 (-0.020 to 0.020)	-0.5 to 0.5 (-0.020 to 0.020)

3. Reinstall any part removed.

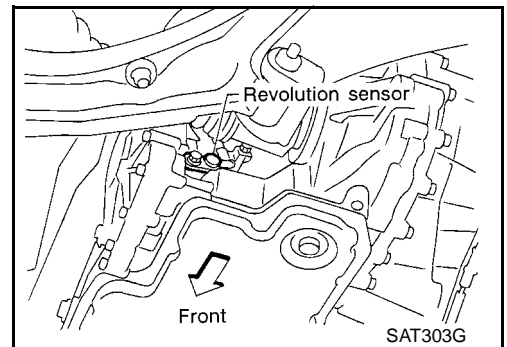


**Revolution Sensor Replacement**

ECS00607

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.**



## REMOVAL AND INSTALLATION

PFP:00000

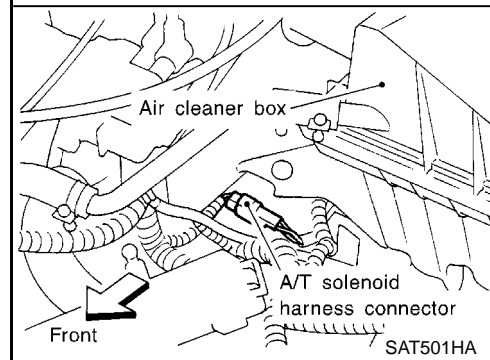
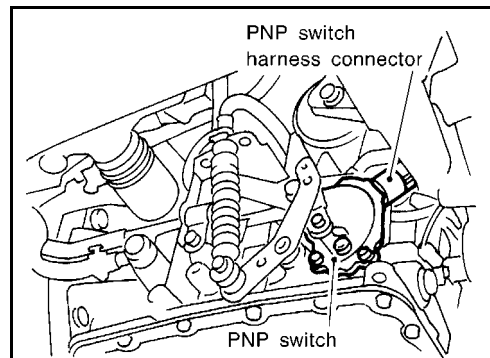
### Removal

ECS00608

#### CAUTION:


Before separating transaxle from engine, remove the crankshaft position sensor (OBD) from transaxle. Be careful not to damage sensor.

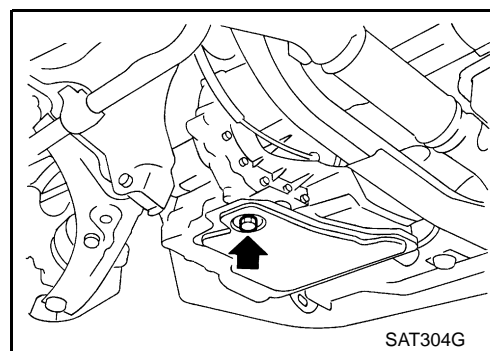
1. Remove battery and bracket.
2. Remove air duct between throttle body and air cleaner.
3. Disconnect A/T solenoid harness connector, PNP switch harness connector and revolution sensor harness connector.
4. Remove crankshaft position sensor (OBD) from transaxle.



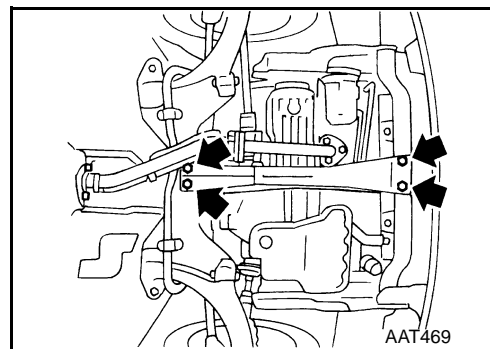
5. Drain ATF from transaxle.
6. Disconnect control cable from transaxle.
7. Disconnect oil cooler hoses.
8. Remove drive shafts. Refer to [FAX-11, "FRONT DRIVE SHAFT"](#).
9. Remove the intake manifold support bracket. Refer to [EM-19, "INTAKE MANIFOLD"](#).
10. Remove starter motor from transaxle.

**Tighten bolts to specified torque.**

 : 41 - 52 N-m (4.2 - 5.3 kg-m, 30 - 38 ft-lb)



11. Remove upper bolts fixing transaxle to engine.
12. Support transaxle with a jack.
13. Remove center member.
  - Tighten center member fixing bolts to specified torque, Refer to [EM-66, "ENGINE ASSEMBLY"](#).



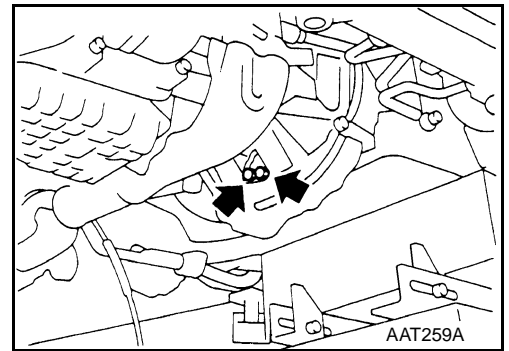
14. Remove center member, engine insulator and engine mounting bracket.
  - Tighten center member fixing bolts to specified torque, Refer to [EM-66, "ENGINE ASSEMBLY"](#).



# REMOVAL AND INSTALLATION

[ALL]

15. Remove suspension member. Refer to [FSU-12, "FRONT SUSPENSION MEMBER"](#).
16. Remove dust cover from converter housing.  
Rotate crankshaft to gain access to securing bolts.
17. Remove securing bolts between drive plate and torque converter. when crank shaft rotates, turn to right at the front side of engine.
18. Support engine with a jack.
19. Remove bolts fixing transaxle to engine.
20. Lower transaxle while supporting it with a jack.



A  
B  
AT

## Installation

1. Check drive plate runout.

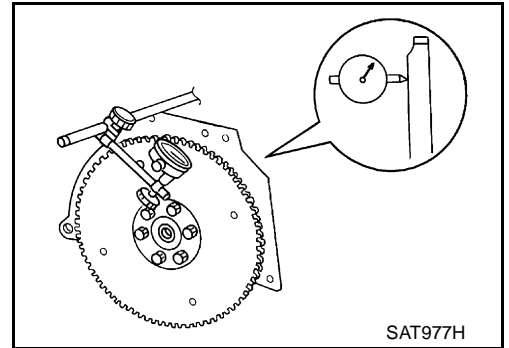
**CAUTION:**

Do not allow any magnetic materials to contact the ring gear teeth.

Maximum allowable runout :

Refer to [EM-92, "FLYWHEEL RUNOUT"](#).

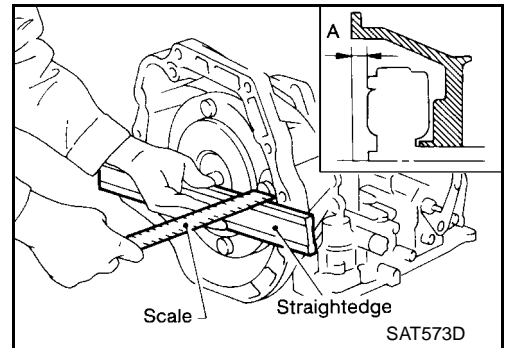
- If this runout is out of allowance, replace drive plate with ring gear.



D  
E  
F  
G

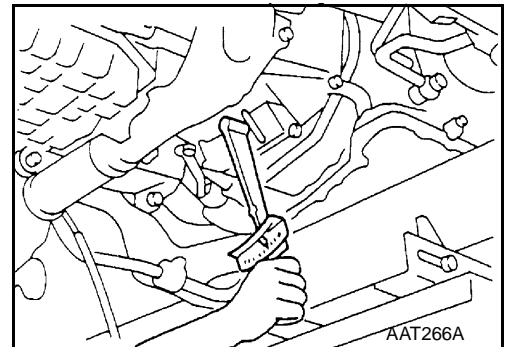
2. When connecting torque converter to transaxle, measure distance "A" to be certain that they are correctly assembled.

Distance "A": 21.1 mm (0.831 in) or more



H  
I  
J  
K

3. Install torque converter to drive plate.
  - With converter installed, rotate crankshaft several turns to check that transaxle rotates freely without binding.



L  
M

# REMOVAL AND INSTALLATION

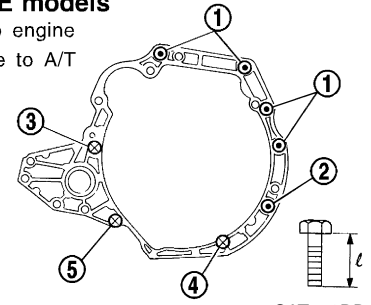
[ALL]

## 4. Tighten belts fixing transaxle.

Bolt No.	Tightening torque N-m (kg-m, ft-lb)	Bolt length "L" mm (in)
1	70 - 79 (7.1 - 8.1, 51 - 59)	55 (2.17)
2	70 - 79 (7.1 - 8.1, 51 - 59)	50 (1.97)
3	70 - 79 (7.1 - 8.1, 51 - 59)	65 (2.56)
4	16 - 21 (1.6 - 2.1, 12 - 15)	35 (1.38)
5	16 - 21 (1.6 - 2.1, 12 - 15)	47 (1.85)

### SR20DE models

- ⊙ A/T to engine
- ⊗ Engine to A/T



5. Reinstall any part removed.
6. Adjust control cable. Refer to [AT-406, "Control Cable Adjustment"](#) .
7. Check continuity of PNP switch. Refer to [AT-110, "DTC P0705 PARK/NEUTRAL POSITION \(PNP\) SWITCH"](#) .
8. Refill transaxle with ATF and check fluid level.
9. 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.
10. Perform road test. Refer to [AT-66, "Road Test"](#) .



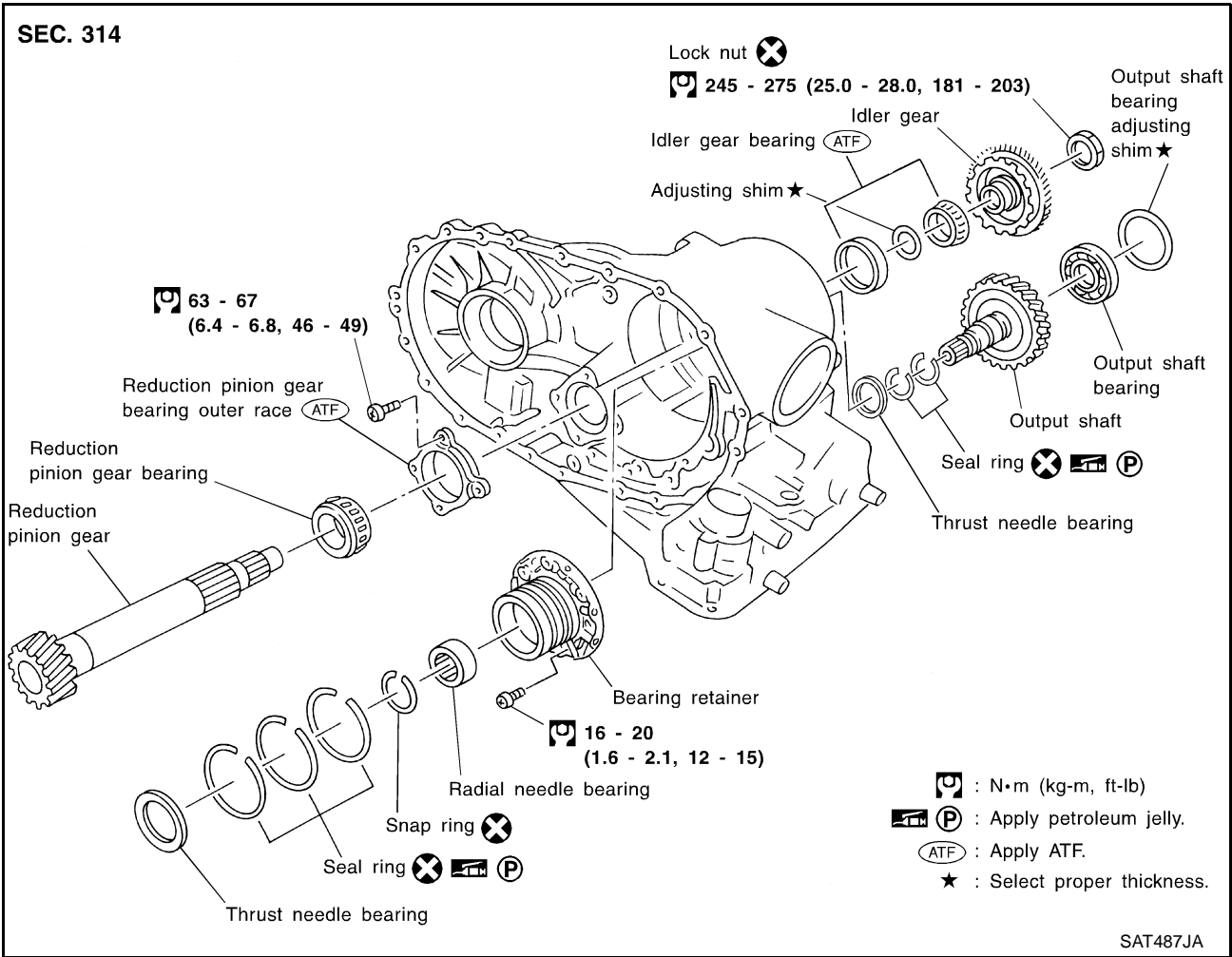
OVERHAUL

PFP:00000

Output Shaft, Idler Gear, Reduction Pinion Gear and Bearing Retainer COMPONENTS

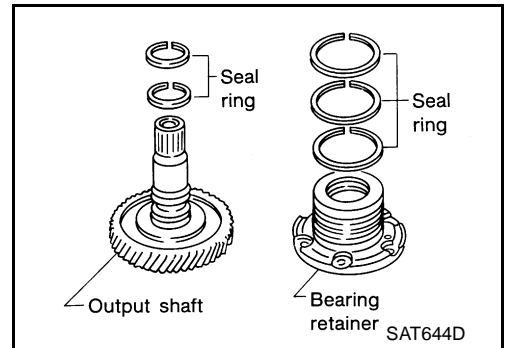
ECS0060A

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M



DISASSEMBLY

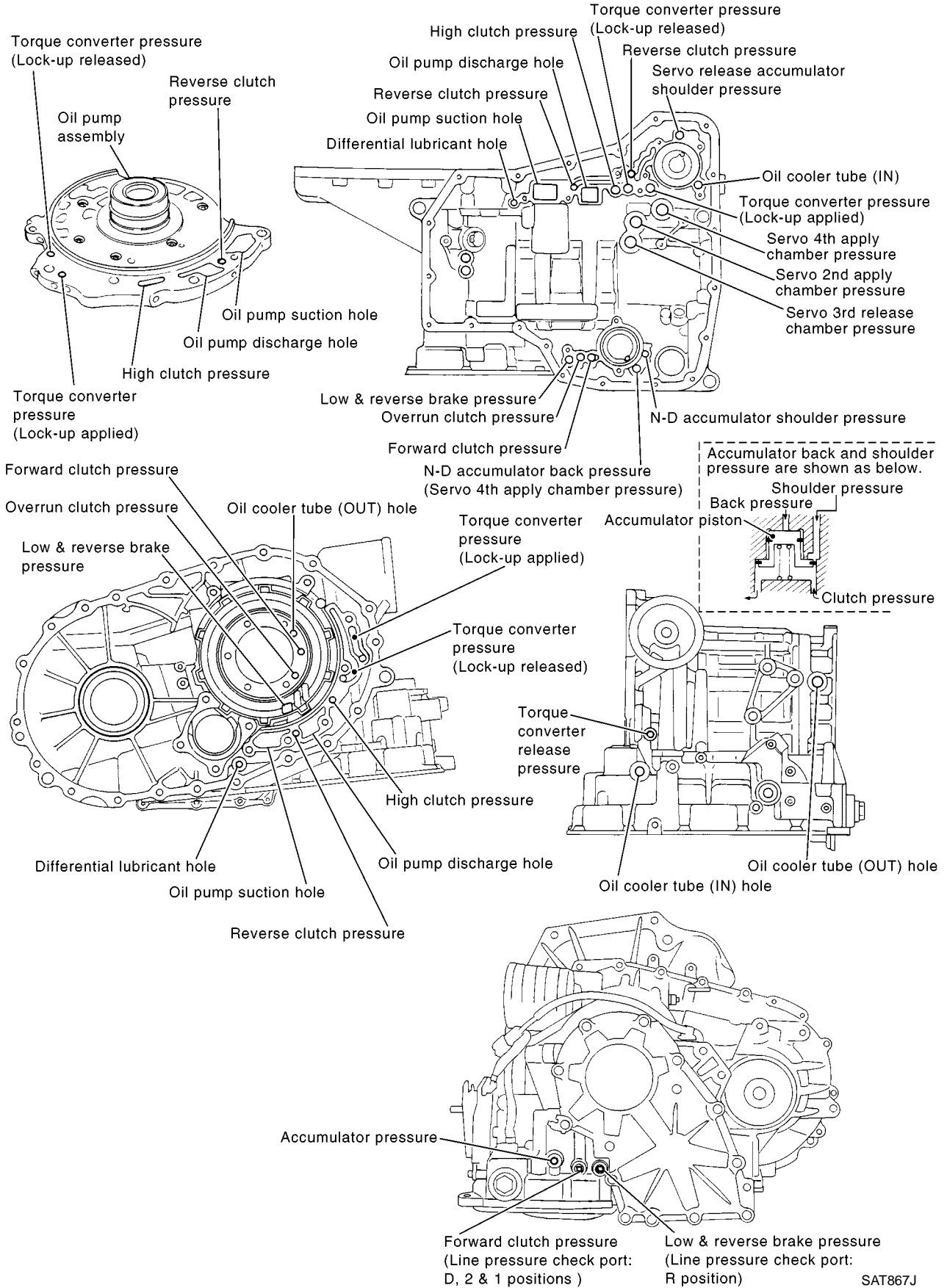
1. Remove seal rings from output shaft and bearing retainer.







Oil Channel



SAT867J

# OVERHAUL

[ALL]

## Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

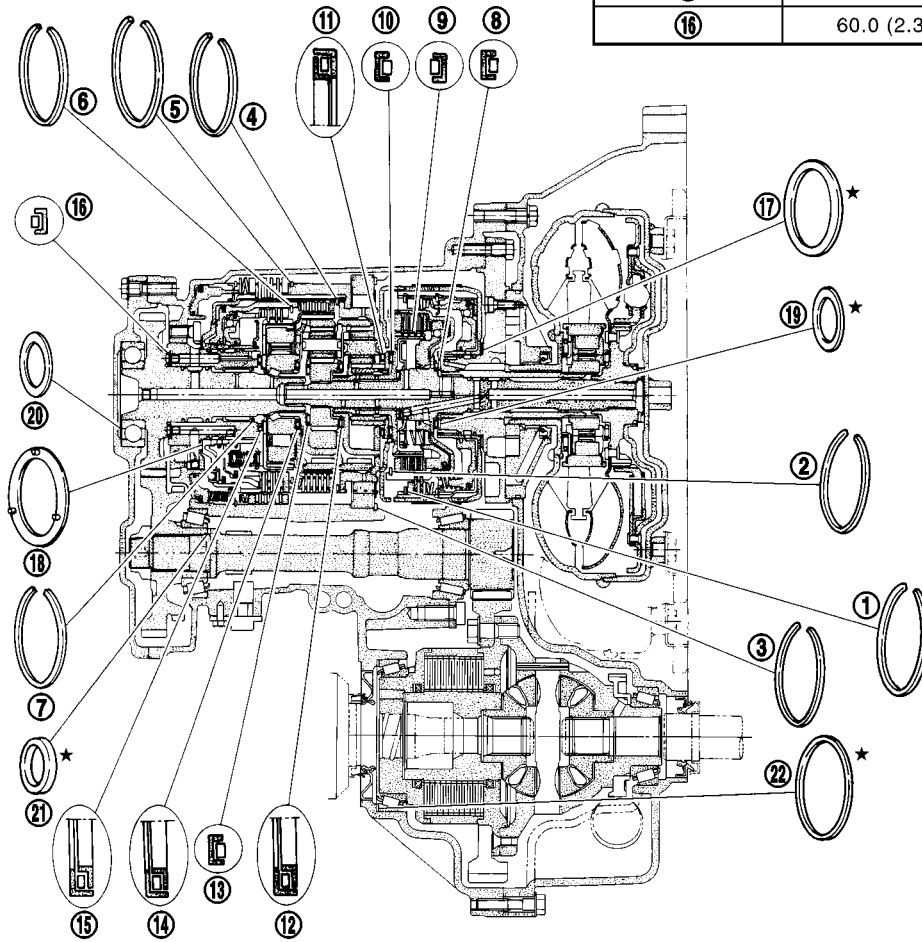
ECS0060C

Outer diameter and color of thrust washers

Item number	Outer diameter mm (in)	Color
⑰	72.0 (2.835)	Black
⑱	78.5 (3.091)	

Outer & inner diameter of needle bearings

Item number	Outer diameter mm (in)	Inner diameter mm (in)
⑧	47.0 (1.850)	32.0 (1.260)
⑨	35.0 (1.378)	20.1 (0.791)
⑩	60.0 (2.362)	42.1 (1.657)
⑪	60.0 (2.362)	45.0 (1.772)
⑫	47.0 (1.850)	30.0 (1.181)
⑬	42.6 (1.677)	26.0 (1.024)
⑭	48.0 (1.890)	33.5 (1.319)
⑮	55.0 (2.165)	40.5 (1.594)
⑯	60.0 (2.362)	40.1 (1.579)



★ : Select proper thickness.

Outer & inner diameter of bearing race and adjusting shims

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)
㉑	34.5 (1.358)	26.1 (1.028)
㉒	Viscous type	105.0 (4.13)
	Conventional type	68.0 (2.677)

Outer diameter of snap rings

Item number	Outer diameter mm (in)
①	142.0 (5.59)
②	113.0 (4.45)
③	162.4 (6.39)
④	135.4 (5.33)
⑤	162.3 (6.39)
⑥	126.0 (4.96)
⑦	40.5 (1.594)

SAT325GC

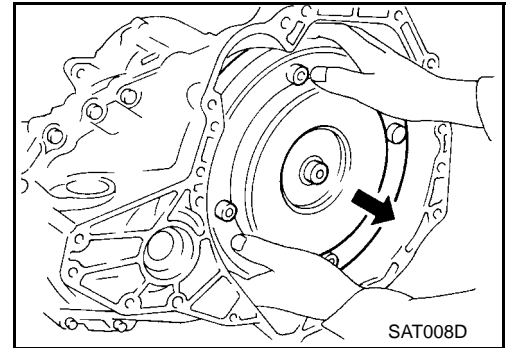
## DISASSEMBLY

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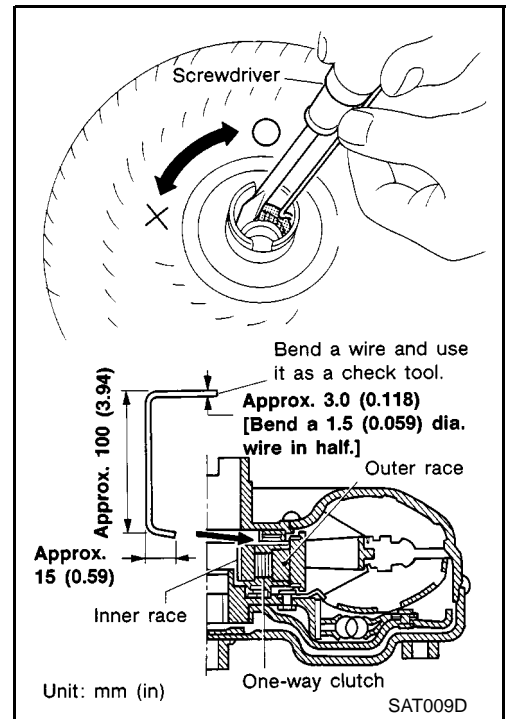
### Disassembly

ECS0060D

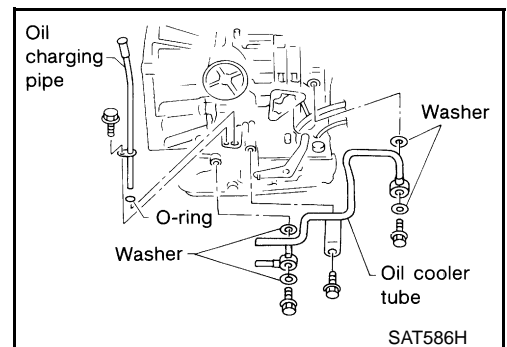
1. Drain ATF through drain plug.
2. Remove torque converter.



3. Check torque converter one-way clutch using check tool as shown at left.
  - 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.

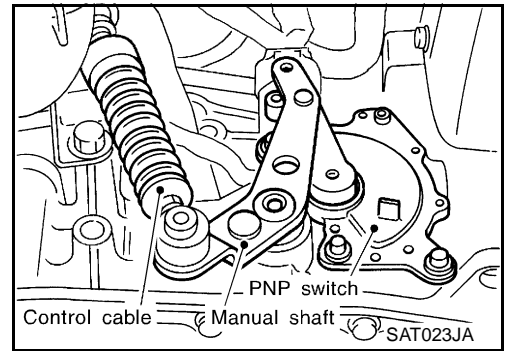




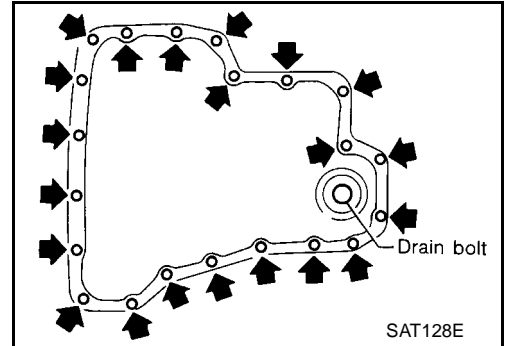
# DISASSEMBLY

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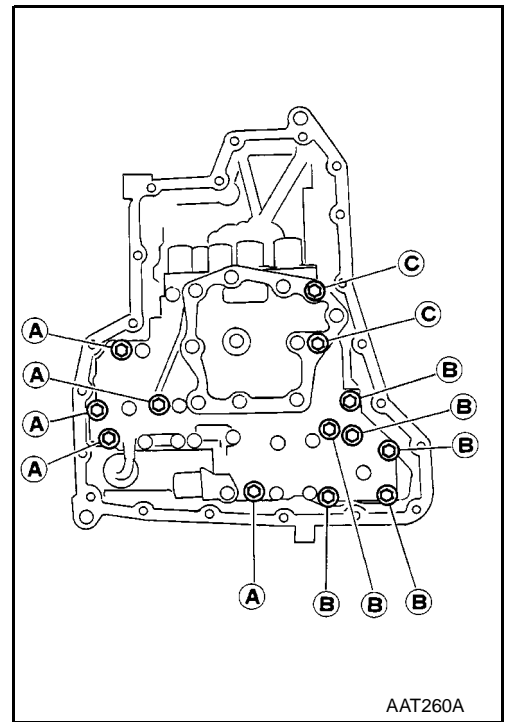
5. Set manual shaft to position P.
6. Remove park/neutral position (PNP) switch.



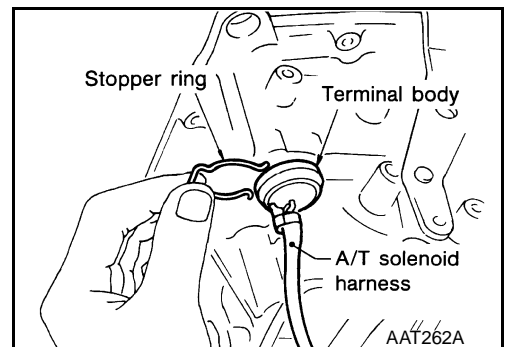
7. Remove oil pan and oil pan gasket.
  - **Do not reuse oil pan bolts.**
8. Check foreign materials in oil pan to help determine causes of malfunction. If the fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film 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 [CO-11, "RADIATOR"](#) .**



9. Remove control valve assembly according to the following procedures.
  - a. Remove control valve assembly mounting bolts A, B and C.



- b. Remove snap ring from terminal body.

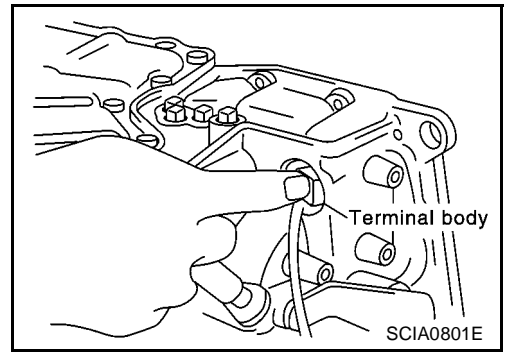


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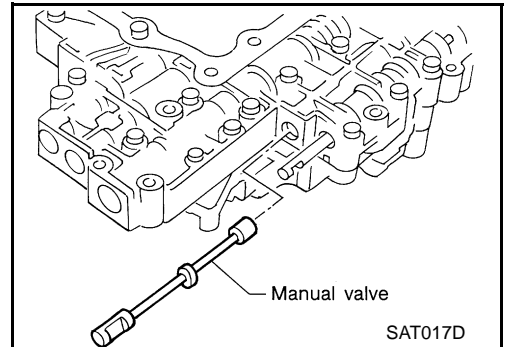
# DISASSEMBLY

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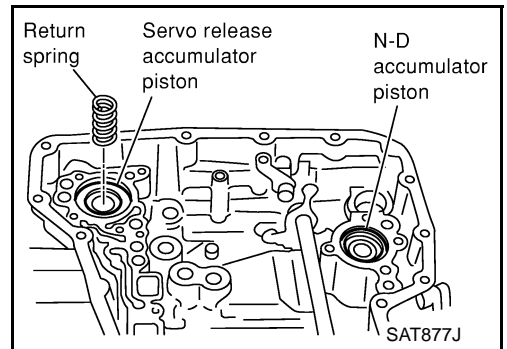
c. Push terminal body into transmission case.



10. Remove manual valve from control valve assembly.

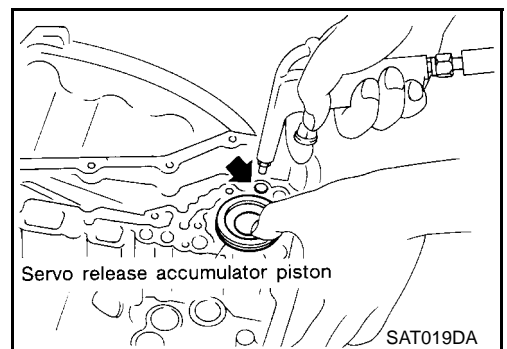


11. Remove return spring from servo release accumulator piston.



12. Remove servo release accumulator piston with compressed air.

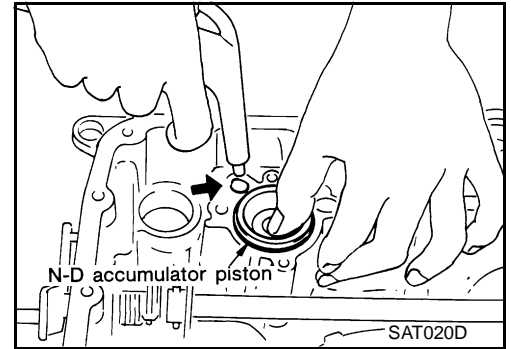
13. Remove O-rings from servo release accumulator piston.



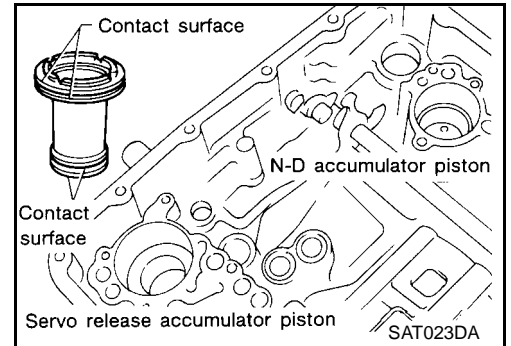
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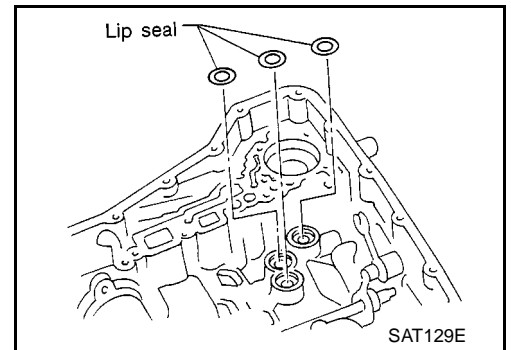
14. Remove N-D accumulator piston and return spring with compressed air.
15. Remove O-rings from N-D accumulator piston.



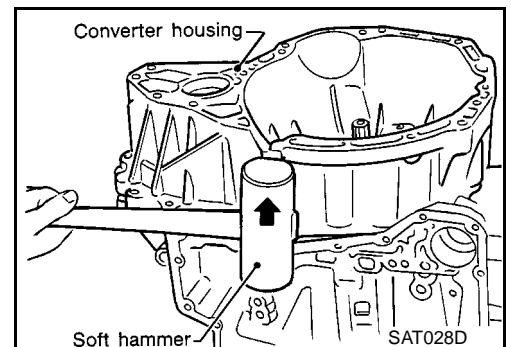
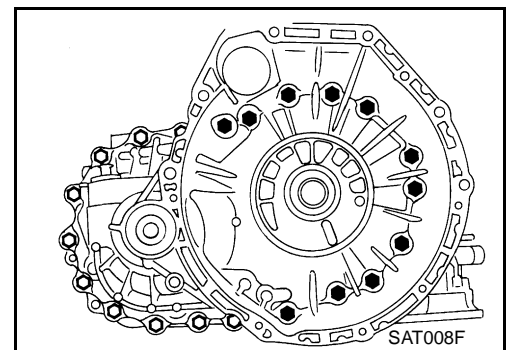
16. Check accumulator pistons and contact surface of transmission case for damage.
17. Check accumulator return springs for damage and free length.



18. Remove lip seals.



19. Remove converter housing according to the following procedures.
  - a. Remove converter housing mounting bolts.
  - b. Remove converter housing by tapping it lightly.

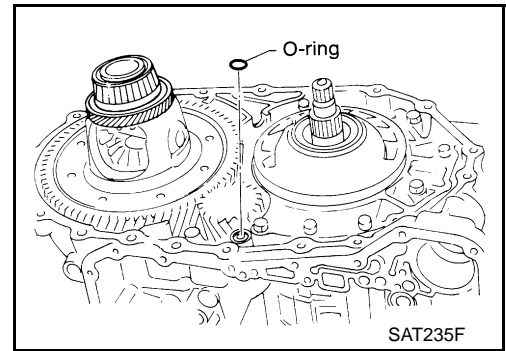


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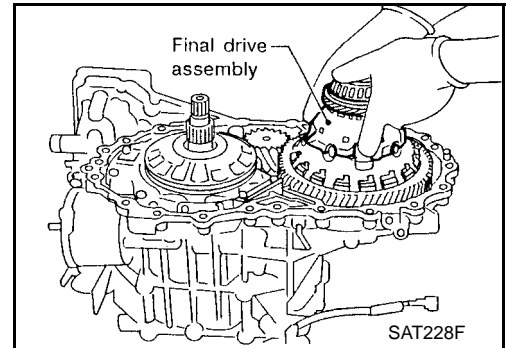
# DISASSEMBLY

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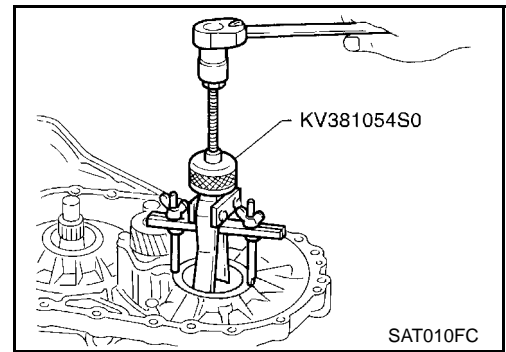
- c. Remove O-ring from differential oil port.



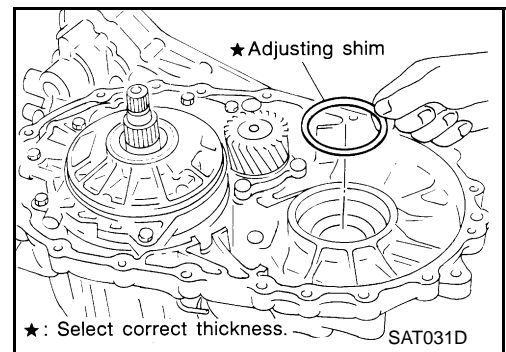
20. Remove final drive assembly from transmission case.



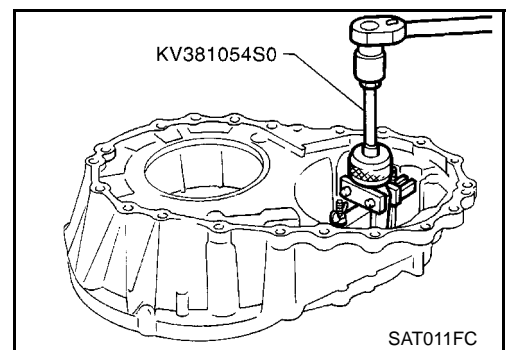
21. Remove differential side bearing outer race and side bearing adjusting shim from transmission case.



22. Remove differential side bearing adjusting shim from transmission case.



23. Remove differential side bearing outer race from converter housing.

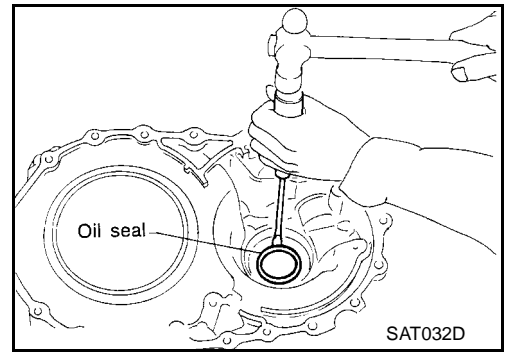


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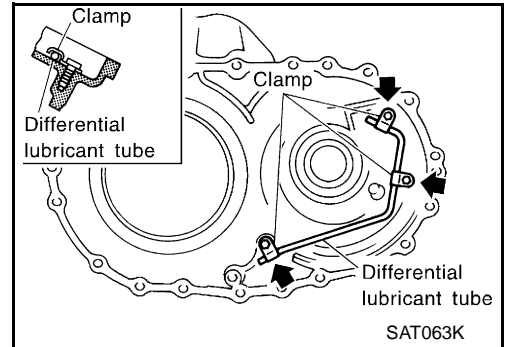
24. Remove oil seal with screwdriver from converter housing.

- Be careful not to damage case.



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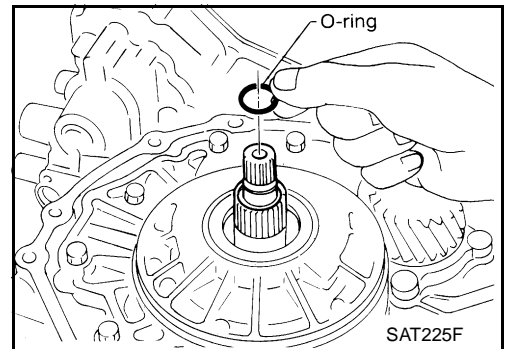
25. Remove differential lubricant tube from converter housing.



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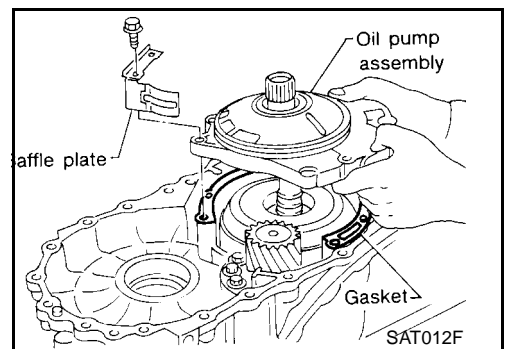
26. Remove oil pump according to the following procedures.

a. Remove O-ring from input shaft.



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b. Remove oil pump assembly, baffle plate and gasket from transmission case.

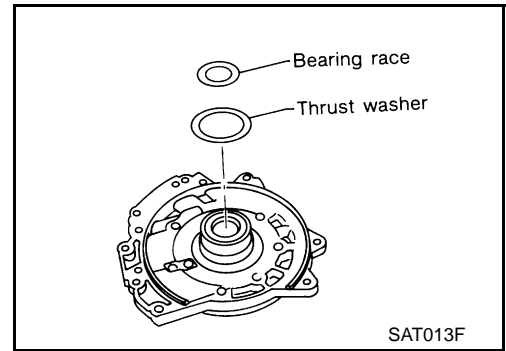


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# DISASSEMBLY

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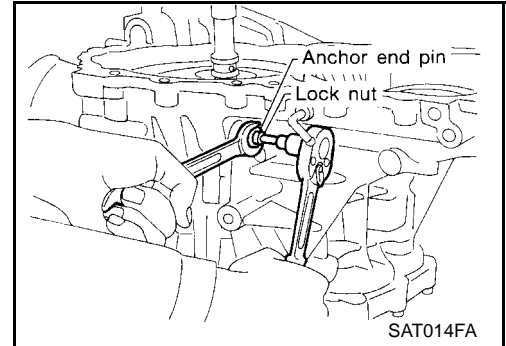
- c. Remove thrust washer and bearing race from oil pump assembly.



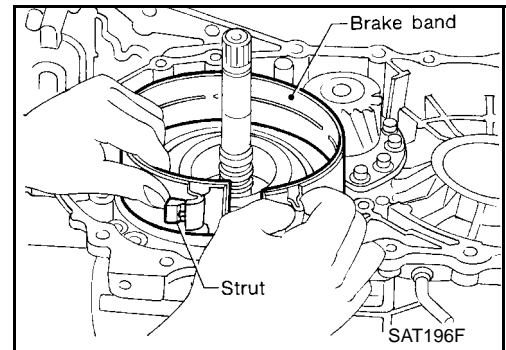
27. Remove brake band according to the following procedures.

- a. Loosen lock nut, then back off anchor end pin.

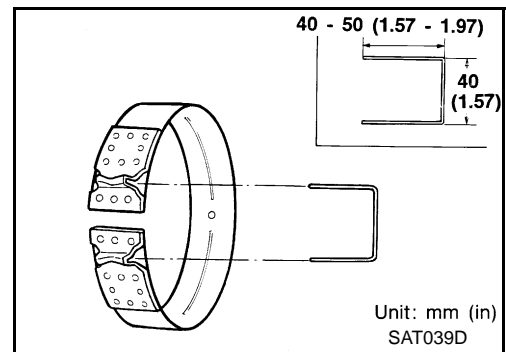
- Do not reuse anchor end pin.



- b. Remove brake band and strut from transmission case.



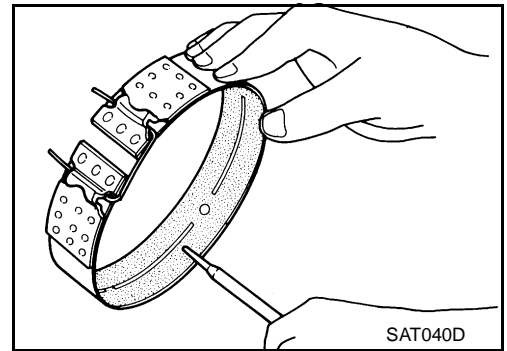
- To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown in the figure at left. Leave the clip in position after removing the brake band.



# DISASSEMBLY

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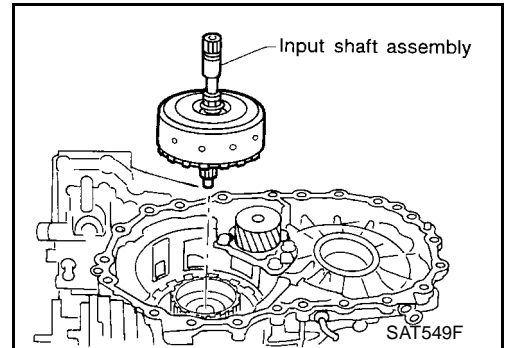
c. Check brake band facing for damage, cracks, wear or burns.



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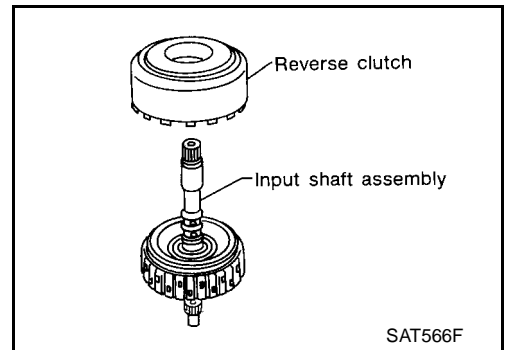
28. Remove input shaft assembly (high clutch) and reverse clutch according to the following procedures.

a. Remove input shaft assembly (high clutch) with reverse clutch.



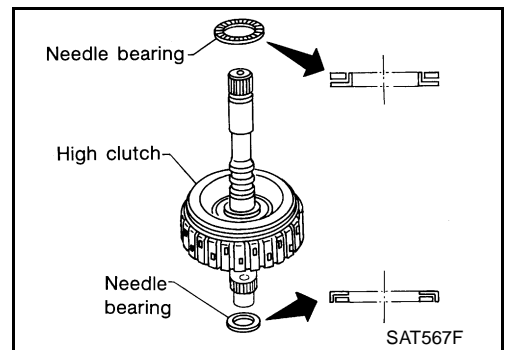
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b. Remove input shaft assembly (high clutch) from reverse clutch.



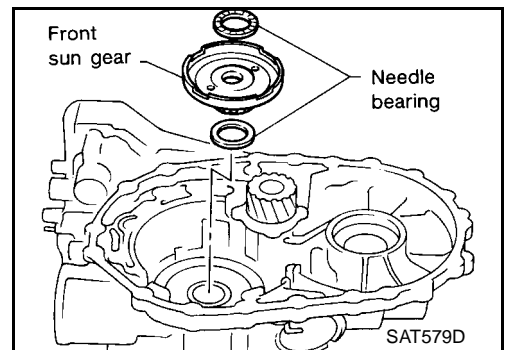
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c. Remove needle bearings from high clutch drum and check for damage or wear.



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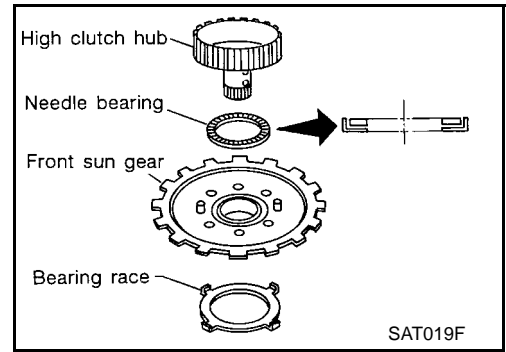
d. Remove high clutch hub and front sun gear from transmission case.



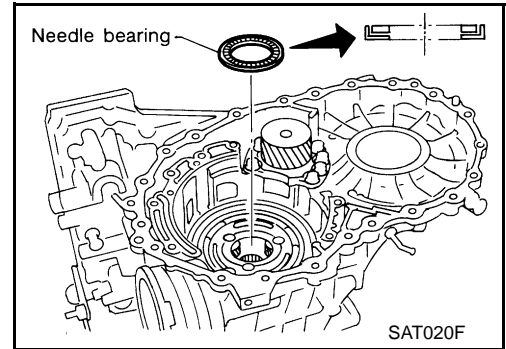
# DISASSEMBLY

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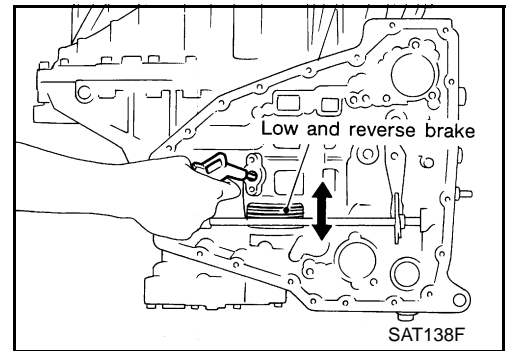
- e. Remove front sun gear and needle bearing from high clutch hub and check for damage or wear.
- f. Remove bearing race from front sun gear and check for damage or wear.



- 29. Remove needle bearing from transmission case and check for damage or wear.

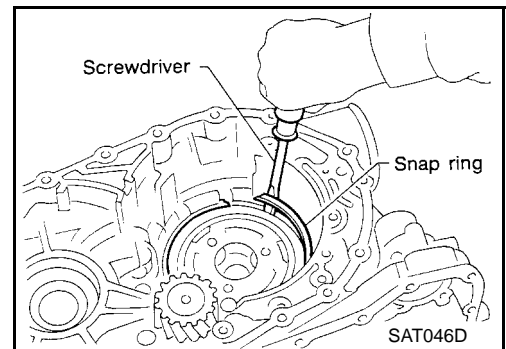


- 30. Apply compressed air and check to see that low and reverse brake operates.



- 31. Remove low one-way clutch and front planetary carrier assembly according to the following procedures.

- a. Remove snap ring with flat-bladed screwdriver.

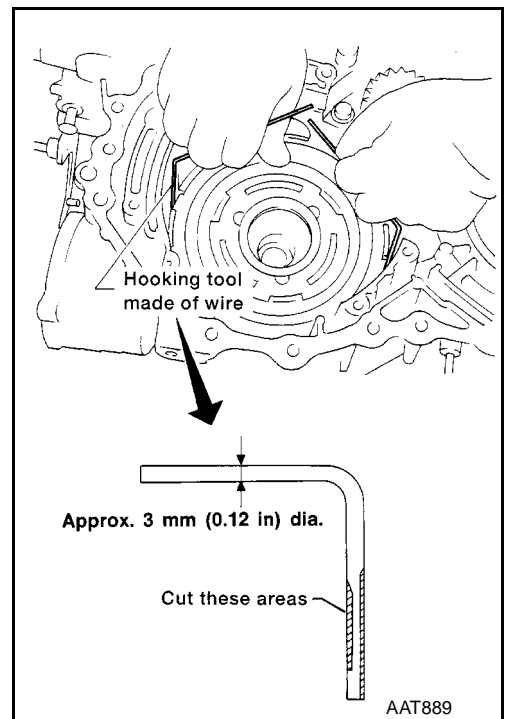




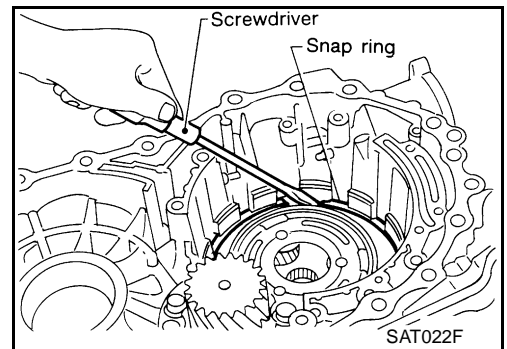
# DISASSEMBLY

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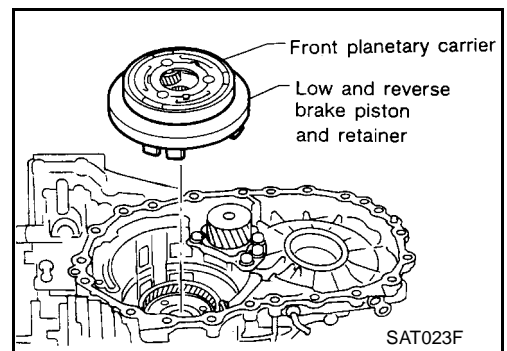
- b. Remove low one-way clutch with a hook made of wire.



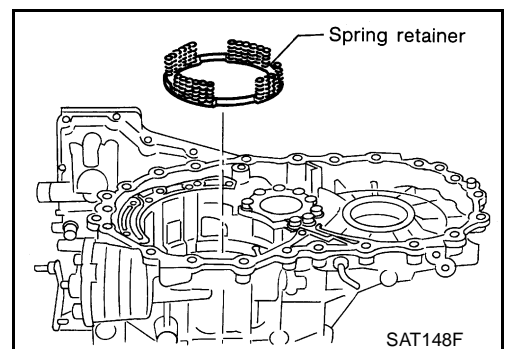
- c. Remove snap ring with flat-bladed screwdriver.



- d. Remove front planetary carrier with low and reverse brake piston and retainer.



- e. Remove low and reverse brake spring retainer.
- Do not remove return springs from spring retainer.

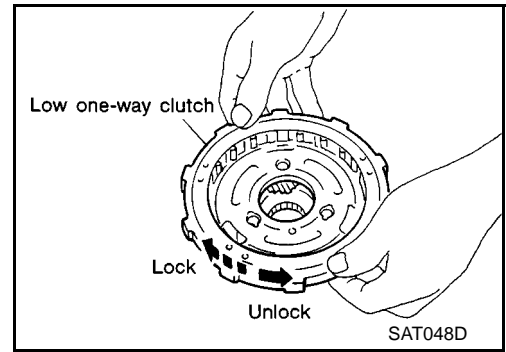


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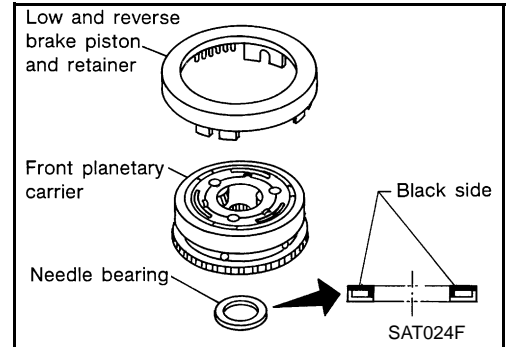
# DISASSEMBLY

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- 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.

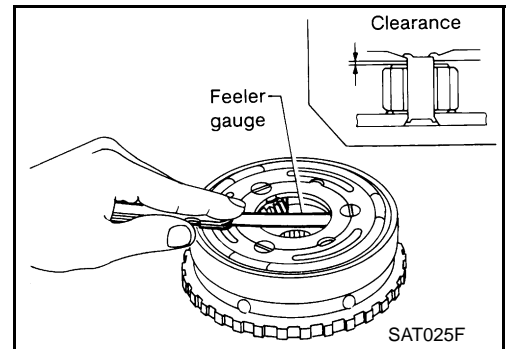


- h. Check front planetary carrier, low one-way clutch and needle bearing for damage or wear.  
i. Check clearance between planetary gears and planetary carrier with feeler gauge.

**Standard clearance: 0.20 - 0.70 mm (0.0079 - 0.0276 in)**

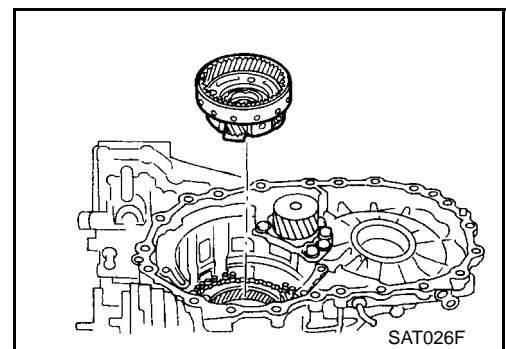
**Allowable limit: 0.80 mm (0.0315 in)**

Replace front planetary carrier if the clearance exceeds allowable limit.



32. Remove rear planetary carrier assembly and rear sun gear according to the following procedures.

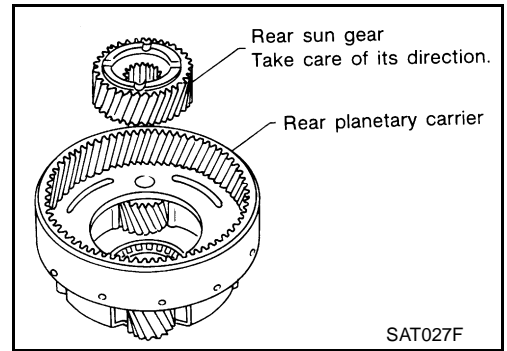
- a. Remove rear planetary carrier assembly from transmission case.



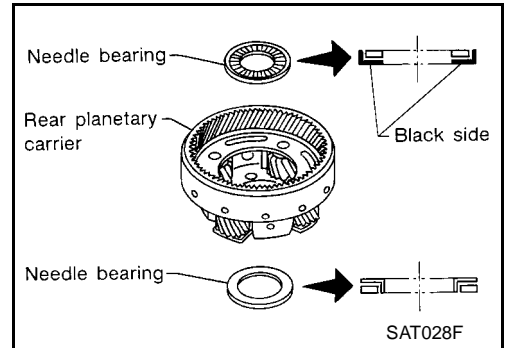
# DISASSEMBLY

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- b. Remove rear sun gear from rear planetary carrier.



- c. Remove needle bearings from rear planetary carrier assembly.

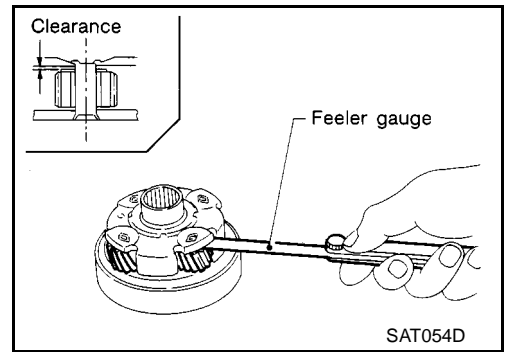


- d. Check rear planetary carrier, rear sun gear and needle bearings for damage or wear.
- e. Check clearance between pinion washer and rear planetary carrier with feeler gauge.

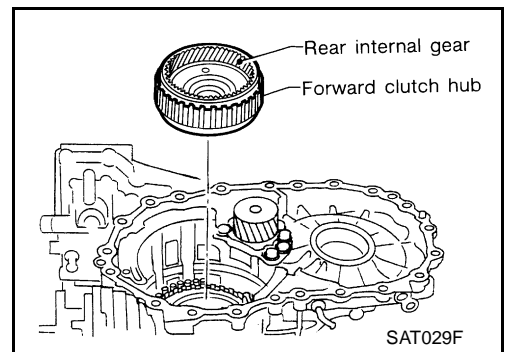
**Standard clearance: 0.20 - 0.70 mm (0.0079 - 0.0276 in)**

**Allowable limit: 0.80 mm (0.0315 in)**

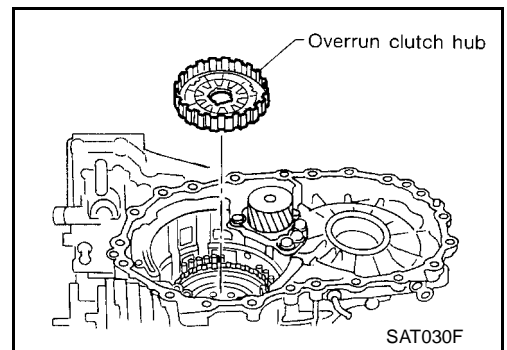
Replace rear planetary carrier if the clearance exceeds allowable limit.



33. Remove rear internal gear and forward clutch hub from transmission case.



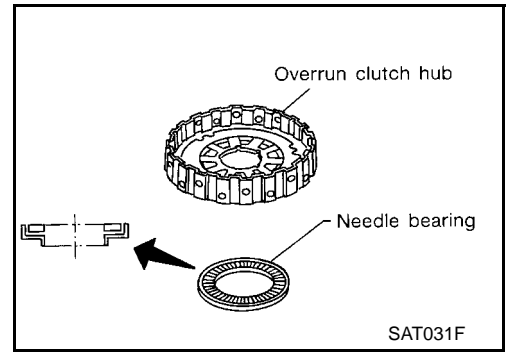
34. Remove overrun clutch hub from transmission case.



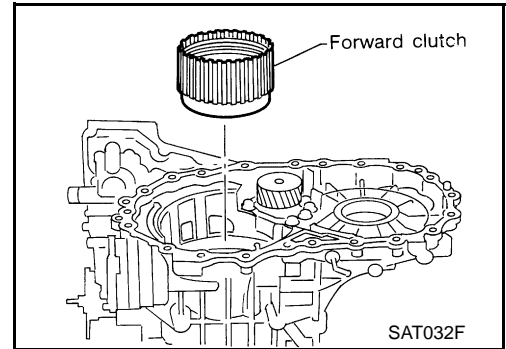
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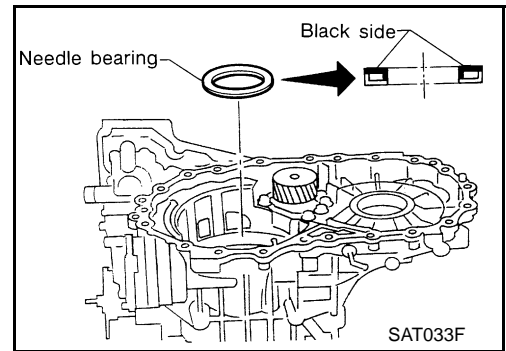
35. Remove needle bearing from overrun clutch hub and check for damage or wear.



36. Remove forward clutch assembly from transmission case.



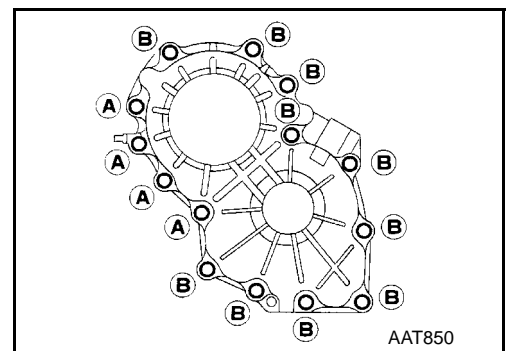
37. Remove needle bearing from transmission case.



38. Remove output shaft assembly according to the following procedures.

- a. Remove side cover bolts.

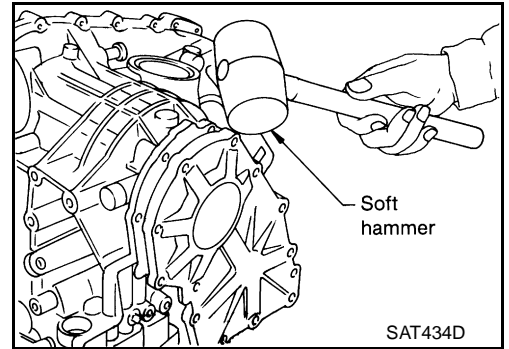
- Do not mix bolts A and B.
- Always replace bolts A as they are self-sealing bolts.



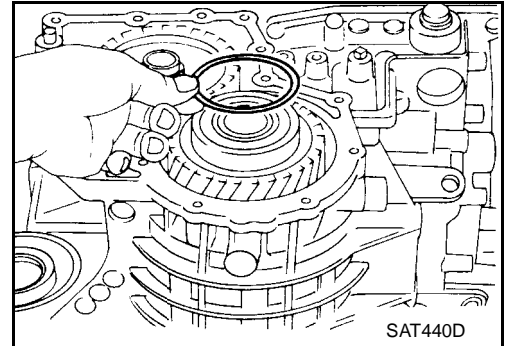
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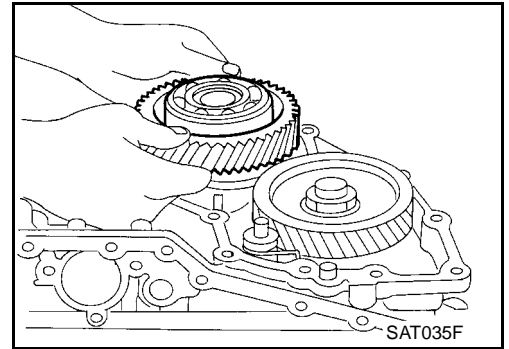
- b. Remove side cover by lightly tapping it with a soft hammer.
- Be careful not to drop output shaft assembly. It might come out when removing side cover.



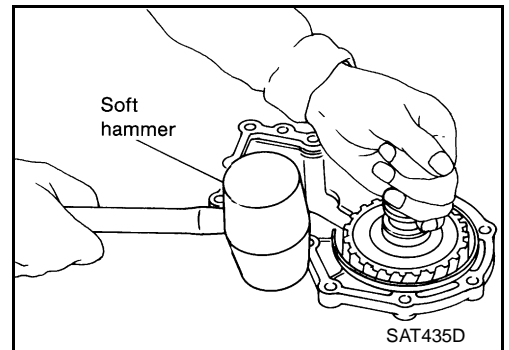
- c. Remove adjusting shim.



- d. Remove output shaft assembly.



- If output shaft assembly came off with side cover, tap cover with a soft hammer to separate.

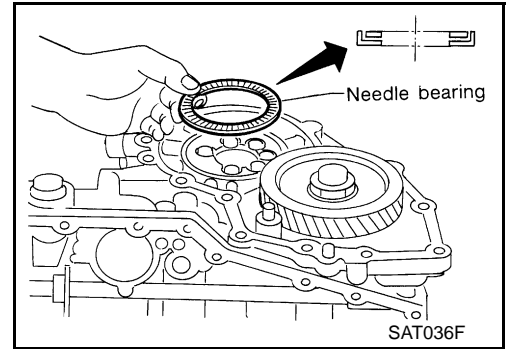


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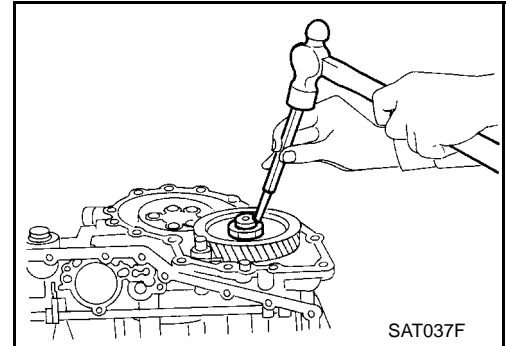
[ALL]

- e. Remove needle bearing.

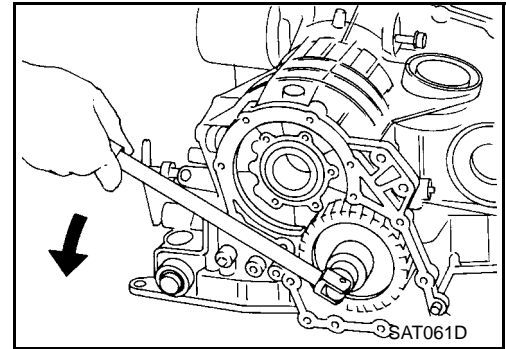


39. Disassemble reduction pinion gear according to the following procedures.

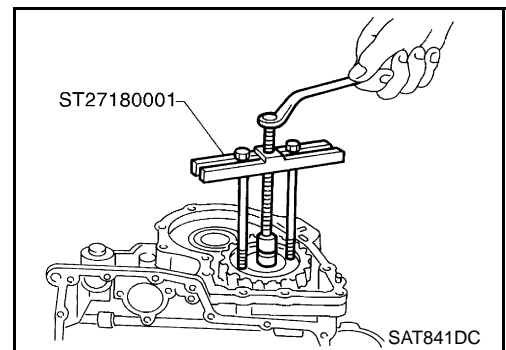
- a. Set manual shaft to position P to fix idler gear.  
b. Unlock idler gear lock nut using a pin punch.



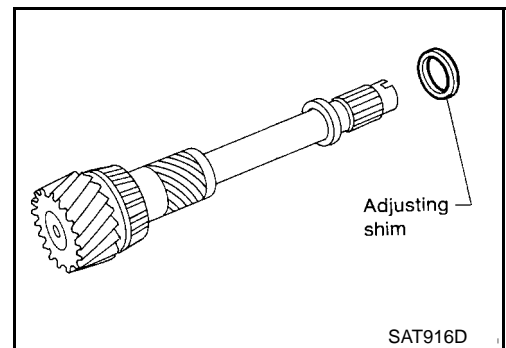
- c. Remove idler gear lock nut.  
● **Do not reuse idler gear lock nut.**



- d. Remove idler gear with puller.



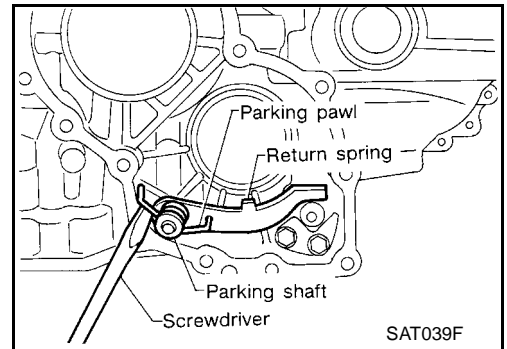
- e. Remove reduction pinion gear.  
f. Remove adjusting shim from reduction pinion gear.



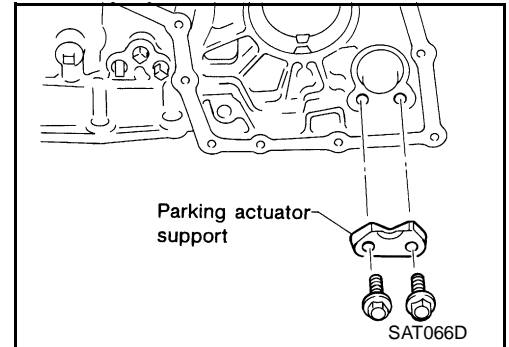
# DISASSEMBLY

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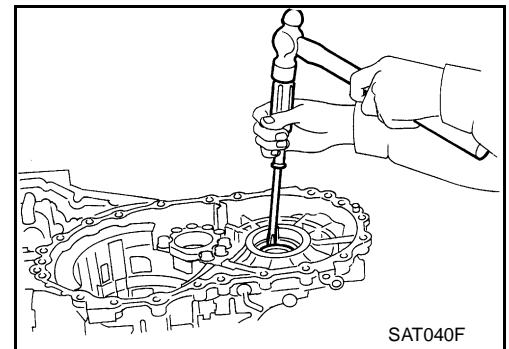
- 40. Remove return spring from parking shaft with screwdriver.
- 41. Draw out parking shaft and remove parking pawl from transmission case.
- 42. Check parking pawl and shaft for damage or wear.



- 43. Remove parking actuator support from transmission case.
- 44. Check parking actuator support for damage or wear.



- 45. Remove side oil seal with screwdriver from transmission case.



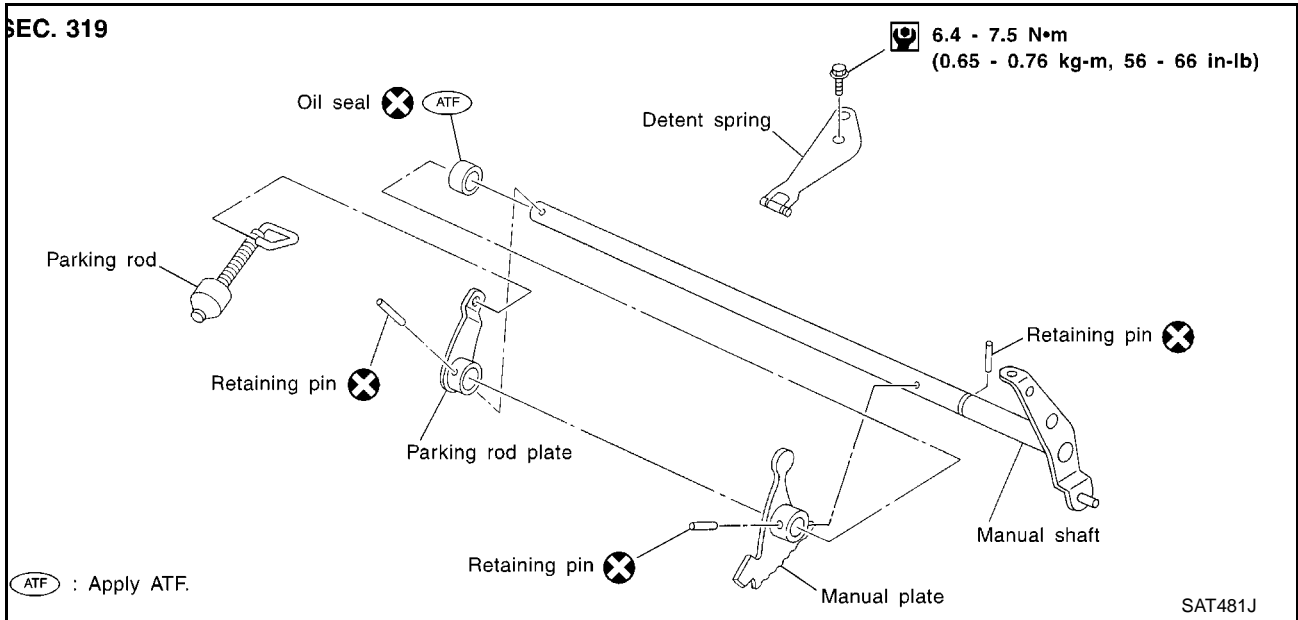
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## REPAIR FOR COMPONENT PARTS

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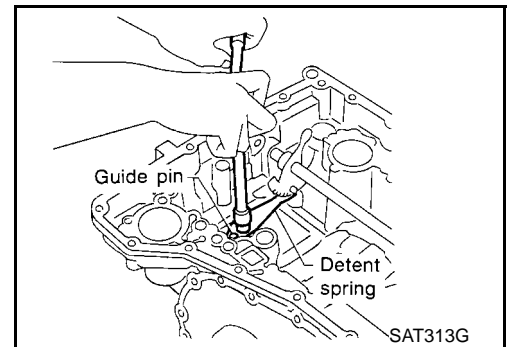
### Manual Shaft COMPONENTS

ECS0060E

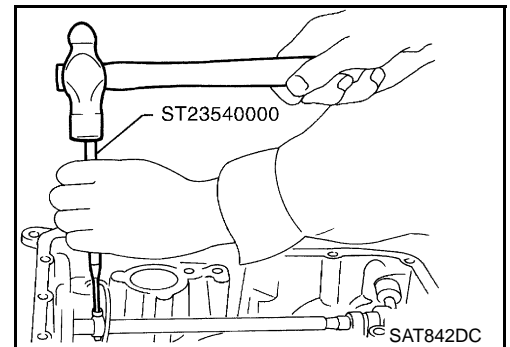


### REMOVAL

1. Remove detent spring from transmission case.



2. Drive out manual plate retaining pin.

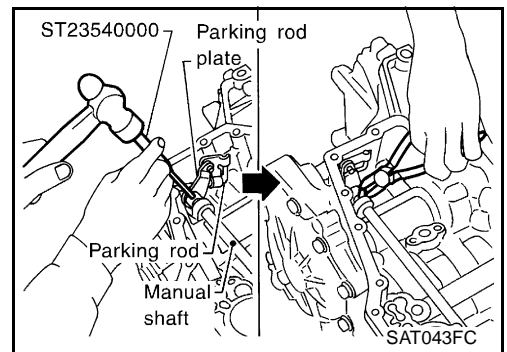




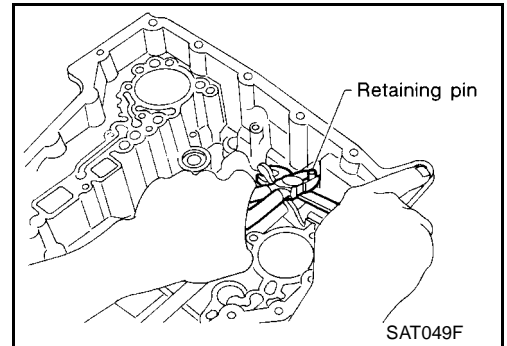
# REPAIR FOR COMPONENT PARTS

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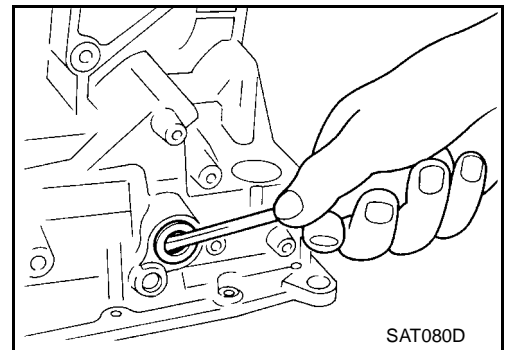
3. Drive and pull out parking rod plate retaining pin.
4. Remove parking rod plate from manual shaft.
5. Draw out parking rod from transmission case.



6. Pull out manual shaft retaining pin.
7. Remove manual shaft and manual plate from transmission case.



8. Remove manual shaft oil seal.

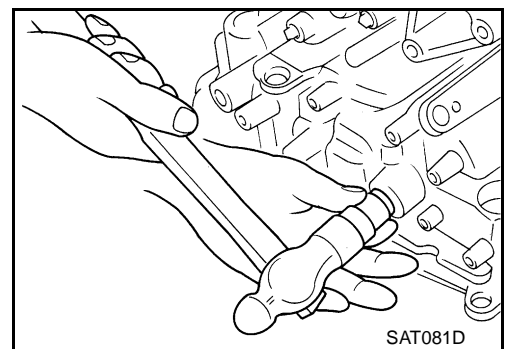


## INSPECTION

- 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.

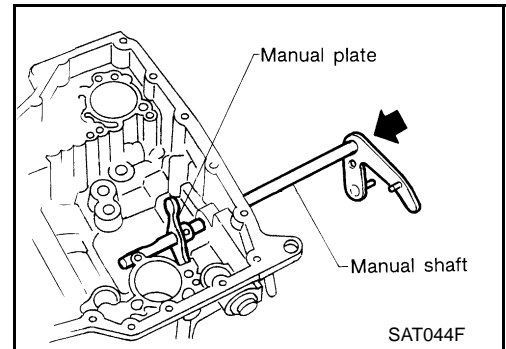


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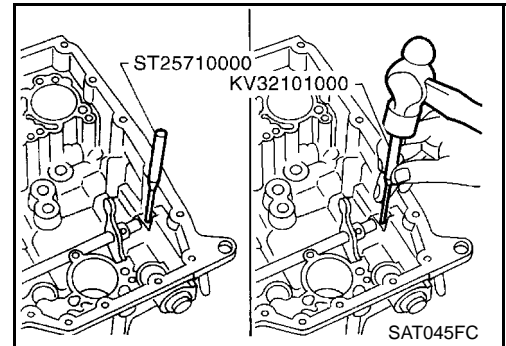
# REPAIR FOR COMPONENT PARTS

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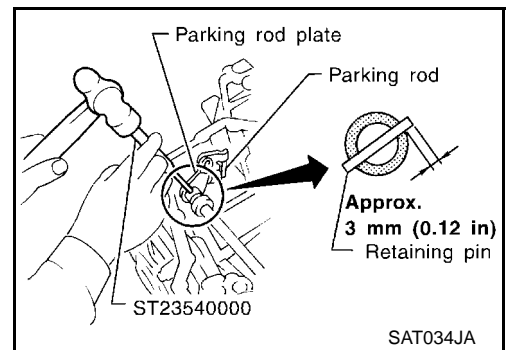
2. Install manual shaft and manual plate.



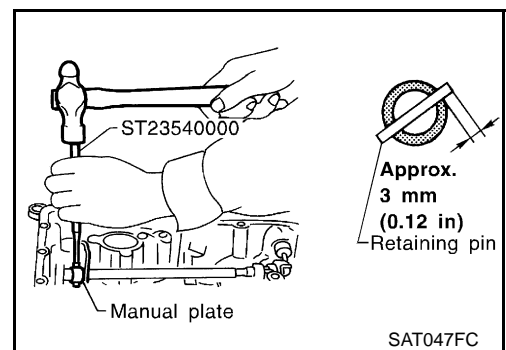
3. Align groove of manual shaft and hole of transmission case.  
4. Install manual shaft retaining pin up to bottom of hole.



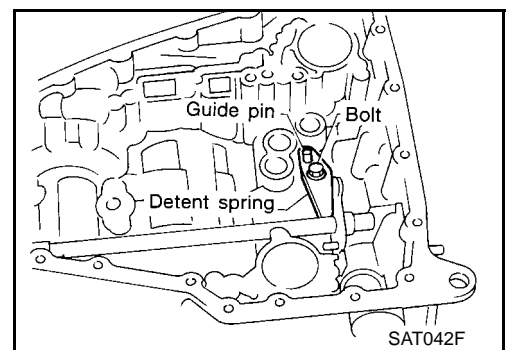
5. Install parking rod to parking rod plate.  
6. Set parking rod assembly onto manual shaft and drive retaining pin.  
● Both ends of pin should protrude.



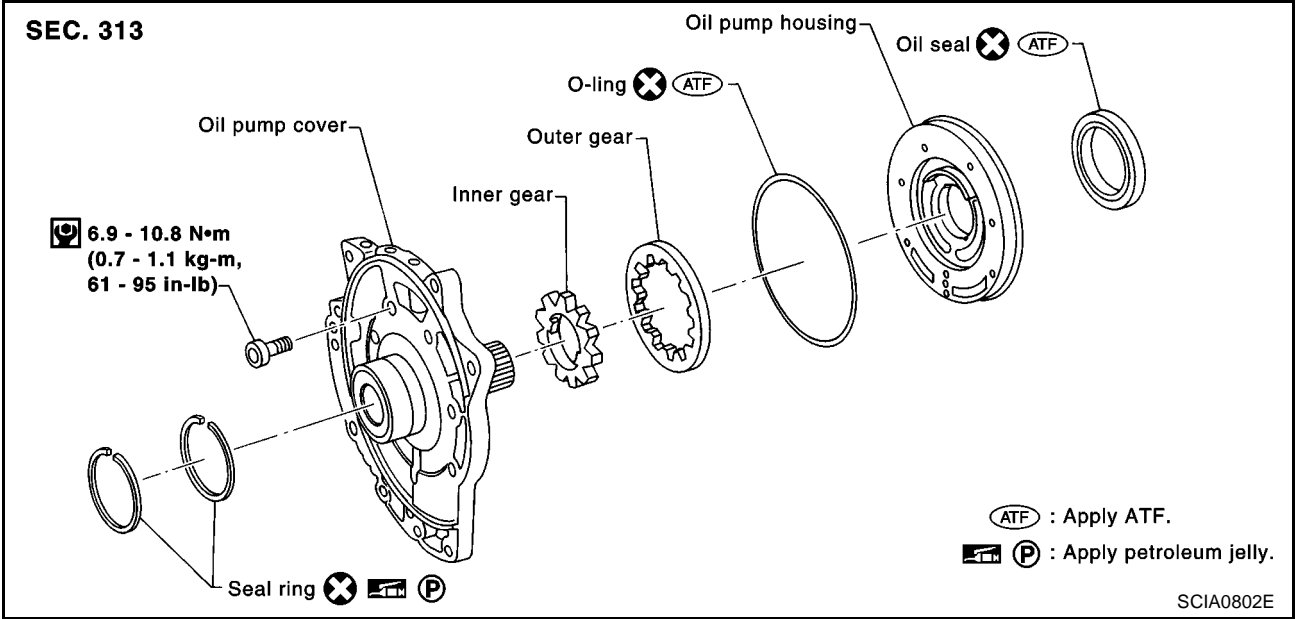
7. Drive manual plate retaining pin.  
● Both ends of pin should protrude.



8. Install detent spring. Tighten detent spring bolts to the specified torque. Refer to [AT-432, "COMPONENTS"](#).

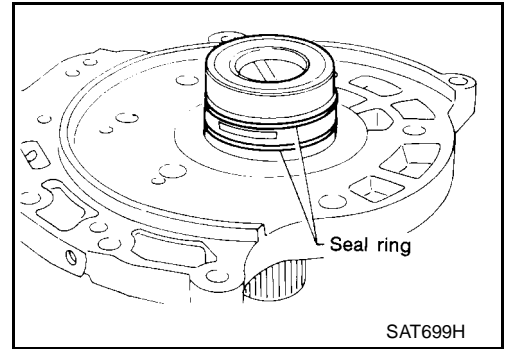


Oil Pump  
COMPONENTS

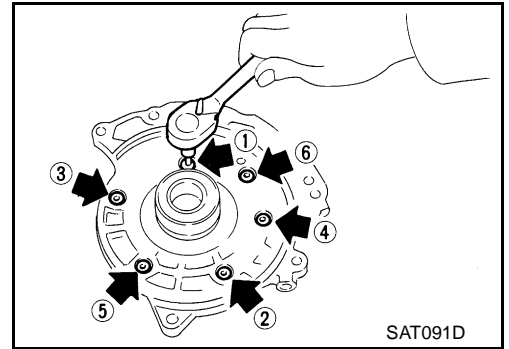


**DISASSEMBLY**

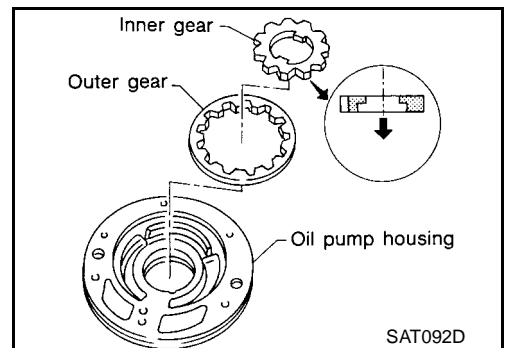
1. Remove seal rings.



2. Loosen bolts in a crisscross pattern and remove oil pump cover.

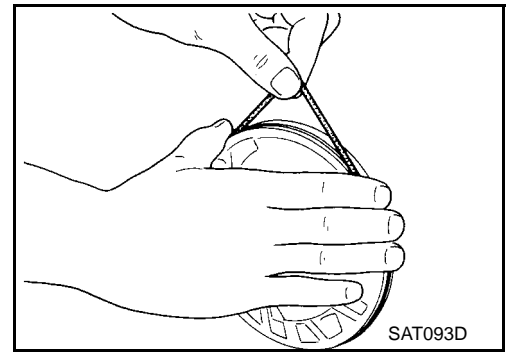


3. Remove inner and outer gear from oil pump housing.

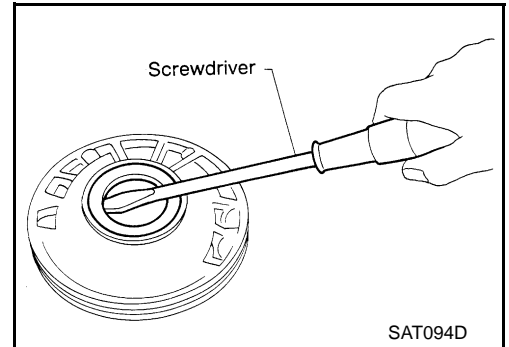


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- Remove O-ring from oil pump housing.



- 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.

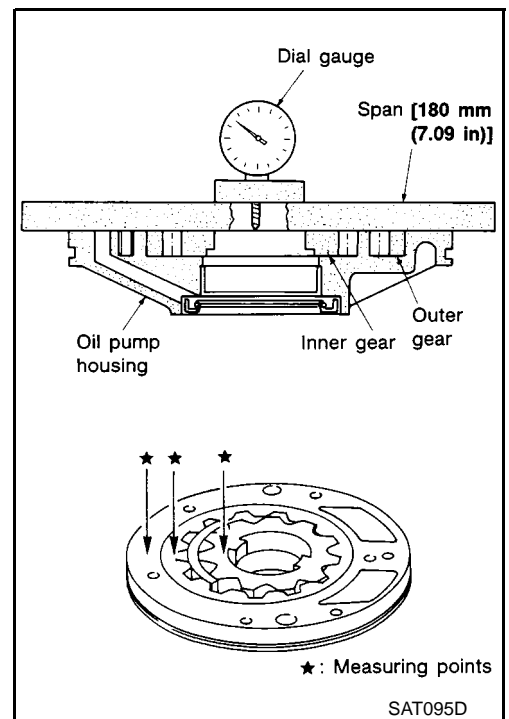
**Standard clearance: 0.02 - 0.04 mm (0.0008 - 0.0016 in)**

- 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 [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#)**

- If clearance is more than standard, replace whole oil pump assembly except oil pump cover.



# REPAIR FOR COMPONENT PARTS

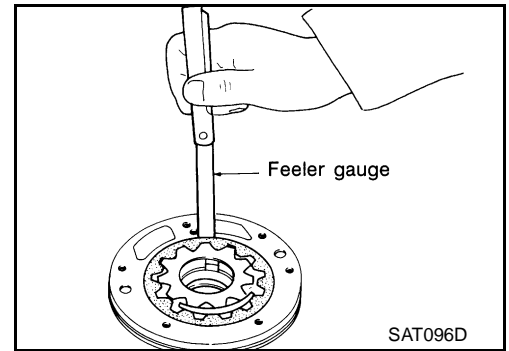
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- Measure clearance between outer gear and oil pump housing.

**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.



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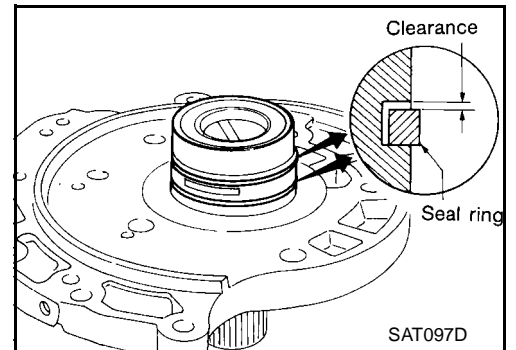
## Seal Ring Clearance

- 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.



E

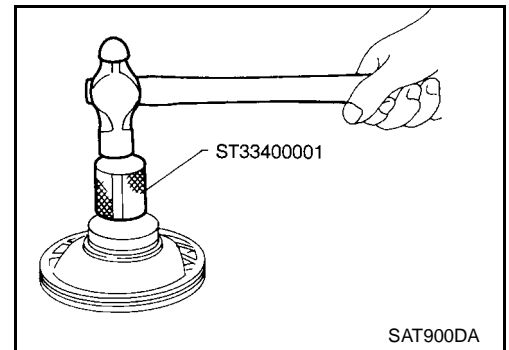
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## ASSEMBLY

1. Install oil seal on oil pump housing.



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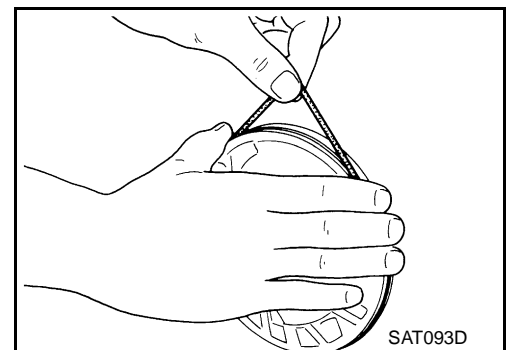
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2. Install O-ring on oil pump housing.

- Apply ATF to O-ring.



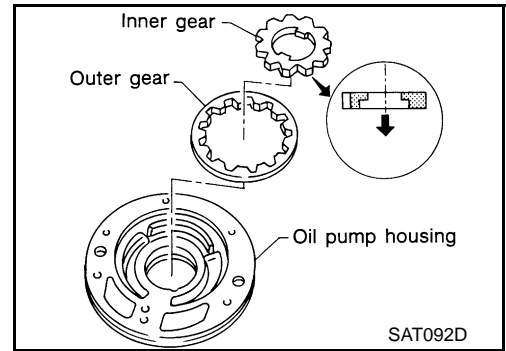
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## REPAIR FOR COMPONENT PARTS

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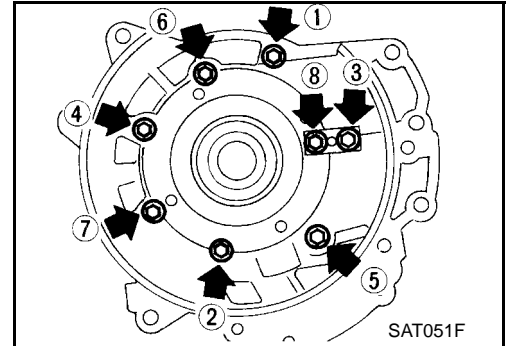
3. Install inner and outer gears on oil pump housing.

- Be careful of direction of inner gear.



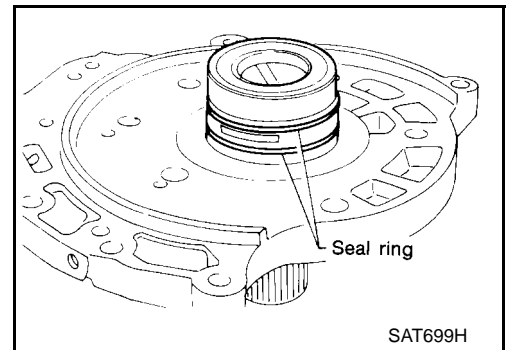
4. Install oil pump cover on oil pump housing.

- 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 a crisscross pattern. Tighten oil pump cover bolts to the specified torque. Refer to [AT-435, "COMPONENTS"](#)

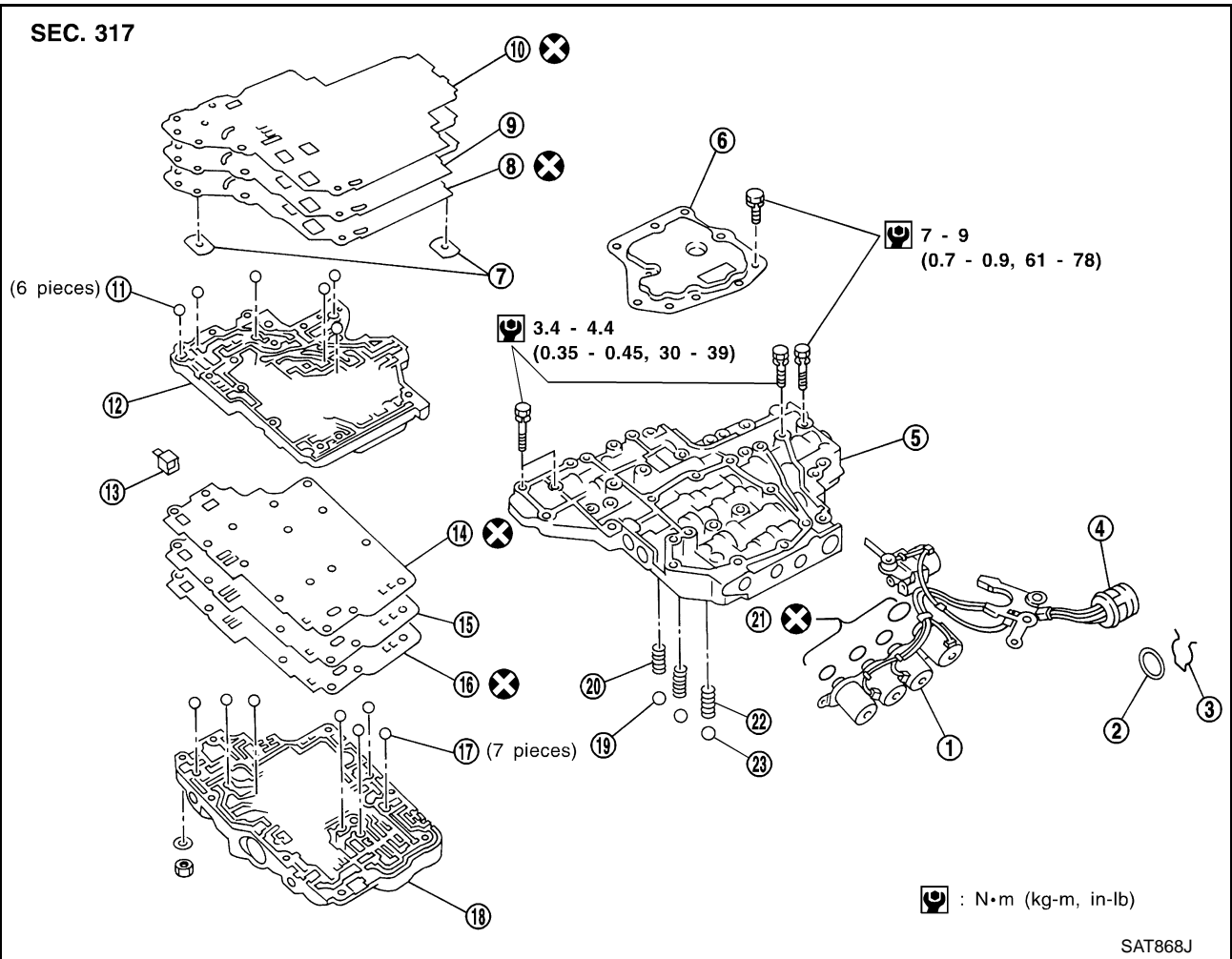


5. Install new seal rings carefully after packing ring groove with petroleum jelly.

- Do not spread gap of seal ring excessively while installing. The ring may be deformed.



## Control Valve Assembly COMPONENTS




- |                                 |                                    |                              |
|---------------------------------|------------------------------------|------------------------------|
| 1. Solenoid valve assembly      | 2. O-ring                          | 3. Clip                      |
| 4. Terminal body                | 5. Control valve lower body        | 6. Oil strainer              |
| 7. Support plate                | 8. Lower inter separating gasket   | 9. Separating plate          |
| 10. Lower separating gasket     | 11. Steel ball                     | 12. Control valve inter body |
| 13. Pilot filter                | 14. Upper inter separating gasket  | 15. Separating plate         |
| 16. Upper separating gasket     | 17. Steel ball                     | 18. Control valve upper body |
| 19. Check ball                  | 20. Oil cooler relief valve spring | 21. O-ring                   |
| 22. T/C pressure holding spring | 23. Check ball                     |                              |

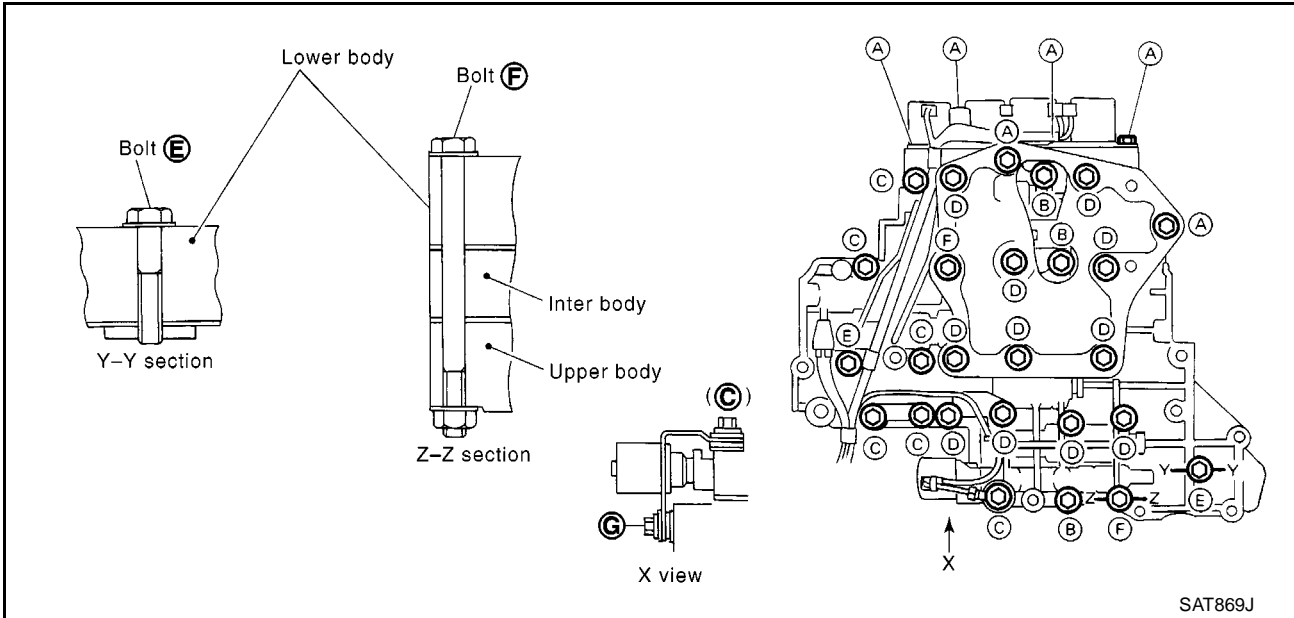
## DISASSEMBLY

- Disassemble upper, inter and lower bodies.

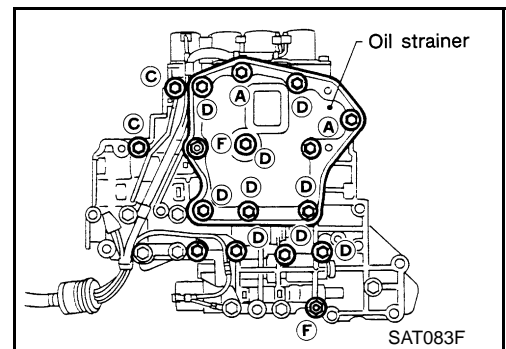
### Bolt length, number and location:

Bolt symbol	A	B	C	D	E	F	G
Bolt length "ℓ" 	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 and nut

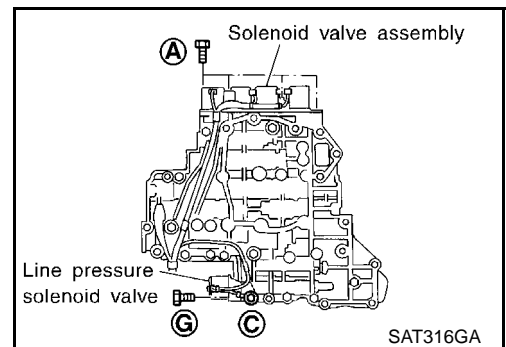


- Remove bolts A, D and F, and remove oil strainer from control valve assembly.



- Remove solenoid valve assembly and line pressure solenoid valve from control valve assembly.

- Be careful not to lose the line pressure solenoid valve spring.

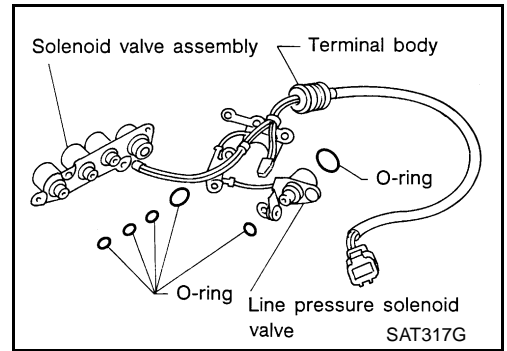




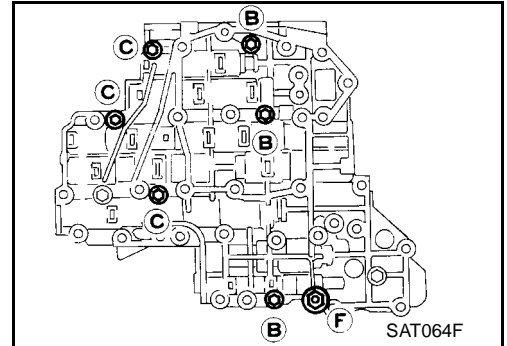
# REPAIR FOR COMPONENT PARTS

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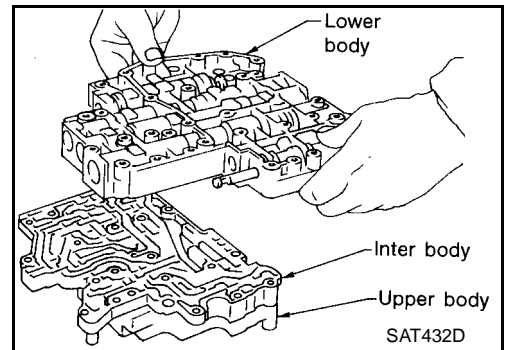
3. Remove O-rings from solenoid valves and terminal body.



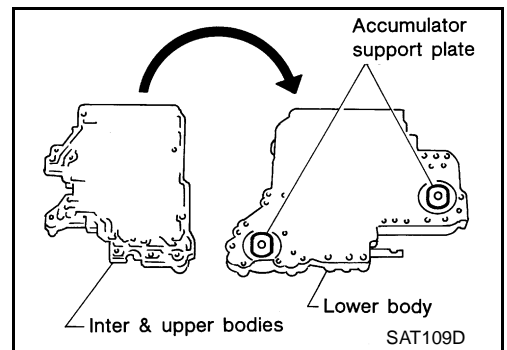
4. Place upper body facedown, and remove bolts B, C and F.



5. Remove lower body from inter body.



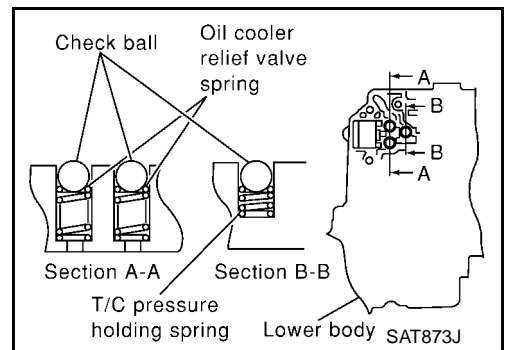
6. Turn over lower body, and accumulator support plates.



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.

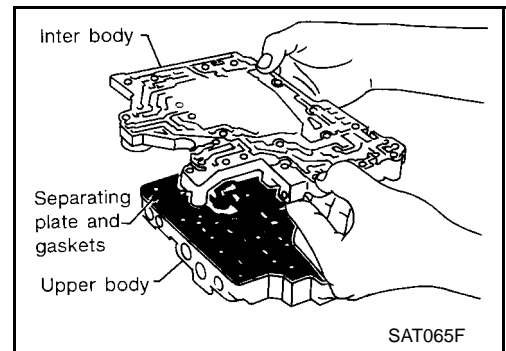


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# REPAIR FOR COMPONENT PARTS

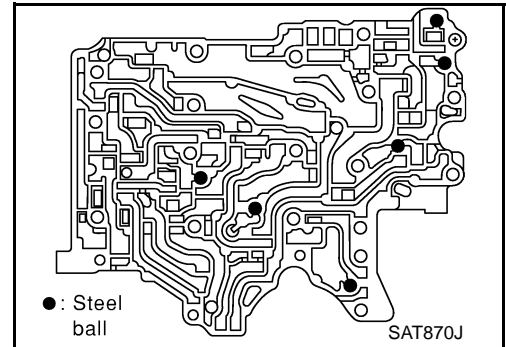
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9. Remove inter body from upper body.



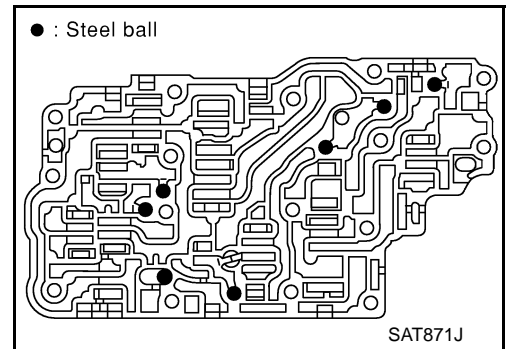
10. Check to see that steel balls are properly positioned in inter body and then remove them.

- Be careful not to lose steel balls.



11. Check to see that steel balls are properly positioned in upper body and then remove them.

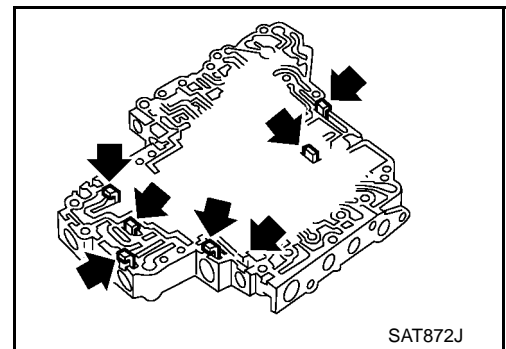
- Be careful not to lose steel balls.



## INSPECTION

### Lower and Upper Bodies

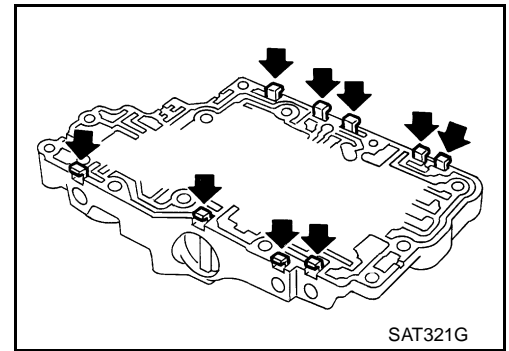
- Check to see that retainer plates are properly positioned in lower body.



# REPAIR FOR COMPONENT PARTS

[ALL]

- Check to see that retainer plates are properly positioned in upper body.
- **Be careful not to lose these parts.**

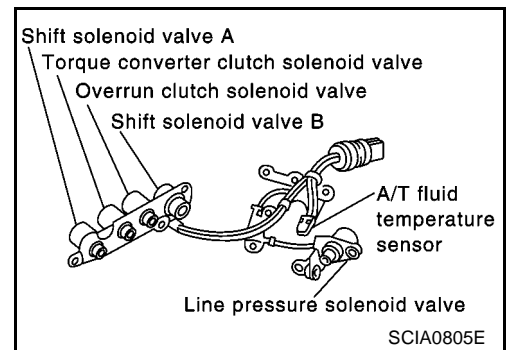


## Oil Strainer

- 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

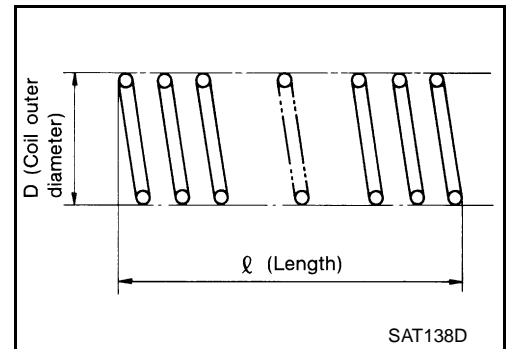
- Measure resistance.
- Except for EURO-OBD:
- For shift solenoid valve A, refer to [AT-356, "SHIFT SOLENOID VALVE A"](#) .
- For shift solenoid valve B, refer to [AT-361, "SHIFT SOLENOID VALVE B"](#) .
- For line pressure solenoid valve, refer to [AT-386, "LINE PRESSURE SOLENOID VALVE"](#) .
- For torque converter clutch solenoid valve, refer to [AT-371, "TORQUE CONVERTER CLUTCH SOLENOID VALVE"](#) .
- For overrun clutch solenoid valve, refer to [AT-366, "OVERRUN CLUTCH SOLENOID VALVE"](#) .
- EURO-OBD:
- For shift solenoid valve A, refer to [AT-170, "DTC P0750 SHIFT SOLENOID VALVE A"](#) .
- For shift solenoid valve B, refer to [AT-175, "DTC P0755 SHIFT SOLENOID VALVE B"](#) .
- For line pressure solenoid valve, refer to [AT-163, "DTC P0745 LINE PRESSURE SOLENOID VALVE"](#) .
- For torque converter clutch solenoid valve, refer to [AT-158, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"](#) .
- For overrun clutch solenoid valve, refer to [AT-185, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"](#) .



## Oil Cooler Relief Valve Spring

- Check springs for damage or deformation.
- Measure free length and outer diameter.

**Inspection standard: Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .**

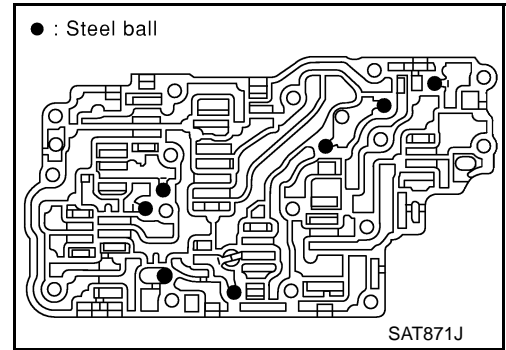


# REPAIR FOR COMPONENT PARTS

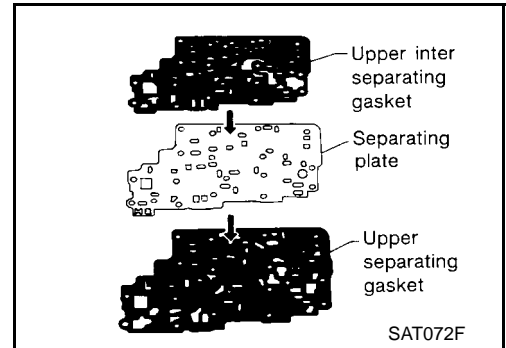
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## ASSEMBLY

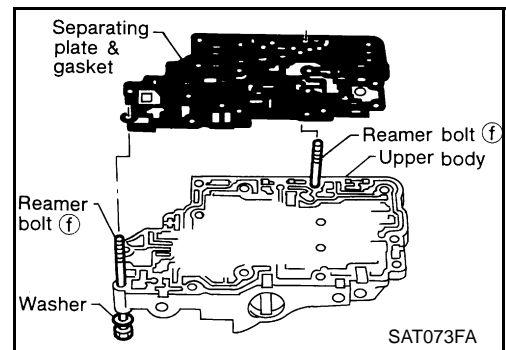
1. Install upper, inter and lower body.
- a. Place oil circuit of upper body face up. Install steel balls in their proper positions.



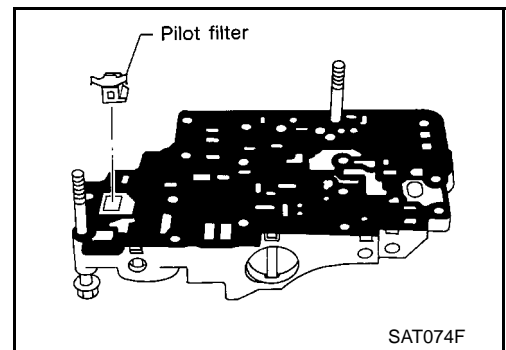
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- b. Install upper separating gasket, upper inter separating gasket and upper separating plate in order shown in illustration.



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- c. Install reamer bolts **f** from bottom of upper body. Using reamer bolts as guides, install separating plate and gaskets as a set.



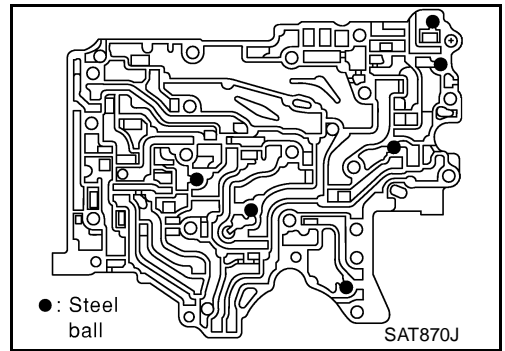
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- d. Install pilot filter.



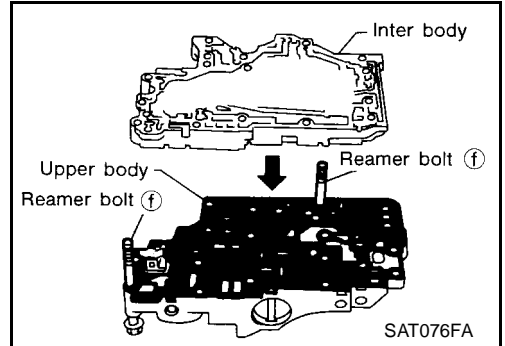
# REPAIR FOR COMPONENT PARTS

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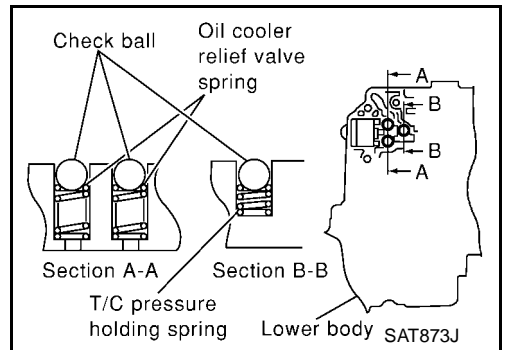
- e. Place lower body as shown in illustration (side of inter body face up). Install steel balls in their proper positions.



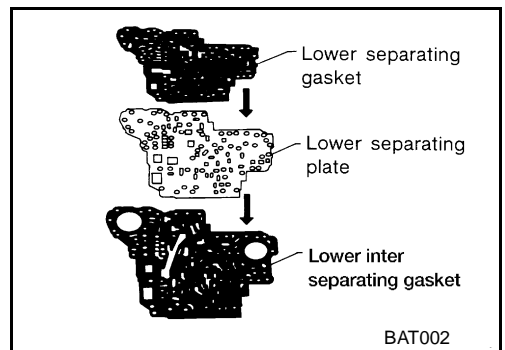
- f. Install inter body on upper body using reamer bolts **f** as guides.  
 ● **Be careful not to dislocate or drop steel balls.**



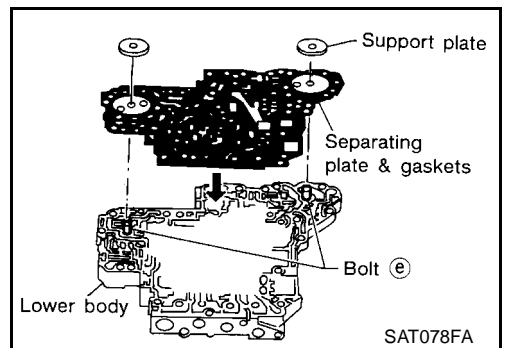
- g. Install check balls and oil cooler relief valve springs in their proper positions in lower body.



- 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.

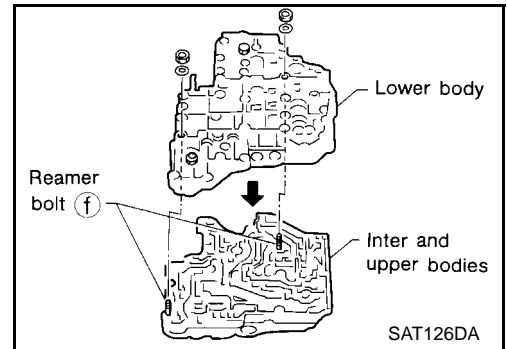


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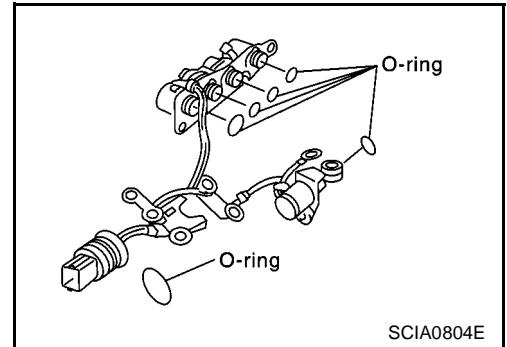
# REPAIR FOR COMPONENT PARTS

[ALL]

- k. Install lower body on inter body using reamer bolts **f** as guides and tighten reamer bolts **f** slightly.




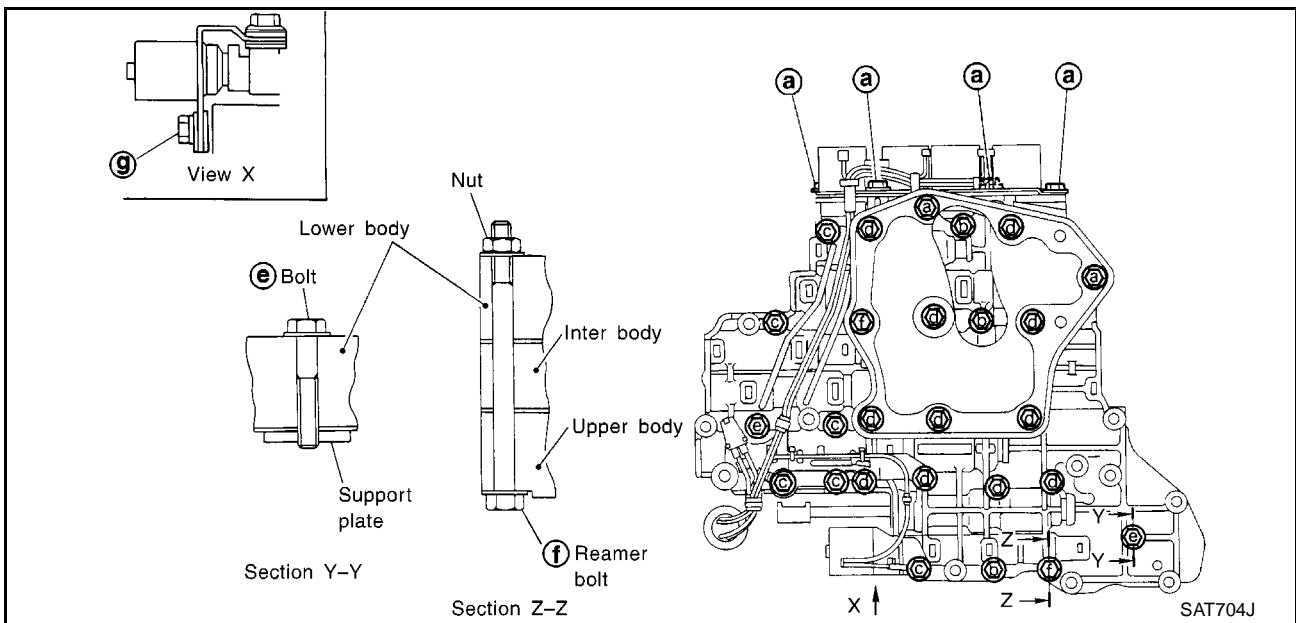
2. Install O-rings to solenoid valves and terminal body.  
 ● Apply ATF to O-rings.



3. Install and tighten bolts.

### Bolt length, number and location:

Bolt symbol	a	b	c	d	e	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

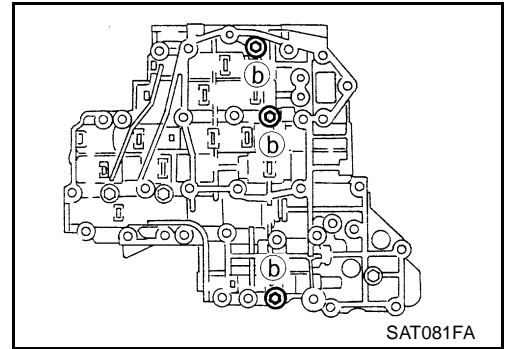


# REPAIR FOR COMPONENT PARTS

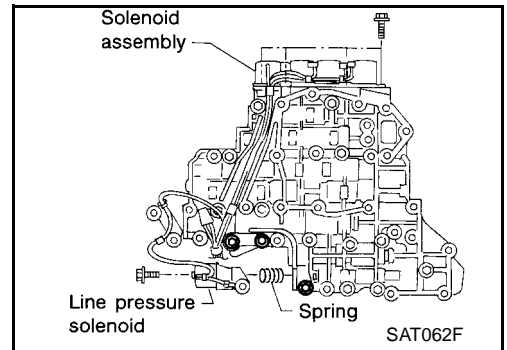
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- a. Install and tighten bolts **b** to specified torque.

 : 7 - 9 N-m (0.7 - 0.9 kg-m, 61 - 78 in-lb)

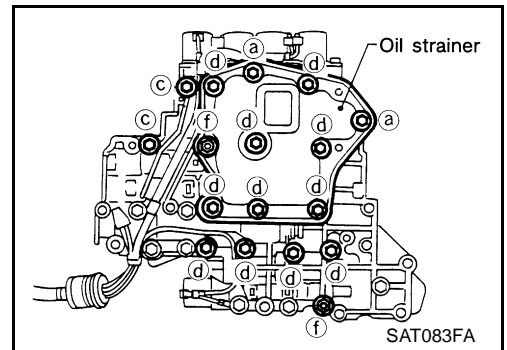


- b. Install solenoid valve assembly and line pressure solenoid valve to lower body.



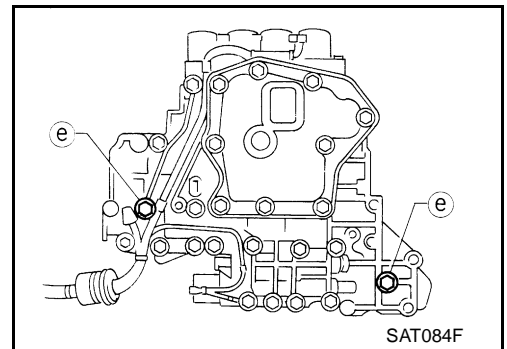
- c. Set oil strainer, then tighten bolts **a**, **c**, **d** and nuts **f** to specified torque.

 : 7 - 9 N-m (0.7 - 0.9 kg-m, 61 - 78 in-lb)



- d. Tighten bolts **e** to specified torque.

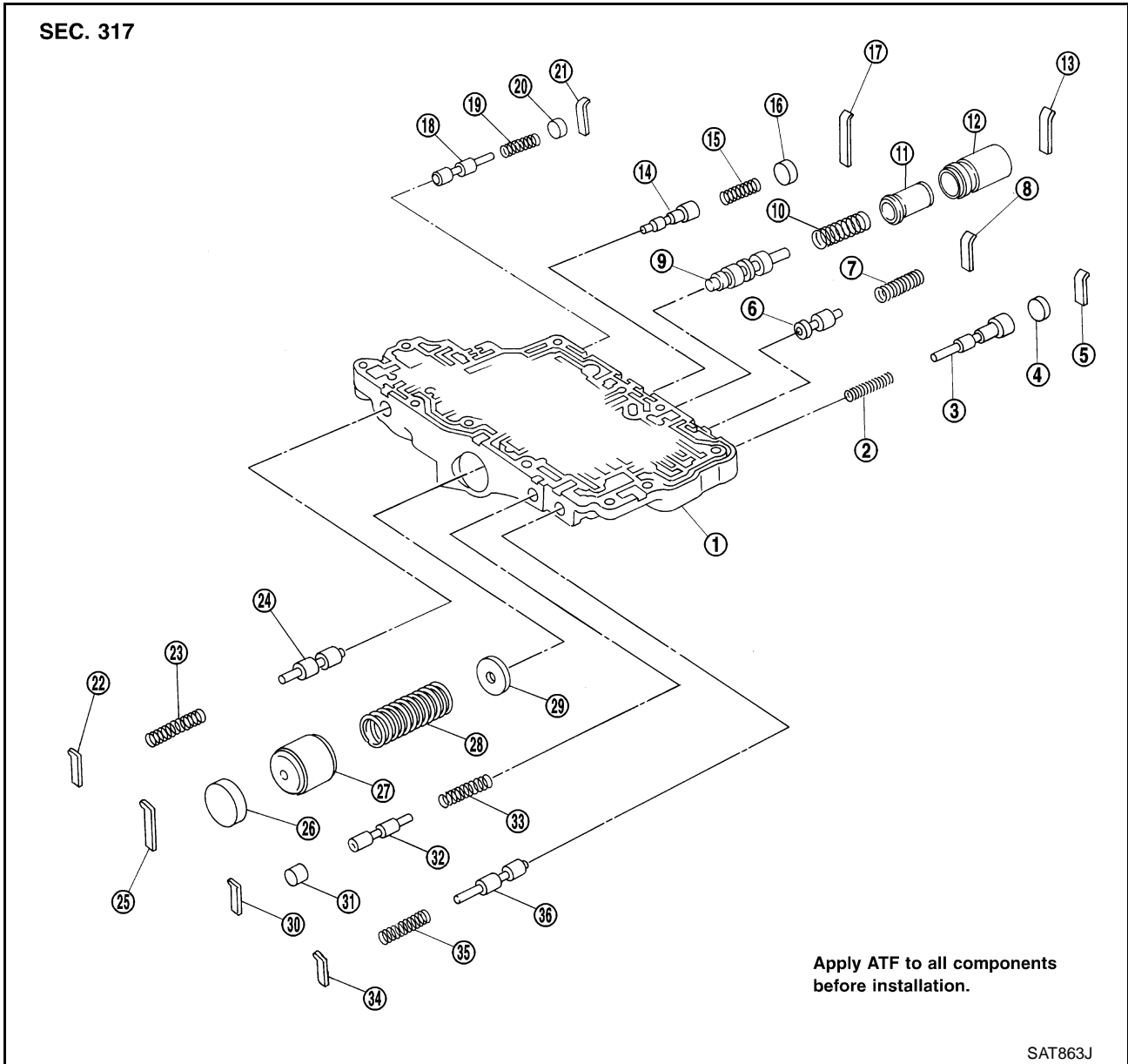
 : 3.4 - 4.4 N-m (0.35 - 0.45 kg-m, 30.4 - 39.1 in-lb)



A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

## Control Valve Upper Body COMPONENTS

Numbers preceding valve springs correspond with those shown in [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).

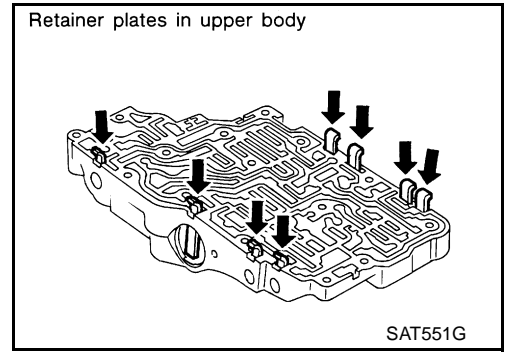


- |                             |                                    |                                          |
|-----------------------------|------------------------------------|------------------------------------------|
| 1. Control valve upper body | 2. Return spring                   | 3. Overrun clutch reducing valve         |
| 4. Plug                     | 5. Retainer plate                  | 6. Torque converter relief valve         |
| 7. Return spring            | 8. Retainer plate                  | 9. Torque converter clutch control valve |
| 10. Return spring           | 11. Plug                           | 12. Sleeve                               |
| 13. Retainer plate          | 14. 1-2 accumulator valve          | 15. Return spring                        |
| 16. Plug                    | 17. Retainer plate                 | 18. Cooler check valve                   |
| 19. Return spring           | 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                     |

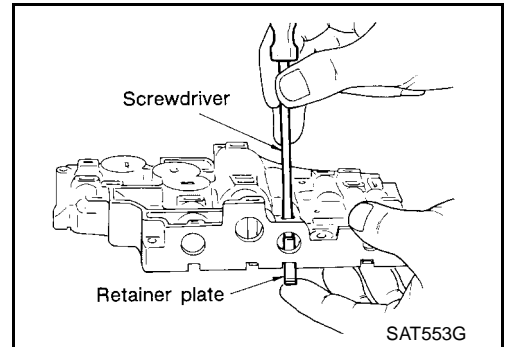


## DISASSEMBLY

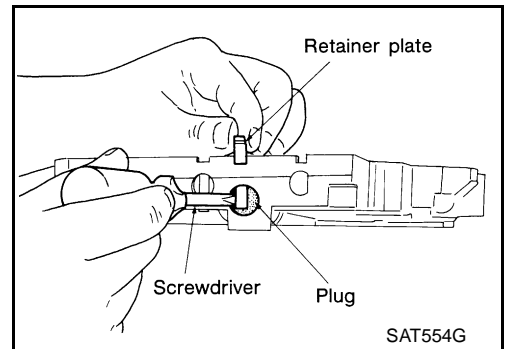
1. Remove valves at retainer plates.
  - Do not use a magnetic pick-up tool.



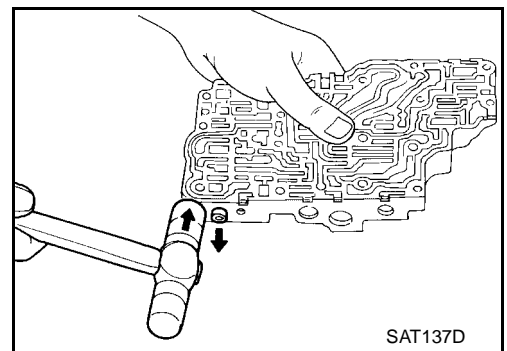
- a. Use a screwdriver to remove retainer plates.



- 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.



A  
B  
AT  
D  
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I  
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K  
L  
M

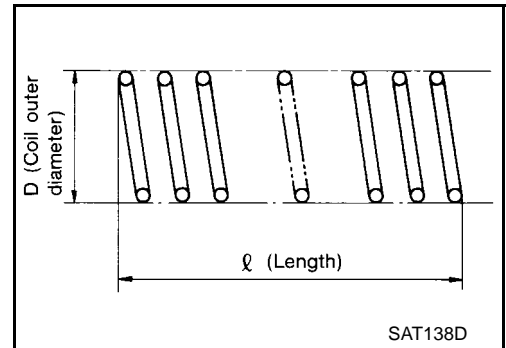
## INSPECTION

### Valve Spring

- Measure free length and outer diameter of each valve spring. Also check for damage or deformation.

**Inspection standard** :Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .

- Replace valve springs if deformed or fatigued.

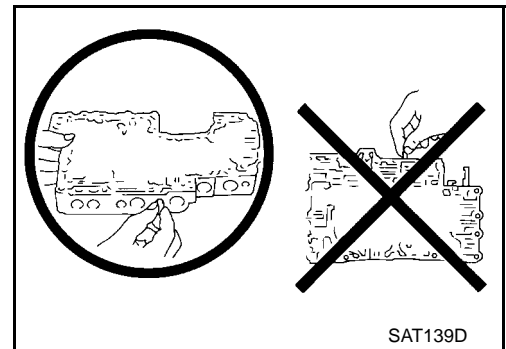


### Control Valves

- Check sliding surfaces of valves, sleeves and plugs.

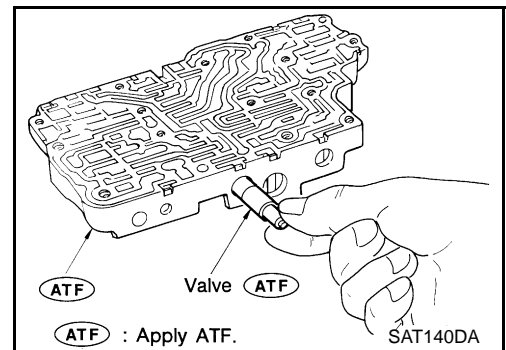
## ASSEMBLY

- Lay control valve body down when installing valves. Do not stand the control valve body upright.

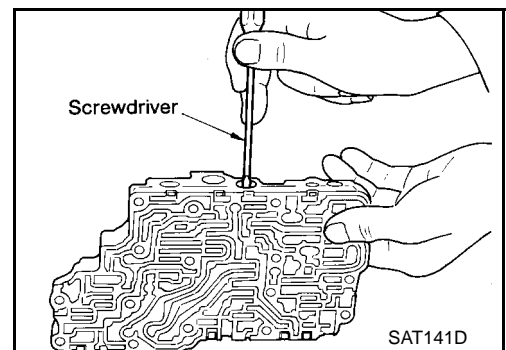


1. Lubricate the control valve body and all valves with ATF. Install control valves by sliding them carefully into their bores.

- Be careful not to scratch or damage valve body.

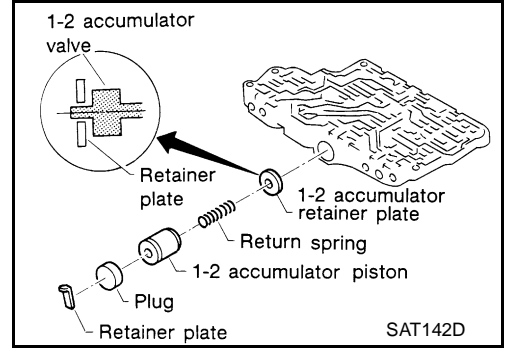


- Wrap a small screwdriver with vinyl tape and use it to insert the valves into their proper positions.

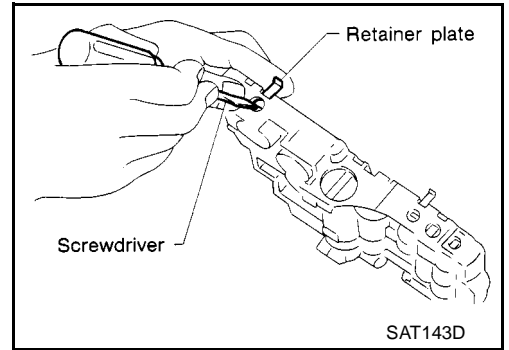


## 1-2 Accumulator Valve

- 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.



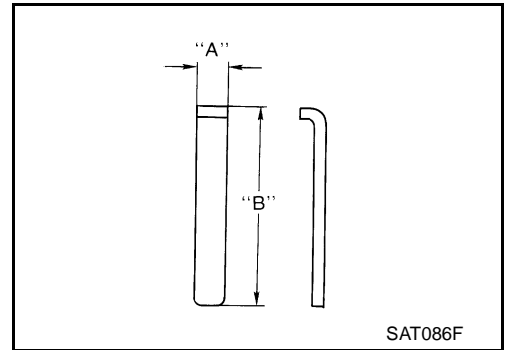
1. Install retainer plates.
  - While pushing plug or return spring, install retainer plate.



## Retainer Plate (Upper Body)

Unit: mm (in)

No.	Name of control valve	Width A	Length B
22	Pilot valve	6.0 (0.236)	21.5 (0.846)
30	1st reducing valve		
34	3-2 timing valve		
17	Torque converter relief valve		40.5 (1.59)
9	1-2 accumulator valve		
25	1-2 accumulator piston valve		24.0 (0.945)
21	Overrun clutch reducing valve		
5	Cooler check valve		28.0 (1.102)
14	Torque converter clutch control valve		



- Install proper retainer plates.  
Refer to [AT-448, "Control Valve Upper Body"](#) .

## Control Valve Lower Body COMPONENTS

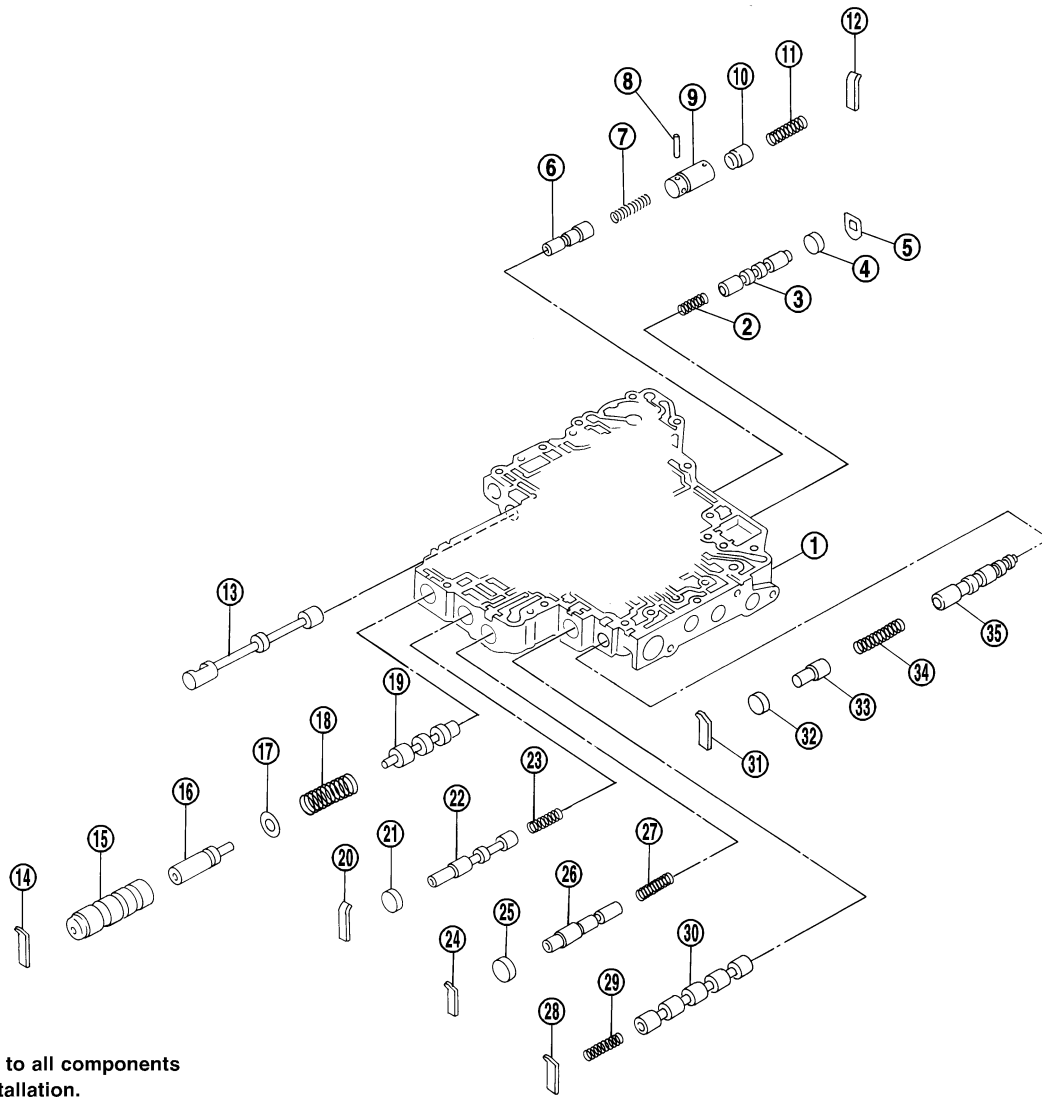
ECS0061J

Numbers preceding valve springs correspond with those shown in [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .

# REPAIR FOR COMPONENT PARTS

[ALL]

## SEC. 317



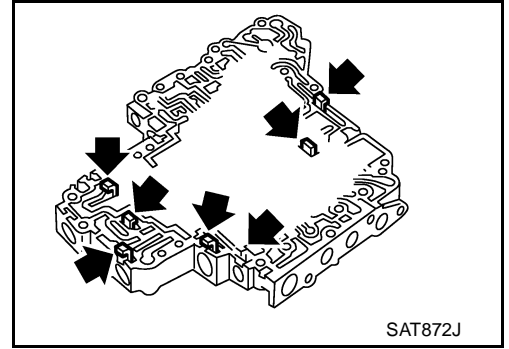
Apply ATF to all components before installation.

SAT864J

- |                                  |                               |                            |
|----------------------------------|-------------------------------|----------------------------|
| 1. Control valve lower body      | 2. Return spring              | 3. Shift valve B           |
| 4. Plug                          | 5. Retainer plate             | 6. Pressure modifier valve |
| 7. Return spring                 | 8. Parallel pin               | 9. Sleeve                  |
| 10. Piston                       | 11. Return spring             | 12. Retainer plate         |
| 13. Manual valve                 | 14. Retainer plate            | 15. Sleeve                 |
| 16. Plug                         | 17. Spring seat               | 18. Return spring          |
| 19. Pressure regulator valve     | 20. Retainer plate            | 21. Plug                   |
| 22. Overrun clutch control valve | 23. Return spring             | 24. Retainer plate         |
| 25. Plug                         | 26. Accumulator control valve | 27. Return spring          |
| 28. Retainer plate               | 29. Return spring             | 30. Shift valve A          |
| 31. Retainer plate               | 32. Plug                      | 33. Plug                   |
| 34. Return spring                | 35. Shuttle control valve     |                            |

## DISASSEMBLY

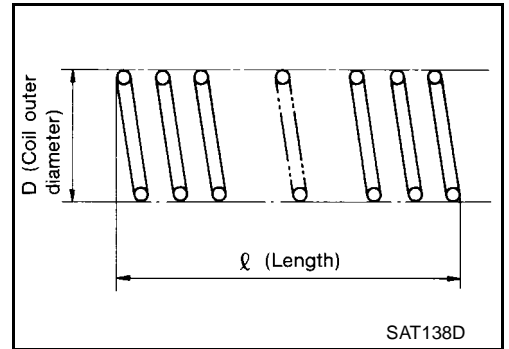
- Remove valves at retainer plate.  
For removal procedures, refer to [AT-449, "DISASSEMBLY"](#).



## INSPECTION

### Valve Springs

- Check each valve spring for damage or deformation. Also measure free length and outer diameter.  
**Inspection standard** :Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).
- Replace valve springs if deformed or fatigued.

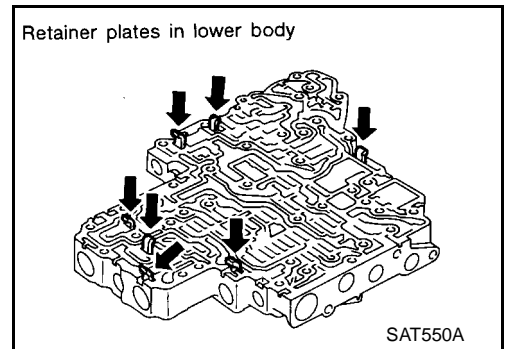


### Control Valves

- Check sliding surfaces of control valves, sleeves and plugs for damage.

## ASSEMBLY

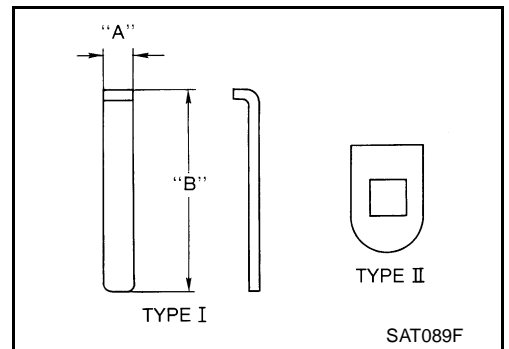
- Install control valves.  
For installation procedures, refer to [AT-450, "ASSEMBLY"](#).



### Retainer Plate (for control valve lower body)

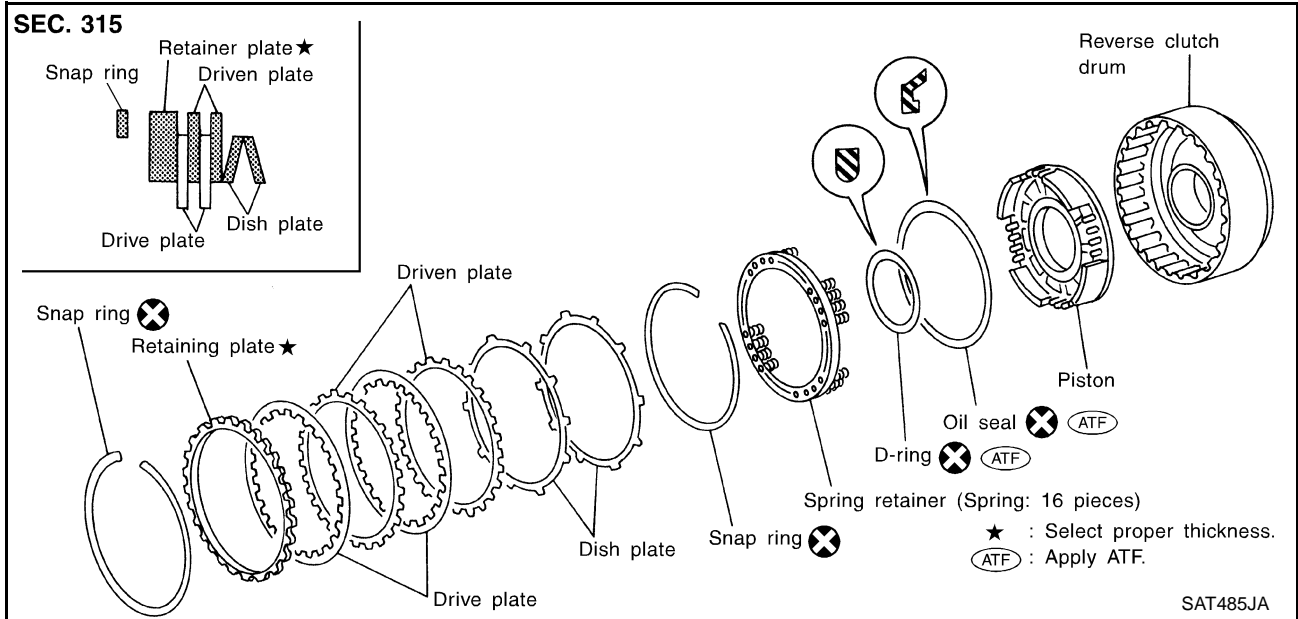
Unit: mm (in)

Name of control valve	No.	Length 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	—	—	II
Shift valve B	5			



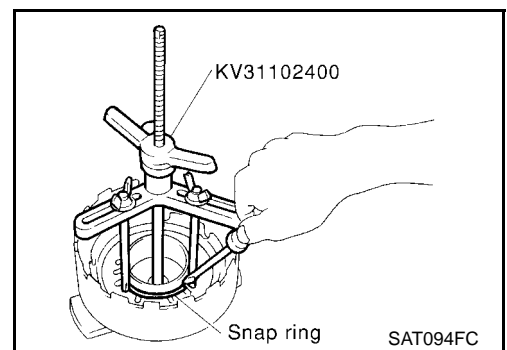
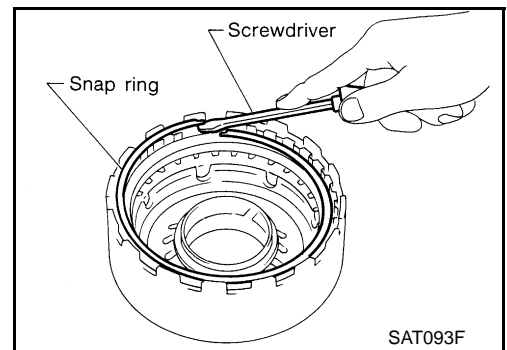
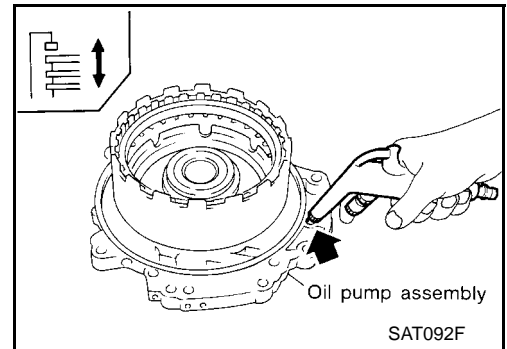
- Install proper retainer plates.  
Refer to [AT-451, "Control Valve Lower Body"](#).

## Reverse Clutch COMPONENTS

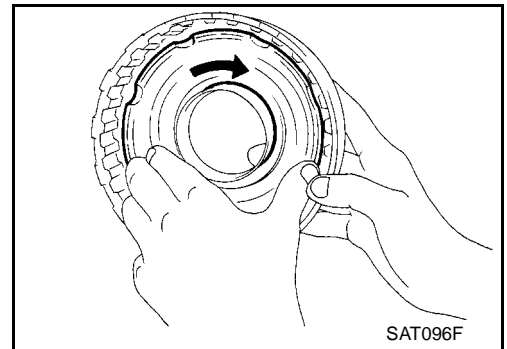


### DISASSEMBLY

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.
  - 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.
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.



A  
B  
AT

## INSPECTION

### Reverse Clutch Snap Ring, Spring Retainer and Return Springs

- Check for deformation, fatigue or damage. If necessary, replace.

D  
E  
F

### Reverse Clutch Drive Plates

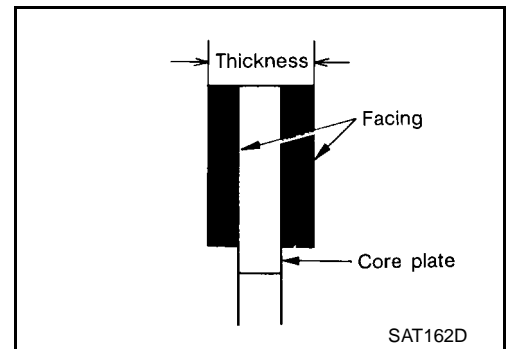
- Check facing for burns, cracks or damage.
- Measure thickness of facing.

**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.



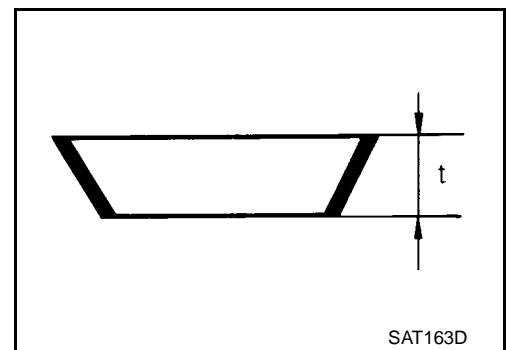
G  
H  
I  
J  
K

### 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.



L  
M

### Reverse Clutch Piston

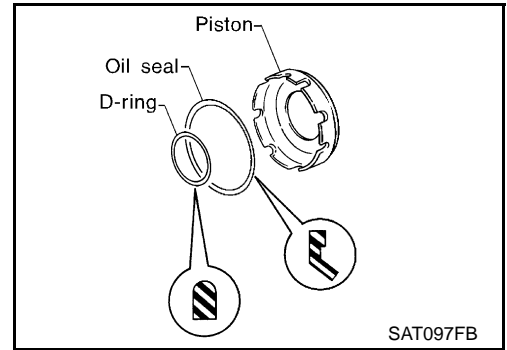
- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure that air leaks past ball.

# REPAIR FOR COMPONENT PARTS

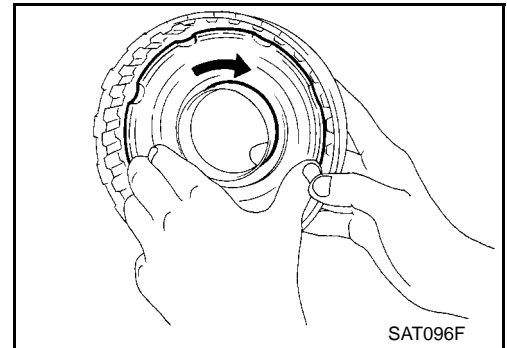
[ALL]

## ASSEMBLY

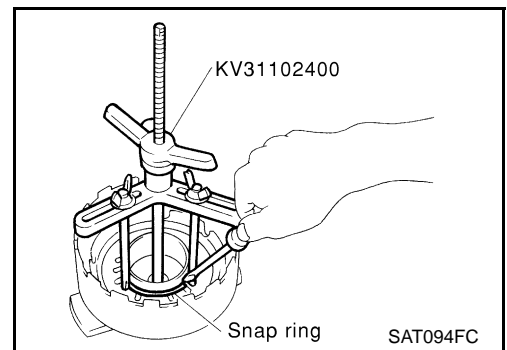
1. Install D-ring and oil seal on piston.
  - Take care with the direction of oil seal.
  - Apply ATF to both parts.



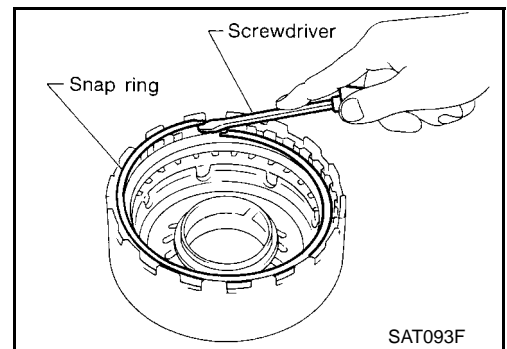
2. Install piston assembly by turning it slowly.
  - Apply ATF to inner surface of drum.



3. Install return springs and spring retainer on piston.
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.





# REPAIR FOR COMPONENT PARTS

[ALL]

7. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate.

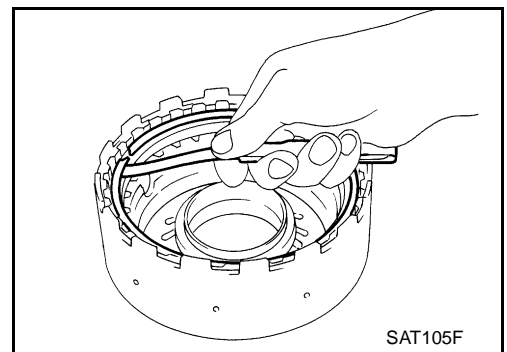
**Specified clearance:**

**Standard: 0.5 - 0.8mm (0.020 - 0.031 in)**

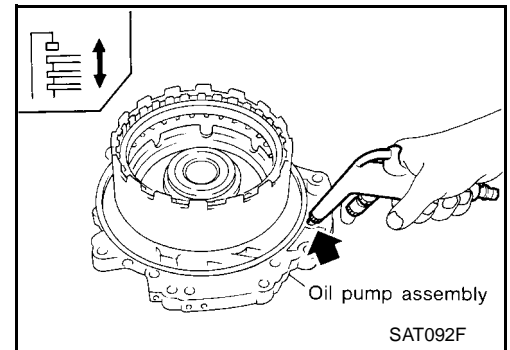
**Allowable limit: 1.2 mm (0.047 in)**

**Retaining plate:**

Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).



8. Check operation of reverse clutch.  
Refer to [AT-454, "Reverse Clutch"](#).

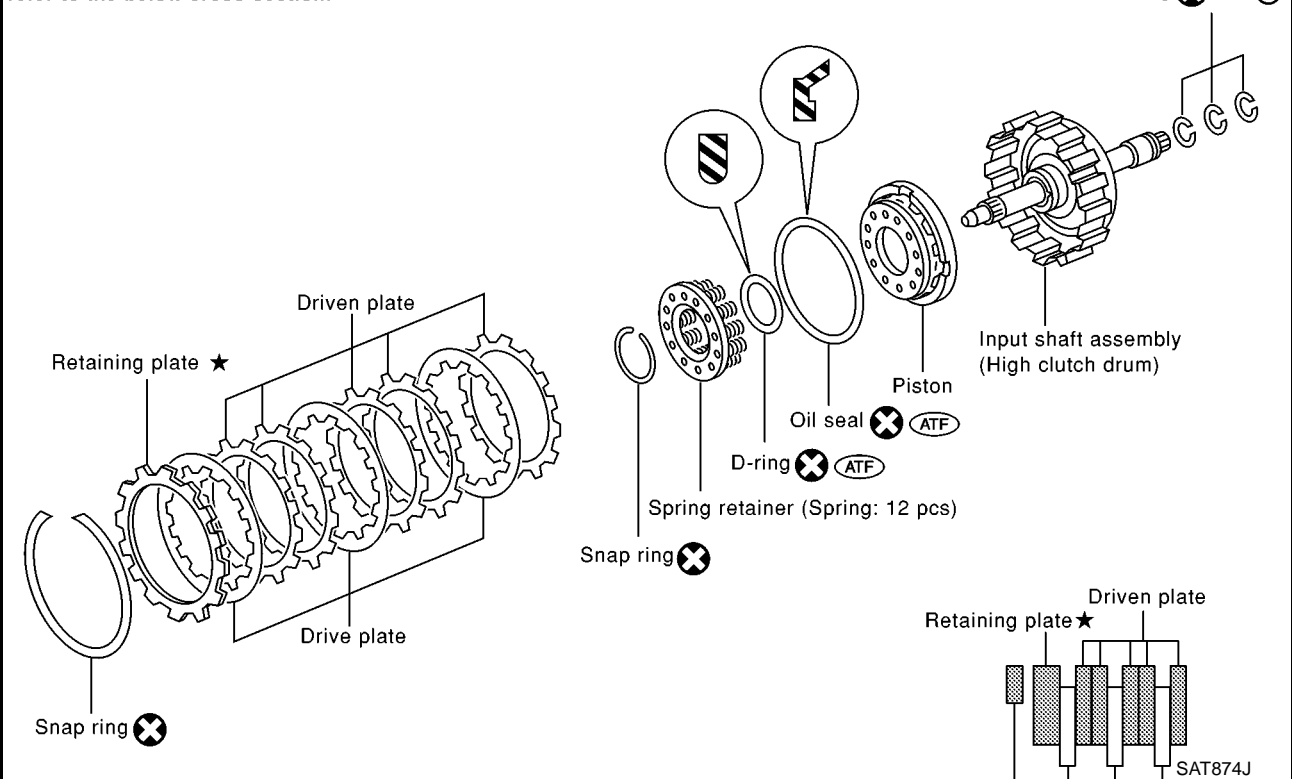


## High Clutch COMPONENTS

ECS0060K

### SEC. 315

For the number of clutch sheets (drive plates and driven plates), refer to the below cross-section.

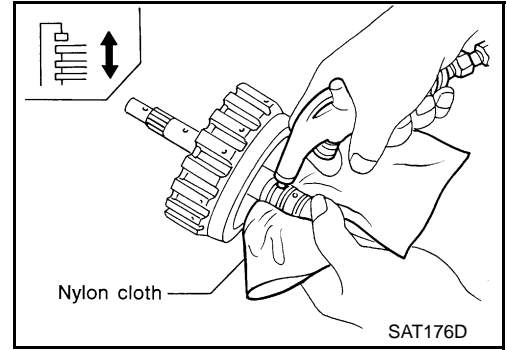


# REPAIR FOR COMPONENT PARTS

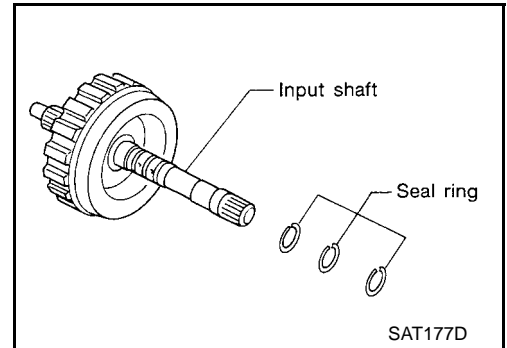
[ALL]

## DISASSEMBLY

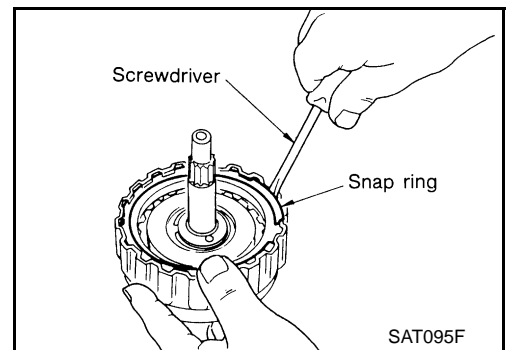
1. Check operation of high clutch.
  - a. Apply compressed air to oil hole of input shaft with nylon cloth.
    - **Stop up hole on opposite side of input shaft with nylon cloth.**
  - b. Check to see that retaining plate moves to snap ring.
  - c. If retaining plate does not contact snap ring:
    - D-ring might be damaged.
    - Oil seal might be damaged.
    - Fluid might be leaking past piston check ball.



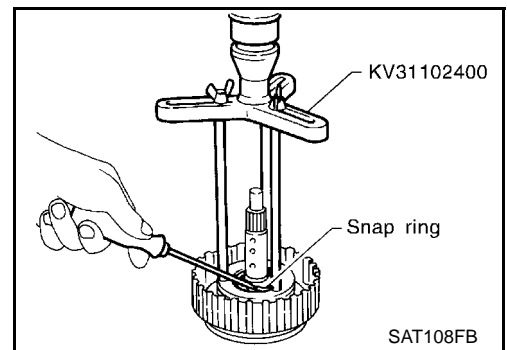
2. Remove seal rings from input shaft.
  - **Always replace when removed.**



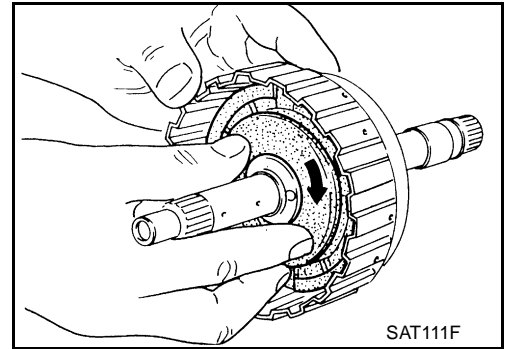
3. Remove snap ring.
4. Remove drive plates, driven plates and retaining plate.



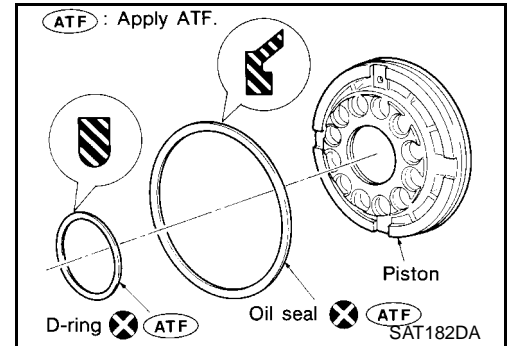
5. Set Tool on spring retainer and remove snap ring from high clutch drum while compressing return springs.
  - **Set Tool directly over springs.**
  - **Do not expand snap ring excessively.**
6. Remove spring retainer and return springs.



- 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

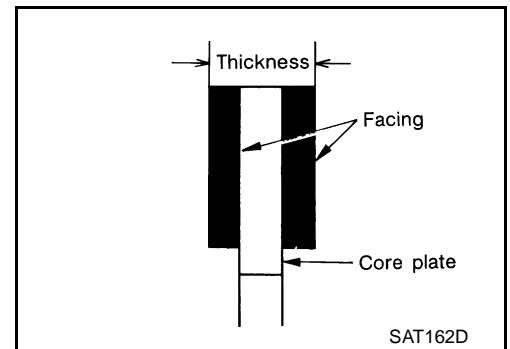
- Check facing for burns, cracks or damage.
- Measure thickness of facing.

**Thickness of drive plate:**

**Standard value 1.6 mm (0.063 in)**

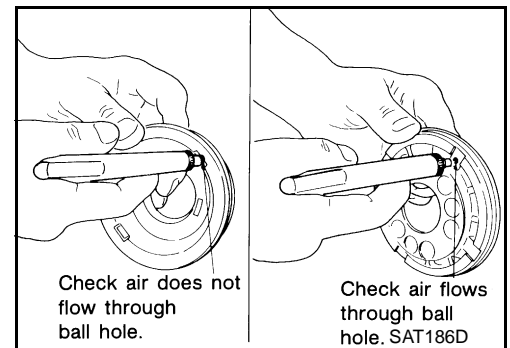
**Wear limit 1.5 mm (0.059 in)**

- If not within wear limit, replace.



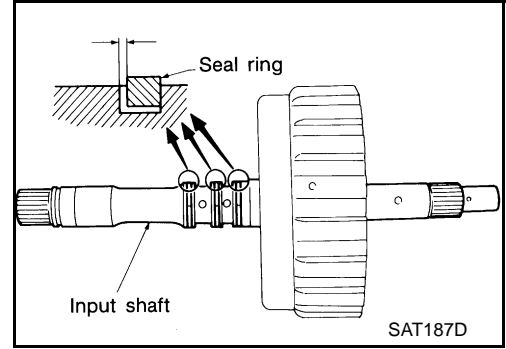
### High Clutch Piston

- 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.



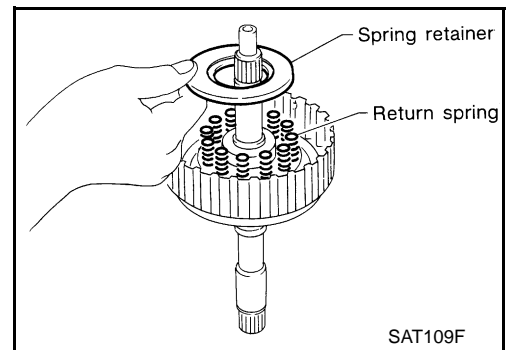
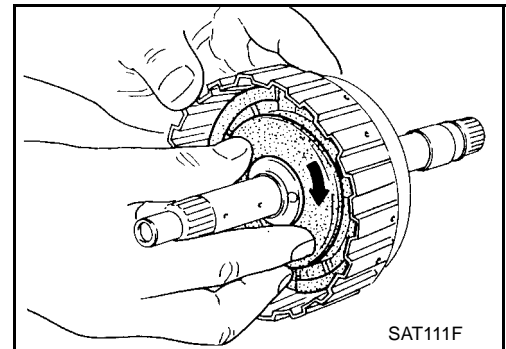
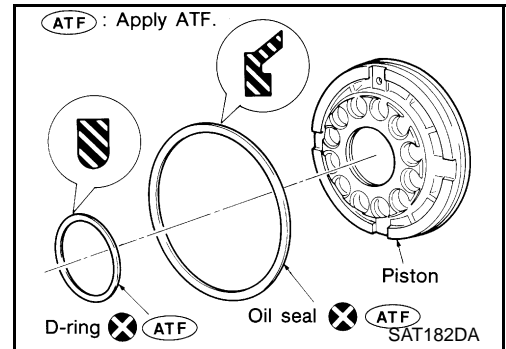
## Seal Ring Clearance

- 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.**
2. Install piston assembly by turning it slowly.
  - **Apply ATF to inner surface of drum.**
3. Install return springs and spring retainer on piston.

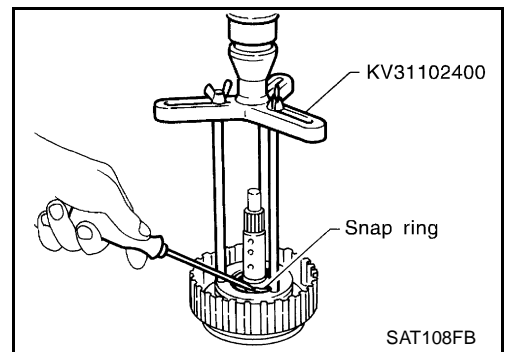


# REPAIR FOR COMPONENT PARTS

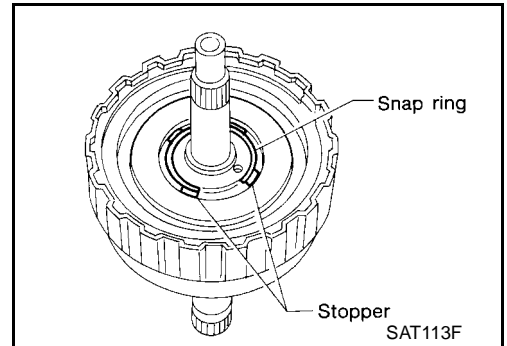
[ALL]

4. Set Tool on spring retainer and install snap ring while compressing return springs.

- Set Tool directly over return springs.



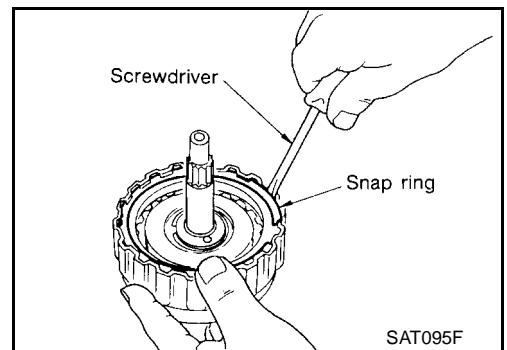
- Do not align snap ring gap with spring retainer stopper.



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.

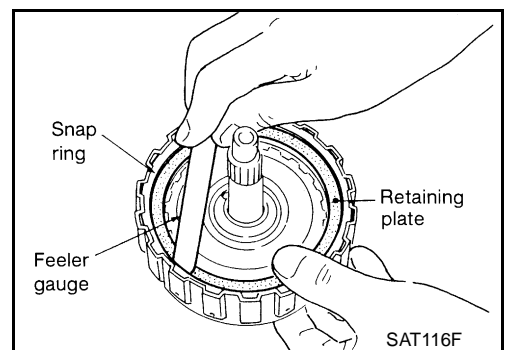
**Specified clearance:**

**Standard 1.4 - 1.8 mm (0.055 - 0.071 in)**

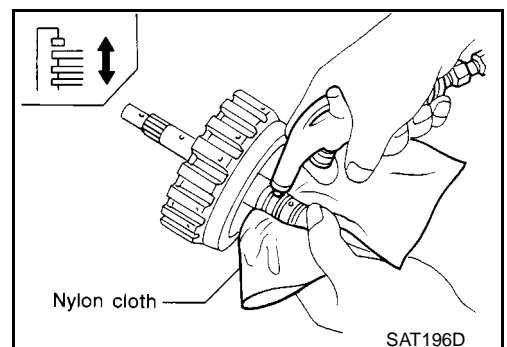
**Allowable limit 2.4 mm (0.094 in)**

**Retaining plate:**

**Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).**



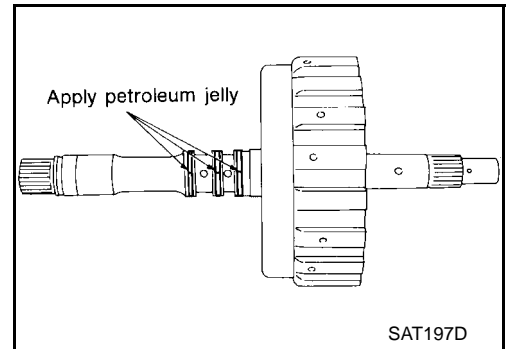
8. Check operation of high clutch.  
Refer to [AT-457, "High Clutch"](#).



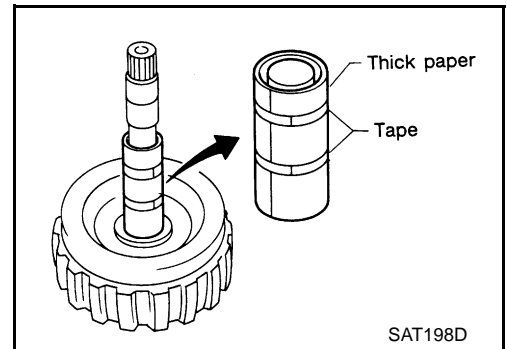
# REPAIR FOR COMPONENT PARTS

[ALL]

9. Install seal rings to input shaft.
- Apply petroleum jelly to seal rings.
  - Always replace when removed.

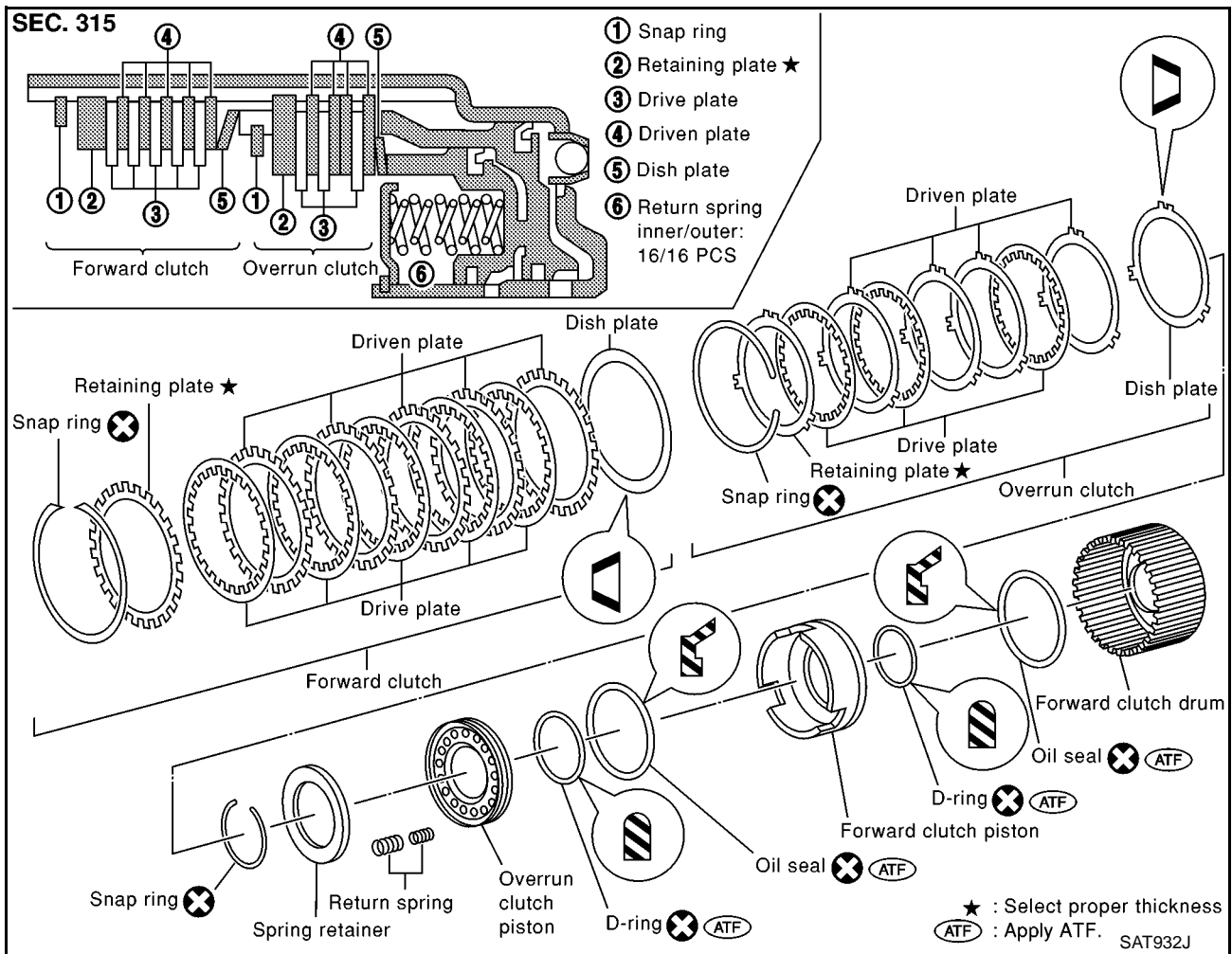


- Roll paper around seal rings to prevent seal rings from spreading.



## Forward and Overrun Clutches COMPONENTS

ECS0060L

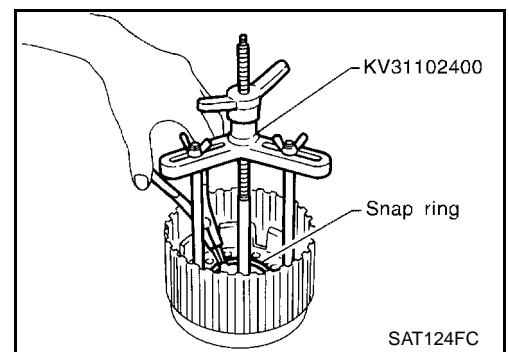
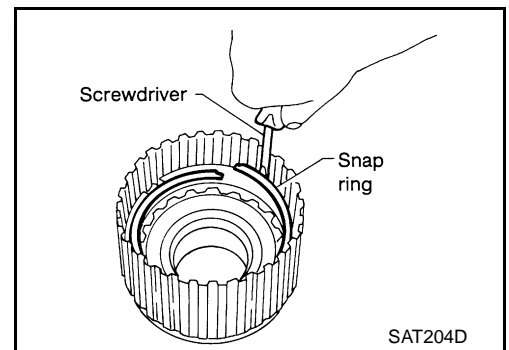
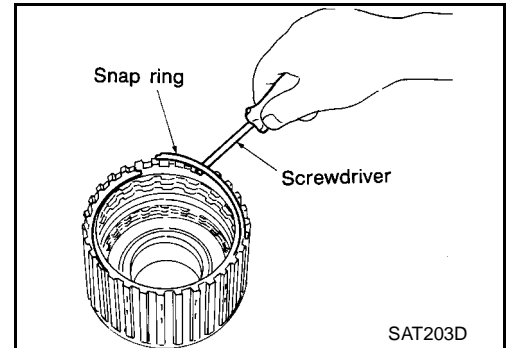
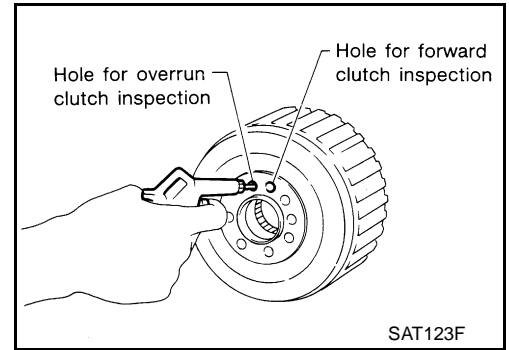


# REPAIR FOR COMPONENT PARTS

[ALL]

## 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.
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.**

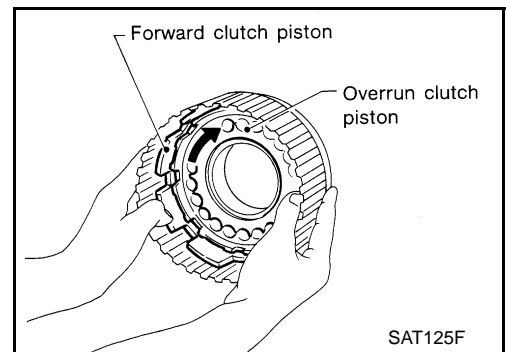


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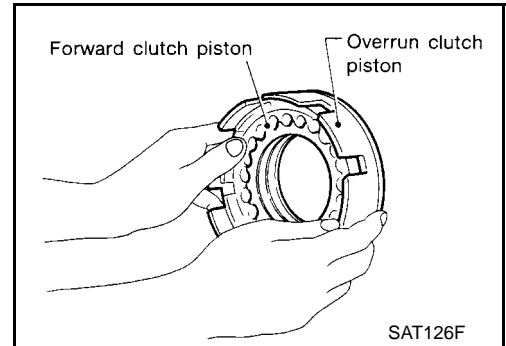
# REPAIR FOR COMPONENT PARTS

[ALL]

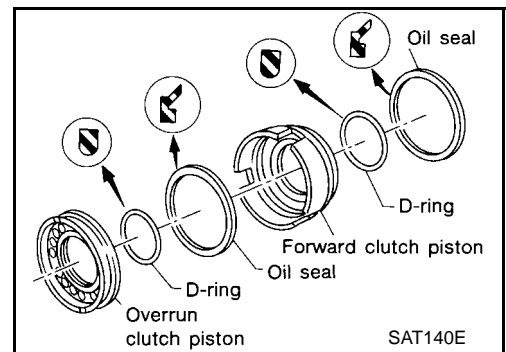
8. Remove forward clutch piston with overrun clutch piston from forward clutch drum by turning it.



9. 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.



## 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: 1.8 mm (0.071 in)**

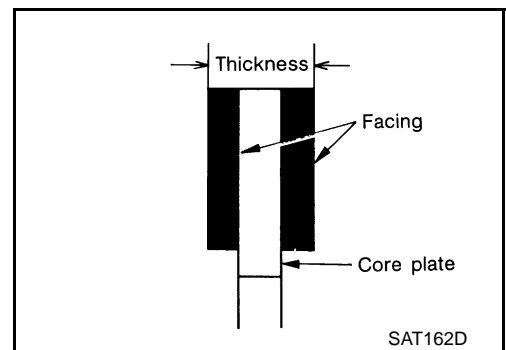
**Wear limit: 1.6 mm (0.063 in)**

##### 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

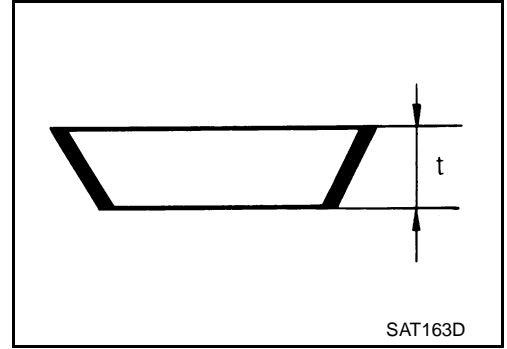
- Check for deformation or damage.
- Measure thickness of dish plate.

### Thickness of dish plate:

Forward clutch 2.5 mm (0.098 in)

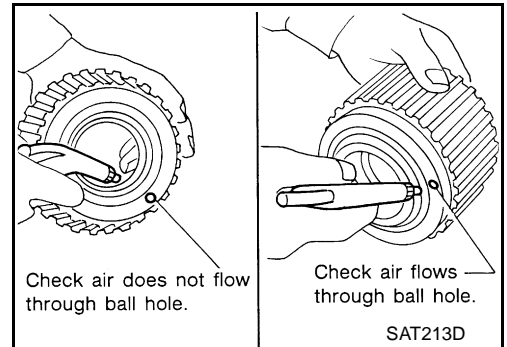
Overrun clutch 2.15 mm (0.0846 in)

- If deformed or fatigued, replace.



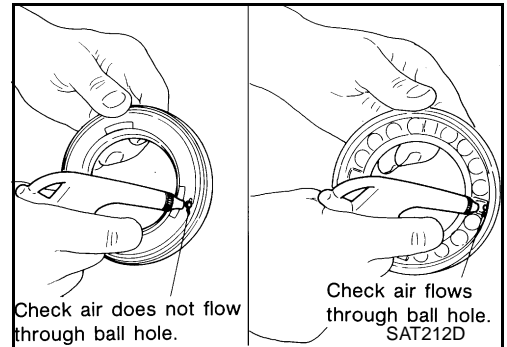
## Forward Clutch Drum

- 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.



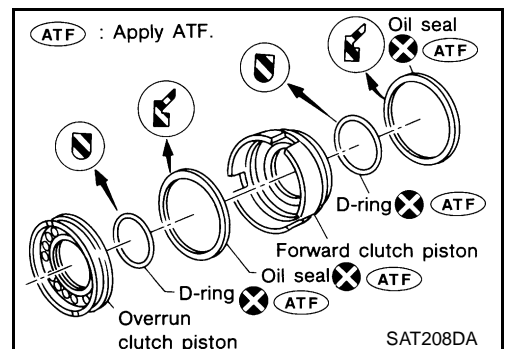
## Overrun Clutch Piston

- 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.



## 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.

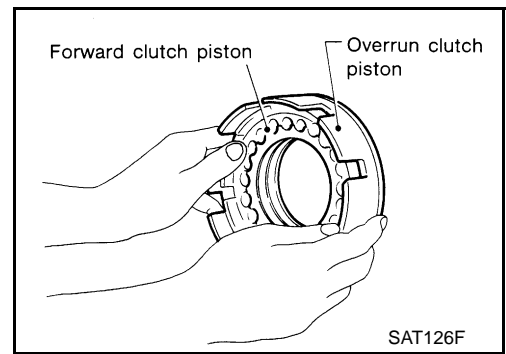


# REPAIR FOR COMPONENT PARTS

[ALL]

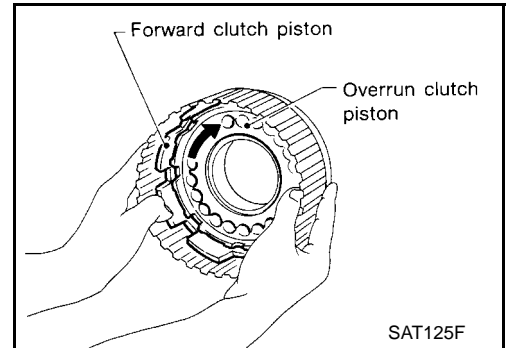
2. Install overrun clutch piston assembly on forward clutch piston by turning it slowly.

- Apply ATF to inner surface of forward clutch piston.

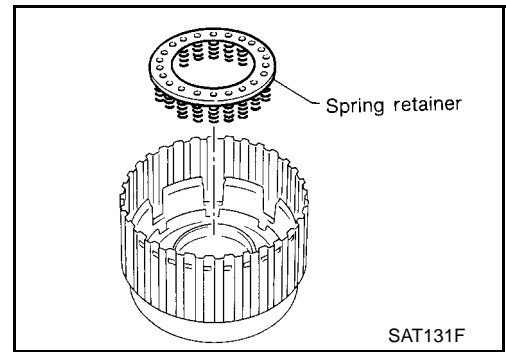


3. Install forward clutch piston assembly on forward clutch drum by turning it slowly.

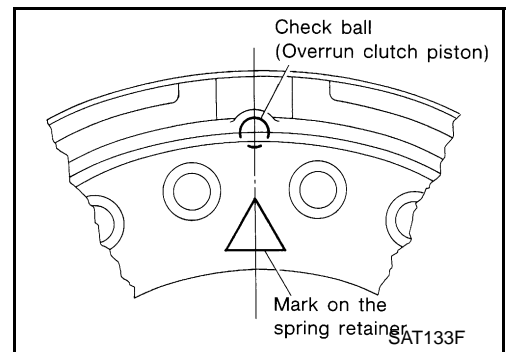
- Apply ATF to inner surface of drum.



4. Install return spring on overrun clutch piston.



- Align the mark on spring retainer with check ball in overrun clutch piston.

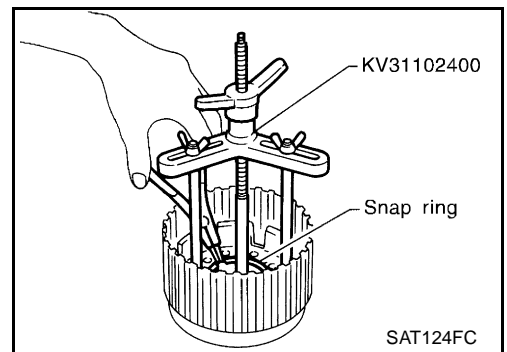


# REPAIR FOR COMPONENT PARTS

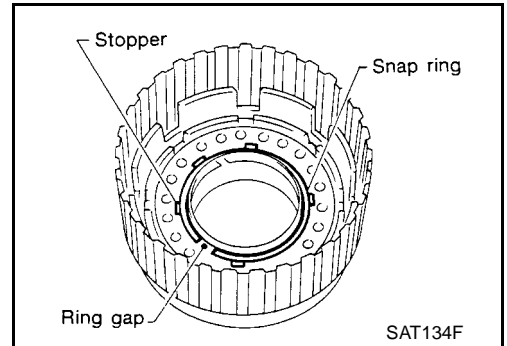
[ALL]

5. Set Tool on spring retainer and install snap ring while compressing return springs.

- Set Tool directly over return springs.



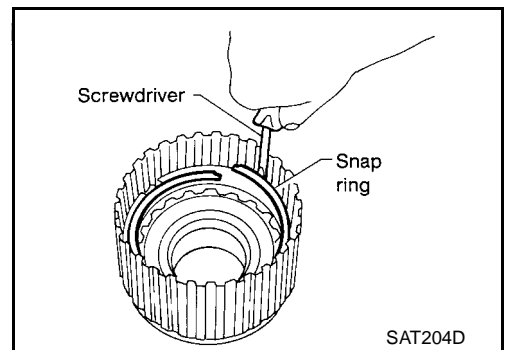
- Do not align snap ring gap with spring retainer stopper.



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.



8. Measure clearance between overrun clutch retaining plate and snap ring.

If not within allowable limit, select proper retaining plate.

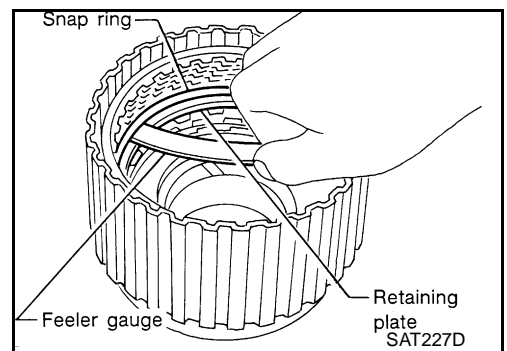
**Specified clearance:**

**Standard 1.0 - 1.4 mm (0.039 - 0.055 in)**

**Allowable limit 2.0 mm (0.079 in)**

**Overrun clutch retaining plate:**

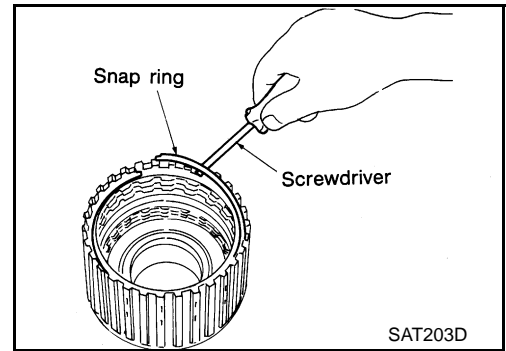
**Refer to [AT-517](#), "[SERVICE DATA AND SPECIFICATIONS \(SDS\)](#)".**



# REPAIR FOR COMPONENT PARTS

[ALL]

9. 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.

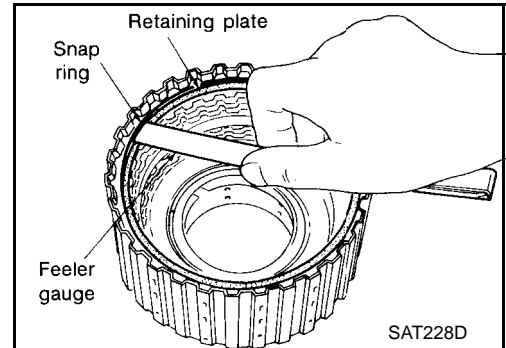
**Specified clearance:**

**Standard 0.45 - 0.85 mm (0.0177 - 0.0335 in)**

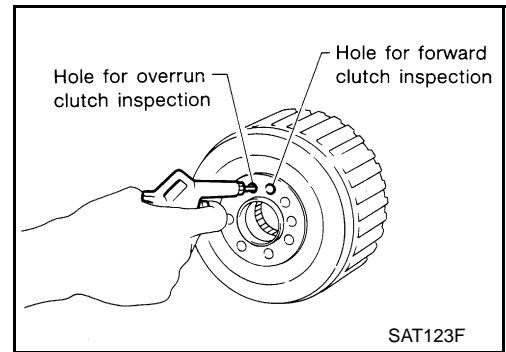
**Allowable limit 1.85 mm (0.0728 in)**

**Forward clutch retaining plate:**

**Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).**

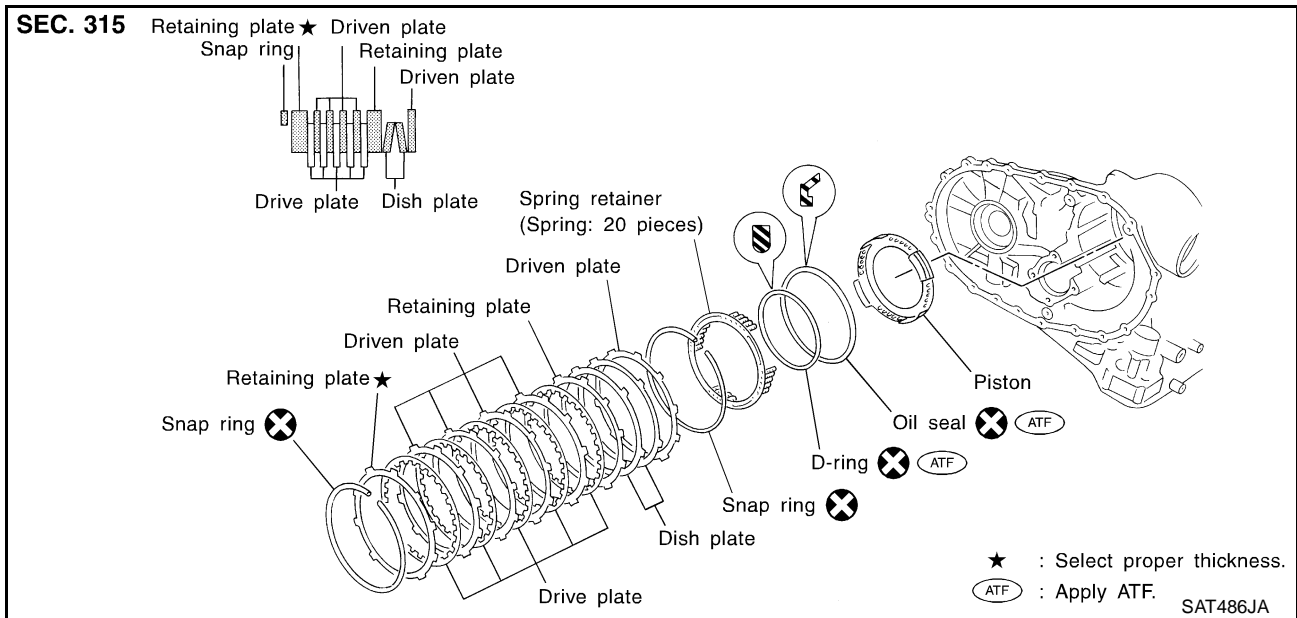


12. Check operation of forward clutch.  
Refer to [AT-462, "Forward and Overrun Clutches"](#).
13. Check operation of overrun clutch.  
Refer to [AT-462, "Forward and Overrun Clutches"](#).



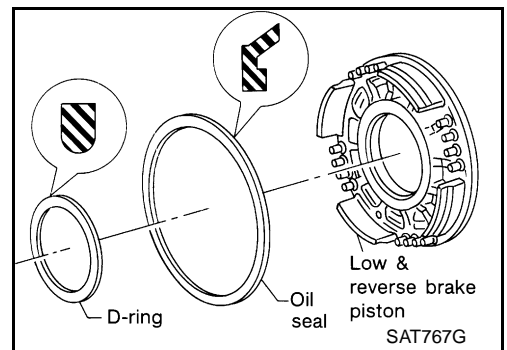
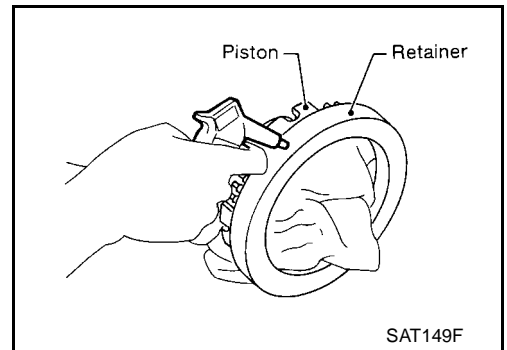
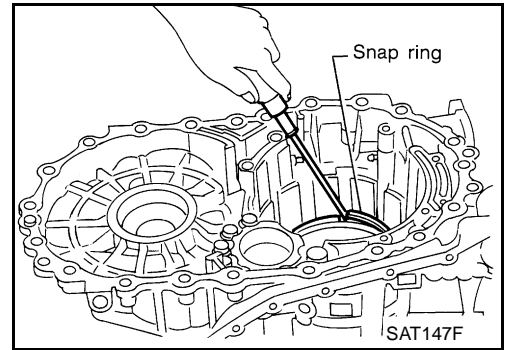
## Low & Reverse Brake COMPONENTS

ECS0060M



## DISASSEMBLY

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.
    - 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.



## 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

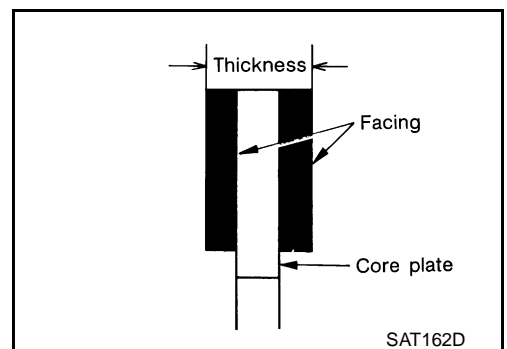
- Check facing for burns, cracks or damage.
- Measure thickness of facing.

**Thickness of drive plate:**

**Standard value 2.0 mm (0.071 in)**

**Wear limit 1.8 mm (0.063 in)**

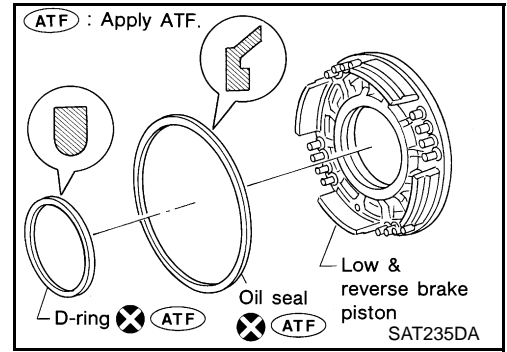
- If not within wear limit, replace.



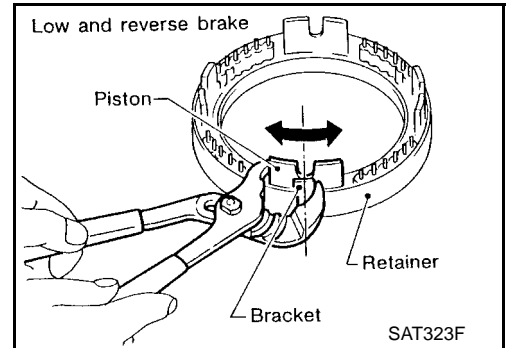
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## ASSEMBLY

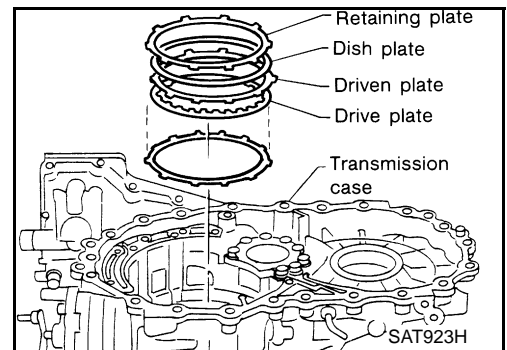
1. Install D-rings on piston.
  - Apply ATF to both parts.



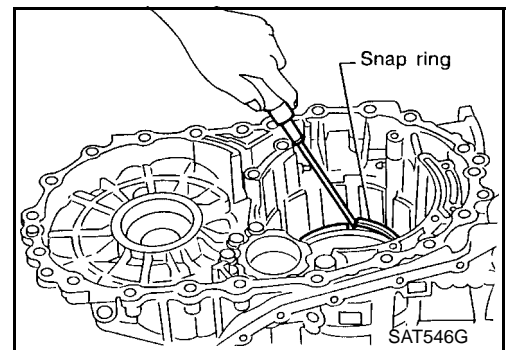
2. Set and align piston with retainer.
  - This operation is required in order to engage the protrusions of piston to return springs correctly. Further procedures are given in [AT-494, "ASSEMBLY"](#).



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.



4. Install snap ring.



# REPAIR FOR COMPONENT PARTS

[ALL]

5. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate (front side).

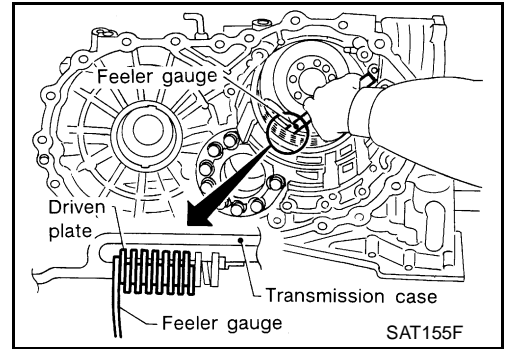
**Specified clearance:**

Standard 1.4 - 1.8 mm (0.055 - 0.071 in)

Allowable limit 2.8 mm (0.110 in)

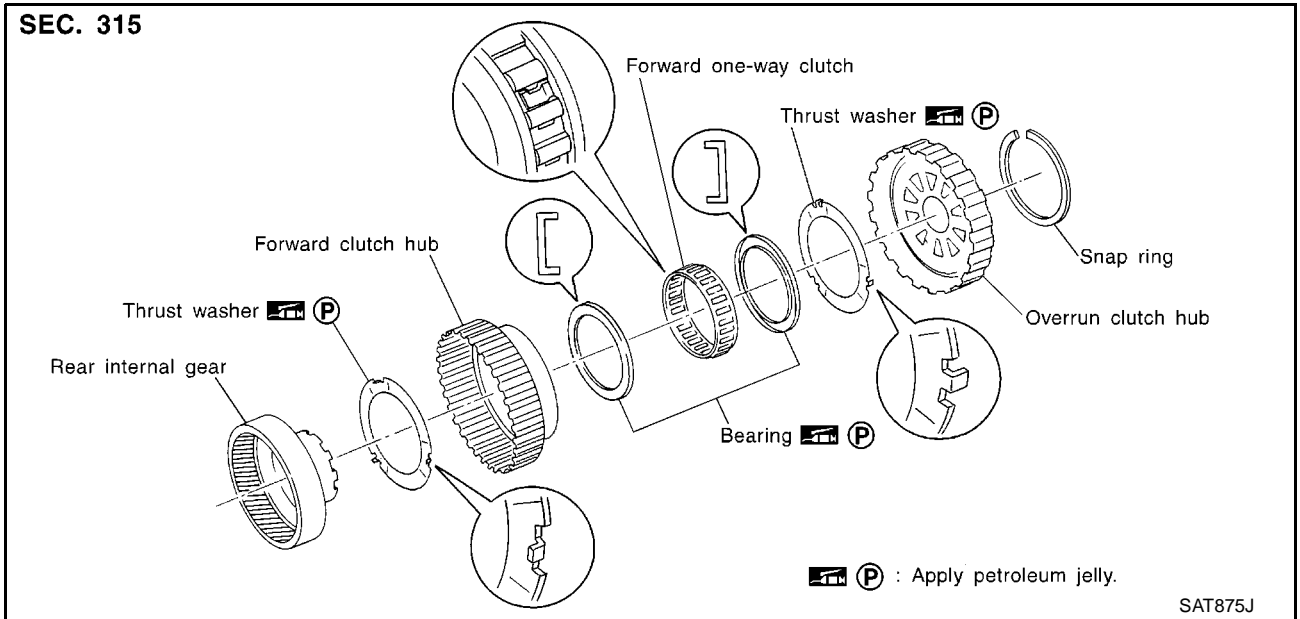
**Retaining plate:**

Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).



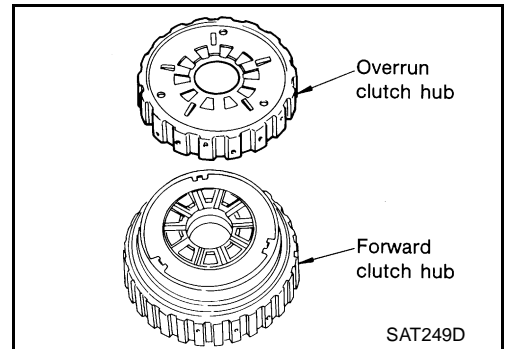
## Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub COMPONENTS

ECS0060N

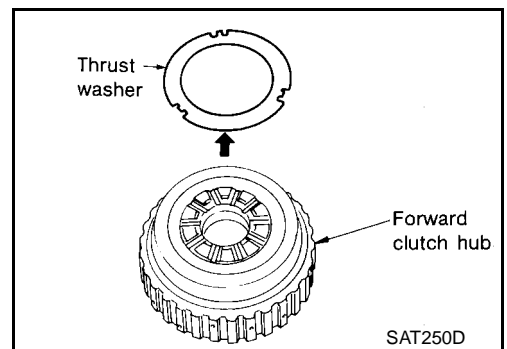


### DISASSEMBLY

1. Remove overrun clutch hub and thrust washer from forward clutch hub.



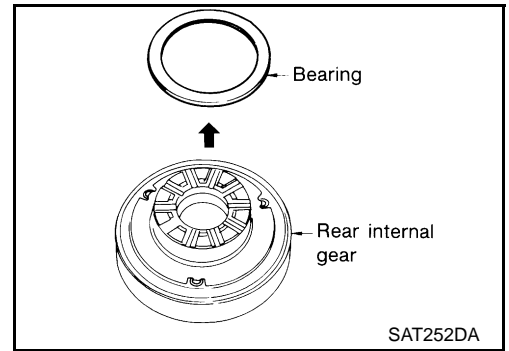
2. Remove forward clutch hub from rear internal gear.



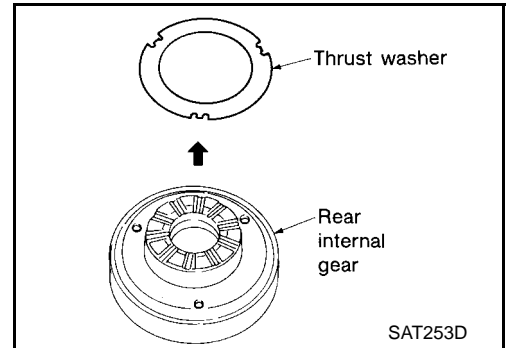
# REPAIR FOR COMPONENT PARTS

[ALL]

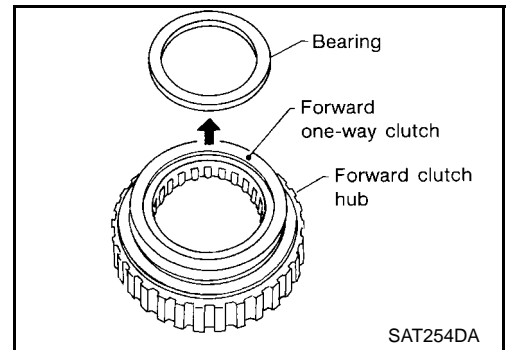
3. Remove bearing from rear internal gear.



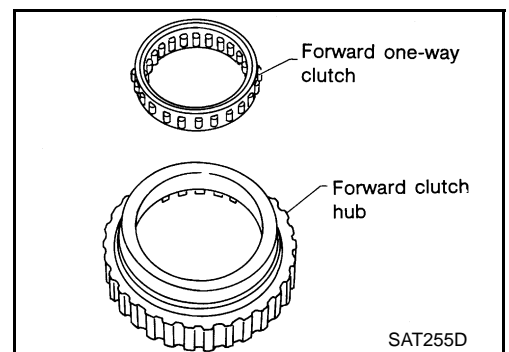
4. Remove thrust washer from rear internal gear.



5. Remove bearing from forward one-way clutch.



6. Remove forward one-way clutch from forward clutch hub.

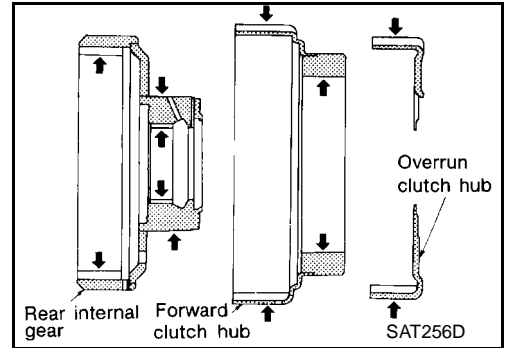




## INSPECTION

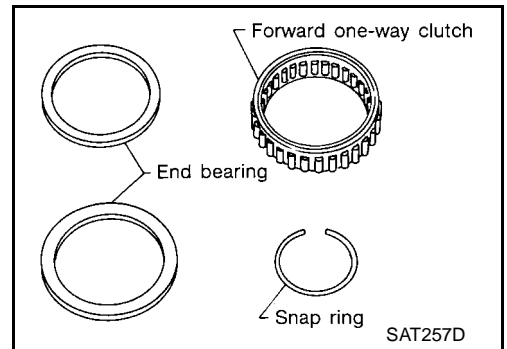
### Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub

- Check rubbing surfaces for wear or damage.



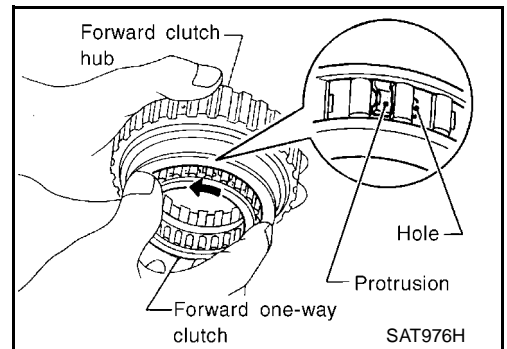
### Snap Ring, End Bearings and Forward One-way Clutch

- Check snap ring and end bearings for deformation and damage.
- Check forward one-way clutch for wear and damage.

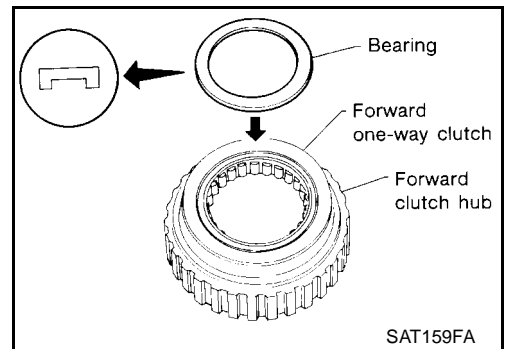


## ASSEMBLY

1. Install forward one-way clutch on forward clutch.
  - Take care with the direction of forward one-way clutch.



2. Install bearing on forward one-way clutch.
  - Apply petroleum jelly to bearing.

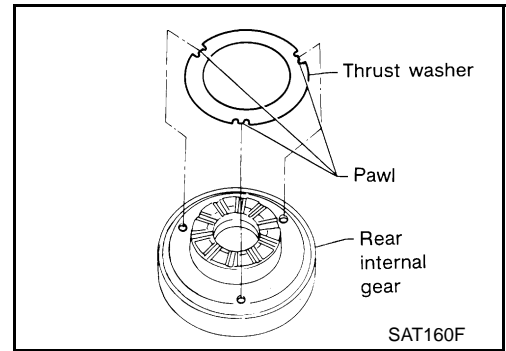


## REPAIR FOR COMPONENT PARTS

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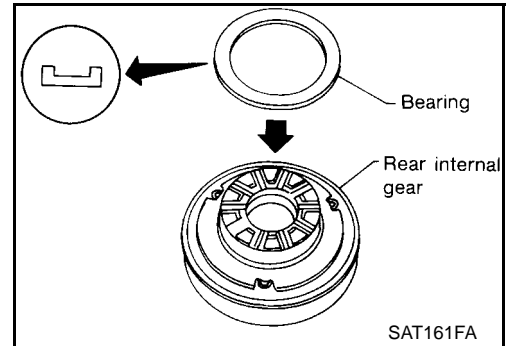
3. Install thrust washer on rear internal gear.

- Apply petroleum jelly to thrust washer.
- Align hooks of thrust washer with holes of rear internal gear.



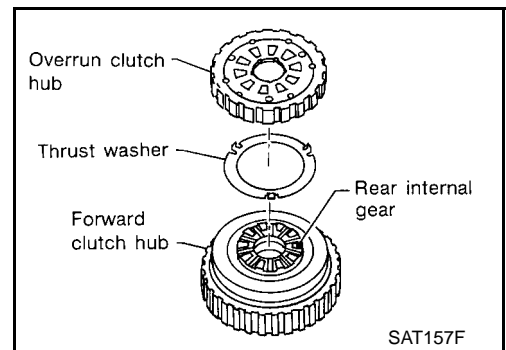
4. Install bearing on rear internal gear.

- Apply petroleum jelly to bearing.



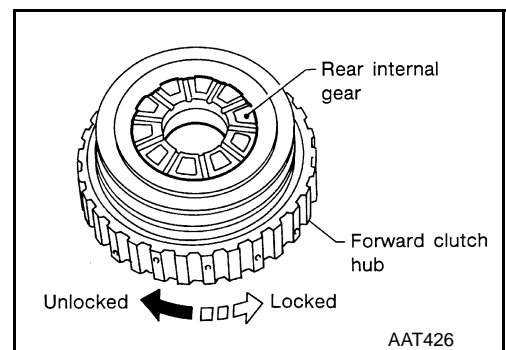
5. Install thrust washer and overrun clutch hub.

- 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.

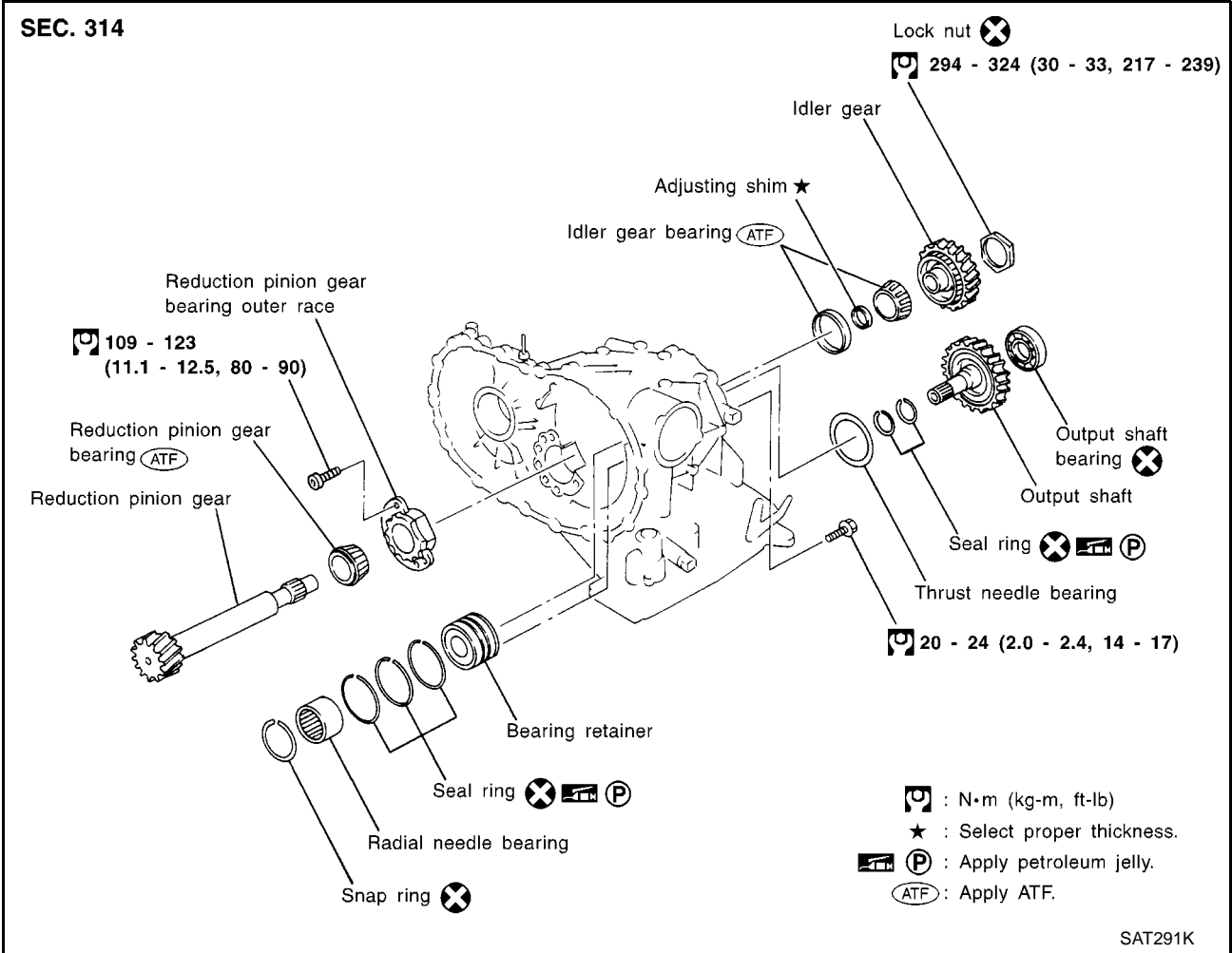
- Check operation of forward one-way clutch. Hold rear internal gear and turn forward clutch hub. Check forward clutch hub for correct locking and unlocking directions.
- If not as shown in illustration, check installation direction of forward one-way clutch.



Output Shaft, Idler Gear, Reduction Pinion Gear and Bearing Retainer COMPONENTS

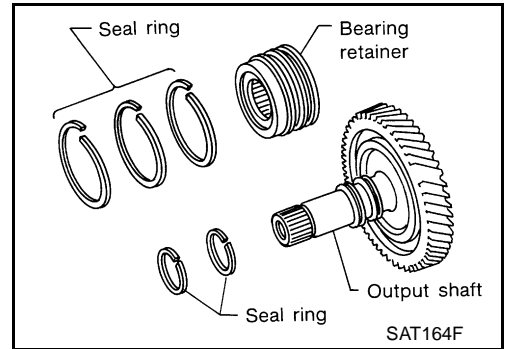
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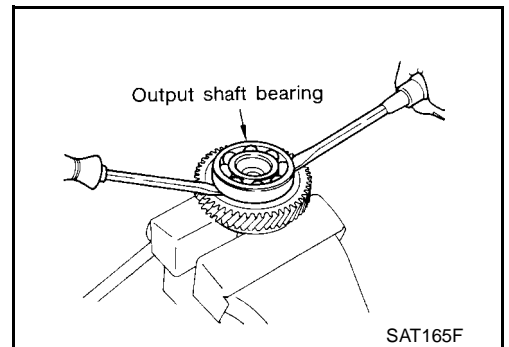


DISASSEMBLY

1. Remove seal rings from output shaft and bearing retainer.



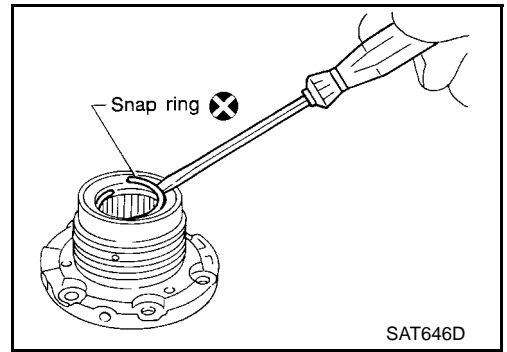
2. Remove output shaft bearing with screwdrivers.
- Always replace bearing with a new one when removed.
  - Do not damage output shaft.



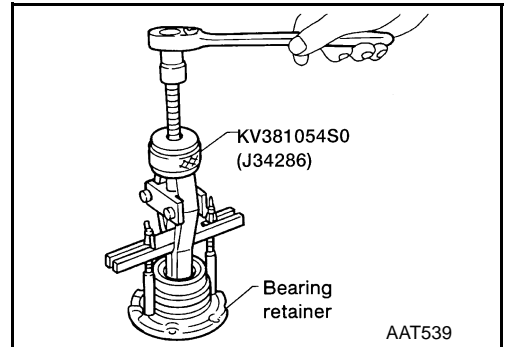
# REPAIR FOR COMPONENT PARTS

[ALL]

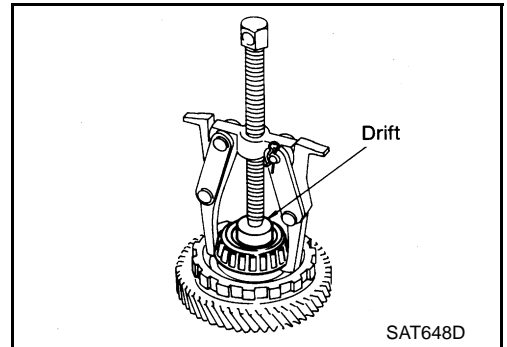
3. Remove snap ring from bearing retainer.



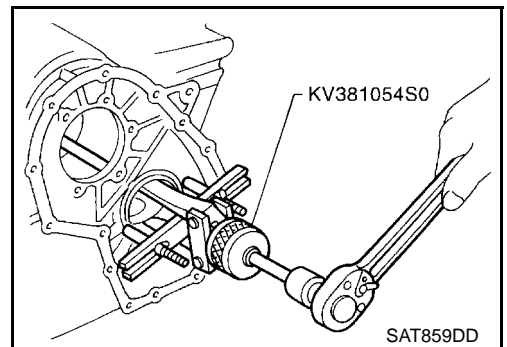
4. Remove needle bearing from bearing retainer.



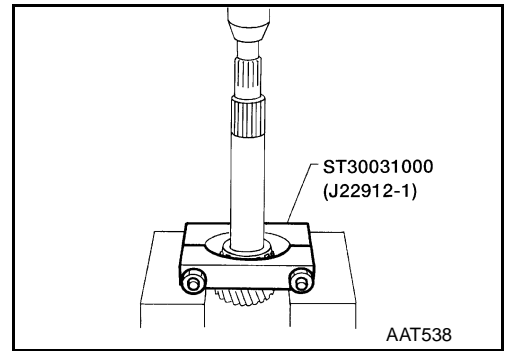
5. Remove idler gear bearing inner race from idler gear.



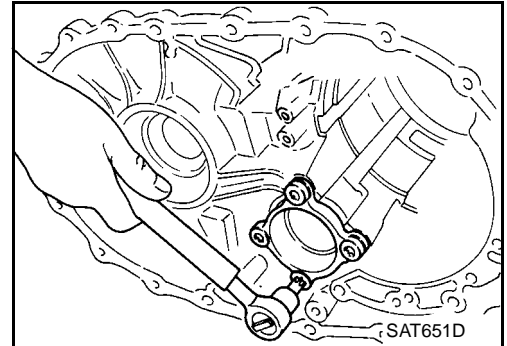
6. Remove idler gear bearing outer race from transmission case.



- Press out reduction pinion gear bearing inner race from reduction pinion gear.



- Remove reduction pinion gear bearing outer race from transmission case.



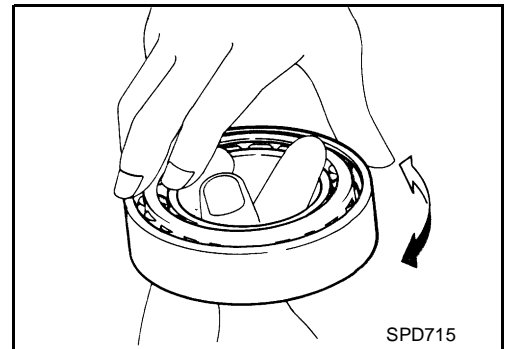
## INSPECTION

### Output Shaft, Idler Gear and Reduction Pinion Gear

- Check shafts for cracks, wear or bending.
- Check gears for wear, chips and cracks.

### Bearing

- 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.

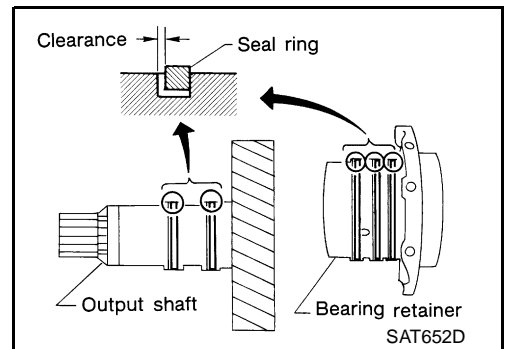
**Standard clearance:**

**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 - 0.25 mm (0.0039 - 0.0118 in)**

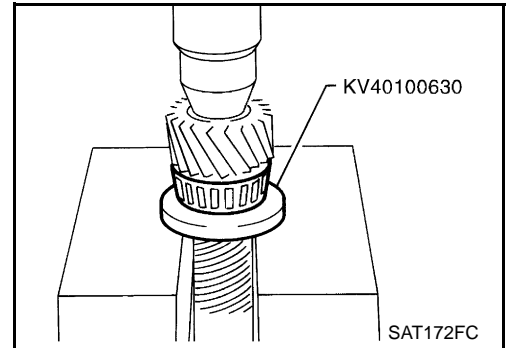
**Allowable limit:**

**0.25 mm (0.0118 in)**

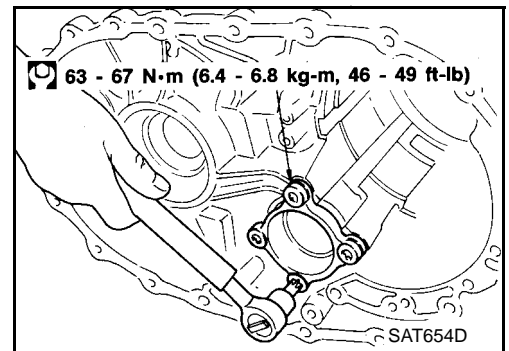
- If not within allowable limit, replace bearing retainer.

**ASSEMBLY**

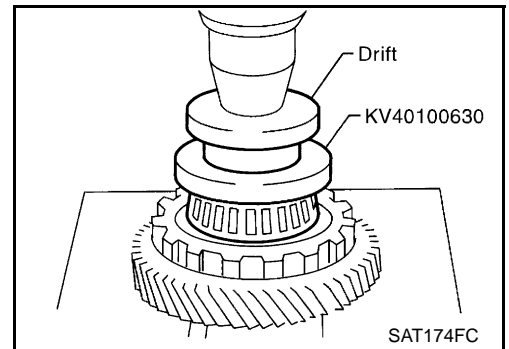
1. Press reduction pinion gear bearing inner race on reduction pinion gear.



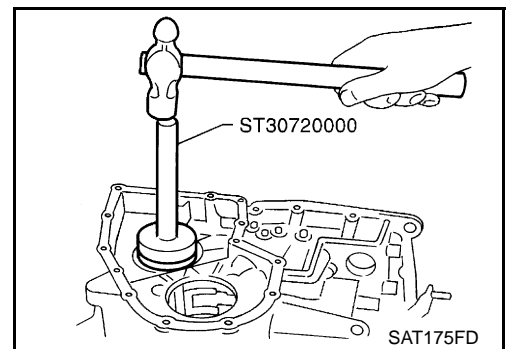
2. Install reduction pinion gear bearing outer race on transmission case.



3. Press idler gear bearing inner race on idler gear.



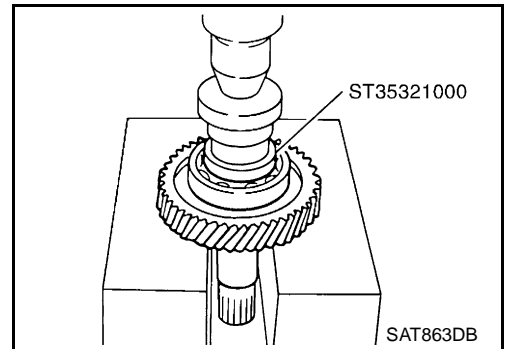
4. Install idler gear bearing outer race on transmission case.



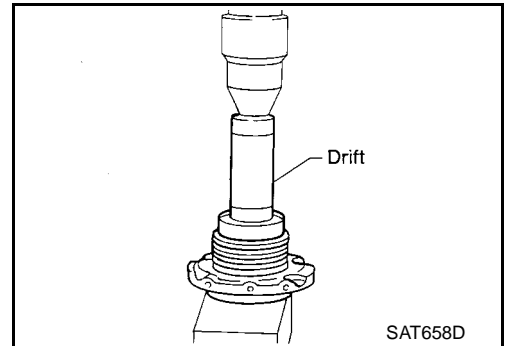
# REPAIR FOR COMPONENT PARTS

[ALL]

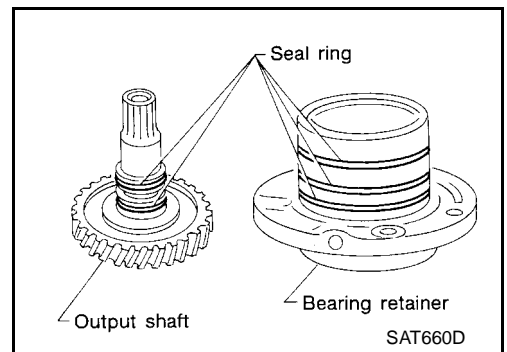
5. Press output shaft bearing on output shaft.



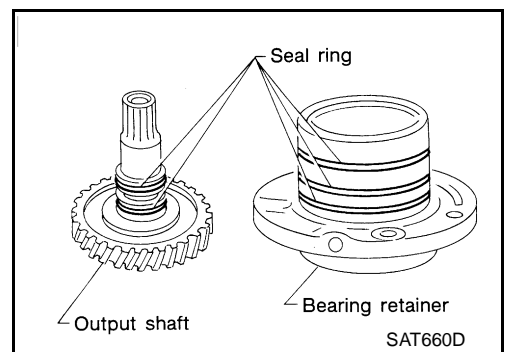
6. Press needle bearing on bearing retainer.



7. Install snap ring to bearing retainer.



8. After packing ring grooves with petroleum jelly, carefully install new seal rings on output shaft and bearing retainer.

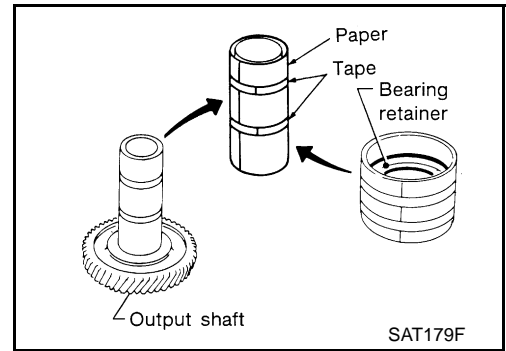


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# REPAIR FOR COMPONENT PARTS

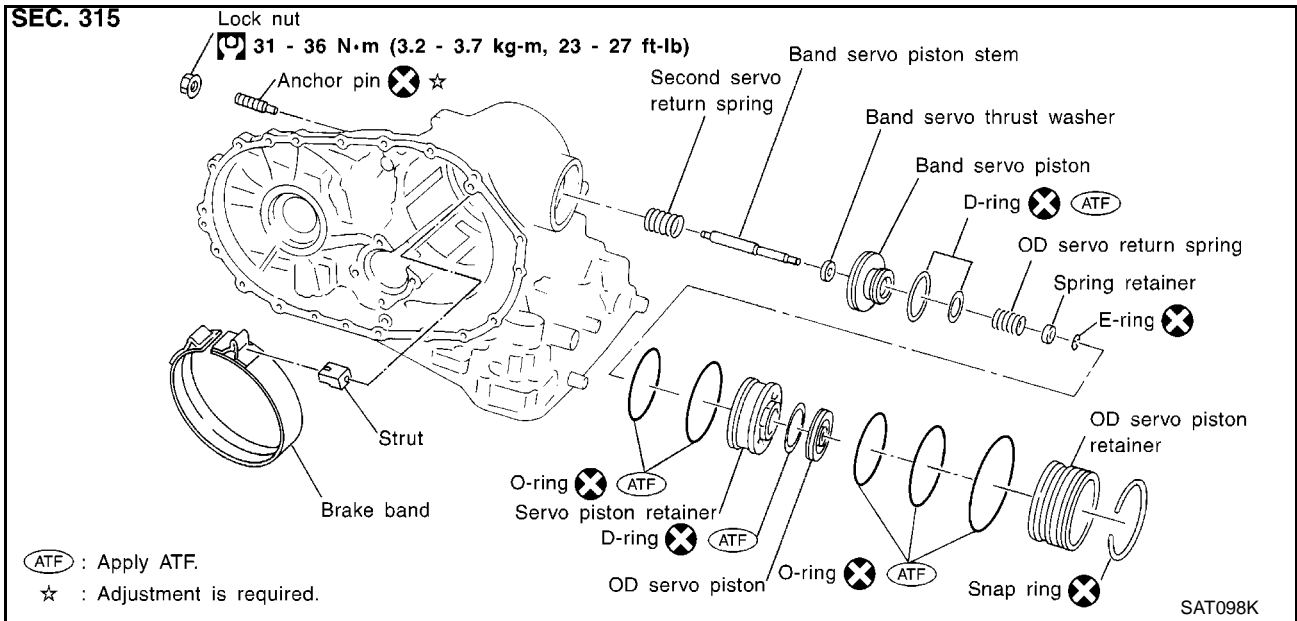
[ALL]

- Roll paper around seal rings to prevent seal rings from spreading.



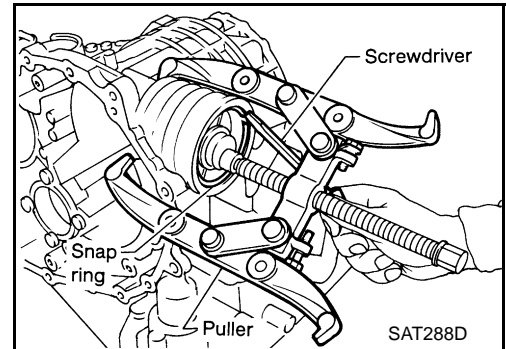
## Band Servo Piston Assembly COMPONENT

ECS0060P

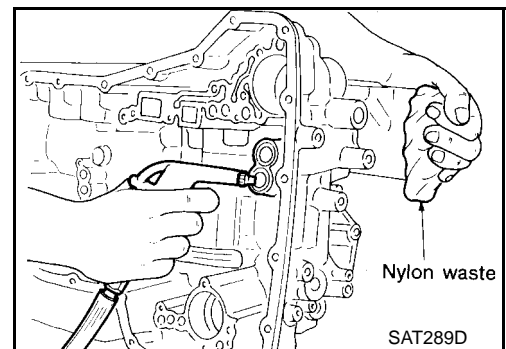


## DISASSEMBLY

1. Remove band servo piston snap ring.



2. 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.

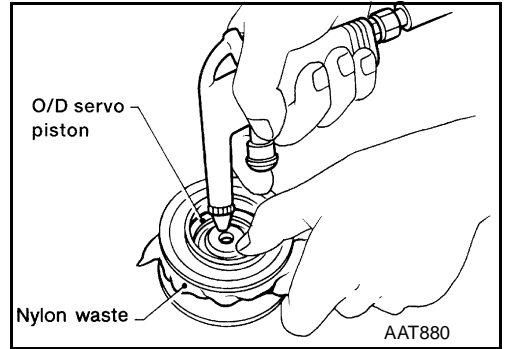




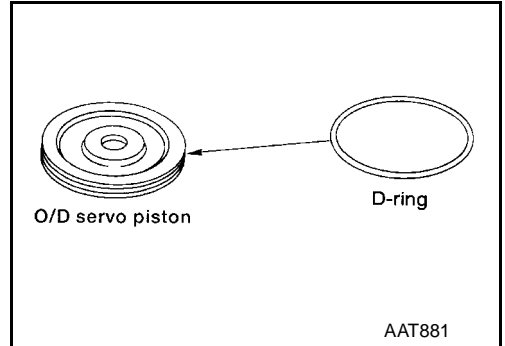
# REPAIR FOR COMPONENT PARTS

[ALL]

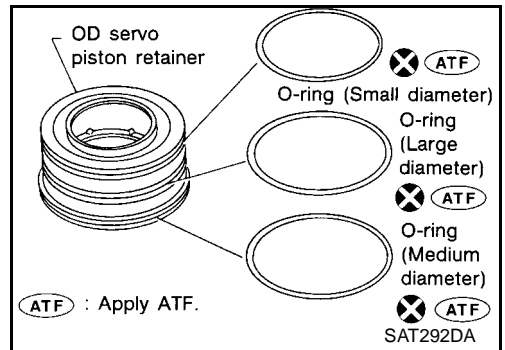
3. Apply compressed air to oil hole in O/D servo piston retainer to remove O/D servo piston from retainer.
  - Hold O/D band servo piston while applying compressed air.



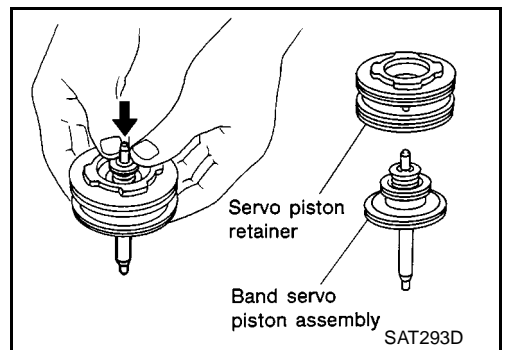
4. Remove D-ring from O/D servo piston.



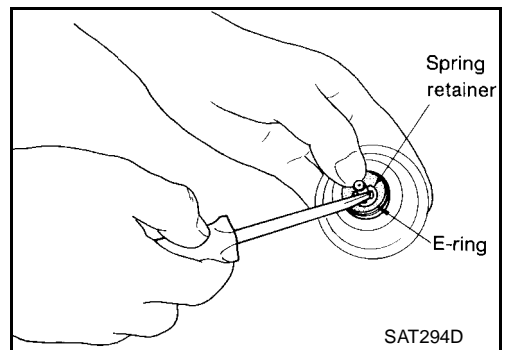
5. Remove O-rings from O/D servo piston retainer.



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.

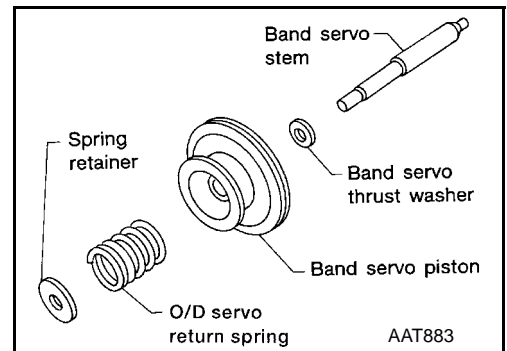


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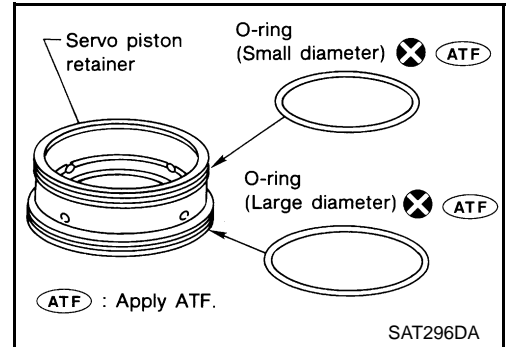
# REPAIR FOR COMPONENT PARTS

[ALL]

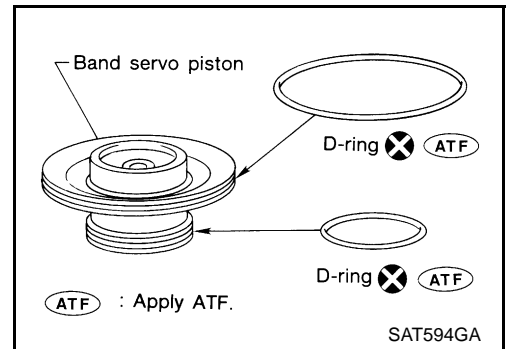
8. Remove O/D servo return spring, band servo thrust washer and band servo piston stem from band servo piston.



9. Remove O-rings from servo piston retainer.



10. Remove D-rings from band servo piston.



## INSPECTION

### Pistons, Retainers and Piston Stem

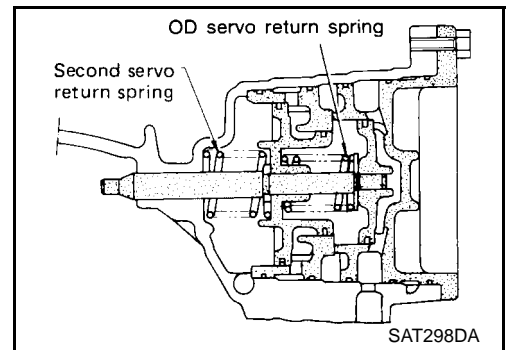
- Check frictional surfaces for abnormal wear or damage.

### Return Springs

- Check for deformation or damage.
- Measure free length and outer diameter.

#### Inspection standard:

Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#)

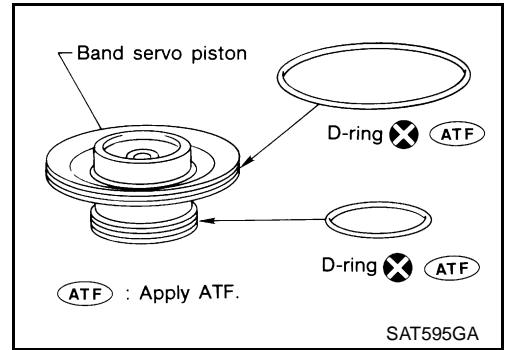


# REPAIR FOR COMPONENT PARTS

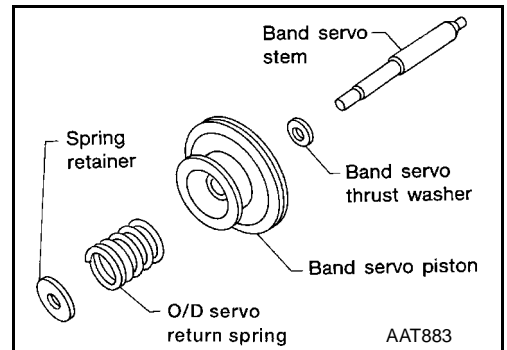
[ALL]

## ASSEMBLY

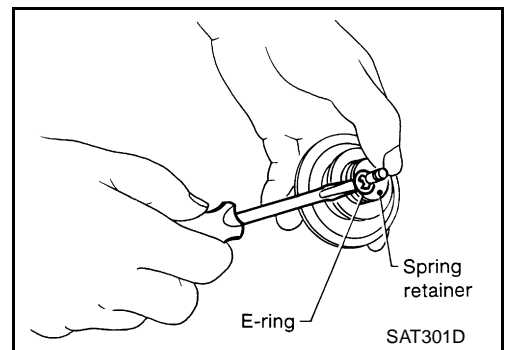
1. Install D-rings to servo piston retainer.
  - Apply ATF to D-rings.
  - Pay attention to position of each O-ring.



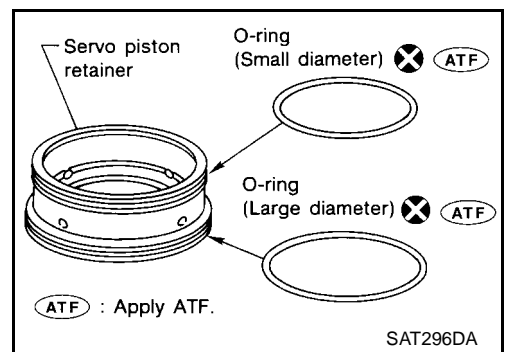
2. Install band servo piston stem, band servo thrust washer, O/D servo return spring and spring retainer to band servo piston.



3. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, install E-ring.



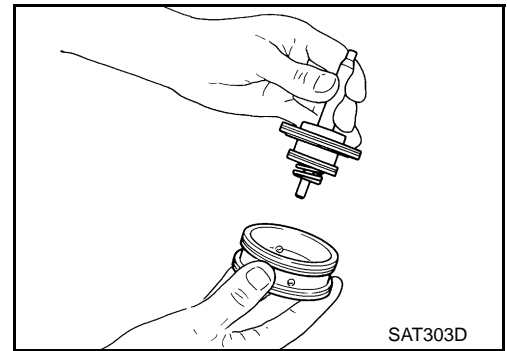
4. Install O-rings to servo piston retainer.
  - Apply ATF to O-rings.
  - Pay attention to position of each O-ring.



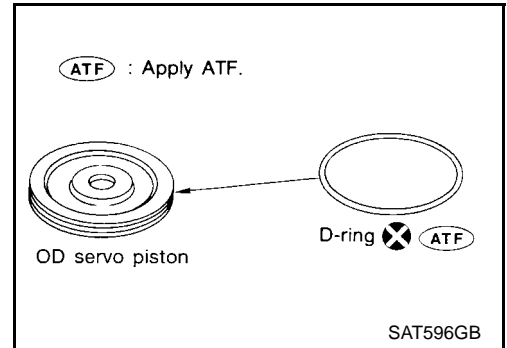
# REPAIR FOR COMPONENT PARTS

[ALL]

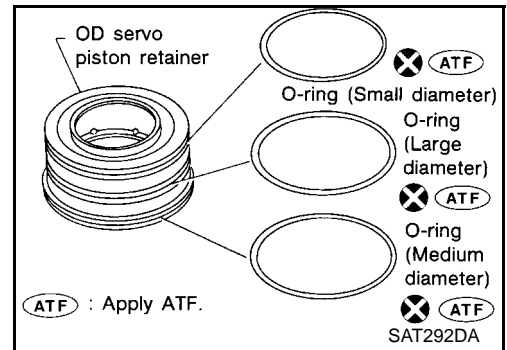
5. Install band servo piston assembly to servo piston retainer by pushing it inward.



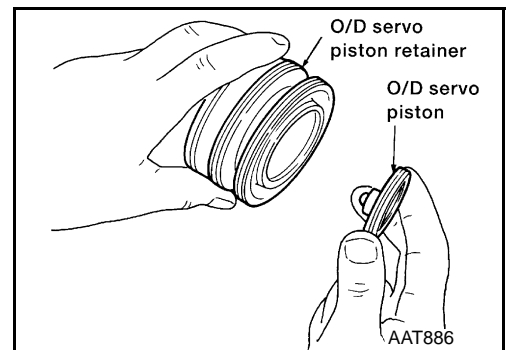
6. Install D-ring to O/D servo piston.  
● **Apply ATF to D-ring.**



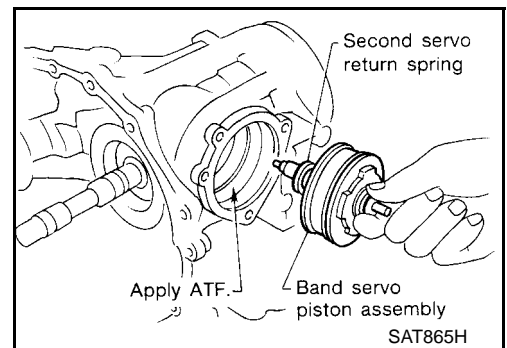
7. Install O-rings to O/D servo piston retainer.  
● **Apply ATF to O-rings.**  
● **Pay attention to position of each O-ring.**



8. Install O/D servo piston to O/D servo piston retainer.



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.**

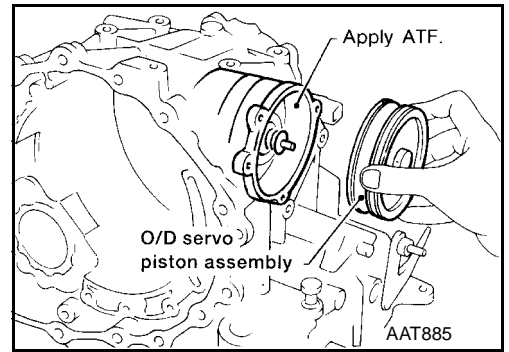


# REPAIR FOR COMPONENT PARTS

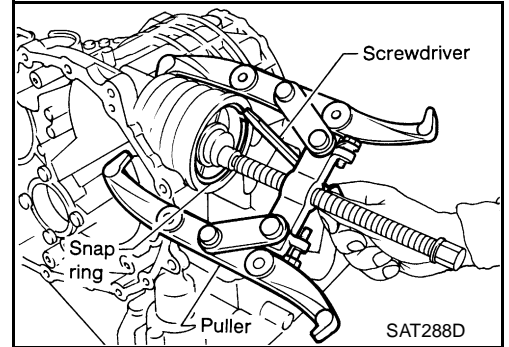
[ALL]

10. Install O/D servo piston assembly to transmission case.

- Apply ATF to O-ring of band servo piston and transmission case.

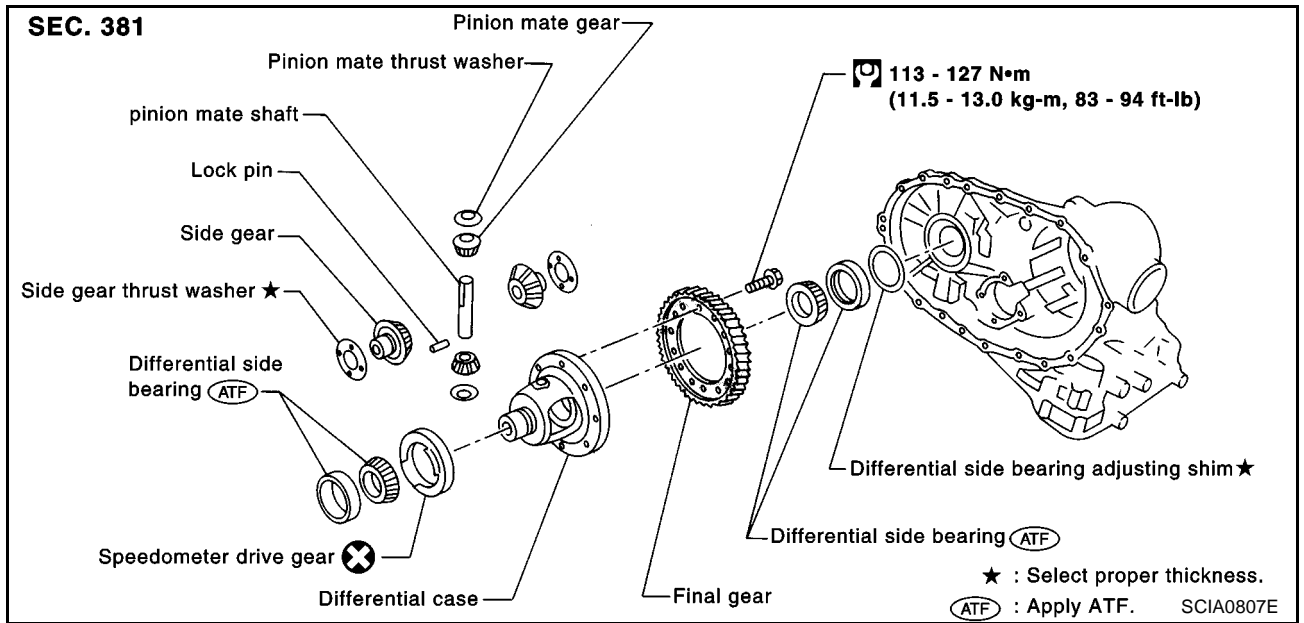


11. Install O/D servo piston retainer to transmission case. Refer to [AT-414, "Oil Channel"](#).



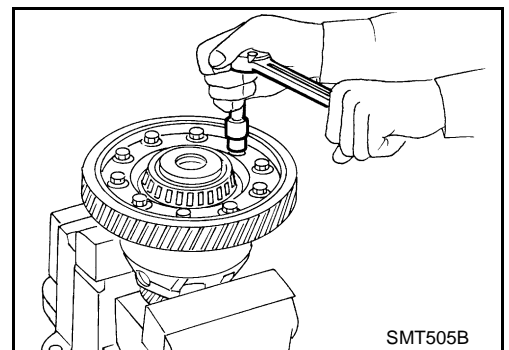
## Final Drive COMPONENTS

ECS0068D



## DISASSEMBLY

1. Remove final gear.

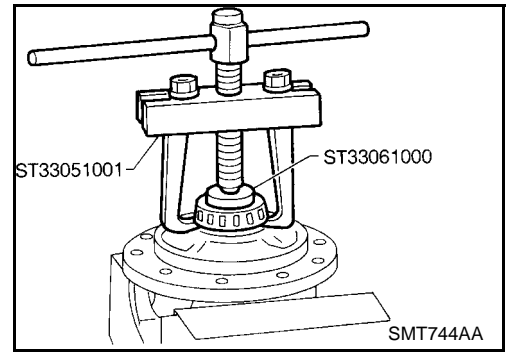


# REPAIR FOR COMPONENT PARTS

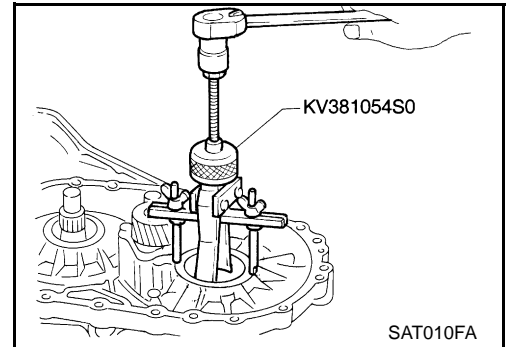
[ALL]

2. Press out differential side bearings.

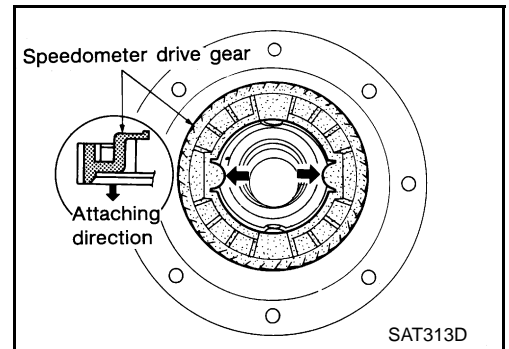
- Be careful not to mix up the right and left bearings.



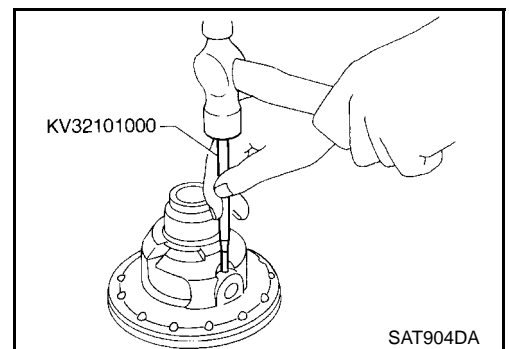
3. Remove differential side bearing outer race, and side bearing adjusting shim from transmission case.



4. Remove speedometer drive gear.



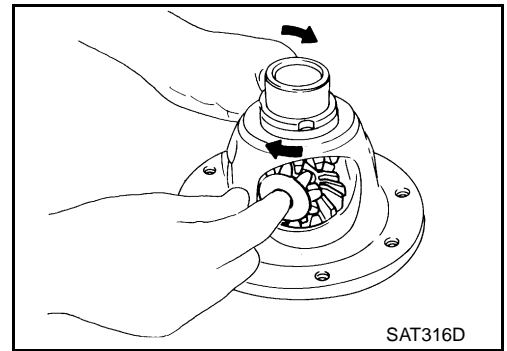
5. Drive out pinion mate shaft lock pin.



## REPAIR FOR COMPONENT PARTS

[ALL]

6. Draw out pinion mate shaft lock pin.
7. Remove pinion mate gears and side gears.

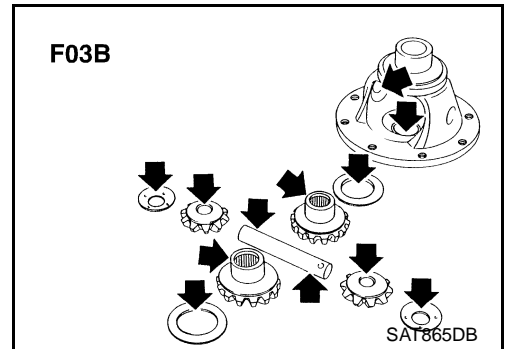


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### INSPECTION

#### Gear, Washer, Shaft and Case

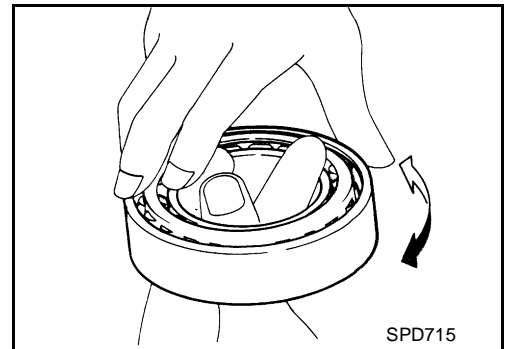
- Check mating surfaces of differential case, side gears and pinion mate gears.
- Check washers for wear.



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#### 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.**

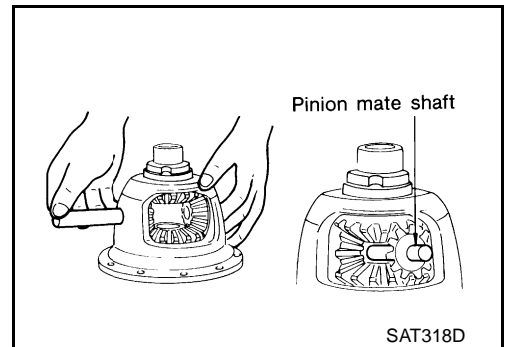


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### ASSEMBLY

#### — RE4F03B —

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.**

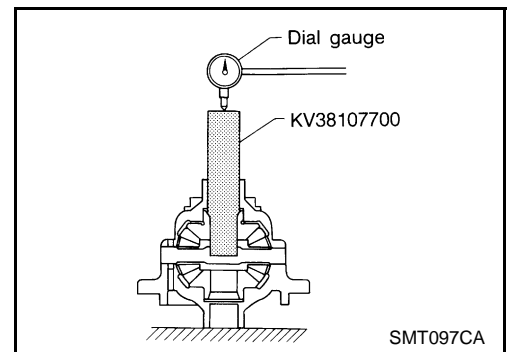


M

## REPAIR FOR COMPONENT PARTS

[ALL]

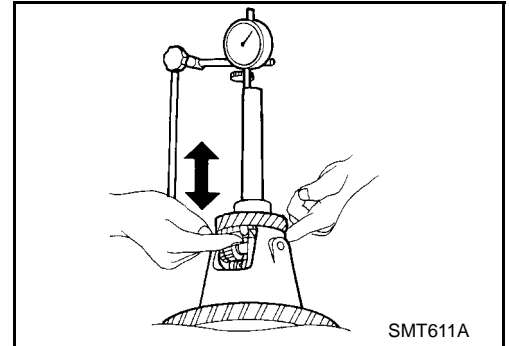
3. Measure clearance between side gear and differential case with washers following the procedure below:
  - a. Set Tool and dial indicator on side gear.



- 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)**

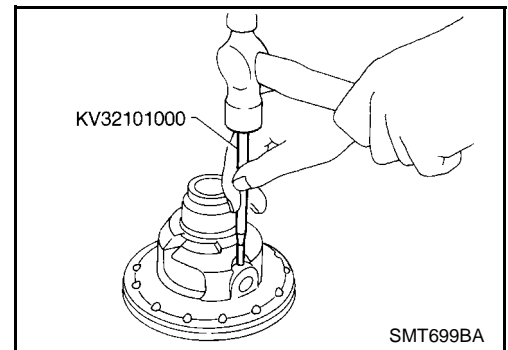


- c. If not within specification, adjust clearance by changing thickness of differential side gear thrust washers.

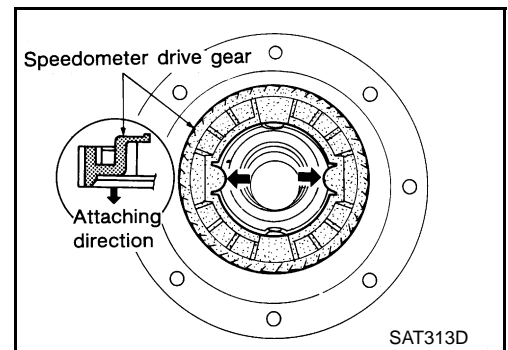
**Differential side gear thrust washers:**

**Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).**

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.**

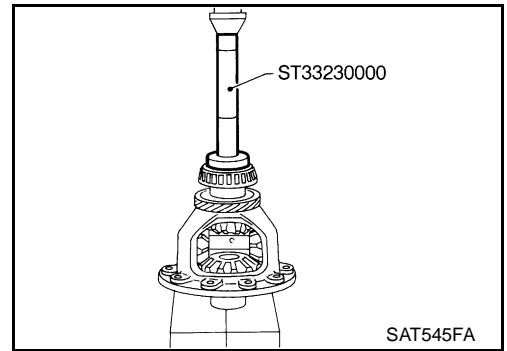




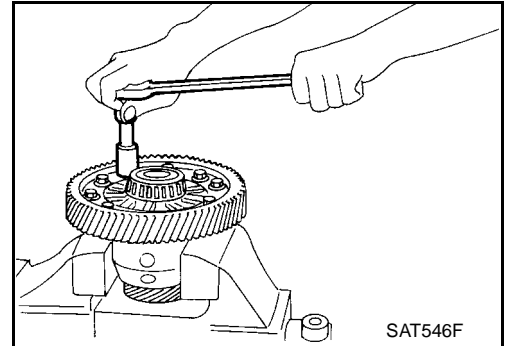
# REPAIR FOR COMPONENT PARTS

[ALL]

6. Press on differential side bearings.

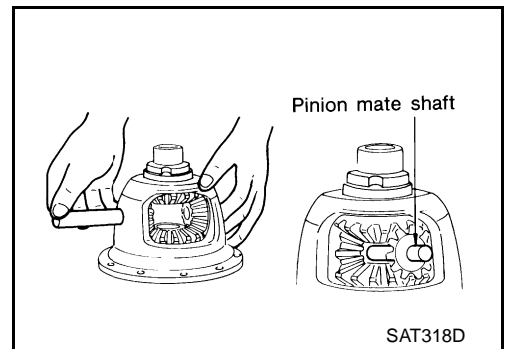


7. Install final gear and tighten fixing bolts in a crisscross pattern.



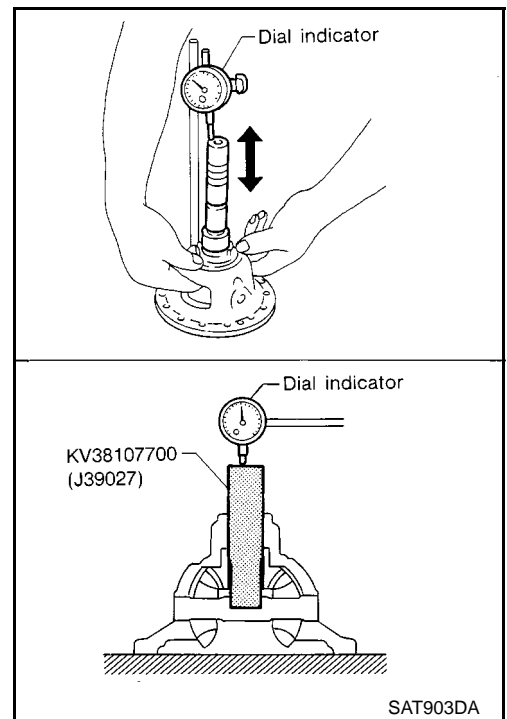
## — RE4F03W —

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.



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3. Measure clearance between side gear and differential case & viscous coupling with washers using the following procedure:



## Differential Case Side

1. Set Tool and dial indicator on side gear.
2. Move side gear up and down to measure dial indicator deflection.

**Clearance between side gear and differential case with washer:**

**0.1 - 0.2 mm (0.004 - 0.008 in)**

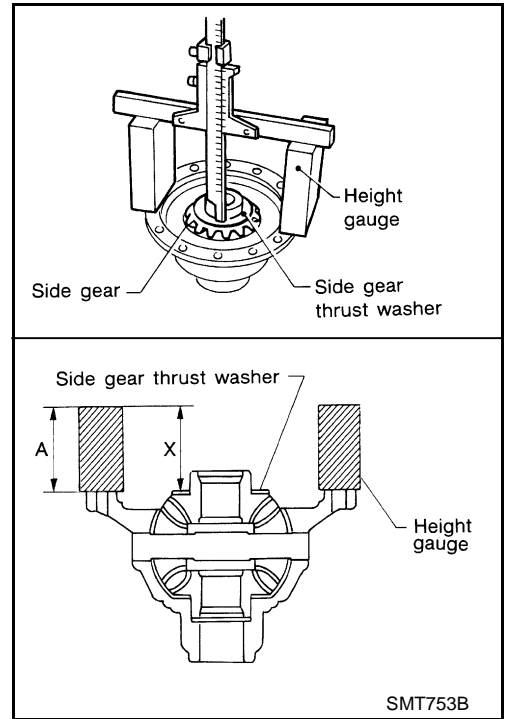
3. If not within specification adjust clearance by changing thickness of side gear thrust washer.

**Side gear thrust washers for differential case side:**

**Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .**

## Viscous Coupling Side

1. Place side gear and thrust washer on pinion mate gears installed on differential case.
2. Measure dimension X.
- **Measure dimension X in at least two places.**



3. Measure dimension Y.
- **Measure dimension Y in at least two places.**

**Clearance between side gear and viscous coupling**  
**= X + Y - 2A:**

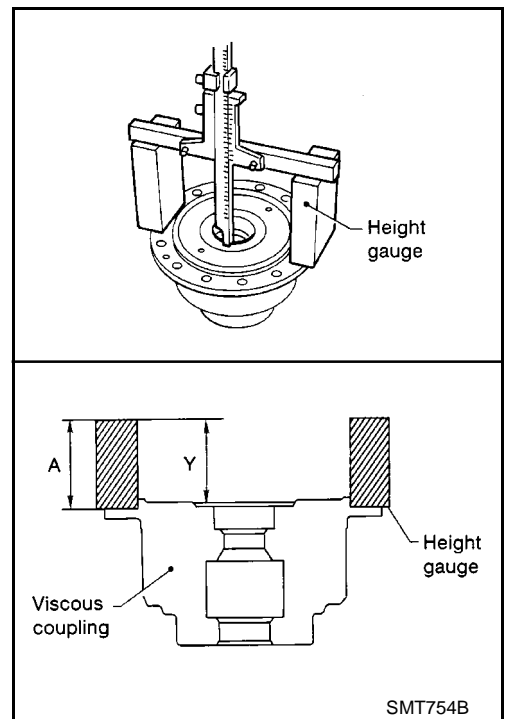
**0.1 - 0.2 mm (0.004 - 0.008 in)**

**A: Height of gauge**

4. If not within specification, adjust clearance by changing thickness of side gear thrust washer.

**Side gear thrust washers for viscous coupling side:**

**Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).**

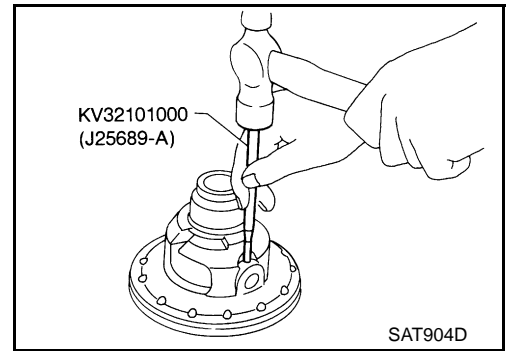


## REPAIR FOR COMPONENT PARTS

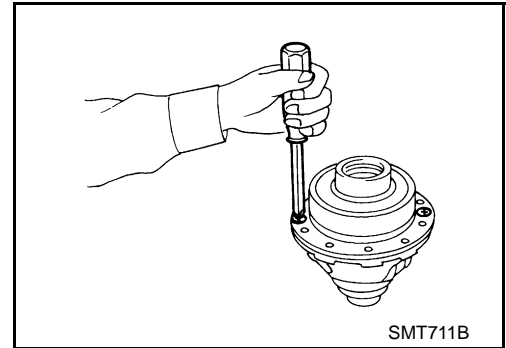
[ALL]

5. Install lock pin.

- Make sure that lock pin is flush with case.

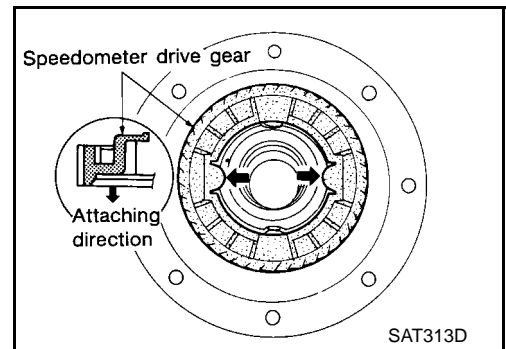


6. Install side gear (viscous coupling side) on differential case and then install viscous coupling.

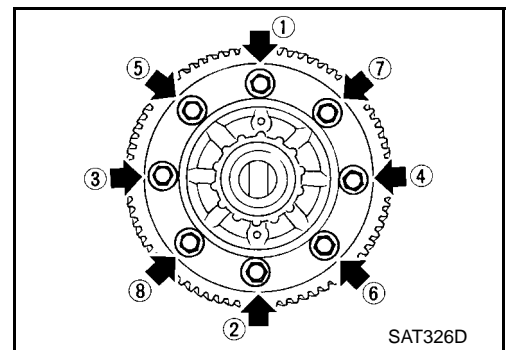


7. Install speedometer drive gear on differential case.

- Align the projection of speedometer drive gear with the groove of differential case.



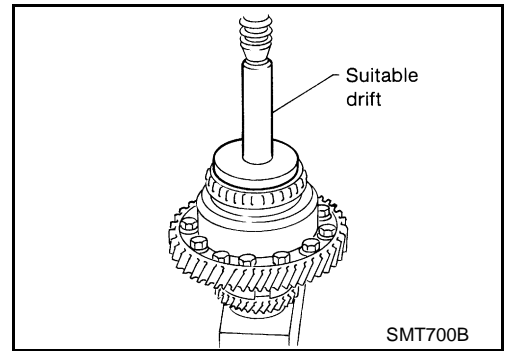
8. Install final gear and tighten fixing bolts in numerical order.



# REPAIR FOR COMPONENT PARTS

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9. Press on differential side bearings.



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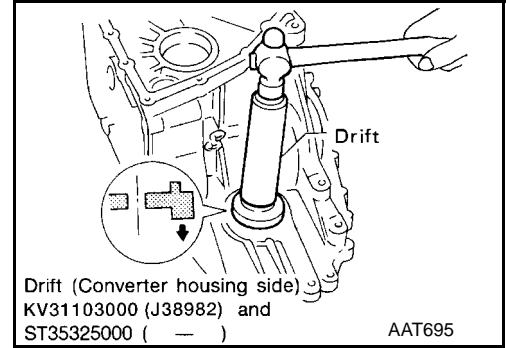
## ASSEMBLY

PFP:00000

### Assembly (1)

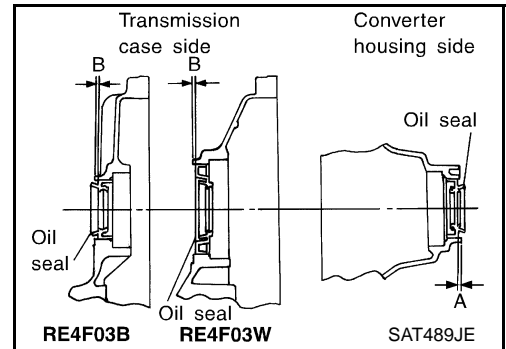
ECS0060R

1. Install differential side oil seals on transmission case and converter housing.



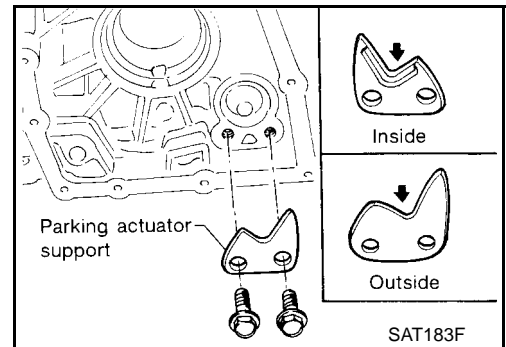
Unit: mm (in)

A	B
5.5 - 6.5 (0.217 - 0.256)	-0.5 to 0.5 (-0.020 to 0.020)

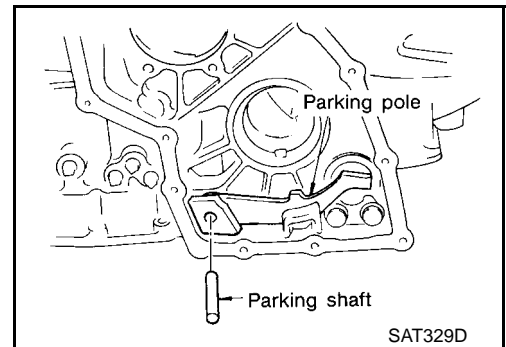


2. Install parking actuator support to transmission case. Tighten parking actuator support bolts to the specified torque. Refer to [AT-411, "OVERHAUL"](#).

- Pay attention to direction of parking actuator support.



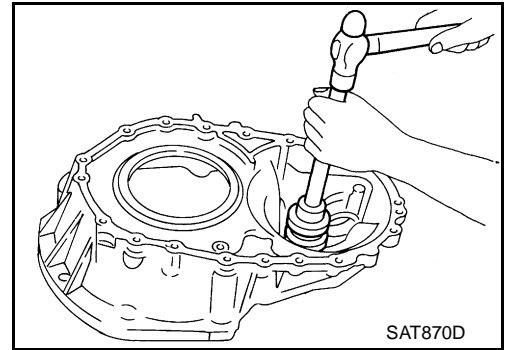
3. Install parking pawl on transmission case and fix it with parking shaft.
4. Install return spring.



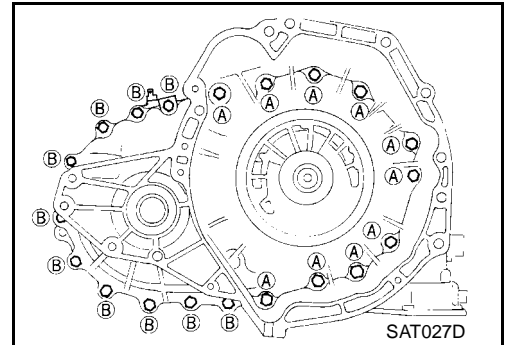
## Adjustment (1)

### DIFFERENTIAL SIDE BEARING PRELOAD

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.
4. Install transmission case on converter housing. Tighten transmission case fixing bolts to the specified torque. Refer to [AT-411, "OVERHAUL"](#).



5. 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.

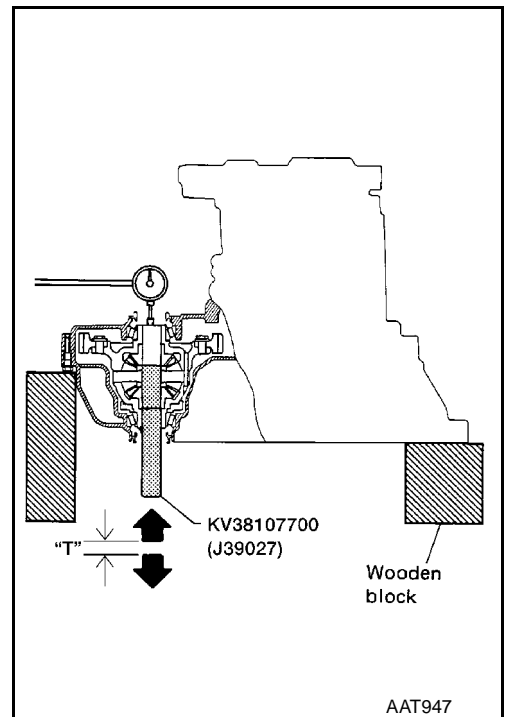
**Differential side bearing preload "T":**

**0.04 - 0.09 mm (0.0016 - 0.0035 in)**

8. Select proper thickness of differential side bearing adjusting shim(s) using SDS table as a guide.

**Differential side bearing adjusting shim:**

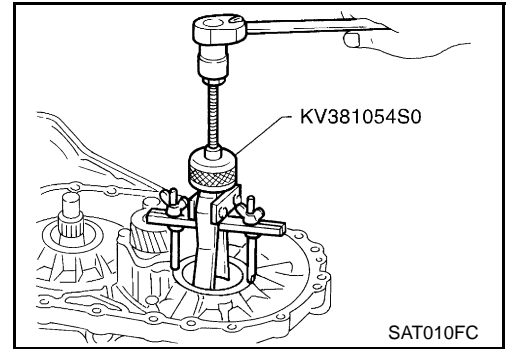
**Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).**



# ASSEMBLY

[ALL]

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-411, "OVERHAUL"](#).

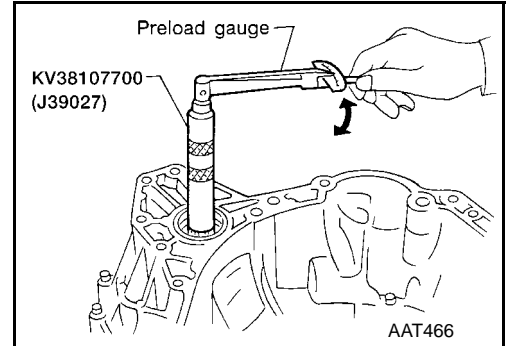


14. Insert Tool and measure turning torque of final drive assembly.
  - Turn final drive assembly in both directions several times to seat bearing rollers correctly.

**Turning torque of final drive assembly (New bearing):**  
**0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 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: KV38105210**



## 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) in the left figure by the following formula. And adjust the inspection standard for pre-load (rotating slide torque) as shown below.

$$T = A - E$$

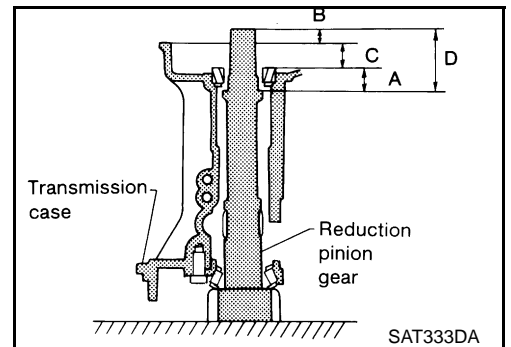
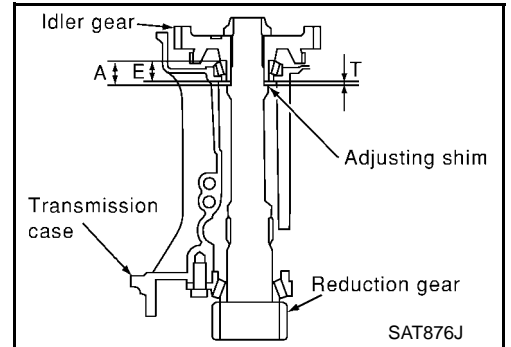
**Inspection standard for preload:**

$$0.1 - 0.69 \text{ N-m (1.1 - 7.0 kg-cm, 0.95 - 6.08 in-lb)}$$

1. 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.**

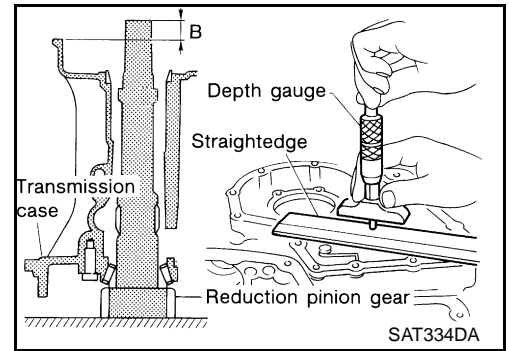




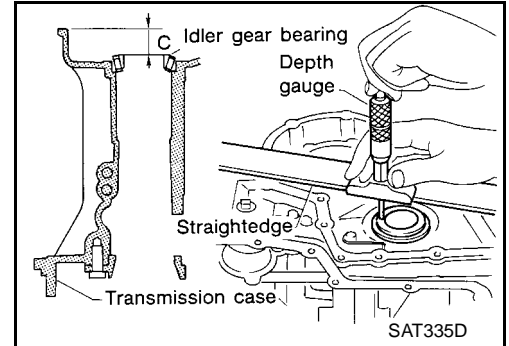
# ASSEMBLY

[ALL]

- Measure dimension “B” between the end of reduction pinion gear and the surface of transmission case.
- **Measure dimension “B” in at least two places.**

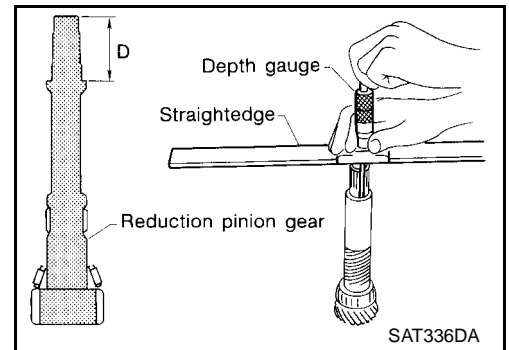


- Measure dimension “C” between the surface of idler gear bearing inner race and the surface of transmission case.
- **Measure dimension “C” in at least two places.**



- 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”.

$$A = D - (B + C)$$

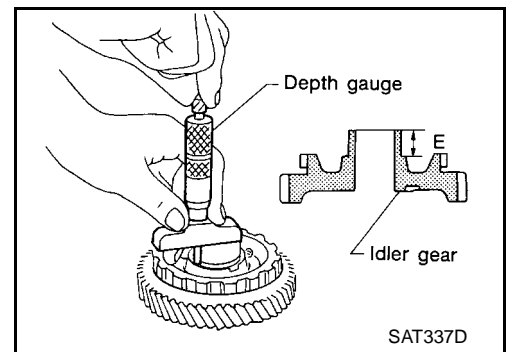


- d. Measure dimension “E” between the end of idler gear and the idler gear bearing inner race mating surface of idler gear.
- **Measure dimension “E” in at least two places.**
- e. Select proper thickness of reduction pinion gear bearing adjusting shim.

**Proper shim thickness = A – E – 0.05 mm (0.0020 in)\***  
**(\*... Bearing preload)**

**Reduction pinion gear bearing adjusting shim:**

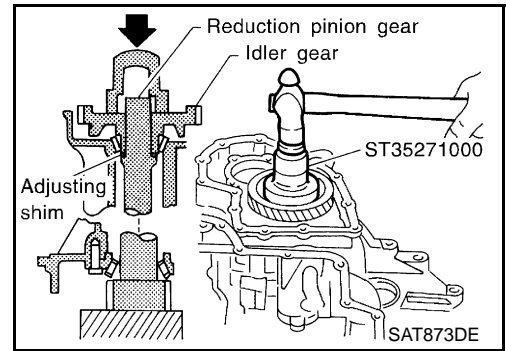
**Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).**



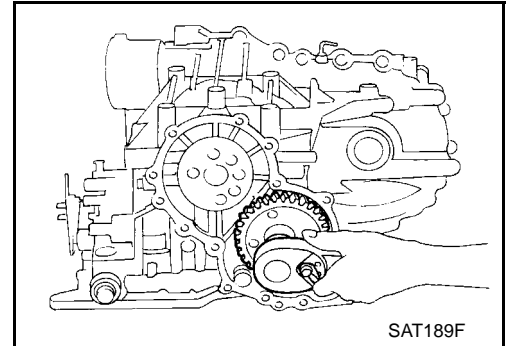
# ASSEMBLY

[ALL]

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-411, "OVERHAUL"](#).
  - Lock idler gear with parking pawl when tightening lock nut.

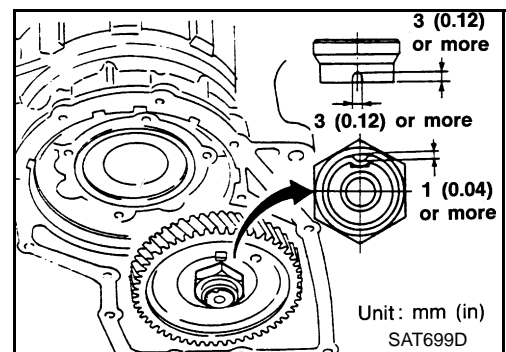
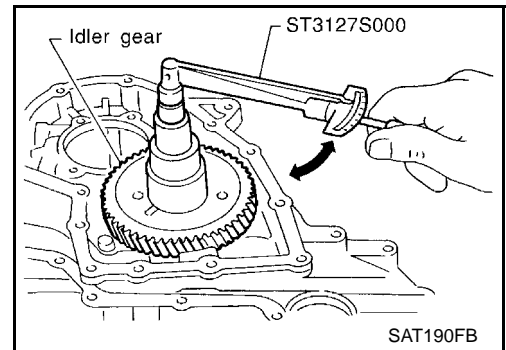


7. Measure turning torque of reduction pinion gear.
  - When measuring turning torque, turn reduction pinion gear in both directions several times to seat bearing rollers correctly.

Turning torque of reduction pinion gear:

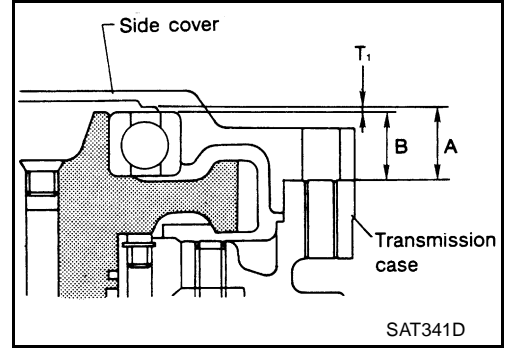
0.05 - 0.39 N-m (0.5 - 4.0 kg-cm, 0.43 - 3.47 in-lb)

- 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.

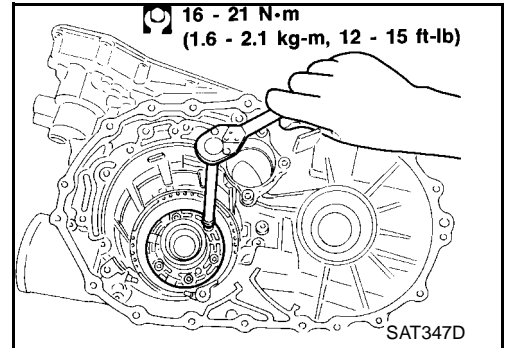


## OUTPUT SHAFT END PLAY

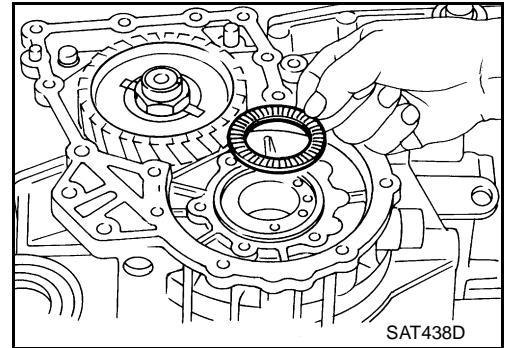
- Measure clearance between side cover and the end of the output shaft bearing.
- Select proper thickness of adjusting shim so that clearance is within specifications.



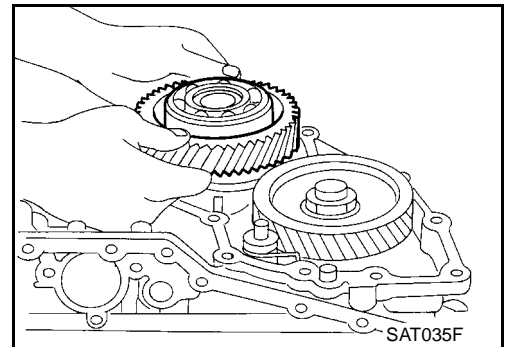
1. Install bearing retainer for output shaft.



2. Install output shaft thrust needle bearing on bearing retainer.



3. Install output shaft on transmission case.



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# ASSEMBLY

[ALL]

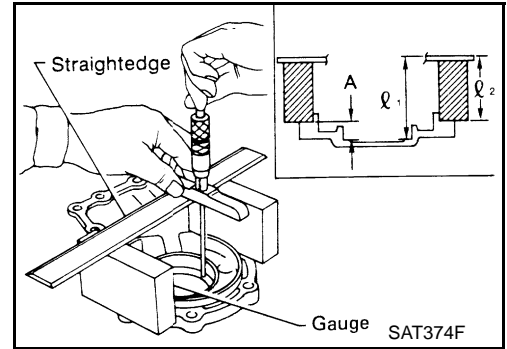
4. Measure dimensions “ $l_1$ ” and “ $l_2$ ” at side cover and then calculate dimension “A”.

- Measure dimension “ $l_1$ ” and “ $l_2$ ” in at least two places.

“A”: Distance between transmission case fitting surface and adjusting shim mating surface.

$$A = l_1 - l_2$$

$l_2$ : Height of gauge



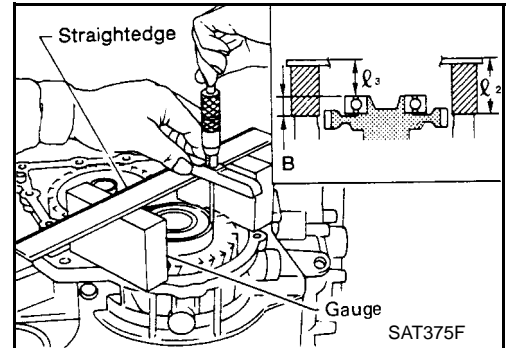
5. Measure dimensions “ $l_2$ ” and “ $l_3$ ” and then calculate dimension “B”.

- 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.

$$B = l_2 - l_3$$

$l_2$ : 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.

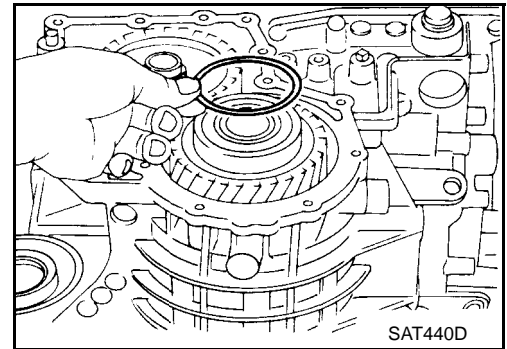
**Output shaft end play (A – B):**

**0 - 0.15 mm (0 - 0.0059 in)**

**Output shaft end play adjusting shims:**

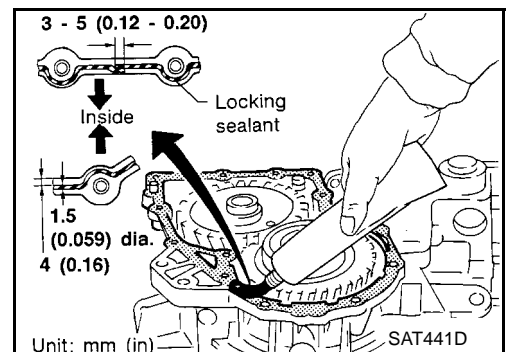
**Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).**

7. Install adjusting shim on output shaft bearing.



## Assembly (2)

1. Apply locking sealant (Loctite #518) to transmission case as shown in illustration.

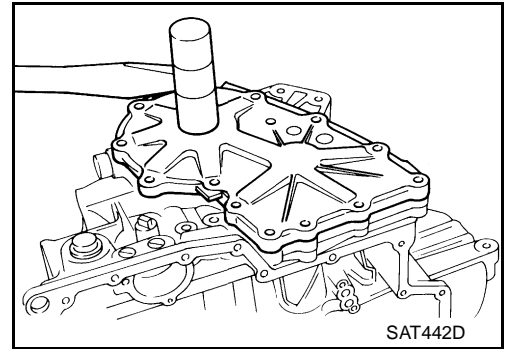


# ASSEMBLY

[ALL]

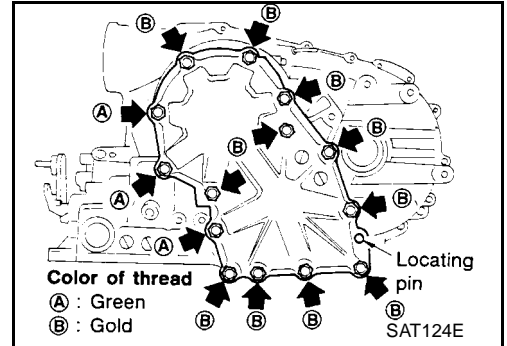
2. Set side cover on transmission case.

- Apply locking sealant to the mating surface of transmission case.



3. Tighten side cover fixing bolts to specified torque. Refer to [AT-411, "OVERHAUL"](#).

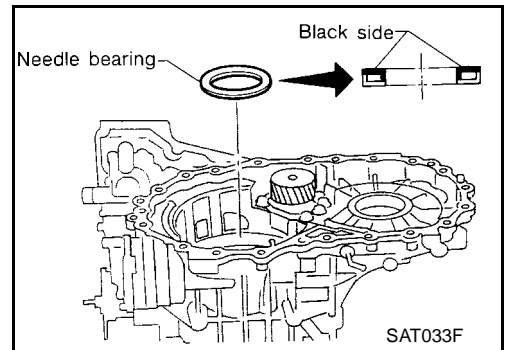
- Do not mix bolts A and B.
- Always replace bolts A as they are self-sealing bolts.



4. Remove paper rolled around bearing retainer.

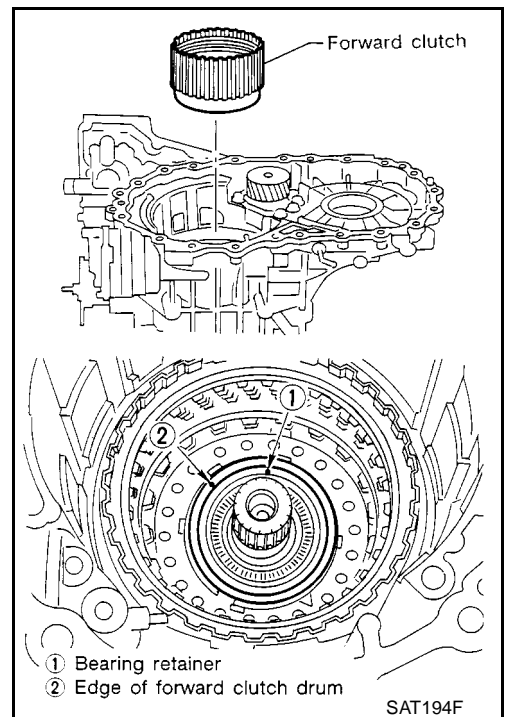
5. Install thrust washer on bearing retainer.

- Apply petroleum jelly to thrust washer.

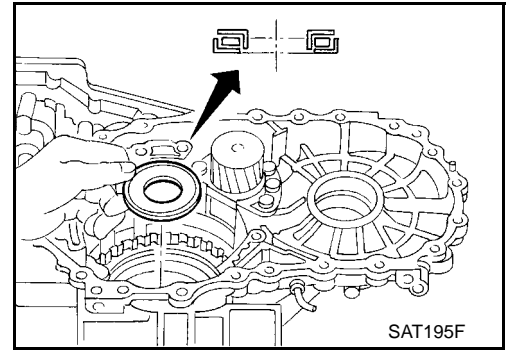


6. Install forward clutch assembly.

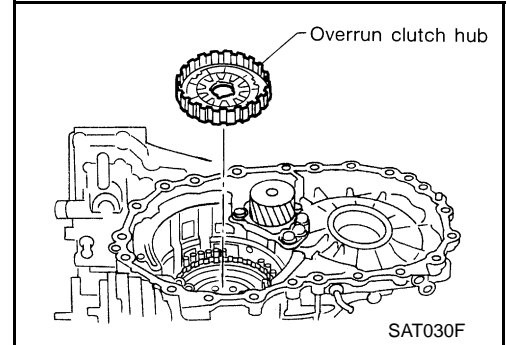
- Align teeth of low & reverse brake drive plates before installing.
- Make sure that bearing retainer seal rings are not spread.
- If forward clutch assembly is correctly seated, points 1 and 2 are at almost same level.



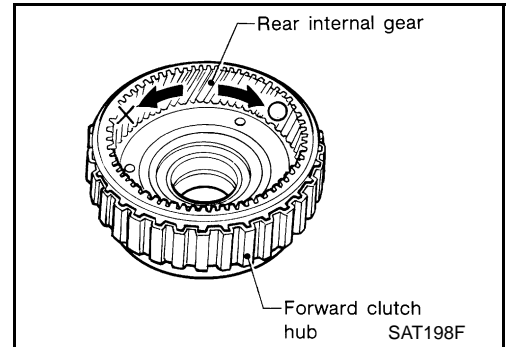
7. Install thrust needle bearing on bearing retainer.
- Apply petroleum jelly to thrust needle bearing.
  - Pay attention to direction of thrust needle bearing.



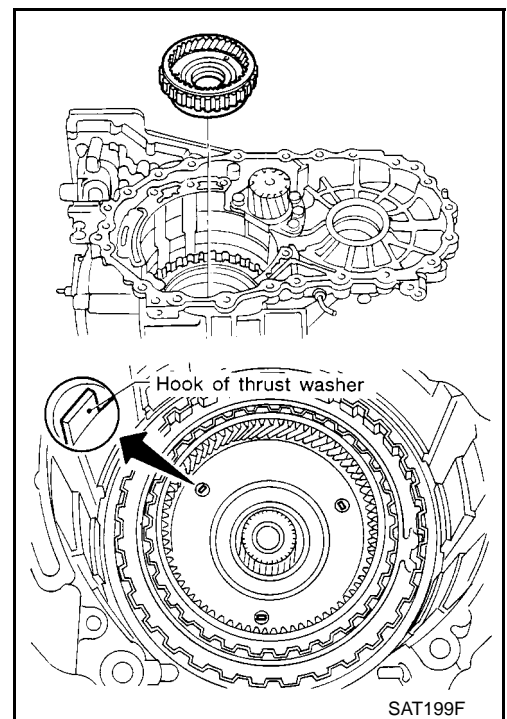
8. Install overrun clutch hub.
- Apply petroleum jelly to thrust washers.
  - Align teeth of overrun clutch drive plates before installing.



9. 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.

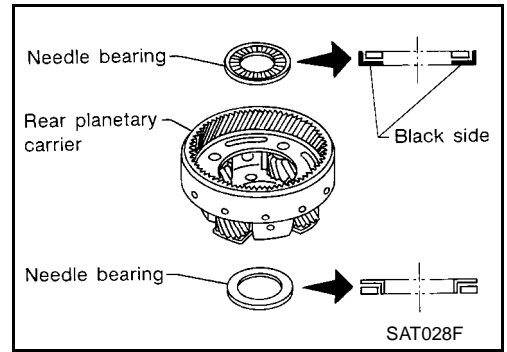


# ASSEMBLY

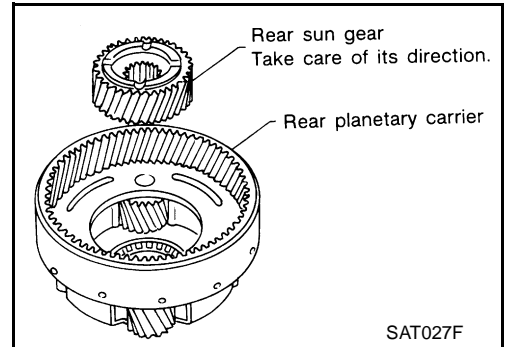
[ALL]

11. Install rear planetary carrier assembly and rear sun gear according to the following procedures.

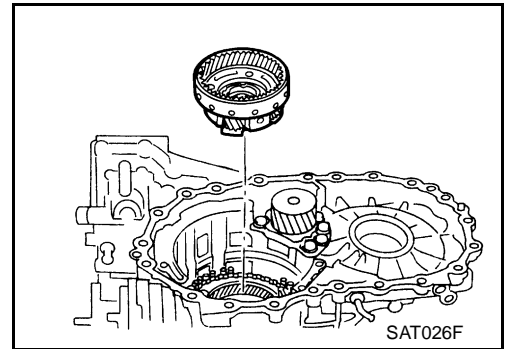
- a. Install needle bearings on rear planetary carrier.
- Apply petroleum jelly to needle bearings.
  - Pay attention to direction of needle bearings.



- b. Install rear sun gear on rear planetary carrier.
- Pay attention to direction of rear sun gear.

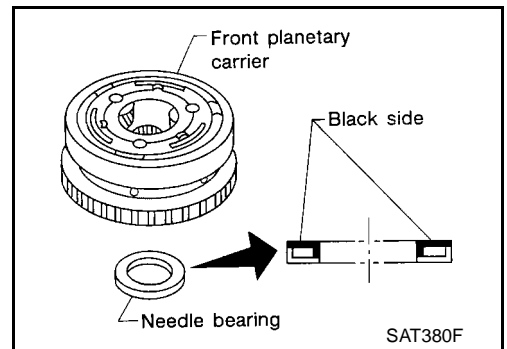


- c. Install rear planetary carrier on transmission case.



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.

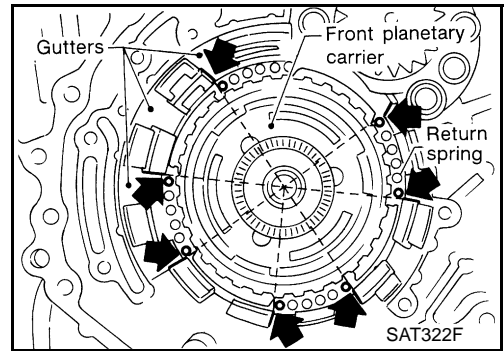


# ASSEMBLY

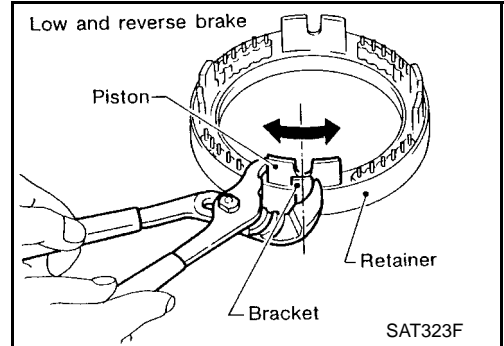
[ALL]

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.

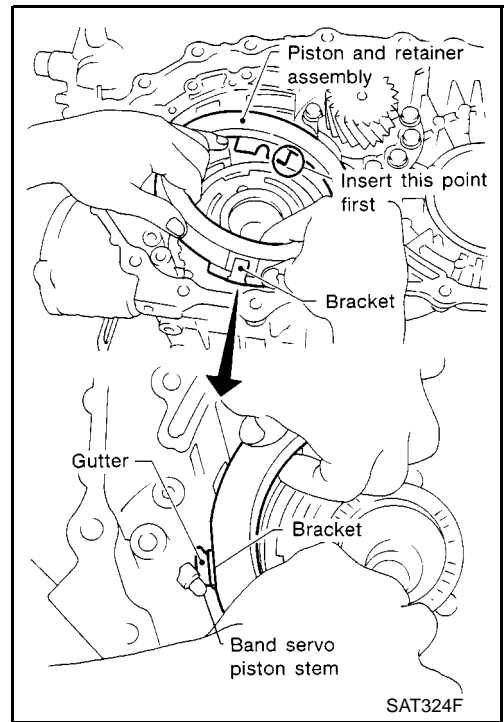


b. Set and align piston with retainer.



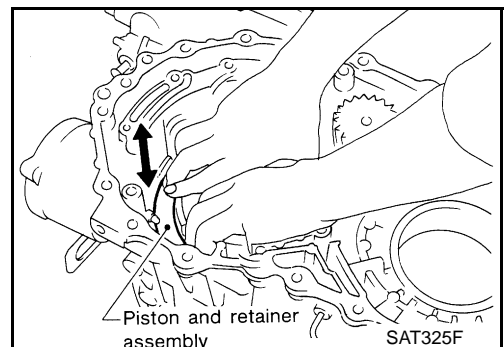
c. Install piston and retainer assembly on the transmission case.

● **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".**

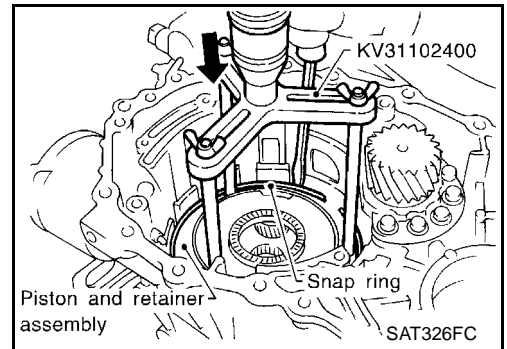




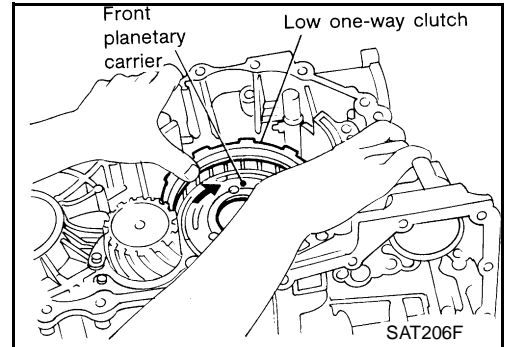
# ASSEMBLY

[ALL]

- e. Push down piston and retainer assembly and install snap ring.

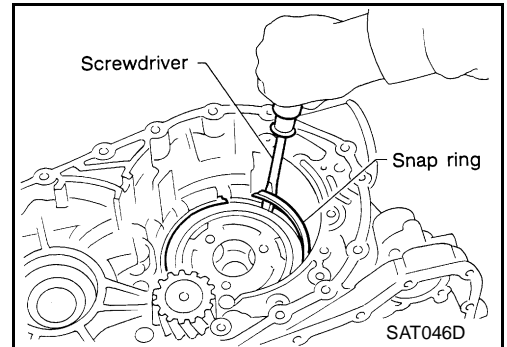


14. Install low one-way clutch to front planetary carrier by turning carrier in the direction of the arrow shown.



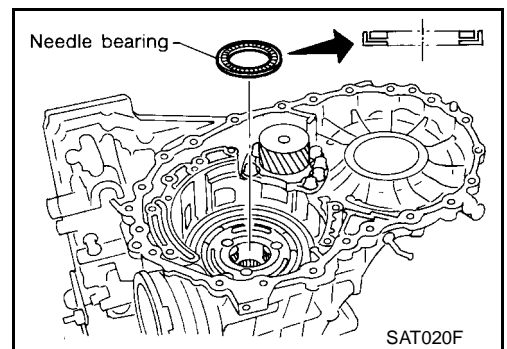
15. Install snap ring with screwdriver.

- **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.**



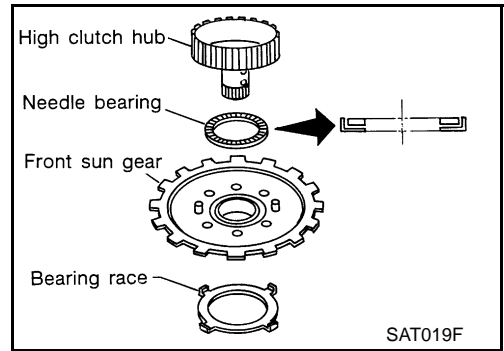
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# ASSEMBLY

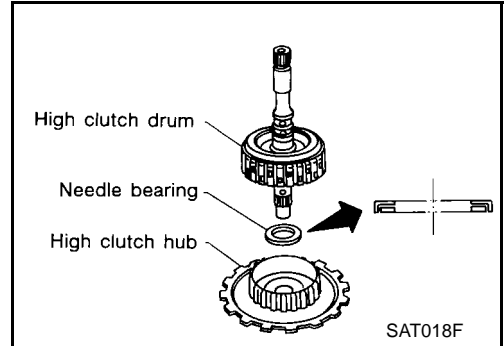
[ALL]

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.

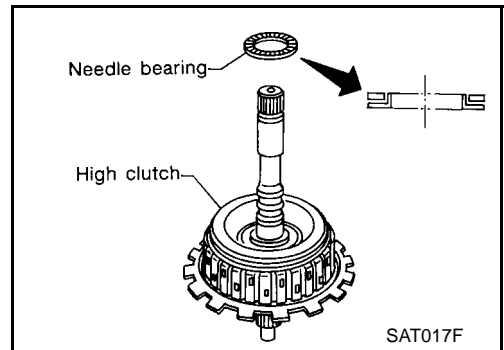


18. Install needle bearing and high clutch drum on high clutch hub.



19. Install needle bearing on high clutch drum.

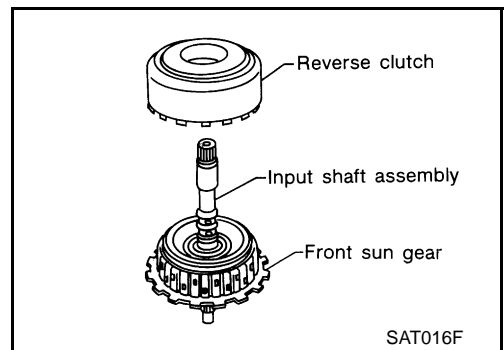
- Apply petroleum jelly to needle bearing.
- Pay attention to direction of needle bearing.



20. Remove paper rolled around input shaft.

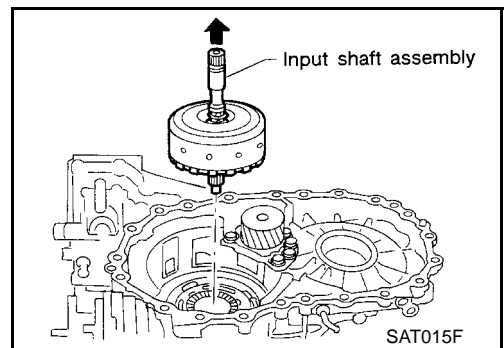
21. Install input shaft assembly in reverse clutch.

- 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.



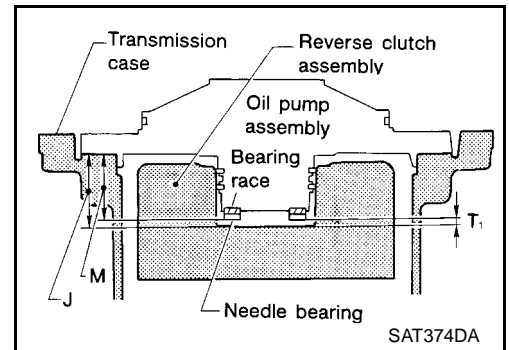
## Adjustment (2)

When any parts listed below are replaced, adjust total end play and reverse clutch end play.

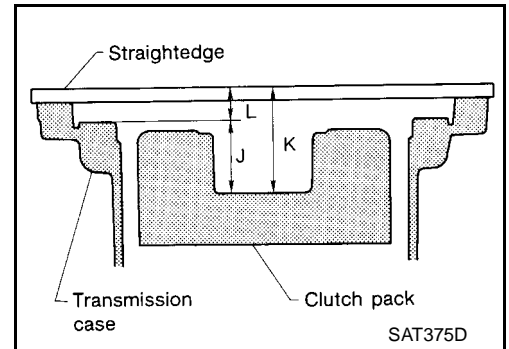
Part name	Total end play	Reverse clutch end play
Transmission case	●	●
Overrun clutch hub	●	●
Rear internal gear	●	●
Rear planetary carrier	●	●
Rear sun gear	●	●
Front planetary carrier	●	●
Front sun gear	●	●
High clutch hub	●	●
High clutch drum	●	●
Oil pump cover	●	●
Reverse clutch drum	—	●

### TOTAL END PLAY

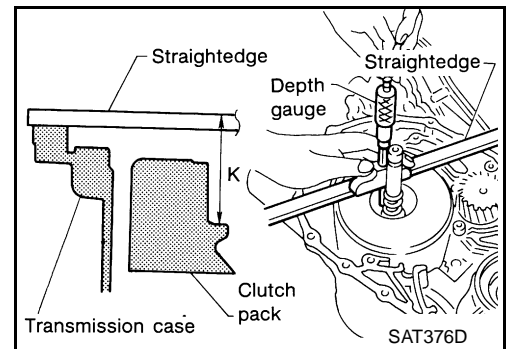
- Measure clearance between reverse clutch drum and needle bearing for oil pump cover.
- Select proper thickness of bearing race so that end play is within specifications.



1. Measure dimensions "K" and "L" and then calculate dimension "J".



- a. Measure dimension "K".



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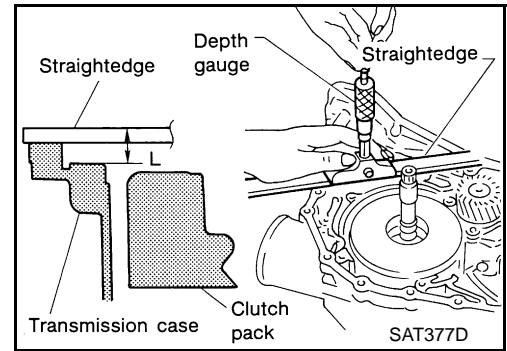
# ASSEMBLY

[ALL]

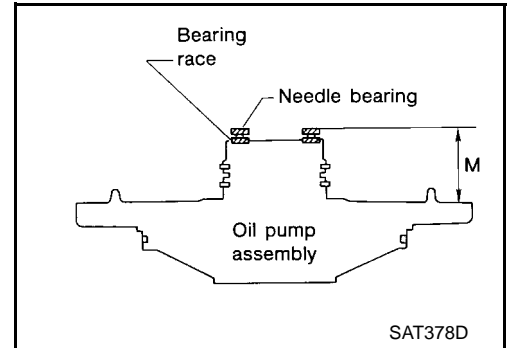
- b. Measure dimension "L".
- c. Calculate dimension "J".

**"J": Distance between oil pump fitting surface of transmission case and needle bearing mating surface of high clutch drum.**

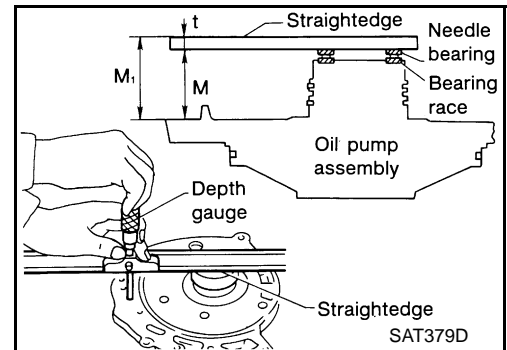
$$J = K - L$$



2. Measure dimension "M".
- a. Place bearing race and needle bearing on oil pump assembly.

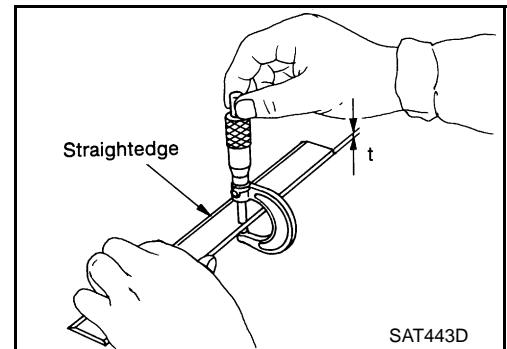


- b. Measure dimension "M".
- "M": Distance between transmission case fitting surface of oil pump cover and needle bearing on oil pump cover.**  
**"M1": Indication of gauge.**



- c. Measure thickness of straightedge "t".

$$M = M_1 - t$$



3. Adjust total end play "T1".

$$T_1 = J - M$$

**Total end play "T1":**

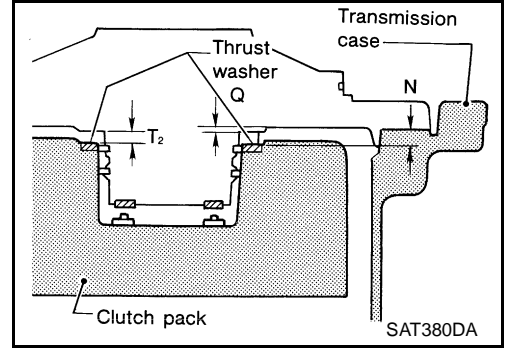
**0.25 - 0.55 mm (0.0098 - 0.0217 in)**

- Select proper thickness of bearing race so that total end play is within specifications.

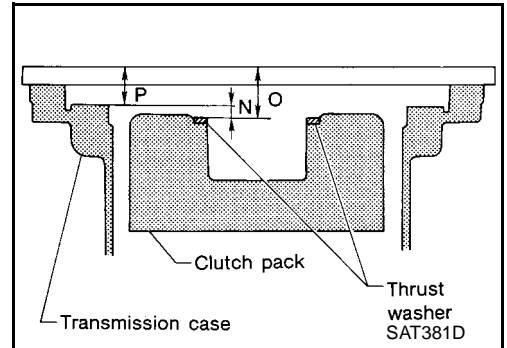
**Bearing races: Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#)**

## REVERSE CLUTCH END PLAY

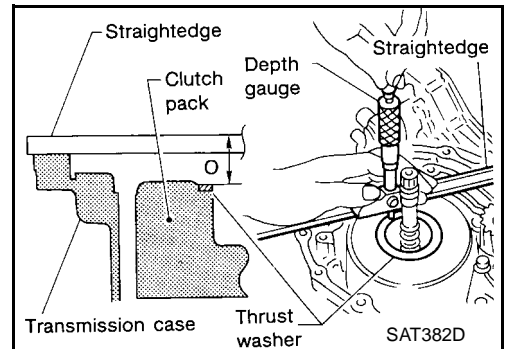
- Measure clearance between oil pump cover and thrust washer for reverse clutch drum.
- Select proper thickness of thrust washer so that end play is within specification.



1. Measure dimensions "O" and "P" and then calculate dimension "N".



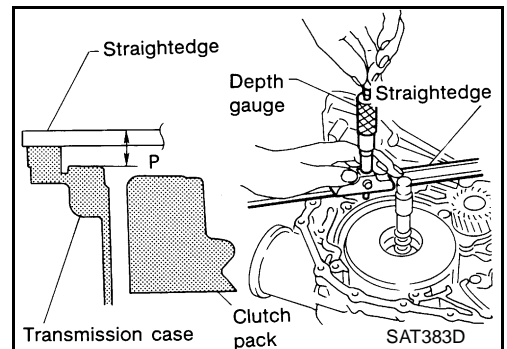
- a. Place thrust washer on reverse clutch drum.
- b. Measure dimension "O".



- 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.**

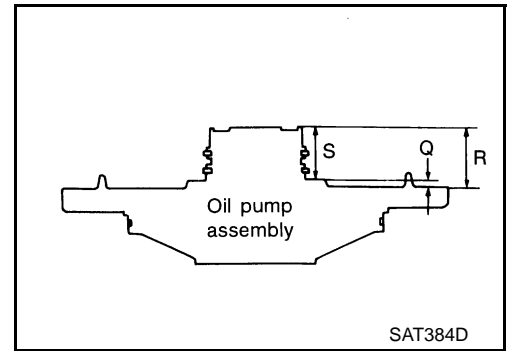
$$N = O - P$$



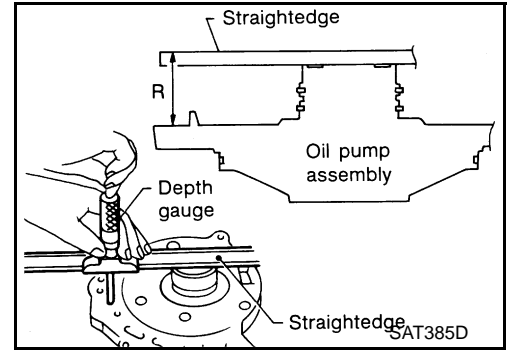
# ASSEMBLY

[ALL]

2. Measure dimensions "R" and "S" and then calculate dimension "Q".



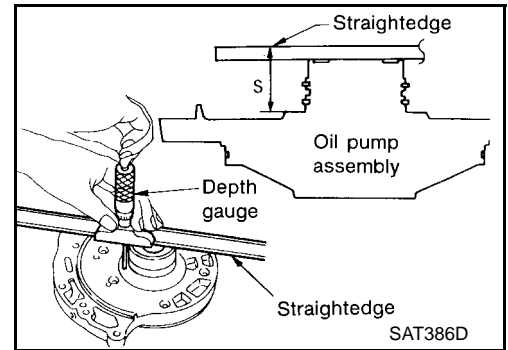
- a. Measure dimension "R".



- 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 "T<sub>2</sub>".

$$T_2 = N - Q$$

**Reverse clutch end play:**

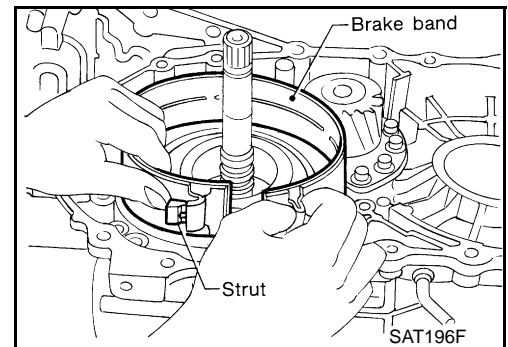
**0.65 - 0.90 mm (0.0256 - 0.0394 in)**

- Select proper thickness of thrust washer so that reverse clutch end play is within specifications.

**Thrust washer: Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .**

## Assembly (3)

1. Install anchor end pin and lock nut on transmission case.
2. 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.



ECS0060V

# ASSEMBLY

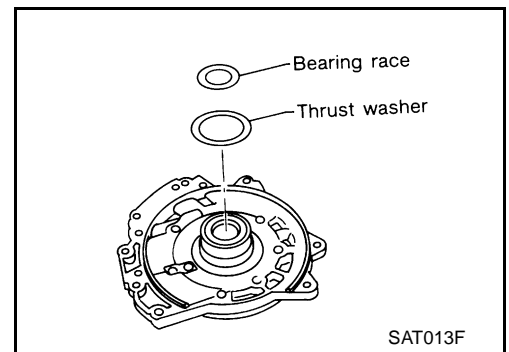
[ALL]

3. Place bearing race selected in total end play adjustment step on oil pump cover.

- **Apply petroleum jelly to bearing race.**

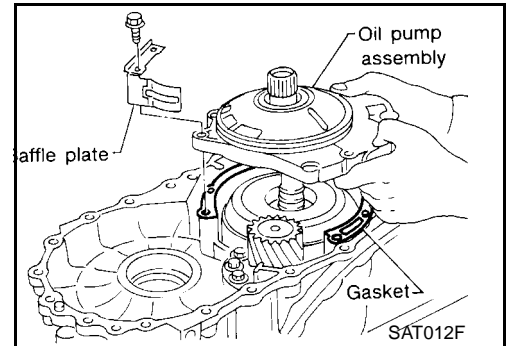
4. Place thrust washer selected in reverse clutch end play step on reverse clutch drum.

- **Apply petroleum jelly to thrust washer.**



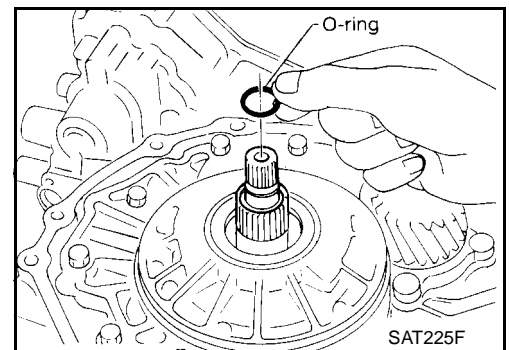
5. Install oil pump assembly, baffle plate and gasket on transmission case.

6. Tighten oil pump fixing bolts to the specified torque.



7. Install O-ring to input shaft.

- **Apply ATF to O-ring.**



8. Adjust brake band.

- a. Tighten anchor end pin to the specified torque.

**Anchor end pin:**

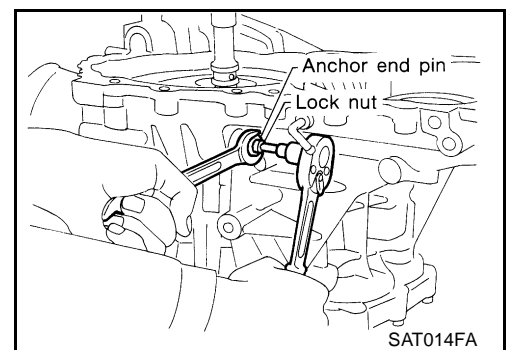
**Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .**

- b. Back off anchor end pin two and a half turns.

- c. While holding anchor end pin, tighten lock nut.

**Lock nut:**

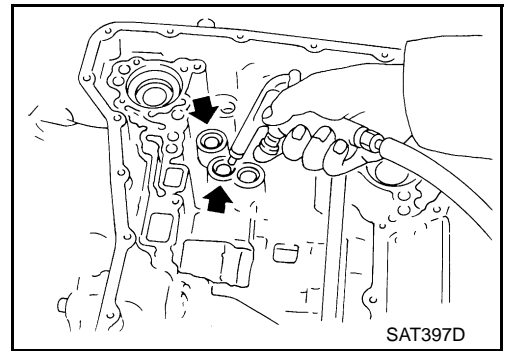
**Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .**



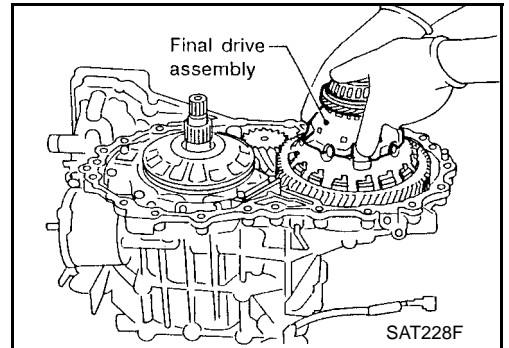
# ASSEMBLY

[ALL]

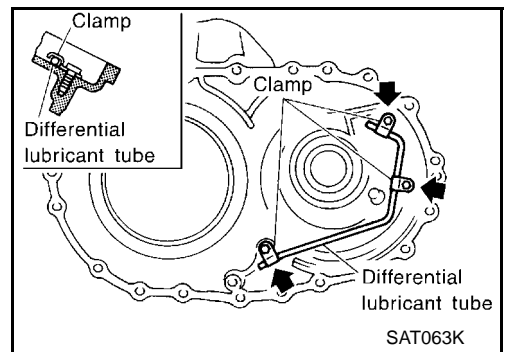
9. Apply compressed air to oil holes of transmission case and check operation of brake band.



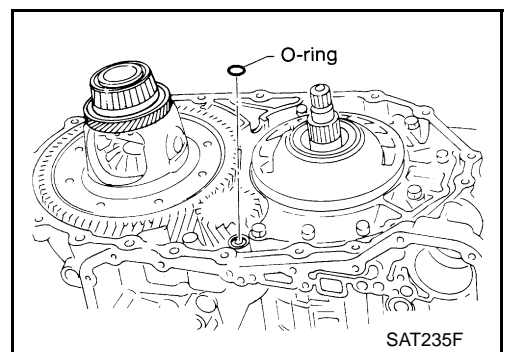
10. Install final drive assembly on transmission case.



11. Install differential lubricant tube on converter housing. Tighten differential lubricant tube bolts to the specified torque. Refer to [AT-411, "OVERHAUL"](#).

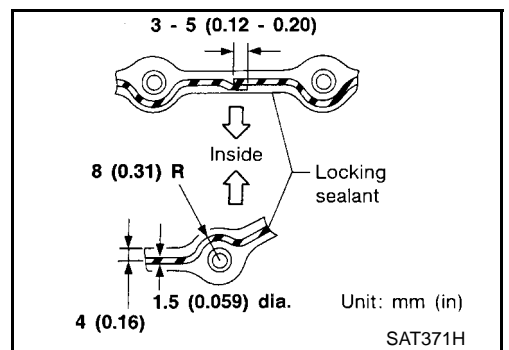


12. Install O-ring on differential oil port of transmission case.



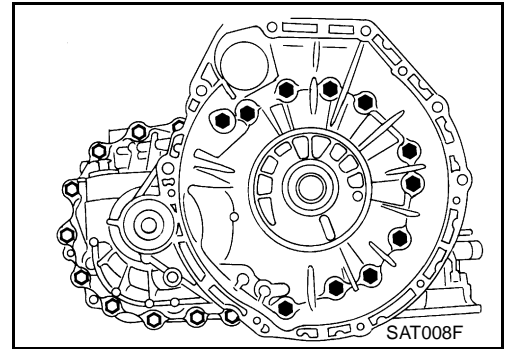
13. Install converter housing on transmission case.

- Apply locking sealant (Loctite #518) to mating surface of converter housing.



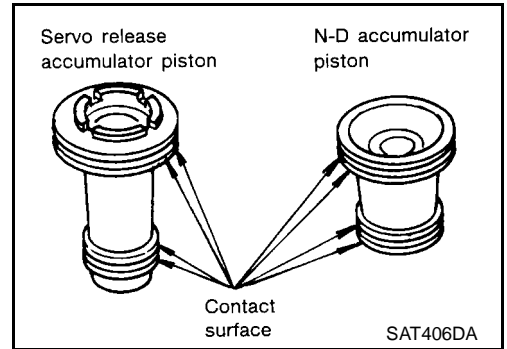


- Tighten converter housing bolts to the specified torque. Refer to [AT-411, "OVERHAUL"](#) .



A  
B  
AT

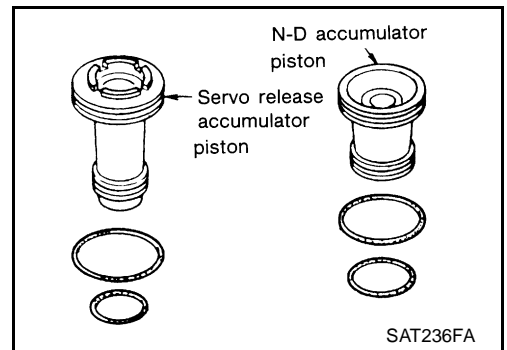
14. Install accumulator piston.
- a. Check contact surface of accumulator piston for damage.



D  
E  
F  
G

- b. Install O-rings on accumulator piston.
- Apply ATF to O-rings.

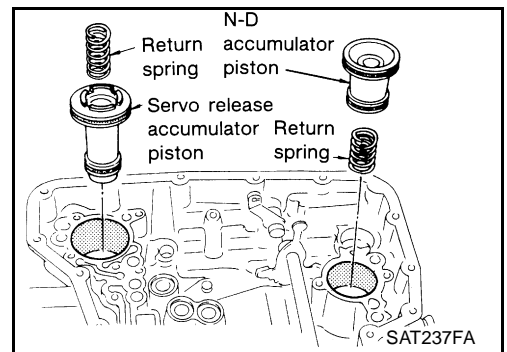
**Accumulator piston O-rings:**  
Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .



H  
I  
J  
K

- c. Install accumulator pistons and return springs on transmission case.
- Apply ATF to inner surface of transmission case.

**Return springs:**  
Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .



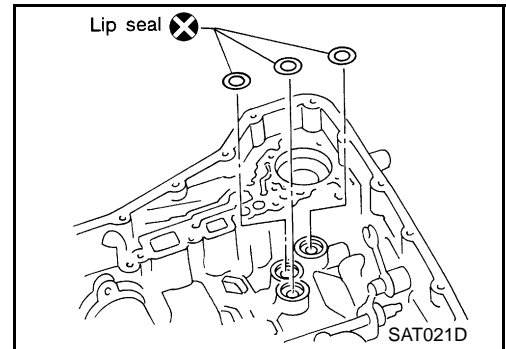
L  
M

# ASSEMBLY

[ALL]

15. Install lip seals for band servo oil holes on transmission case.

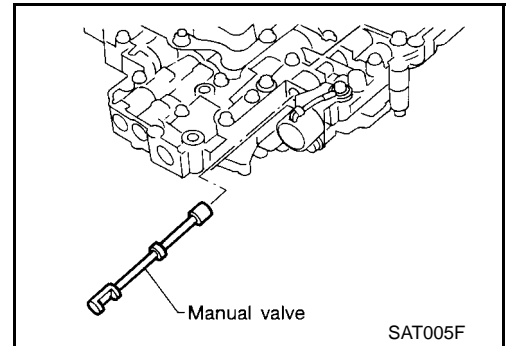
- Apply petroleum jelly to lip seals.



16. Install control valve assembly.

a. Insert manual valve into control valve assembly.

- Apply ATF to manual valve.

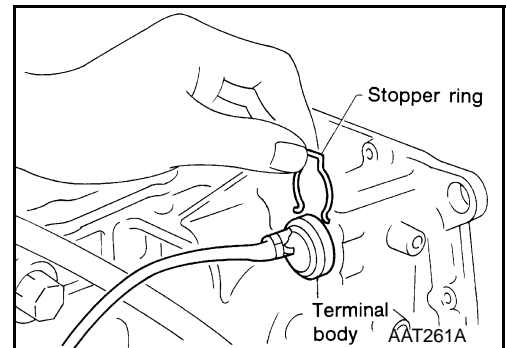


b. Set manual shaft in Neutral position.

c. Install control valve assembly on transmission case while aligning manual valve with manual plate.

d. Pass solenoid harness through transmission case and install terminal body on transmission case by pushing it.

e. Install stopper ring to terminal body.




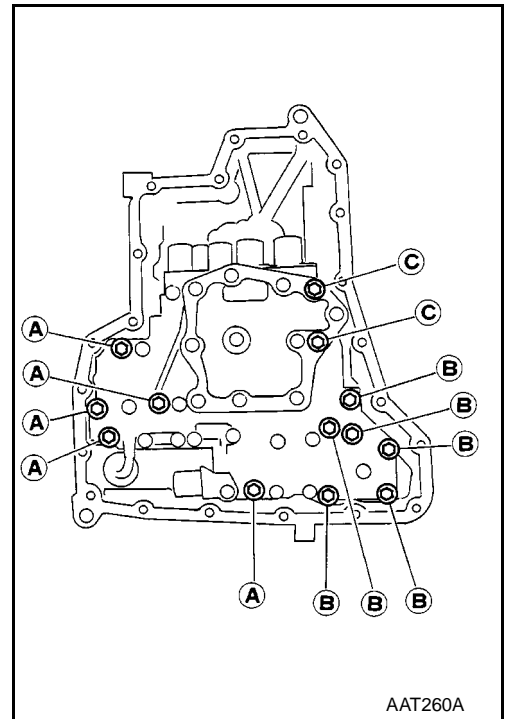
f. Tighten bolts I , X and ●.

# ASSEMBLY

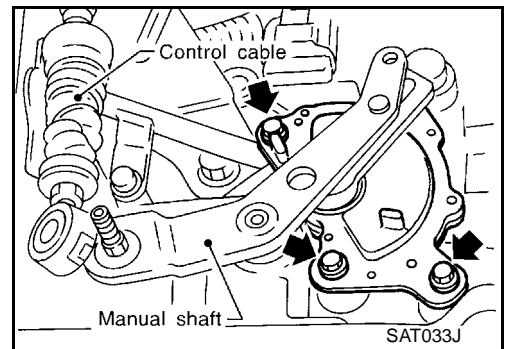
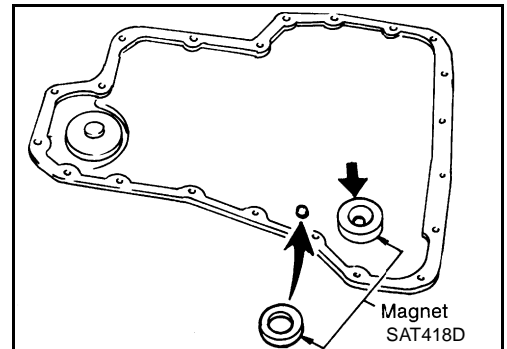
[ALL]

## Bolt length, number and location:

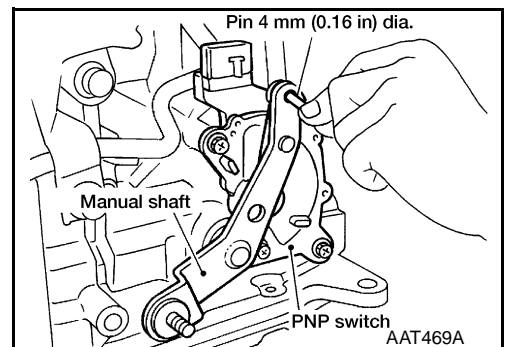
Bolt	A	B	C
Bolt length "ℓ"  mm (in)	40 (1.57)	33 (1.30)	43.5 (1.713)
Number of bolts	5	6	2



17. Install oil pan.
  - a. Attach a 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 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-411, "OVERHAUL"](#).
18. Install park/neutral position (PNP) switch.
  - a. Set manual shaft in P position.
  - b. Temporarily install park/neutral position (PNP) switch on manual shaft.
  - c. Move selector lever to N position.



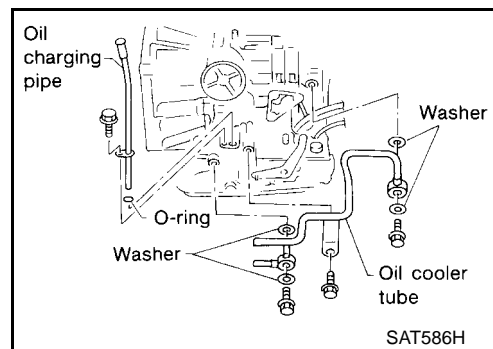
- d. Use a 4 mm (0.16 in) pin for this adjustment.
  - i. Insert the pin straight into the manual shaft adjustment hole.
  - ii. Rotate park/neutral position (PNP) switch until the pin can also be inserted straight into hole in park/neutral position (PNP) switch.
- e. Tighten park/neutral position (PNP) switch fixing bolts. Refer to [AT-411, "OVERHAUL"](#).
- f. Remove pin from adjustment hole after adjusting park/neutral position (PNP) switch.



# ASSEMBLY

[ALL]

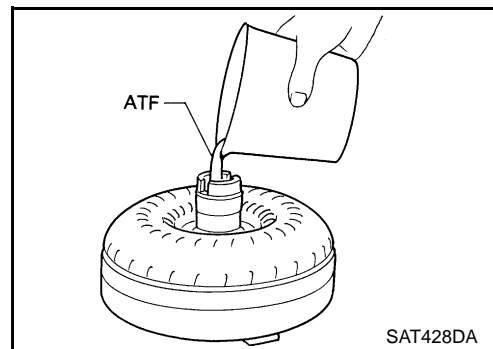
19. Install A/T fluid charging pipe and fluid cooler tube to transmission case. Tighten A/T fluid charging pipe and fluid cooler tube bolts to the specified torque. Refer to [AT-411, "OVERHAUL"](#) .



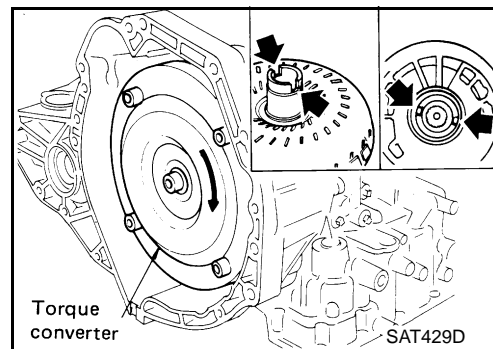
20. Install torque converter.

- 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.



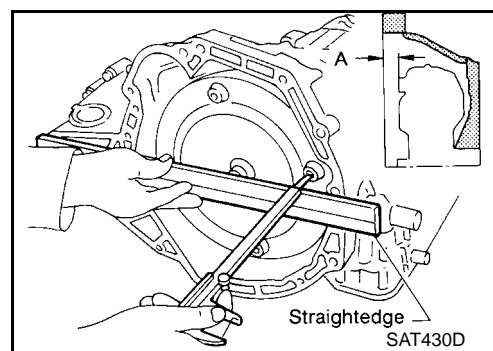
- b. Install torque converter while aligning notches of torque converter with notches of oil pump.



- c. Measure distance "A" to check that torque converter is in proper position.

**Distance A:**

Refer to [AT-517, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .



# SERVICE DATA AND SPECIFICATIONS (SDS)

[ALL]

## SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

### General Specifications

ECS0061L

Engine	QG18DE	
Automatic transaxle model	RE4F03B	
Automatic transaxle assembly	Model code number	3AX70
Transaxle gear ratio	1st	2.861
	2nd	1.562
	3rd	1.000
	4th	0.697
	Reverse	2.310
	Final drive	4.072
Recommended fluid	Genuine Nissan Automatic Transmission Fluid or equivalent*	
Fluid capacity	7.7 ℓ (6-3/4 Imp qt)	

\*: Refer to [MA-16, "Fluids and Lubricants"](#).

### Shift Schedule

ECS0061M

#### VEHICLE SPEED WHEN SHIFTING GEARS

Throttle position	Shift pattern	Vehicle speed km/h (MPH)						
		D1 → D2	D2 → D3	D3 → D4	D4 → D3	D3 → D2	D2 → D1	12 → 11
Full throttle	Comfort	54 - 62 (20 - 23)	102 - 110 (64 - 69)	162 - 170 (96 - 100)	158 - 166 (99 - 104)	92 - 100 (57 - 63)	41 - 49 (25 - 30)	54 - 62 (34 - 39)
Half throttle	Comfort	29 - 37 (18 - 23)	51 - 59 (32 - 37)	123 - 131 (77 - 80)	69 - 77 (43 - 48)	34 - 42 (21 - 26)	5 - 13 (3 - 8)	54 - 62 (34 - 39)

#### VEHICLE SPEED WHEN PERFORMING LOCK-UP

Throttle opening	CD switch	Shift pattern	Vehicle speed km/h (MPH)	
			Lock-up ON	Lock-up OFF
2/8	ON (D4)	Comfort	96 - 104 (60 - 65)	65 - 73 (41 - 46)
	OFF (D3)	Comfort	96 - 104 (60 - 65)	93 - 101 (58 - 63)

### Stall Revolution

ECS0061N

Engine model	Stall revolution rpm
QG18DE	2,300 - 2,750

### Line Pressure

ECS0061O

Engine speed rpm	Line pressure kPa (bar, kg/cm <sup>2</sup> , psi)			
	R position	D position	2 position	1 position
Idle	778 (7.8, 7.9, 113)	500 (5.0, 5.1, 73)	500 (5.0, 5.1, 73)	500 (5.0, 5.1, 73)
Stall	1,813 (18.1, 18.5, 263)	1,165 (11.7, 11.9, 169)	1,165 (11.7, 11.9, 169)	1,165 (11.7, 11.9, 169)

# SERVICE DATA AND SPECIFICATIONS (SDS)

[ALL]

## Control Valves CONTROL VALVE AND PLUG RETURN SPRINGS

ECS0061P

Unit: mm (in)

	No.	Parts	Part No.*	Free length	Outer diameter
Upper body Refer to "Control Valve Upper Body", <a href="#">AT-448</a> .	35	3-2 timing valve spring	31736-01X00	23.0 (0.906)	6.65 (0.2618)
	19	Cooler check valve spring	31742-3AX05	28.04 (1.1039)	7.15 (0.2815)
	23	Pilot valve spring	31742-3AX03	38.98 (1.5346)	8.9 (0.350)
	15	1-2 accumulator valve spring	31742-3AX00	20.5 (0.807)	6.95 (0.2736)
	28	1-2 accumulator piston spring	31742-3AX09	55.66 (2.1913)	19.5 (0.7677)
	33	1st reducing valve spring	31742-80X05	27.0 (1.063)	7.0 (0.276)
	2	Overrun clutch reducing valve spring	31742-80X06	37.5 (1.476)	7.0 (0.276)
	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)
Lower body Refer to "Control Valve Lower Body", <a href="#">AT-451</a> .	34	Shuttle 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)
	23	Overrun clutch control valve spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	27	Accumulator control valve spring	31742-80X02	22.0 (0.866)	6.5 (0.256)
	29	Shift valve A spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	2	Shift valve B spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	11	Pressure modifier valve spring	31742-41X15	30.5 (1.201)	9.8 (0.386)
	7		31742-80X16	32.0 (1.260)	6.9 (0.272)
	—	Oil cooler relief valve spring	31872-31X00	17.02 (0.670)	8.0 (0.315)
—	T/C pressure spring	31742-3AX07	9.0 (0.354)	7.3 (0.287)	

\*: Always check with the Parts Department for the latest parts information.

## Clutch and Brakes REVERSE CLUTCH

ECS0061Q

Number of drive plates		2
Number of driven plates		2
Drive plate thickness mm (in)	Standard	2.0 (0.079)
	Allowable limit	1.8 (0.071)
Clearance mm (in)	Standard	0.5 - 0.8 (0.020 - 0.031)
	Allowable limit	1.2 (0.047)
Thickness of retaining plates	Thickness mm (in)	Part number*
	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.

## HIGH CLUTCH

Number of drive plates		3
Number of driven plates		5
Drive plate thickness mm (in)	Standard	1.6 (0.063)
	Allowable limit	1.5 (0.059)
Clearance mm (in)	Standard	1.4 - 1.8 (0.055 - 0.071)
	Allowable limit	2.4 (0.094)

# SERVICE DATA AND SPECIFICATIONS (SDS)

[ALL]

	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)

\*: Always check with the Parts Department for the latest parts information.

## FORWARD CLUTCH

Number of drive plates	5	
Number of driven plates	5	
Drive plate thickness mm (in)	Standard	1.8 (0.071)
	Allowable limit	1.6 (0.063)
Clearance mm (in)	Standard	0.45 - 0.85 (0.0177 - 0.0335)
	Allowable limit	1.85 (0.0728)
Thickness of retaining plates	Thickness mm (in)	Part number*
	3.6 (0.142)	31537-31X60
	3.8 (0.150)	31537-31X61
	4.0 (0.157)	31537-31X62
	4.2 (0.165)	31537-31X63
	4.4 (0.173)	31537-31X64
	4.6 (0.181)	31537-31X65

\*: Always check with the Parts Department for the latest parts information.

## OVERRUN CLUTCH

Number of drive plates	3	
Number of driven plates	5	
Drive plate thickness mm (in)	Standard	1.6 (0.063)
	Allowable limit	1.4 (0.055)
Clearance mm (in)	Standard	1.0 - 1.4 (0.039 - 0.055)
	Allowable limit	2.0 (0.079)
Thickness of retaining plates	Thickness mm (in)	Part number*
	3.6 (0.142)	31567-31X79
	3.8 (0.150)	31567-31X80
	4.0 (0.157)	31567-31X81
	4.2 (0.165)	31567-31X82
	4.4 (0.173)	31567-31X83

\*: Always check with the Parts Department for the latest parts information.

## LOW & REVERSE BRAKE

Number of drive plates	5	
Number of driven plates	4 + 1	
Drive plate thickness mm (in)	Standard	2.0 (0.079)
	Allowable limit	1.8 (0.071)
Clearance mm (in)	Standard	1.4 - 1.8 (0.055 - 0.071)
	Allowable limit	2.8 (0.110)

# SERVICE DATA AND SPECIFICATIONS (SDS)

[ALL]

Thickness of retaining plates	Thickness mm (in)	Part number*
	3.6 (0.142)	31667-31X16
3.8 (0.150)	31667-31X17	
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 - 5.8 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

ECS0061R

Unit: mm (in)

Parts	Free length	Outer diameter	Part number*	
Forward clutch (Overrun clutch)	Outer (16 pcs)	26.6 (1.047)	10.6 (0.417)	31505-31X02
	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

ECS0061S

Oil pump side clearance mm (in)	0.02 - 0.04 (0.0008 - 0.0016)		
Thickness of inner gears and outer gears	Inner gear		
	Thickness mm (in)	Part number*	
	9.99 - 10.00 (0.3933 - 0.3937)	31346-31X00	
	9.98 - 9.99 (0.3929 - 0.3933)	31346-31X01	
	9.97 - 9.98 (0.3925 - 0.3929)	31346-31X02	
	Outer gear		
	Thickness mm (in)	Part number*	
	9.99 - 10.00 (0.3933 - 0.3937)	31347-31X00	
9.98 - 9.99 (0.3929 - 0.3933)	31347-31X01		
9.97 - 9.98 (0.3925 - 0.3929)	31347-31X02		
Clearance between oil pump housing and outer gear mm (in)	Standard	0.08 - 0.15 (0.0031 - 0.0059)	
	Allowable limit	0.15 (0.0059)	
Oil pump cover seal ring clearance mm (in)	Standard	0.1 - 0.25 (0.0039 - 0.0098)	
	Allowable limit	0.25 (0.0098)	

\*: Always check with the Parts Department for the latest parts information.

## Input Shaft

ECS0061T

Unit: mm (in)

Input shaft seal ring clearance	Standard	0.08 - 0.23 (0.0031 - 0.0091)
	Allowable limit	0.23 (0.0091)

Unit: mm (in)

Clearance between planetary carrier and pinion washer	Standard	0.15 - 0.70 (0.0059 - 0.0276)
	Allowable limit	0.80 (0.0315)



# SERVICE DATA AND SPECIFICATIONS (SDS)

[ALL]

## Final Drive

EC50061U

### DIFFERENTIAL SIDE GEAR CLEARANCE

Clearance between side gear and differential case with washer	0.1 - 0.2 mm (0.004 - 0.008 in)
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### DIFFERENTIAL SIDE GEAR THRUST WASHERS (FOR RE4F03B)

Thickness mm (in)	Part number*
0.75 - 0.80 (0.0295 - 0.0315)	38424-D2111
0.80 - 0.85 (0.0315 - 0.0335)	38424-D2112
0.85 - 0.90 (0.0335 - 0.0354)	38424-D2113
0.90 - 0.95 (0.0354 - 0.0374)	38424-D2114
0.95 - 1.00 (0.0374 - 0.0394)	38424-D2115

\*: Always check with the Parts Department for the latest parts information.

### BEARING PRELOAD

Differential side bearing preload "T"	0.04 - 0.09 mm (0.0016 - 0.0035 in)
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### TURNING TORQUE

Turning torque of final drive assembly	0.49 - 1.08 N-m (5.0 - 11.0 kg-cm, 4.3 - 9.5 in-lb)
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### DIFFERENTIAL SIDE BEARING ADJUSTING SHIMS (FOR RE4F03B)

Thickness mm (in)	Part number*
0.40 (0.0157)	31499-21X07
0.44 (0.0173)	31499-21X08
0.48 (0.0189)	31499-21X09
0.52 (0.0205)	31499-21X10
0.56 (0.0220)	31499-21X11
0.60 (0.0236)	31499-21X12
0.64 (0.0252)	31499-21X13
0.68 (0.0268)	31499-21X14
0.72 (0.0283)	31499-21X15
0.76 (0.0299)	31499-21X16
0.80 (0.0315)	31499-21X17
0.84 (0.0331)	31499-21X18
0.88 (0.0346)	31499-21X19
0.92 (0.0362)	31499-21X20
1.44 (0.0567)	31499-21X21

\*: Always check with the Parts Department for the latest parts information.

# SERVICE DATA AND SPECIFICATIONS (SDS)

[ALL]

## TABLE FOR SELECTING DIFFERENTIAL SIDE BEARING ADJUSTING SHIMS (FOR RE4F03B)

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)
1.91 - 1.95 (0.0752 - 0.0768)	0.56 (0.0220) + 1.44 (0.0567)

### Reduction Pinion Gear BEARING PRELOAD

ECS0061V

Reduction pinion gear bearing preload	0.05 mm (0.0020 in)
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### 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)
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# SERVICE DATA AND SPECIFICATIONS (SDS)

[ALL]

## REDUCTION PINION GEAR BEARING ADJUSTING SHIMS

Thickness mm (in)	Part number*
1.74 (0.0685)	31438-31X16
1.78 (0.0701)	31438-31X17
1.82 (0.0717)	31438-31X18
1.86 (0.0732)	31438-31X19
1.90 (0.0748)	31438-31X20
1.92 (0.0756)	31439-31X60
1.94 (0.0764)	31438-31X21
1.96 (0.0772)	31439-31X61
1.98 (0.0780)	31438-31X22
2.00 (0.0787)	31439-31X62
2.02 (0.0795)	31438-31X23
2.04 (0.0803)	31439-31X63
2.06 (0.0811)	31438-31X24
2.08 (0.0819)	31439-31X64
2.10 (0.0827)	31438-31X60
2.12 (0.0835)	31439-31X65
2.14 (0.0843)	31438-31X61
2.16 (0.0850)	31439-31X66
2.18 (0.0858)	31438-31X62
2.20 (0.0866)	31439-31X67
2.22 (0.0874)	31438-31X63
2.24 (0.0882)	31439-31X68
2.26 (0.0890)	31438-31X64
2.28 (0.0898)	31439-31X69
2.30 (0.0906)	31438-31X65
2.34 (0.0921)	31438-31X66
2.38 (0.0937)	31438-31X67
2.42 (0.0953)	31438-31X68
2.46 (0.0969)	31438-31X69
2.50 (0.0984)	31438-31X70
2.54 (0.1000)	31438-31X71
2.58 (0.1016)	31438-31X72
2.62 (0.1031)	31438-31X73
2.66 (0.1047)	31438-31X74

\*: Always check with the Parts Department for the latest parts information.

A  
B  
AT  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# SERVICE DATA AND SPECIFICATIONS (SDS)

[ALL]

## TABLE FOR SELECTING REDUCTION PINION GEAR BEARING ADJUSTING SHIM

Unit: mm (in)

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

ECS0061W

Unit: mm (in)

Output shaft seal ring clearance	Standard	0.10 - 0.25 (0.0039 - 0.0098)
	Allowable limit	0.25 (0.0098)

### END PLAY

Output shaft end play	0 - 0.5 mm (0 - 0.020 in)
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### 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 80X09

\*: Always check with the Parts Department for the latest parts information.

### 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.

# SERVICE DATA AND SPECIFICATIONS (SDS)

[ALL]

## Bearing Retainer SEAL RING CLEARANCE

ECS0061X

Unit: mm (in)

Bearing retainer seal ring clearance	Standard	0.10 - 0.25 (0.0039 - 0.0098)
	Allowable limit	0.25 (0.0098)

## Total End Play

ECS0061Y

Total end play "T1"	0.25 - 0.55 mm (0.0098 - 0.0217 in)
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## BEARING RACE FOR ADJUSTING TOTAL END PLAY

Thickness mm (in)	Part number*
0.6 (0.024)	31435-31X01
0.8 (0.031)	31435-31X02
1.0 (0.039)	31435-31X03
1.2 (0.047)	31435-31X04
1.4 (0.055)	31435-31X05
1.6 (0.063)	31435-31X06
1.8 (0.071)	31435-31X07
2.0 (0.079)	31435-31X08

\*: Always check with the Parts Department for the latest parts information.

## Reverse Clutch End Play

ECS0061Z

Reverse clutch end play "T2"	0.65 - 1.00 mm (0.0256 - 0.0394 in)
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## THRUST WASHERS FOR ADJUSTING REVERSE CLUTCH END PLAY

Thickness mm (in)	Part number*
0.65 (0.0256)	31508-31X10
0.80 (0.0315)	31508-31X11
0.95 (0.0374)	31508-31X12
1.10 (0.0433)	31508-31X13
1.25 (0.0492)	31508-31X14
1.40 (0.0551)	31508-31X15

\*: Always check with the Parts Department for the latest parts information.

## O-RING

Unit: mm (in)

Accumulator	Diameter (Small)	Part number*	Diameter (Large)	Part number*
Servo release accumulator	26.9 (1.059)	31526-41X03	44.2 (1.740)	31526-41X02
N-D accumulator	34.6 (1.362)	31526-31X08	39.4 (1.551)	31672-21X00

\*: Always check with the Parts Department for the latest parts information.

## 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.

# SERVICE DATA AND SPECIFICATIONS (SDS)

[ALL]

## Band Servo RETURN SPRING

ECS00620

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

ECS00621

Unit: mm (in)

Distance between end of converter housing and torque converter	21.1 (0.831) or more
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## Shift Solenoid Valves

ECS00622

Gear	Solenoid A	Solenoid B
1st	ON	ON
2nd	OFF	ON
3rd	OFF	OFF
4th	ON	OFF

## Solenoid Valves

ECS00623

Solenoid valve	Resistance (Approx.)	Terminal 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 Sensor

ECS0061F

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

## Revolution Sensor

ECS00624

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

## Dropping Resistor

ECS00625

Resistance	10 - 15Ω
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