

# SECTION **AT**

## AUTOMATIC TRANSMISSION

A  
B  
**AT**

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PFP:00024

### Alphabetical Index

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#### NOTE:

If DTC “U1000 CAN COMM CIRCUIT” is displayed with other DTCs, first perform the trouble diagnosis for “DTC U1000 CAN COMMUNICATION LINE”. Refer to [AT-94](#).

Items (CONSULT-III screen terms)	DTC		Reference page
	OBD-II	Except OBD-II	
	CONSULT-III GST <sup>*1</sup>	CONSULT-III only “TRANSMIS- SION”	
A/T 1ST E/BRAKING	—	P1731	<a href="#">AT-143</a>
A/T 1ST GR FNCTN	P0731	P0731	<a href="#">AT-115</a>
A/T 2ND GR FNCTN	P0732	P0732	<a href="#">AT-117</a>
A/T 3RD GR FNCTN	P0733	P0733	<a href="#">AT-119</a>
A/T 4TH GR FNCTN	P0734	P0734	<a href="#">AT-121</a>
A/T 5TH GR FNCTN	P0735	P0735	<a href="#">AT-123</a>
A/T INTERLOCK	P1730	P1730	<a href="#">AT-141</a>
A/T TCC S/V FNCTN	P0744 <sup>*2</sup>	P0744	<a href="#">AT-127</a>
ATF TEMP SEN/CIRC	P0710	P1710	<a href="#">AT-134</a>
CAN COMM CIRCUIT	U1000	U1000	<a href="#">AT-94</a>
D/C SOLENOID/CIRC	P1762	P1762	<a href="#">AT-149</a>
ENGINE SPEED SIG	P0725	P0725	<a href="#">AT-113</a>
FR/B SOLENOID/CIRC	P1757	P1757	<a href="#">AT-147</a>
HLR/C SOL/CIRC	P1767	P1767	<a href="#">AT-151</a>
I/C SOLENOID/CIRC	P1752	P1752	<a href="#">AT-145</a>
L/PRESS SOL/CIRC	P0745	P0745	<a href="#">AT-129</a>
LC/B SOLENOID/CIRC	P1772	P1772	<a href="#">AT-153</a>
LC/B SOLENOID FNCT	P1774 <sup>*2</sup>	P1774	<a href="#">AT-155</a>
MANU MODE SW/CIRC	—	P1815	<a href="#">AT-157</a>
PNP SW/CIRC	P0705	P0705	<a href="#">AT-102</a>
STARTER RELAY/CIRC	—	P0615	<a href="#">AT-97</a>
TCC SOLENOID/CIRC	P0740	P0740	<a href="#">AT-125</a>
TCM	P0700	P0700	<a href="#">AT-101</a>
TP SEN/CIRC A/T	P1705	P1705	<a href="#">AT-131</a>
TURBINE REV S/CIRC	P0717	P0717	<a href="#">AT-106</a>
VEH SPD SE/CIR-MTR	—	P1721	<a href="#">AT-139</a>
VEH SPD SEN/CIR AT	P0720	P0720	<a href="#">AT-108</a>

● <sup>\*1</sup>: These numbers are prescribed by SAE J2012.

● <sup>\*2</sup>: These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.

# INDEX FOR DTC

NCS00018

## DTC No. Index

**NOTE:**

If DTC “U1000 CAN COMM CIRCUIT” is displayed with other DTCs, first perform the trouble diagnosis for “DTC U1000 CAN COMMUNICATION LINE”. Refer to [AT-94](#).

DTC		Items (CONSULT-III screen terms)	Reference page
OBD-II	Except OBD-II		
CONSULT-III GST <sup>*1</sup>	CONSULT-III only “TRANSMIS- SION”		
—	P0615	STARTER RELAY/CIRC	<a href="#">AT-97</a>
P0700	P0700	TCM	<a href="#">AT-101</a>
P0705	P0705	PNP SW/CIRC	<a href="#">AT-102</a>
P0710	P1710	ATF TEMP SEN/CIRC	<a href="#">AT-134</a>
P0717	P0717	TURBINE REV S/CIRC	<a href="#">AT-106</a>
P0720	P0720	VEH SPD SEN/CIR AT	<a href="#">AT-108</a>
P0725	P0725	ENGINE SPEED SIG	<a href="#">AT-113</a>
P0731	P0731	A/T 1ST GR FNCTN	<a href="#">AT-115</a>
P0732	P0732	A/T 2ND GR FNCTN	<a href="#">AT-117</a>
P0733	P0733	A/T 3RD GR FNCTN	<a href="#">AT-119</a>
P0734	P0734	A/T 4TH GR FNCTN	<a href="#">AT-121</a>
P0735	P0735	A/T 5TH GR FNCTN	<a href="#">AT-123</a>
P0740	P0740	TCC SOLENOID/CIRC	<a href="#">AT-125</a>
P0744 <sup>*2</sup>	P0744	A/T TCC S/V FNCTN	<a href="#">AT-127</a>
P0745	P0745	L/PRESS SOL/CIRC	<a href="#">AT-129</a>
P1705	P1705	TP SEN/CIRC A/T	<a href="#">AT-131</a>
—	P1721	VEH SPD SE/CIR-MTR	<a href="#">AT-139</a>
P1730	P1730	A/T INTERLOCK	<a href="#">AT-141</a>
—	P1731	A/T 1ST E/BRAKING	<a href="#">AT-143</a>
P1752	P1752	I/C SOLENOID/CIRC	<a href="#">AT-145</a>
P1757	P1757	FR/B SOLENOID/CIRC	<a href="#">AT-147</a>
P1762	P1762	D/C SOLENOID/CIRC	<a href="#">AT-149</a>
P1767	P1767	HLR/C SOL/CIRC	<a href="#">AT-151</a>
P1772	P1772	LC/B SOLENOID/CIRC	<a href="#">AT-153</a>
P1774 <sup>*2</sup>	P1774	LC/B SOLENOID FNCT	<a href="#">AT-155</a>
—	P1815	MANU MODE SW/CIRC	<a href="#">AT-157</a>
U1000	U1000	CAN COMM CIRCUIT	<a href="#">AT-94</a>

● <sup>\*1</sup>: These numbers are prescribed by SAE J2012.

● <sup>\*2</sup>: These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.

# PRECAUTIONS

## PRECAUTIONS

PPF:00001

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

NCS00019

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. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

#### **WARNING:**

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

### Precautions for Battery Service

NCS0001A

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

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

NCS0001B

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

#### **CAUTION:**

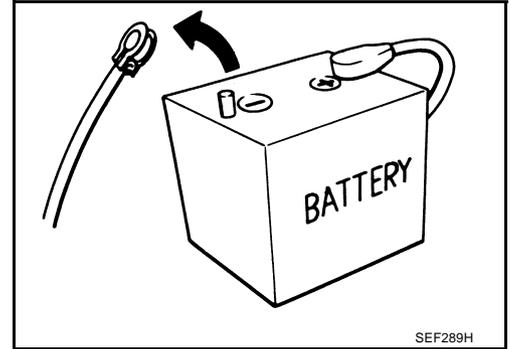
- Be sure to turn the ignition switch OFF and disconnect the battery cable from the negative terminal before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. Will cause the MIL to light up.
- Be sure to connect and lock the connectors securely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

# PRECAUTIONS

## Precautions

NC50001C

- Before connecting or disconnecting the A/T assembly harness connector, turn ignition switch OFF and disconnect the battery cable from the negative terminal. Because battery voltage is applied to TCM even if ignition switch is turned OFF.



- After performing each TROUBLE DIAGNOSIS, perform "DTC Confirmation Procedure".  
If the repair is completed the DTC should not be displayed in the "DTC Confirmation Procedure".



- Always use the specified brand of ATF. Refer to [MA-11, "Fluids and Lubricants"](#) .
- Use lint-free paper not cloth rags during work.
- After replacing the ATF, dispose of the waste oil using the methods prescribed by law, ordinance, etc.
- Before proceeding with disassembly, thoroughly clean the outside of the A/T. 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 paper or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the A/T.
- 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 A/T 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.
- Clean or replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer. Refer to [AT-9, "ATF COOLER SERVICE"](#) .
- After overhaul, refill the A/T with new ATF.
- When the A/T drain plug is removed, only some of the ATF is drained. Old ATF will remain in torque converter and ATF cooling system.  
Always follow the procedures under "Changing A/T Fluid" in the AT section when changing A/T fluid. Refer to [AT-12, "Changing A/T Fluid"](#) , [AT-12, "Checking A/T Fluid"](#) .

# PRECAUTIONS

## Service Notice or Precautions

NCS0001D

### ATF COOLER SERVICE

If ATF contains frictional material (clutches, bands, etc.), or if an A/T is repaired, overhauled, or replaced, inspect and clean the A/T fluid cooler mounted in the radiator or replace the radiator. Flush cooler lines using cleaning solvent and compressed air after repair. For A/T fluid cooler cleaning procedure, refer to [AT-14, "A/T Fluid Cooler Cleaning"](#) . For radiator replacement, refer to [CO-13, "RADIATOR"](#) .

### OBD-II SELF-DIAGNOSIS

- A/T self-diagnosis is performed by the TCM in combination with the ECM. The results can be read through the blinking pattern of the A/T CHECK indicator or the malfunction indicator lamp (MIL). Refer to the table on [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) for the indicator used to display each self-diagnostic result.
- The self-diagnostic results indicated by the MIL are automatically stored in both the ECM and TCM memories.  
**Always perform the procedure on [AT-38, "HOW TO ERASE DTC"](#) to complete the repair and avoid unnecessary blinking of the MIL.**

For details of OBD-II, refer to [EC-47, "ON BOARD DIAGNOSTIC \(OBD\) SYSTEM"](#) .

- **Certain systems and components, especially those related to OBD, may use the new style slide-locking type harness connector. For description and how to disconnect, refer to [PG-76, "HARNESS CONNECTOR"](#) .**

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# PREPARATION

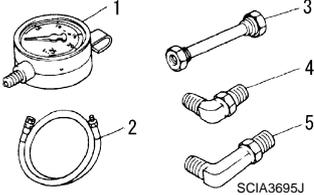
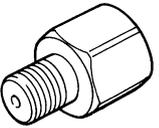
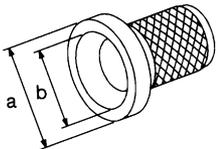
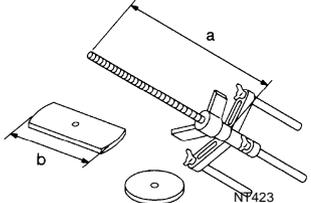
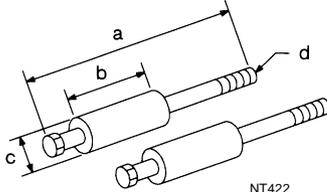
## PREPARATION

PFP:00002

### Special Service Tools

NCS0001F

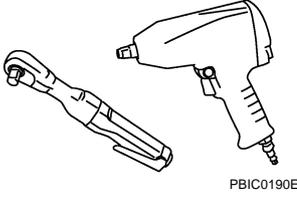
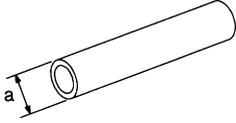
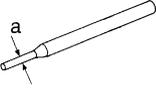
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST2505S001 (J-34301-C) Oil pressure gauge set 1. ST25051001 ( — ) Oil pressure gauge 2. ST25052000 ( — ) Hose 3. ST25053000 ( — ) Joint pipe 4. ST25054000 ( — ) Adapter 5. ST25055000 ( — ) Adapter	Measuring line pressure 
KV31103600 (J-45674) Joint pipe adapter (With ST25054000)	Measuring line pressure  <p style="text-align: center;">ZZA1227D</p>
ST33400001 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.	<ul style="list-style-type: none"> <li>● Installing rear oil seal</li> <li>● Installing oil pump housing oil seal</li> </ul>  <p style="text-align: center;">NT086</p>
KV31102400 (J-34285 and J-34285-87) Clutch spring compressor a: 320 mm (12.60 in) b: 174 mm (6.85 in)	Installing reverse brake return spring retainer  <p style="text-align: center;">NT423</p>
ST25850000 (J-25721-A) Sliding hammer a: 179 mm (7.05 in) b: 70 mm (2.76 in) c: 40 mm (1.57 in) d: M12X1.75P	Remove oil pump assembly  <p style="text-align: center;">NT422</p>

# PREPARATION

## Commercial Service Tools

NCS0001G

Tool name	Description
<p>Power tool</p>  <p>PBIC0190E</p>	<p>Loosening bolts and nuts</p>
<p>Drift a: 22 mm (0.87 in) dia.</p>  <p>NT083</p>	<p>Installing manual shaft oil seals</p>
<p>Pin punch a: 4 mm (0.16 in) dia.</p>  <p>NT410</p>	<p>Removing retaining pin</p>

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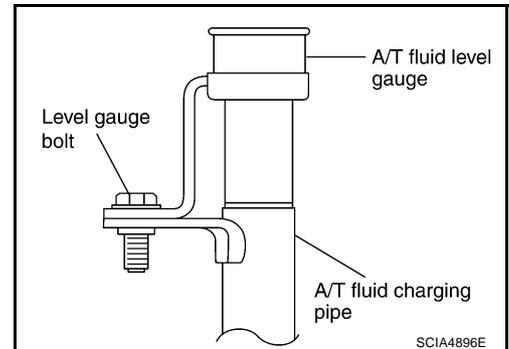
## A/T FLUID

PFP:KLE40

### Changing A/T Fluid

NCS0001H

1. Warm up ATF.
2. Stop engine.
3. Loosen the level gauge bolt.
4. Drain ATF from drain plug and refill with new ATF. Always refill same volume with drained ATF.
  - To replace the ATF, pour in new ATF at the A/T fluid charging pipe with the engine idling and at the same time drain the old ATF from the radiator cooler hose return side.
  - When the color of the ATF coming out is about the same as the color of the new ATF, the replacement is complete. The amount of new ATF to use should be 30 to 50% increase of the stipulated amount.



**ATF:** **Genuine NISSAN Matic J ATF**  
**Fluid capacity:** **10.3 l (10-7/8 US qt, 9-1/8 Imp qt)**

#### CAUTION:

- Use only **Genuine NISSAN Matic J ATF**. Do not mix with other ATF.
- Using ATF other than **Genuine NISSAN Matic J ATF** will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the **NISSAN** new vehicle limited warranty.
- When filling ATF, take care not to splash heat generating parts such as exhaust with ATF.
- Do not reuse drain plug gasket.

#### Drain plug:

 : **34 N·m (3.5 kg·m, 25 ft·lb)**

5. Run engine at idle speed for 5 minutes.
6. Check A/T fluid level and condition. Refer to [AT-12, "Checking A/T Fluid"](#) . If ATF is still dirty, repeat step 2. through 5.
7. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.
8. Tighten the level gauge bolt.

#### Level gauge bolt:

 : **5.1 N·m (0.52 kg·m, 45 in·lb)**

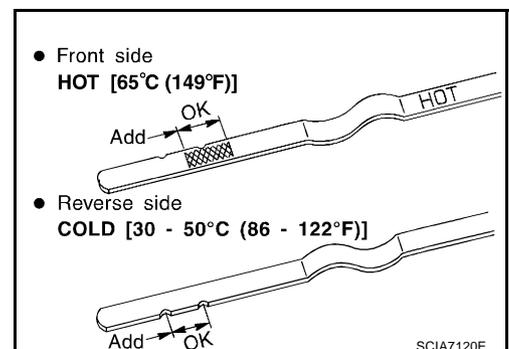
### Checking A/T Fluid

NCS0001I

1. Warm up engine.
2. Check for A/T fluid leakage.
3. Loosen the level gauge bolt.
4. Before driving, A/T fluid level can be checked at A/T fluid temperatures of 30 to 50°C (86 to 122°F) using "COLD" range on A/T fluid level gauge as follows.
  - 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 A/T fluid level with engine idling.
  - d. Remove A/T fluid level gauge and wipe clean with lint-free paper.

#### CAUTION:

**When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.**



# A/T FLUID

- e. Re-insert A/T fluid level gauge into A/T fluid charging pipe as far as it will go.

**CAUTION:**

To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge reversed from the normal attachment conditions.

- f. Remove A/T fluid level gauge and note reading. If reading is at low side of range, add ATF to the A/T fluid charging pipe.

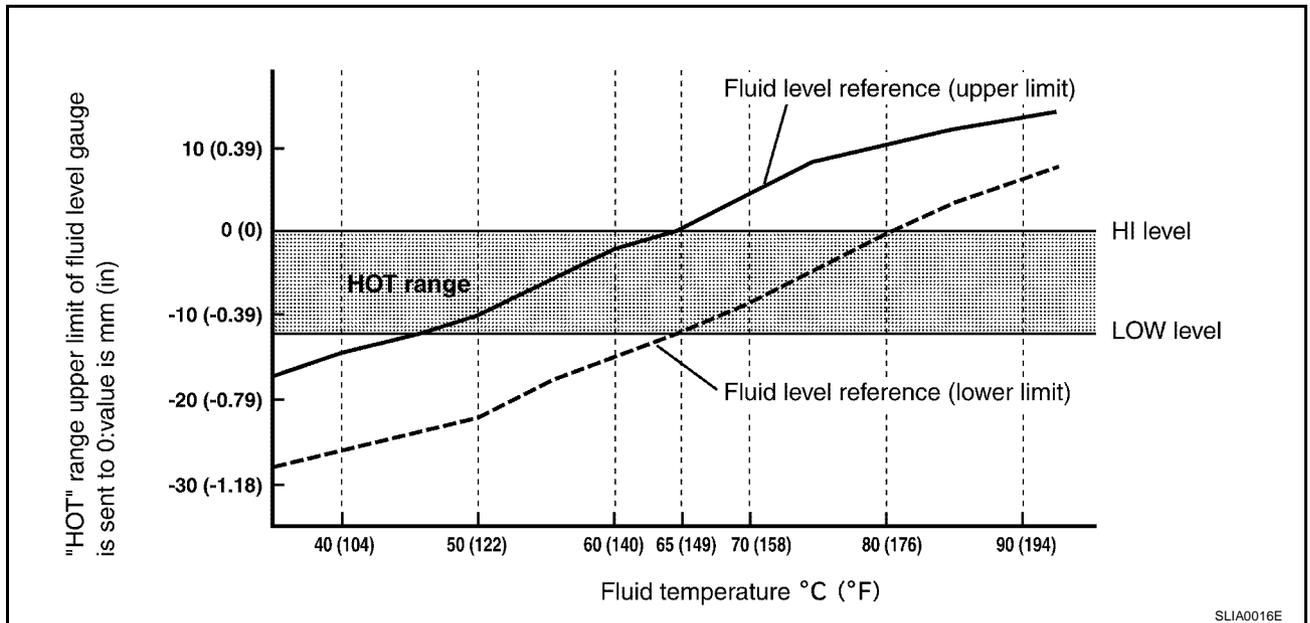
**CAUTION:**

Do not overfill.

5. Drive vehicle for approximately 5 minutes in urban areas.  
6. Make the A/T fluid temperature approximately 65°C (149°F).

**NOTE:**

A/T fluid level will be greatly affected by temperature as shown in the figure. Therefore, be certain to perform operation while checking data with CONSULT-III.



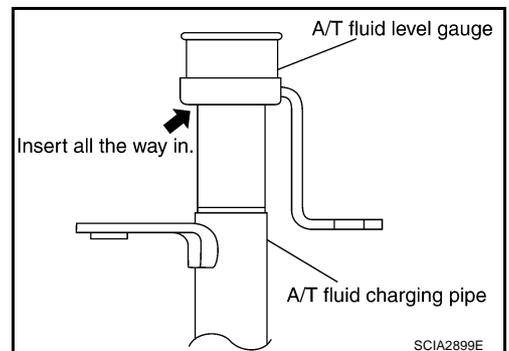
- a. Select "DATA MONITOR".  
b. Read out the value of "ATF TEMP 1".  
7. Re-check A/T fluid level at A/T fluid temperatures of approximately 65°C (149°F) using "HOT" range on A/T fluid level gauge.

**CAUTION:**

- When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.
- To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge rotated from the normal attachment conditions as shown.

8. Check A/T fluid condition.

- If ATF is very dark or smells burned, check operation of A/T. Flush cooling system after repair of A/T.
- If ATF 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-13, "RADIATOR"](#) and [AT-14, "A/T Fluid Cooler Cleaning"](#).



9. Install the removed A/T fluid level gauge in the A/T fluid charging pipe.

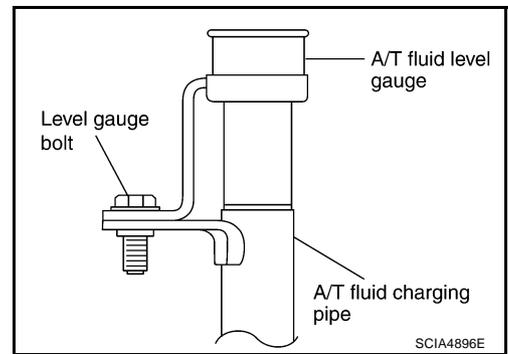
# A/T FLUID

10. Tighten level gauge bolt.

## Level gauge bolt:



: 5.1 N-m (0.52 kg-m, 45 in-lb)



NCS0001J

## A/T Fluid Cooler Cleaning

Whenever an A/T is replaced, the A/T fluid cooler mounted in the radiator must be inspected and cleaned. Metal debris and friction material, if present, can become trapped in the A/T fluid cooler. This debris can contaminate the newly serviced A/T or, in severe cases, can block or restrict the flow of ATF. In either case, malfunction of the newly serviced A/T may result.

Debris, if present, may build up as ATF enters the cooler inlet. It will be necessary to back flush the cooler through the cooler outlet in order to flush out any built up debris.

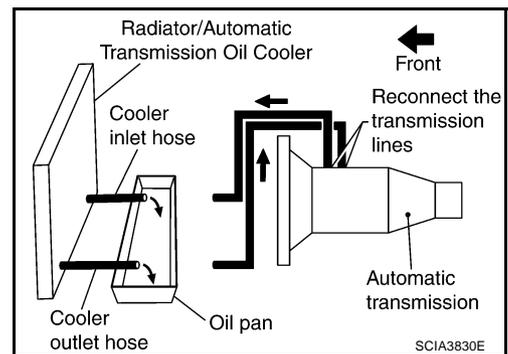
### A/T FLUID COOLER CLEANING PROCEDURE

1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Identify the inlet and outlet A/T fluid cooler hoses.
3. Disconnect the A/T fluid cooler inlet and outlet rubber hoses from the steel cooler tubes or bypass valve.

#### NOTE:

Replace the cooler hoses if rubber material from the hose remains on the tube fitting.

4. Allow any ATF that remains in the cooler hoses to drain into the oil pan.

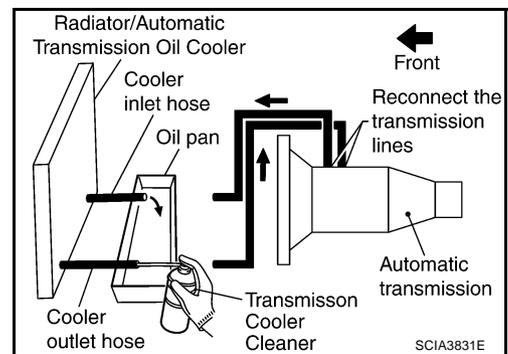


5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

#### CAUTION:

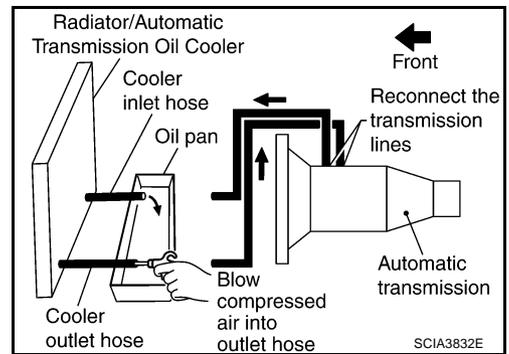
- Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.
- Spray Transmission Cooler Cleaner only with adequate ventilation.
- Avoid contact with eyes and skin.
- Do not breath vapors or spray mist.

6. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.



# A/T FLUID

7. Insert the tip of an air gun into the end of the cooler outlet hose.
8. Wrap a shop rag around the air gun tip and of the cooler outlet hose.
9. Blow compressed air regulated to 5 to 9 kg/cm<sup>2</sup> (70 to 130 psi) through the cooler outlet hose for 10 seconds to force out any remaining ATF.
10. Repeat steps 5 through 9 three additional times.
11. Position an oil pan under the banjo bolts that connect the A/T fluid cooler steel lines to the A/T.
12. Remove the banjo bolts.
13. Flush each steel line from the cooler side back toward the A/T by spraying Transmission Cooler Cleaner in a continuous stream for 5 seconds.
14. Blow compressed air regulated to 5 to 9 kg/cm<sup>2</sup> (70 to 130 psi) through each steel line from the cooler side back toward the A/T for 10 seconds to force out any remaining ATF.
15. Ensure all debris is removed from the steel cooler lines.
16. Ensure all debris is removed from the banjo bolts and fittings.
17. Perform [AT-15, "A/T FLUID COOLER DIAGNOSIS PROCEDURE"](#) .



## A/T FLUID COOLER DIAGNOSIS PROCEDURE

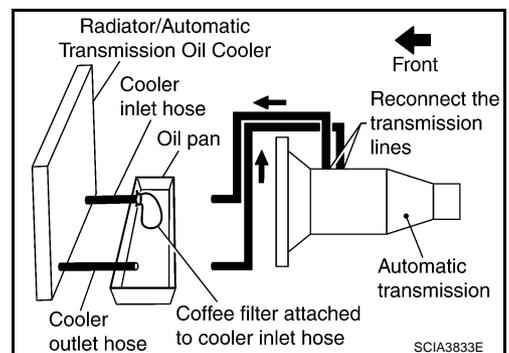
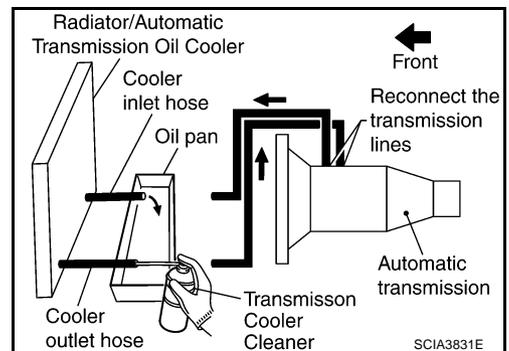
### NOTE:

Insufficient cleaning of the cooler inlet hose exterior may lead to inaccurate debris identification.

1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Clean the exterior and tip of the cooler inlet hose.
3. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

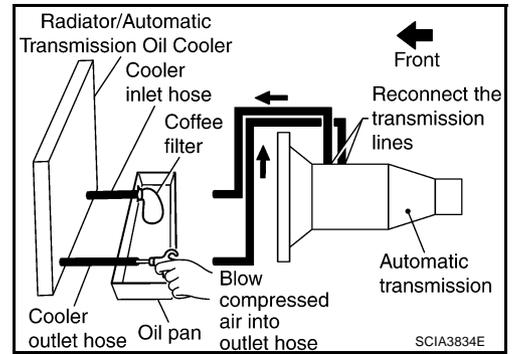
### CAUTION:

- **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
  - **Spray Transmission Cooler Cleaner only with adequate ventilation.**
  - **Avoid contact with eyes and skin.**
  - **Do not breath vapors or spray mist.**
4. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.
  5. Tie a common white, basket-type coffee filter to the end of the cooler inlet hose.



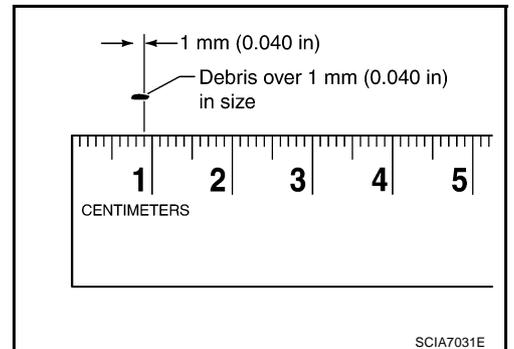
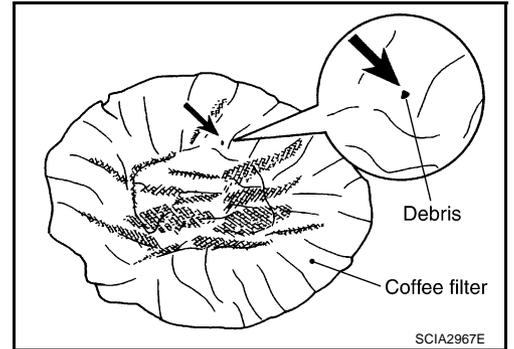
# A/T FLUID

6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 to 9 kg/cm<sup>2</sup> (70 to 130 psi) through the cooler outlet hose to force any remaining ATF into the coffee filter.
9. Remove the coffee filter from the end of the cooler inlet hose.
10. Perform [AT-16, "A/T FLUID COOLER INSPECTION PROCEDURE"](#) .



## A/T FLUID COOLER INSPECTION PROCEDURE

1. Inspect the coffee filter for debris.
  - a. If small metal debris less than 1 mm (0.04 in) in size or metal powder is found in the coffee filter, this is normal. If normal debris is found, the A/T fluid cooler/radiator can be re-used and the procedure is ended.
  - b. If one or more pieces of debris are found that are over 1 mm (0.04 in) in size and/or peeled clutch facing material is found in the coffee filter, the A/T fluid cooler is not serviceable. The A/T fluid cooler/radiator must be replaced and the inspection procedure is ended. Refer to [CO-13, "RADIATOR"](#) and [CO-17, "RADIATOR \(ALUMINUM TYPE\)"](#) .



## A/T FLUID COOLER FINAL INSPECTION

After performing all procedures, ensure that all remaining oil is cleaned from all components.

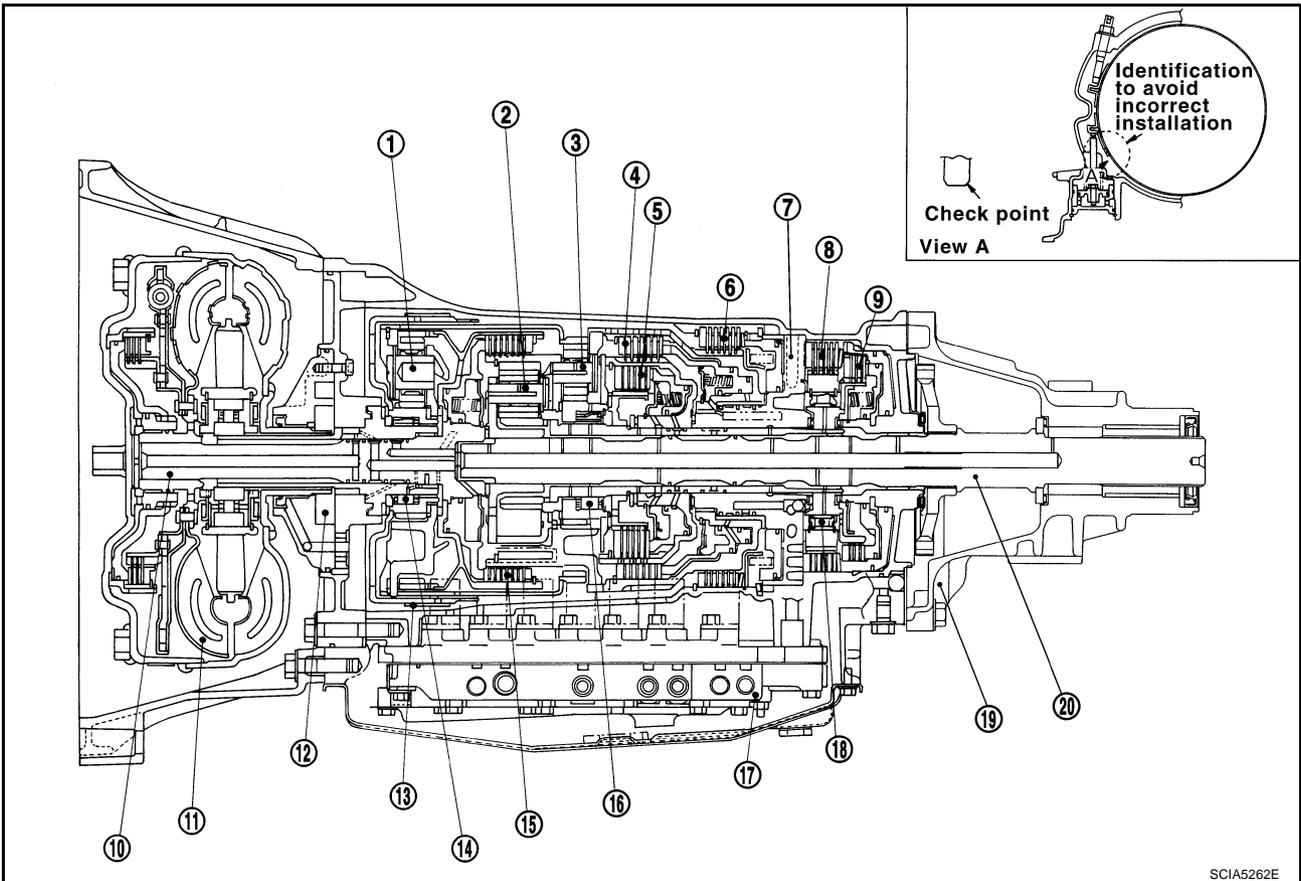
# A/T CONTROL SYSTEM

## A/T CONTROL SYSTEM

PFP:31036

### Cross-sectional View

NCS0001K



SCIA5262E

- |                         |                                |                            |
|-------------------------|--------------------------------|----------------------------|
| 1. Front planetary gear | 2. Mid planetary gear          | 3. Rear planetary gear     |
| 4. Direct clutch        | 5. High and low reverse clutch | 6. Reverse brake           |
| 7. Drum support         | 8. Forward brake               | 9. Low coast brake         |
| 10. Input shaft         | 11. Torque converter           | 12. Oil pump               |
| 13. Front brake         | 14. 3rd one-way clutch         | 15. Input clutch           |
| 16. 1st one-way clutch  | 17. Control valve with TCM     | 18. Forward one-way clutch |
| 19. Rear extension      | 20. Output shaft               |                            |

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# A/T CONTROL SYSTEM

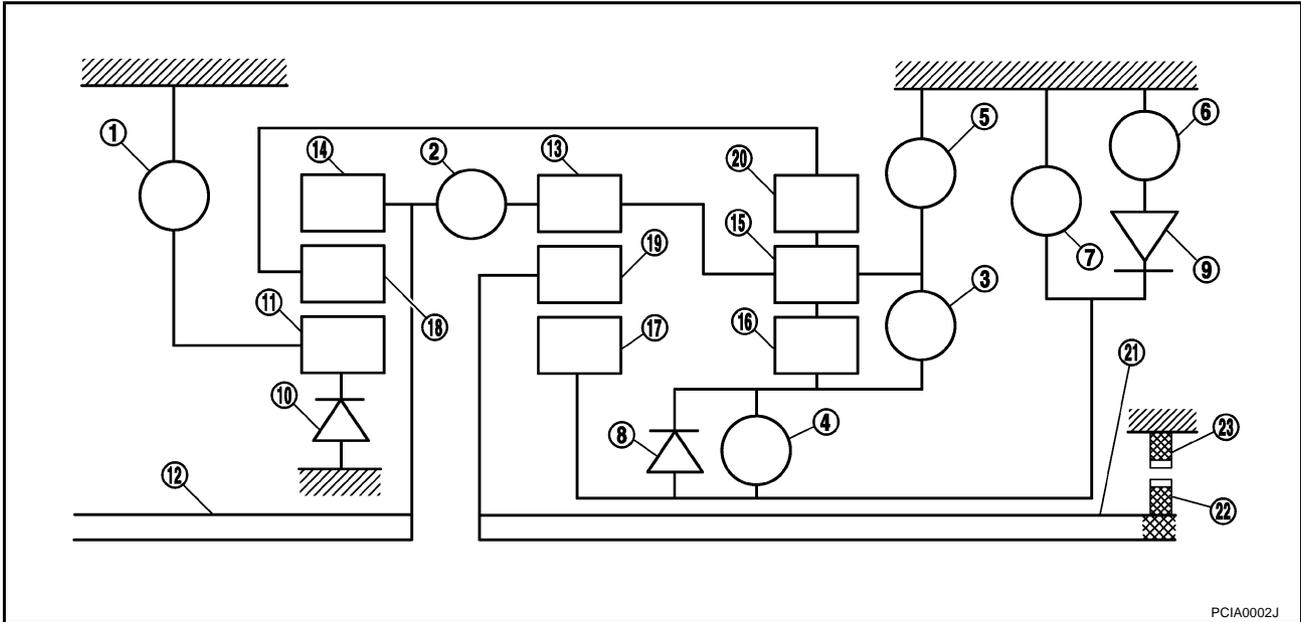
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## Shift Mechanism

The A/T uses compact triple planetary gear systems to improve power transmission efficiency, simplify construction and reduce weight.

It also employs an optimum shift control and super wide gear ratios. They improve starting performance and acceleration during medium and high-speed operation.

## CONSTRUCTION



PCIA0002J

- |                                |                         |                           |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake                 | 2. Input clutch         | 3. Direct clutch          |
| 4. High and low reverse clutch | 5. Reverse brake        | 6. Forward brake          |
| 7. Low coast brake             | 8. 1st one-way clutch   | 9. Forward one-way clutch |
| 10. 3rd one-way clutch         | 11. Front sun gear      | 12. Input shaft           |
| 13. Mid internal gear          | 14. Front internal gear | 15. Rear carrier          |
| 16. Rear sun gear              | 17. Mid sun gear        | 18. Front carrier         |
| 19. Mid carrier                | 20. Rear internal gear  | 21. Output shaft          |
| 22. Parking gear               | 23. Parking pawl        |                           |

## FUNCTION OF CLUTCH AND BRAKE

Name of the Part	Abbreviation	Function
Front brake (1)	FR/B	Fastens the front sun gear (11).
Input clutch (2)	I/C	Connects the input shaft (12), the front internal gear (14) and the mid internal gear (13).
Direct clutch (3)	D/C	Connects the rear carrier (15) and the rear sun gear (16).
High and low reverse clutch (4)	HLR/C	Connects the mid sun gear (17) and the rear sun gear (16).
Reverse brake (5)	R/B	Fastens the rear carrier (15).
Forward brake (6)	Fwd/B	Fastens the mid sun gear (17).
Low coast brake (7)	LC/B	Fastens the mid sun gear (17).
1st one-way clutch (8)	1st OWC	Allows the rear sun gear (16) to turn freely forward relative to the mid sun gear (17) but fastens it for reverse rotation.
Forward one-way clutch (9)	Fwd OWC	Allows the mid sun gear (17) to turn freely in the forward direction but fastens it for reverse rotation.
3rd one-way clutch (10)	3rd OWC	Allows the front sun gear (11) to turn freely in the forward direction but fastens it for reverse rotation.

# A/T CONTROL SYSTEM

## CLUTCH AND BAND CHART

Shift position	I/C	HLR/C	D/C	R/B	FR/B	LC/B	Fwd/B	1st OWC	Fwd OWC	3rd OWC	Remarks
P		△			△						PARK POSITION
R		○		○	○			◎		◎	REVERSE POSITION
N		△			△						NEUTRAL POSITION
D	1st	△ *			△	△ **	○	◎	◎	◎	Automatic shift 1↔2↔3↔4↔5
	2nd		○		△		○		◎	◎	
	3rd		○	○		○	△	◇		◎	
	4th	○	○	○			△	◇			
	5th	○	○			○	△	◇		◇	
M5	5th	○	○				△	◇		◇	Locks* (held stationary) in 5th gear
M4	4th	○	○	○			△	◇			Locks* (held stationary) in 4th gear
M3	3rd		○	○			△	◇		◎	Locks* (held stationary) in 3rd gear
M2	2nd			○		○	○		◎	◎	Locks* (held stationary) in 2nd gear
M1	1st		○			○	○	◎	◎	◎	Locks* (held stationary) in 1st gear

○ – Operates

◎ – Operates during “progressive” acceleration.

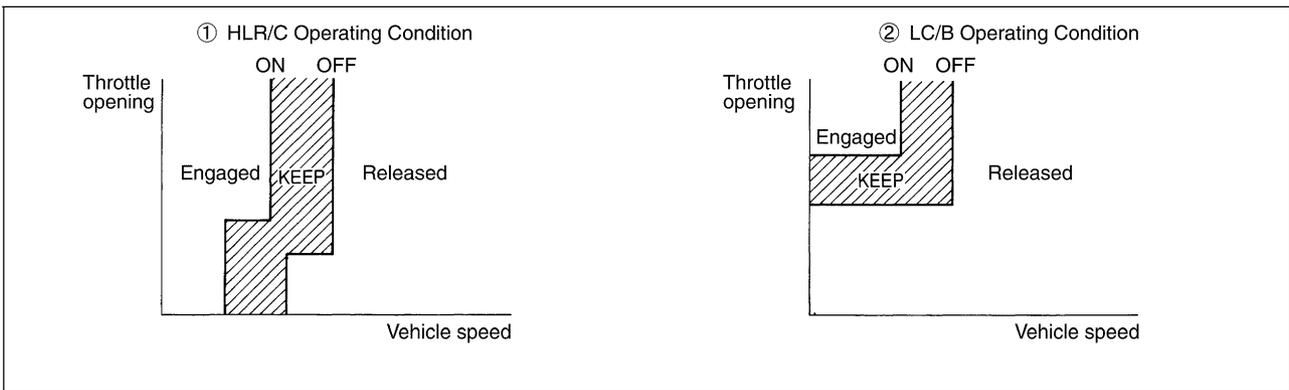
◇ – Operates and affects power transmission while coasting.

△ – Line pressure is applied but does not affect power transmission.

△ \* – Operates under conditions shown in illustration ①.

△ \*\* – Operates under conditions shown in illustration ②. Delay control is applied during D (4,3,2,1) → N shift.

\* : Down shift automatically according to the vehicle speed.



SCIA6962E

# A/T CONTROL SYSTEM

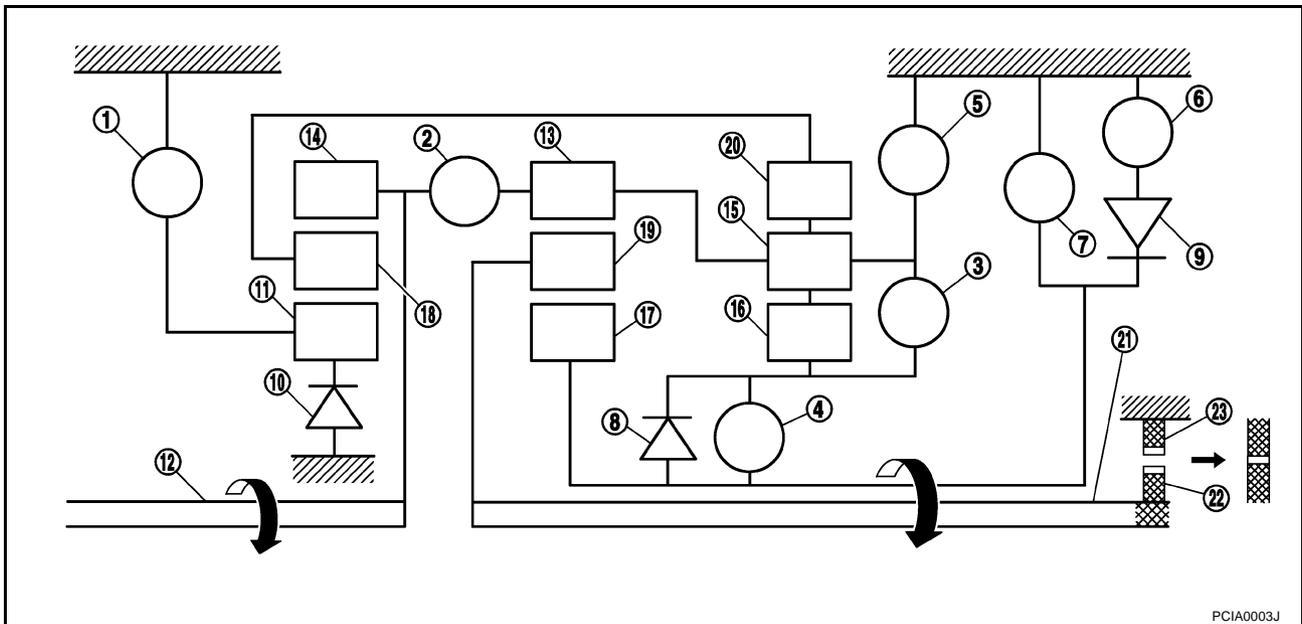
## POWER TRANSMISSION

### “N” Position

Since both the forward brake and the reverse brake are released, torque from the input shaft drive is not transmitted to the output shaft.

### “P” Position

- The same as for the “N” position, both the forward brake and the reverse brake are released, so torque from the input shaft drive is not transmitted to the output shaft.
- The parking pawl linked with the selector lever meshes with the parking gear and fastens the output shaft mechanically.

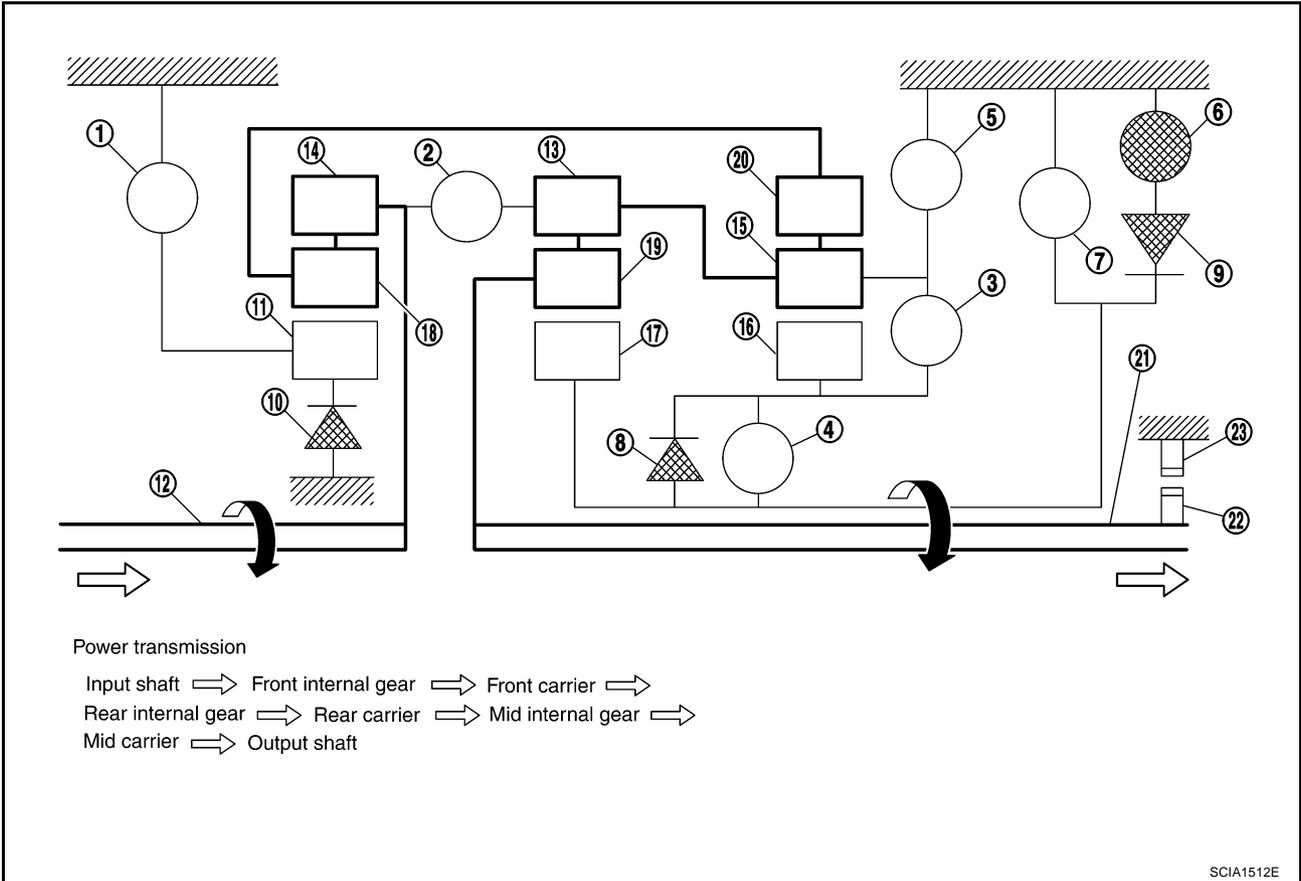


- |                                |                         |                           |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake                 | 2. Input clutch         | 3. Direct clutch          |
| 4. High and low reverse clutch | 5. Reverse brake        | 6. Forward brake          |
| 7. Low coast brake             | 8. 1st one-way clutch   | 9. Forward one-way clutch |
| 10. 3rd one-way clutch         | 11. Front sun gear      | 12. Input shaft           |
| 13. Mid internal gear          | 14. Front internal gear | 15. Rear carrier          |
| 16. Rear sun gear              | 17. Mid sun gear        | 18. Front carrier         |
| 19. Mid carrier                | 20. Rear internal gear  | 21. Output shaft          |
| 22. Parking gear               | 23. Parking pawl        |                           |

# A/T CONTROL SYSTEM

## “D1 ” Position

- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The 1st one-way clutch regulates reverse rotation of the rear sun gear.
- The 3rd one-way clutch regulates reverse rotation of the front sun gear.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and the engine brake is not activated.



- |                                |                         |                           |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake                 | 2. Input clutch         | 3. Direct clutch          |
| 4. High and low reverse clutch | 5. Reverse brake        | 6. Forward brake          |
| 7. Low coast brake             | 8. 1st one-way clutch   | 9. Forward one-way clutch |
| 10. 3rd one-way clutch         | 11. Front sun gear      | 12. Input shaft           |
| 13. Mid internal gear          | 14. Front internal gear | 15. Rear carrier          |
| 16. Rear sun gear              | 17. Mid sun gear        | 18. Front carrier         |
| 19. Mid carrier                | 20. Rear internal gear  | 21. Output shaft          |
| 22. Parking gear               | 23. Parking pawl        |                           |

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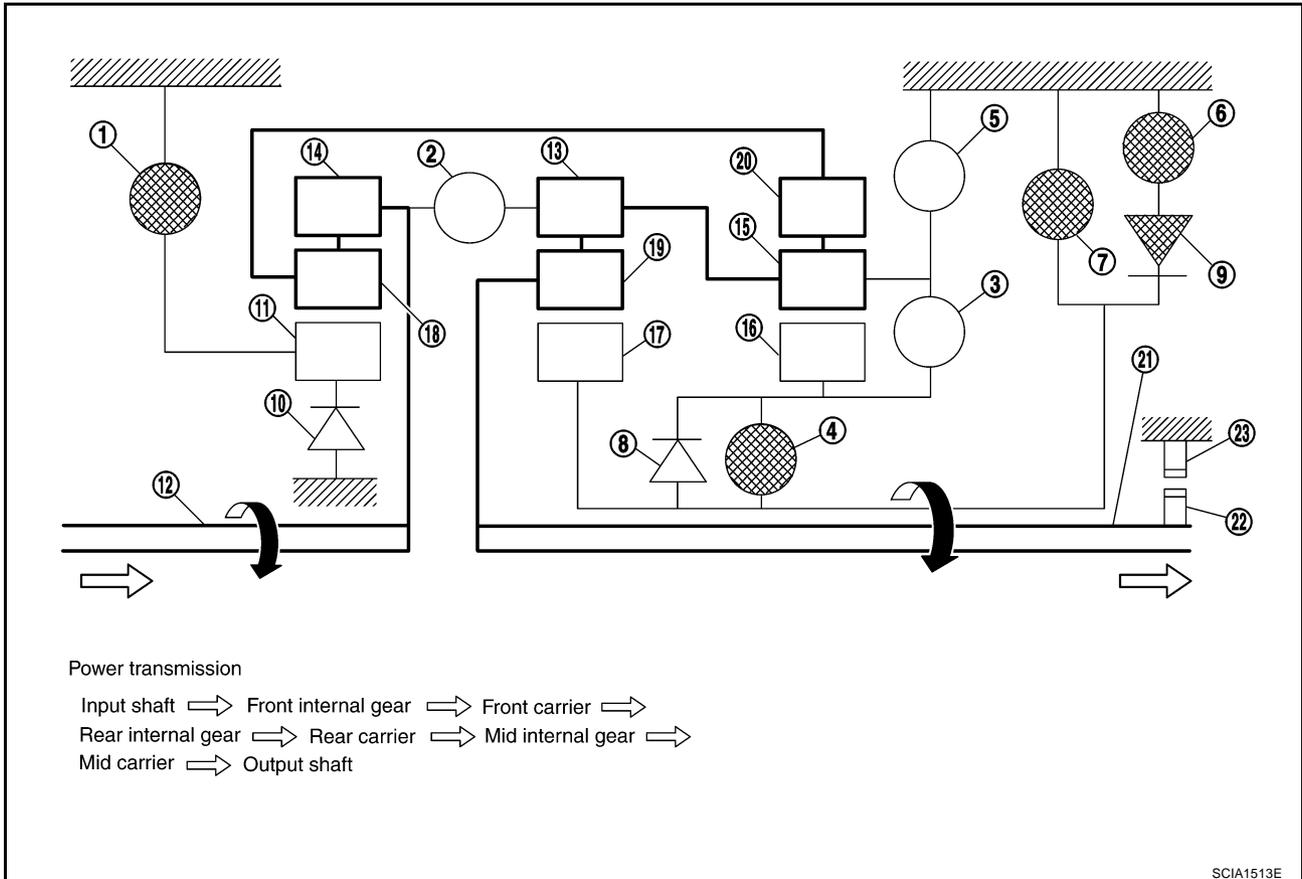
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M

# A/T CONTROL SYSTEM

## “M1 ” Position

- The front brake fastens the front sun gear.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- High and low reverse clutch connects the rear sun gear and the mid sun gear.
- The low coast brake fastens the mid sun gear.
- During deceleration, the low coast brake regulates forward rotation of the mid sun gear and the engine brake functions.

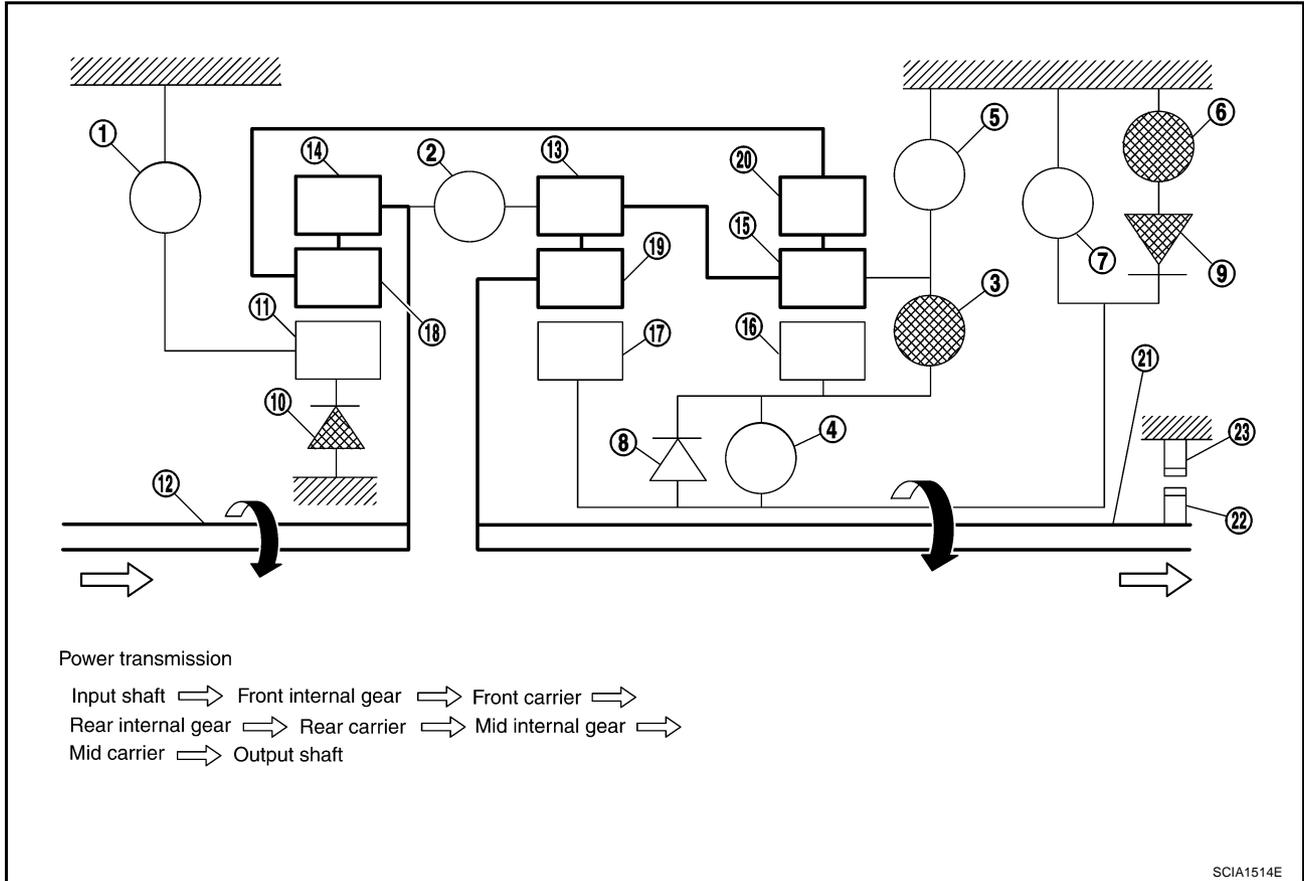


- |                                |                         |                           |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake                 | 2. Input clutch         | 3. Direct clutch          |
| 4. High and low reverse clutch | 5. Reverse brake        | 6. Forward brake          |
| 7. Low coast brake             | 8. 1st one-way clutch   | 9. Forward one-way clutch |
| 10. 3rd one-way clutch         | 11. Front sun gear      | 12. Input shaft           |
| 13. Mid internal gear          | 14. Front internal gear | 15. Rear carrier          |
| 16. Rear sun gear              | 17. Mid sun gear        | 18. Front carrier         |
| 19. Mid carrier                | 20. Rear internal gear  | 21. Output shaft          |
| 22. Parking gear               | 23. Parking pawl        |                           |

# A/T CONTROL SYSTEM

## “D2 ” Position

- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The 3rd one-way clutch regulates reverse rotation of the front sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and engine brake is not activated.



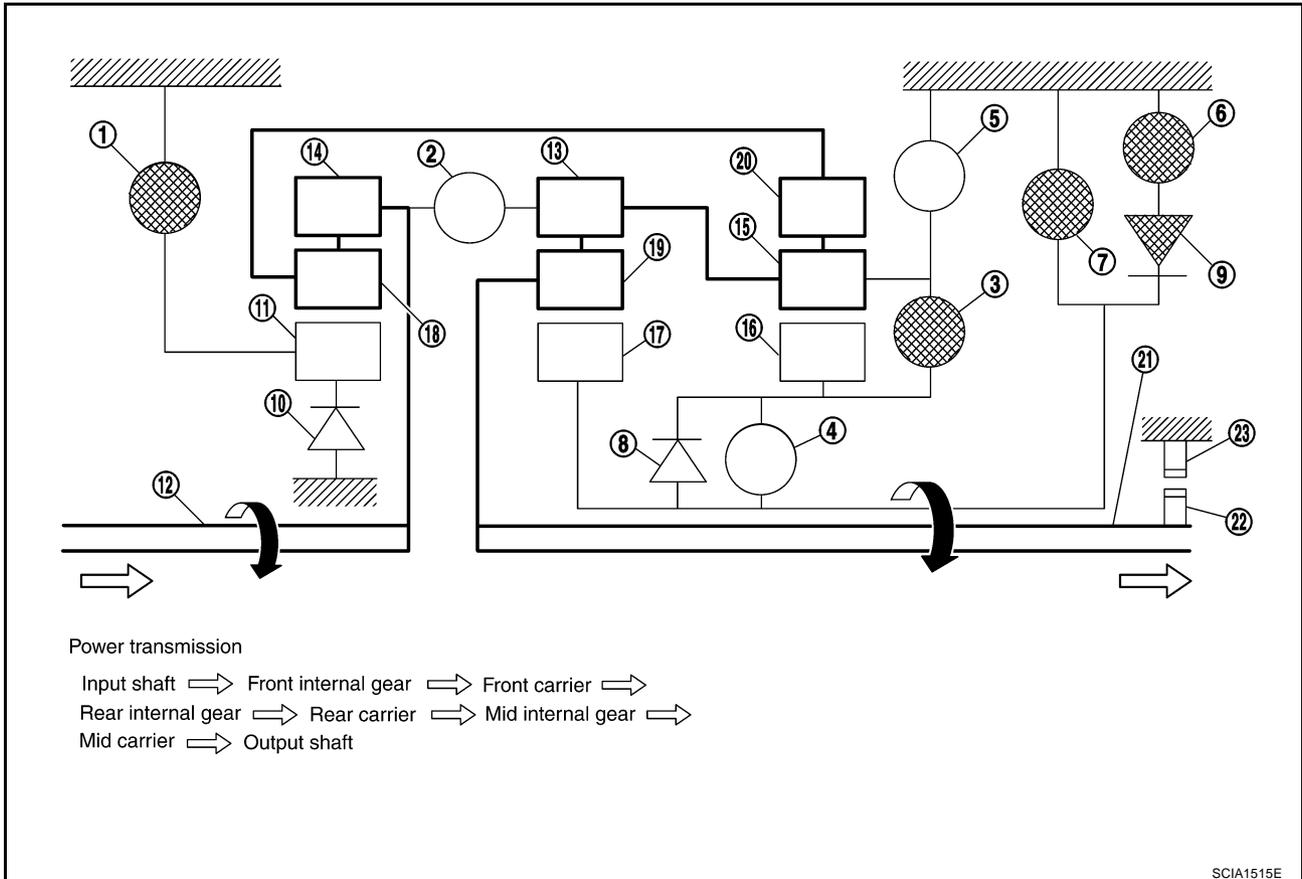
- |                                |                         |                           |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake                 | 2. Input clutch         | 3. Direct clutch          |
| 4. High and low reverse clutch | 5. Reverse brake        | 6. Forward brake          |
| 7. Low coast brake             | 8. 1st one-way clutch   | 9. Forward one-way clutch |
| 10. 3rd one-way clutch         | 11. Front sun gear      | 12. Input shaft           |
| 13. Mid internal gear          | 14. Front internal gear | 15. Rear carrier          |
| 16. Rear sun gear              | 17. Mid sun gear        | 18. Front carrier         |
| 19. Mid carrier                | 20. Rear internal gear  | 21. Output shaft          |
| 22. Parking gear               | 23. Parking pawl        |                           |

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# A/T CONTROL SYSTEM

## "M2" Position

- The front brake fastens the front sun gear.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The low coast brake fastens the mid sun gear.
- During deceleration, the low coast brake regulates forward rotation of the mid sun gear and the engine brake functions.

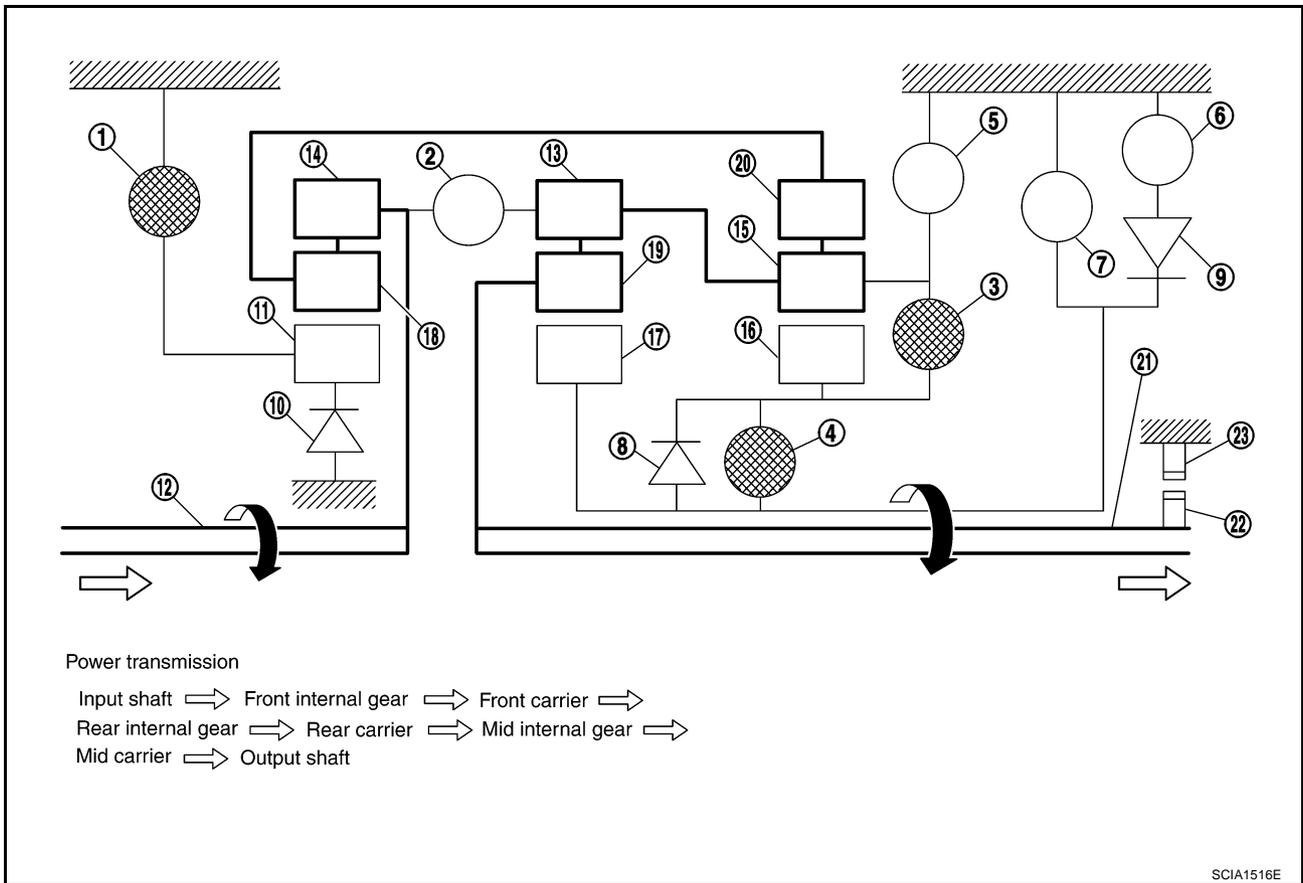


- |                                |                         |                           |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake                 | 2. Input clutch         | 3. Direct clutch          |
| 4. High and low reverse clutch | 5. Reverse brake        | 6. Forward brake          |
| 7. Low coast brake             | 8. 1st one-way clutch   | 9. Forward one-way clutch |
| 10. 3rd one-way clutch         | 11. Front sun gear      | 12. Input shaft           |
| 13. Mid internal gear          | 14. Front internal gear | 15. Rear carrier          |
| 16. Rear sun gear              | 17. Mid sun gear        | 18. Front carrier         |
| 19. Mid carrier                | 20. Rear internal gear  | 21. Output shaft          |
| 22. Parking gear               | 23. Parking pawl        |                           |

# A/T CONTROL SYSTEM

## “D3 ” and “M3 ” Positions

- The front brake fastens the front sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.



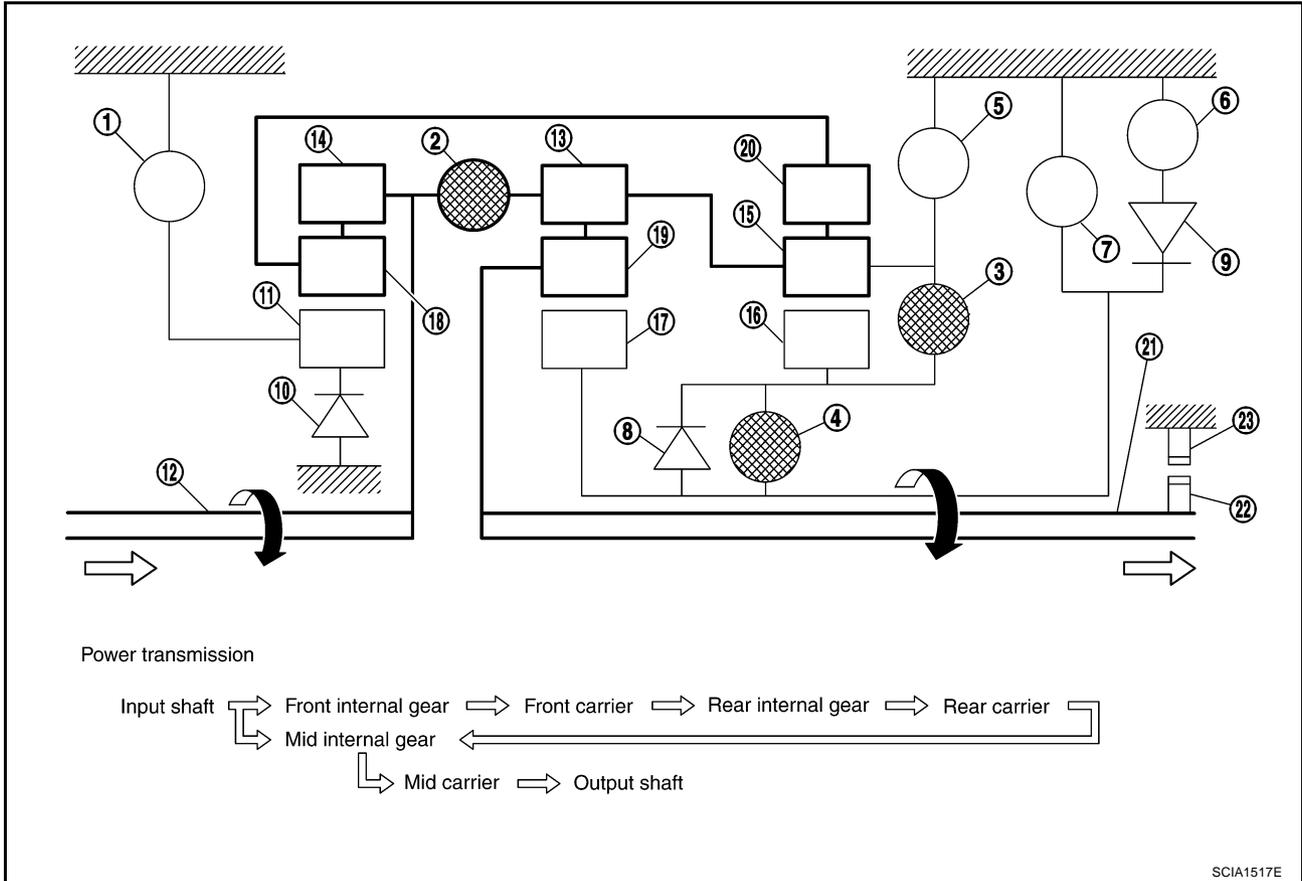
- |                                |                         |                           |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake                 | 2. Input clutch         | 3. Direct clutch          |
| 4. High and low reverse clutch | 5. Reverse brake        | 6. Forward brake          |
| 7. Low coast brake             | 8. 1st one-way clutch   | 9. Forward one-way clutch |
| 10. 3rd one-way clutch         | 11. Front sun gear      | 12. Input shaft           |
| 13. Mid internal gear          | 14. Front internal gear | 15. Rear carrier          |
| 16. Rear sun gear              | 17. Mid sun gear        | 18. Front carrier         |
| 19. Mid carrier                | 20. Rear internal gear  | 21. Output shaft          |
| 22. Parking gear               | 23. Parking pawl        |                           |

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# A/T CONTROL SYSTEM

## “D4 ” and “M4 ” Positions

- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.
- The input clutch is coupled, and the front internal gear and mid internal gear are connected.
- The drive power is conveyed to the front internal gear, mid internal gear, and rear carrier and the three planetary gears rotate forward as one unit.

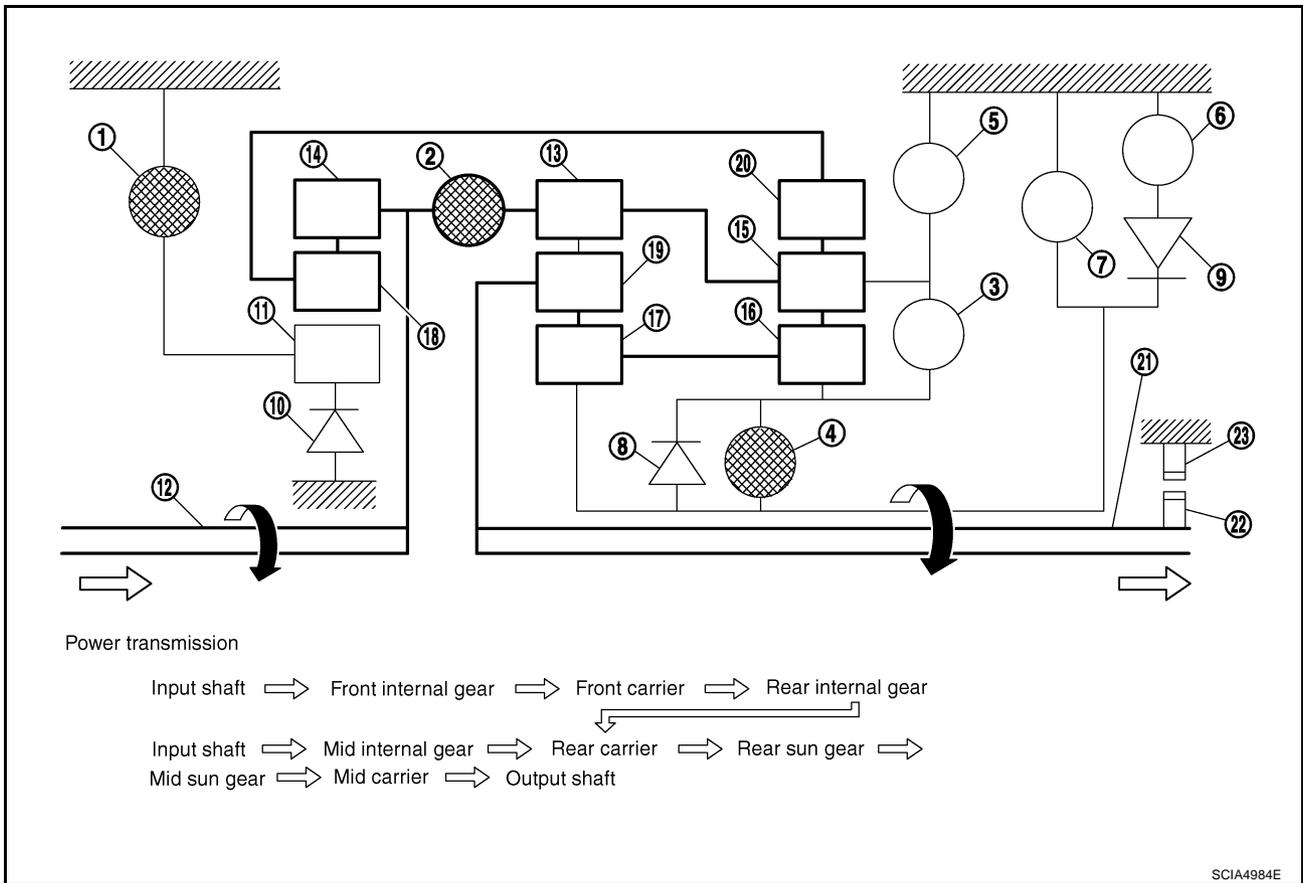


- |                                |                         |                           |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake                 | 2. Input clutch         | 3. Direct clutch          |
| 4. High and low reverse clutch | 5. Reverse brake        | 6. Forward brake          |
| 7. Low coast brake             | 8. 1st one-way clutch   | 9. Forward one-way clutch |
| 10. 3rd one-way clutch         | 11. Front sun gear      | 12. Input shaft           |
| 13. Mid internal gear          | 14. Front internal gear | 15. Rear carrier          |
| 16. Rear sun gear              | 17. Mid sun gear        | 18. Front carrier         |
| 19. Mid carrier                | 20. Rear internal gear  | 21. Output shaft          |
| 22. Parking gear               | 23. Parking pawl        |                           |

# A/T CONTROL SYSTEM

## “D5” and “M5” Positions

- The front brake fastens the front sun gear.
- The input clutch is coupled, and the front internal gear and mid internal gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.



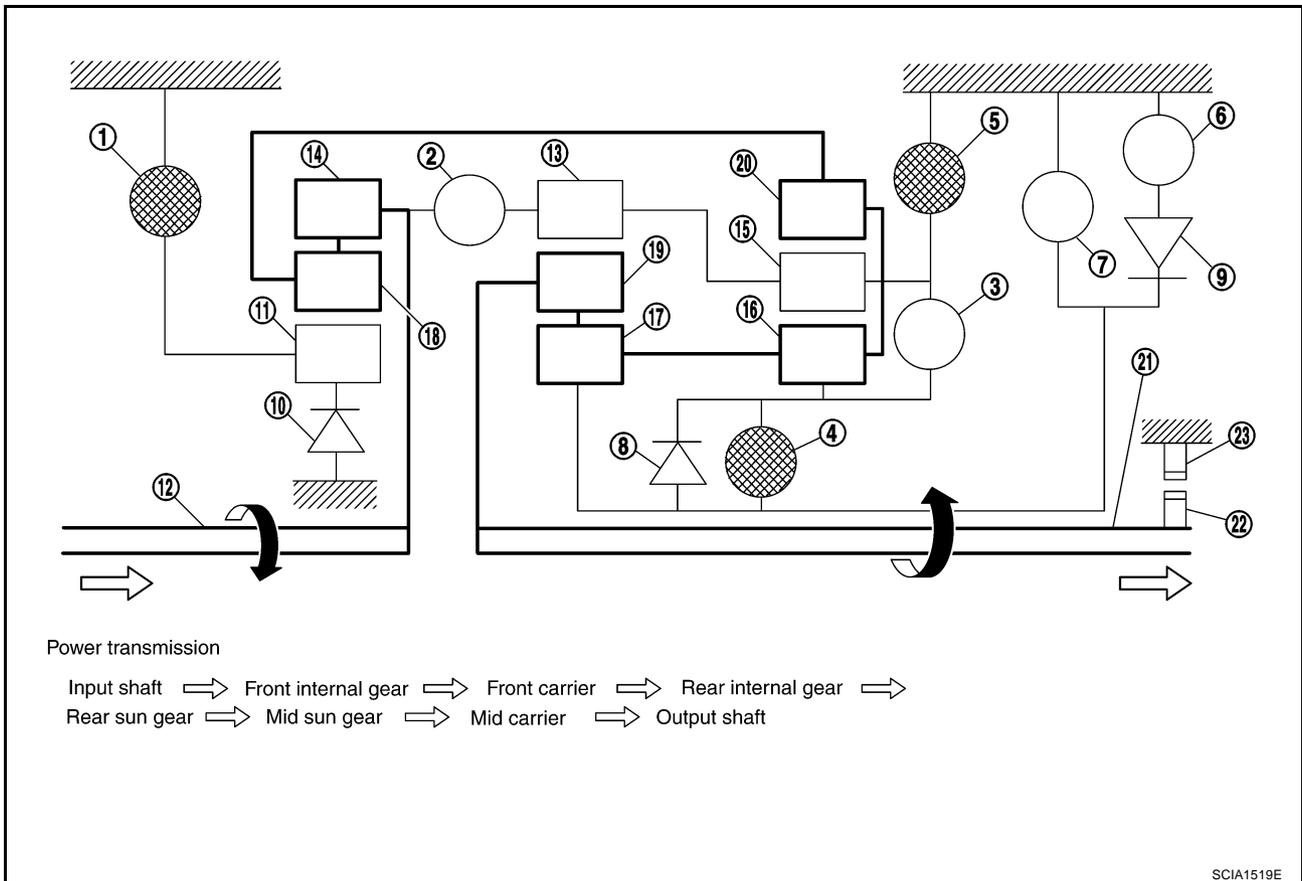
- |                                |                         |                           |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake                 | 2. Input clutch         | 3. Direct clutch          |
| 4. High and low reverse clutch | 5. Reverse brake        | 6. Forward brake          |
| 7. Low coast brake             | 8. 1st one-way clutch   | 9. Forward one-way clutch |
| 10. 3rd one-way clutch         | 11. Front sun gear      | 12. Input shaft           |
| 13. Mid internal gear          | 14. Front internal gear | 15. Rear carrier          |
| 16. Rear sun gear              | 17. Mid sun gear        | 18. Front carrier         |
| 19. Mid carrier                | 20. Rear internal gear  | 21. Output shaft          |
| 22. Parking gear               | 23. Parking pawl        |                           |

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# A/T CONTROL SYSTEM

## “R” Position

- The front brake fastens the front sun gear.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.
- The reverse brake fastens the rear carrier.



SCIA1519E

- |                                |                         |                           |
|--------------------------------|-------------------------|---------------------------|
| 1. Front brake                 | 2. Input clutch         | 3. Direct clutch          |
| 4. High and low reverse clutch | 5. Reverse brake        | 6. Forward brake          |
| 7. Low coast brake             | 8. 1st one-way clutch   | 9. Forward one-way clutch |
| 10. 3rd one-way clutch         | 11. Front sun gear      | 12. Input shaft           |
| 13. Mid internal gear          | 14. Front internal gear | 15. Rear carrier          |
| 16. Rear sun gear              | 17. Mid sun gear        | 18. Front carrier         |
| 19. Mid carrier                | 20. Rear internal gear  | 21. Output shaft          |
| 22. Parking gear               | 23. Parking pawl        |                           |

# A/T CONTROL SYSTEM

NCS0001M

## TCM Function

The function of the TCM is to:

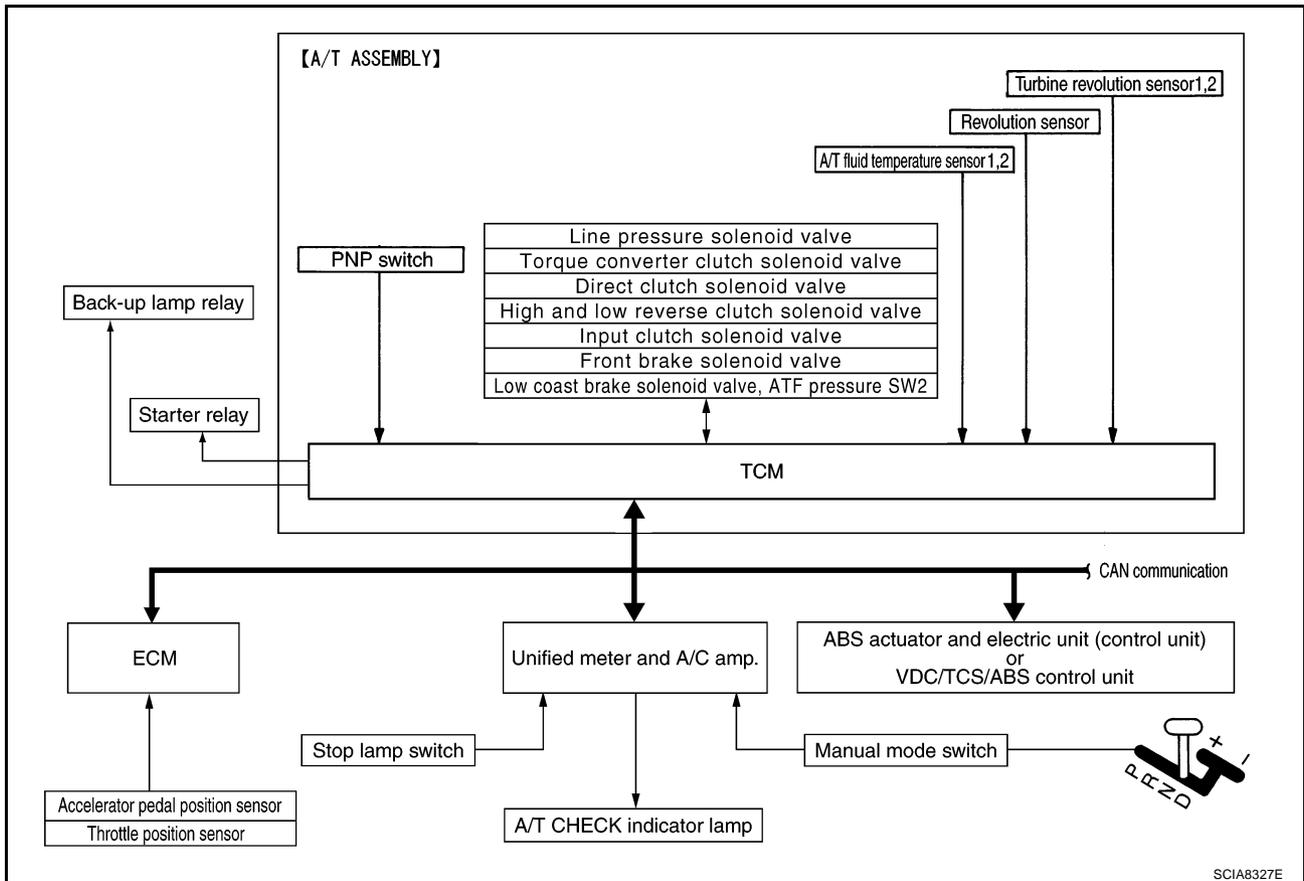
- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids.

## CONTROL SYSTEM OUTLINE

The A/T senses vehicle operating conditions through various sensors or signals. It always controls the optimum shift position and reduces shifting and lock-up shocks.

SENSORS (or SIGNALS)		TCM		ACTUATORS
PNP switch Accelerator pedal position signal Closed throttle position signal Wide open throttle position signal Engine speed signal A/T fluid temperature sensor Revolution sensor Vehicle speed signal Manual mode switch signal Stop lamp switch signal Turbine revolution sensor ATF pressure switch	⇒	Shift control Line pressure control Lock-up control Engine brake control Timing control Fail-safe control Self-diagnosis CONSULT-III communication line Duet-EA control CAN system	⇒	Input clutch solenoid valve Direct clutch solenoid valve Front brake solenoid valve High and low reverse clutch solenoid valve Low coast brake solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve A/T CHECK indicator lamp Starter relay Back-up lamp relay

## CONTROL SYSTEM DIAGRAM



SCIA8327E

# A/T CONTROL SYSTEM

## CAN Communication SYSTEM DESCRIPTION

NCS0001N

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. For details, refer to [LAN-48, "CAN System Specification Chart"](#).

## Input/Output Signal of TCM

NCS0001O

Control item		Line pressure control	Vehicle speed control	Shift control	Lock-up control	Engine brake control	Fail-safe function <sup>(*3)</sup>	Self-diagnostics function	
Input	Accelerator pedal position signal <sup>(*5)</sup>	X	X	X	X	X	X	X	
	Vehicle speed sensor A/T (revolution sensor)	X	X	X	X	X	X	X	
	Vehicle speed sensor MTR <sup>(*1)</sup> <sup>(*5)</sup>						X		
	Closed throttle position signal <sup>(*5)</sup>		X <sup>(*2)</sup>	X	X		X	X <sup>(*4)</sup>	
	Wide open throttle position signal <sup>(*5)</sup>						X	X <sup>(*4)</sup>	
	Turbine revolution sensor 1		X		X	X	X	X	
	Turbine revolution sensor 2 (for 4th speed only)		X		X	X	X	X	
	Engine speed signals <sup>(*5)</sup>	X	X	X	X	X	X	X	
	Stop lamp switch signal <sup>(*5)</sup>		X	X	X			X <sup>(*4)</sup>	
	A/T fluid temperature sensors 1, 2	X	X	X	X		X	X	
	ASCD	Operation signal <sup>(*5)</sup>		X	X	X			
		Overdrive cancel signal <sup>(*5)</sup>		X					
Output	Direct clutch solenoid		X	X			X	X	
	Input clutch solenoid		X	X			X	X	
	High and low reverse clutch solenoid		X	X			X	X	
	Front brake solenoid		X	X			X	X	
	Low coast brake solenoid (ATF pressure switch 2)		X	X		X	X	X	
	Line pressure solenoid	X	X	X	X	X	X	X	
	TCC solenoid				X		X	X	
	Self-diagnostics table <sup>(*6)</sup>							X	
	Starter relay						X	X	

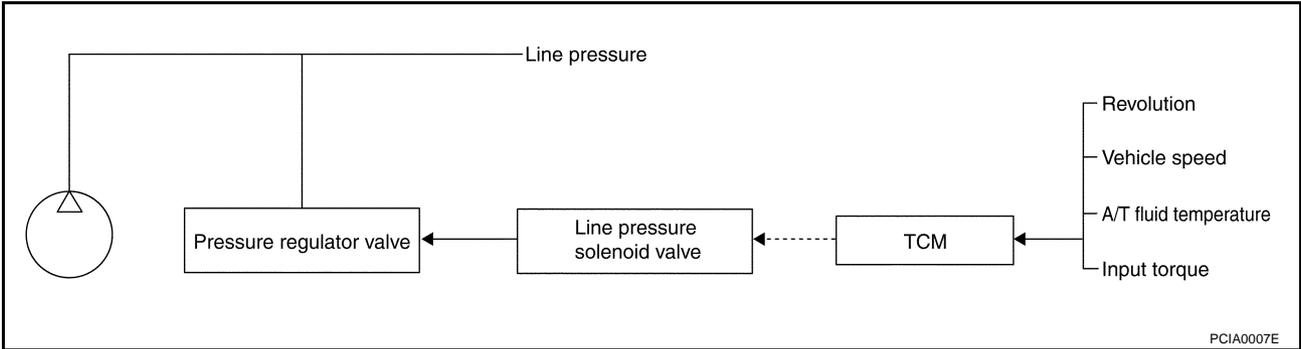
- \*1: Spare for vehicle speed sensor A/T (revolution sensor)
- \*2: Spare for accelerator pedal position signal
- \*3: If these input and output signals are different, the TCM triggers the fail-safe function.
- \*4: Used as a condition for starting self-diagnostics; if self-diagnostics are not started, it is judged that there is some kind of error.
- \*5: Input by CAN communications
- \*6: Output by CAN communications

# A/T CONTROL SYSTEM

## Line Pressure Control

NCS0001P

- When an input torque signal equivalent to the engine drive force is sent from the ECM to the TCM, the TCM controls the line pressure solenoid.
- This line pressure solenoid controls the pressure regulator valve as the signal pressure and adjusts the pressure of the operating oil discharged from the oil pump to the line pressure most appropriate to the driving state.

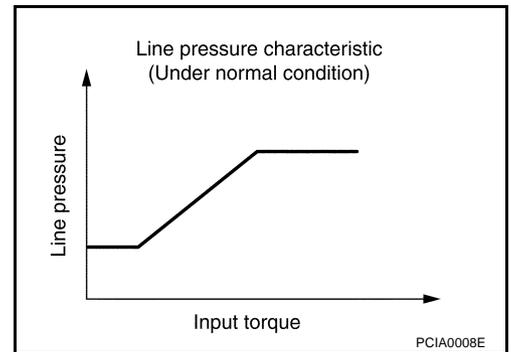


## LINE PRESSURE CONTROL IS BASED ON THE TCM LINE PRESSURE CHARACTERISTIC PATTERN

- The TCM has stored in memory a number of patterns for the optimum line pressure characteristic for the driving state.
- In order to obtain the most appropriate line pressure characteristic to meet the current driving state, the TCM controls the line pressure solenoid current valve and thus controls the line pressure.

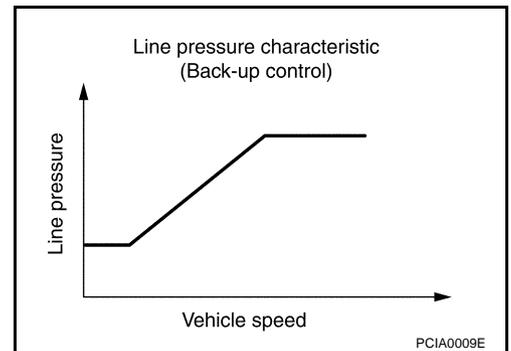
### Normal Control

Each clutch is adjusted to the necessary pressure to match the engine drive force.



### Back-up Control (Engine Brake)

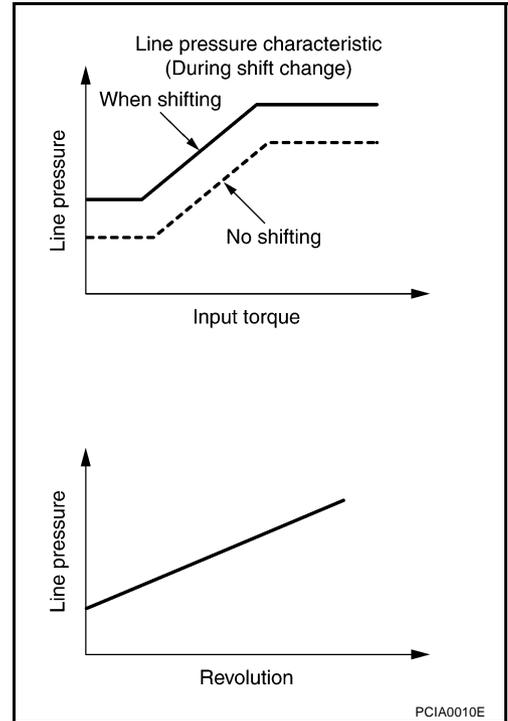
When the select operation is performed during driving and the A/T is shifted down, the line pressure is set according to the vehicle speed.



# A/T CONTROL SYSTEM

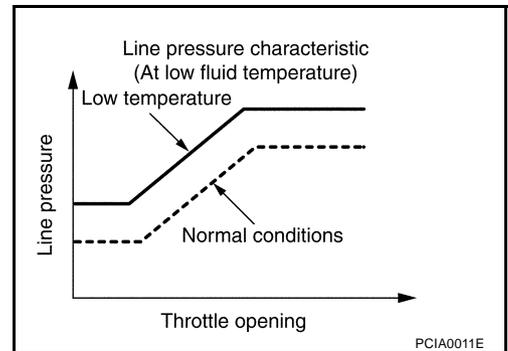
## During Shift Change

The necessary and adequate line pressure for shift change is set. For this reason, line pressure pattern setting corresponds to input torque and gearshift selection. Also, line pressure characteristic is set according to engine speed, during engine brake operation.



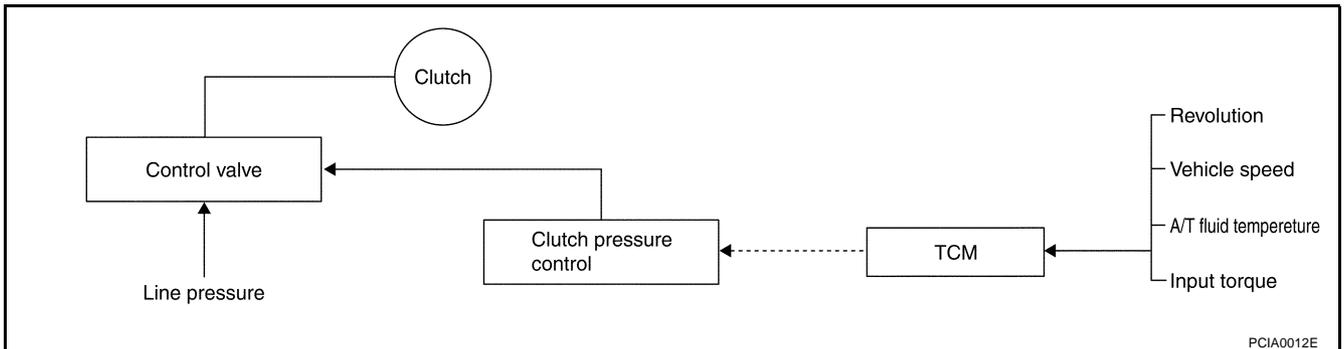
## At Low Fluid Temperature

When the A/T fluid temperature drops below the prescribed temperature, in order to speed up the action of each friction element, the line pressure is set higher than the normal line pressure characteristic.



## Shift Control

The clutch pressure control solenoid is controlled by the signals from the switches and sensors. Thus, the clutch pressure is adjusted to be appropriate to the engine load state and vehicle driving state. It becomes possible to finely control the clutch hydraulic pressure with high precision and a smoother shift change characteristic is attained.

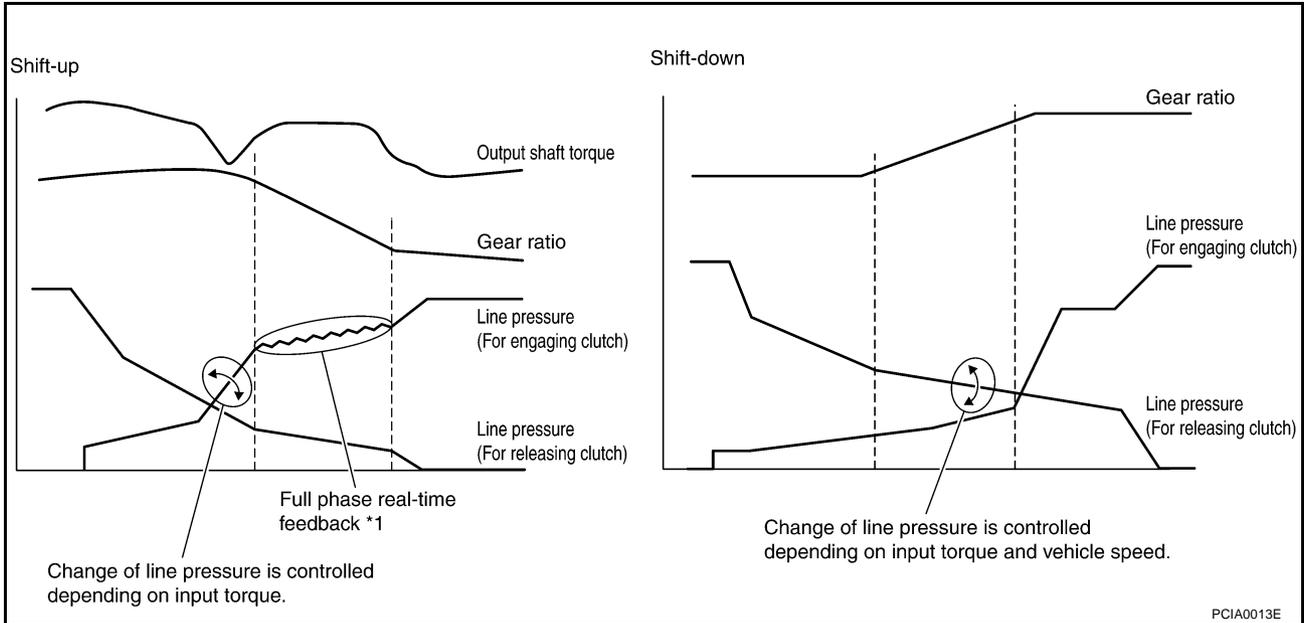


# A/T CONTROL SYSTEM

## NORMAL SHIFT CONTROL

The clutch is controlled with the optimum timing and oil pressure by the engine speed, engine torque information, etc.

### Shift Change System Diagram



\*1: Full phase real-time feedback control monitors movement of gear ratio at gear change, and controls oil pressure at real-time to achieve the best gear ratio.

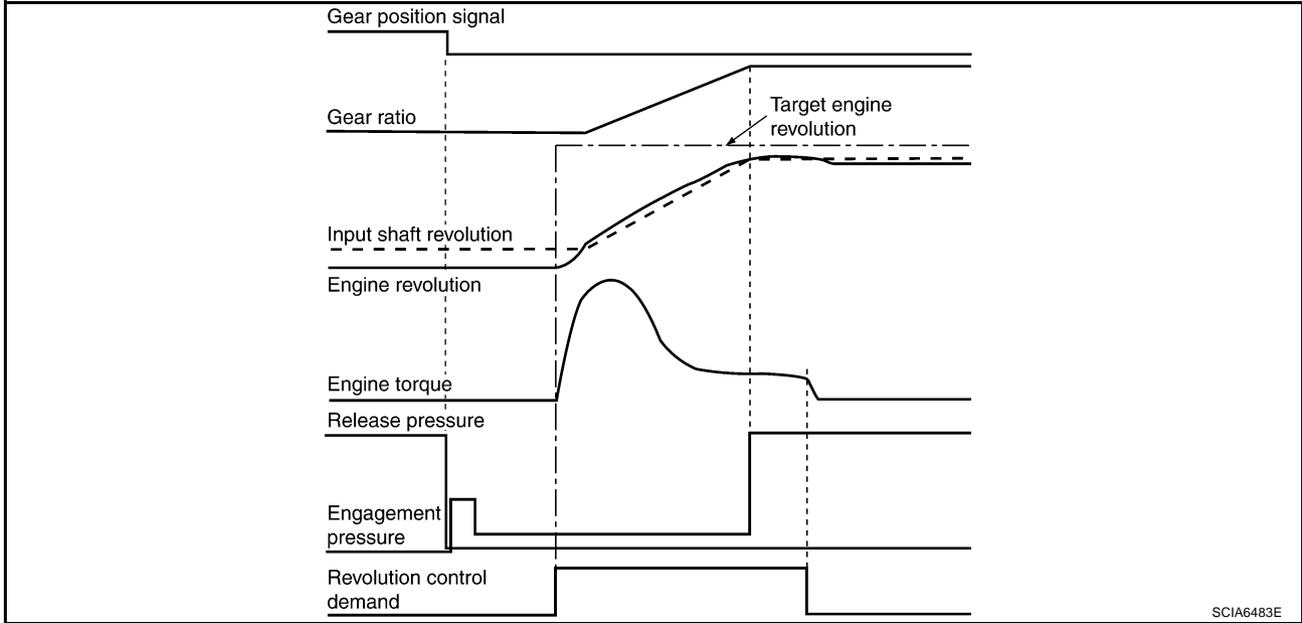
## BLIPPING CONTROL

This system makes transmission clutch engage readily by controlling (synchronizing) engine revolution according to the (calculation of) engine revolution after shifting down.

- “BLIPPING CONTROL” functions.
  - When downshifting by accelerator pedal depression at “D” position.
  - When downshifting under the manual mode.
- TCM selects “BLIPPING CONTROL” or “NORMAL SHIFT CONTROL” according to the gear position, the select lever position, the engine torque and the speed when accelerating by pedal depression.
- Revolution control demand signal is transmitted from TCM to ECM under “BLIPPING CONTROL”.
- TCM synchronizes engine revolution according to the revolution control demand signal.

# A/T CONTROL SYSTEM

## Shift Change System Diagram



## Lock-up Control

NCS0001R

The torque converter clutch piston in the torque converter is engaged to eliminate torque converter slip to increase power transmission efficiency.

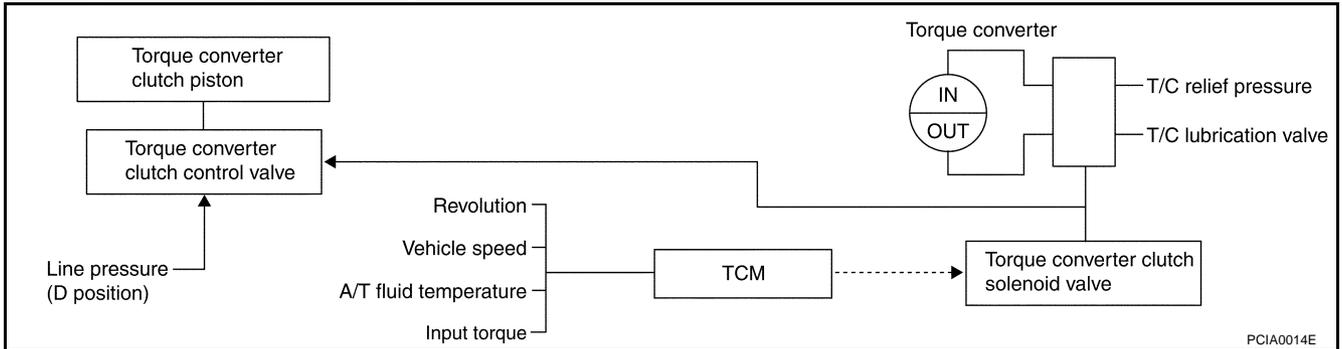
The torque converter clutch control valve operation is controlled by the torque converter clutch solenoid valve, which is controlled by a signal from TCM, and the torque converter clutch control valve engages or releases the torque converter clutch piston.

### Lock-up operation condition table

selector lever	"D" position		"M" position			
Gear position	5	4	5	4	3	2
Lock-up	×	—	×	×	×	×
Slip lock-up	×	×	—	—	—	—

## TORQUE CONVERTER CLUTCH CONTROL VALVE CONTROL

### Lock-up Control System Diagram



### Lock-up Released

In the lock-up released state, the torque converter clutch control valve is set into the unlocked state by the torque converter clutch solenoid and the lock-up apply pressure is drained.

In this way, the torque converter clutch piston is not coupled.

### Lock-up Applied

In the lock-up applied state, the torque converter clutch control valve is set into the locked state by the torque converter clutch solenoid and lock-up apply pressure is generated.

In this way, the torque converter clutch piston is pressed and coupled.

# A/T CONTROL SYSTEM

## SMOOTH LOCK-UP CONTROL

When shifting from the lock-up released state to the lock-up applied state, the current output to the torque converter clutch solenoid is controlled with the TCM. In this way, when shifting to the lock-up applied state, the torque converter clutch is temporarily set to the half-clutched state to reduce the shock.

### Half-clutched State

The current output from the TCM to the torque converter clutch solenoid is varied to gradually increase the torque converter clutch solenoid pressure.

In this way, the lock-up apply pressure gradually rises and while the torque converter clutch piston is put into half-clutched status, the torque converter clutch piston operating pressure is increased and the coupling is completed smoothly.

### Slip Lock-up Control

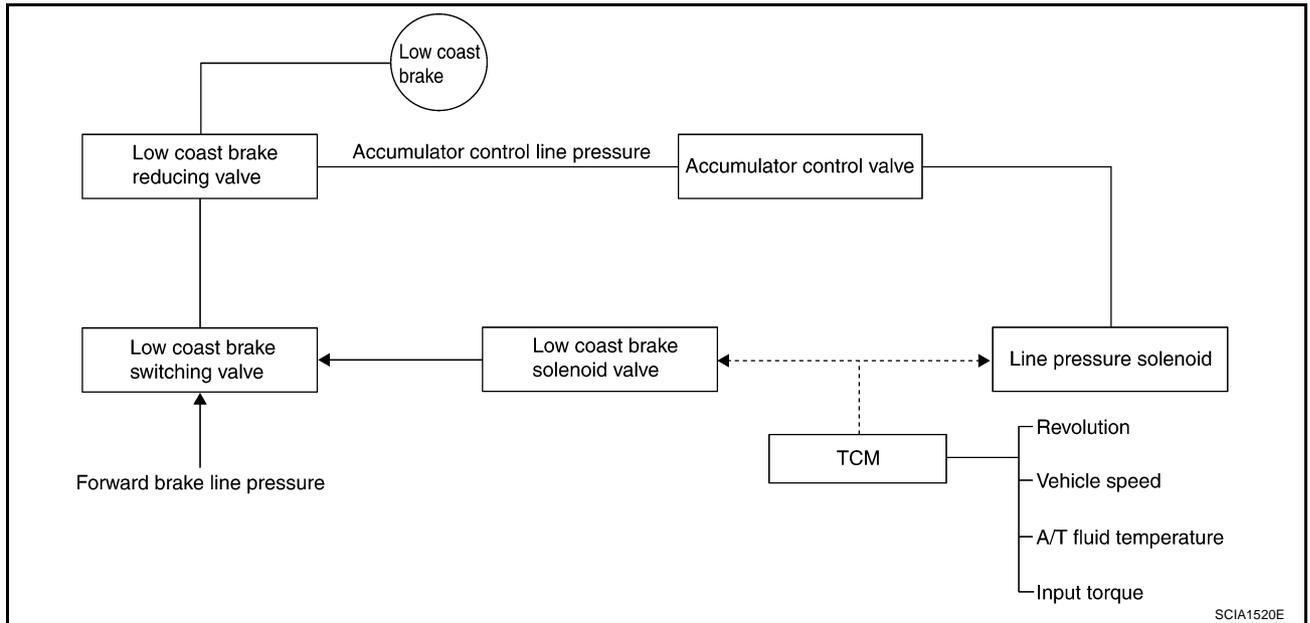
In the slip region, the torque converter clutch solenoid current is controlled with the TCM to put it into the half-clutched state. This absorbs the engine torque fluctuation and lock-up operates from low speed.

This raises the fuel efficiency for 4th and 5th gears at both low speed and when the accelerator has a low degree of opening.

## Engine Brake Control

NCS0001S

- The forward one-way clutch transmits the drive force from the engine to the rear wheels. But the reverse drive from the rear wheels is not transmitted to the engine because the one-way clutch is idling. Therefore, the low coast brake solenoid is operated to prevent the forward one-way clutch from idling and the engine brake is operated in the same manner as conventionally.



- The operation of the low coast brake solenoid switches the low coast brake switching valve and controls the coupling and releasing of the low coast brake. The low coast brake reducing valve controls the low coast brake coupling force.

## Control Valve

NCS0001T

### FUNCTION OF CONTROL VALVE

Name	Function
Torque converter regulator valve	In order to prevent the pressure supplied to the torque converter from being excessive, the line pressure is adjusted to the optimum pressure (torque converter operating pressure).
Pressure regulator valve Pressure regulator plug Pressure regulator sleeve	Adjusts the oil discharged from the oil pump to the optimum pressure (line pressure) for the driving state.
Front brake control valve	When the front brake is coupled, adjusts the line pressure to the optimum pressure (front brake pressure) and supplies it to the front brake. (In 1st, 2nd, 3rd, and 5th gears, adjusts the clutch pressure.)

## A/T CONTROL SYSTEM

Name	Function
Accumulator control valve	Adjusts the pressure (accumulator control pressure) acting on the accumulator piston and low coast reducing valve to the pressure appropriate to the driving state.
Pilot valve A	Adjusts the line pressure and produces the constant pressure (pilot pressure) required for line pressure control, shift change control, and lock-up control.
Pilot valve B	Adjusts the line pressure and produces the constant pressure (pilot pressure) required for shift change control.
Low coast brake switching valve	During engine braking, supplies the line pressure to the low coast brake reducing valve.
Low coast brake reducing valve	When the low coast brake is coupled, adjusts the line pressure to the optimum pressure (low coast brake pressure) and supplies it to the low coast brake.
N-R accumulator	Produces the stabilizing pressure for when N-R is selected.
Direct clutch piston switching valve	Operates in 4th gear and switches the direct clutch coupling capacity.
High and low reverse clutch control valve	When the high and low reverse clutch is coupled, adjusts the line pressure to the optimum pressure (high and low reverse clutch pressure) and supplies it to the high and low reverse clutch. (In 1st, 3rd, 4th and 5th gears, adjusts the clutch pressure.)
Input clutch control valve	When the input clutch is coupled, adjusts the line pressure to the optimum pressure (input clutch pressure) and supplies it to the input clutch. (In 4th and 5th gears, adjusts the clutch pressure.)
Direct clutch control valve	When the direct clutch is coupled, adjusts the line pressure to the optimum pressure (direct clutch pressure) and supplies it to the direct clutch. (In 2nd, 3rd, and 4th gears, adjusts the clutch pressure.)
TCC control valve TCC control plug TCC control sleeve	Switches the lock-up to operating or released. Also, by performing the lock-up operation transiently, lock-up smoothly.
Torque converter lubrication valve	Operates during lock-up to switch the torque converter, cooling, and lubrication system oil passage.
Cool bypass valve	Allows excess oil to bypass cooler circuit without being fed into it.
Line pressure relief valve	Discharges excess oil from line pressure circuit.
N-D accumulator	Produces the stabilizing pressure for when N-D is selected.
Manual valve	Sends line pressure to each circuit according to the select position. The circuits to which the line pressure is not sent drain.

### FUNCTION OF ATF PRESSURE SWITCH

Name	Function
ATF pressure switch 2 (LC/B)	Detects any malfunction in the low coast brake hydraulic pressure. When it detects any malfunction, it puts the system into fail-safe mode.

## ON BOARD DIAGNOSTIC (OBD) SYSTEM

PFP:00028

### Introduction

NCS0001U

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

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

The second is the TCM original self-diagnosis indicated by the A/T CHECK indicator lamp. The malfunction is stored in the TCM memory. The detected items are overlapped with OBD-II self-diagnostic items. For detail, refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#).

### OBD-II Function for A/T System

NCS0001V

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

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

### One or Two Trip Detection Logic of OBD-II

NCS0001W

#### ONE TRIP DETECTION LOGIC

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

#### TWO TRIP DETECTION LOGIC

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

If the same malfunction as that experienced during the first test drive is sensed during the second test drive, the MIL will illuminate. — 2nd trip

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

### OBD-II Diagnostic Trouble Code (DTC)

NCS0001X

#### HOW TO READ DTC AND 1ST TRIP DTC

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

( with **CONSULT-III** or ( **GST**) CONSULT-III or GST (Generic Scan Tool) Examples: P0705, P0720 etc.

These DTC are prescribed by SAE J2012.

(CONSULT-III 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-III can identify them as shown below, therefore, CONSULT-III (if available) is recommended.**

### 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-III or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-III screen, not on the GST. For detail, refer to [EC-116, "CONSULT-III Function \(ENGINE\)"](#).

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

# ON BOARD DIAGNOSTIC (OBD) SYSTEM

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 DTC) are cleared when the ECM memory is erased.

## HOW TO ERASE DTC

The diagnostic trouble code can be erased by CONSULT-III, GST or ECM DIAGNOSTIC TEST MODE as described following.

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

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to [EC-48, "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-III)

1. The emission related diagnostic information in the TCM and ECM can be erased by selecting "ALL Erase" in the "Description" of "FINAL CHECK" mode with CONSULT-III.

### 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 10 seconds and then turn it ON (engine stopped) again.
2. Perform [AT-92, "OBD-II SELF-DIAGNOSTIC PROCEDURE \(WITH GST\)"](#). (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Select Mode 4 with GST (Generic Scan Tool). For details, refer to [EC-125, "Generic Scan Tool \(GST\) Function"](#).

### HOW TO ERASE DTC (NO TOOLS)

The A/T CHECK indicator lamp is located on the instrument panel.

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform [AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#). (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Perform "OBD-II SELF-DIAGNOSTIC PROCEDURE (No tools)". Refer to [EC-61, "How to Erase DTC"](#).

# ON BOARD DIAGNOSTIC (OBD) SYSTEM

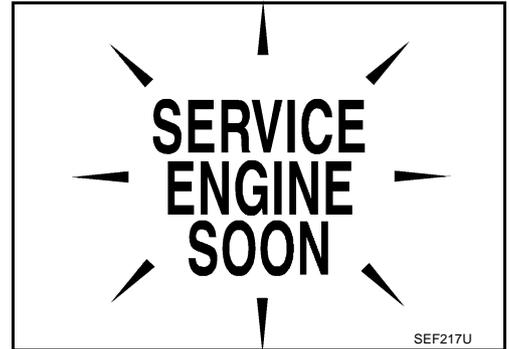
## Malfunction Indicator Lamp (MIL)

NCS0001Y

### DESCRIPTION

The MIL is located on the instrument panel.

1. The MIL will light up when the ignition switch is turned ON without the engine running. This is a bulb check.
  - If the MIL does not light up, refer to [DI-56, "WARNING LAMPS"](#), or see [EC-716, "MIL AND DATA LINK CONNECTOR"](#).
2. When the engine is started, the MIL should go off. If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



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# TROUBLE DIAGNOSIS

## TROUBLE DIAGNOSIS

PFP:00004

### DTC Inspection Priority Chart

NCS0001Z

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

#### NOTE:

If DTC "U1000 CAN COMM CIRCUIT" is displayed with other DTCs, first perform the trouble diagnosis for "DTC U1000 CAN COMMUNICATION LINE". Refer to [AT-94](#).

Priority	Detected items (DTC)
1	U1000 CAN communication line
2	Except above

### Fail-safe

NCS00020

The TCM has an electrical fail-safe mode. This mode makes it possible to operate even if there is a an error in a main electronic control input/output signal circuit.

In fail-safe mode, even if the selector lever is "D" or "M" mode, the A/T is fixed in 2nd, 4th or 5th (depending on the breakdown position), so the customer should feel "slipping" or "poor acceleration".

Even when the electronic circuits are normal, under special conditions (for example, when slamming on the brake with the wheels spinning drastically and stopping the tire rotation), the A/T can go into fail-safe mode. If this happens, switch OFF the ignition switch for 10 seconds, then switch it ON again to return to the normal shift pattern. Therefore, the customer's vehicle has returned to normal, so handle according to the [AT-43](#), "WORK FLOW".

### FAIL-SAFE FUNCTION

If any malfunction occurs in a sensor or solenoid, this function controls the A/T to mark driving possible.

### Vehicle Speed Sensor A/T

Signals are input from two systems - from vehicle speed sensor A/T (revolution sensor) installed on the A/T and from combination meter so normal driving is possible even if there is a malfunction in one of the systems. And if vehicle speed sensor A/T (revolution sensor) has unusual cases, 5th gear and manual mode are prohibited.

### Accelerator Pedal Position Sensor

If there is a malfunction in one of the systems, the accelerator opening angle is controlled by ECM according to a pre-determined accelerator angle to make driving possible. And if there are malfunctions in tow systems, the engine speed is fixed by ECM to a pre-determined engine speed to make driving possible.

### Throttle Position Sensor

If there is a malfunction in one of the systems, the accelerator opening angle is controlled by ECM according to a pre-determined accelerator angle to make driving possible. And if there are malfunctions in tow systems, the accelerator opening angle is controlled by the idle signal sent from the ECM which is based on input indicating either idle condition or off-idle condition (pre-determined accelerator opening) in order to make driving possible.

### PNP Switch

In the unlikely event that a malfunction signal enters the TCM, the position indicator is switched OFF, the starter relay is switched OFF (starter starting is disabled), the back-up lamp relay switched OFF (back-up lamp is OFF) and the position is fixed to the "D" position to make driving possible.

### Starter Relay

The starter relay is switched OFF. (Starter starting is disabled.)

# TROUBLE DIAGNOSIS

## A/T Interlock

- If there is an A/T interlock judgment malfunction, the transmission is fixed in 2nd gear to make driving possible.

### NOTE:

**When the vehicle is driven fixed in 2nd gear a turbine revolution sensor malfunction is displayed, but this is not a turbine revolution sensor malfunction.**

- When interlock is detected at the 3rd gear or more, it is locked at the 2nd gear.

## A/T 1st Engine Braking

When there is an A/T first gear engine brake judgment malfunction, the low coast brake solenoid is switched OFF to avoid the engine brake operation.

## Line Pressure Solenoid

The solenoid is switched OFF and the line pressure is set to the maximum hydraulic pressure to make driving possible.

## Torque Converter Clutch Solenoid

The solenoid is switched OFF to release the lock-up.

## Low Coast Brake Solenoid

When a malfunction (electrical or functional) occurs, in order to make driving possible, if the solenoid is ON, the A/T is held in 2nd gear; if the solenoid is OFF, the A/T is held in 4th gear. (Engine brake is not applied in 1st and 2nd gear.)

## Input Clutch Solenoid

If a malfunction (electrical or functional) occurs with the solenoid either ON or OFF, the A/T is held in 4th gear to make driving possible.

## Direct Clutch Solenoid

If a malfunction (electrical or functional) occurs with the solenoid either ON or OFF, the A/T is held in 4th gear to make driving possible.

## Front Brake Solenoid

If a malfunction (electrical or functional) occurs with the solenoid ON, in order to make driving possible, the A/T is held in 5th gear; if the solenoid is OFF, 4th gear.

## High and Low Reverse Clutch Solenoid

If a malfunction (electrical or functional) occurs with the solenoid either ON or OFF, the A/T is held in 4th gear to make driving possible.

## Turbine Revolution Sensor 1 or 2

The control is the same as if there were no turbine revolution sensors, 5th gear and manual mode are prohibited.

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# TROUBLE DIAGNOSIS

## How to Perform Trouble Diagnosis for Quick and Accurate Repair

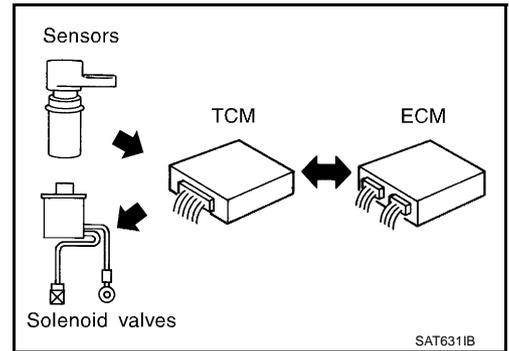
NCS00021

### INTRODUCTION

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

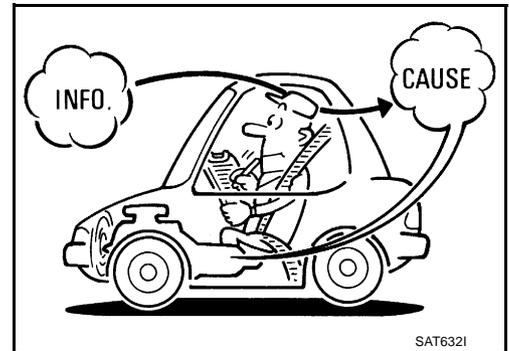
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.

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



It is much more difficult to diagnose a error that occurs intermittently rather than continuously. Most intermittent errors 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.

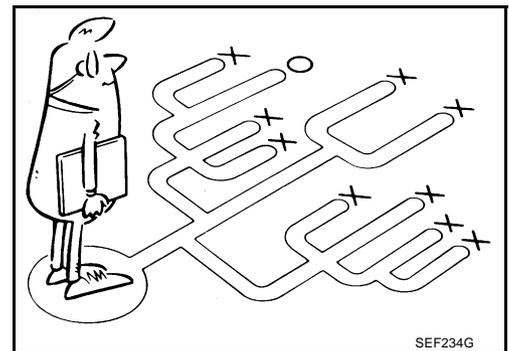
A visual check only may not find the cause of the errors. A road test with CONSULT-III (or GST) or a circuit tester connected should be performed. Follow the [AT-43. "WORK FLOW"](#) .



Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such errors, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A "DIAGNOSTIC WORKSHEET" as shown on the example (Refer to [AT-44](#) ) should be used.

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

Also check related Service bulletins.



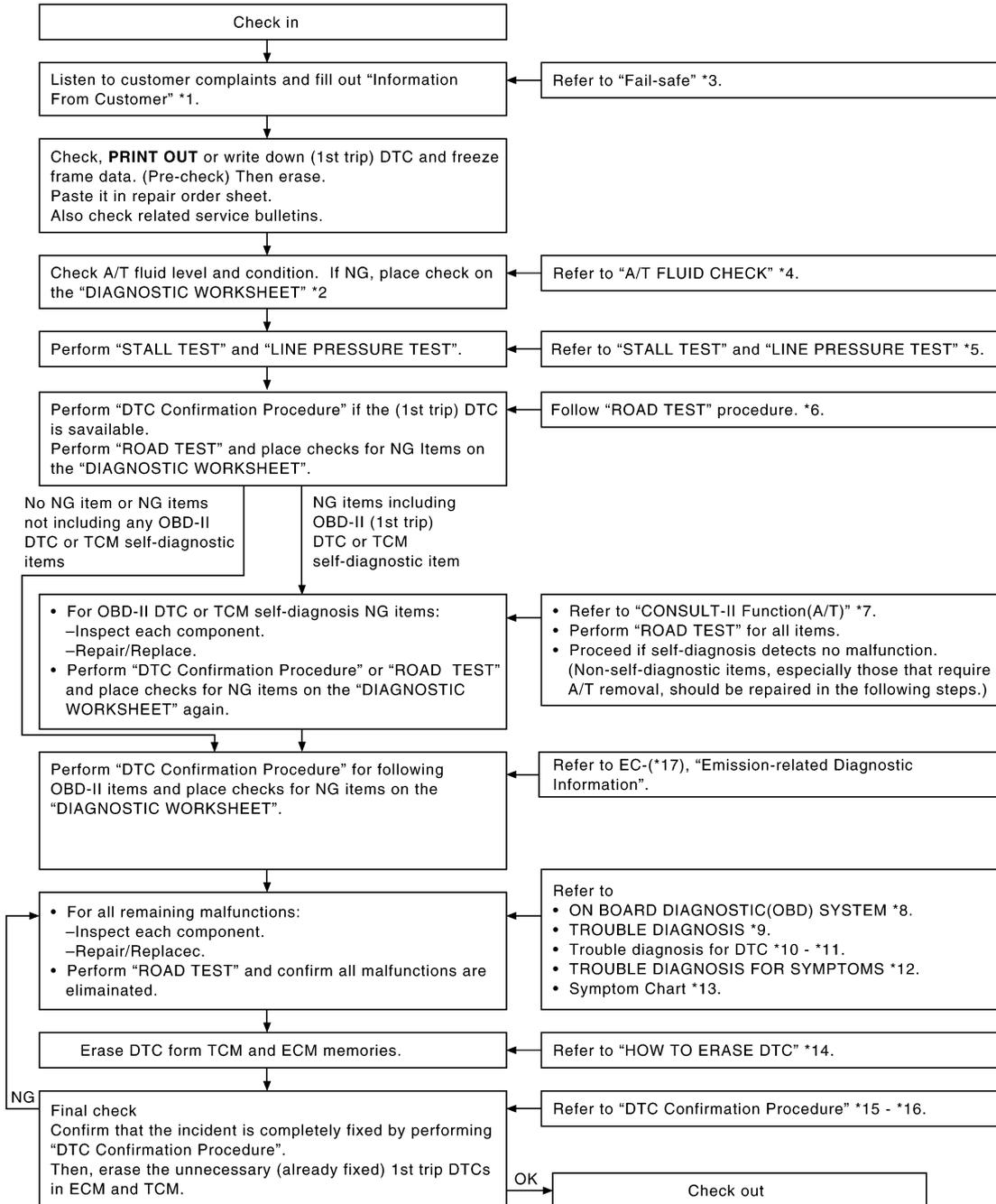
# TROUBLE DIAGNOSIS

## WORK FLOW

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

Make good use of the two sheets provided, [AT-44, "Information from Customer"](#) and [AT-44, "Diagnostic Worksheet Chart"](#), to perform the best troubleshooting possible.

## Work Flow Chart



- \*1. [AT-44](#)
- \*4. [AT-49](#)
- \*7. [AT-84](#)
- \*10. [AT-94](#)
- \*13. [AT-59](#)
- \*16. [AT-157](#)

- \*2. [AT-44](#)
- \*5. [AT-49, AT-50](#)
- \*8. [AT-37](#)
- \*11. [AT-157](#)
- \*14. [AT-38](#)
- \*17. [EC-48](#)

- \*3. [AT-40](#)
- \*6. [AT-52](#)
- \*9. [AT-40](#)
- \*12. [AT-169](#)
- \*15. [AT-94](#)

SCIA7037E



# TROUBLE DIAGNOSIS

		<input type="checkbox"/> Perform all road tests and enter checks in required inspection items.	<a href="#">AT-52</a>	A
4	4-1.	Check before engine is started	<a href="#">AT-53</a>	B
		<input type="checkbox"/> <a href="#">AT-172, "A/T Check Indicator Lamp Does Not Come On"</a> <input type="checkbox"/> Perform self-diagnostics. Enter checks for detected items. <a href="#">AT-86</a> , <a href="#">AT-92</a>		C
		<input type="checkbox"/> <a href="#">AT-94, "DTC U1000 CAN COMMUNICATION LINE"</a> <input type="checkbox"/> <a href="#">AT-97, "DTC P0615 START SIGNAL CIRCUIT"</a> <input type="checkbox"/> <a href="#">AT-101, "DTC P0700 TCM"</a> <input type="checkbox"/> <a href="#">AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"</a> <input type="checkbox"/> <a href="#">AT-106, "DTC P0717 TURBINE REVOLUTION SENSOR"</a> <input type="checkbox"/> <a href="#">AT-108, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)"</a> <input type="checkbox"/> <a href="#">AT-113, "DTC P0725 ENGINE SPEED SIGNAL"</a> <input type="checkbox"/> <a href="#">AT-115, "DTC P0731 A/T 1ST GEAR FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-117, "DTC P0732 A/T 2ND GEAR FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-119, "DTC P0733 A/T 3RD GEAR FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-121, "DTC P0734 A/T 4TH GEAR FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-123, "DTC P0735 A/T 5TH GEAR FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-125, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-127, "DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)"</a> <input type="checkbox"/> <a href="#">AT-129, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-131, "DTC P1705 THROTTLE POSITION SENSOR"</a> <input type="checkbox"/> <a href="#">AT-134, "DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT"</a> <input type="checkbox"/> <a href="#">AT-139, "DTC P1721 VEHICLE SPEED SENSOR MTR"</a> <input type="checkbox"/> <a href="#">AT-141, "DTC P1730 A/T INTERLOCK"</a> <input type="checkbox"/> <a href="#">AT-143, "DTC P1731 A/T 1ST ENGINE BRAKING"</a> <input type="checkbox"/> <a href="#">AT-145, "DTC P1752 INPUT CLUTCH SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-147, "DTC P1757 FRONT BRAKE SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-149, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-151, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-153, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-155, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-157, "DTC P1815 MANUAL MODE SWITCH"</a>		D E F G H I
4-2.	Check at Idle	<a href="#">AT-53</a>	J	
	<input type="checkbox"/> <a href="#">AT-173, "Engine Cannot Be Started in "P" or "N" Position"</a> <input type="checkbox"/> <a href="#">AT-173, "In "P" Position, Vehicle Moves When Pushed"</a> <input type="checkbox"/> <a href="#">AT-174, "In "N" Position, Vehicle Moves"</a> <input type="checkbox"/> <a href="#">AT-175, "Large Shock ("N" to "D" Position)"</a> <input type="checkbox"/> <a href="#">AT-177, "Vehicle Does Not Creep Backward in "R" Position"</a> <input type="checkbox"/> <a href="#">AT-179, "Vehicle Does Not Creep Forward in "D" Position"</a>		K	
4-3.	Cruise test	<a href="#">AT-55</a>	L	
	Part 1		M	
	<input type="checkbox"/> <a href="#">AT-181, "Vehicle Cannot Be Started from D1"</a> <input type="checkbox"/> <a href="#">AT-183, "A/T Does Not Shift: D1 → D2"</a> <input type="checkbox"/> <a href="#">AT-185, "A/T Does Not Shift: D2 → D3"</a> <input type="checkbox"/> <a href="#">AT-187, "A/T Does Not Shift: D3 → D4"</a> <input type="checkbox"/> <a href="#">AT-189, "A/T Does Not Shift: D4 → D5"</a> <input type="checkbox"/> <a href="#">AT-191, "A/T Does Not Lock-up"</a> <input type="checkbox"/> <a href="#">AT-193, "A/T Does Not Hold Lock-up Condition"</a> <input type="checkbox"/> <a href="#">AT-194, "Lock-up Is Not Released"</a> <input type="checkbox"/> <a href="#">AT-195, "Engine Speed Does Not Return to Idle"</a>			

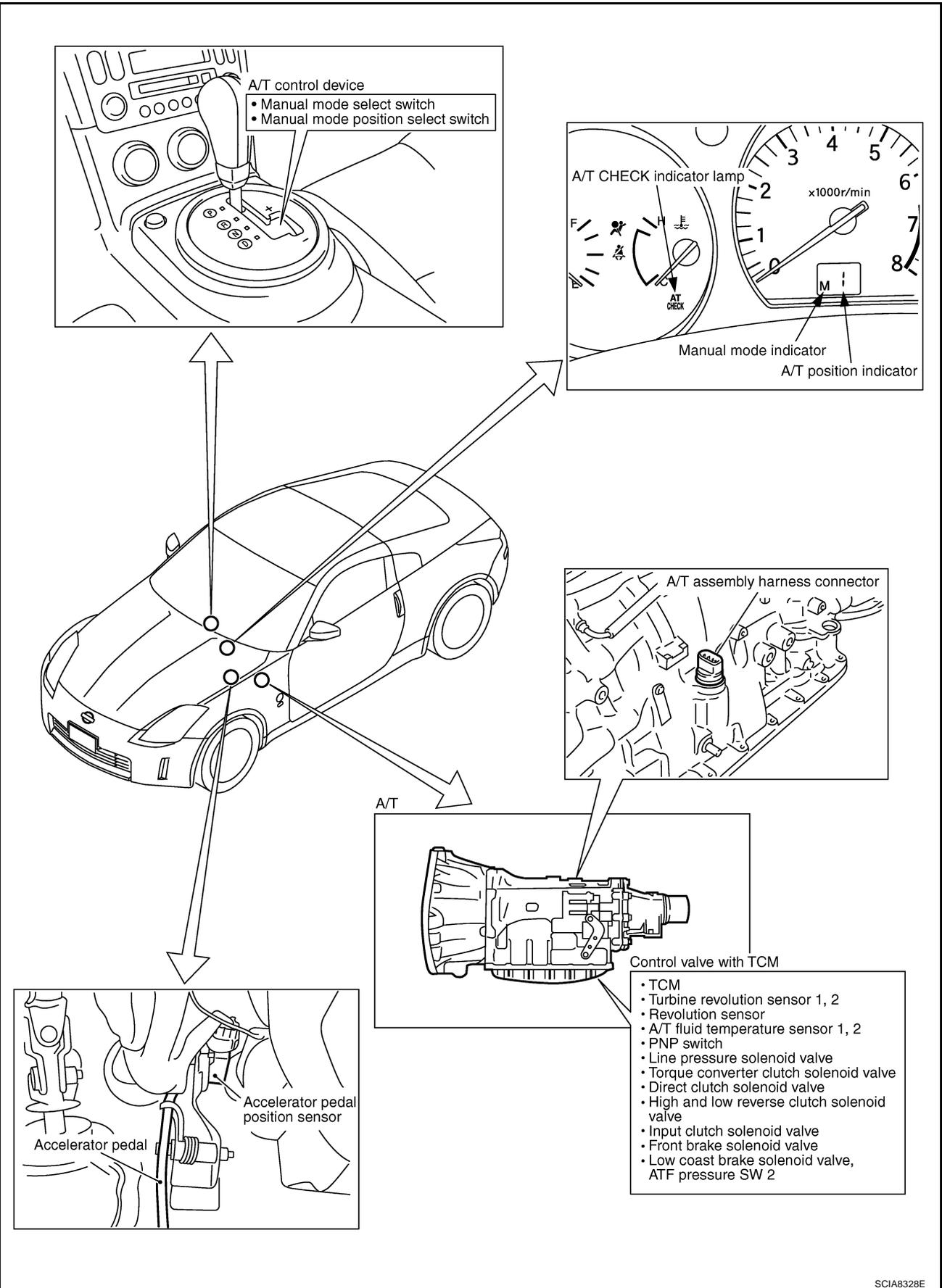
# TROUBLE DIAGNOSIS

4	4-3.	Part 2 <input type="checkbox"/> <a href="#">AT-181, "Vehicle Cannot Be Started from D1"</a> <input type="checkbox"/> <a href="#">AT-183, "A/T Does Not Shift: D1 → D2"</a> <input type="checkbox"/> <a href="#">AT-185, "A/T Does Not Shift: D2 → D3"</a> <input type="checkbox"/> <a href="#">AT-187, "A/T Does Not Shift: D3 → D4"</a>	<a href="#">AT-57</a>
		Part 3 <input type="checkbox"/> <a href="#">AT-196, "Cannot Be Changed to Manual Mode"</a> <input type="checkbox"/> <a href="#">AT-196, "A/T Does Not Shift: 5th Gear → 4th Gear"</a> <input type="checkbox"/> <a href="#">AT-198, "A/T Does Not Shift: 4th Gear → 3rd Gear"</a> <input type="checkbox"/> <a href="#">AT-199, "A/T Does Not Shift: 3rd Gear → 2nd Gear"</a> <input type="checkbox"/> <a href="#">AT-201, "A/T Does Not Shift: 2nd Gear → 1st Gear"</a> <input type="checkbox"/> <a href="#">AT-202, "Vehicle Does Not Decelerate by Engine Brake"</a> <input type="checkbox"/> Perform self-diagnostics. Enter checks for detected items. <a href="#">AT-86</a> , <a href="#">AT-92</a>	<a href="#">AT-58</a>
		<input type="checkbox"/> <a href="#">AT-94, "DTC U1000 CAN COMMUNICATION LINE"</a> <input type="checkbox"/> <a href="#">AT-97, "DTC P0615 START SIGNAL CIRCUIT"</a> <input type="checkbox"/> <a href="#">AT-101, "DTC P0700 TCM"</a> <input type="checkbox"/> <a href="#">AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"</a> <input type="checkbox"/> <a href="#">AT-106, "DTC P0717 TURBINE REVOLUTION SENSOR"</a> <input type="checkbox"/> <a href="#">AT-108, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)"</a> <input type="checkbox"/> <a href="#">AT-113, "DTC P0725 ENGINE SPEED SIGNAL"</a> <input type="checkbox"/> <a href="#">AT-115, "DTC P0731 A/T 1ST GEAR FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-117, "DTC P0732 A/T 2ND GEAR FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-119, "DTC P0733 A/T 3RD GEAR FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-121, "DTC P0734 A/T 4TH GEAR FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-123, "DTC P0735 A/T 5TH GEAR FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-125, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-127, "DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)"</a> <input type="checkbox"/> <a href="#">AT-129, "DTC P0745 LINE PRESSURE SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-131, "DTC P1705 THROTTLE POSITION SENSOR"</a> <input type="checkbox"/> <a href="#">AT-134, "DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT"</a> <input type="checkbox"/> <a href="#">AT-139, "DTC P1721 VEHICLE SPEED SENSOR MTR"</a> <input type="checkbox"/> <a href="#">AT-141, "DTC P1730 A/T INTERLOCK"</a> <input type="checkbox"/> <a href="#">AT-143, "DTC P1731 A/T 1ST ENGINE BRAKING"</a> <input type="checkbox"/> <a href="#">AT-145, "DTC P1752 INPUT CLUTCH SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-147, "DTC P1757 FRONT BRAKE SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-149, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-151, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-153, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE"</a> <input type="checkbox"/> <a href="#">AT-155, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION"</a> <input type="checkbox"/> <a href="#">AT-157, "DTC P1815 MANUAL MODE SWITCH"</a>	
		<input type="checkbox"/> Inspect each system for items found to be NG in the self-diagnostics and repair or replace the malfunctioning parts.	
5		<input type="checkbox"/> Perform all road tests and enter the checks again for the required items.	<a href="#">AT-52</a>
6		<input type="checkbox"/> For any remaining NG items, perform the "diagnostics procedure" and repair or replace the malfunctioning parts. See the chart for diagnostics by symptoms. (This chart also contains other symptoms and inspection procedures.)	<a href="#">AT-59</a>
7		<input type="checkbox"/> Erase the results of the self-diagnostics from TCM and ECM.	<a href="#">AT-93</a> , <a href="#">AT-38</a>
8			

# TROUBLE DIAGNOSIS

## A/T Electrical Parts Location

NCS00022



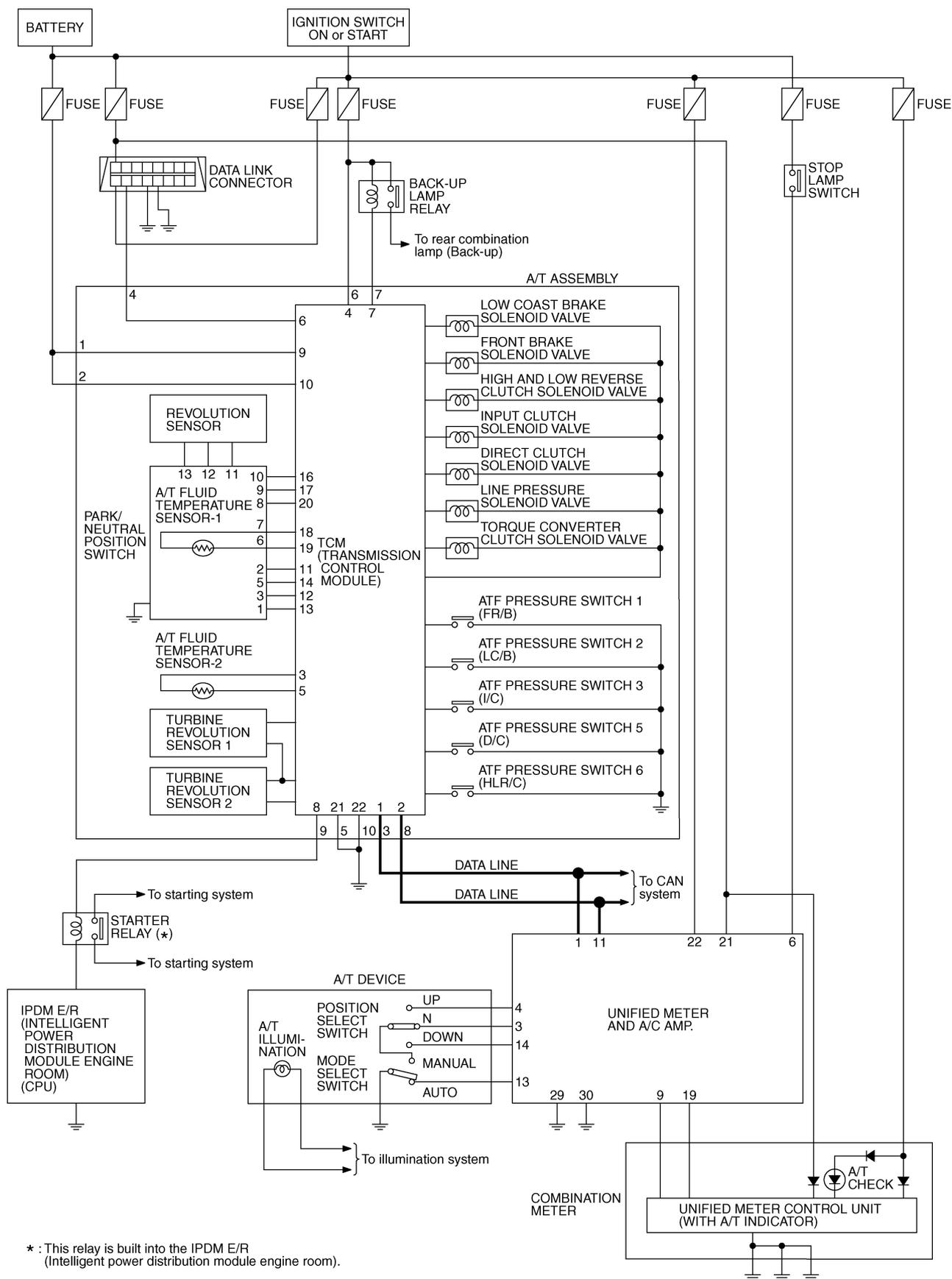
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# TROUBLE DIAGNOSIS

## Circuit Diagram

NCS00023



TCWT0437E

# TROUBLE DIAGNOSIS

NCS00024

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## Inspections Before Trouble Diagnosis

### A/T FLUID CHECK

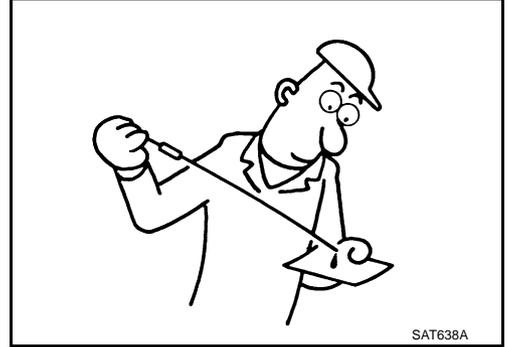
#### A/T Fluid Leakage and A/T Fluid Level Check

Inspect for A/T fluid leakage and check the A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

#### A/T Fluid Condition Check

Inspect the A/T fluid condition.

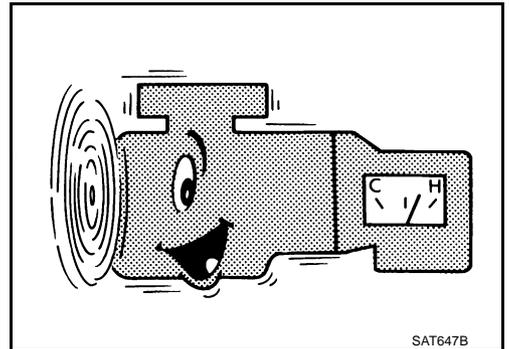
Fluid condition	Conceivable Cause	Required Operation
Varnished (viscous varnish state)	Clutch, brake scorched	Replace the ATF and check the A/T main unit and the vehicle for malfunctions (wire harnesses, cooler pipes, etc.)
Milky white or cloudy	Water in the fluid	Replace the ATF and check for places where water is getting in.
Large amount of metal powder mixed in	Unusual wear of sliding parts within A/T	Replace the ATF and check for improper operation of the A/T.



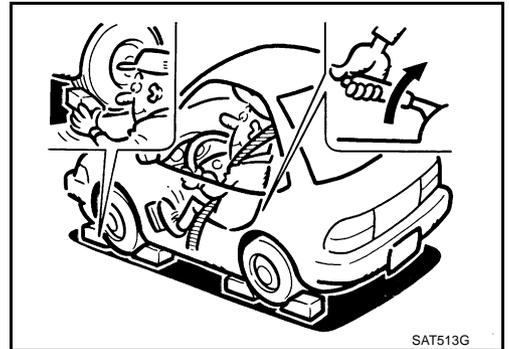
## STALL TEST

### Stall Test Procedure

1. Inspect the amount of engine oil. Replenish the engine oil if necessary.
2. Drive for about 10 minutes to warm up the vehicle so that the A/T fluid temperature is 50 to 80°C (122 to 176°F). Inspect the amount of ATF. Replenish if necessary.



3. Securely engage the parking brake so that the tires do not turn.
4. Engine start, apply foot brake, and place selector lever in "D" position.

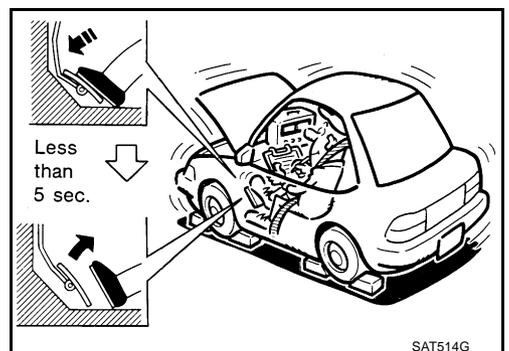


5. While holding down the foot brake, gradually press down accelerator pedal.
6. Quickly read off the stall speed, then quickly remove your foot from accelerator pedal.

**CAUTION:**

**Do not hold down accelerator pedal for more than 5 seconds during this test.**

**Stall speed: 2,700 – 3,000 rpm**



7. Move selector lever to "N" position.

# TROUBLE DIAGNOSIS

8. Cool down the ATF.

**CAUTION:**

**Run the engine at idle for at least one minute.**

9. Repeat steps 5 through 8 with selector lever in "R" position.

## Judgment Stall Test

	Selector lever position		Expected problem location
	"D" and "M"	"R"	
Stall speed	H	O	<ul style="list-style-type: none"> <li>● Forward brake</li> <li>● Forward one-way clutch</li> <li>● 1st one-way clutch</li> <li>● 3rd one-way clutch</li> </ul>
	O	H	<ul style="list-style-type: none"> <li>● Reverse brake</li> </ul>
	L	L	<ul style="list-style-type: none"> <li>● Engine and torque converter one-way clutch</li> </ul>
	H	H	<ul style="list-style-type: none"> <li>● Line pressure low</li> </ul>

O: Stall speed within standard value position

H: Stall speed higher than standard value

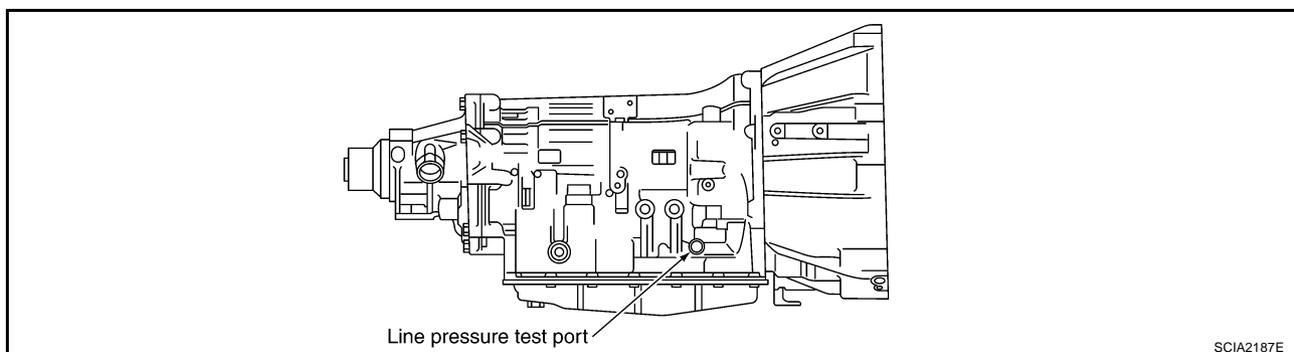
L: Stall speed lower than standard value

## Stall Test Standard Value Position

Does not shift-up "D" or "M" position 1 → 2	Slipping in 2nd, 3rd or 4th gear	Direct clutch slippage
Does not shift-up "D" or "M" position 2 → 3	Slipping in 3rd, 4th or 5th gear	High and low reverse clutch slippage
Does not shift-up "D" or "M" position 3 → 4	Slipping in 4th or 5th gear	Input clutch slippage
Does not shift-up "D" or "M" position 4 → 5	Slipping in 5th gear	Front brake slippage

## LINE PRESSURE TEST

### Line Pressure Test Port



### Line Pressure Test Procedure

1. Inspect the amount of engine oil and replenish if necessary.
2. Drive the car for about 10 minutes to warm it up so that the ATF reaches in range of 50 to 80°C (122 to 176°F), then inspect the amount of ATF and replenish if necessary.

**NOTE:**

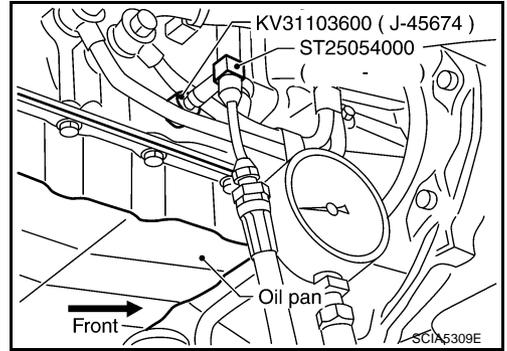
**The A/T fluid temperature rises in range of 50 to 80°C (122 to 176°F) during 10 minutes of driving.**

# TROUBLE DIAGNOSIS

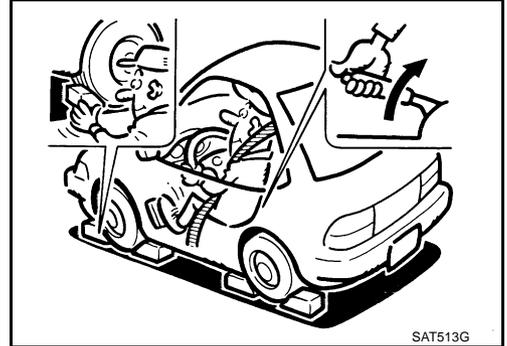
3. After warming up remove the oil pressure detection plug and install the oil pressure gauge [ST2505S001(J-34301-C)].

**CAUTION:**

When using the oil pressure gauge, be sure to use O-ring attached to the oil pressure detection plug.



4. Securely engage the parking brake so that the tires do not turn.



5. Start the engine, then measure the line pressure at both idle and the stall speed.

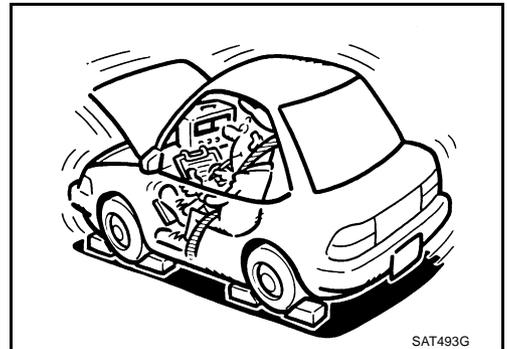
**CAUTION:**

- Keep brake pedal pressed all the way down during measurement.
- When measuring the line pressure at the stall speed, refer to [AT-49, "STALL TEST"](#).

6. After the measurements are complete, install the oil pressure detection plug and tighten to the specified torque. Refer to [AT-246, "Components"](#).

**CAUTION:**

- Do not reuse O-ring.
- Apply ATF to O-ring.



## Line Pressure

Engine speed	Line pressure kPa (kg/cm <sup>2</sup> , psi)	
	"R" position	"D" and "M" positions
At idle speed	425 – 465 (4.3 – 4.7, 62 – 67)	379 – 428 (3.9 – 4.4, 55 – 62)
At stall speed	1,605 – 1,950 (16.4 – 19.9, 233 – 283)	1,310 – 1,500 (13.4 – 15.3, 190 – 218)

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

# TROUBLE DIAGNOSIS

## Judgment of Line Pressure Test

	Judgment	Possible cause
Idle speed	Low for all positions ("P", "R", "N", "D", "M")	<p>Possible causes include malfunctions in the pressure supply system and low oil pump output. For example</p> <ul style="list-style-type: none"> <li>● Oil pump wear</li> <li>● Pressure regulator valve or plug sticking or spring fatigue</li> <li>● Oil strainer ⇒ oil pump ⇒ pressure regulator valve passage oil leak</li> <li>● Engine idle speed too low</li> </ul>
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.
	High	<p>Possible causes include a sensor malfunction or malfunction in the line pressure adjustment function. For example</p> <ul style="list-style-type: none"> <li>● Accelerator pedal position signal malfunction</li> <li>● A/T fluid temperature sensor malfunction</li> <li>● Line pressure solenoid malfunction (sticking in OFF state, filter clog, cut line)</li> <li>● Pressure regulator valve or plug sticking</li> </ul>
Stall speed	Line pressure does not rise higher than the line pressure for idle.	<p>Possible causes include a sensor malfunction or malfunction in the pressure adjustment function. For example</p> <ul style="list-style-type: none"> <li>● Accelerator pedal position signal malfunction</li> <li>● TCM breakdown</li> <li>● Line pressure solenoid malfunction (shorting, sticking in ON state)</li> <li>● Pressure regulator valve or plug sticking</li> <li>● Pilot valve sticking or pilot filter clogged</li> </ul>
	The pressure rises, but does not enter the standard position.	<p>Possible causes include malfunctions in the pressure supply system and malfunction in the pressure adjustment function. For example</p> <ul style="list-style-type: none"> <li>● Accelerator pedal position signal malfunction</li> <li>● Line pressure solenoid malfunction (sticking, filter clog)</li> <li>● Pressure regulator valve or plug sticking</li> <li>● Pilot valve sticking or pilot filter clogged</li> </ul>
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.

## ROAD TEST

### Description

- The road test inspects overall performance of A/T and analyzes possible malfunction causes.
- The road test is performed in the following three stages.
  1. Check before engine is started. Refer to [AT-53, "Check Before Engine is Started"](#) .
  2. Check at idle. Refer to [AT-53, "Check at Idle"](#) .
  3. Cruise test
    - Inspect all the items from Part 1 to Part 3. Refer to [AT-55, "Cruise Test — Part 1"](#) , [AT-57, "Cruise Test — Part 2"](#) and [AT-58, "Cruise Test — Part 3"](#) .
- Before beginning the road test, check the test procedure and inspection items.
- Test all inspection items until the symptom is uncovered. Diagnose NG items when all road tests are complete.

# TROUBLE DIAGNOSIS

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## Check Before Engine is Started

NCS00025

### 1. CHECK A/T CHECK INDICATOR LAMP

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1. Park vehicle on level surface.
  2. Move selector lever to "P" position.
  3. Turn ignition switch OFF and wait at least 10 seconds.
  4. Turn ignition switch ON. (Do not start engine.)
- Does A/T CHECK indicator lamp light up for about 2 seconds?

YES >> 1. Turn ignition switch OFF.

2. Perform self-diagnostics and record all NG items on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) . Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

3. Go to [AT-53, "Check at Idle"](#) .

NO >> Stop the road test and go to [AT-172, "A/T Check Indicator Lamp Does Not Come On"](#) .

## Check at Idle

NCS00026

### 1. CHECK STARTING THE ENGINE

---

1. Park vehicle on level surface.
2. Move selector lever to "P" or "N" position.
3. Turn ignition switch OFF.
4. Start engine.

Does the engine start?

YES >> GO TO 2.

NO >> Stop the road test and go to [AT-173, "Engine Cannot Be Started in "P" or "N" Position"](#) .

### 2. CHECK STARTING THE ENGINE

---

1. Turn ignition switch ON. (Do not start engine.)
2. Move selector lever in "D", "M" or "R" position.
3. Start engine.

Does the engine start in each position?

YES >> Stop the road test and go to [AT-173, "Engine Cannot Be Started in "P" or "N" Position"](#) .

NO >> GO TO 3.

### 3. CHECK "P" POSITION FUNCTIONS

---

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

When you push the vehicle with disengaging the parking brake, does it move?

YES >> Enter a check mark at [AT-173, "In "P" Position, Vehicle Moves When Pushed"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) , then continue the road test.

NO >> GO TO 4.

# TROUBLE DIAGNOSIS

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## 4. CHECK "N" POSITION FUNCTIONS

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1. Start engine.
2. Move selector lever to "N" position.
3. Release the parking brake.

Does vehicle move forward or backward?

- YES >> Enter a check mark at [AT-174, "In "N" Position, Vehicle Moves"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#), then continue the road test.
- NO >> GO TO 5.

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## 5. CHECK SHIFT SHOCK

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1. Engage the brake.
2. Move selector lever to "D" position.

When the A/T is shifted from "N" to "D", is there an excessive shock?

- YES >> Enter a check mark at [AT-175, "Large Shock \("N" to "D" Position\)"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#), then continue the road test.
- NO >> GO TO 6.

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## 6. CHECK "R" POSITION FUNCTIONS

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1. Engage the brake.
2. Move selector lever to "R" position.
3. Release the brake for 4 to 5 seconds.

Does the vehicle creep backward?

- YES >> GO TO 7.
- NO >> Enter a check mark at [AT-177, "Vehicle Does Not Creep Backward in "R" Position"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#), then continue the road test.

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## 7. CHECK "D" POSITION FUNCTIONS

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Inspect whether the vehicle creep forward when the A/T is put into the "D" position.

Does the vehicle creep forward in the "D" position?

- YES >> Go to [AT-55, "Cruise Test — Part 1"](#), [AT-57, "Cruise Test — Part 2"](#) and [AT-58, "Cruise Test — Part 3"](#).
- NO >> Enter a check mark at [AT-179, "Vehicle Does Not Creep Forward in "D" Position"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#), then continue the road test. Go to [AT-55, "Cruise Test — Part 1"](#), [AT-57, "Cruise Test — Part 2"](#) and [AT-58, "Cruise Test — Part 3"](#).

## Cruise Test — Part 1

### 1. CHECK STARTING OUT FROM D1

1. Drive the vehicle for about 10 minutes to warm up the engine oil and ATF. Appropriate temperature for the ATF: 50 to 80°C (122 to 176°F)
2. Park the vehicle on a level surface.
3. Move selector lever to "P" position.
4. Start engine.
5. Move selector lever to "D" position.
6. Press the accelerator pedal about half-way down to accelerate the vehicle.

**Ⓟ With CONSULT-III**

Read the gear position. Refer to [AT-88, "DATA MONITOR MODE"](#) .

Starts from D1 ?

YES >> GO TO 2.

NO >> Enter a check mark at [AT-181, "Vehicle Cannot Be Started from D1"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) , then continue the road test.

### 2. CHECK SHIFT-UP D1 → D2

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up (D1 → D2 ) at the appropriate speed. Refer to [AT-58, "Vehicle Speed at When Gears Shifting Occurs"](#) .

**Ⓟ With CONSULT-III**

Read the gear position, throttle position, and vehicle speed. Refer to [AT-88, "DATA MONITOR MODE"](#) .

Does the A/T shift-up D1 → D2 at the correct speed?

YES >> GO TO 3.

NO >> Enter a check mark at [AT-183, "A/T Does Not Shift: D1 → D2"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) , then continue the road test.

### 3. CHECK SHIFT-UP D2 → D3

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up (D2 → D3 ) at the appropriate speed. Refer to [AT-58, "Vehicle Speed at When Gears Shifting Occurs"](#) .

**Ⓟ With CONSULT-III**

Read the gear position, throttle position, and vehicle speed. Refer to [AT-88, "DATA MONITOR MODE"](#) .

Does the A/T shift-up D2 → D3 at the correct speed?

YES >> GO TO 4.

NO >> Enter a check mark at [AT-185, "A/T Does Not Shift: D2 → D3"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) , then continue the road test.

### 4. CHECK SHIFT-UP D3 → D4

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up (D3 → D4 ) at the appropriate speed. Refer to [AT-58, "Vehicle Speed at When Gears Shifting Occurs"](#) .

**Ⓟ With CONSULT-III**

Read the gear position, throttle position, and vehicle speed. Refer to [AT-88, "DATA MONITOR MODE"](#) .

Does the A/T shift-up D3 → D4 at the correct speed?

YES >> GO TO 5.

NO >> Enter a check mark at [AT-187, "A/T Does Not Shift: D3 → D4"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) , then continue the road test.

# TROUBLE DIAGNOSIS

## 5. CHECK SHIFT-UP D4 → D5

---

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up (D4 → D5) at the appropriate speed. Refer to [AT-58, "Vehicle Speed at When Gears Shifting Occurs"](#) .

**With CONSULT-III**

Read the gear position, throttle position, and vehicle speed. Refer to [AT-88, "DATA MONITOR MODE"](#) .

Does the A/T shift-up D4 → D5 at the correct speed?

YES >> GO TO 6.

NO >> Enter a check mark at [AT-189, "A/T Does Not Shift: D4 → D5"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) , then continue the road test.

## 6. CHECK LOCK-UP

---

When releasing accelerator pedal (closed throttle position signal: OFF) from D5 , check lock-up from D5 to L/U. Refer to [AT-58, "Vehicle Speed at When Gears Shifting Occurs"](#) .

**With CONSULT-III**

Select "TCC SOLENOID" with the "MAIN SIGNALS" mode for "A/T". Refer to [AT-84, "CONSULT-III REFERENCE VALUE"](#) .

Does it lock-up?

YES >> GO TO 7.

NO >> Enter a check mark at [AT-191, "A/T Does Not Lock-up"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) , then continue the road test.

## 7. CHECK LOCK-UP HOLD

---

Check hold lock-up.

**With CONSULT-III**

Select "TCC SOLENOID" with the "MAIN SIGNALS" mode for "A/T". Refer to [AT-84, "CONSULT-III REFERENCE VALUE"](#) .

Does it maintain lock-up status?

YES >> GO TO 8.

NO >> Enter a check mark at [AT-193, "A/T Does Not Hold Lock-up Condition"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) , then continue the road test.

## 8. CHECK LOCK-UP RELEASE

---

Check lock-up cancellation by depressing brake pedal lightly to decelerate.

**With CONSULT-III**

Select "TCC SOLENOID" with the "MAIN SIGNALS" mode for "A/T". Refer to [AT-84, "CONSULT-III REFERENCE VALUE"](#) .

Does lock-up cancel?

YES >> GO TO 9.

NO >> Enter a check mark at [AT-194, "Lock-up Is Not Released"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) , then continue the road test.

## 9. CHECK SHIFT-DOWN D5 → D4

---

Decelerate by pressing lightly on the brake pedal.

**With CONSULT-III**

Read the gear position and engine speed. [AT-88, "DATA MONITOR MODE"](#) .

When the A/T shift-down D5 → D4 , does the engine speed drop smoothly back to idle?

YES >> 1. Stop the vehicle.

2. Go to [AT-57, "Cruise Test — Part 2"](#) .

NO >> Enter a check mark at [AT-195, "Engine Speed Does Not Return to Idle"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) , then continue the road test. Go to [AT-57, "Cruise Test — Part 2"](#) .

**Cruise Test — Part 2****1. CHECK STARTING FROM D1**

1. Move selector lever into "D" position.
2. Accelerate at half throttle.

 **With CONSULT-III**

Read the gear position. Refer to [AT-88, "DATA MONITOR MODE"](#).

Does it start from D1?

YES >> GO TO 2.

NO >> Enter a check mark at [AT-181, "Vehicle Cannot Be Started from D1"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#), then continue the road test.

**2. CHECK SHIFT-UP D1 → D2**

Press the accelerator pedal down all the way and inspect whether or not the A/T shifts up (D1 → D2) at the correct speed. Refer to [AT-58, "Vehicle Speed at When Gears Shifting Occurs"](#).

 **With CONSULT-III**

Read the gear position, throttle position and vehicle speed. Refer to [AT-88, "DATA MONITOR MODE"](#).

Does the A/T shift-up D1 → D2 at the correct speed?

YES >> GO TO 3.

NO >> Enter a check mark at [AT-183, "A/T Does Not Shift: D1 → D2"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#), then continue the road test.

**3. CHECK SHIFT UP D2 → D3**

Press the accelerator pedal down all the way and inspect whether or not the A/T shifts up (D2 → D3) at the correct speed. Refer to [AT-58, "Vehicle Speed at When Gears Shifting Occurs"](#).

 **With CONSULT-III**

Read the gear position, throttle position and vehicle speed. Refer to [AT-88, "DATA MONITOR MODE"](#).

Does the A/T shift-up D2 → D3 at the correct speed?

YES >> GO TO 4.

NO >> Enter a check mark at [AT-185, "A/T Does Not Shift: D2 → D3"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#), then continue the road test.

**4. CHECK SHIFT-UP D3 → D4 AND ENGINE BRAKE**

When the A/T changes speed D3 → D4, return the accelerator pedal.

 **With CONSULT-III**

Read the gear position. Refer to [AT-88, "DATA MONITOR MODE"](#).

Does the A/T shift-up D3 → D4 and apply the engine brake?

YES >> 1. Stop the vehicle.

2. Go to [AT-58, "Cruise Test — Part 3"](#).

NO >> Enter a check mark at [AT-187, "A/T Does Not Shift: D3 → D4"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#), then continue the road test. Go to [AT-58, "Cruise Test — Part 3"](#).

# TROUBLE DIAGNOSIS

## Cruise Test — Part 3

NCS00029

### 1. MANUAL MODE FUNCTION

Move to manual mode from "D" position.

Does it switch to manual mode?

YES >> GO TO 2.

NO >> Continue road test and add check mark to [AT-196, "Cannot Be Changed to Manual Mode"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#).

### 2. CHECK SHIFT-DOWN

During manual mode driving, is downshift from M5 → M4 → M3 → M2 → M1 performed?

Ⓜ **With CONSULT-III**

Read the gear position. Refer to [AT-88, "DATA MONITOR MODE"](#).

Is downshifting correctly performed?

YES >> GO TO 2.

NO >> Enter a check mark at "A/T Does Not Shift" at the corresponding position (5th → 4th, 4th → 3rd, 3rd → 2nd, 2nd → 1st) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#), then continue the road test.

### 3. CHECK ENGINE BRAKE

Check engine brake.

Does engine braking effectively reduce speed in M1 position?

YES >> 1. Stop the vehicle.

2. Perform self-diagnostics. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#), [AT-92, "Diagnostic Procedure Without CONSULT-III"](#).

NO >> Enter a check mark at [AT-202, "Vehicle Does Not Decelerate by Engine Brake"](#) on the [AT-44, "DIAGNOSTIC WORKSHEET"](#), then continue trouble diagnosis.

### Vehicle Speed at When Gears Shifting Occurs

NCS0002A

Throttle position	Vehicle speed km/h (MPH)							
	D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
Full throttle	50 – 54 (31 – 34)	97 – 105 (60 – 65)	154 – 164 (96 – 102)	224 – 234 (139 – 145)	220 – 230 (137 – 143)	145 – 155 (90 – 96)	86 – 94 (53 – 58)	39 – 43 (24 – 27)
Half throttle	29 – 33 (18 – 21)	63 – 69 (39 – 43)	100 – 108 (62 – 67)	136 – 144 (85 – 89)	88 – 96 (55 – 60)	64 – 72 (40 – 45)	28 – 34 (17 – 21)	9 – 13 (6 – 8)

- At half throttle, the accelerator opening is 4/8 of the full opening.

### Vehicle Speed at Which Lock-up Occurs/Releases

NCS0002B

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up ON	Lock-up OFF
Closed throttle	62 – 70 (39 – 44)	59 – 67 (37 – 42)
Half throttle	136 – 144 (85 – 89)	88 – 96 (55 – 60)

- At closed throttle, the accelerator opening is less than 1/8 condition. (Closed throttle position signal: OFF)
- At half throttle, the accelerator opening is 4/8 of the full opening.

# TROUBLE DIAGNOSIS

## Symptom Chart

NCS0002C

- The diagnostics item numbers show the sequence for inspection. Inspect in order from item 1.
- Overhaul and inspect inside the A/T only if A/T fluid condition is NG. Refer to [AT-49, "A/T Fluid Condition Check"](#).

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
1		Large shock. ("N" → "D" position) Refer to <a href="#">AT-175, "Large Shock ("N" to "D" Position)"</a> .	ON vehicle	1. Engine idle speed	<a href="#">EC-76</a>
				2. Engine speed signal	<a href="#">AT-113</a>
				3. Accelerator pedal position sensor	<a href="#">AT-131</a>
				4. A/T position	<a href="#">AT-206</a>
				5. A/T fluid temperature sensor	<a href="#">AT-134</a>
				6. Front brake solenoid valve	<a href="#">AT-147</a>
				7. CAN communication line	<a href="#">AT-94</a>
				8. A/T fluid level and state	<a href="#">AT-49</a>
				9. Line pressure test	<a href="#">AT-50</a>
				10. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	11. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17, "Cross-sectional View"</a> .)	<a href="#">AT-255</a>
2	Shift Shock	Shock is too large when changing D1 → D2 or M1 → M2.	ON vehicle	1. Accelerator pedal position sensor	<a href="#">AT-131</a>
				2. A/T position	<a href="#">AT-206</a>
				3. Direct clutch solenoid valve	<a href="#">AT-149</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Engine speed signal	<a href="#">AT-113</a>
				6. Turbine revolution sensor	<a href="#">AT-106</a>
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				8. A/T fluid level and state	<a href="#">AT-49</a>
				9. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	10. Direct clutch	<a href="#">AT-288</a>
3		Shock is too large when changing D2 → D3 or M2 → M3.	ON vehicle	1. Accelerator pedal position sensor	<a href="#">AT-131</a>
				2. A/T position	<a href="#">AT-206</a>
				3. High and low reverse clutch solenoid valve	<a href="#">AT-151</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Engine speed signal	<a href="#">AT-113</a>
				6. Turbine revolution sensor	<a href="#">AT-106</a>
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				8. A/T fluid level and state	<a href="#">AT-49</a>
				9. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	10. High and low reverse clutch	<a href="#">AT-286</a>

## TROUBLE DIAGNOSIS

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
4		Shock is too large when changing D3 → D4 or M3 → M4 .	ON vehicle	1. Accelerator pedal position sensor	<a href="#">AT-131</a>
				2. A/T position	<a href="#">AT-206</a>
				3. Input clutch solenoid valve	<a href="#">AT-145</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Engine speed signal	<a href="#">AT-113</a>
				6. Turbine revolution sensor	<a href="#">AT-106</a>
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108,</a> <a href="#">AT-139</a>
				8. A/T fluid level and state	<a href="#">AT-49</a>
				9. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	10. Input clutch	<a href="#">AT-276</a>
5	Shift Shock	Shock is too large when changing D4 → D5 or M4 → M5 .	ON vehicle	1. Accelerator pedal position sensor	<a href="#">AT-131</a>
				2. A/T position	<a href="#">AT-206</a>
				3. Front brake solenoid valve	<a href="#">AT-147</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Engine speed signal	<a href="#">AT-113</a>
				6. Turbine revolution sensor	<a href="#">AT-106</a>
				7. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108,</a> <a href="#">AT-139</a>
				8. A/T fluid level and state	<a href="#">AT-49</a>
				9. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	10. Front brake (brake band)	<a href="#">AT-255</a>
				11. Input clutch	<a href="#">AT-276</a>
6		Shock is too large for downshift when accelerator pedal is pressed.	ON vehicle	1. Accelerator pedal position sensor	<a href="#">AT-131</a>
				2. A/T position	<a href="#">AT-206</a>
				3. CAN communication line	<a href="#">AT-94</a>
				4. Engine speed signal	<a href="#">AT-113</a>
				5. Turbine revolution sensor	<a href="#">AT-106</a>
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108,</a> <a href="#">AT-139</a>
				7. A/T fluid level and state	<a href="#">AT-49</a>
				8. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	9. Front brake (brake band)	<a href="#">AT-255</a>
				10. Input clutch	<a href="#">AT-276</a>
				11. High and low reverse clutch	<a href="#">AT-286</a>
				12. Direct clutch	<a href="#">AT-288</a>

# TROUBLE DIAGNOSIS

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
7		Shock is too large for upshift when accelerator pedal is released.	ON vehicle	1. Accelerator pedal position sensor	<a href="#">AT-131</a>
				2. A/T position	<a href="#">AT-206</a>
				3. Engine speed signal	<a href="#">AT-113</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Turbine revolution sensor	<a href="#">AT-106</a>
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108,</a> <a href="#">AT-139</a>
				7. A/T fluid level and state	<a href="#">AT-49</a>
				8. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	9. Front brake (brake band)	<a href="#">AT-255</a>
				10. Input clutch	<a href="#">AT-276</a>
				11. High and low reverse clutch	<a href="#">AT-286</a>
				12. Direct clutch	<a href="#">AT-288</a>
8	Shift Shock	Shock is too large for lock-up.	ON vehicle	1. Accelerator pedal position sensor	<a href="#">AT-131</a>
				2. A/T position	<a href="#">AT-206</a>
				3. Engine speed signal	<a href="#">AT-113</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Turbine revolution sensor	<a href="#">AT-106</a>
				6. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108,</a> <a href="#">AT-139</a>
				7. Torque converter clutch solenoid valve	<a href="#">AT-125</a>
				8. A/T fluid level and state	<a href="#">AT-49</a>
				9. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	10. Torque converter	<a href="#">AT-255</a>
9		Shock is too large during engine brake.	ON vehicle	1. Accelerator pedal position sensor	<a href="#">AT-131</a>
				2. A/T position	<a href="#">AT-206</a>
				3. CAN communication line	<a href="#">AT-94</a>
				4. A/T fluid level and state	<a href="#">AT-49</a>
				5. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	6. Front brake (brake band)	<a href="#">AT-255</a>
				7. Input clutch	<a href="#">AT-276</a>
				8. High and low reverse clutch	<a href="#">AT-286</a>
				9. Direct clutch	<a href="#">AT-288</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
10		Gear does not change from D1 → D2 or from M1 → M2 . Refer to <a href="#">AT-183, "A/T Does Not Shift: D1 → D2"</a> .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. Direct clutch solenoid valve	<a href="#">AT-149</a>
				4. Line pressure test	<a href="#">AT-50</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Direct clutch	<a href="#">AT-288</a>
11		Gear does not change from D2 → D3 or from M2 → M3 . Refer to <a href="#">AT-185, "A/T Does Not Shift: D2 → D3"</a> .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. High and low reverse clutch solenoid valve	<a href="#">AT-151</a>
				4. Line pressure test	<a href="#">AT-50</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. High and low reverse clutch	<a href="#">AT-286</a>
12	No Up Shift	Gear does not change from D3 → D4 or from M3 → M4 . Refer to <a href="#">AT-187, "A/T Does Not Shift: D3 → D4"</a> .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. Input clutch solenoid valve	<a href="#">AT-145</a>
				4. Front brake solenoid valve	<a href="#">AT-147</a>
				5. Line pressure test	<a href="#">AT-50</a>
				6. CAN communication line	<a href="#">AT-94</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Input clutch	<a href="#">AT-276</a>
13		Gear does not change from D4 → D5 or from M4 → M5 . Refer to <a href="#">AT-189, "A/T Does Not Shift: D4 → D5"</a> .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. Front brake solenoid valve	<a href="#">AT-147</a>
				4. Direct clutch solenoid valve	<a href="#">AT-149</a>
				5. Turbine revolution sensor	<a href="#">AT-106</a>
				6. Line pressure test	<a href="#">AT-50</a>
				7. CAN communication line	<a href="#">AT-94</a>
				8. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	9. Front brake (brake band)	<a href="#">AT-255</a>
				10. Input clutch	<a href="#">AT-276</a>

## TROUBLE DIAGNOSIS

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
14	No Down Shift	In "D" or "M" position, does not downshift to 4th gear.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. Front brake solenoid valve	<a href="#">AT-147</a>
				4. Direct clutch solenoid valve	<a href="#">AT-149</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Line pressure test	<a href="#">AT-50</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Front brake (brake band)	<a href="#">AT-255</a>
				9. Input clutch	<a href="#">AT-276</a>
15	No Down Shift	In "D" or "M" position, does not downshift to 3rd gear.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. Input clutch solenoid valve	<a href="#">AT-145</a>
				4. Front brake solenoid valve	<a href="#">AT-147</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Line pressure test	<a href="#">AT-50</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Input clutch	<a href="#">AT-276</a>
16	No Down Shift	In "D" or "M" position, does not downshift to 2nd gear.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. High and low reverse clutch solenoid valve	<a href="#">AT-151</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Line pressure test	<a href="#">AT-50</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. High and low reverse clutch	<a href="#">AT-286</a>
17	No Down Shift	In "D" or "M" position, does not downshift to 1st gear.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. Direct clutch solenoid valve	<a href="#">AT-149</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Line pressure test	<a href="#">AT-50</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Direct clutch	<a href="#">AT-288</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
18		When "D" or "M" position, remains in 1st gear.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108</a> , <a href="#">AT-139</a>
				3. Direct clutch solenoid valve	<a href="#">AT-149</a>
				4. Line pressure test	<a href="#">AT-50</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. 3rd one-way clutch	<a href="#">AT-274</a>
				8. 1st one-way clutch	<a href="#">AT-281</a>
				9. Gear system	<a href="#">AT-246</a>
				10. Reverse brake	<a href="#">AT-255</a>
				11. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>
19	Slips/Will Not Engage	When "D" or "M" position, remains in 2nd gear.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108</a> , <a href="#">AT-139</a>
				3. Low coast brake solenoid valve	<a href="#">AT-153</a>
				4. Line pressure test	<a href="#">AT-50</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. 3rd one-way clutch	<a href="#">AT-274</a>
				8. Gear system	<a href="#">AT-246</a>
				9. Direct clutch	<a href="#">AT-288</a>
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>
20		When "D" or "M" position, remains in 3rd gear.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108</a> , <a href="#">AT-139</a>
				3. Line pressure test	<a href="#">AT-50</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	6. 3rd one-way clutch	<a href="#">AT-274</a>
				7. Gear system	<a href="#">AT-246</a>
				8. High and low reverse clutch	<a href="#">AT-286</a>
				9. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
21	Slips/Will Not Engage	When "D" or "M" position, remains in 4th gear.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. Input clutch solenoid valve	<a href="#">AT-145</a>
				4. Direct clutch solenoid valve	<a href="#">AT-149</a>
				5. High and low reverse clutch solenoid valve	<a href="#">AT-151</a>
				6. Low coast brake solenoid valve	<a href="#">AT-153</a>
				7. Front brake solenoid valve	<a href="#">AT-147</a>
				8. Line pressure test	<a href="#">AT-50</a>
				9. CAN communication line	<a href="#">AT-94</a>
				10. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	11. Input clutch	<a href="#">AT-276</a>
				12. Gear system	<a href="#">AT-246</a>
				13. High and low reverse clutch	<a href="#">AT-286</a>
				14. Direct clutch	<a href="#">AT-288</a>
22		When "D" or "M" position, remains in 5th gear.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. Front brake solenoid valve	<a href="#">AT-147</a>
				4. Line pressure test	<a href="#">AT-50</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Front brake (brake band)	<a href="#">AT-255</a>
				8. Input clutch	<a href="#">AT-276</a>
				9. Gear system	<a href="#">AT-246</a>
				10. High and low reverse clutch	<a href="#">AT-286</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page			
23		Vehicle cannot be started from D1 . Refer to <a href="#">AT-181</a> , " <a href="#">Vehicle Cannot Be Started from D1</a> " .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>			
				2. Accelerator pedal position sensor	<a href="#">AT-131</a>			
				3. Line pressure test	<a href="#">AT-50</a>			
				4. CAN communication line	<a href="#">AT-94</a>			
				5. Control valve with TCM	<a href="#">AT-215</a>			
			OFF vehicle	6. Torque converter	<a href="#">AT-255</a>			
				7. Oil pump assembly	<a href="#">AT-271</a>			
				8. 3rd one-way clutch	<a href="#">AT-274</a>			
				9. 1st one-way clutch	<a href="#">AT-281</a>			
				10. Gear system	<a href="#">AT-246</a>			
				11. Reverse brake	<a href="#">AT-255</a>			
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> " .)	<a href="#">AT-255</a>			
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> " .)	<a href="#">AT-255</a>			
24	Slips/Will Not Engage	Does not lock-up. Refer to <a href="#">AT-191</a> , " <a href="#">A/T Does Not Lock-up</a> " .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>			
				2. Line pressure test	<a href="#">AT-50</a>			
				3. Engine speed signal	<a href="#">AT-113</a>			
				4. Turbine revolution sensor	<a href="#">AT-106</a>			
				5. Torque converter clutch solenoid valve	<a href="#">AT-125</a>			
				6. CAN communication line	<a href="#">AT-94</a>			
				7. Control valve with TCM	<a href="#">AT-215</a>			
			OFF vehicle	8. Torque converter	<a href="#">AT-255</a>			
				9. Oil pump assembly	<a href="#">AT-271</a>			
			25		Does not hold lock-up condition. Refer to <a href="#">AT-193</a> , " <a href="#">A/T Does Not Hold Lock-up Condition</a> " .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
							2. Line pressure test	<a href="#">AT-50</a>
							3. Engine speed signal	<a href="#">AT-113</a>
							4. Turbine revolution sensor	<a href="#">AT-106</a>
5. Torque converter clutch solenoid valve	<a href="#">AT-125</a>							
6. CAN communication line	<a href="#">AT-94</a>							
7. Control valve with TCM	<a href="#">AT-215</a>							
OFF vehicle	8. Torque converter	<a href="#">AT-255</a>						
	9. Oil pump assembly	<a href="#">AT-271</a>						

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
26		Lock-up is not released. Refer to <a href="#">AT-194</a> , " <a href="#">Lock-up Is Not Released</a> ".	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. Engine speed signal	<a href="#">AT-113</a>
				4. Turbine revolution sensor	<a href="#">AT-106</a>
				5. Torque converter clutch solenoid valve	<a href="#">AT-125</a>
				6. CAN communication line	<a href="#">AT-94</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Torque converter	<a href="#">AT-255</a>
				9. Oil pump assembly	<a href="#">AT-271</a>
27	Slips/Will Not Engage	No shock at all or the clutch slips when vehicle changes speed D1 → D2 or M1 → M2 .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108</a> , <a href="#">AT-139</a>
				3. Direct clutch solenoid valve	<a href="#">AT-149</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Line pressure test	<a href="#">AT-50</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Torque converter	<a href="#">AT-255</a>
				8. Oil pump assembly	<a href="#">AT-271</a>
				9. 3rd one-way clutch	<a href="#">AT-274</a>
				10. Gear system	<a href="#">AT-246</a>
				11. Direct clutch	<a href="#">AT-288</a>
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
28	Slips/Will Not Engage	No shock at all or the clutch slips when vehicle changes speed D2 → D3 or M2 → M3 .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108</a> , <a href="#">AT-139</a>
				3. High and low reverse clutch solenoid valve	<a href="#">AT-151</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Line pressure test	<a href="#">AT-50</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Torque converter	<a href="#">AT-255</a>
				8. Oil pump assembly	<a href="#">AT-271</a>
				9. 3rd one-way clutch	<a href="#">AT-274</a>
				10. Gear system	<a href="#">AT-246</a>
				11. High and low reverse clutch	<a href="#">AT-286</a>
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>
29	Slips/Will Not Engage	No shock at all or the clutch slips when vehicle changes speed D3 → D4 or M3 → M4 .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108</a> , <a href="#">AT-139</a>
				3. Input clutch solenoid valve	<a href="#">AT-145</a>
				4. Front brake solenoid valve	<a href="#">AT-147</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Line pressure test	<a href="#">AT-50</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Torque converter	<a href="#">AT-255</a>
				9. Oil pump assembly	<a href="#">AT-271</a>
				10. Input clutch	<a href="#">AT-276</a>
				11. Gear system	<a href="#">AT-246</a>
				12. High and low reverse clutch	<a href="#">AT-286</a>
				13. Direct clutch	<a href="#">AT-288</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
30	Slips/Will Not Engage	No shock at all or the clutch slips when vehicle changes speed D4 → D5 or M4 → M5 .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. Front brake solenoid valve	<a href="#">AT-147</a>
				4. Direct clutch solenoid valve	<a href="#">AT-149</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Line pressure test	<a href="#">AT-50</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Torque converter	<a href="#">AT-255</a>
				9. Oil pump assembly	<a href="#">AT-271</a>
				10. Front brake (brake band)	<a href="#">AT-255</a>
				11. Input clutch	<a href="#">AT-276</a>
				12. Gear system	<a href="#">AT-246</a>
				13. High and low reverse clutch	<a href="#">AT-286</a>
31	Slips/Will Not Engage	When you press the accelerator pedal and shift speed D5 → D4 or M5 → M4 the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				3. Front brake solenoid valve	<a href="#">AT-147</a>
				4. Direct clutch solenoid valve	<a href="#">AT-149</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Line pressure test	<a href="#">AT-50</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Torque converter	<a href="#">AT-255</a>
				9. Oil pump assembly	<a href="#">AT-271</a>
				10. Input clutch	<a href="#">AT-276</a>
				11. Gear system	<a href="#">AT-246</a>
				12. High and low reverse clutch	<a href="#">AT-286</a>
				13. Direct clutch	<a href="#">AT-288</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
32	Slips/Will Not Engage	When you press the accelerator pedal and shift speed D4 → D3 or M4 → M3 the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108</a> , <a href="#">AT-139</a>
				3. Input clutch solenoid valve	<a href="#">AT-145</a>
				4. Front brake solenoid valve	<a href="#">AT-147</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Line pressure test	<a href="#">AT-50</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Torque converter	<a href="#">AT-255</a>
				9. Oil pump assembly	<a href="#">AT-271</a>
				10. 3rd one-way clutch	<a href="#">AT-274</a>
				11. Gear system	<a href="#">AT-246</a>
				12. High and low reverse clutch	<a href="#">AT-286</a>
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> . "Cross-sectional View" .)	<a href="#">AT-255</a>
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> . "Cross-sectional View" .)	<a href="#">AT-255</a>
33		When you press the accelerator pedal and shift speed D3 → D2 or M3 → M2 the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108</a> , <a href="#">AT-139</a>
				3. High and low reverse clutch solenoid valve	<a href="#">AT-151</a>
				4. Direct clutch solenoid valve	<a href="#">AT-149</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Line pressure test	<a href="#">AT-50</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Torque converter	<a href="#">AT-255</a>
				9. Oil pump assembly	<a href="#">AT-271</a>
				10. 3rd one-way clutch	<a href="#">AT-274</a>
				11. Gear system	<a href="#">AT-246</a>
				12. Direct clutch	<a href="#">AT-288</a>
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> . "Cross-sectional View" .)	<a href="#">AT-255</a>

## TROUBLE DIAGNOSIS

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
34	Slips/Will Not Engage	When you press the accelerator pedal and shift speed D2 → D1 or M2 → M1 the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108</a> , <a href="#">AT-139</a>
				3. Direct clutch solenoid valve	<a href="#">AT-149</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Line pressure test	<a href="#">AT-50</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Torque converter	<a href="#">AT-255</a>
				8. Oil pump assembly	<a href="#">AT-271</a>
				9. 3rd one-way clutch	<a href="#">AT-274</a>
				10. 1st one-way clutch	<a href="#">AT-281</a>
				11. Gear system	<a href="#">AT-246</a>
				12. Reverse brake	<a href="#">AT-255</a>
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , "Cross-sectional View" .)	<a href="#">AT-255</a>
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , "Cross-sectional View" .)	<a href="#">AT-255</a>
35	With selector lever in "D" position, acceleration is extremely poor.		ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. Accelerator pedal position sensor	<a href="#">AT-131</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. PNP switch	<a href="#">AT-102</a>
				6. A/T position	<a href="#">AT-206</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Torque converter	<a href="#">AT-255</a>
				9. Oil pump assembly	<a href="#">AT-271</a>
				10. 1st one-way clutch	<a href="#">AT-281</a>
				11. Gear system	<a href="#">AT-246</a>
				12. Reverse brake	<a href="#">AT-255</a>
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , "Cross-sectional View" .)	<a href="#">AT-255</a>
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , "Cross-sectional View" .)	<a href="#">AT-255</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
36		With selector lever in "R" position, acceleration is extremely poor.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. Accelerator pedal position sensor	<a href="#">AT-131</a>
				4. High and low reverse clutch solenoid valve	<a href="#">AT-151</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. PNP switch	<a href="#">AT-102</a>
				7. A/T position	<a href="#">AT-206</a>
				8. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	9. Gear system	<a href="#">AT-246</a>
				10. Output shaft	<a href="#">AT-255</a>
				11. Reverse brake	<a href="#">AT-255</a>
37	Slips/Will Not Engage	While starting off by accelerating in 1st, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. Accelerator pedal position sensor	<a href="#">AT-131</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	6. Torque converter	<a href="#">AT-255</a>
				7. Oil pump assembly	<a href="#">AT-271</a>
				8. 3rd one-way clutch	<a href="#">AT-274</a>
				9. 1st one-way clutch	<a href="#">AT-281</a>
				10. Gear system	<a href="#">AT-246</a>
				11. Reverse brake	<a href="#">AT-255</a>
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , "Cross-sectional View" .)	<a href="#">AT-255</a>
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , "Cross-sectional View" .)	<a href="#">AT-255</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
38		While accelerating in 2nd, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. Accelerator pedal position sensor	<a href="#">AT-131</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Direct clutch solenoid valve	<a href="#">AT-149</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Torque converter	<a href="#">AT-255</a>
				8. Oil pump assembly	<a href="#">AT-271</a>
				9. 3rd one-way clutch	<a href="#">AT-274</a>
				10. Gear system	<a href="#">AT-246</a>
				11. Direct clutch	<a href="#">AT-288</a>
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>
39	Slips/Will Not Engage	While accelerating in 3rd, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. Accelerator pedal position sensor	<a href="#">AT-131</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. High and low reverse clutch solenoid valve	<a href="#">AT-151</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Torque converter	<a href="#">AT-255</a>
				8. Oil pump assembly	<a href="#">AT-271</a>
				9. 3rd one-way clutch	<a href="#">AT-274</a>
				10. Gear system	<a href="#">AT-246</a>
				11. High and low reverse clutch	<a href="#">AT-286</a>
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
40		While accelerating in 4th, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. Accelerator pedal position sensor	<a href="#">AT-131</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Input clutch solenoid valve	<a href="#">AT-145</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Torque converter	<a href="#">AT-255</a>
				8. Oil pump assembly	<a href="#">AT-271</a>
				9. Input clutch	<a href="#">AT-276</a>
				10. Gear system	<a href="#">AT-246</a>
				11. High and low reverse clutch	<a href="#">AT-286</a>
				12. Direct clutch	<a href="#">AT-288</a>
41	Slips/Will Not Engage	While accelerating in 5th, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. Accelerator pedal position sensor	<a href="#">AT-131</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Front brake solenoid valve	<a href="#">AT-147</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Torque converter	<a href="#">AT-255</a>
				8. Oil pump assembly	<a href="#">AT-271</a>
				9. Front brake (brake band)	<a href="#">AT-255</a>
				10. Input clutch	<a href="#">AT-276</a>
				11. Gear system	<a href="#">AT-246</a>
				12. High and low reverse clutch	<a href="#">AT-286</a>
42		Slips at lock-up.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. Engine speed signal	<a href="#">AT-113</a>
				4. Turbine revolution sensor	<a href="#">AT-106</a>
				5. Torque converter clutch solenoid valve	<a href="#">AT-125</a>
				6. CAN communication line	<a href="#">AT-94</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Torque converter	<a href="#">AT-255</a>
				9. Oil pump assembly	<a href="#">AT-271</a>

# TROUBLE DIAGNOSIS

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
43	Slips/Will Not Engage	No creep at all. Refer to <a href="#">AT-177</a> . "Vehicle Does Not Creep Backward in "R" Position", <a href="#">AT-179</a> . "Vehicle Does Not Creep Forward in "D" Position" .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. Accelerator pedal position sensor	<a href="#">AT-131</a>
				4. Direct clutch solenoid valve	<a href="#">AT-149</a>
				5. PNP switch	<a href="#">AT-102</a>
				6. CAN communication line	<a href="#">AT-94</a>
				7. A/T position	<a href="#">AT-206</a>
				8. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	9. Torque converter	<a href="#">AT-255</a>
				10. Oil pump assembly	<a href="#">AT-271</a>
				11. 1st one-way clutch	<a href="#">AT-281</a>
				12. Gear system	<a href="#">AT-246</a>
				13. Reverse brake	<a href="#">AT-255</a>
				14. Direct clutch	<a href="#">AT-288</a>
				15. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> . "Cross-sectional View" .)	<a href="#">AT-255</a>
				16. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> . "Cross-sectional View" .)	<a href="#">AT-255</a>
44	Vehicle cannot run in all positions.		ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. PNP switch	<a href="#">AT-102</a>
				4. A/T position	<a href="#">AT-206</a>
				5. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	6. Oil pump assembly	<a href="#">AT-271</a>
				7. Gear system	<a href="#">AT-246</a>
				8. Output shaft	<a href="#">AT-255</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
45	Slips/Will Not Engage	With selector lever in "D" position, driving is not possible.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. PNP switch	<a href="#">AT-102</a>
				4. A/T position	<a href="#">AT-206</a>
				5. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	6. Torque converter	<a href="#">AT-255</a>
				7. Oil pump assembly	<a href="#">AT-271</a>
				8. 1st one-way clutch	<a href="#">AT-281</a>
				9. Gear system	<a href="#">AT-246</a>
				10. Reverse brake	<a href="#">AT-255</a>
				11. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> . "Cross-sectional View" .)	<a href="#">AT-255</a>
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> . "Cross-sectional View" .)	<a href="#">AT-255</a>
46		With selector lever in "R" position, driving is not possible.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. PNP switch	<a href="#">AT-102</a>
				4. A/T position	<a href="#">AT-206</a>
				5. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	6. Gear system	<a href="#">AT-246</a>
				7. Output shaft	<a href="#">AT-255</a>
				8. Reverse brake	<a href="#">AT-255</a>
47	Does Not Change	Does not change M5 → M4 . Refer to <a href="#">AT-196</a> . "A/T Does Not Shift: 5th Gear → 4th Gear" .	ON vehicle	1. PNP switch	<a href="#">AT-102</a>
				2. A/T fluid level and state	<a href="#">AT-49</a>
				3. A/T position	<a href="#">AT-206</a>
				4. Manual mode switch	<a href="#">AT-157</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Front brake (brake band)	<a href="#">AT-255</a>
48		Does not change M4 → M3 . Refer to <a href="#">AT-198</a> . "A/T Does Not Shift: 4th Gear → 3rd Gear" .	ON vehicle	1. PNP switch	<a href="#">AT-102</a>
				2. A/T fluid level and state	<a href="#">AT-49</a>
				3. A/T position	<a href="#">AT-206</a>
				4. Manual mode switch	<a href="#">AT-157</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Front brake (brake band)	<a href="#">AT-255</a>
				8. Input clutch	<a href="#">AT-276</a>

# TROUBLE DIAGNOSIS

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
49	Does Not Change	Does not change M3 → M2 . Refer to <a href="#">AT-199, "A/T Does Not Shift: 3rd Gear → 2nd Gear"</a> .	ON vehicle	1. PNP switch	<a href="#">AT-102</a>
				2. A/T fluid level and state	<a href="#">AT-49</a>
				3. A/T position	<a href="#">AT-206</a>
				4. Manual mode switch	<a href="#">AT-157</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Front brake (brake band)	<a href="#">AT-255</a>
				8. Input clutch	<a href="#">AT-276</a>
				9. High and low reverse clutch	<a href="#">AT-286</a>
50	Does Not Change	Does not change M2 → M1 . Refer to <a href="#">AT-201, "A/T Does Not Shift: 2nd Gear → 1st Gear"</a> .	ON vehicle	1. PNP switch	<a href="#">AT-102</a>
				2. A/T fluid level and state	<a href="#">AT-49</a>
				3. A/T position	<a href="#">AT-206</a>
				4. Manual mode switch	<a href="#">AT-157</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Input clutch	<a href="#">AT-276</a>
				8. High and low reverse clutch	<a href="#">AT-286</a>
				9. Direct clutch	<a href="#">AT-288</a>
51	Others	Cannot be changed to manual mode. Refer to <a href="#">AT-196, "Cannot Be Changed to Manual Mode"</a> .	ON vehicle	1. Manual mode switch	<a href="#">AT-157</a>
				2. Turbine revolution sensor	<a href="#">AT-106</a>
				3. CAN communication line	<a href="#">AT-94</a>
52	Others	Shift point is high in "D" position.	ON vehicle	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				2. Accelerator pedal position sensor	<a href="#">AT-131</a>
				3. CAN communication line	<a href="#">AT-94</a>
				4. A/T fluid temperature sensor	<a href="#">AT-134</a>
				5. Control valve with TCM	<a href="#">AT-215</a>
53	Others	Shift point is low in "D" position.	ON vehicle	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108, AT-139</a>
				2. Accelerator pedal position sensor	<a href="#">AT-131</a>
				3. CAN communication line	<a href="#">AT-94</a>
				4. Control valve with TCM	<a href="#">AT-215</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
54		Judder occurs during lock-up.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Engine speed signal	<a href="#">AT-113</a>
				3. Turbine revolution sensor	<a href="#">AT-106</a>
				4. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108</a> , <a href="#">AT-139</a>
				5. Accelerator pedal position sensor	<a href="#">AT-131</a>
				6. CAN communication line	<a href="#">AT-94</a>
				7. Torque converter clutch solenoid valve	<a href="#">AT-125</a>
				8. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	9. Torque converter	<a href="#">AT-255</a>
55	Others	Strange noise in "R" position.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Engine speed signal	<a href="#">AT-113</a>
				3. CAN communication line	<a href="#">AT-94</a>
				4. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	5. Torque converter	<a href="#">AT-255</a>
				6. Oil pump assembly	<a href="#">AT-271</a>
				7. Gear system	<a href="#">AT-246</a>
				8. High and low reverse clutch	<a href="#">AT-286</a>
				9. Reverse brake	<a href="#">AT-255</a>
56		Strange noise in "N" position.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Engine speed signal	<a href="#">AT-113</a>
				3. CAN communication line	<a href="#">AT-94</a>
				4. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	5. Torque converter	<a href="#">AT-255</a>
				6. Oil pump assembly	<a href="#">AT-271</a>
				7. Gear system	<a href="#">AT-246</a>
57		Strange noise in "D" position.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Engine speed signal	<a href="#">AT-113</a>
				3. CAN communication line	<a href="#">AT-94</a>
				4. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	5. Torque converter	<a href="#">AT-255</a>
				6. Oil pump assembly	<a href="#">AT-271</a>
				7. Gear system	<a href="#">AT-246</a>
				8. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ".)	<a href="#">AT-255</a>

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page			
58		Vehicle does not decelerate by engine brake. Refer to <a href="#">AT-202</a> , " <a href="#">Vehicle Does Not Decelerate by Engine Brake</a> ".	ON vehicle	1. PNP switch	<a href="#">AT-102</a>			
				2. A/T fluid level and state	<a href="#">AT-49</a>			
				3. A/T position	<a href="#">AT-206</a>			
				4. Manual mode switch	<a href="#">AT-157</a>			
				5. CAN communication line	<a href="#">AT-94</a>			
				6. Control valve with TCM	<a href="#">AT-215</a>			
			OFF vehicle	7. Input clutch	<a href="#">AT-276</a>			
				8. High and low reverse clutch	<a href="#">AT-286</a>			
				9. Direct clutch	<a href="#">AT-288</a>			
59		Engine brake does not work M5 → M4 .	ON vehicle	1. PNP switch	<a href="#">AT-102</a>			
				2. A/T fluid level and state	<a href="#">AT-49</a>			
				3. A/T position	<a href="#">AT-206</a>			
				4. Manual mode switch	<a href="#">AT-157</a>			
				5. CAN communication line	<a href="#">AT-94</a>			
				6. Control valve with TCM	<a href="#">AT-215</a>			
			OFF vehicle	7. Front brake (brake band)	<a href="#">AT-255</a>			
60	Others	Engine brake does not work M4 → M3 .	ON vehicle	1. PNP switch	<a href="#">AT-102</a>			
				2. A/T fluid level and state	<a href="#">AT-49</a>			
				3. A/T position	<a href="#">AT-206</a>			
				4. Manual mode switch	<a href="#">AT-157</a>			
				5. CAN communication line	<a href="#">AT-94</a>			
				6. Control valve with TCM	<a href="#">AT-215</a>			
			OFF vehicle	7. Front brake (brake band)	<a href="#">AT-255</a>			
				8. Input clutch	<a href="#">AT-276</a>			
				61		ON vehicle	1. PNP switch	<a href="#">AT-102</a>
							2. A/T fluid level and state	<a href="#">AT-49</a>
3. A/T position	<a href="#">AT-206</a>							
4. Manual mode switch	<a href="#">AT-157</a>							
5. CAN communication line	<a href="#">AT-94</a>							
6. Control valve with TCM	<a href="#">AT-215</a>							
OFF vehicle	7. Front brake (brake band)	<a href="#">AT-255</a>						
	8. Input clutch	<a href="#">AT-276</a>						
	9. High and low reverse clutch	<a href="#">AT-286</a>						

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No.	Items	Symptom	Condition	Diagnostic Item	Reference page
62	Others	Engine brake does not work M2 → M1 .	ON vehicle	1. PNP switch	<a href="#">AT-102</a>
				2. A/T fluid level and state	<a href="#">AT-49</a>
				3. A/T position	<a href="#">AT-206</a>
				4. Manual mode switch	<a href="#">AT-157</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Input clutch	<a href="#">AT-276</a>
				8. High and low reverse clutch	<a href="#">AT-286</a>
				9. Direct clutch	<a href="#">AT-288</a>
63	Others	Maximum speed low.	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Line pressure test	<a href="#">AT-50</a>
				3. Accelerator pedal position sensor	<a href="#">AT-131</a>
				4. CAN communication line	<a href="#">AT-94</a>
				5. Direct clutch solenoid valve	<a href="#">AT-149</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Torque converter	<a href="#">AT-255</a>
				8. Oil pump assembly	<a href="#">AT-271</a>
				9. Input clutch	<a href="#">AT-276</a>
				10. Gear system	<a href="#">AT-246</a>
				11. High and low reverse clutch	<a href="#">AT-286</a>
				12. Direct clutch	<a href="#">AT-288</a>
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ". )	<a href="#">AT-255</a>
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17</a> , " <a href="#">Cross-sectional View</a> ". )	<a href="#">AT-255</a>
64	Others	Extremely large creep.	ON vehicle	1. Engine idle speed	<a href="#">EC-76</a>
				2. CAN communication line	<a href="#">AT-94</a>
			OFF vehicle	3. Torque converter	<a href="#">AT-255</a>
65	Others	With selector lever in "P" position, vehicle does not enter parking condition or, with selector lever in another position, parking condition is not cancelled.	ON vehicle	1. PNP switch	<a href="#">AT-102</a>
				2. A/T position	<a href="#">AT-206</a>
				3. Parking pawl components	<a href="#">AT-246</a>
66	Others	Vehicle runs with A/T in "P" position.	ON vehicle	1. PNP switch	<a href="#">AT-102</a>
				2. A/T fluid level and state	<a href="#">AT-49</a>
				3. A/T position	<a href="#">AT-206</a>
				4. Control valve with TCM	<a href="#">AT-215</a>
				5. Parking pawl components	<a href="#">AT-246</a>
			OFF vehicle	6. Gear system	<a href="#">AT-246</a>

# TROUBLE DIAGNOSIS

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
67	Others	Vehicle runs with A/T in "N" position. Refer to <a href="#">AT-174, "In "N" Position, Vehicle Moves"</a> .	ON vehicle	1. PNP switch	<a href="#">AT-102</a>
				2. A/T fluid level and state	<a href="#">AT-49</a>
				3. A/T position	<a href="#">AT-206</a>
				4. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	5. Input clutch	<a href="#">AT-276</a>
				6. Gear system	<a href="#">AT-246</a>
				7. Direct clutch	<a href="#">AT-288</a>
				8. Reverse brake	<a href="#">AT-255</a>
				9. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17, "Cross-sectional View"</a> .)	<a href="#">AT-255</a>
				10. Low coast brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to <a href="#">AT-17, "Cross-sectional View"</a> .)	<a href="#">AT-255</a>
68	Others	Engine does not start in "N" or "P" position. Refer to <a href="#">AT-173, "Engine Cannot Be Started in "P" or "N" Position"</a> .	ON vehicle	1. Ignition switch and starter	<a href="#">PG-4, SC-8</a>
				2. A/T position	<a href="#">AT-206</a>
				3. PNP switch	<a href="#">AT-102</a>
69	Others	Engine starts in positions other than "N" or "P".	ON vehicle	1. Ignition switch and starter	<a href="#">PG-4, SC-8</a>
70	Others	Engine stall.	ON vehicle	2. A/T position	<a href="#">AT-206</a>
				3. PNP switch	<a href="#">AT-102</a>
				1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Engine speed signal	<a href="#">AT-113</a>
				3. Turbine revolution sensor	<a href="#">AT-106</a>
				4. Torque converter clutch solenoid valve	<a href="#">AT-125</a>
			5. CAN communication line	<a href="#">AT-94</a>	
6. Control valve with TCM	<a href="#">AT-215</a>				
OFF vehicle	7. Torque converter	<a href="#">AT-255</a>			
71	Others	Engine stalls when selector lever shifted "N" → "D", "R".	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Engine speed signal	<a href="#">AT-113</a>
				3. Turbine revolution sensor	<a href="#">AT-106</a>
				4. Torque converter clutch solenoid valve	<a href="#">AT-125</a>
				5. CAN communication line	<a href="#">AT-94</a>
				6. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	7. Torque converter	<a href="#">AT-255</a>

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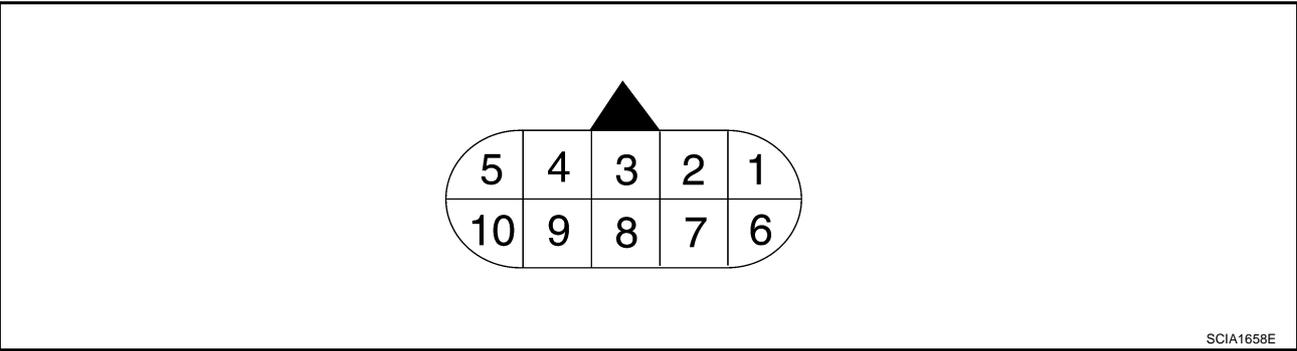
## TROUBLE DIAGNOSIS

No.	Items	Symptom	Condition	Diagnostic Item	Reference page
72	Others	Engine speed does not return to idle. Refer to <a href="#">AT-195</a> . <a href="#">"Engine Speed Does Not Return to Idle"</a> .	ON vehicle	1. A/T fluid level and state	<a href="#">AT-49</a>
				2. Direct clutch solenoid valve	<a href="#">AT-149</a>
				3. Front brake solenoid valve	<a href="#">AT-147</a>
				4. Accelerator pedal position sensor	<a href="#">AT-131</a>
				5. Vehicle speed sensor A/T and vehicle speed sensor MTR	<a href="#">AT-108</a> , <a href="#">AT-139</a>
				6. CAN communication line	<a href="#">AT-94</a>
				7. Control valve with TCM	<a href="#">AT-215</a>
			OFF vehicle	8. Front brake (brake band)	<a href="#">AT-255</a>
			9. Direct clutch	<a href="#">AT-288</a>	

# TROUBLE DIAGNOSIS

## TCM Input/Output Signal Reference Values A/T ASSEMBLY HARNESS CONNECTOR TERMINAL LAYOUT

NCS0002D



SCIA1658E

### TCM INSPECTION TABLE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)	
1	G	Power supply (Memory back-up)	Always	Battery voltage	
2	G	Power supply (Memory back-up)	Always	Battery voltage	
3	L	CAN-H	—	—	
4	PU/W	K-line (CONSULT-III signal)	The terminal is connected to the data link connector for CONSULT-III.		
5	B	Ground	Always	0 V	
6	Y/R	Power supply		—	Battery voltage
				—	0 V
7	Y	Back-up lamp relay		Selector lever in "R" position.	0 V
				Selector lever in other positions.	Battery voltage
8	P	CAN-L	—	—	
9	GY/R	Starter relay		Selector lever in "N" and "P" positions.	Battery voltage
				Selector lever in other positions.	0 V
10	B	Ground	Always	0 V	

# TROUBLE DIAGNOSIS

## CONSULT-III Function (TRANSMISSION)

NCS0002E

CONSULT-III can display each diagnostic item using the diagnostic test mode shown following.

### FUNCTION

Diagnostic test mode	Function
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-III.
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.
Data monitor	Input/Output data in the ECU can be read.
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.
Function test	Performed by CONSULT-III instead of a technician to determine whether each system is "OK" or "NG".
DTC work support	Select the operating condition to confirm Diagnosis Trouble Codes.
ECU part number	TCM part number can be read.

### CONSULT-III REFERENCE VALUE

#### NOTICE:

- The CONSULT-III 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-III display. If the difference is noticeable, mechanical parts (except solenoids, sensors, etc.) may be malfunctioning. Check mechanical parts using applicable diagnostic procedures.
- Shift schedule (which implies gear position) displayed on CONSULT-III 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-III indicates the point where shifts are completed.
- Display of solenoid valves on CONSULT-III changes at the start of shifting, while gear position is displayed upon completion of shifting (which is computed by TCM).

Item name	Condition	Display value (Approx.)
ATF TEMP SE 1	0°C (32° F) – 20°C (68°F) – 80°C (176°F)	3.3 – 2.7 – 0.9 V
ATF TEMP SE 2		3.3 – 2.5 – 0.7 V
ATF TEMP 1	Ignition switch ON	Measured ATF temperature is displayed.
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A
SLCT LVR POSI	Selector lever in "N" and "P" positions.	N/P
	Selector lever in "R" position.	R
	Selector lever in "D" position.	D
VHCL/S SE-A/T	During driving	Approximately matches the speedometer reading.
VEHICLE SPEED	During driving	Approximately matches the speedometer reading.
ENGINE SPEED	Engine running	Closely matches the tachometer reading.
LINE PRES SOL	During driving	0.2 – 0.6 A
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.
VHCL/S SE-MTR	During driving	Approximately matches the speedometer reading.
ATF PRES SW 2	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF

## TROUBLE DIAGNOSIS

Item name	Condition	Display value (Approx.)	
I/C SOLENOID	Input clutch disengaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A	A
	Input clutch engaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A	
FR/B SOLENOID	Front brake engaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A	B
	Front brake disengaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A	
D/C SOLENOID	Direct clutch disengaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A	AT
	Direct clutch engaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A	
HLR/C SOL	High and low reverse clutch disengaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A	D
	High and low reverse clutch engaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A	
ON OFF SOL	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON	E
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF	
MANU MODE SW	Manual shift gate position (neutral)	ON	F
	Other than the above	OFF	
NON M-MODE SW	Manual shift gate position	OFF	G
	Other than the above	ON	
UP SW LEVER	Selector lever: + side	ON	H
	Other than the above	OFF	
DOWN SW LEVER	Selector lever: - side	ON	I
	Other than the above	OFF	
STARTER RELAY	Selector lever in “N” and “P” positions.	ON	J
	Selector lever in other positions.	OFF	
ACCELE POSI	Released accelerator pedal.	0.0/8	K
	Fully depressed accelerator pedal.	8.0/8	
CLSD THL POS	Released accelerator pedal.	ON	L
	Fully depressed accelerator pedal.	OFF	
W/O THL POS	Fully depressed accelerator pedal.	ON	M
	Released accelerator pedal.	OFF	
BRAKE SW	Depressed brake pedal.	ON	
	Released brake pedal.	OFF	
GEAR	During driving	1, 2, 3, 4, 5	

# TROUBLE DIAGNOSIS

## SELF-DIAGNOSTIC RESULT MODE

After performing self-diagnosis, place check marks for results on the [AT-44, "DIAGNOSTIC WORKSHEET"](#) . Reference pages are provided following the items.

### Display Items List

X: Applicable, —: Not applicable

Items (CONSULT-III screen terms)	Malfunction is detected when...	TCM self-diagnosis	OBD-II (DTC)	Reference page
		"TRANSMISSION" with CONSULT-III	MIL*1, "ENGINE" with CONSULT-III or GST	
CAN COMM CIRCUIT	When TCM is not transmitting or receiving CAN communication signal for 2 seconds or more.	U1000	U1000	<a href="#">AT-94</a>
STARTER RELAY/CIRC	If this signal is ON other than in "P" or "N" position, this is judged to be a malfunction. (And if it is OFF in "P" or "N" position, this too is judged to be a malfunction.)	P0615	—	<a href="#">AT-97</a>
TCM	TCM is malfunctioning	P0700	P0700	<a href="#">AT-101</a>
PNP SW/CIRC	<ul style="list-style-type: none"> <li>● PNP switch 1–4 signals input with impossible pattern.</li> <li>● "P" position is detected from "N" position without any other position being detected in between.</li> </ul>	P0705	P0705	<a href="#">AT-102</a>
TURBINE REV S/CIRC	<ul style="list-style-type: none"> <li>● TCM does not receive the proper voltage signal from the sensor.</li> <li>● TCM detects an irregularity only at position of 4th gear for turbine revolution sensor 2.</li> </ul>	P0717	P0717	<a href="#">AT-106</a>
VEH SPD SEN/CIR AT	<ul style="list-style-type: none"> <li>● Signal from vehicle speed sensor A/T (Revolution sensor) not input due to cut line or the like.</li> <li>● Unexpected signal input during running.</li> <li>● After ignition switch is turned ON, unexpected signal input from vehicle speed sensor MTR before the vehicle starts moving.</li> </ul>	P0720	P0720	<a href="#">AT-108</a>
ENGINE SPEED SIG	TCM does not receive the CAN communication signal from the ECM.	P0725	P0725	<a href="#">AT-113</a>
A/T 1ST GR FNCTN	A/T cannot shift to 1st gear	P0731	P0731	<a href="#">AT-115</a>
A/T 2ND GR FNCTN	A/T cannot shift to 2nd gear	P0732	P0732	<a href="#">AT-117</a>
A/T 3RD GR FNCTN	A/T cannot shift to 3rd gear	P0733	P0733	<a href="#">AT-119</a>
A/T 4TH GR FNCTN	A/T cannot shift to 4th gear	P0734	P0734	<a href="#">AT-121</a>
A/T 5TH GR FNCTN	A/T cannot shift to 5th gear	P0735	P0735	<a href="#">AT-123</a>
TCC SOLENOID/CIRC	Normal voltage not applied to solenoid due to cut line, short, or the like.	P0740	P0740	<a href="#">AT-125</a>
A/T TCC S/V FNCTN	<ul style="list-style-type: none"> <li>● A/T cannot perform lock-up even if electrical circuit is good.</li> <li>● TCM detects as irregular by comparing difference value with slip rotation.</li> </ul>	P0744	P0744*2	<a href="#">AT-127</a>
L/PRESS SOL/CIRC	<ul style="list-style-type: none"> <li>● Normal voltage not applied to solenoid due to cut line, short, or the like.</li> <li>● TCM detects as irregular by comparing target value with monitor value.</li> </ul>	P0745	P0745	<a href="#">AT-129</a>
TP SEN/CIRC A/T	TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM.	P1705	P1705	<a href="#">AT-131</a>
ATF TEMP SEN/CIRC	During running, the A/T fluid temperature sensor signal voltage is excessively high or low.	P1710	P0710	<a href="#">AT-134</a>

# TROUBLE DIAGNOSIS

Items (CONSULT-III screen terms)	Malfunction is detected when...	TCM self-diagnosis	OBD-II (DTC)	Reference page	
		"TRANSMISSION" with CONSULT-III	MIL*1, "ENGINE" with CONSULT-III or GST		
VEH SPD SE/CIR-MTR	<ul style="list-style-type: none"> <li>● Signal (CAN communication) from vehicle speed sensor MTR not input due to cut line or the like.</li> <li>● Unexpected signal input during running.</li> </ul>	P1721	—	<a href="#">AT-139</a>	AT
A/T INTERLOCK	Except during shift change, the gear position and ATF pressure switch states are monitored and comparative judgment made.	P1730	P1730	<a href="#">AT-141</a>	D
A/T 1ST E/BRAKING	Each ATF pressure switch and solenoid current is monitored and if a pattern is detected having engine braking 1st gear other than in the M1 position, a malfunction is detected.	P1731	—	<a href="#">AT-143</a>	E
I/C SOLENOID/CIRC	<ul style="list-style-type: none"> <li>● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like.</li> <li>● TCM detects as irregular by comparing target value with monitor value.</li> </ul>	P1752	P1752	<a href="#">AT-145</a>	F
FR/B SOLENOID/CIRC	<ul style="list-style-type: none"> <li>● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like.</li> <li>● TCM detects as irregular by comparing target value with monitor value.</li> </ul>	P1757	P1757	<a href="#">AT-147</a>	G
D/C SOLENOID/CIRC	<ul style="list-style-type: none"> <li>● Normal voltage not applied to solenoid due to cut line, short, or the like.</li> <li>● TCM detects as irregular by comparing target value with monitor value.</li> </ul>	P1762	P1762	<a href="#">AT-149</a>	H
HLR/C SOL/CIRC	<ul style="list-style-type: none"> <li>● Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like.</li> <li>● TCM detects as irregular by comparing target value with monitor value.</li> </ul>	P1767	P1767	<a href="#">AT-151</a>	J
LC/B SOLENOID/CIRC	Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like.	P1772	P1772	<a href="#">AT-153</a>	K
LC/B SOLENOID FNCT	<ul style="list-style-type: none"> <li>● TCM detects an improper voltage drop when it tries to operate the solenoid valve.</li> <li>● Condition of ATF pressure switch 2 is different from monitor value, and relation between gear position and actual gear ratio is irregular.</li> </ul>	P1774	P1774*2	<a href="#">AT-155</a>	L
MANU MODE SW/CIRC	When an impossible pattern of switch signals is detected, a malfunction is detected.	P1815	—	<a href="#">AT-157</a>	M
NO DTC IS DETECTED FURTHER TESTING MAY BE REQUIRED	No NG item has been detected.	X	X	—	

● \*1: Refer to [AT-39, "Malfunction Indicator Lamp \(MIL\)"](#).

● \*2: These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.

# TROUBLE DIAGNOSIS

## DATA MONITOR MODE

### Display Items List

X: Standard, —: Not applicable, ▼: Option

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
VHCL/S SE-A/T (km/h)	X	X	▼	Revolution sensor
VHCL/S SE-MTR (km/h)	X	—	▼	
ACCELE POSI (0.0/8)	X	—	▼	Accelerator pedal position signal
THROTTLE POSI (0.0/8)	X	X	▼	Degree of opening for accelerator recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
CLSD THL POS (ON/OFF)	X	—	▼	Signal input with CAN communications.
W/O THL POS (ON/OFF)	X	—	▼	
BRAKE SW (ON/OFF)	X	—	▼	Stop lamp switch
GEAR	—	X	▼	Gear position recognized by the TCM updated after gear-shifting.
ENGINE SPEED (rpm)	X	X	▼	
TURBINE REV (rpm)	X	X	▼	
OUTPUT REV (rpm)	X	X	▼	
GEAR RATIO	—	X	▼	
TC SLIP SPEED (rpm)	—	X	▼	Difference between engine speed and torque converter input shaft speed.
F SUN GR REV (rpm)	—	—	▼	
F CARR GR REV (rpm)	—	—	▼	
ATF TEMP SE 1 (V)	X	—	▼	
ATF TEMP SE 2 (V)	X	—	▼	
ATF TEMP 1 (°C)	—	X	▼	
ATF TEMP 2 (°C)	—	X	▼	
BATTERY VOLT (V)	X	—	▼	
ATF PRES SW 1 (ON/OFF)	X	X	▼	(for FR/B solenoid)
ATF PRES SW 2 (ON/OFF)	X	X	▼	(for LC/B solenoid)
ATF PRES SW 3 (ON/OFF)	X	X	▼	(for I/C solenoid)
ATF PRES SW 5 (ON/OFF)	X	X	▼	(for D/C solenoid)
ATF PRES SW 6 (ON/OFF)	X	X	▼	(for HLR/C solenoid)
PNP SW 1 (ON/OFF)	X	—	▼	
PNP SW 2 (ON/OFF)	X	—	▼	
PNP SW 3 (ON/OFF)	X	—	▼	
PNP SW 4 (ON/OFF)	X	—	▼	
1 POSITION SW (ON/OFF)	X	—	▼	

# TROUBLE DIAGNOSIS

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
SLCT LVR POSI	—	X	▼	Selector lever position is recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
OD CONT SW (ON/OFF)	X	—	▼	Not mounted but displayed.
POWERSHIFT SW (ON/OFF)	X	—	▼	
HOLD SW (ON/OFF)	X	—	▼	
MANU MODE SW (ON/OFF)	X	—	▼	
NON M-MODE SW (ON/OFF)	X	—	▼	
UP SW LEVER (ON/OFF)	X	—	▼	Not mounted but displayed.
DOWN SW LEVER (ON/OFF)	X	—	▼	
SFT UP ST SW (ON/OFF)	—	—	▼	
SFT DWN ST SW (ON/OFF)	—	—	▼	Not mounted but displayed.
ASCD-OD CUT (ON/OFF)	—	—	▼	
ASCD-CRUISE (ON/OFF)	—	—	▼	Not mounted but displayed.
ABS SIGNAL (ON/OFF)	—	—	▼	
ACC OD CUT (ON/OFF)	—	—	▼	
ACC SIGNAL (ON/OFF)	—	—	▼	Not mounted but displayed.
TCS GR/P KEEP (ON/OFF)	—	—	▼	
TCS SIGNAL 2 (ON/OFF)	—	—	▼	Not mounted but displayed.
TCS SIGNAL 1 (ON/OFF)	—	—	▼	
TCC SOLENOID (A)	—	X	▼	
LINE PRES SOL (A)	—	X	▼	Not mounted but displayed.
I/C SOLENOID (A)	—	X	▼	
FR/B SOLENOID (A)	—	X	▼	
D/C SOLENOID (A)	—	X	▼	Not mounted but displayed.
HLR/C SOL (A)	—	X	▼	
ON OFF SOL (ON/OFF)	—	—	▼	LC/B solenoid
TCC SOL MON (A)	—	—	▼	Not mounted but displayed.
L/P SOL MON (A)	—	—	▼	
I/C SL MON (A)	—	—	▼	
FR/B SOL MON (A)	—	—	▼	Not mounted but displayed.
D/C SOL MON (A)	—	—	▼	
HLR/C SOL MON (A)	—	—	▼	Not mounted but displayed.
ON OFF SOL MON (ON/OFF)	—	—	▼	
P POSI IND (ON/OFF)	—	—	▼	Not mounted but displayed.
R POSI IND (ON/OFF)	—	—	▼	

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# TROUBLE DIAGNOSIS

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
N POSI IND (ON/OFF)	—	—	▼	
D POSI IND (ON/OFF)	—	—	▼	
4TH POSI IND (ON/OFF)	—	—	▼	
3RD POSI IND (ON/OFF)	—	—	▼	
2ND POSI IND (ON/OFF)	—	—	▼	
1ST POSI IND (ON/OFF)	—	—	▼	
MANU MODE IND (ON/OFF)	—	—	▼	
POWER M LAMP (ON/OFF)	—	—	▼	
F-SAFE IND/L (ON/OFF)	—	—	▼	
ATF WARN LAMP (ON/OFF)	—	—	▼	Not mounted but displayed.
BACK-UP LAMP (ON/OFF)	—	—	▼	
STARTER RELAY (ON/OFF)	—	—	▼	
PNP SW3 MON (ON/OFF)	—	—	▼	
C/V CLB ID1	—	—	▼	
C/V CLB ID2	—	—	▼	
C/V CLB ID3	—	—	▼	
UNIT CLB ID1	—	—	▼	
UNIT CLB ID2	—	—	▼	
UNIT CLB ID3	—	—	▼	
TRGT GR RATIO	—	—	▼	
TRGT PRES TCC (kPa)	—	—	▼	
TRGT PRES L/P (kPa)	—	—	▼	
TRGT PRES I/C (kPa)	—	—	▼	
TRGT PRE FR/B (kPa)	—	—	▼	
TRGT PRES D/C (kPa)	—	—	▼	
TRG PRE HLR/C (kPa)	—	—	▼	
SHIFT PATTERN	—	—	▼	
DRV CST JUDGE	—	—	▼	
START RLY MON	—	—	▼	
NEXT GR POSI	—	—	▼	
SHIFT MODE	—	—	▼	
MANU GR POSI	—	—	▼	
VEHICLE SPEED (km/h)	—	X	▼	Vehicle speed recognized by the TCM.
Voltage (V)	—	—	▼	Displays the value measured by the voltage probe.

# TROUBLE DIAGNOSIS

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Frequency (Hz)	—	—	▼	The value measured by the pulse probe is displayed.
DUTY-HI (high) (%)	—	—	▼	
DUTY-LOW (low) (%)	—	—	▼	
PLS WIDTH-HI (ms)	—	—	▼	
PLS WIDTH-LOW (ms)	—	—	▼	

## DTC WORK SUPPORT MODE

### Display Items List

DTC work support item	Description	Check item
1ST GR FUNCTN P0731	Following items for "1st gear function" can be confirmed. <ul style="list-style-type: none"> <li>● Self-diagnosis status (whether the diagnosis is being performed or not)</li> <li>● Self-diagnostic results (OK or NG)</li> </ul>	
2ND GR FUNCTN P0732	Following items for "2nd gear function" can be confirmed. <ul style="list-style-type: none"> <li>● Self-diagnosis status (whether the diagnosis is being performed or not)</li> <li>● Self-diagnostic results (OK or NG)</li> </ul>	<ul style="list-style-type: none"> <li>● Input clutch solenoid valve</li> <li>● Front brake solenoid valve</li> </ul>
3RD GR FUNCTN P0733	Following items for "3rd gear function" can be confirmed. <ul style="list-style-type: none"> <li>● Self-diagnosis status (whether the diagnosis is being performed or not)</li> <li>● Self-diagnostic results (OK or NG)</li> </ul>	<ul style="list-style-type: none"> <li>● Direct clutch solenoid valve</li> </ul>
4TH GR FUNCTN P0734	Following items for "4th gear function" can be confirmed. <ul style="list-style-type: none"> <li>● Self-diagnosis status (whether the diagnosis is being performed or not)</li> <li>● Self-diagnostic results (OK or NG)</li> </ul>	<ul style="list-style-type: none"> <li>● High and low reverse clutch solenoid valve</li> <li>● Each clutch</li> </ul>
5TH GR FUNCTN P0735	Following items for "5th gear function" can be confirmed. <ul style="list-style-type: none"> <li>● Self-diagnosis status (whether the diagnosis is being performed or not)</li> <li>● Self-diagnostic results (OK or NG)</li> </ul>	<ul style="list-style-type: none"> <li>● Hydraulic control circuit</li> </ul>

# TROUBLE DIAGNOSIS

NCS0002F

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## Diagnostic Procedure Without CONSULT-III OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)



Refer to [EC-125, "Generic Scan Tool \(GST\) Function"](#) .

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



Refer to [EC-62, "Malfunction Indicator Lamp \(MIL\)"](#) .

## TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)



### Description

When the ignition switch is turned ON, the indicator lamp lights up 2 seconds. As a method for locating the suspect circuit, when the self-diagnostics start signal is input, the memory for the malfunction location is output and A/T CHECK indicator lamp flashes to display the corresponding DTC.

### Diagnostic Procedure

#### 1. CHECK A/T CHECK INDICATOR LAMP

1. Start the engine with selector lever in "P" position. Warm engine to normal operating temperature.
2. Turn ignition switch ON and OFF at least twice, then leave it in the OFF position.
3. Wait 10 seconds.
4. Turn ignition switch ON. (Do not start engine.)

Does A/T CHECK indicator lamp come on for about 2 seconds?

YES >> GO TO 2.

NO >> Go to [AT-172, "A/T Check Indicator Lamp Does Not Come On"](#) .

#### 2. JUDGMENT PROCEDURE

1. Turn ignition switch OFF.
2. Keep pressing shift lock release button.
3. Move selector lever from "P" to "D" position.
4. Release accelerator pedal. (Set the closed throttle position signal ON.)
5. Depress brake pedal. (Stop lamp switch signal ON.)
6. Turn ignition switch ON. (Do not start engine.)
7. Wait 3 seconds.
8. Move the selector lever to the manual shift gate side. (Manual mode switch ON.)
9. Release brake pedal. (Stop lamp switch signal OFF.)
10. Move the selector lever to "D" position. (Manual mode switch OFF.)
11. Depress brake pedal. (Stop lamp switch signal ON.)
12. Release brake pedal. (Stop lamp switch signal OFF.)
13. Depress accelerator pedal fully and release it.

>> GO TO 3.

#### 3. CHECK SELF-DIAGNOSIS CODE

Check A/T CHECK indicator lamp. Refer to [AT-93, "Judgment Self-diagnosis Code"](#) .

If the system does not go into self-diagnostics. Refer to [AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#) , [AT-157, "DTC P1815 MANUAL MODE SWITCH"](#) , [AT-166, "CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT"](#) , [AT-167, "BRAKE SIGNAL CIRCUIT"](#) .

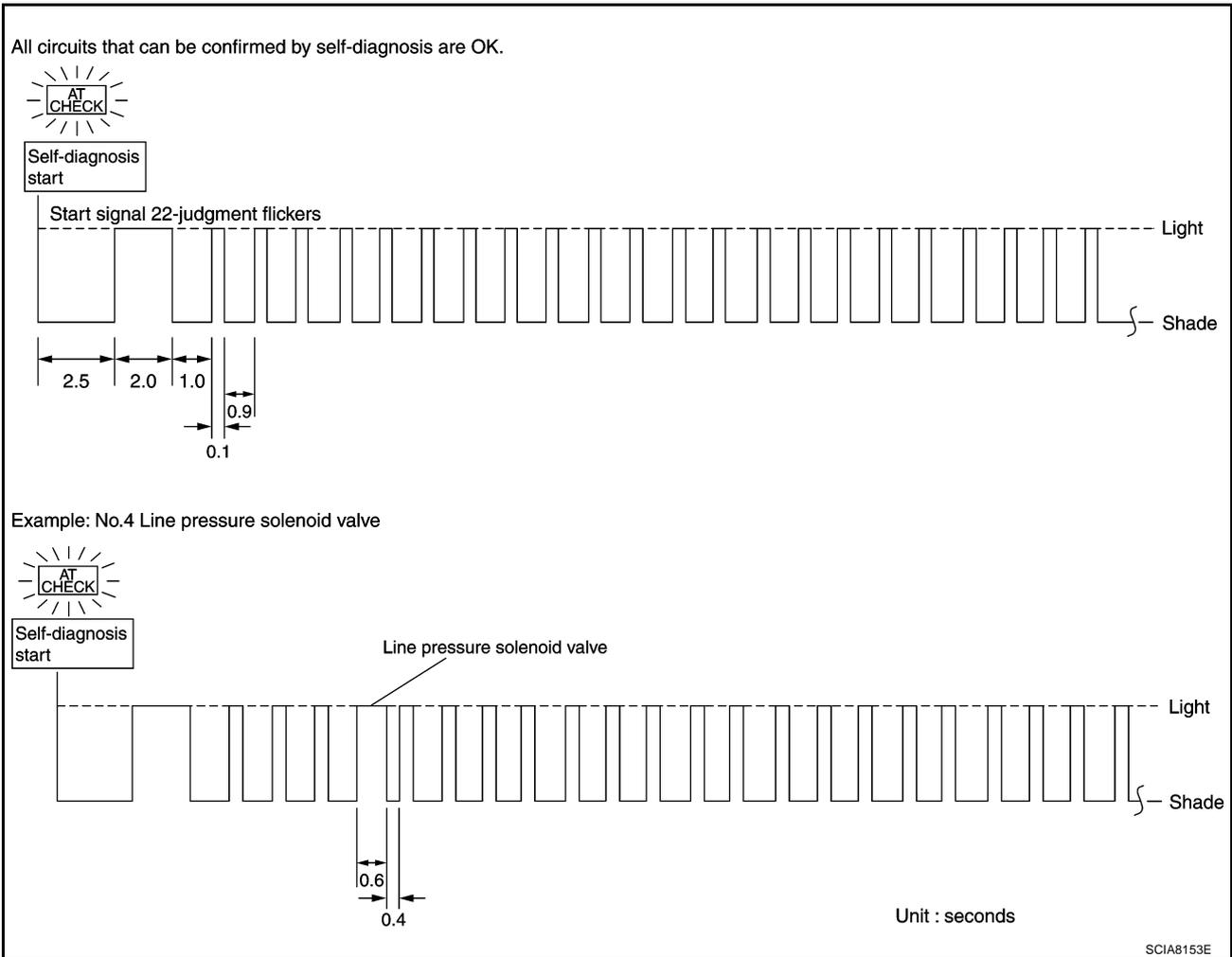
>> DIAGNOSIS END

# TROUBLE DIAGNOSIS

## Judgment Self-diagnosis Code

If there is a malfunction, the lamp lights up for the time corresponding to the suspect circuit.

No.	Malfunctioning item	No.	Malfunctioning item
1	Revolution sensor <a href="#">AT-108</a>	12	A/T interlock <a href="#">AT-141</a>
2	Direct clutch solenoid valve <a href="#">AT-149</a>	13	A/T 1st engine braking <a href="#">AT-143</a>
3	Torque converter clutch solenoid valve <a href="#">AT-125</a>	14	Start signal <a href="#">AT-97</a>
4	Line pressure solenoid valve <a href="#">AT-129</a>	15	Accelerator pedal position sensor <a href="#">AT-131</a>
5	Input clutch solenoid valve <a href="#">AT-145</a>	16	Engine speed signal <a href="#">AT-113</a>
6	Front brake solenoid valve <a href="#">AT-147</a>	17	CAN communication line <a href="#">AT-94</a>
7	Low coast brake solenoid valve <a href="#">AT-153</a> , <a href="#">AT-155</a>	18	1st gear function <a href="#">AT-115</a>
8	High and low reverse clutch solenoid valve <a href="#">AT-151</a>	19	2nd gear function <a href="#">AT-117</a>
9	PNP switch <a href="#">AT-102</a>	20	3rd gear function <a href="#">AT-119</a>
10	A/T fluid temperature sensor <a href="#">AT-134</a>	21	4th gear function <a href="#">AT-121</a>
11	Turbine revolution sensor <a href="#">AT-106</a>	22	5th gear function <a href="#">AT-123</a>



## Erase Self-diagnosis

- In order to make it easier to find the cause of hard-to-duplicate malfunctions, malfunction information is stored into the control unit as necessary during use by the user. This memory is not erased no matter how many times the ignition switch is turned ON and OFF.
- However, this information is erased by turning ignition switch OFF after performing self-diagnostics or by erasing the memory using the CONSULT-III.

# DTC U1000 CAN COMMUNICATION LINE

## DTC U1000 CAN COMMUNICATION LINE

PFP:23710

### Description

NCS0002G

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 malfunction detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

### On Board Diagnosis Logic

NCS0002H

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "U1000 CAN COMM CIRCUIT" with CONSULT-III or 17th judgment flicker without CONSULT-III is detected when TCM cannot communicate to other control units.

### Possible Cause

NCS0002I

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

### DTC Confirmation Procedure

NCS0002J

#### NOTE:

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

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

#### WITH CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" or "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine and wait for at least 6 seconds.
4. If DTC is detected, go to [AT-96, "Diagnostic Procedure"](#).

#### WITH GST

Follow the procedure "WITH CONSULT-III".

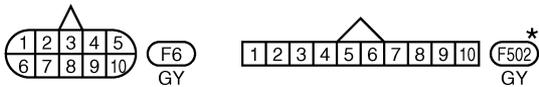
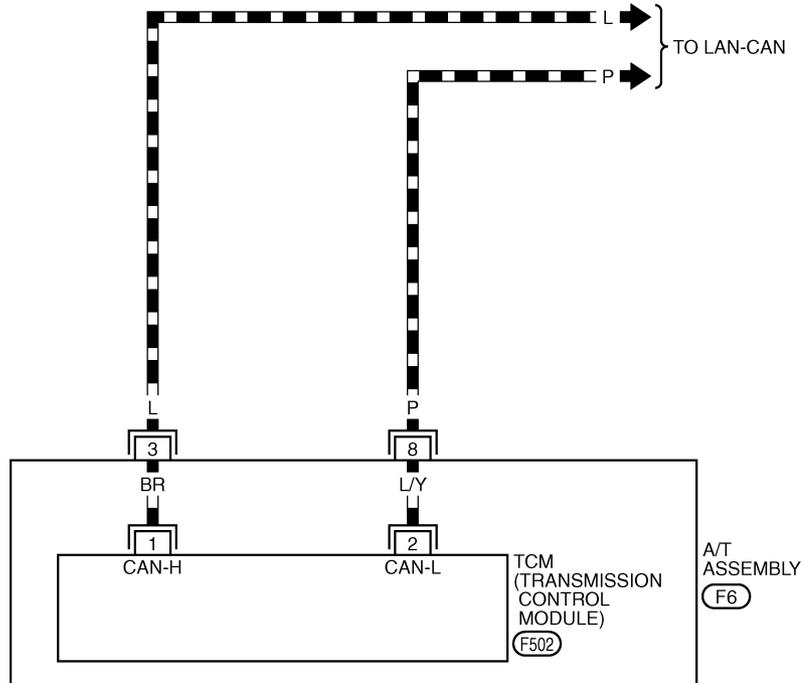
# DTC U1000 CAN COMMUNICATION LINE

## Wiring Diagram — AT — CAN

NCS0002K

### AT-CAN-01

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



\*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

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

# DTC U1000 CAN COMMUNICATION LINE

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
3	L	CAN-H	—	—
8	P	CAN-L	—	—

## Diagnostic Procedure

NCS0002L

### 1. CHECK CAN COMMUNICATION CIRCUIT

#### ④ With CONSULT-III

1. Turn ignition switch ON and start engine.
2. Select "SELF-DIAG RESULTS" mode for "TRANSMISSION" with CONSULT-III.

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

- YES >> Print out CONSULT-III screen, GO TO LAN section. Refer to [LAN-48, "CAN System Specification Chart"](#).
- NO >> **INSPECTION END**

# DTC P0615 START SIGNAL CIRCUIT

## DTC P0615 START SIGNAL CIRCUIT

PFP:25230

### Description

NCS0002M

Prohibits cranking other at "P" or "N" position.

### CONSULT-III Reference Value

NCS0002N

Item name	Condition	Display value
STARTER RELAY	Selector lever in "N" and "P" positions.	ON
	Selector lever in other positions.	OFF

### On Board Diagnosis Logic

NCS0002O

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0615 STARTER RELAY/CIRC" with CONSULT-III or 14th judgment flicker without CONSULT-III is detected when starter relay is switched ON other than at "P" or "N" position. (Or when switched OFF at "P" or "N" position.)

### Possible Cause

NCS0002P

- Harness or connectors  
(Starter relay and TCM circuit is open or shorted.)
- Starter relay circuit

### DTC Confirmation Procedure

NCS0002Q

#### NOTE:

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

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

#### ④ WITH CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" or "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Touch "START".
4. Start engine.
5. Vehicle start for at least 2 consecutive seconds.
6. If DTC is detected, go to [AT-99, "Diagnostic Procedure"](#).

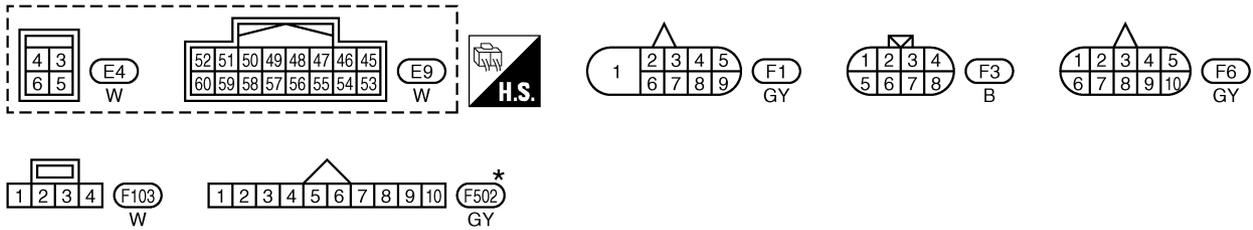
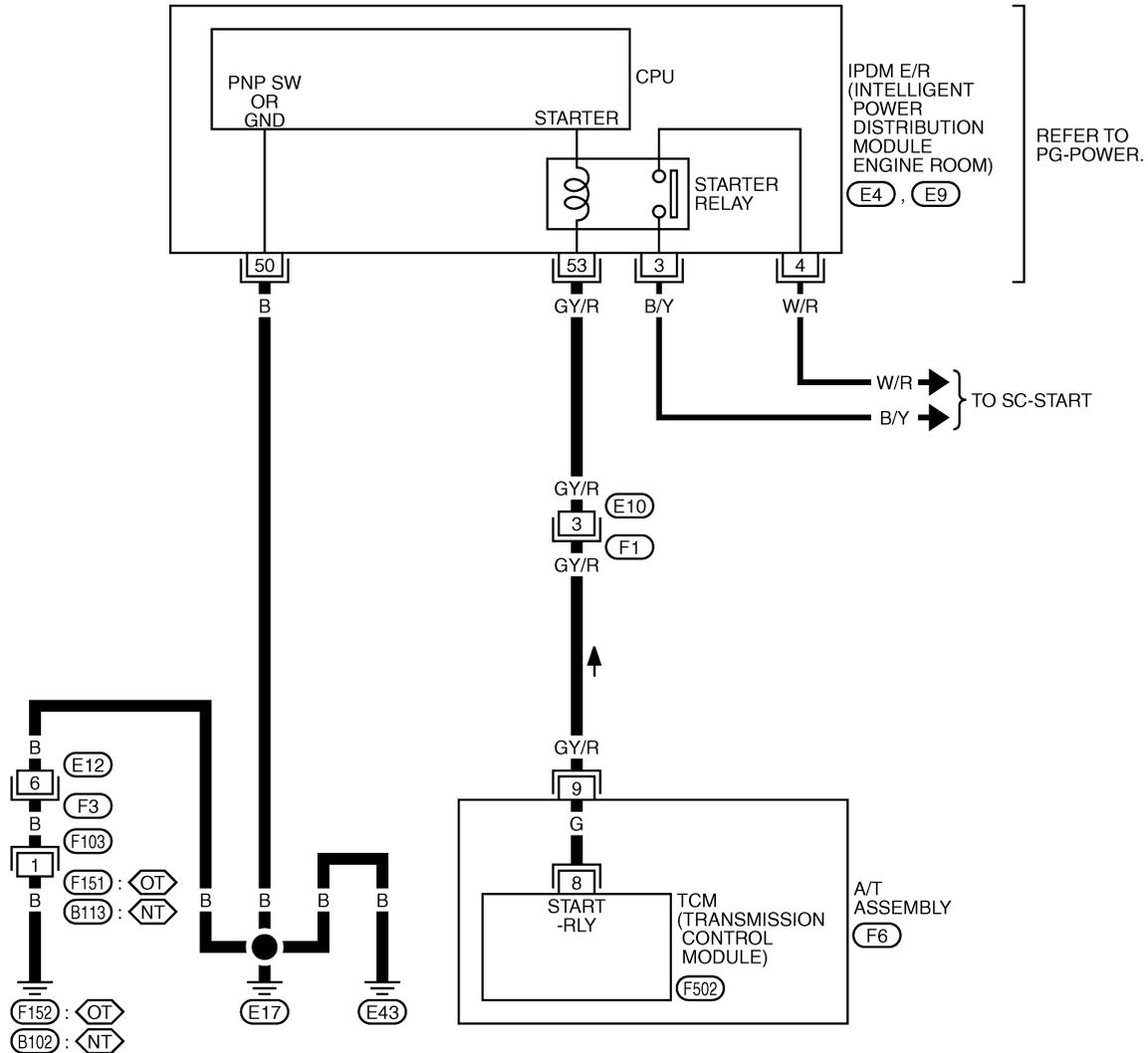
# DTC P0615 START SIGNAL CIRCUIT

## Wiring Diagram — AT — STSIG

NCS0002R

### AT-STSIG-01

- : DETECTABLE LINE FOR DTC
- : NON-DETECTABLE LINE FOR DTC
- ◁NT▷** : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
- ◁OT▷** : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE



\*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWT0438E

# DTC P0615 START SIGNAL CIRCUIT

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
9	GY/R	Starter relay	 Selector lever in "N" and "P" positions.	Battery voltage
			Selector lever in other positions.	0 V

## Diagnostic Procedure

NCS0002S

### 1. CHECK STARTER RELAY

#### With CONSULT-III

- Turn ignition switch ON.
- Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III and check monitor "STARTER RELAY" ON/OFF.

Item name	Condition	Display value
STARTER RELAY	Selector lever in "N" and "P" positions.	ON
	Selector lever in other positions.	OFF

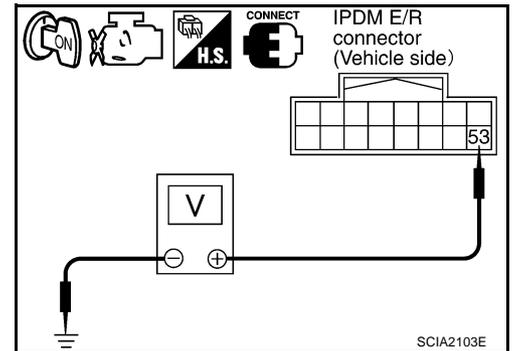
#### Without CONSULT-III

- Turn ignition switch ON.
- Check voltage between the IPDM E/R connector and ground.

Item	Connector	Terminal	Shift position	Voltage (Approx.)
Starter relay	E9	53 – Ground	"N", "P"	Battery voltage
			Other positions	0 V

#### OK or NG

- OK >> GO TO 5.  
 NG >> GO TO 2.



### 2. CHECK HARNESS BETWEEN A/T ASSEMBLY HARNESS CONNECTOR AND IPDM E/R CONNECTOR

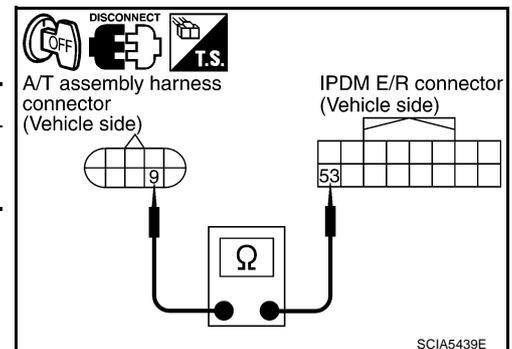
- Turn ignition switch OFF.
- Disconnect A/T assembly harness connector and IPDM E/R connector.
- Check continuity between A/T assembly harness connector and IPDM E/R connector.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	9	Yes
IPDM E/R connector	E9	53	

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



# DTC P0615 START SIGNAL CIRCUIT

## 3. CHECK TERMINAL CORD ASSEMBLY

1. Remove control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disconnect A/T assembly harness connector and TCM connector.
3. Check continuity between A/T assembly harness connector terminal and TCM connector terminal.

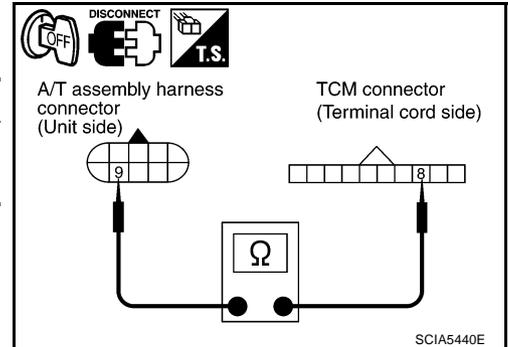
Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	9	Yes
TCM connector	F502	8	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG

OK >> GO TO 4.

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



## 4. DETECT MALFUNCTIONING ITEM

Check the following.

- Starter relay, Refer to [SC-8, "STARTING SYSTEM"](#) .
- IPDM E/R, Refer to [PG-16, "IPDM E/R \(INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM\)"](#) .

OK or NG

OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .

NG >> Repair or replace damaged parts.

## 5. CHECK DTC

Perform [AT-97, "DTC Confirmation Procedure"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

## DTC P0700 TCM

PFP:31036

### Description

NCS0002T

The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls A/T.

### On Board Diagnosis Logic

NCS0002U

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0700 TCM" with CONSULT-III is detected when TCM is malfunctioning.

### Possible Cause

NCS0002V

TCM.

### DTC Confirmation Procedure

NCS0002W

#### NOTE:

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

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

#### Ⓟ WITH CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" or "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Touch "START".
4. Start engine.
5. Run engine for at least 2 consecutive seconds at idle speed.
6. If DTC is detected, go to [AT-101, "Diagnostic Procedure"](#).

#### Ⓢ WITH GST

Follow the procedure "WITH CONSULT-III".

### Diagnostic Procedure

NCS0002X

#### 1. CHECK DTC

#### Ⓟ With CONSULT-III

1. Turn ignition switch ON.
2. Select "SELF DIAG RESULTS" mode for "TRANSMISSION" with CONSULT-III.
3. Touch "ERASE".
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Perform [AT-101, "DTC Confirmation Procedure"](#).

Is the "TCM" displayed again?

YES >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

NO >> **INSPECTION END**

# DTC P0705 PARK/NEUTRAL POSITION SWITCH

## DTC P0705 PARK/NEUTRAL POSITION SWITCH

PF3:32006

### Description

NCS0002Y

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

### CONSULT-III Reference Value

NCS0002Z

Item name	Condition	Display value
SLCT LVR POSI	Selector lever in "N" and "P" positions.	N/P
	Selector lever in "R" position.	R
	Selector lever in "D" position.	D

### On Board Diagnosis Logic

NCS00030

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0705 PNP SW/CIRC" with CONSULT-III or 9th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM does not receive the correct voltage signal from PNP switch 1, 2, 3 and 4 based on the gear position.
  - When no other position but "P" position is detected from "N" position.

### Possible Cause

NCS00031

- Harness or connectors  
PNP switch 1, 2, 3, 4 and TCM circuit is open or shorted.
- PNP switch 1, 2, 3 and 4

### DTC Confirmation Procedure

NCS00032

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

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

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

#### Ⓟ WITH CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" or "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Touch "START".
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.  
**ACCELE POSI: More than 1.0/8**
6. If DTC is detected, go to [AT-104, "Diagnostic Procedure"](#).

#### Ⓟ WITH GST

Follow the procedure "WITH CONSULT-III".

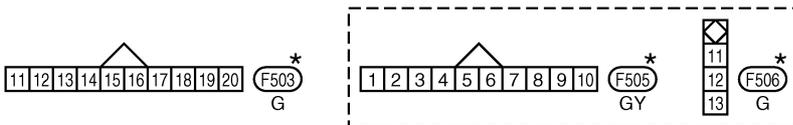
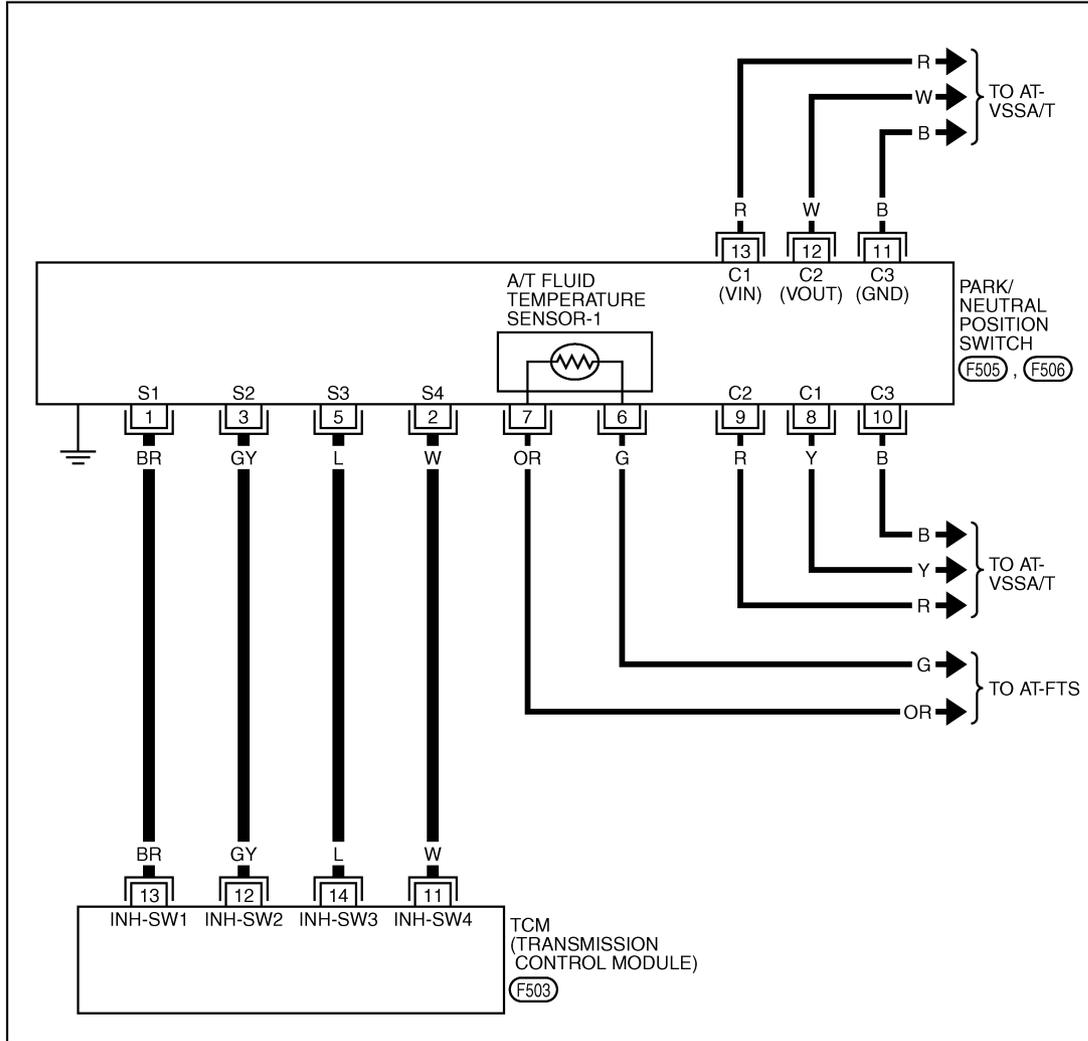
# DTC P0705 PARK/NEUTRAL POSITION SWITCH

## Wiring Diagram — AT — PNP/SW

NCS00033

### AT-PNP/SW-01

**—** : DETECTABLE LINE FOR DTC  
**—** : NON-DETECTABLE LINE FOR DTC



\*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

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

A/T ASSEMBLY

# DTC P0705 PARK/NEUTRAL POSITION SWITCH

NCS00034

## Diagnostic Procedure

### 1. CHECK PNP SW CIRCUIT

#### ④ With CONSULT-III

1. Turn ignition switch ON.
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Check if correct selector lever position (N/P, R or D) is displayed as selector lever is moved into each position.

Item name	Condition	Display value
SLCT LVR POSI	Selector lever in "N" and "P" positions.	N/P
	Selector lever in "R" position.	R
	Selector lever in "D" position.	D

#### OK or NG

- OK >> GO TO 5.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#).

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

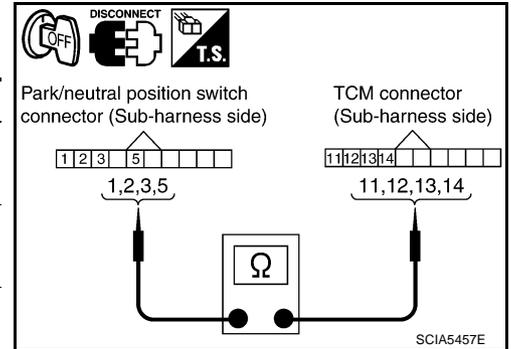
- OK >> GO TO 4.  
NG >> Repair or replace damaged parts.

# DTC P0705 PARK/NEUTRAL POSITION SWITCH

## 4. CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disconnect park/neutral position switch connector and TCM connector.
3. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	1	Yes
TCM connector	F503	13	
Park/neutral position switch connector	F505	2	Yes
TCM connector	F503	11	
Park/neutral position switch connector	F505	3	Yes
TCM connector	F503	12	
Park/neutral position switch connector	F505	5	Yes
TCM connector	F503	14	



4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
- NG >> Replace open circuit or short to ground and short to power in harness or connectors.

## 5. CHECK DTC

Perform [AT-102, "DTC Confirmation Procedure"](#) .

### OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 2.

# DTC P0717 TURBINE REVOLUTION SENSOR

## DTC P0717 TURBINE REVOLUTION SENSOR

PFP:31935

### Description

NCS0019V

The turbine revolution sensor detects input shaft rpm (revolutions per minute). It is located on the input side of the A/T. Monitors revolution of sensor 1 and sensor 2 for non-standard conditions.

### CONSULT-III Reference Value

NCS0019W

Item name	Condition	Display value
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.

### On Board Diagnosis Logic

NCS0019X

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0717 TURBINE REV S/CIRC" with CONSULT-III or 11th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM does not receive the proper voltage signal from the sensor.
  - When TCM detects an irregularity only at position of 4th gear for turbine revolution sensor 2.

### Possible Cause

NCS0019Y

- Harness or connectors  
(Sensor circuit is open or shorted.)
- Turbine revolution sensor 1 and/or 2

### DTC Confirmation Procedure

NCS0019Z

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

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

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

#### WITH CONSULT-III

1. Turn ignition switch ON.
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III and check monitor "VHCL/S SE-A/T", "ACCELE POSI", "ENGINE SPEED", "SLCT LVR POSI" and "GEAR".
3. Touch "START".
4. Start engine and maintain the following conditions for at least 5 consecutive seconds.
  - VHCL/S SE-A/T: 40 km/h (25 MPH) or more**
  - ACCELE POSI: More than 0.5/8**
  - ENGINE SPEED: 1,500 rpm or more**
  - SLCT LVR POSI: "D" position**
  - GEAR (Turbine revolution sensor 1): "4" or "5" position**
  - GEAR (Turbine revolution sensor 2): All positions**
  - Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
5. If DTC is detected, go to [AT-107, "Diagnostic Procedure"](#).

#### WITH GST

Follow the procedure "WITH CONSULT-III".

# DTC P0717 TURBINE REVOLUTION SENSOR

## Diagnostic Procedure

NCS001A0

### 1. CHECK INPUT SIGNAL

#### ④ With CONSULT-III

1. Start engine.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Vehicle start and read out the value of "TURBINE REV".

Item name	Condition	Display value
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.

#### OK or NG

- OK >> GO TO 4.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#).

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).  
NG >> Repair or replace damaged parts.

### 4. CHECK DTC

Perform [AT-106, "DTC Confirmation Procedure"](#).

#### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 2.

A  
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AT  
D  
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M

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

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

PDF:32702

### Description

NCS00035

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

### CONSULT-III Reference Value

NCS00036

Item name	Condition	Display value
VHCL/S SE-A/T	During driving	Approximately matches the speedometer reading.

### On Board Diagnosis Logic

NCS00037

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0720 VEH SPD SEN/CIR AT" with CONSULT-III or 1st judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM does not receive the proper voltage signal from the sensor.
  - After ignition switch is turned ON, irregular signal input from vehicle speed sensor MTR before the vehicle starts moving.

### Possible Cause

NCS00038

- Harness or connectors  
(Sensor circuit is open or shorted.)
- Revolution sensor
- Vehicle speed sensor MTR

### DTC Confirmation Procedure

NCS00039

#### CAUTION:

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

#### NOTE:

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

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

#### WITH CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Touch "START".
4. Drive vehicle and check for an increase of "VHCL/S SE-A/T" value in response to "VHCL/S SE-MTR" value.  
If the check result is NG, go to [AT-111, "Diagnostic Procedure"](#).  
If the check result is OK, go to following step.
5. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III and check monitor "VHCL/S SE-A/T", "ACCELE POSI", "ENGINE SPEED" and "SLCT LVR POSI".
6. Start engine and maintain the following conditions for at least 5 consecutive seconds.  
**VHCL/S SE-A/T: 30 km/h (19 MPH) or more**  
**ACCELE POSI: More than 1.0/8**  
**SLCT LVR POSI: "D" position**  
**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-111, "Diagnostic Procedure"](#).  
If the check result is OK, go to following step.
7. Maintain the following conditions for at least 5 consecutive seconds.  
**ENGINE SPEED: 3,500 rpm or more**  
**ACCELE POSI: More than 1.0/8**  
**SLCT LVR POSI: "D" position**

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

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

8. If DTC is detected, go to [AT-111, "Diagnostic Procedure"](#) .

 **WITH GST**

Follow the procedure "WITH CONSULT-III".

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

NCS0003B

## Diagnostic Procedure

### 1. CHECK INPUT SIGNAL

#### With CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Read out the value of "VHCL/S SE-A/T" while driving. Check the value changes according to driving speed.

Item name	Condition	Display value
VHCL/S SE-A/T	During driving	Approximately matches the speedometer reading.

#### OK or NG

- OK >> GO TO 6.  
 NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#).

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

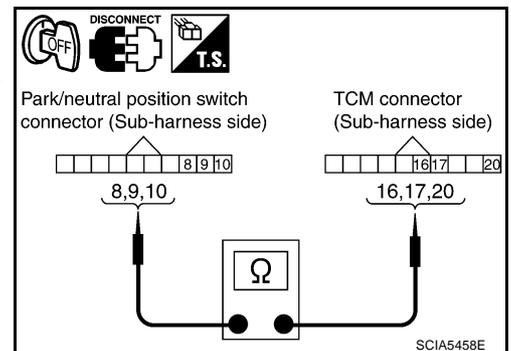
#### OK or NG

- OK >> GO TO 4.  
 NG >> Repair or replace damaged parts.

### 4. CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
2. Disconnect park/neutral position switch connector and TCM connector.
3. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	8	Yes
TCM connector	F503	20	
Park/neutral position switch connector	F505	9	Yes
TCM connector	F503	17	
Park/neutral position switch connector	F505	10	Yes
TCM connector	F503	16	



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

5. Reinstall any part removed.

#### OK or NG

- OK >> GO TO 5.  
 NG >> Replace open circuit or short to ground and short to power in harness or connectors.

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

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### 5. REPLACE THE REVOLUTION SENSOR AND CHECK DTC

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1. Replace revolution sensor. Refer to [AT-235, "Revolution Sensor"](#) .
2. Perform [AT-108, "DTC Confirmation Procedure"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .

### 6. CHECK DTC

---

Perform [AT-108, "DTC Confirmation Procedure"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

# DTC P0725 ENGINE SPEED SIGNAL

## DTC P0725 ENGINE SPEED SIGNAL

PPF:24825

### Description

NCS0003C

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

### CONSULT-III Reference Value

NCS0003D

Item name	Condition	Display value
ENGINE SPEED	Engine running	Closely matches the tachometer reading.

### On Board Diagnosis Logic

NCS0003E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0725 ENGINE SPEED SIG" with CONSULT-III or 16th judgment flicker without CONSULT-III is detected when TCM does not receive the ignition signal from ECM during engine cranking or running.

### Possible Cause

NCS0003F

Harness or connectors  
(ECM to TCM circuit is open or shorted.)

### DTC Confirmation Procedure

NCS0003G

#### **CAUTION:**

Always drive vehicle at a safe speed.

#### **NOTE:**

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

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

#### **Ⓟ WITH CONSULT-III**

1. Turn ignition switch ON.
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III and check monitor "VHCL/S SE-A/T", "ACCELE POSI" and "SLCT LVR POSI".
3. Touch "START".
4. Start engine and maintain the following conditions for at least 10 consecutive seconds.  
**VHCL/S SE-A/T: 10 km/h (6 MPH) or more**  
**ACCELE POSI: More than 1.0/8**  
**SLCT LVR POSI: "D" position**
5. If DTC is detected, go to [AT-114, "Diagnostic Procedure"](#).

#### **Ⓢ WITH GST**

Follow the procedure "WITH CONSULT-III".

# DTC P0725 ENGINE SPEED SIGNAL

NCS0003H

## Diagnostic Procedure

### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is a malfunction in the CAN communication indicated in the results?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .
- NO >> GO TO 2.

### 2. CHECK DTC WITH TCM

#### With CONSULT-III

1. Start engine.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. While monitoring engine speed, check for engine speed change corresponding to wide-open throttle position signal.

Item name	Condition	Display value
ENGINE SPEED	Engine running	Closely matches the tachometer reading.

OK or NG

- OK >> GO TO 3.
- NG >> Check the ignition signal circuit. Refer to [EC-698, "IGNITION SIGNAL"](#) .

### 3. CHECK DTC

Perform [AT-113, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 4.

### 4. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

OK or NG

- OK >> GO TO 5.
- NG >> Repair or replace damaged parts.

### 5. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
- NG >> Repair or replace damaged parts.

# DTC P0731 A/T 1ST GEAR FUNCTION

## DTC P0731 A/T 1ST GEAR FUNCTION

PFP:31940

### Description

NCS001SB

This malfunction is detected when the A/T does not shift into 1st gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

### On Board Diagnosis Logic

NCS001SC

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0731 A/T 1ST GR FNCTN" with CONSULT-III or 18th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

### Possible Cause

NCS001SD

- Harness or connectors  
(Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

### DTC Confirmation Procedure

NCS001SE

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

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

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

#### WITH CONSULT-III

1. Start the engine and select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
2. Make sure that "ATF TEMP 1" is within the following range.  
**ATF TEMP 1: 20°C – 140°C**  
If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select "1ST GR FNCTN P0731" of "DTC WORK SUPPORT" mode for "TRANSMISSION" with CONSULT-III.
4. Drive vehicle and maintain the following conditions.  
**VEHICLE SPEED: 10 km/h (6 MPH) or more**  
**ACCELE POSI: 0.6/8 or more**  
**ENGINE SPEED: TURBINE REV – 50 rpm or more**  
**TURBINE REV: 300 rpm or more**  
**GEAR: "1" position**  
**MANU MODE SW: ON**
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from "OUT OF CONDITION" to "TESTING".

#### CAUTION:

If "TESTING" does not appear on CONSULT-III for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0731 is shown, refer to ["AT-86. "Display Items List" "](#).

If "COMPLETED RESULT NG" is detected, go to ["AT-116. "Diagnostic Procedure" "](#).

If "STOP VEHICLE" is detected, go to the following step.

6. Stop vehicle.
7. Drive vehicle in "D" position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.
  - Touch "OK" to complete the inspection when normally shifted from the 1st to 5th gear.
  - Touch "NG" when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to ["AT-52. "ROAD TEST" "](#).

# DTC P0731 A/T 1ST GEAR FUNCTION

- Perform [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) when not shifted from the 1st to 5th gear. (Neither "OK" nor "NG" are indicated.)

## Diagnostic Procedure

NCS001SF

### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is a malfunction in the CAN communication indicated in the results?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .
- NO >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

OK or NG

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

### 3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

- OK >> GO TO 4.
- NG >> Repair or replace damaged parts.

### 4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Perform [AT-115, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> Confirm malfunction phenomena by "ROAD TEST" to repair malfunctioning part. Refer to [AT-52, "ROAD TEST"](#) .

# DTC P0732 A/T 2ND GEAR FUNCTION

## DTC P0732 A/T 2ND GEAR FUNCTION

PPF:31940

### Description

NCS001SG

This malfunction is detected when the A/T does not shift into 2nd gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

### On Board Diagnosis Logic

NCS001SH

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0732 A/T 2ND GR FNCTN" with CONSULT-III or 19th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

### Possible Cause

NCS001SI

- Harness or connectors  
(Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

### DTC Confirmation Procedure

NCS001SJ

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

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

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

#### WITH CONSULT-III

1. Start the engine and select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
2. Make sure that "ATF TEMP 1" is within the following range.  
**ATF TEMP 1: 20°C – 140°C**  
If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select "2ND GR FNCTN P0732" of "DTC WORK SUPPORT" mode for "TRANSMISSION" with CONSULT-III.
4. Drive vehicle and maintain the following conditions.  
**VEHICLE SPEED: 10 km/h (6 MPH) or more**  
**ACCELE POSI: 0.6/8 or more**  
**ENGINE SPEED: TURBINE REV – 50 rpm or more**  
**TURBINE REV: 300 rpm or more**  
**GEAR: "2" position**  
**MANU MODE SW: ON**
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from "OUT OF CONDITION" to "TESTING".

#### CAUTION:

If "TESTING" does not appear on CONSULT-III for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0732 is shown, refer to ["AT-86. "Display Items List" "](#).

If "COMPLETED RESULT NG" is detected, go to ["AT-118. "Diagnostic Procedure" "](#).

If "STOP VEHICLE" is detected, go to the following step.

6. Stop vehicle.
7. Drive vehicle in "D" position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.
  - Touch "OK" to complete the inspection when normally shifted from the 1st to 5th gear.
  - Touch "NG" when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to ["AT-52. "ROAD TEST" "](#).

# DTC P0732 A/T 2ND GEAR FUNCTION

- Perform [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) when not shifted from the 1st to 5th gear. (Neither "OK" nor "NG" are indicated.)

## Diagnostic Procedure

NCS00170

### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is a malfunction in the CAN communication indicated in the results?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .
- NO >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

OK or NG

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

### 3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

- OK >> GO TO 4.
- NG >> Repair or replace damaged parts.

### 4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Perform [AT-117, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> Confirm malfunction phenomena by "ROAD TEST" to repair malfunctioning part. Refer to [AT-52, "ROAD TEST"](#) .

# DTC P0733 A/T 3RD GEAR FUNCTION

## DTC P0733 A/T 3RD GEAR FUNCTION

PFP:31940

### Description

NCS001SL

This malfunction is detected when the A/T does not shift into 3rd gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

### On Board Diagnosis Logic

NCS001SM

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0733 A/T 3RD GR FNCTN" with CONSULT-III or 20th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

### Possible Cause

NCS001SN

- Harness or connectors  
(Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

### DTC Confirmation Procedure

NCS001SO

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

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

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

#### WITH CONSULT-III

1. Start the engine and select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
2. Make sure that "ATF TEMP 1" is within the following range.  
**ATF TEMP 1: 20°C – 140°C**  
If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select "3RD GR FNCTN P0733" of "DTC WORK SUPPORT" mode for "TRANSMISSION" with CONSULT-III.
4. Drive vehicle and maintain the following conditions.  
**VEHICLE SPEED: 10 km/h (6 MPH) or more**  
**ACCELE POSI: 0.6/8 or more**  
**ENGINE SPEED: TURBINE REV – 50 rpm or more**  
**TURBINE REV: 300 rpm or more**  
**GEAR: "3" position**  
**MANU MODE SW: ON**
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from "OUT OF CONDITION" to "TESTING".

#### CAUTION:

If "TESTING" does not appear on CONSULT-III for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0732 is shown, refer to ["AT-86, "Display Items List"](#) .

If "COMPLETED RESULT NG" is detected, go to [AT-120, "Diagnostic Procedure"](#) .

If "STOP VEHICLE" is detected, go to the following step.

6. Stop vehicle.
7. Drive vehicle in "D" position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.
  - Touch "OK" to complete the inspection when normally shifted from the 1st to 5th gear.
  - Touch "NG" when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to [AT-52, "ROAD TEST"](#) .

# DTC P0733 A/T 3RD GEAR FUNCTION

- Perform [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) when not shifted from the 1st to 5th gear. (Neither "OK" nor "NG" are indicated.)

## Diagnostic Procedure

NCS001T1

### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is a malfunction in the CAN communication indicated in the results?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .
- NO >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

OK or NG

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

### 3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

- OK >> GO TO 4.
- NG >> Repair or replace damaged parts.

### 4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Perform [AT-119, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> Confirm malfunction phenomena by "ROAD TEST" to repair malfunctioning part. Refer to [AT-52, "ROAD TEST"](#) .

# DTC P0734 A/T 4TH GEAR FUNCTION

## DTC P0734 A/T 4TH GEAR FUNCTION

PFP:31940

### Description

NCS001SQ

This malfunction is detected when the A/T does not shift into 4th gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

### On Board Diagnosis Logic

NCS001SR

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0734 A/T 4TH GR FNCTN" with CONSULT-III or 21th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

### Possible Cause

NCS001SS

- Harness or connectors  
(Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

### DTC Confirmation Procedure

NCS001ST

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

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

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

#### WITH CONSULT-III

1. Start the engine and select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
2. Make sure that "ATF TEMP 1" is within the following range.  
**ATF TEMP 1: 20°C – 140°C**  
If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select "4TH GR FNCTN P0734" of "DTC WORK SUPPORT" mode for "TRANSMISSION" with CONSULT-III.
4. Drive vehicle and maintain the following conditions.  
**VEHICLE SPEED: 10 km/h (6 MPH) or more**  
**ACCELE POSI: 0.6/8 or more**  
**ENGINE SPEED: TURBINE REV – 50 rpm or more**  
**TURBINE REV: 300 rpm or more**  
**GEAR: "4" position**  
**MANU MODE SW: ON**
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from "OUT OF CONDITION" to "TESTING".

#### CAUTION:

If "TESTING" does not appear on CONSULT-III for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0734 is shown, refer to ["AT-86. "Display Items List" "](#).

If "COMPLETED RESULT NG" is detected, go to [AT-122. "Diagnostic Procedure" "](#).

If "STOP VEHICLE" is detected, go to the following step.

6. Stop vehicle.
7. Drive vehicle in "D" position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.
  - Touch "OK" to complete the inspection when normally shifted from the 1st to 5th gear.
  - Touch "NG" when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to [AT-52. "ROAD TEST" "](#).

# DTC P0734 A/T 4TH GEAR FUNCTION

- Perform [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) when not shifted from the 1st to 5th gear. (Neither "OK" nor "NG" are indicated.)

## Diagnostic Procedure

NCS001T2

### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is a malfunction in the CAN communication indicated in the results?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .
- NO >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

OK or NG

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

### 3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

- OK >> GO TO 4.
- NG >> Repair or replace damaged parts.

### 4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Perform [AT-121, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> Confirm malfunction phenomena by "ROAD TEST" to repair malfunctioning part. Refer to [AT-52, "ROAD TEST"](#) .

## DTC P0735 A/T 5TH GEAR FUNCTION

PFP:31940

### Description

NCS001SV

This malfunction is detected when the A/T does not shift into 5th gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

### On Board Diagnosis Logic

NCS001SW

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P0735 A/T 5TH GR FNCTN" with CONSULT-III or 22th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

### Possible Cause

NCS001SX

- Harness or connectors  
(Solenoid circuits are open or shorted.)
- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch
- Hydraulic control circuit

### DTC Confirmation Procedure

NCS001SY

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

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

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

#### WITH CONSULT-III

1. Start the engine and select "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
2. Make sure that "ATF TEMP 1" is within the following range.  
**ATF TEMP 1: 20°C – 140°C**  
If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select "5TH GR FNCTN P0735" of "DTC WORK SUPPORT" mode for "TRANSMISSION" with CONSULT-III.
4. Drive vehicle and maintain the following conditions.  
**VEHICLE SPEED: 10 km/h (6 MPH) or more**  
**ACCELE POSI: 0.6/8 or more**  
**ENGINE SPEED: TURBINE REV – 50 rpm or more**  
**TURBINE REV: 300 rpm or more**  
**GEAR: "5" position**  
**MANU MODE SW: ON**
5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from "OUT OF CONDITION" to "TESTING".

#### CAUTION:

If "TESTING" does not appear on CONSULT-III for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0735 is shown, refer to ["AT-86. "Display Items List" "](#).

If "COMPLETED RESULT NG" is detected, go to [AT-124, "Diagnostic Procedure"](#).

If "STOP VEHICLE" is detected, go to the following step.

6. Stop vehicle.
7. Drive vehicle in "D" position allowing it to shift from 1st to 5th gear and check shift timing and shift shock.
  - Touch "OK" to complete the inspection when normally shifted from the 1st to 5th gear.
  - Touch "NG" when an unusual shift shock, etc. occurs in spite of shifting from the 1st to 5th gear. Go to [AT-52, "ROAD TEST"](#).

# DTC P0735 A/T 5TH GEAR FUNCTION

- Perform [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) when not shifted from the 1st to 5th gear. (Neither "OK" nor "NG" are indicated.)

## Diagnostic Procedure

NCS00173

### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is a malfunction in the CAN communication indicated in the results?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .
- NO >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

OK or NG

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

### 3. DETECT MALFUNCTION ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

- OK >> GO TO 4.
- NG >> Repair or replace damaged parts.

### 4. REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Perform [AT-123, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> Confirm malfunction phenomena by "ROAD TEST" to repair malfunctioning part. Refer to [AT-52, "ROAD TEST"](#) .

# DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

## DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

### Description

NCS0003I

- Torque converter clutch solenoid valve is activated, with the gear in D4 , D5 , M2 , M3 , M4 and M5 by the TCM in response to signals sent from the vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Torque converter clutch 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 1.0/8) 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-III Reference Value

NCS0003J

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

### On Board Diagnosis Logic

NCS0003K

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0740 TCC SOLENOID/CIRC” with CONSULT-III or 3rd judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

### Possible Cause

NCS0003L

- Torque converter clutch solenoid valve
- Harness or connectors  
(Solenoid circuit is open or shorted.)

### DTC Confirmation Procedure

NCS0003M

#### **CAUTION:**

Always drive vehicle at a safe speed.

#### **NOTE:**

If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

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

#### Ⓟ WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI” and “SLCT LVR POSI”.
3. Touch “START”.
4. Start engine and maintain the following conditions for at least 5 consecutive seconds.  
**VHCL/S SE-A/T: 80 km/h (50 MPH) or more**  
**ACCELE POSI: 0.5/8 – 1.0/8**  
**SLCT LVR POSI: “D” position**  
**Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
5. If DTC is detected go to [AT-126, "Diagnostic Procedure"](#) .

#### Ⓢ WITH GST

Follow the procedure “WITH CONSULT-III”.

# DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

## Diagnostic Procedure

NCSS0003N

### 1. CHECK INPUT SIGNAL

#### ④ With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Read out the value of "TCC SOLENOID" while driving.

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

#### OK or NG

- OK >> GO TO 4.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#).

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).  
NG >> Repair or replace damaged parts.

### 4. CHECK DTC

Perform [AT-125, "DTC Confirmation Procedure"](#).

#### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 2.

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

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

PFP:31940

### Description

NCS00030

This malfunction is detected when the A/T does not shift into 5th gear position or the torque converter clutch does not lock-up as instructed by the TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

### CONSULT-III Reference Value

NCS0003P

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

### On Board Diagnosis Logic

NCS0003Q

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0744 A/T TCC S/V FNCTN” with CONSULT-III or 3rd judgment flicker without CONSULT-III is detected under the following conditions.
  - When A/T cannot perform lock-up even if electrical circuit is good.
  - When TCM detects as irregular by comparing difference value with slip rotation.

### Possible Cause

NCS0003R

- Harness or connectors  
(Solenoid circuit is open or shorted.)
- Torque converter clutch solenoid valve
- Hydraulic control circuit

### DTC Confirmation Procedure

NCS0003S

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

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

#### WITH CONSULT-III

1. Start engine.
2. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Drive vehicle and maintain the following conditions for at least 30 consecutive seconds.
  - ACCELE POSI: More than 1.0/8**
  - SLCT LVR POSI: “D” position**
  - TCC SOLENOID: 0.4 – 0.6 A**
  - VEHICLE SPEED: 80 km/h (50 MPH) or more**
  - Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
4. If DTC is detected, go to [AT-128, "Diagnostic Procedure"](#).

#### WITH GST

Follow the procedure “WITH CONSULT-III”.

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

NCS0003T

## Diagnostic Procedure

### 1. CHECK INPUT SIGNAL

#### ④ With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Read out the value of "TCC SOLENOID" while driving.

Item name	Condition	Display value (Approx.)
TCC SOLENOID	Lock-up is active	0.4 – 0.6 A

#### OK or NG

- OK >> GO TO 4.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#).

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).  
NG >> Repair or replace damaged parts.

### 4. CHECK DTC

Perform [AT-127, "DTC Confirmation Procedure"](#).

#### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 2.

# DTC P0745 LINE PRESSURE SOLENOID VALVE

## DTC P0745 LINE PRESSURE SOLENOID VALVE

PPF:31940

### Description

NCS0003U

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

### CONSULT-III Reference Value

NCS0003V

Item name	Condition	Display value (Approx.)
LINE PRES SOL	During driving	0.2 – 0.6 A

### On Board Diagnosis Logic

NCS0003W

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0745 L/PRESS SOL/CIRC” with CONSULT-III or 4th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

### Possible Cause

NCS0003X

- Harness or connectors  
(Solenoid circuit is open or shorted.)
- Line pressure solenoid valve

### DTC Confirmation Procedure

NCS0003Y

#### NOTE:

If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

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

#### Ⓟ WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III.
3. Touch “START”.
4. Start engine and wait at least 5 seconds.
5. If DTC is detected, go to [“AT-130, "Diagnostic Procedure" .](#)

#### Ⓢ WITH GST

Follow the procedure “WITH CONSULT-III”.

# DTC P0745 LINE PRESSURE SOLENOID VALVE

## Diagnostic Procedure

NCS0003Z

### 1. CHECK INPUT SIGNAL

#### ④ With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Read out the value of "LINE PRES SOL" while driving.

Item name	Condition	Display value (Approx.)
LINE PRES SOL	During driving	0.2 – 0.6 A

#### OK or NG

- OK >> GO TO 4.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#).

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector

#### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).  
NG >> Repair or replace damaged parts.

### 4. CHECK DTC

Perform [AT-129, "DTC Confirmation Procedure"](#).

#### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 2.

# DTC P1705 THROTTLE POSITION SENSOR

## DTC P1705 THROTTLE POSITION SENSOR

PFP:22620

### Description

NCS0004A

Electric throttle control actuator consists of throttle control motor, accelerator pedal position sensor, throttle position sensor, etc. The actuator sends a signal to the ECM, and ECM sends signals to TCM with CAN communication.

### CONSULT-III Reference Value

NCS0004B

Item name	Condition	Display value (Approx.)
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8.0/8

### On Board Diagnosis Logic

NCS0004C

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1705 TP SEN/CIRC A/T" with CONSULT-III or 15th judgment flicker without CONSULT-III is detected when TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM.

### Possible Cause

NCS0004D

Harness or connectors  
(Sensor circuit is open or shorted.)

### DTC Confirmation Procedure

NCS0004E

#### NOTE:

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

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

#### WITH CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Touch "START".
4. Start engine and let it idle for 1 second.
5. If DTC is detected, go to [AT-132, "Diagnostic Procedure"](#).

#### WITH GST

Follow the procedure "WITH CONSULT-III".

# DTC P1705 THROTTLE POSITION SENSOR

NCS0004F

## Diagnostic Procedure

### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is a malfunction in the CAN communication indicated in the results?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .
- NO >> GO TO 2.

### 2. CHECK DTC WITH TCM

#### With CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Depress accelerator pedal and read out the value of "ACCELE POSI".

Item name	Condition	Display value (Approx.)
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8.0/8

4. Select "SELF-DIAG RESULTS" mode for "A/T" with CONSULT-III. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#)

OK or NG

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

### 3. CHECK DTC WITH ECM

#### With CONSULT-III

1. Turn ignition switch ON.
2. Select "SELF-DIAG RESULTS" mode for "ENGINE" with CONSULT-III. Refer to [EC-116, "CONSULT-III Function \(ENGINE\)"](#) .

OK or NG

- OK >> GO TO 4.
- NG >> Check the DTC detected item. Refer to [EC-116, "CONSULT-III Function \(ENGINE\)"](#) .
  - If CAN communication line is detected, go to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .

### 4. CHECK DTC

Perform [AT-131, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 5.

### 5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

OK or NG

- OK >> GO TO 6.
- NG >> Repair or replace damaged parts.

# DTC P1705 THROTTLE POSITION SENSOR

## 6. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).
- NG >> Repair or replace damaged parts.

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

# DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

## DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

PDF:31940

### Description

NCS0004G

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

### CONSULT-III Reference Value

NCS0004H

Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 1	0 (32) – 20 (68) – 80 (176)	3.3 – 2.7 – 0.9 V
ATF TEMP SE 2		3.3 – 2.5 – 0.7 V

### On Board Diagnosis Logic

NCS0004I

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1710 (A/T), P0710 (ENGINE) ATF TEMP SEN/CIRC” with CONSULT-III or 10th judgment flicker without CONSULT-III is detected when TCM receives an excessively low or high voltage from the sensor.

### Possible Cause

NCS0004J

- Harness or connectors  
(Sensor circuit is open or shorted.)
- A/T fluid temperature sensors 1 and/or 2

### DTC Confirmation Procedure

NCS0004K

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

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

#### WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “VHCL/S SE-A/T”, “ACCELE POSI” and “SLCT LVR POSI”.
3. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)  
**VHCL/S SE-A/T: 10 km/h (6 MPH) or more**  
**ACCELE POSI: More than 1.0/8**  
**SLCT LVR POSI: “D” position**
4. If DTC is detected, go to [AT-136, "Diagnostic Procedure"](#).

#### WITH GST

Follow the procedure “WITH CONSULT-III”.

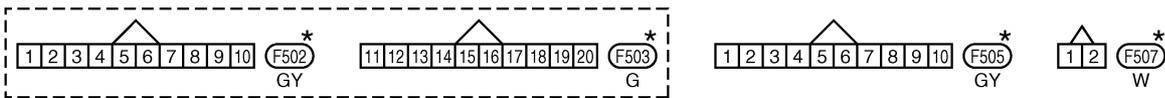
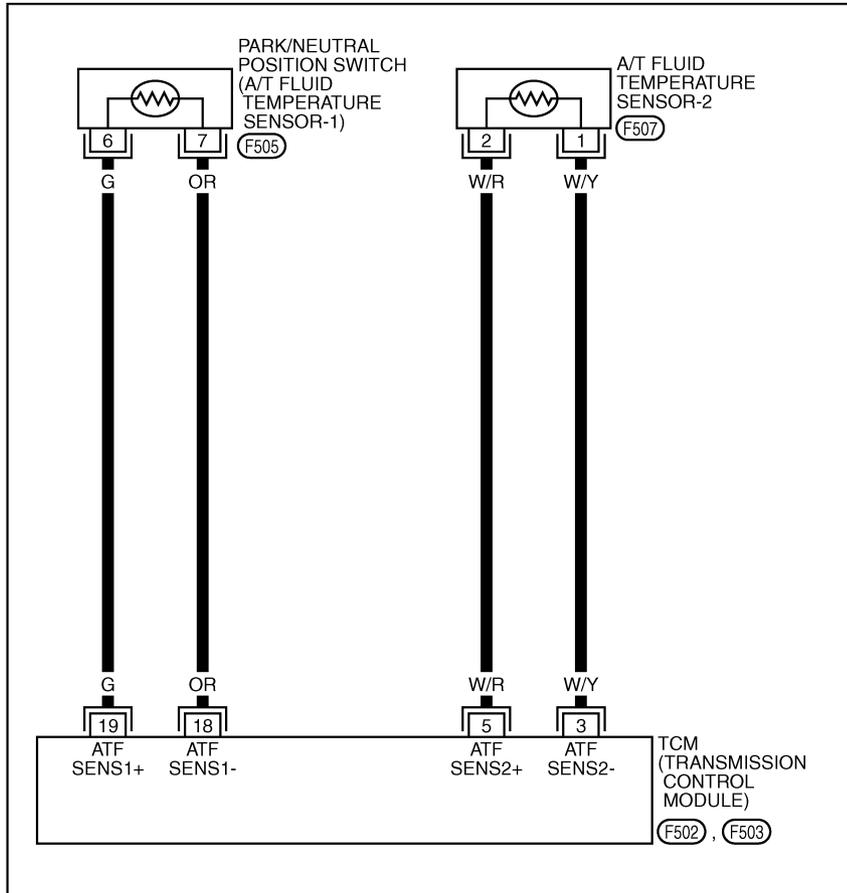
# DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

## Wiring Diagram — AT — FTS

NCS0004L

### AT-FTS-01

**—** : DETECTABLE LINE FOR DTC  
**—** : NON-DETECTABLE LINE FOR DTC



\*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWT0374E

# DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

NCS0004M

## Diagnostic Procedure

### 1. CHECK A/T FLUID TEMPERATURE SENSOR 1 SIGNAL

#### With CONSULT-III

1. Start engine.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Read out the value of "ATF TEMP SE 1".

Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 1	0 (32) – 20 (68) – 80 (176)	3.3 – 2.7 – 0.9 V

#### OK or NG

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

### 2. CHECK A/T FLUID TEMPERATURE SENSOR 2 SIGNAL

#### With CONSULT-III

1. Start engine.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Read out the value of "ATF TEMP SE 2".

Item name	Condition °C (°F)	Display value (Approx.)
ATF TEMP SE 2	0 (32) – 20 (68) – 80 (176)	3.3 – 2.5 – 0.7 V

#### OK or NG

- OK >> GO TO 8.  
 NG >> GO TO 5.

### 3. CHECK A/T FLUID TEMPERATURE SENSOR 1

Check A/T fluid temperature sensor 1. Refer to [AT-138, "A/T FLUID TEMPERATURE SENSOR 1"](#).

#### OK or NG

- OK >> GO TO 4.  
 NG >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#).

### 4. CHECK SUB-HARNESS

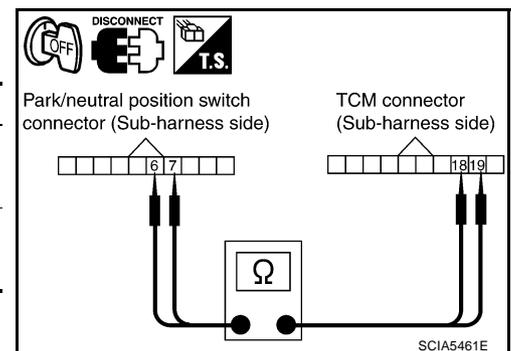
1. Disconnect park/neutral position switch connector and TCM connector.
2. Check continuity between park/neutral position switch connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
Park/neutral position switch connector	F505	6	Yes
TCM connector	F503	19	
Park/neutral position switch connector	F505	7	Yes
TCM connector	F503	18	

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

#### OK or NG

- OK >> GO TO 7.  
 NG >> Replace open circuit or short to ground and short to power in harness or connectors.



# DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

## 5. CHECK A/T FLUID TEMPERATURE SENSOR 2

Check A/T fluid temperature sensor 2. Refer to [AT-138, "A/T FLUID TEMPERATURE SENSOR 2"](#) .

OK or NG

OK >> GO TO 6.

NG >> Replace A/T fluid temperature sensor 2. Refer to [AT-223, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION"](#) .

## 6. CHECK TERMINAL CORD ASSEMBLY

1. Disconnect A/T fluid temperature sensor 2 connector and TCM connector.
2. Check continuity between A/T fluid temperature sensor 2 connector terminals and TCM connector terminals.

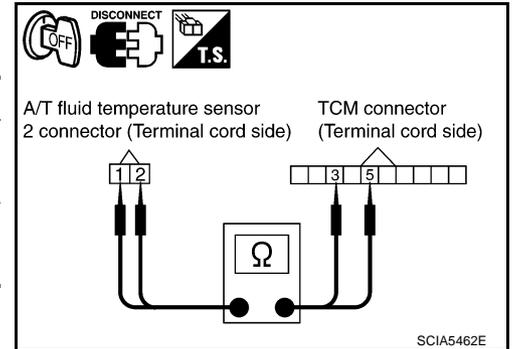
Item	Connector	Terminal	Continuity
A/T fluid temperature sensor 2 connector	F507	1	Yes
TCM connector	F502	3	
A/T fluid temperature sensor 2 connector	F507	2	Yes
TCM connector	F502	5	

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

OK or NG

OK >> GO TO 7.

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



## 7. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

1. Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .
2. Reinstall any part removed.

OK or NG

OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .

NG >> Repair or replace damaged parts.

## 8. CHECK DTC

Perform [AT-134, "DTC Confirmation Procedure"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 1.

# DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

NCS0004N

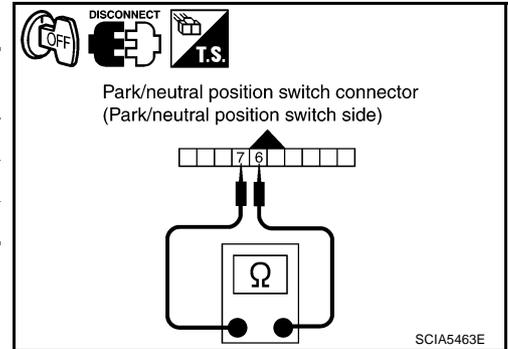
## Component Inspection

### A/T FLUID TEMPERATURE SENSOR 1

1. Remove control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check resistance between terminals.

Name	Connector	Terminal	Temperature °C (°F)	Resistance (Approx.)
A/T fluid temperature sensor 1	F505	6 – 7	0 (32)	15 kΩ
			20 (68)	6.5 kΩ
			80 (176)	0.9 kΩ

3. If NG, replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .

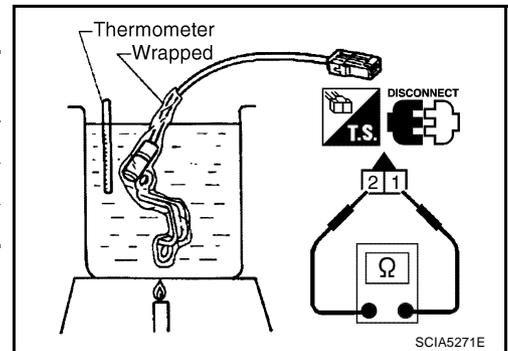


### A/T FLUID TEMPERATURE SENSOR 2

1. Remove A/T fluid temperature sensor 2. Refer to [AT-223, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION"](#) .
2. Check resistance between terminals.

Name	Connector	Terminal	Temperature °C (°F)	Resistance (Approx.)
A/T fluid temperature sensor 2	F507	1 – 2	0 (32)	10 kΩ
			20 (68)	4 kΩ
			80 (176)	0.5 kΩ

3. If NG, replace A/T fluid temperature sensor 2. Refer to [AT-223, "A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION"](#) .



# DTC P1721 VEHICLE SPEED SENSOR MTR

## DTC P1721 VEHICLE SPEED SENSOR MTR

PPF:24814

### Description

NCS0004U

The vehicle speed sensor-MTR signal is transmitted from combination meter to TCM by CAN communication line. The signal functions as an auxiliary device to revolution sensor when it is malfunctioning. The TCM will then use the vehicle speed sensor-MTR signal.

### CONSULT-III Reference Value

NCS0004V

Item name	Condition	Display value
VHCL/S SE-MTR	During driving	Approximately matches the speedometer reading.

### On Board Diagnosis Logic

NCS0004W

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1721 VEH SPD SE/CIR-MTR" with CONSULT-III is detected when TCM does not receive the proper vehicle speed sensor MTR signal (input by CAN communication) from unified meter and A/C amp.

### Possible Cause

NCS0004X

Harness or connectors  
(Sensor circuit is open or shorted.)

### DTC Confirmation Procedure

NCS0004Y

#### **CAUTION:**

**Always drive vehicle at a safe speed.**

#### **NOTE:**

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

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

#### **Ⓟ WITH CONSULT-III**

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Touch "START".
4. Start engine and maintain the following conditions for at least 5 consecutive seconds.  
**VHCL/S SE-MTR: 30 km/h (19 MPH) or more**  
**ACCELE POSI: 1.0/8 or less**
5. If DTC is detected, go to [AT-140, "Diagnostic Procedure"](#).

# DTC P1721 VEHICLE SPEED SENSOR MTR

NCS0004Z

## Diagnostic Procedure

### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is malfunction in the CAN communication indicated in the result?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .
- NO >> GO TO 2.

### 2. CHECK INPUT SIGNAL

#### With CONSULT-III

1. Start engine.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Drive vehicle and read out the value of "VHCL/S SE-MTR".

Item name	Condition	Display value
VHCL/S SE-MTR	During driving	Approximately matches the speedometer reading.

OK or NG

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

### 3. CHECK UNIFIED METER AND A/C AMP.

Check unified meter and A/C amp. Refer to [DI-44, "UNIFIED METER AND A/C AMP"](#) .

OK or NG

- OK >> GO TO 4.
- NG >> Repair or replace damaged parts.

### 4. CHECK DTC

Perform [AT-139, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 5.

### 5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

OK or NG

- OK >> GO TO 6.
- NG >> Repair or replace damaged parts.

### 6. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
- NG >> Repair or replace damaged parts.

# DTC P1730 A/T INTERLOCK

## DTC P1730 A/T INTERLOCK

PF0:00000

### Description

NCS00050

Fail-safe function to detect interlock conditions.

### On Board Diagnosis Logic

NCS00051

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1730 A/T INTERLOCK" with CONSULT-III or 12th judgment flicker without CONSULT-III is detected when TCM does not receive the proper voltage signal from the sensor and switch.
- TCM monitors and compares gear position and conditions of each ATF pressure switch when gear is steady.

### Possible Cause

NCS00052

- Harness or connectors  
(Solenoid and switch circuit is open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

### DTC Confirmation Procedure

NCS00053

#### NOTE:

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

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

#### WITH CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Touch "START".
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.  
**SLCT LVR POSI: "D" position**
6. If DTC is detected, go to [AT-142, "Diagnostic Procedure"](#).

#### WITH GST

Follow the procedure "WITH CONSULT-III".

### Judgment of A/T Interlock

NCS00054

- When A/T Interlock is judged to be malfunctioning, the vehicle should be fixed in 2nd gear, and should be set in a condition in which it can travel.

#### NOTE:

**When the vehicle is driven fixed in 2nd gear, a turbine revolution sensor malfunction is displayed, but this is not a turbine revolution sensor malfunction.**

- When interlock is detected at the 3rd gear or more, it is locked at the 2nd gear.

## Diagnostic Procedure

### 1. SELF-DIAGNOSIS

#### ④ With CONSULT-III

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON.
4. Select "SELF-DIAG RESULTS" mode for "TRANSMISSION" with CONSULT-III.

#### ⊗ Without CONSULT-III

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON.
4. Perform self-diagnosis. Refer to [AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) .

#### OK or NG

OK >> GO TO 2.

NG >> Check low coast brake solenoid valve circuit and function. Refer to [AT-153, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE"](#) , [AT-155, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION"](#) .

### 2. CHECK DTC

Perform [AT-141, "DTC Confirmation Procedure"](#) .

#### OK or NG

OK >> **INSPECTION END**

NG >> GO TO 3.

### 3. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

#### OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

### 4. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .

NG >> Repair or replace damaged parts.

# DTC P1731 A/T 1ST ENGINE BRAKING

## DTC P1731 A/T 1ST ENGINE BRAKING

PF0:00000

### Description

NCS00056

Fail-safe function to prevent sudden decrease in speed by engine brake other than at M1 position.

### CONSULT-III Reference Value

NCS00057

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF

### On Board Diagnosis Logic

NCS00058

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1731 A/T 1ST E/BRAKING" with CONSULT-III or 13th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM does not receive the proper voltage signal from the sensor.
  - When TCM monitors each ATF pressure switch and solenoid monitor value, and detects as irregular when engine brake of 1st gear acts other than at M1 position.

### Possible Cause

NCS00059

- Harness or connectors  
(The sensor circuit is open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

### DTC Confirmation Procedure

NCS0005A

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

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

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

#### ④ WITH CONSULT-III

1. Turn ignition switch ON.
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III and check monitor "ENGINE SPEED", "MANU MODE SW" and "GEAR".
3. Touch "START".
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.  
**ENGINE SPEED: 1,200 rpm**  
**MANU MODE SW: ON**  
**GEAR: "1" position**
6. If DTC is detected, go to [AT-144, "Diagnostic Procedure"](#) .

# DTC P1731 A/T 1ST ENGINE BRAKING

NCS0005B

## Diagnostic Procedure

### 1. CHECK INPUT SIGNALS

#### ④ With CONSULT-III

1. Start engine.
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Drive vehicle in the "M" position (1st gear), and confirm the ON/OFF actuation of "ATF PRES SW 2" and "ON OFF SOL".

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF

#### OK or NG

- OK >> GO TO 4.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .  
NG >> Repair or replace damaged parts.

### 4. CHECK DTC

Perform [AT-143, "DTC Confirmation Procedure"](#) .

#### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 2.

# DTC P1752 INPUT CLUTCH SOLENOID VALVE

## DTC P1752 INPUT CLUTCH SOLENOID VALVE

PFP:31940

### Description

NCS0005C

Input clutch solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

### CONSULT-III Reference Value

NCS0005D

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A
	Input clutch engaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A

### On Board Diagnosis Logic

NCS0005E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1752 I/C SOLENOID/CIRC” with CONSULT-III or 5th judgment flicker CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

### Possible Cause

NCS0005F

- Harness or connectors  
(Solenoid circuit is open or shorted.)
- Input clutch solenoid valve

### DTC Confirmation Procedure

NCS0005G

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

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

#### WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
  - ACCELE POSI: 1.5/8 – 2.0/8**
  - SLCT LVR POSI: “D” position**
  - GEAR: “3” ⇒ “4” (I/C ON/OFF)**
  - Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
6. If DTC is detected go to “[AT-146, "Diagnostic Procedure"](#) .

#### WITH GST

Follow the procedure “WITH CONSULT-III”.

# DTC P1752 INPUT CLUTCH SOLENOID VALVE

NCS0005H

## Diagnostic Procedure

### 1. CHECK INPUT SIGNAL

#### ④ With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Read out the value of "I/C SOLENOID" while driving.

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A
	Input clutch engaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A

#### OK or NG

- OK >> GO TO 4.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .  
NG >> Repair or replace damaged parts.

### 4. CHECK DTC

Perform [AT-145, "DTC Confirmation Procedure"](#) .

#### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 2.

# DTC P1757 FRONT BRAKE SOLENOID VALVE

## DTC P1757 FRONT BRAKE SOLENOID VALVE

PFP:31940

### Description

NCS00050

Front brake solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

### CONSULT-III Reference Value

NCS0005P

Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A
	Front brake disengaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A

### On Board Diagnosis Logic

NCS0005Q

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1757 FR/B SOLENOID/CIRC” with CONSULT-III or 6th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

### Possible Cause

NCS0005R

- Harness or connectors  
(Solenoid circuit is open or shorted.)
- Front brake solenoid valve

### DTC Confirmation Procedure

NCS0005S

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

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

#### WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
  - ACCELE POSI: 1.5/8 – 2.0/8**
  - SLCT LVR POSI: “D” position**
  - GEAR: “3” ⇒ “4” (FR/B ON/OFF)**
  - Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
6. If DTC is detected go to [AT-148, "Diagnostic Procedure"](#) .

#### WITH GST

Follow the procedure “WITH CONSULT-III”.

# DTC P1757 FRONT BRAKE SOLENOID VALVE

NCS0005T

## Diagnostic Procedure

### 1. CHECK INPUT SIGNAL

#### ④ With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Read out the value of "FR/B SOLENOID" while driving.

Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A
	Front brake disengaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A

#### OK or NG

- OK >> GO TO 4.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .  
NG >> Repair or replace damaged parts.

### 4. CHECK DTC

Perform [AT-147, "DTC Confirmation Procedure"](#) .

#### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 2.

# DTC P1762 DIRECT CLUTCH SOLENOID VALVE

## DTC P1762 DIRECT CLUTCH SOLENOID VALVE

PFP:31940

### Description

NCS00060

Direct clutch solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

### CONSULT-III Reference Value

NCS00061

Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A
	Direct clutch engaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A

### On Board Diagnosis Logic

NCS00062

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1762 D/C SOLENOID/CIRC” with CONSULT-III or 2nd judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

### Possible Cause

NCS00063

- Harness or connectors  
(Solenoid circuit is open or shorted.)
- Direct clutch solenoid valve

### DTC Confirmation Procedure

NCS00064

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

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

#### WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
  - ACCELE POSI: 1.5/8 – 2.0/8**
  - SLCT LVR POSI: “D” position**
  - GEAR: “1” ⇒ “2” (D/C ON/OFF)**
  - Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
6. If DTC is detected, go to [AT-150, "Diagnostic Procedure"](#) .

#### WITH GST

Follow the procedure “WITH CONSULT-III”.

# DTC P1762 DIRECT CLUTCH SOLENOID VALVE

NCS00065

## Diagnostic Procedure

### 1. CHECK INPUT SIGNAL

#### Ⓜ With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Read out the value of "D/C SOLENOID" while driving.

Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A
	Direct clutch engaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A

#### OK or NG

- OK >> GO TO 4.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .  
NG >> Repair or replace damaged parts.

### 4. CHECK DTC

Perform [AT-149, "DTC Confirmation Procedure"](#) .

#### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 2.

# DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE

## DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE

PFP:31940

### Description

NCS0006C

High and low reverse clutch solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

### CONSULT-III Reference Value

NCS0006D

Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A
	High and low reverse clutch engaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A

### On Board Diagnosis Logic

NCS0006E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1767 HLR/C SOL/CIRC” with CONSULT-III or 8th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

### Possible Cause

NCS0006F

- Harness or connectors  
(Solenoid circuit is open or shorted.)
- High and low reverse clutch solenoid valve

### DTC Confirmation Procedure

NCS0006G

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

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

#### WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-III and check monitor “ACCELE POSI”, “SLCT LVR POSI” and “GEAR”.
3. Touch “START”.
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
  - ACCELE POSI: 1.5/8 – 2.0/8**
  - SLCT LVR POSI: “D” position**
  - GEAR: “2” ⇒ “3” (HLR/C ON/OFF)**
  - Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.**
6. If DTC is detected, go to [AT-152, "Diagnostic Procedure"](#) .

#### WITH GST

Follow the procedure “WITH CONSULT-III”.

# DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE

NCS0006H

## Diagnostic Procedure

### 1. CHECK INPUT SIGNAL

#### With CONSULT-III

1. Turn ignition switch ON.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Read out the value of "HLR/C SOL" while driving.

Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to <a href="#">AT-19</a> .	0.6 – 0.8 A
	High and low reverse clutch engaged. Refer to <a href="#">AT-19</a> .	0 – 0.05 A

#### OK or NG

- OK >> GO TO 4.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .  
NG >> Repair or replace damaged parts.

### 4. CHECK TCM

Perform [AT-151, "DTC Confirmation Procedure"](#) .

#### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 2.

# DTC P1772 LOW COAST BRAKE SOLENOID VALVE

## DTC P1772 LOW COAST BRAKE SOLENOID VALVE

PF3:31940

### Description

NCS00060

Low coast brake solenoid valve is turned ON or OFF by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

### CONSULT-III Reference Value

NCS0006P

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF

### On Board Diagnosis Logic

NCS0006Q

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1772 LC/B SOLENOID/CIRC" with CONSULT-III or 7th judgment flicker without CONSULT-III is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

### Possible Cause

NCS0006R

- Harness or connectors  
(Solenoid circuit is open or shorted.)
- Low coast brake solenoid valve

### DTC Confirmation Procedure

NCS0006S

#### **CAUTION:**

**Always drive vehicle at a safe speed.**

#### **NOTE:**

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

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

#### **Ⓟ WITH CONSULT-III**

1. Turn ignition switch ON.
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III and check monitor "MANU MODE SW" and "GEAR".
3. Touch "START".
4. Start engine.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.  
**MANU MODE SW: ON**  
**GEAR: "1" or "2" (LC/B ON/OFF)**
6. If DTC is detected, go to [AT-154, "Diagnostic Procedure"](#) .

#### **Ⓢ WITH GST**

Follow the procedure "WITH CONSULT-III".

# DTC P1772 LOW COAST BRAKE SOLENOID VALVE

NCS0006T

## Diagnostic Procedure

### 1. CHECK INPUT SIGNAL

#### ④ With CONSULT-III

1. Turn ignition switch ON.
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Read out the value of "ON OFF SOL" while driving.

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF

#### OK or NG

- OK >> GO TO 4.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .  
NG >> Repair or replace damaged parts.

### 4. CHECK DTC

Perform [AT-153, "DTC Confirmation Procedure"](#) .

#### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 2.

# DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION

## DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION

PFP:31940

### Description

NCS0006U

- Low coast brake solenoid valve is turned ON or OFF by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

### CONSULT-III Reference Value

NCS0006V

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF

### On Board Diagnosis Logic

NCS0006W

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1774 LC/B SOLENOID FNCT" with CONSULT-III or 7th judgment flicker without CONSULT-III is detected under the following conditions.
  - When TCM detects that actual gear ratio is irregular, and relation between gear position and condition of ATF pressure switch 2 is irregular during depressing accelerator pedal (Other than during shift change)
  - When TCM detects that relation between gear position and condition of ATF pressure switch 2 is irregular during releasing accelerator pedal (Other than during shift change)

### Possible Cause

NCS0006X

- Harness or connectors  
(The solenoid and switch circuits are open or shorted.)
- Low coast brake solenoid valve
- ATF pressure switch 2

### DTC Confirmation Procedure

NCS0006Y

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

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

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

#### WITH CONSULT-III

1. Start engine.
2. Accelerate vehicle to maintain the following conditions.  
**MANU MODE SW: ON**  
**GEAR: "1" or "2" (LC/B ON/OFF)**
3. Perform step 2 again.
4. Turn ignition switch OFF, then perform step 1 to 3 again.
5. Check "SELF-DIAG RESULTS" mode for "TRANSMISSION" with CONSULT-III.  
If DTC (P1774) is detected, refer to [AT-156, "Diagnostic Procedure"](#) .  
If DTC (P1772) is detected, go to [AT-154, "Diagnostic Procedure"](#) .

#### WITH GST

Follow the procedure "WITH CONSULT-III".

# DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION

NCS0006Z

## Diagnostic Procedure

### 1. CHECK INPUT SIGNALS

#### ④ With CONSULT-III

1. Start engine.
2. Select "SELECTION FROM MENU" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Drive vehicle in the manual mode ("1" or "2" gear), and confirm the ON/OFF actuation of the "ATF PRES SW 2" and "ON OFF SOL".

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to <a href="#">AT-19</a> .	ON
	Low coast brake disengaged. Refer to <a href="#">AT-19</a> .	OFF

#### OK or NG

- OK >> GO TO 4.  
NG >> GO TO 2.

### 2. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

#### OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

#### OK or NG

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .  
NG >> Repair or replace damaged parts.

### 4. CHECK DTC

Perform [AT-155, "DTC Confirmation Procedure"](#) .

#### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 2.

# DTC P1815 MANUAL MODE SWITCH

## DTC P1815 MANUAL MODE SWITCH

PFP:34901

### Description

NCS00070

Manual mode switch is installed in A/T device. It sends manual mode switch, shift up and shift down switch signals to TCM.

TCM sends the switch signals to unified meter and A/C amp. By CAN communication line. Then manual mode switch position is indicated on the A/T position indicator. For inspection, refer to [AT-168, "A/T INDICATOR CIRCUIT"](#).

### CONSULT-III Reference Value in Data Monitor Mode

NCS00071

Item name	Condition	Display Value
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	Selector lever: + side	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever: - side	ON
	Other than the above	OFF

### On Board Diagnosis Logic

NCS00072

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code "P1815 MANU MODE SW/CIRC" with CONSULT-III is detected when TCM monitors Manual mode, Non manual mode, Up or Down switch signal, and detects as irregular when impossible input pattern occurs 1 second or more.

### Possible Cause

NCS00073

- Harness or connectors  
(These switches circuit is open or shorted.)
- Manual mode select switch (Into control device)
- Manual mode position select switch (Into control device)

### DTC Confirmation Procedure

NCS00074

#### CAUTION:

Always drive vehicle at a safe speed.

#### NOTE:

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

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

#### WITH CONSULT-III

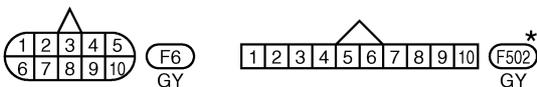
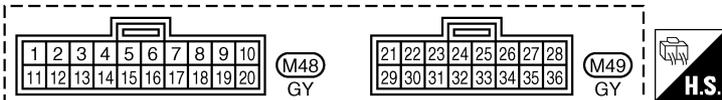
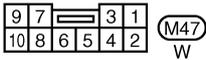
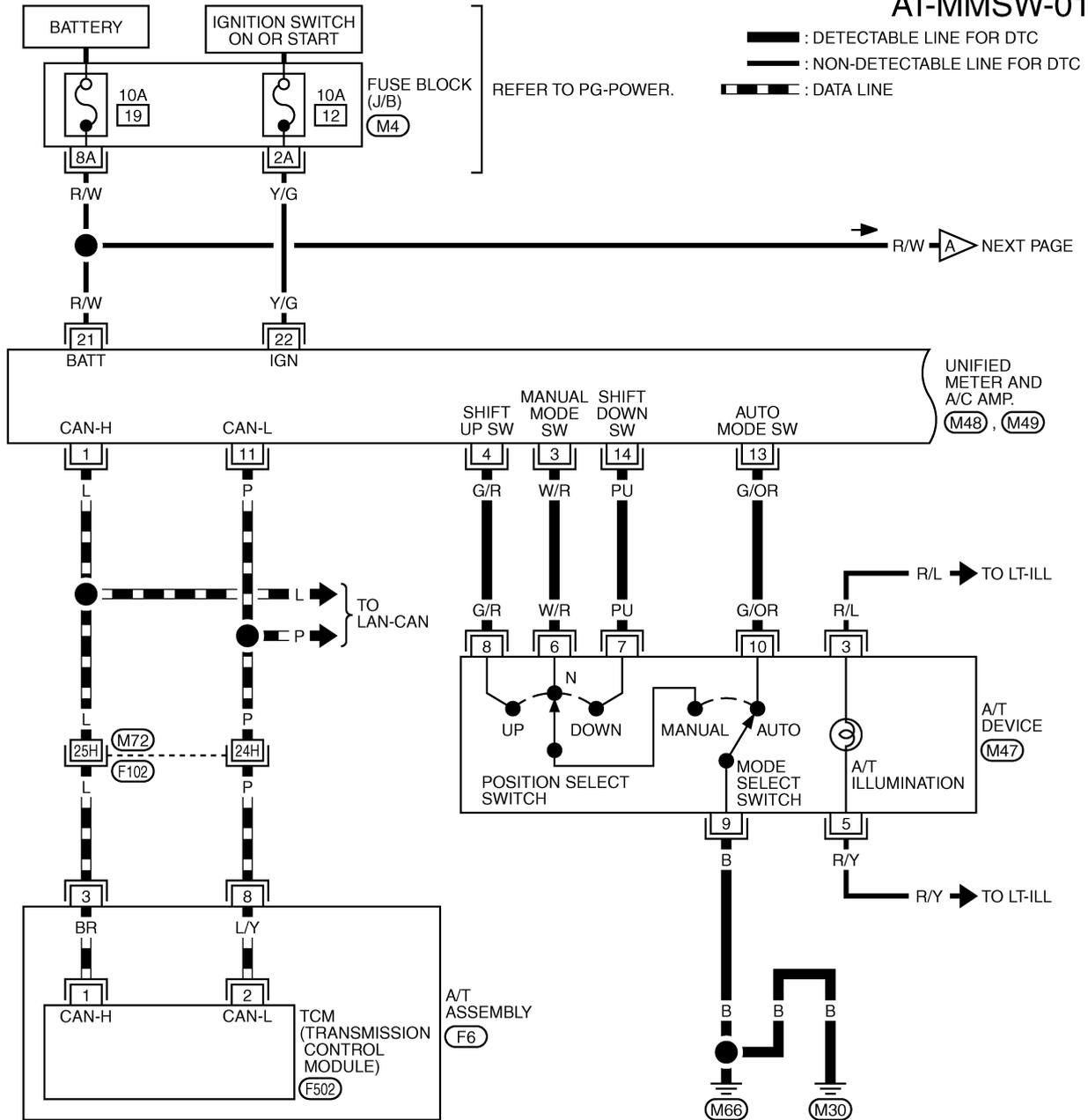
1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Start engine.
4. Move selector lever to "M" position.
5. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.  
**MANU MODE SW: ON**
6. If DTC is detected, go to [AT-160, "Diagnostic Procedure"](#).

# DTC P1815 MANUAL MODE SWITCH

## Wiring Diagram — AT — MMSW

NCS00075

### AT-MMSW-01



\*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.

(F102) -SUPER MULTIPLE JUNCTION (SMJ)

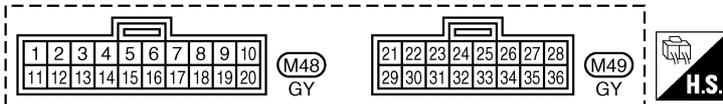
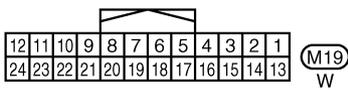
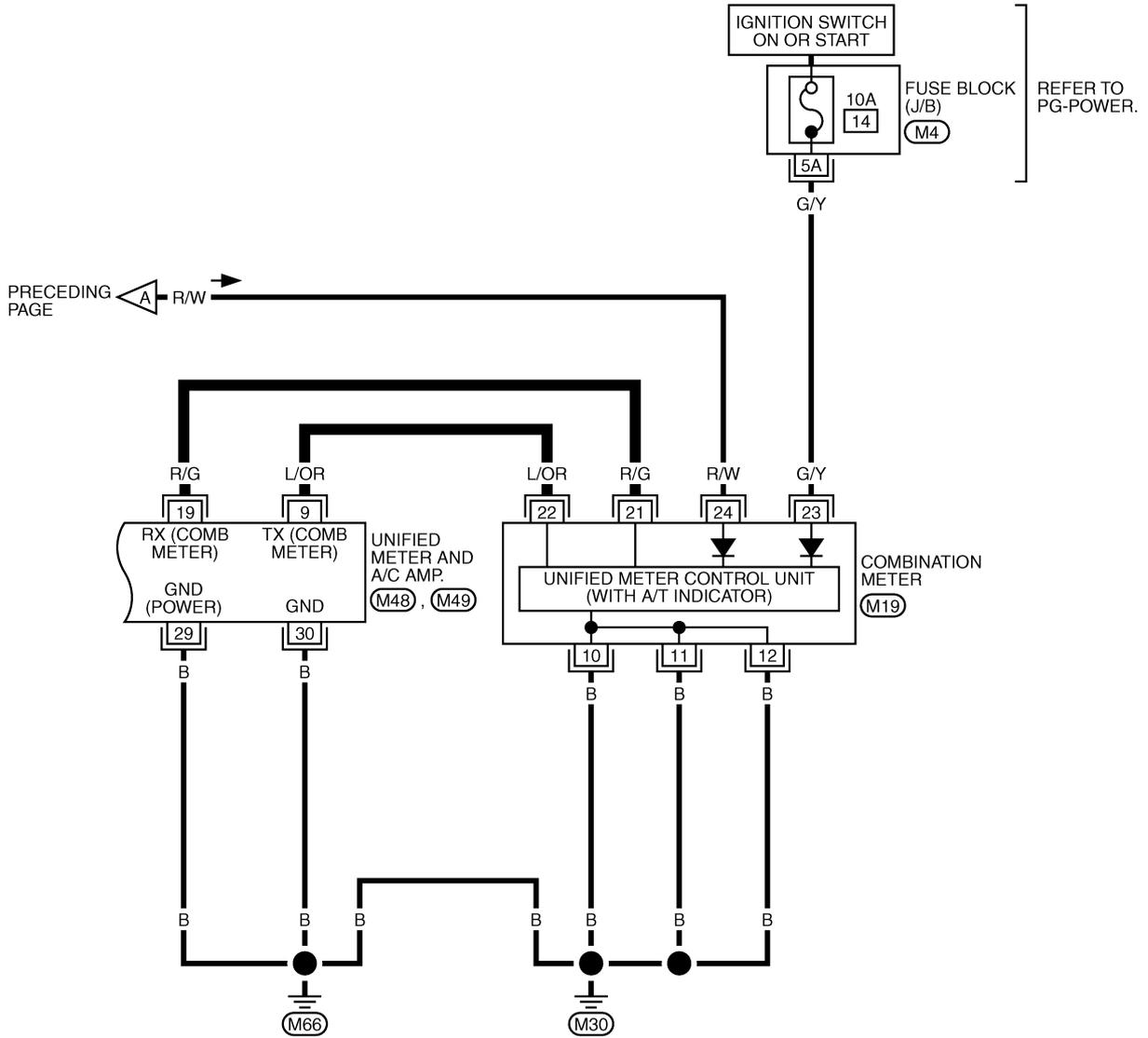
(M4) -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0439E

# DTC P1815 MANUAL MODE SWITCH

AT-MMSW-02

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



REFER TO THE FOLLOWING.  
**(M4)** - FUSE BLOCK-JUNCTION BOX (J/B)

TCWM0263E

# DTC P1815 MANUAL MODE SWITCH

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
3	L	CAN-H	—	—
8	P	CAN-L	—	—

## Diagnostic Procedure

NCS00076

### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) .

Is a malfunction in the CAN communication indicated in the results?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .  
NO >> GO TO 2.

### 2. CHECK MANUAL MODE SWITCH CIRCUIT

#### With CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Read out ON/OFF switching action of "MANU MODE SW", "NON M-MODE SW", "UP SW LEVER", "DOWN SW LEVER".

Item name	Condition	Display Value
MANU MODE SW	Manual shift gate position (neutral)	ON
	Other than the above	OFF
NON M-MODE SW	Manual shift gate position	OFF
	Other than the above	ON
UP SW LEVER	selector lever: +side	ON
	Other than the above	OFF
DOWN SW LEVER	selector lever: -side	ON
	Other than the above	OFF

#### Without CONSULT-III

Drive vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the "+" (up) or "-" (down)" side (1st ↔ 5th gear).

OK or NG

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

### 3. DETECT MALFUNCTIONING ITEM

Check the following.

- Manual mode switch. Refer to [AT-161, "Component Inspection"](#) .
- Pin terminals for damage or loose connection with harness connector.
- Open circuit or short to ground or short to power in harness or connector for A/T device (manual mode switch).
- Unified meter and A/C amp. Refer to [DI-44, "UNIFIED METER AND A/C AMP"](#) .

OK or NG

- OK >> GO TO 4.  
NG >> Repair or replace damaged parts.

# DTC P1815 MANUAL MODE SWITCH

## 4. CHECK DTC

Perform [AT-157, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 5.

## 5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

OK or NG

- OK >> GO TO 6.
- NG >> Repair or replace damaged parts.

## 6. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

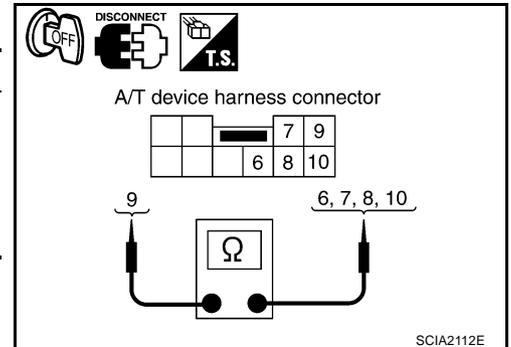
- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
- NG >> Repair or replace damaged parts.

## Component Inspection MANUAL MODE SWITCH

NCS00077

Check continuity between terminals.

Item	Position	Connector	Terminal	Continuity
Manual mode select switch	Auto	M47	9 – 10	Yes
	Manual		6 – 9	
Manual mode position select switch	UP		8 – 9	
	DOWN		7 – 9	



SCIA2112E

# MAIN POWER SUPPLY AND GROUND CIRCUIT

## MAIN POWER SUPPLY AND GROUND CIRCUIT

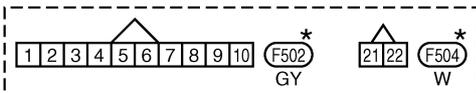
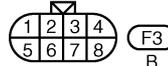
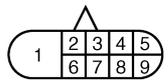
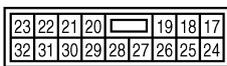
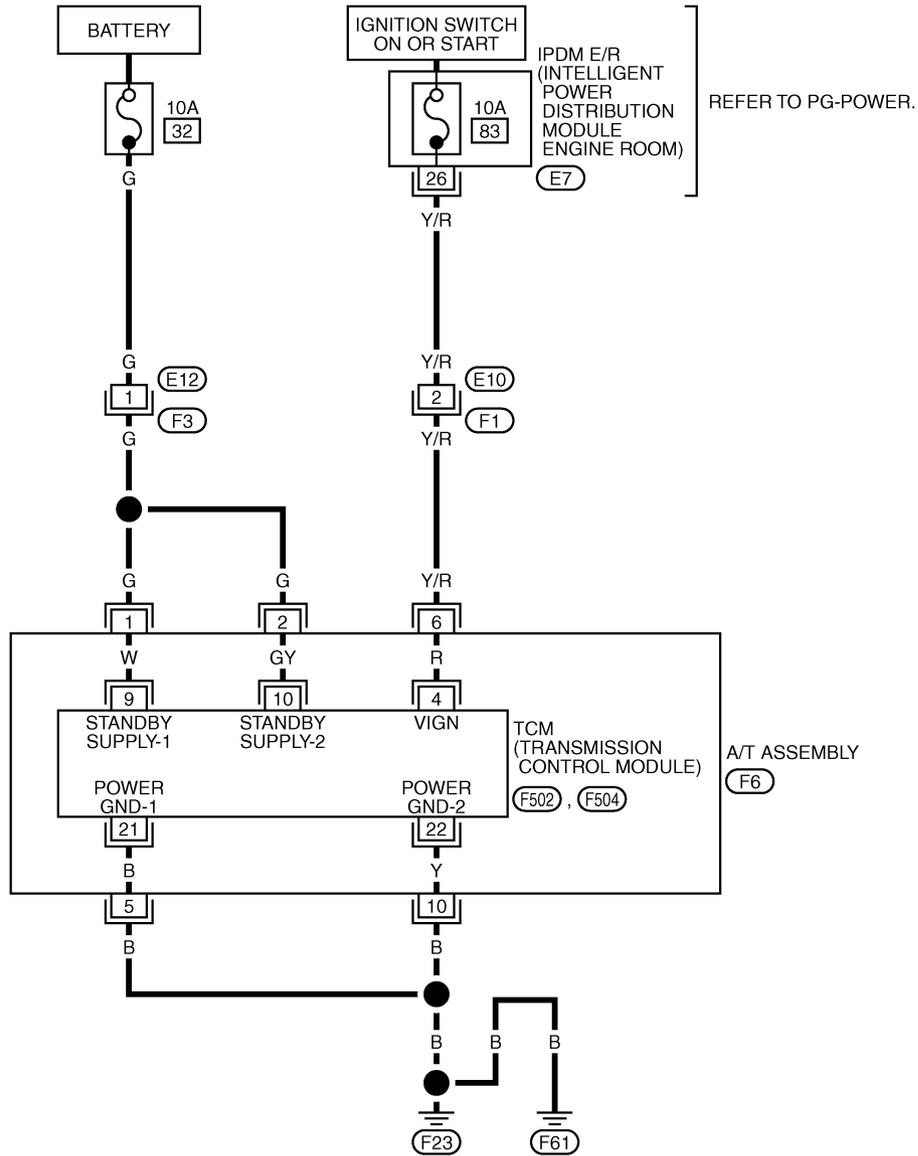
PFP:00100

### Wiring Diagram — AT — MAIN

NCS0007W

#### AT-MAIN-01

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



\*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

# MAIN POWER SUPPLY AND GROUND CIRCUIT

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
1	G	Power supply (Memory back-up)	Always	Battery voltage
2	G	Power supply (Memory back-up)	Always	Battery voltage
5	B	Ground	Always	0 V
6	Y/R	Power supply		—
				—
10	B	Ground	Always	0 V

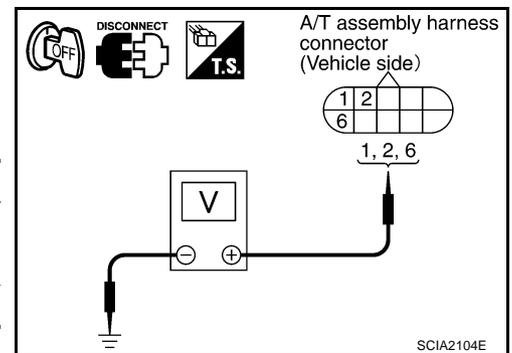
## Diagnostic Procedure

NCS0007X

### 1. CHECK TCM POWER SOURCE STEP 1

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Check voltage between A/T assembly harness connector and ground.

Item	Connector	Terminal	Voltage (Approx.)
TCM	F6	1 – Ground	Battery voltage
		2 – Ground	
		6 – Ground	0 V



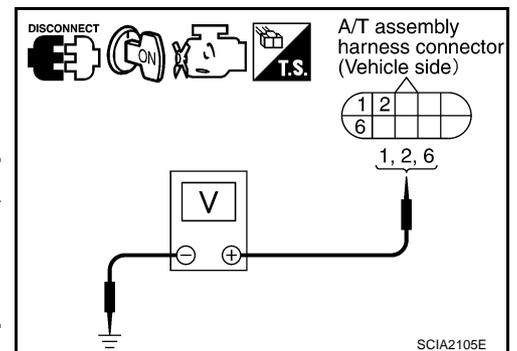
OK or NG

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

### 2. CHECK TCM POWER SOURCE STEP 2

1. Disconnect A/T assembly harness connector.
2. Turn ignition switch ON.
3. Check voltage between A/T assembly harness connector and ground.

Item	Connector	Terminal	Voltage (Approx.)
TCM	F6	1 – Ground	Battery voltage
		2 – Ground	
		6 – Ground	



OK or NG

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

# MAIN POWER SUPPLY AND GROUND CIRCUIT

## 3. DETECT MALFUNCTIONING ITEM

Check the following.

- Harness for short or open between battery and A/T assembly harness connector terminals 1, 2
- Harness for short or open between ignition switch and A/T assembly harness connector terminal 6
- 10 A fuse (No. 32, located in the fuse and fusible link block) and 10 A fuse (No. 83, located in the IPDM E/R)
- Ignition switch, Refer to [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#) .

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

## 4. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Check continuity between A/T assembly harness connector terminals and ground.

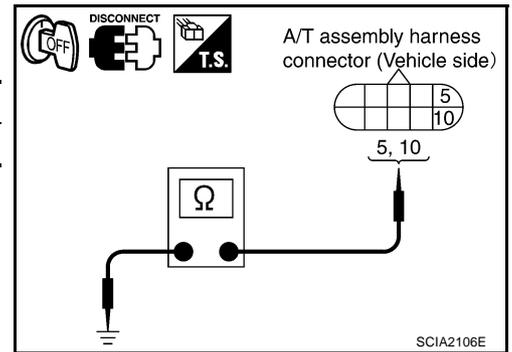
Item	Connector	Terminal	Continuity
TCM	F6	5, 10 – Ground	Yes

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

OK or NG

OK >> GO TO 5.

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



## 5. DETECT MALFUNCTIONING ITEM

Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

## 6. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) .

OK or NG

OK >> **INSPECTION END**

NG-1 >> Self-diagnosis does not activate: GO TO 7.

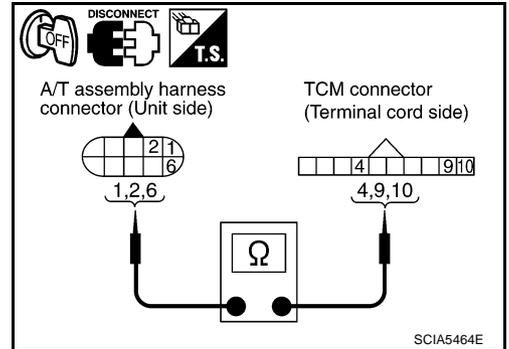
NG-2 >> DTC is displayed: Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) .

# MAIN POWER SUPPLY AND GROUND CIRCUIT

## 7. CHECK TERMINAL CORD ASSEMBLY

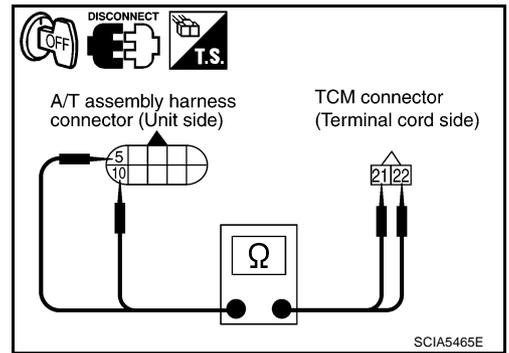
1. Remove control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disconnect A/T assembly harness connector and TCM connector.
3. Check continuity between A/T assembly harness connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	1	Yes
TCM connector	F502	9	
A/T assembly harness connector	F6	2	Yes
TCM connector	F502	10	
A/T assembly harness connector	F6	6	Yes
TCM connector	F502	4	



4. Check continuity between A/T assembly harness connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F6	5	Yes
TCM connector	F504	21	
A/T assembly harness connector	F6	10	Yes
TCM connector	F504	22	



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

**OK or NG**

- OK >> Replace control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
- NG >> Replace open circuit or short to ground and short to power in harness or connectors.

# CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT

## CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT

PFP:18002

### CONSULT-III Reference Value

NCS0007Y

Item name	Condition	Display value
CLSD THL POS	Released accelerator pedal.	ON
	Fully depressed accelerator pedal.	OFF
W/O THL POS	Fully depressed accelerator pedal.	ON
	Released accelerator pedal.	OFF

### Diagnostic Procedure

NCS0007Z

#### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) .

Is a malfunction in the CAN communication indicated in the results?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .  
NO >> GO TO 2.

#### 2. CHECK THROTTLE POSITION SIGNAL CIRCUIT

##### Ⓟ With CONSULT-III

1. Turn ignition switch ON.
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
3. Depress accelerator pedal and read out the value of "CLSD THL POS" and "W/O THL POS".

Accelerator Pedal Operation	Monitor Item	
	CLSD THL POS	W/O THL POS
Released	ON	OFF
Fully depressed	OFF	ON

##### OK or NG

- OK >> **INSPECTION END**  
NG >> Check the following. If NG, repair or replace damaged parts.
- Perform self-diagnosis for "ENGINE" with CONSULT-III. Refer to [EC-116, "CONSULT-III Function \(ENGINE\)"](#) .
  - Open circuit or short to ground or short to power in harness or connectors.
  - Pin terminals for damage or loose connection with harness connector.

# BRAKE SIGNAL CIRCUIT

## BRAKE SIGNAL CIRCUIT

PPF:25320

### CONSULT-III Reference Value

NCS00080

Item name	Condition	Display value
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

### Diagnostic Procedure

NCS00081

#### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) .

Is a malfunction in the CAN communication indicated in the results?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .  
 NO >> GO TO 2.

#### 2. CHECK STOP LAMP SWITCH CIRCUIT

##### With CONSULT-III

- Turn ignition switch ON.
- Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III.
- Read out ON/OFF switching action of the "BRAKE SW".

Item name	Condition	Display value
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

OK or NG

- OK >> **INSPECTION END**  
 NG >> GO TO 3.

#### 3. CHECK STOP LAMP SWITCH

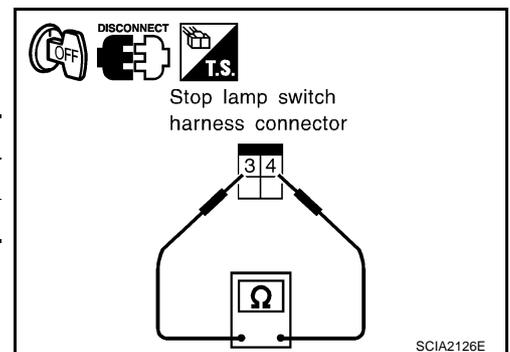
Check continuity between stop lamp switch harness connector E111 terminals 3 and 4. Refer to [AT-169, "Wiring Diagram — AT — NON-DTC"](#) .

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-7, "BRAKE PEDAL"](#) .

OK or NG

- OK >> Check the following. If NG, repair or replace damaged parts.
- Harness for short or open between battery and stop lamp switch.
  - Harness for short or open between stop lamp switch and unified meter and A/C amp.
  - 10 A fuse (No. 20, located in fuse block).
- NG >> Repair or replace the stop lamp switch.



# A/T INDICATOR CIRCUIT

## A/T INDICATOR CIRCUIT

PFP:24810

### Description

NCS00082

The TCM sends the switch signals to unified meter and A/C amp. By CAN communication line. Then manual mode switch position is indicated on the A/T position indicator.

### CONSULT-III Reference Value

NCS00083

Item name	Condition	Display value
GEAR	During driving	1, 2, 3, 4, 5

### Diagnostic Procedure

NCS00084

#### 1. CHECK INPUT SIGNALS

##### Ⓟ With CONSULT-III

1. Start engine.
2. Select "MAIN SIGNALS" in "DATA MONITOR" mode for "TRANSMISSION" with CONSULT-III and read out the value of "GEAR".
3. Drive vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the "+ (up)" or "- (down)" side (1st ↔ 5th gear).

##### OK or NG

- OK >> **INSPECTION END**  
NG >> Check the following.

### A/T INDICATOR SYMPTOM CHART

Items	Presumed Location of Trouble
The actual gear position does not change, or shifting into the manual mode is not possible (no gear shifting in the manual mode possible). The A/T position indicator is not indicated.	Manual mode switch Refer to <a href="#">AT-157, "DTC P1815 MANUAL MODE SWITCH"</a> . A/T main system (Fail-safe function actuated) ● Refer to <a href="#">AT-86, "SELF-DIAGNOSTIC RESULT MODE"</a> .
The actual gear position changes, but the A/T position indicator is not indicated.	Perform the self-diagnosis function. ● Refer to <a href="#">AT-86, "SELF-DIAGNOSTIC RESULT MODE"</a> .
The actual gear position and the indication on the A/T position indicator do not coincide.	Perform the self-diagnosis function. ● Refer to <a href="#">AT-86, "SELF-DIAGNOSTIC RESULT MODE"</a> .
Only a specific position or positions is/are not indicated on the A/T position indicator.	Check the unified meter and A/C amp. ● Refer to <a href="#">DI-4, "COMBINATION METERS"</a> .

# TROUBLE DIAGNOSIS FOR SYMPTOMS

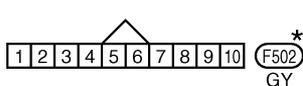
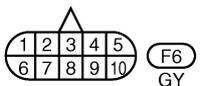
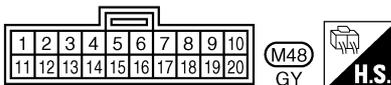
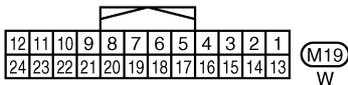
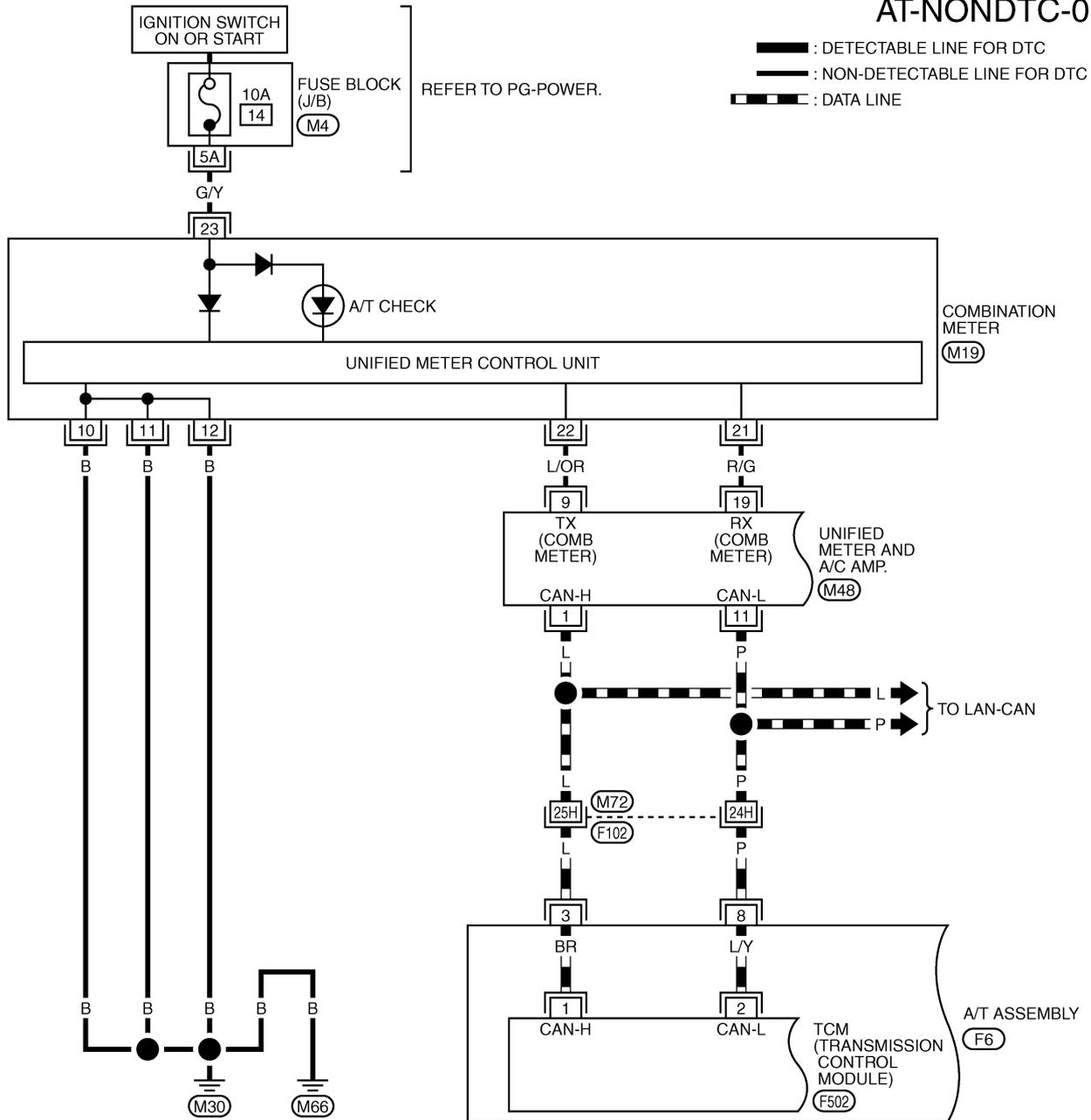
## TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

### Wiring Diagram — AT — NONDTC

NCS00085

#### AT-NONDTC-01



\*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

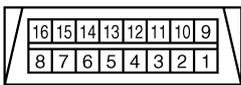
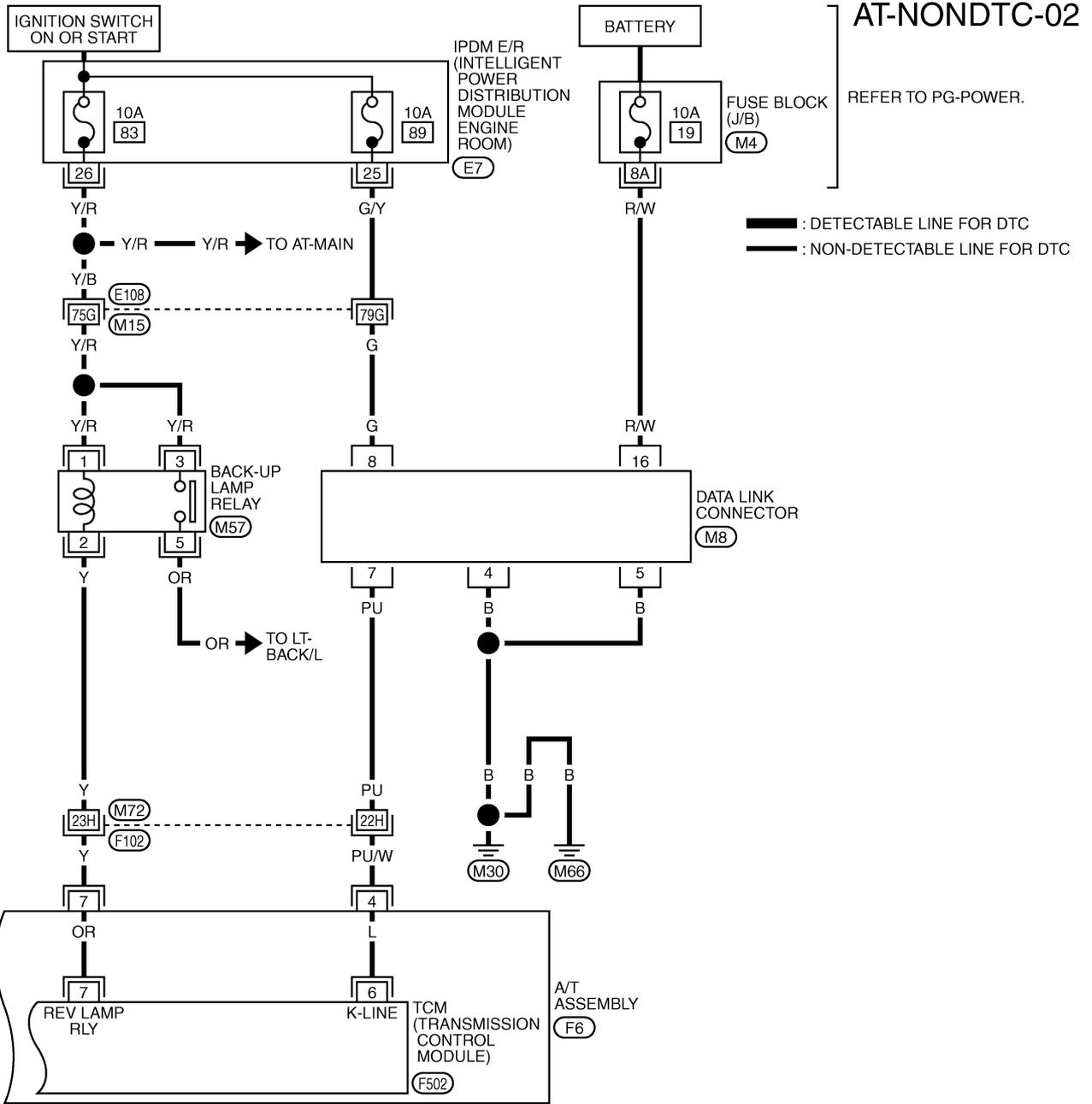
REFER TO THE FOLLOWING.

F102 -SUPER MULTIPLE JUNCTION (SMJ)

M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0441E

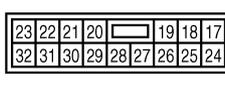
# TROUBLE DIAGNOSIS FOR SYMPTOMS



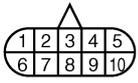
(M8)  
W



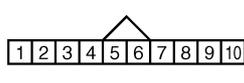
(M57)  
L



(E7)  
GY



(F6)  
GY



(F502)  
GY

REFER TO THE FOLLOWING.

(E108), (F102) -SUPER MULTIPLE JUNCTION (SMJ)

(M4) -FUSE BLOCK-JUNCTION BOX (J/B)

\*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

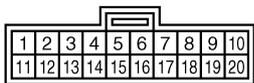
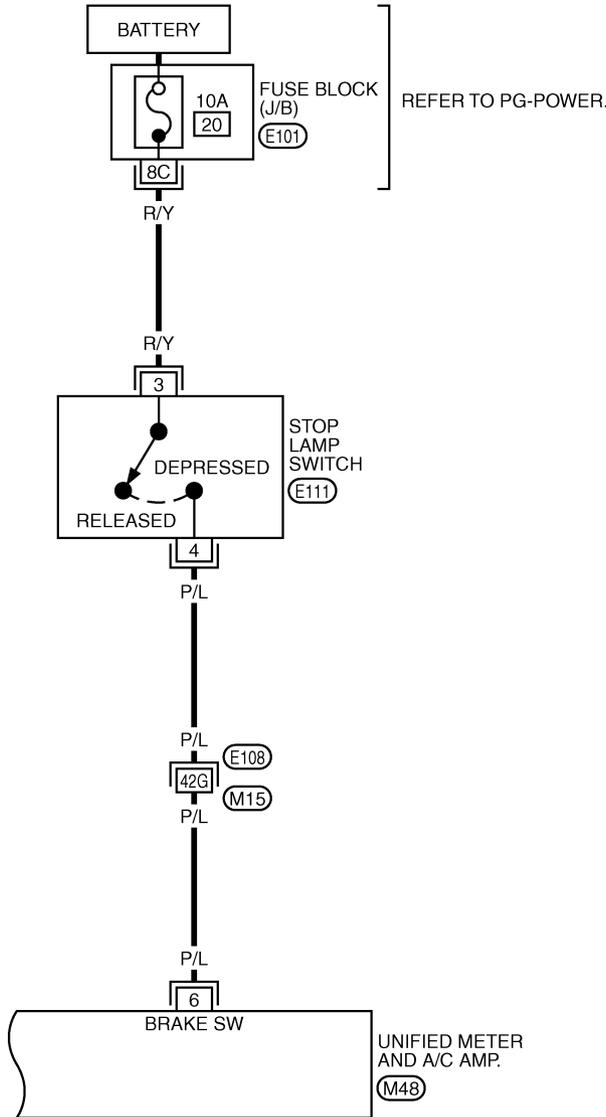
TCWT0442E

# TROUBLE DIAGNOSIS FOR SYMPTOMS

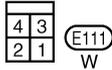
AT-NONDTC-03

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

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



M48  
GY



E111  
W

REFER TO THE FOLLOWING.

(E108) -SUPER MULTIPLE JUNCTION (SMJ)

(E101) -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0378E

# TROUBLE DIAGNOSIS FOR SYMPTOMS

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition	Data (Approx.)
3	L	CAN-H	—	—
4	PU/W	K-line (CONSULT-III signal)	The terminal is connected to the data link connector for CONSULT-III.	
7	Y	Back-up lamp relay	 Selector lever in "R" position.	0 V
			Selector lever in other positions.	Battery voltage
8	P	CAN-L	—	—

## A/T Check Indicator Lamp Does Not Come On

NCS00086

### SYMPTOM:

A/T CHECK indicator lamp does not come on for about 2 seconds when turning ignition switch to ON.

### DIAGNOSTIC PROCEDURE

#### 1. CHECK CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is a malfunction in the CAN communication indicated in the results?

- YES >> Check CAN communication line. Refer to [AT-94, "DTC U1000 CAN COMMUNICATION LINE"](#) .
- NO >> GO TO 2.

#### 2. CHECK A/T CHECK INDICATOR LAMP CIRCUIT

Check combination meter. Refer to [DI-4, "COMBINATION METERS"](#) .

OK or NG

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

#### 3. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to [AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT"](#) .

OK or NG

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

# TROUBLE DIAGNOSIS FOR SYMPTOMS

## Engine Cannot Be Started in “P” or “N” Position

NCS00087

### SYMPTOM:

- Engine cannot be started with selector lever in “P” or “N” position.
- Engine can be started with selector lever in “D” or “R” position.

### DIAGNOSTIC PROCEDURE

#### 1. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to [AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#) .

NO >> GO TO 2.

#### 2. CHECK A/T POSITION

Check A/T position. Refer to [AT-206, "Checking of A/T Position"](#) .

OK or NG

OK >> GO TO 3.

NG >> Adjust A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) .

#### 3. CHECK STARTING SYSTEM

Check starting system. Refer to [SC-8, "STARTING SYSTEM"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

## In “P” Position, Vehicle Moves When Pushed

NCS00088

### SYMPTOM:

Even though the selector lever is set in the “P” position, the parking mechanism is not actuated, allowing the vehicle to be moved when it is pushed.

### DIAGNOSTIC PROCEDURE

#### 1. CHECK A/T POSITION

Check A/T position. Refer to [AT-206, "Checking of A/T Position"](#) .

OK or NG

OK >> GO TO 2.

NG >> Adjust A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) .

#### 2. CHECK PARKING COMPONENTS

Check parking components. Refer to [AT-227, "Parking Components"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

NCS00089

## In "N" Position, Vehicle Moves

### SYMPTOM:

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

### DIAGNOSTIC PROCEDURE

#### 1. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Do the self-diagnostic results indicate PNP switch?

- YES >> Check the malfunctioning system. Refer to [AT-102, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#) .
- NO >> GO TO 2.

#### 2. CHECK A/T POSITION

Check A/T position. Refer to [AT-206, "Checking of A/T Position"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Adjust A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) .

#### 3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

- OK >> GO TO 4.
- NG >> Refill ATF.

#### 4. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

OK or NG

- OK >> GO TO 5.
- NG >> Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 67).

#### 5. CHECK SYMPTOM

Check again. Refer to [AT-53, "Check at Idle"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 6.

#### 6. CHECK TCM

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

# TROUBLE DIAGNOSIS FOR SYMPTOMS

NCS0008A

## Large Shock (“N” to “D” Position)

### SYMPTOM:

A noticeable shock occurs when the selector lever is shifted from the “N” to “D” position.

### DIAGNOSTIC PROCEDURE

#### 1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .
- NO >> GO TO 2.

#### 2. ENGINE IDLE SPEED

Check engine idle speed. Refer to [EC-76, "Idle Speed and Ignition Timing Check"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Adjust engine idle speed. Refer to [EC-76, "Idle Speed and Ignition Timing Check"](#) .

#### 3. CHECK A/T POSITION

Check A/T position. Refer to [AT-206, "Checking of A/T Position"](#) .

OK or NG

- OK >> GO TO 4.
- NG >> Adjust A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) .

#### 4. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

- OK >> GO TO 5.
- NG >> Refill ATF.

#### 5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in “D” position. Refer to [AT-50, "LINE PRESSURE TEST"](#) .

OK or NG

- OK >> GO TO 8.
- NG - 1 >> Line pressure high: GO TO 6.
- NG - 2 >> Line pressure low: GO TO 7.

#### 6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .

OK or NG

- OK >> GO TO 8.
- NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 7. DETECT MALFUNCTIONING ITEM

---

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .
  - Power train system. Refer to [AT-255, "DISASSEMBLY"](#) .
  - Transmission case. Refer to [AT-255, "DISASSEMBLY"](#) .

### OK or NG

- OK >> GO TO 8.  
NG >> Repair or replace damaged parts.

---

## 8. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

### OK or NG

- OK >> GO TO 10.  
NG >> GO TO 9.

---

## 9. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 1).

### OK or NG

- OK >> GO TO 10.  
NG >> Repair or replace damaged parts.

---

## 10. CHECK SYMPTOM

---

Check again. Refer to [AT-53, "Check at Idle"](#) .

### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 11.

---

## 11. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

### OK or NG

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

# TROUBLE DIAGNOSIS FOR SYMPTOMS

## Vehicle Does Not Creep Backward in “R” Position

NCS0008B

### SYMPTOM:

The vehicle does not creep in the “R” position. Or an extreme lack of acceleration is observed.

### DIAGNOSTIC PROCEDURE

#### 1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .
- NO >> GO TO 2.

#### 2. CHECK A/T POSITION

Check A/T position. Refer to [AT-206, "Checking of A/T Position"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Adjust A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) .

#### 3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

- OK >> GO TO 4.
- NG >> Refill ATF.

#### 4. CHECK STALL TEST

Check stall revolution with selector lever in “M” and “R” positions.

Refer to [AT-49, "STALL TEST"](#) .

OK or NG

- OK >> GO TO 6.
- OK in “M” position, NG in “R” position>>GO TO 5.
- NG in both “M” and “R” positions>>GO TO 8.

#### 5. DETECT MALFUNCTIONING ITEM

1. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
2. Check the following.
  - Reverse brake. Refer to [AT-255, "Disassembly"](#) .

OK or NG

- OK >> GO TO 9.
- NG >> Repair or replace damaged parts.

#### 6. CHECK LINE PRESSURE

Check line pressure with the engine idling. Refer to [AT-50, "LINE PRESSURE TEST"](#) .

OK or NG

- OK >> GO TO 9.
- NG - 1 >> Line pressure high. GO TO 7.
- NG - 2 >> Line pressure low. GO TO 8.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 7. DETECT MALFUNCTIONING ITEM

---

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .

OK or NG

- OK >> GO TO 9.  
NG >> Repair or replace damaged parts.

---

## 8. DETECT MALFUNCTIONING ITEM

---

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .
  - Power train system. Refer to [AT-255, "DISASSEMBLY"](#) .
  - Transmission case. Refer to [AT-255, "DISASSEMBLY"](#) .

OK or NG

- OK >> GO TO 9.  
NG >> Repair or replace damaged parts.

---

## 9. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

OK or NG

- OK >> GO TO 10.  
NG >> GO TO 13.

---

## 10. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 43).

OK or NG

- OK >> GO TO 11.  
NG >> Repair or replace damaged parts.

---

## 11. CHECK SYMPTOM

---

Check again. Refer to [AT-53, "Check at Idle"](#) .

OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 12.

---

## 12. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

# TROUBLE DIAGNOSIS FOR SYMPTOMS

## 13. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 43).

OK or NG

OK >> GO TO 11.

NG >> Repair or replace damaged parts.

### Vehicle Does Not Creep Forward in "D" Position

NCS0008C

#### SYMPTOM:

Vehicle does not creep forward when selecting "D" position.

#### DIAGNOSTIC PROCEDURE

### 1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .

NO >> GO TO 2.

### 2. CHECK A/T POSITION

Check A/T position. Refer to [AT-206, "Checking of A/T Position"](#) .

OK or NG

OK >> GO TO 3.

NG >> Adjust A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) .

### 3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

OK >> GO TO 4.

NG >> Refill ATF.

### 4. CHECK STALL TEST

Check stall revolution with selector lever in "D" position. Refer to [AT-49, "STALL TEST"](#) .

OK or NG

OK >> GO TO 5.

NG >> GO TO 7.

### 5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in "D" position. Refer to [AT-50, "LINE PRESSURE TEST"](#) .

OK or NG

OK >> GO TO 8.

NG - 1 >> Line pressure high. GO TO 6.

NG - 2 >> Line pressure low. GO TO 7.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 6. DETECT MALFUNCTIONING ITEM

---

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .

OK or NG

- OK >> GO TO 8.  
NG >> Repair or replace damaged parts.

---

## 7. DETECT MALFUNCTIONING ITEM

---

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .
  - Power train system. Refer to [AT-255, "DISASSEMBLY"](#) .
  - Transmission case. Refer to [AT-255, "DISASSEMBLY"](#) .

OK or NG

- OK >> GO TO 8.  
NG >> Repair or replace damaged parts.

---

## 8. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

OK or NG

- OK >> GO TO 9.  
NG >> GO TO 12.

---

## 9. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 43).

OK or NG

- OK >> GO TO 10.  
NG >> Repair or replace damaged parts.

---

## 10. CHECK SYMPTOM

---

Check again. Refer to [AT-53, "Check at Idle"](#) .

OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 11.

---

## 11. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

# TROUBLE DIAGNOSIS FOR SYMPTOMS

## 12. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 43).

OK or NG

OK >> GO TO 10.

NG >> Repair or replace damaged parts.

### Vehicle Cannot Be Started from D1

NCS0008D

#### SYMPTOM:

Vehicle cannot be started from D1 on cruise test - Part 1.

#### DIAGNOSTIC PROCEDURE

### 1. CHECK SYMPTOM

Check if vehicle creeps in "R" position.

OK or NG

OK >> GO TO 2.

NG >> Refer to [AT-177, "Vehicle Does Not Creep Backward in "R" Position"](#) .

### 2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#)

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .

NO >> GO TO 3.

### 3. CHECK ACCELERATOR POSITION SENSOR

Check accelerator pedal position sensor. Refer to [AT-131, "DTC P1705 THROTTLE POSITION SENSOR"](#)

OK or NG

OK >> GO TO 4.

NG >> Repair or replace accelerator pedal position sensor.

### 4. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

OK >> GO TO 5.

NG >> Refill ATF.

### 5. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [AT-50, "LINE PRESSURE TEST"](#) .

OK or NG

OK >> GO TO 8.

NG - 1 >> Line pressure high. GO TO 6.

NG - 2 >> Line pressure low. GO TO 7.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

## 6. DETECT MALFUNCTIONING ITEM

---

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .

OK or NG

- OK >> GO TO 8.  
NG >> Repair or replace damaged parts.

## 7. DETECT MALFUNCTIONING ITEM

---

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .
  - Power train system. Refer to [AT-255, "DISASSEMBLY"](#) .
  - Transmission case. Refer to [AT-255, "DISASSEMBLY"](#) .

OK or NG

- OK >> GO TO 8.  
NG >> Repair or replace damaged parts.

## 8. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

OK or NG

- OK >> GO TO 9.  
NG >> GO TO 12.

## 9. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 23).

OK or NG

- OK >> GO TO 10.  
NG >> Repair or replace damaged parts.

## 10. CHECK SYMPTOM

---

Check again. Refer to [AT-55, "Cruise Test — Part 1"](#) , [AT-57, "Cruise Test — Part 2"](#) .

OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 11.

## 11. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

# TROUBLE DIAGNOSIS FOR SYMPTOMS

## 12. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 23).

OK or NG

- OK >> GO TO 10.
- NG >> Repair or replace damaged parts.

### A/T Does Not Shift: D1 → D2

NCS0008E

#### SYMPTOM:

The vehicle does not shift-up from the D1 to D2 gear at the specified speed.

#### DIAGNOSTIC PROCEDURE

### 1. CHECK SYMPTOM

Check if vehicle creeps forward in "D" position and vehicle can be started from D1.

OK or NG

- OK >> GO TO 2.
- NG >> Refer to [AT-179, "Vehicle Does Not Creep Forward in "D" Position"](#) , [AT-181, "Vehicle Cannot Be Started from D1"](#) .

### 2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .
- NO >> GO TO 3.

### 3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

- OK >> GO TO 4.
- NG >> Refill ATF.

### 4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [AT-50, "LINE PRESSURE TEST"](#) .

OK or NG

- OK >> GO TO 7.
- NG - 1 >> Line pressure high. GO TO 5.
- NG - 2 >> Line pressure low. GO TO 6.

### 5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following items:
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .

OK or NG

- OK >> GO TO 7.
- NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 6. DETECT MALFUNCTIONING ITEM

---

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .
  - Power train system. Refer to [AT-255, "DISASSEMBLY"](#) .
  - Transmission case. Refer to [AT-255, "DISASSEMBLY"](#) .

### OK or NG

- OK >> GO TO 7.  
NG >> Repair or replace damaged parts.

---

## 7. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

### OK or NG

- OK >> GO TO 8.  
NG >> GO TO 11.

---

## 8. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 10).

### OK or NG

- OK >> GO TO 9.  
NG >> Repair or replace damaged parts.

---

## 9. CHECK SYMPTOM

---

Check again. Refer to [AT-55, "Cruise Test — Part 1"](#) , [AT-57, "Cruise Test — Part 2"](#) .

### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 10.

---

## 10. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

### OK or NG

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

---

## 11. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 10).

### OK or NG

- OK >> GO TO 9.  
NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

## A/T Does Not Shift: D2 → D3

NCS0008F

### SYMPTOM:

The vehicle does not shift-up from D2 to D3 gear at the specified speed.

### DIAGNOSTIC PROCEDURE

#### 1. CHECK SYMPTOM

Check if vehicle creeps forward in "D" position and vehicle can be started from D1.

##### OK or NG

OK >> GO TO 2.

NG >> Refer to [AT-179, "Vehicle Does Not Creep Forward in "D" Position"](#) , [AT-181, "Vehicle Cannot Be Started from D1"](#) .

#### 2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .

NO >> GO TO 3.

#### 3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

##### OK or NG

OK >> GO TO 4.

NG >> Refill ATF.

#### 4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [AT-50, "LINE PRESSURE TEST"](#) .

##### OK or NG

OK >> GO TO 7.

NG - 1 >> Line pressure high. GO TO 5.

NG - 2 >> Line pressure low. GO TO 6.

#### 5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .

2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .

3. Check the following.

- Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .

##### OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 6. DETECT MALFUNCTIONING ITEM

---

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .
  - Power train system. Refer to [AT-255, "DISASSEMBLY"](#) .
  - Transmission case. Refer to [AT-255, "DISASSEMBLY"](#) .

### OK or NG

- OK >> GO TO 7.  
NG >> Repair or replace damaged parts.

---

## 7. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

### OK or NG

- OK >> GO TO 8.  
NG >> GO TO 11.

---

## 8. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 11).

### OK or NG

- OK >> GO TO 9.  
NG >> Repair or replace damaged parts.

---

## 9. CHECK SYMPTOM

---

Check again. Refer to [AT-55, "Cruise Test — Part 1"](#) , [AT-57, "Cruise Test — Part 2"](#) .

### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 10.

---

## 10. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

### OK or NG

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

---

## 11. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 11).

### OK or NG

- OK >> GO TO 9.  
NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

## A/T Does Not Shift: D3 → D4

NC50008G

### SYMPTOM:

The vehicle does not shift-up from the D3 to D4 gear at the specified speed.

### DIAGNOSTIC PROCEDURE

#### 1. CHECK SYMPTOM

Check if vehicle creeps forward in "D" position and vehicle can be started from D1.

##### OK or NG

OK >> GO TO 2.

NG >> Refer to [AT-179, "Vehicle Does Not Creep Forward in "D" Position"](#) , [AT-181, "Vehicle Cannot Be Started from D1"](#) .

#### 2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .

NO >> GO TO 3.

#### 3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

##### OK or NG

OK >> GO TO 4.

NG >> Refill ATF.

#### 4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [AT-50, "LINE PRESSURE TEST"](#) .

##### OK or NG

OK >> GO TO 7.

NG - 1 >> Line pressure high. GO TO 5.

NG - 2 >> Line pressure low. GO TO 6.

#### 5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .

2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .

3. Check the following.

- Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .

##### OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 6. DETECT MALFUNCTIONING ITEM

---

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .
  - Power train system. Refer to [AT-255, "DISASSEMBLY"](#) .
  - Transmission case. Refer to [AT-255, "DISASSEMBLY"](#) .

### OK or NG

- OK >> GO TO 7.  
NG >> Repair or replace damaged parts.

---

## 7. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

### OK or NG

- OK >> GO TO 8.  
NG >> GO TO 11.

---

## 8. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 12).

### OK or NG

- OK >> GO TO 9.  
NG >> Repair or replace damaged parts.

---

## 9. CHECK SYMPTOM

---

Check again. Refer to [AT-55, "Cruise Test — Part 1"](#) , [AT-57, "Cruise Test — Part 2"](#) .

### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 10.

---

## 10. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

### OK or NG

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

---

## 11. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 12).

### OK or NG

- OK >> GO TO 9.  
NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

## A/T Does Not Shift: D4 → D5

NCS000BH

### SYMPTOM:

- The vehicle does not shift-up from the D4 to D5 gear at the specified speed.
- The vehicle does not shift-up from the D4 to D5 gear unless A/T is warmed up.

### DIAGNOSTIC PROCEDURE

#### 1. CHECK SYMPTOM

Check if vehicle creeps forward in "D" position and vehicle can be started from D1.

##### OK or NG

OK >> GO TO 2.

NG >> Refer to [AT-179, "Vehicle Does Not Creep Forward in "D" Position"](#) , [AT-181, "Vehicle Cannot Be Started from D1"](#) .

#### 2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .

NO >> GO TO 3.

#### 3. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

##### OK or NG

OK >> GO TO 4.

NG >> Refill ATF.

#### 4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [AT-50, "LINE PRESSURE TEST"](#) .

##### OK or NG

OK >> GO TO 7.

NG - 1 >> Line pressure high. GO TO 5.

NG - 2 >> Line pressure low. GO TO 6.

#### 5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .

2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .

3. Check the following.

- Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .

##### OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 6. DETECT MALFUNCTIONING ITEM

---

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .
  - Power train system. Refer to [AT-255, "DISASSEMBLY"](#) .
  - Transmission case. Refer to [AT-255, "DISASSEMBLY"](#) .

### OK or NG

- OK >> GO TO 7.  
NG >> Repair or replace damaged parts.

---

## 7. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

### OK or NG

- OK >> GO TO 8.  
NG >> GO TO 11.

---

## 8. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 13).

### OK or NG

- OK >> GO TO 9.  
NG >> Repair or replace damaged parts.

---

## 9. CHECK SYMPTOM

---

Check again. Refer to [AT-55, "Cruise Test — Part 1"](#) .

### OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 10.

---

## 10. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

### OK or NG

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

---

## 11. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 13).

### OK or NG

- OK >> GO TO 9.  
NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

NCS00081

## A/T Does Not Lock-up

### SYMPTOM:

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

### DIAGNOSTIC PROCEDURE

#### 1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .
- NO >> GO TO 2.

#### 2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Refill ATF.

#### 3. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to [AT-50, "LINE PRESSURE TEST"](#) .

OK or NG

- OK >> GO TO 6.
- NG - 1 >> Line pressure high. GO TO 4.
- NG - 2 >> Line pressure low. GO TO 5.

#### 4. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .

OK or NG

- OK >> GO TO 6.
- NG >> Repair or replace damaged parts.

#### 5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Disassemble A/T. Refer to [AT-255, "DISASSEMBLY"](#) .
3. Check the following.
  - Oil pump assembly. Refer to [AT-271, "Oil Pump"](#) .
  - Power train system. Refer to [AT-255, "DISASSEMBLY"](#) .
  - Transmission case. Refer to [AT-255, "DISASSEMBLY"](#) .

OK or NG

- OK >> GO TO 6.
- NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 6. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

OK or NG

- OK >> GO TO 7.  
NG >> GO TO 10.

## 7. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 24).

OK or NG

- OK >> GO TO 8.  
NG >> Repair or replace damaged parts.

## 8. CHECK SYMPTOM

---

Check again. Refer to [AT-55, "Cruise Test — Part 1"](#) .

OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 9.

## 9. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

## 10. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 24).

OK or NG

- OK >> GO TO 8.  
NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

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

NCS0006J

### SYMPTOM:

The lock-up condition cannot be maintained for more than 30 seconds.

### DIAGNOSTIC PROCEDURE

#### 1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .
- NO >> GO TO 2.

#### 2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Refill ATF.

#### 3. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

OK or NG

- OK >> GO TO 4.
- NG >> GO TO 7.

#### 4. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 25).

OK or NG

- OK >> GO TO 5.
- NG >> Repair or replace damaged parts.

#### 5. CHECK SYMPTOM

Check again. Refer to [AT-55, "Cruise Test — Part 1"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 6.

#### 6. CHECK TCM

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 7. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 25).

OK or NG

- OK >> GO TO 5.  
NG >> Repair or replace damaged parts.

### Lock-up Is Not Released

NCS000BK

#### SYMPTOM:

The lock-up condition cannot be cancelled even after releasing the accelerator pedal.

#### DIAGNOSTIC PROCEDURE

### 1. CHECK SELF-DIAGNOSTIC RESULTS

---

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .  
NO >> GO TO 2.

### 2. CHECK SYMPTOM

---

Check again. Refer to [AT-55, "Cruise Test — Part 1"](#) .

OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 3.

### 3. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

# TROUBLE DIAGNOSIS FOR SYMPTOMS

NCS0008L

## Engine Speed Does Not Return to Idle

### SYMPTOM:

When a shift-down is performed, the engine speed does not smoothly return to the idling speed.

### DIAGNOSTIC PROCEDURE

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

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

##### OK or NG

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

#### 2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#)

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .
- NO >> GO TO 3.

#### 3. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

##### OK or NG

- OK >> GO TO 4.
- NG >> GO TO 7.

#### 4. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 72).

##### OK or NG

- OK >> GO TO 5.
- NG >> Repair or replace damaged parts.

#### 5. CHECK SYMPTOM

Check again. Refer to [AT-55, "Cruise Test — Part 1"](#) .

##### OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 6.

#### 6. CHECK TCM

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

##### OK or NG

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

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# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 7. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 72).

OK or NG

- OK >> GO TO 5.
- NG >> Repair or replace damaged parts.

### Cannot Be Changed to Manual Mode SYMPTOM:

NCS0008M

Does not change to manual mode when manual shift gate is used.

#### DIAGNOSTIC PROCEDURE

##### 1. MANUAL MODE SWITCH

---

Check manual mode switch. Refer to [AT-157, "DTC P1815 MANUAL MODE SWITCH"](#) .

OK or NG

- OK >> GO TO 2.
- NG >> Repair or replace damaged parts.

##### 2. CHECK SELF-DIAGNOSIS RESULTS

---

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .
- NO >> **INSPECTION END**

### A/T Does Not Shift: 5th Gear → 4th Gear SYMPTOM:

NCS0008N

When shifted from M5 to M4 position in manual mode, does not downshift from 5th to 4th gear.

#### DIAGNOSTIC PROCEDURE

##### 1. CHECK SELF-DIAGNOSTIC RESULTS

---

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .
- NO >> GO TO 2.

##### 2. CHECK A/T FLUID LEVEL

---

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Refill ATF.

##### 3. CHECK A/T POSITION

---

Check A/T position. Refer to [AT-206, "Checking of A/T Position"](#) .

OK or NG

- OK >> GO TO 4.
- NG >> Adjust A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) .

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 4. MANUAL MODE SWITCH

---

Check manual mode switch. Refer to [AT-157, "DTC P1815 MANUAL MODE SWITCH"](#) .

OK or NG

- OK >> GO TO 5.
- NG >> Repair or replace damaged parts.

---

## 5. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

OK or NG

- OK >> GO TO 6.
- NG >> GO TO 9.

---

## 6. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 47).

OK or NG

- OK >> GO TO 7.
- NG >> Repair or replace damaged parts.

---

## 7. CHECK SYMPTOM

---

Check again. Refer to [AT-58, "Cruise Test — Part 3"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 8.

---

## 8. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

---

## 9. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 47).

OK or NG

- OK >> GO TO 7.
- NG >> Repair or replace damaged parts.

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# TROUBLE DIAGNOSIS FOR SYMPTOMS

NCS00080

## A/T Does Not Shift: 4th Gear → 3rd Gear

### SYMPTOM:

When shifted from M4 to M3 position in manual mode, does not downshift from 4th to 3rd gear.

### DIAGNOSTIC PROCEDURE

#### 1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .
- NO >> GO TO 2.

#### 2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Refill ATF.

#### 3. CHECK A/T POSITION

Check A/T position. Refer to [AT-206, "Checking of A/T Position"](#) .

OK or NG

- OK >> GO TO 4.
- NG >> Adjust A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) .

#### 4. MANUAL MODE SWITCH

Check manual mode switch. Refer to [AT-157, "DTC P1815 MANUAL MODE SWITCH"](#) .

OK or NG

- OK >> GO TO 5.
- NG >> Repair or replace damaged parts.

#### 5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

OK or NG

- OK >> GO TO 6.
- NG >> GO TO 9.

#### 6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 48).

OK or NG

- OK >> GO TO 7.
- NG >> Repair or replace damaged parts.

#### 7. CHECK SYMPTOM

Check again. Refer to [AT-58, "Cruise Test — Part 3"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 8.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

## 8. CHECK TCM

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

## 9. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 48).

OK or NG

- OK >> GO TO 7.  
NG >> Repair or replace damaged parts.

### A/T Does Not Shift: 3rd Gear → 2nd Gear

NCS0008P

#### SYMPTOM:

When shifted from M3 to M2 position in manual mode, does not downshift from 3rd to 2nd gear.

#### DIAGNOSTIC PROCEDURE

### 1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .  
NO >> GO TO 2.

### 2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

- OK >> GO TO 3.  
NG >> Refill ATF.

### 3. CHECK A/T POSITION

Check A/T position. Refer to [AT-206, "Checking of A/T Position"](#) .

OK or NG

- OK >> GO TO 4.  
NG >> Adjust A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) .

### 4. MANUAL MODE SWITCH

Check manual mode switch. Refer to [AT-157, "DTC P1815 MANUAL MODE SWITCH"](#) .

OK or NG

- OK >> GO TO 5.  
NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 5. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

OK or NG

- OK >> GO TO 6.
- NG >> GO TO 9.

## 6. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 49).

OK or NG

- OK >> GO TO 7.
- NG >> Repair or replace damaged parts.

## 7. CHECK SYMPTOM

---

Check again. Refer to [AT-58, "Cruise Test — Part 3"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 8.

## 8. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

## 9. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 49).

OK or NG

- OK >> GO TO 7.
- NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

NC50008Q

## A/T Does Not Shift: 2nd Gear → 1st Gear

### SYMPTOM:

When shifted from M2 to M1 position in manual mode, does not downshift from 2nd to 1st gear.

### DIAGNOSTIC PROCEDURE

#### 1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .
- NO >> GO TO 2.

#### 2. CHECK A/T FLUID LEVEL

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Refill ATF.

#### 3. CHECK A/T POSITION

Check A/T position. Refer to [AT-206, "Checking of A/T Position"](#) .

OK or NG

- OK >> GO TO 4.
- NG >> Adjust A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) .

#### 4. MANUAL MODE SWITCH

Check manual mode switch. Refer to [AT-157, "DTC P1815 MANUAL MODE SWITCH"](#) .

OK or NG

- OK >> GO TO 5.
- NG >> Repair or replace damaged parts.

#### 5. CHECK A/T FLUID CONDITION

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

OK or NG

- OK >> GO TO 6.
- NG >> GO TO 9.

#### 6. DETECT MALFUNCTIONING ITEM

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 50).

OK or NG

- OK >> GO TO 7.
- NG >> Repair or replace damaged parts.

#### 7. CHECK SYMPTOM

Check again. Refer to [AT-58, "Cruise Test — Part 3"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 8.

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# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 8. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

---

## 9. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 50).

OK or NG

- OK >> GO TO 7.  
NG >> Repair or replace damaged parts.

### Vehicle Does Not Decelerate by Engine Brake

NCS0008R

#### SYMPTOM:

No engine brake is applied when the gear is shifted from the 2nd to 1st gear.

#### DIAGNOSTIC PROCEDURE

### 1. CHECK SELF-DIAGNOSTIC RESULTS

---

Perform self-diagnosis. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-92, "Diagnostic Procedure Without CONSULT-III"](#) .

Is any malfunction detected by self-diagnostic results?

- YES >> Check the malfunctioning system. Refer to [AT-86, "SELF-DIAGNOSTIC RESULT MODE"](#) , [AT-93, "Judgment Self-diagnosis Code"](#) .  
NO >> GO TO 2.

### 2. CHECK A/T FLUID LEVEL

---

Check A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

OK or NG

- OK >> GO TO 3.  
NG >> Refill ATF.

### 3. CHECK A/T POSITION

---

Check A/T position. Refer to [AT-206, "Checking of A/T Position"](#) .

OK or NG

- OK >> GO TO 4.  
NG >> Adjust A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) .

### 4. MANUAL MODE SWITCH

---

Check manual mode switch. Refer to [AT-157, "DTC P1815 MANUAL MODE SWITCH"](#) .

OK or NG

- OK >> GO TO 5.  
NG >> Repair or replace damaged parts.

# TROUBLE DIAGNOSIS FOR SYMPTOMS

---

## 5. CHECK A/T FLUID CONDITION

---

1. Remove oil pan. Refer to [AT-215, "Control Valve with TCM and A/T Fluid Temperature Sensor 2"](#) .
2. Check A/T fluid condition. Refer to [AT-49, "A/T Fluid Condition Check"](#) .

OK or NG

- OK >> GO TO 6.  
NG >> GO TO 9.

---

## 6. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 58).

OK or NG

- OK >> GO TO 7.  
NG >> Repair or replace damaged parts.

---

## 7. CHECK SYMPTOM

---

Check again. Refer to [AT-58, "Cruise Test — Part 3"](#) .

OK or NG

- OK >> **INSPECTION END**  
NG >> GO TO 8.

---

## 8. CHECK TCM

---

1. Check TCM input/output signals. Refer to [AT-83, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

---

## 9. DETECT MALFUNCTIONING ITEM

---

Check the malfunction items. If any items are damaged, repair or replace damaged parts. Refer to [AT-59, "Symptom Chart"](#) (Symptom No. 58).

OK or NG

- OK >> GO TO 7.  
NG >> Repair or replace damaged parts.

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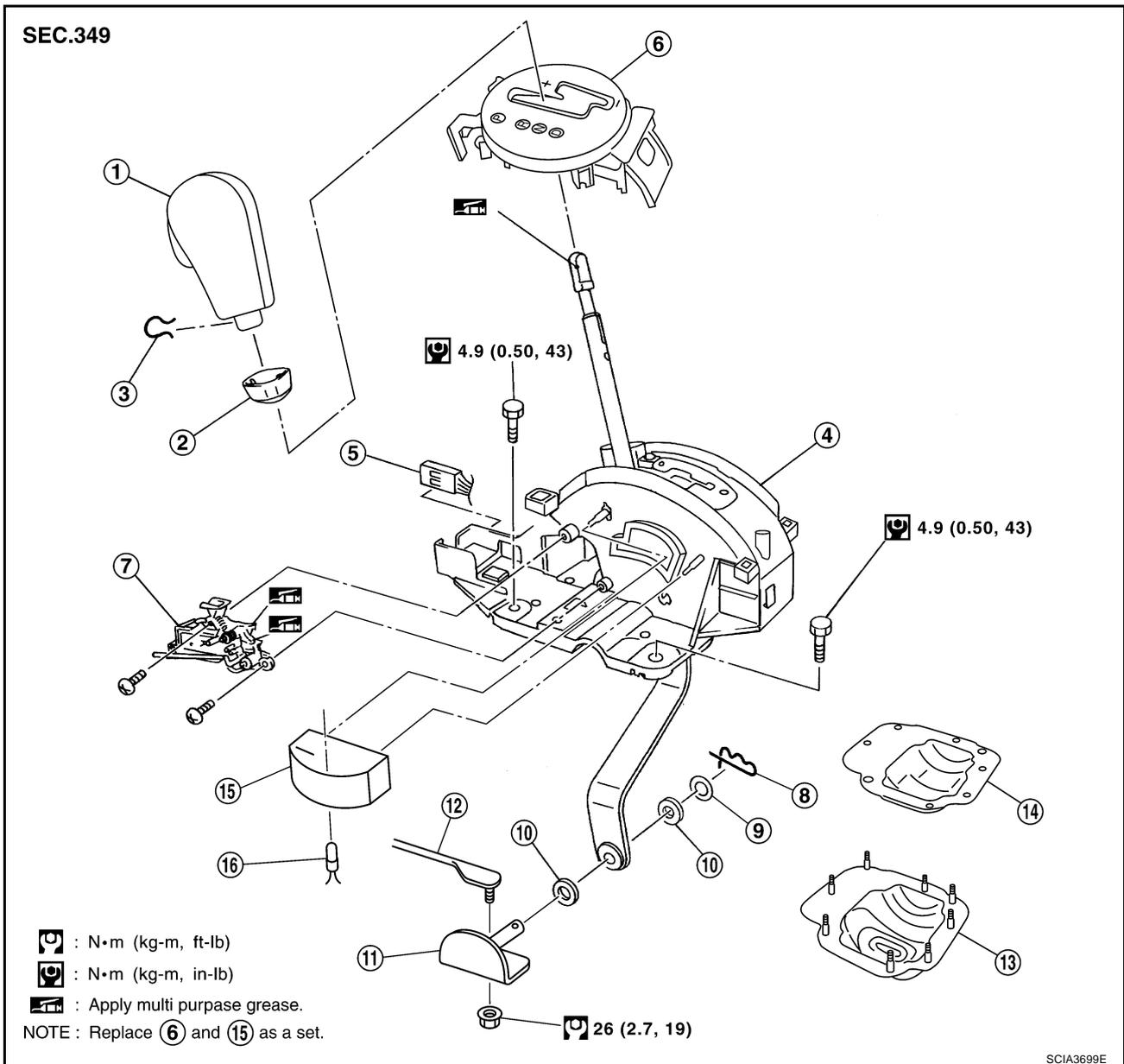
# SHIFT CONTROL SYSTEM

## SHIFT CONTROL SYSTEM

PFP:34901

### Control Device Removal and Installation

NCS0008S



- |  |                                 |                             |
|--|---------------------------------|-----------------------------|
| 1. Selector lever knob                                   | 2. Knob cover                   | 3. Lock pin                 |
| 4. Control device assembly                               | 5. A/T device harness connector | 6. Position indicator plate |
| 7. Shift lock solenoid and park position switch assembly | 8. Snap pin                     | 9. Conical washer           |
| 10. Plain washer   | 11. Bracket                     | 12. Control rod             |
| 13. Dust cover   | 14. Dust cover plate            | 15. Bulb case               |
| 16. Position lamp  |                                 |                             |

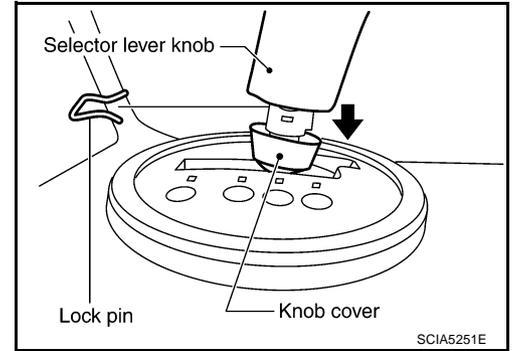
# SHIFT CONTROL SYSTEM

## REMOVAL

### CAUTION:

Make sure that parking brake is applied before removal/installation.

1. Disconnect lower lever of control device and control rod.
2. Remove knob cover below selector lever downward.
3. Pull lock pin out of selector lever knob.
4. Remove selector lever knob.
5. Remove console finisher (A/T ring) and console finisher (A/T). Refer to [IP-10, "Component Parts Drawing"](#).
6. Remove center console. Refer to [IP-10, "Component Parts Drawing"](#).
7. Remove key interlock cable from control device. Refer to [AT-213, "Removal and Installation"](#).
8. Disconnect A/T device harness connector.
9. Remove control device assembly.



### CAUTION:

Do not impact, or damage propeller shaft tube.

## INSTALLATION

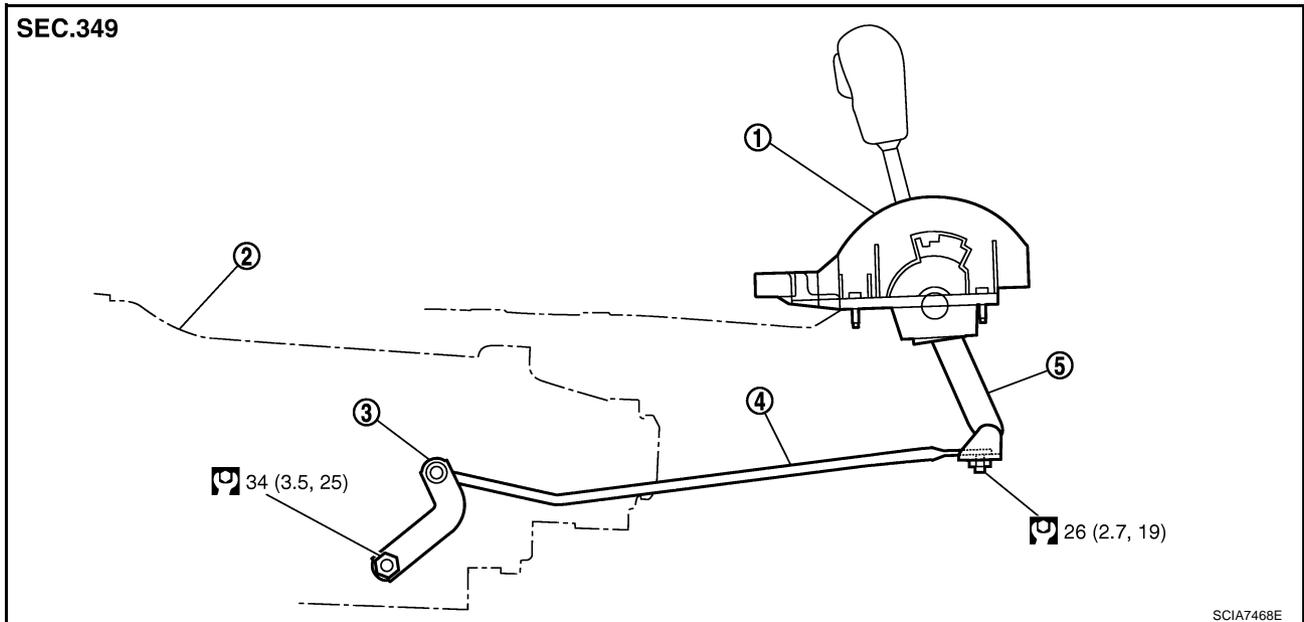
Note the following, and install in the reverse order of removal.

- After installation is completed, adjust and check A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#), [AT-206, "Checking of A/T Position"](#).

## Control Rod Removal and Installation

NCS0008T

### CONTROL ROD COMPONENTS



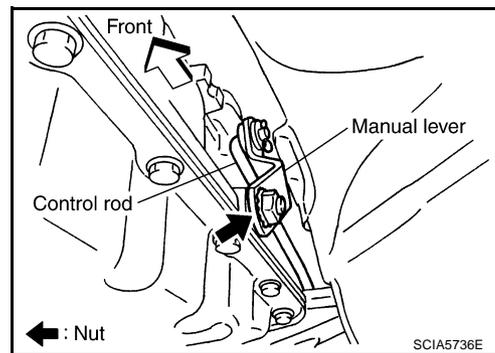
1. Control device assembly
2. A/T
3. Manual lever
4. Control rod
5. Lower lever

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to [GI-11, "Components"](#).

# SHIFT CONTROL SYSTEM

## REMOVAL

1. Disconnect lower lever of control device and control rod.
2. Remove manual lever from A/T.
3. Remove control rod from vehicle.



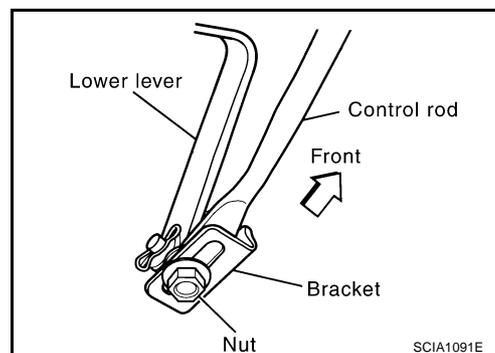
## INSTALLATION

Note the following, and install in the reverse order of removal.

- After installation is completed, adjust and check A/T position. Refer to [AT-206, "Adjustment of A/T Position"](#) and [AT-206, "Checking of A/T Position"](#).

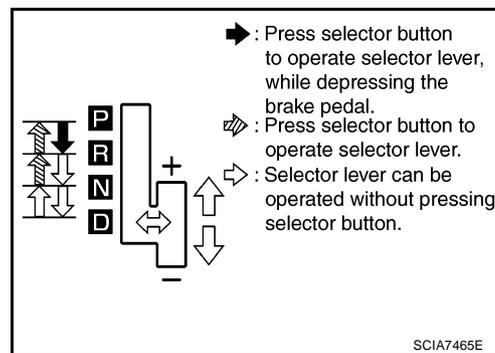
## Adjustment of A/T Position

1. Loosen nut of control rod.
2. Place PNP switch and selector lever in "P" position.
3. While pressing lower lever toward rear of vehicle (in "P" position direction), tighten nut to the specified torque. Refer to [AT-205, "CONTROL ROD COMPONENTS"](#).



## Checking of A/T Position

1. Place selector lever in "P" position, and turn ignition switch ON.
2. Make sure that selector lever can be shifted to other than "P" position when brake pedal is depressed. Also make sure that selector lever can be shifted from "P" position only when brake pedal is depressed.
3. Move the selector lever and check for excessive effort, sticking, noise or rattle.
4. Confirm the selector lever stops at each position with the feel of engagement when it is moved through all the positions. Check whether or not the actual position the selector lever is in matches the position shown by the shift position indicator and the transmission body.
5. The method of operating the lever to individual positions correctly should be as shown in the figure.
6. When selector button is pressed in "P", "R", or "N" position without applying forward/backward force to selector lever, check button operation for sticking.
7. Confirm the back-up lamps illuminate only when lever is placed in the "R" position. Confirm the back-up lamps does not illuminate when selector lever is pushed against "R" position in the "P" or "N" position.
8. Confirm the engine can only be started with the selector lever in the "P" and "N" positions. (With selector lever in the "P" position, engine can be started even when selector lever is moved forward and backward.)
9. Make sure that transmission is locked completely in "P" position.
10. When selector lever is set to manual shift gate, make sure that manual mode is displayed on combination meter.  
Shift selector lever to "+" and "-" sides, and check that set shift position changes.



# A/T SHIFT LOCK SYSTEM

## A/T SHIFT LOCK SYSTEM

PFP:34950

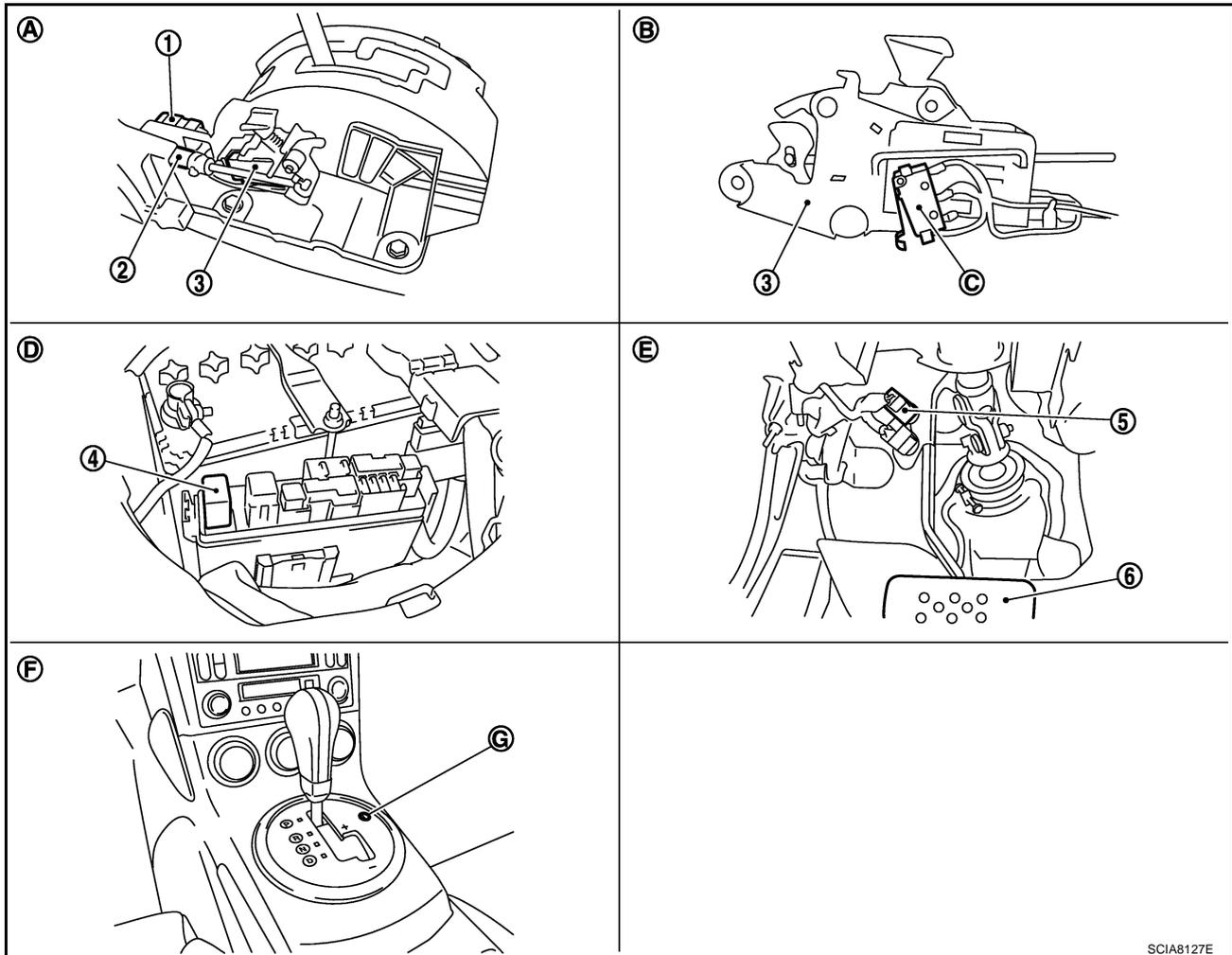
### Description

NCS0008W

- The mechanical key interlock mechanism also operates as a shift lock:  
With the ignition switch turned to ON, the selector lever cannot be shifted from "P" position to any other position unless the brake pedal is depressed.  
With the key removed, the selector lever cannot be shifted from "P" position to any other position.  
The key cannot be removed unless the selector lever is placed in "P" position.
- 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

NCS001RP



- |                                     |                                     |                         |
|-------------------------------------|-------------------------------------|-------------------------|
| 1. A/T device harness connector     | 2. Key inter lock cable             | 3. Shift lock solenoid  |
| 4. Shift lock relay                 | 5. Stop lamp switch                 | 6. Brake pedal          |
| A. Control device assembly          | B. Shift lock solenoid, revers side | C. Park position switch |
| D. Fuse, fusible link and relay box | E. Brake pedal, upper               | F. A/T console finisher |
| G. Shift lock release button        |                                     |                         |

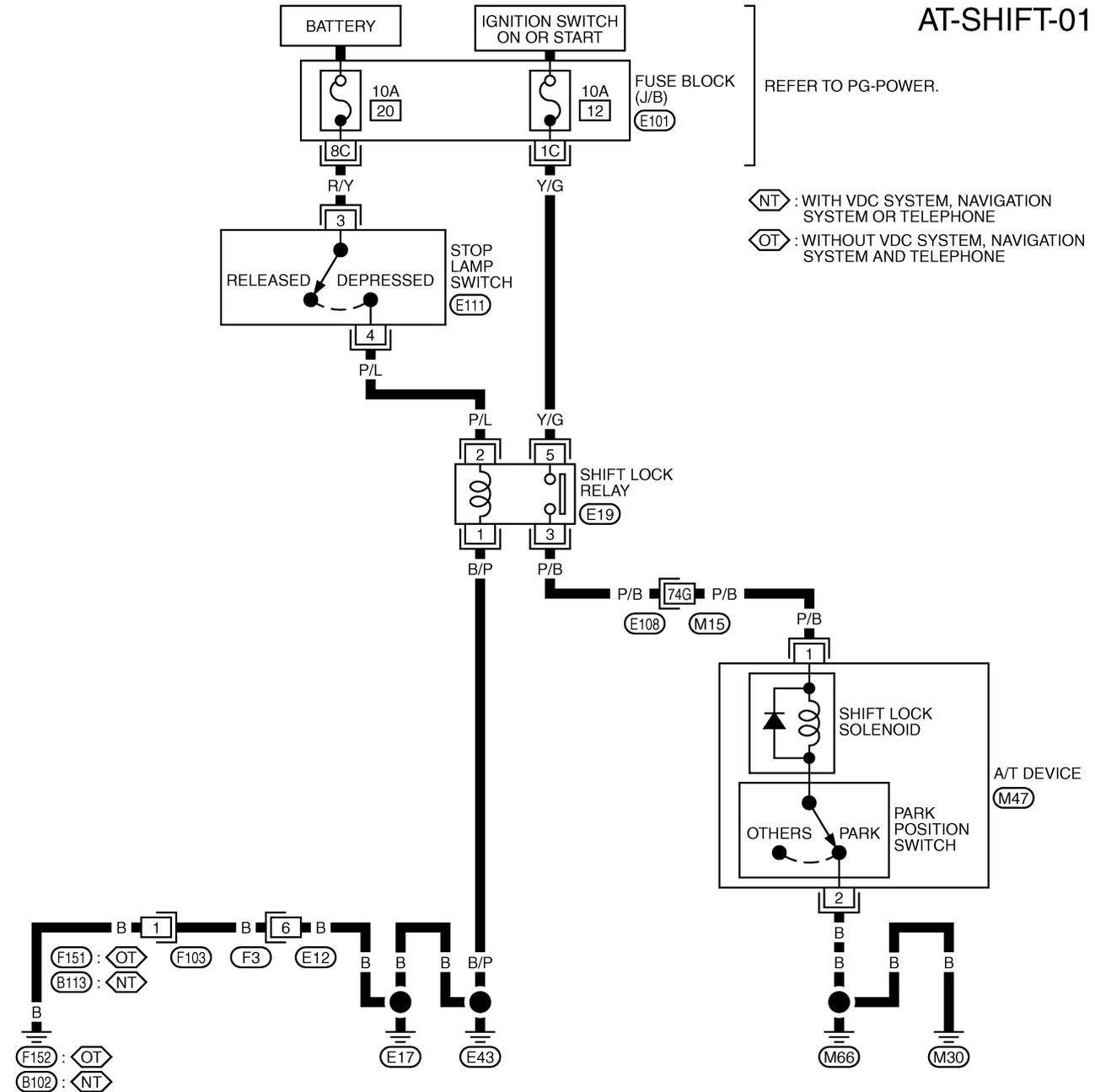
SCIA8127E

# A/T SHIFT LOCK SYSTEM

## Wiring Diagram — AT — SHIFT

NCS0008Y

### AT-SHIFT-01



REFER TO PG-POWER.

(NT) : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE  
 (OT) : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE



REFER TO THE FOLLOWING.

(E108) -SUPER MULTIPLE JUNCTION (SMJ)

(E101) -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0443E

# A/T SHIFT LOCK SYSTEM

NCS0008Z

## 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.
- Ignition key can be removed when selector lever is set to any position except “P” position.

## 1. CHECK KEY INTERLOCK CABLE

Check the key interlock cable for damage.

### OK or NG

OK >> GO TO 2.

NG >> Replace key interlock cable. Refer to [AT-212, "KEY INTERLOCK CABLE"](#) .

## 2. CHECK SELECTOR LEVER POSITION

Check the selector lever position for damage. Refer to [AT-206, "Checking of A/T Position"](#) .

### OK or NG

OK >> GO TO 3.

NG >> Check selector lever. Refer to [AT-206, "Adjustment of A/T Position"](#) .

## 3. CHECK POWER SOURCE

1. Turn ignition switch OFF.
2. Disconnect shift lock relay.
3. Check voltage between shift lock relay E19 terminal 2 and ground.

### Voltage

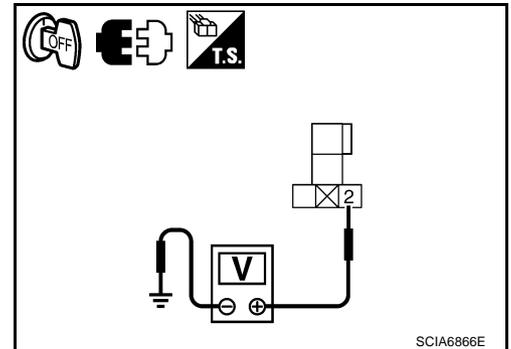
**Brake pedal depressed: Battery voltage**

**Brake pedal released: 0 V**

### OK or NG

OK >> GO TO 5.

NG >> GO TO 4.

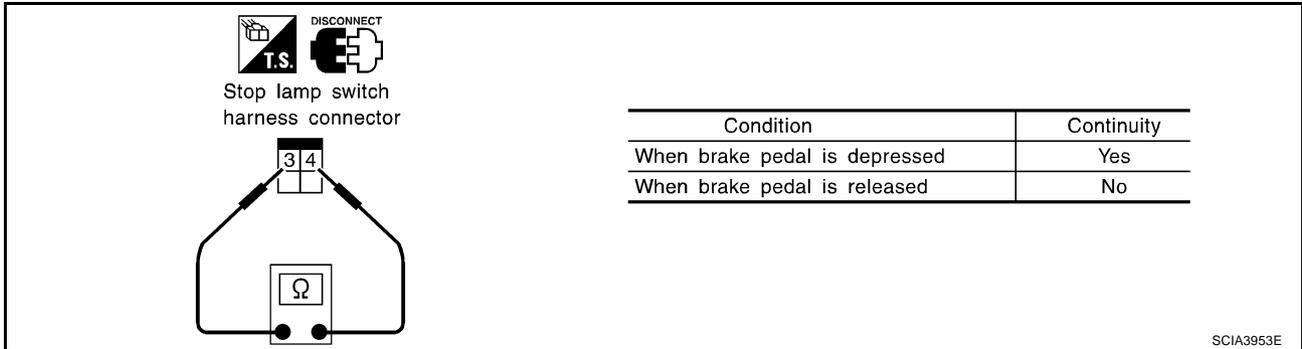


# A/T SHIFT LOCK SYSTEM

## 4. DETECT MALFUNCTIONING ITEM

Check the following.

- Harness for short or open between battery and stop lamp switch harness connector E111 terminal 3.
- Harness for short or open between stop lamp switch harness connector E111 terminal 4 and shift lock relay E19 terminal 2.
- 10 A fuse [No. 20, located in the fuse block (J/B)].
- Stop lamp switch.
- Check continuity between stop lamp switch harness connector E111 terminals 3 and 4.



Check stop lamp switch after adjusting brake pedal — refer to [BR-7. "BRAKE PEDAL"](#).

OK or NG

- OK >> GO TO 5.
- NG >> Repair or replace damaged parts.

## 5. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect shift lock relay.
3. Check continuity between shift lock relay E19 terminal 1 and ground.

### CAUTION:

Connect test probe (BLACK) to shift lock relay, and test probe (RED) to 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 INPUT SIGNAL A/T DEVICE

1. Turn ignition switch ON.
2. Selector lever is set in "P" position.
3. Check voltage between A/T device harness connector M47 terminal 1 and ground.

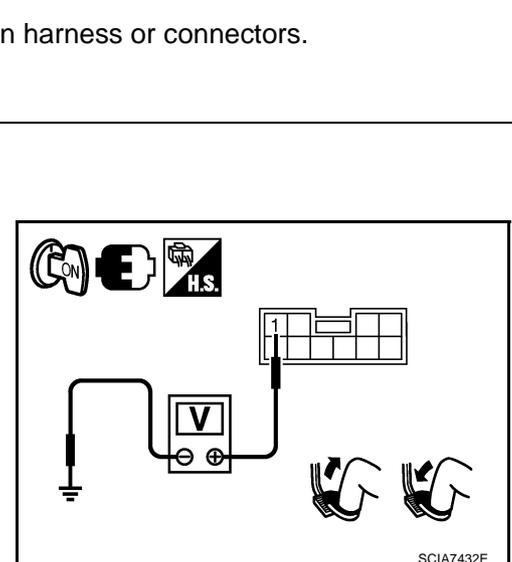
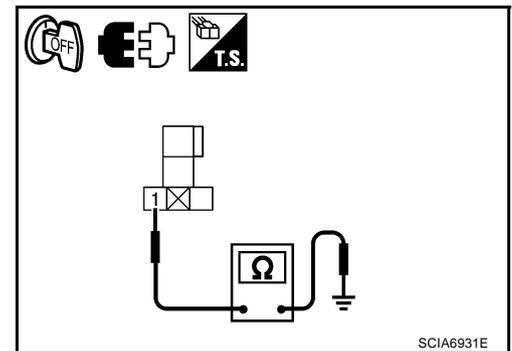
### Voltage

Brake pedal depressed: Battery voltage

Brake pedal released: 0 V

OK or NG

- OK >> GO TO 8.
- NG >> GO TO 7.



# A/T SHIFT LOCK SYSTEM

## 7. DETECT MALFUNCTIONING ITEM

Check the following.

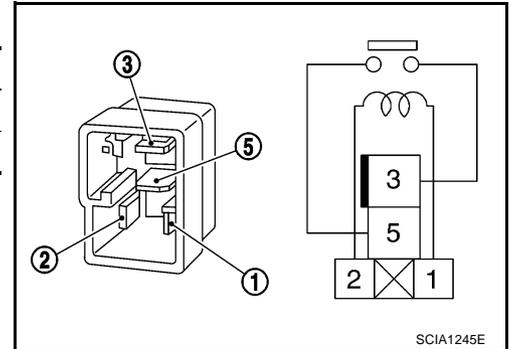
- Harness for short or open between ignition switch and shift lock relay E19 terminal 5.
- Harness for short or open between shift lock relay E19 terminal 3 and A/T device harness connector M47 terminal 1.
- 10 A fuse [No. 12, located in the fuse block (J/B)].
- Ignition switch (Refer to [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#) ).
- Shift lock relay.
- Check continuity between shift lock relay E19 terminal 3 and 5.

Condition	Continuity
12V direct current supply between terminal 1 and 2	Yes
OFF	No

OK or NG

OK >> GO TO 8.

NG >> Repair or replace damaged parts.



## 8. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T device harness connector.
3. Check continuity between A/T device harness connector M47 terminal 2 and ground.

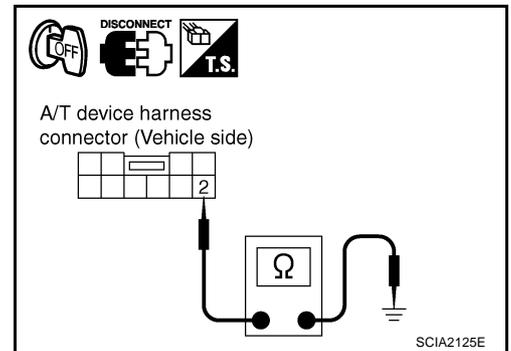
**Continuity should exist.**

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

OK or NG

OK >> GO TO 9.

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



## 9. CHECK SHIFT LOCK SOLENOID AND PARK POSITION SWITCH

1. Connect A/T device harness connector.
2. Turn ignition switch ON.
3. Selector lever is set in "P" position.
4. Check operation.

Condition	Brake pedal	Operation
When ignition switch is turned to "ON" position and selector lever is set in "P" position.	Depressed	Yes
	Released	No

OK or NG

OK >> **INSPECTION END.**

NG >> Repair or replace damaged parts.

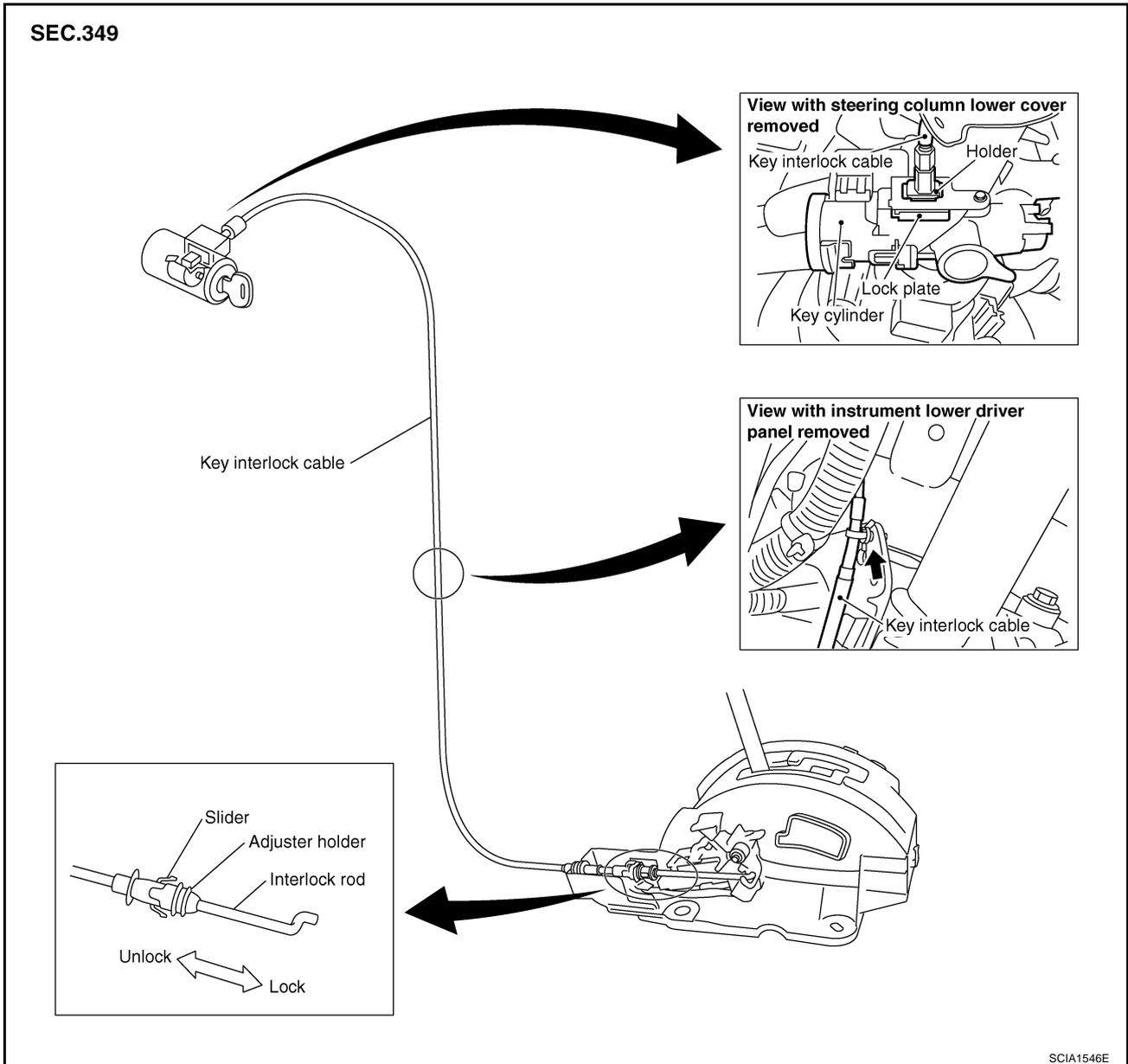
# KEY INTERLOCK CABLE

## KEY INTERLOCK CABLE

PFP:34908

### Components

NCS00090



### CAUTION:

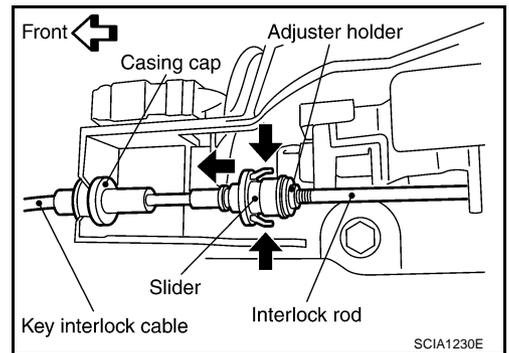
- Install key interlock cable in such a way that it will not be damaged by sharp bends, twists or interference with adjacent parts.
- After installing key interlock cable to control device, make sure that casing cap and bracket are firmly secured in their positions. If casing cap be removed with an external load of less than 39.2 N (4.0 kg, 8.8 lb), replace key interlock cable with new one.

# KEY INTERLOCK CABLE

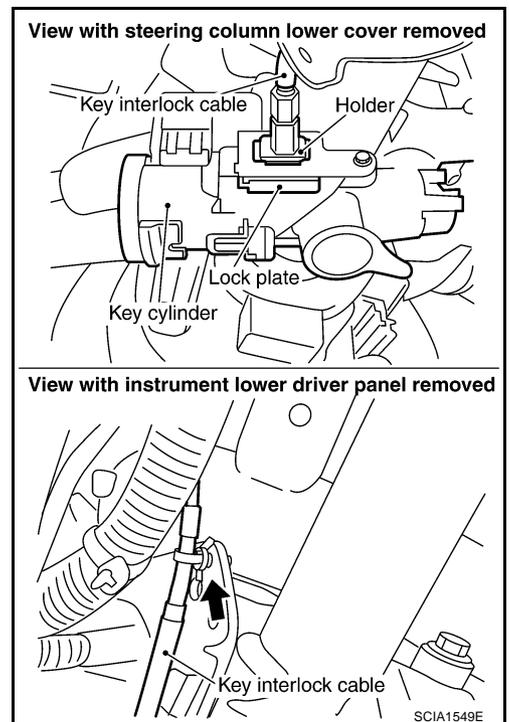
## Removal and Installation

### REMOVAL

1. Unlock slider by squeezing lock tabs on slider from adjuster holder.
2. Remove casing cap from bracket of control device assembly and remove interlock rod from adjuster holder.



3. Remove lock plate from key cylinder.
4. Remove holder from key cylinder and remove key interlock cable.



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# KEY INTERLOCK CABLE

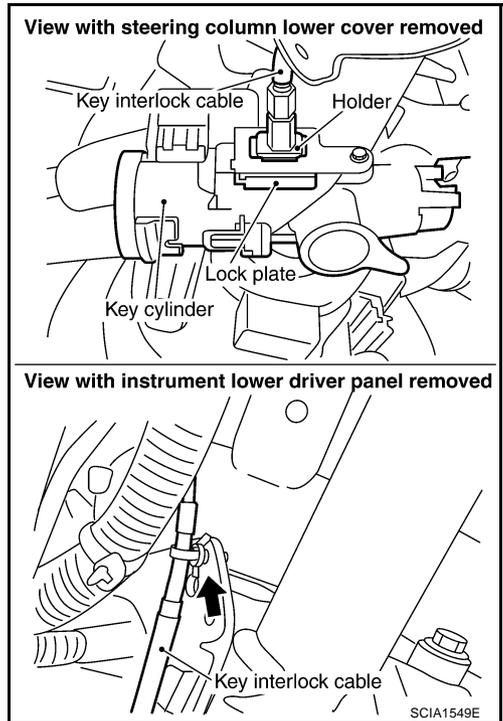
## INSTALLATION

1. Set holder of key interlock cable to key cylinder and install lock plate.

**CAUTION:**

**Do not reuse the lock plate**

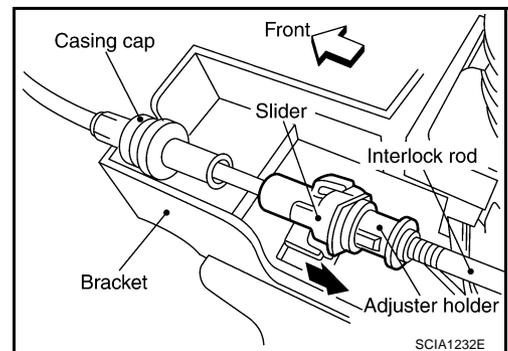
2. Clamp key interlock cable and fix to key interlock cable with band.
3. Turn ignition key to lock position.
4. Set selector lever to "P" position.



5. Insert interlock rod into adjuster holder.
6. Install casing cap to bracket.
7. Move slider in order to fix adjuster holder to interlock rod.

**CAUTION:**

**Do not touch any parts except slider. Do not add any force to slider except force toward slider.**



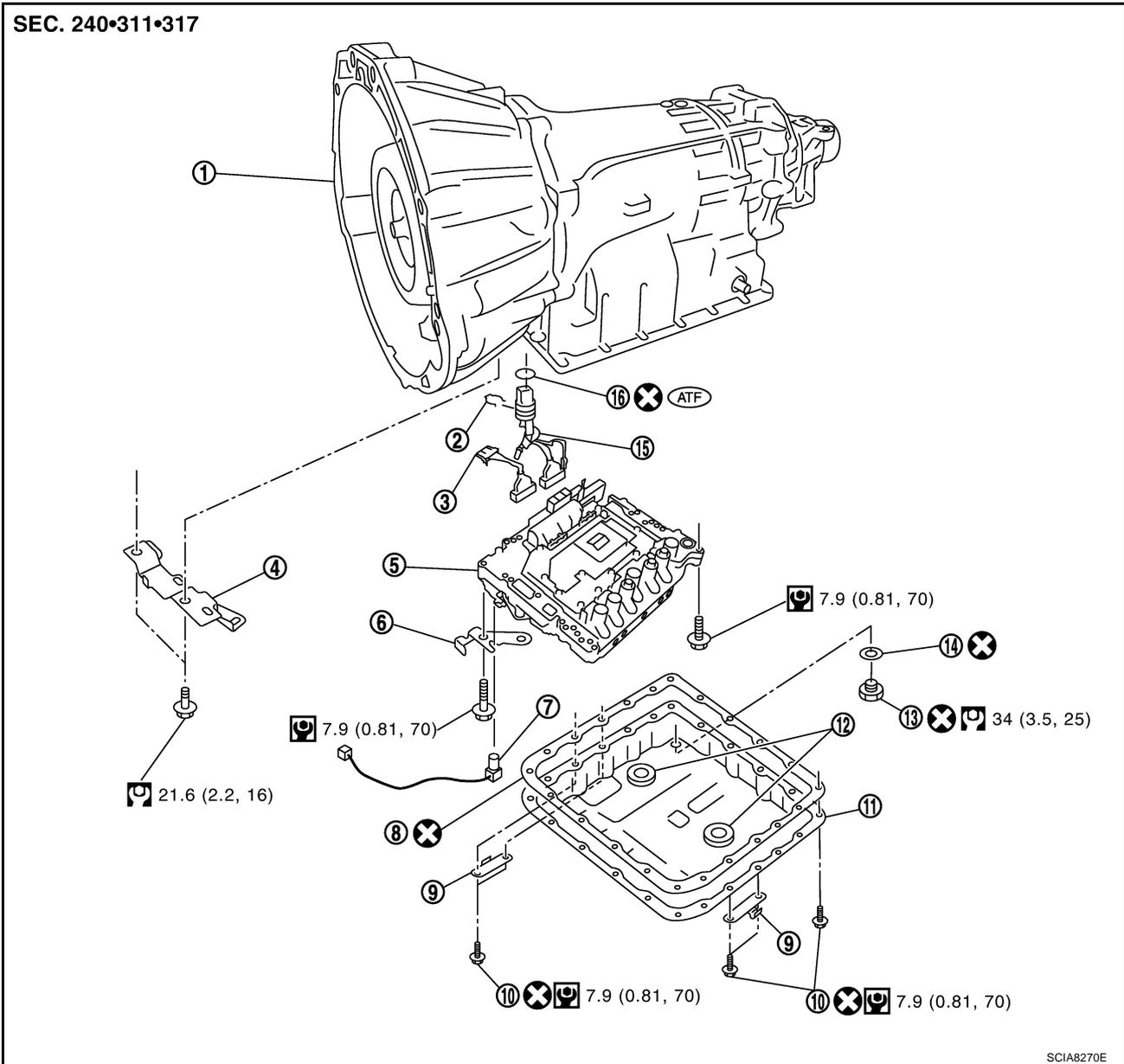
## ON-VEHICLE SERVICE

PF0:00000

### Control Valve with TCM and A/T Fluid Temperature Sensor 2 COMPONENTS

NCS00092

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- |                                   |                           |                            |
|-----------------------------------|---------------------------|----------------------------|
| 1. A/T                            | 2. Snap ring              | 3. Sub-harness             |
| 4. Bracket                        | 5. Control valve with TCM | 6. Bracket                 |
| 7. A/T fluid temperature sensor 2 | 8. Oil pan gasket         | 9. Clip                    |
| 10. Oil pan mounting bolt         | 11. Oil pan               | 12. Magnet                 |
| 13. Drain plug                    | 14. Drain plug gasket     | 15. Terminal cord assembly |
| 16. O-ring                        |                           |                            |

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to [GI-11, "Components"](#).

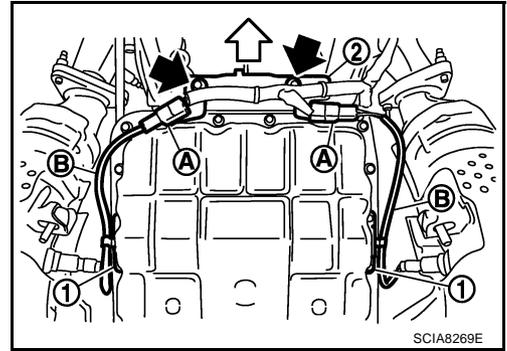
### CONTROL VALVE WITH TCM ASSEMBLY REMOVAL AND INSTALLATION

#### Removal

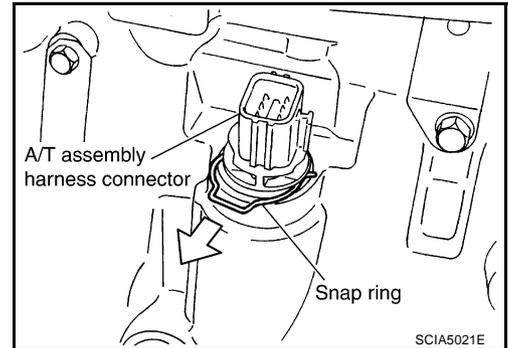
1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain hole.
3. Remove exhaust mounting bracket. Refer to [EX-3, "Removal and Installation"](#).

## ON-VEHICLE SERVICE

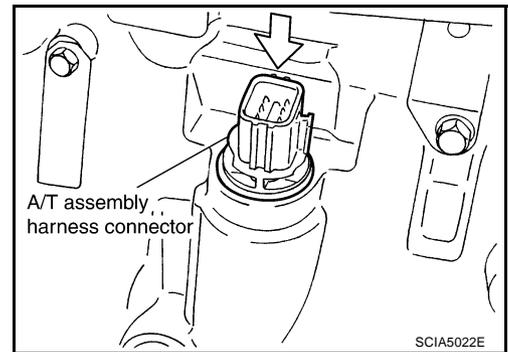
4. Disconnect heated oxygen sensor 2 harness connectors (A).
  - ⇐: Vehicle front
  - ←: Bolt
5. Remove heated oxygen sensor 2 harness (B) from clips (1).
6. Remove bracket (2) from transmission assembly.
7. Disconnect A/T assembly harness connector.



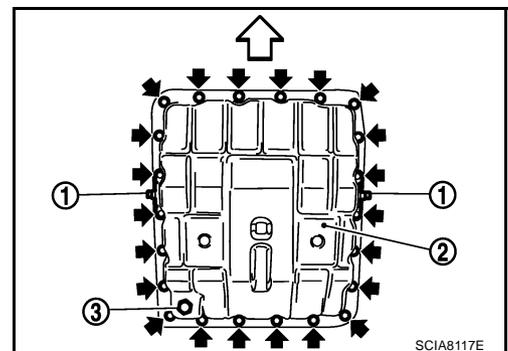
8. Remove snap ring from A/T assembly harness connector.



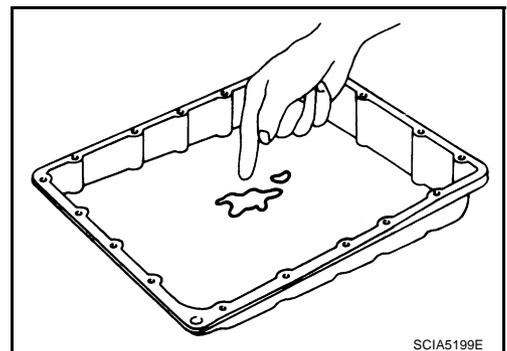
9. Push A/T assembly harness connector.  
**CAUTION:**  
**Be careful not to damage connector.**



10. Remove clips (1), oil pan (2) and oil pan gasket.
  - ⇐: Vehicle front
  - ←: Oil pan mounting bolt
  - Drain bolt (3)

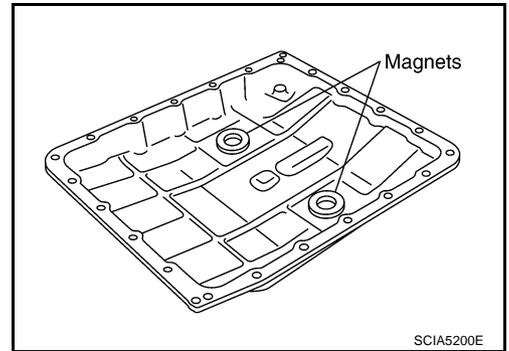


11. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
  - If frictional material is detected, perform A/T fluid cooler cleaning. Refer to [AT-14, "A/T Fluid Cooler Cleaning"](#).



# ON-VEHICLE SERVICE

12. Remove magnets from oil pan.

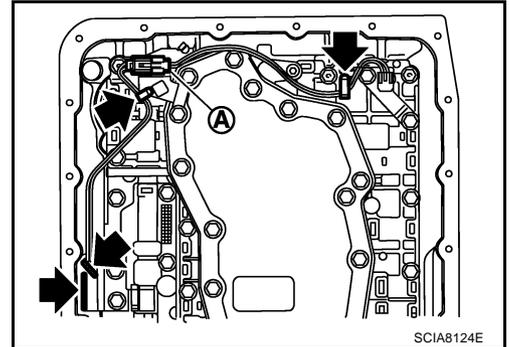


13. Disconnect A/T fluid temperature sensor 2 connector (A).

**CAUTION:**

**Be careful not to damage connector.**

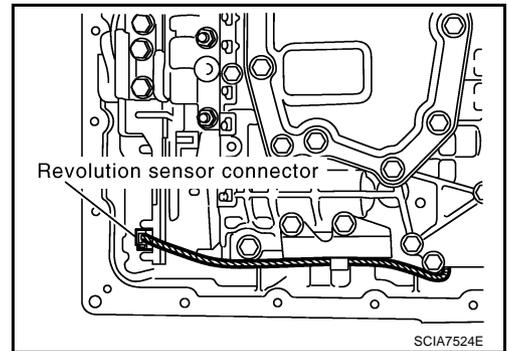
14. Straighten terminal clips (←) to free terminal cord assembly and A/T fluid temperature sensor 2 harness.



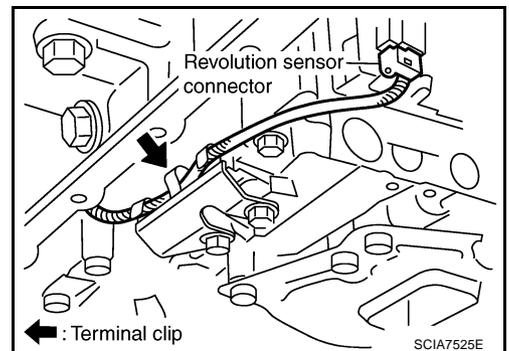
15. Disconnect revolution sensor connector.

**CAUTION:**

**Be careful not to damage connector.**



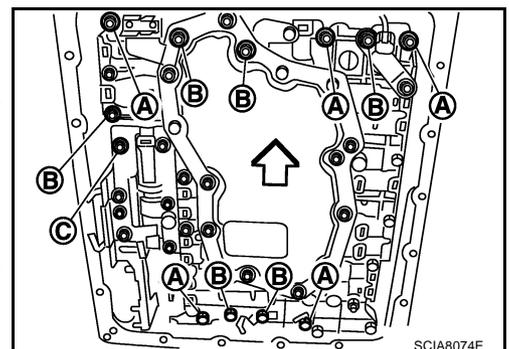
16. Straighten terminal clip to free revolution sensor harness.



17. Remove bolts (A), (B) and (C) from control valve with TCM.

● ←: Vehicle front

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



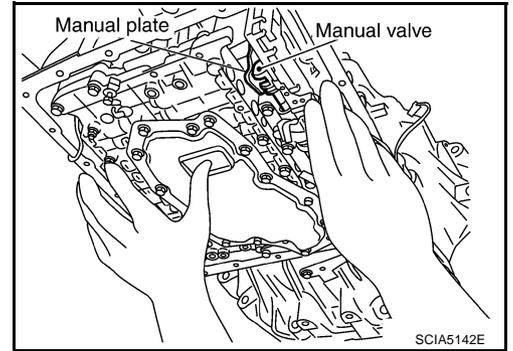
A  
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I  
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L  
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# ON-VEHICLE SERVICE

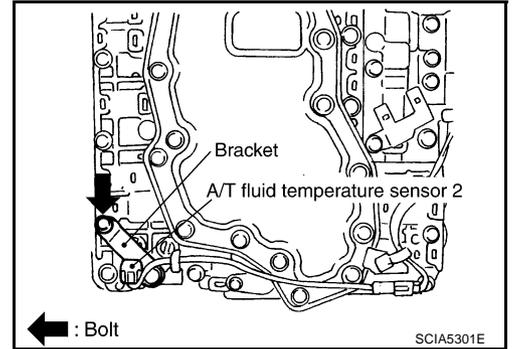
18. Remove control valve with TCM from transmission case.

**CAUTION:**

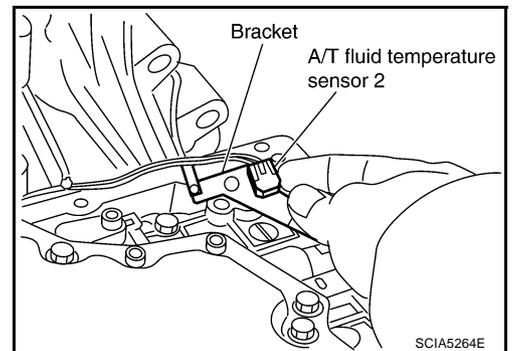
When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



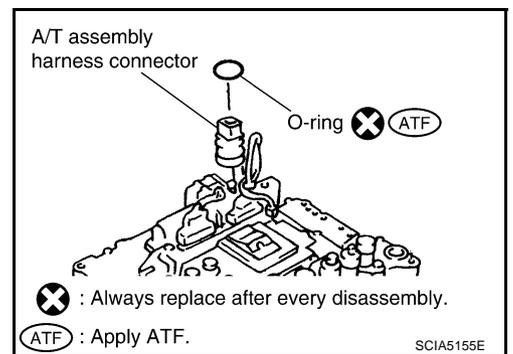
19. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



20. Remove bracket from A/T fluid temperature sensor 2.



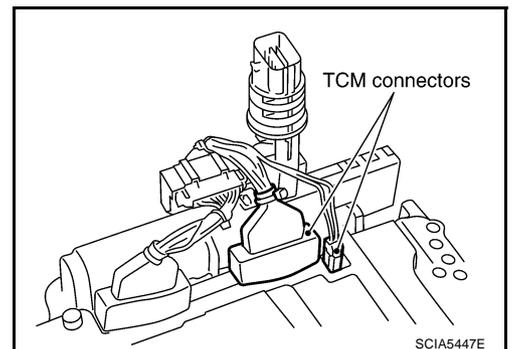
21. Remove O-ring from A/T assembly harness connector.



22. Disconnect TCM connectors.

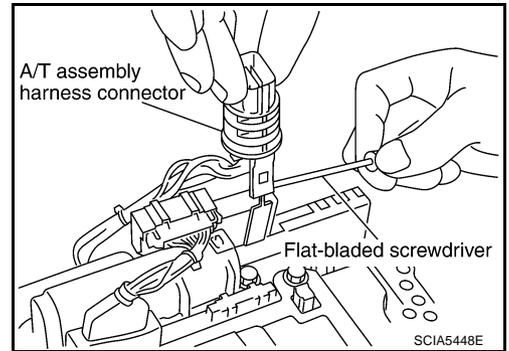
**CAUTION:**

Be careful not to damage connectors.



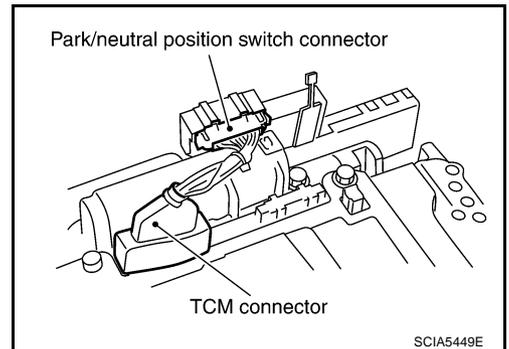
# ON-VEHICLE SERVICE

23. Remove A/T assembly harness connector from control valve with TCM using a flat-bladed screwdriver.



24. Disconnect TCM connector and park/neutral position switch connector.

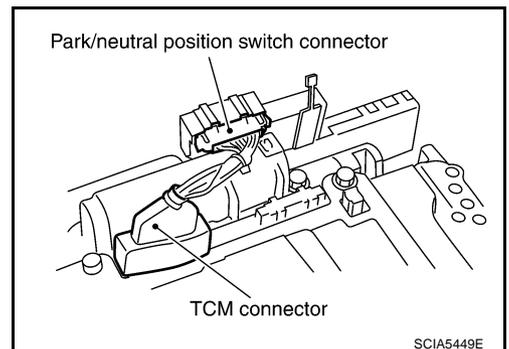
**CAUTION:**  
Be careful not to damage connectors.



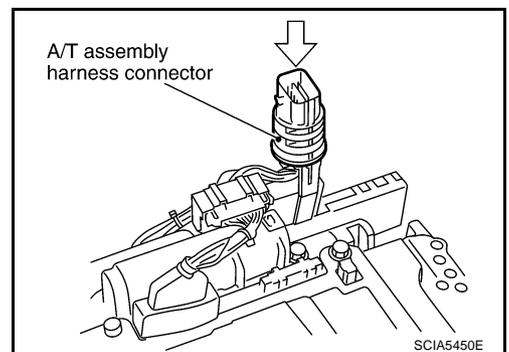
## Installation

**CAUTION:**  
After completing installation, check A/T fluid leakage and A/T fluid level. Refer to [AT-12. "Checking A/T Fluid"](#) .

1. Connect TCM connector and park/neutral position switch connector.



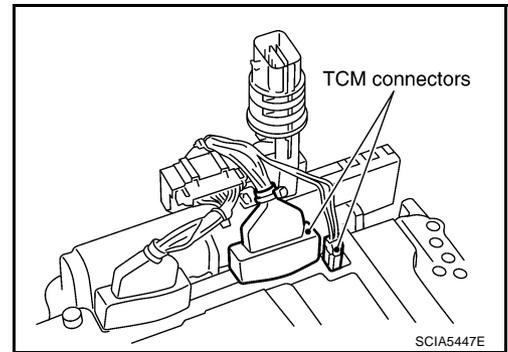
2. Install A/T assembly harness connector from control valve with TCM.



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## ON-VEHICLE SERVICE

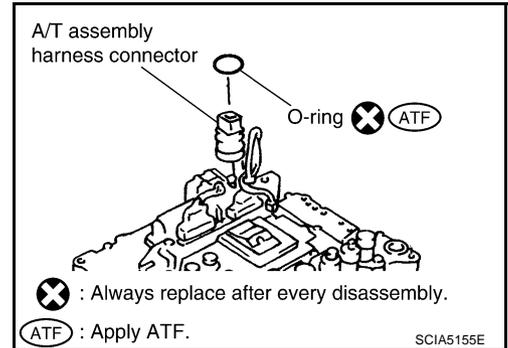
3. Connect TCM connectors.



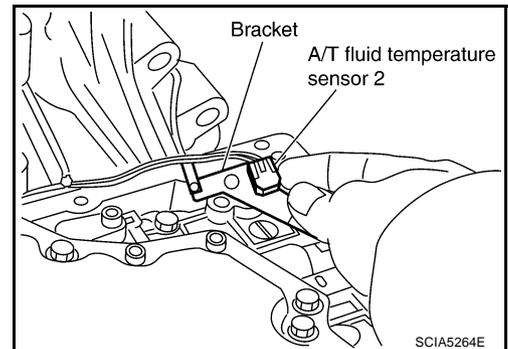
4. Install O-ring in A/T assembly harness connector.

**CAUTION:**

- Do not reuse O-ring.
- Apply ATF to O-ring.



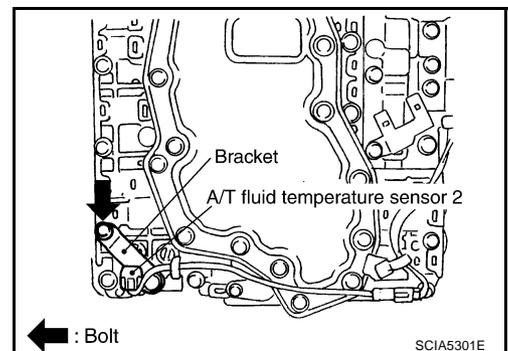
5. Install A/T fluid temperature sensor 2 to bracket.



6. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM, and then tighten A/T fluid temperature sensor 2 bolt to the specified torque. Refer to [AT-215, "COMPONENTS"](#).

**CAUTION:**

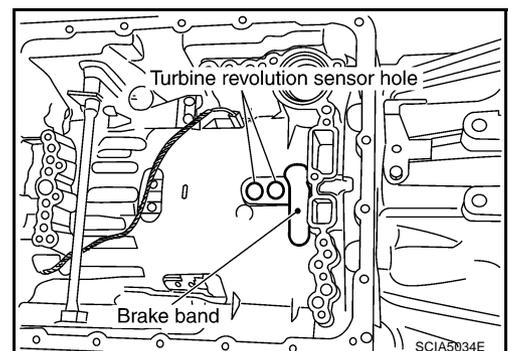
**Adjust bolt hole of bracket to bolt hole of control valve with TCM.**



7. Install control valve with TCM in transmission case.

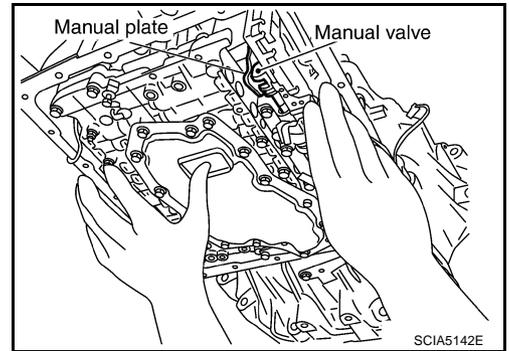
**CAUTION:**

- Make sure that turbine revolution sensor securely installs turbine revolution sensor hole.
- Hang down revolution sensor harness toward outside so as not to disturb installation of control valve with TCM.
- Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.



# ON-VEHICLE SERVICE

- Assemble it so that manual valve cutout is engaged with manual plate projection.

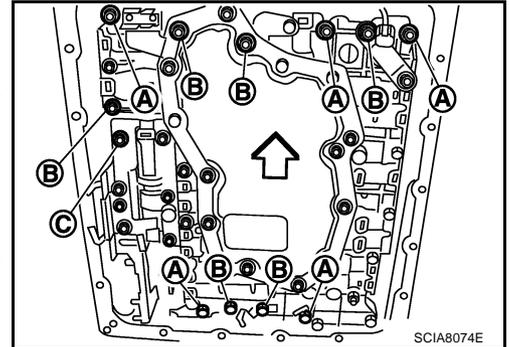


A  
B  
AT

8. Install bolts (A), (B) and (C) in control valve with TCM.

- ←: Vehicle front

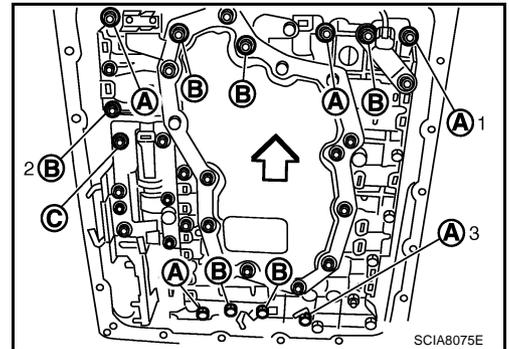
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



D  
E  
F  
G

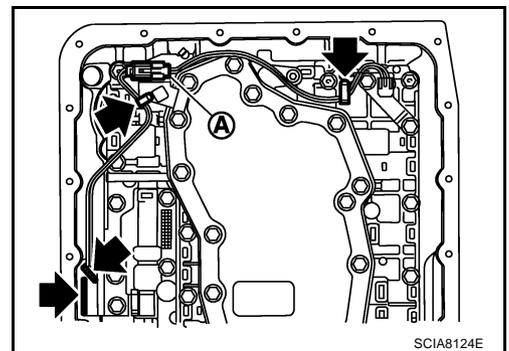
9. Tighten bolt 1, 2 and 3 temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts, and then tighten control valve with TCM mounting bolts to the specified torque. Refer to [AT-215, "COMPONENTS"](#).

- ←: Vehicle front



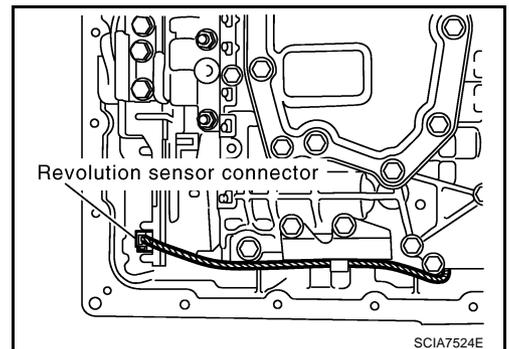
H  
I  
J  
K

10. Connect A/T fluid temperature sensor 2 connector (A).
11. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips (←).



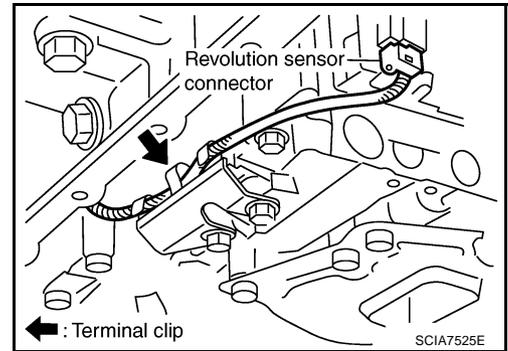
L  
M

12. Connect revolution sensor connector.

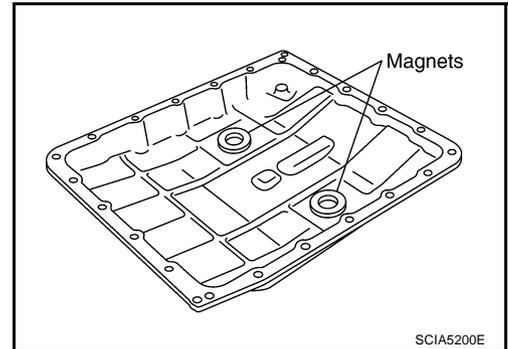


## ON-VEHICLE SERVICE

13. Securely fasten revolution sensor harness with terminal clip.



14. Install magnets in oil pan.



15. Install oil pan to transmission case.

- a. Install oil pan gasket to oil pan.

**CAUTION:**

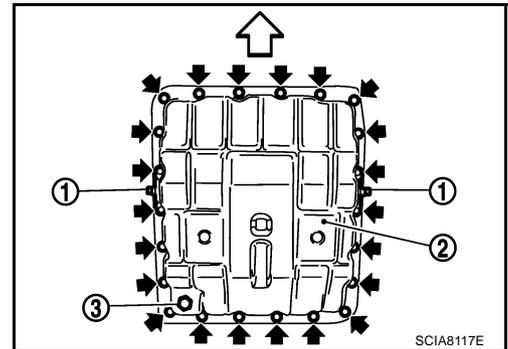
- Do not reuse oil pan gasket.
- Install it in the direction to align hole positions.
- Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.

- b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

- ⇐: Vehicle front
- ←: Oil pan mounting bolt

**CAUTION:**

- Install it so that drain plug (3) comes to the position as shown in the figure.
- Be careful not to pinch harness.
- Complete remove all moisture, oil and old gasket, etc. from oil pan mounting surface.



- c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to [AT-215, "COMPONENTS"](#).

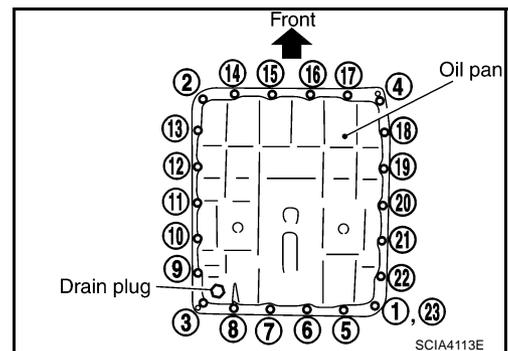
**CAUTION:**

**Do not reuse oil pan mounting bolts.**

16. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to [AT-215, "COMPONENTS"](#).

**CAUTION:**

**Do not reuse drain plug gasket.**

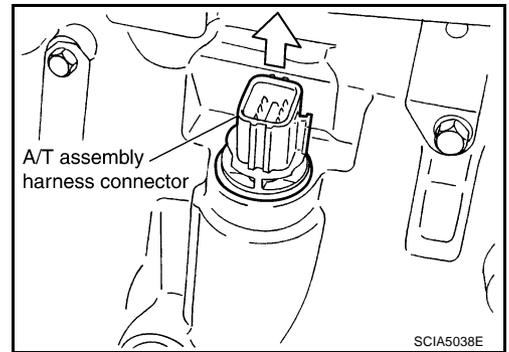


# ON-VEHICLE SERVICE

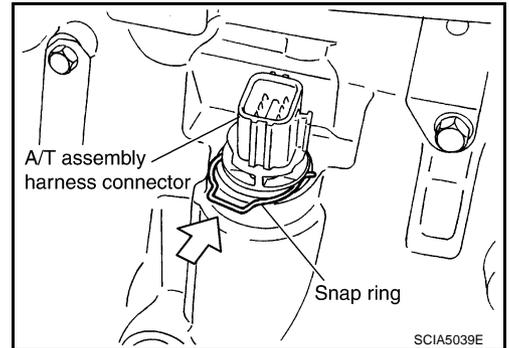
17. Pull up A/T assembly harness connector.

**CAUTION:**

**Be careful not to damage connector.**



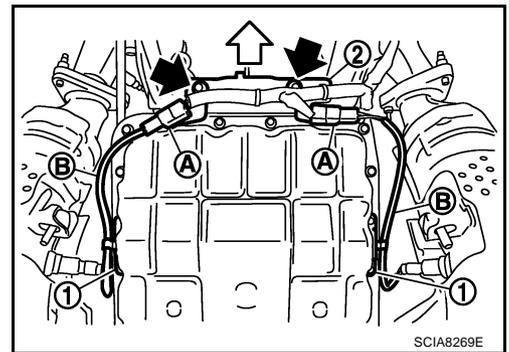
18. Install snap ring to A/T assembly harness connector.  
19. Connect A/T assembly harness connector.



20. Install bracket (2) from transmission assembly. Refer to [AT-215, "COMPONENTS"](#).

- ←: Vehicle front
- ←: Bolt

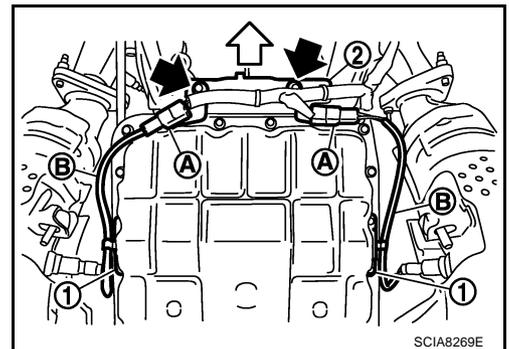
21. Install heated oxygen sensor 2 harness (B) from clips (1).  
22. Connect heated oxygen sensor 2 harness connectors (A).  
23. Install exhaust mounting bracket. Refer to [EX-3, "Removal and Installation"](#).  
24. Pour ATF into A/T assembly. Refer to [AT-12, "Changing A/T Fluid"](#).  
25. Connect the battery cable to the negative terminal.



## A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION

### Removal

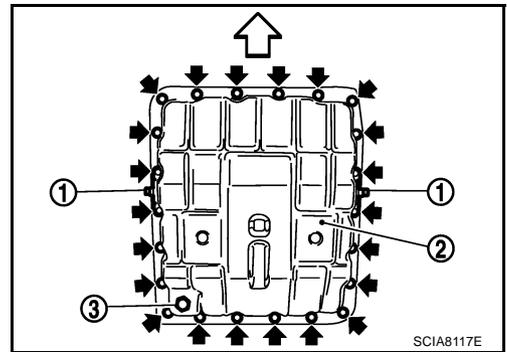
1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain hole.
3. Remove exhaust mounting bracket. Refer to [EX-3, "Removal and Installation"](#).
4. Disconnect heated oxygen sensor 2 harness connectors (A).
  - ←: Vehicle front
  - ←: Bolt
5. Remove heated oxygen sensor 2 harness (B) from clips (1).
6. Remove bracket (2) from transmission assembly.



## ON-VEHICLE SERVICE

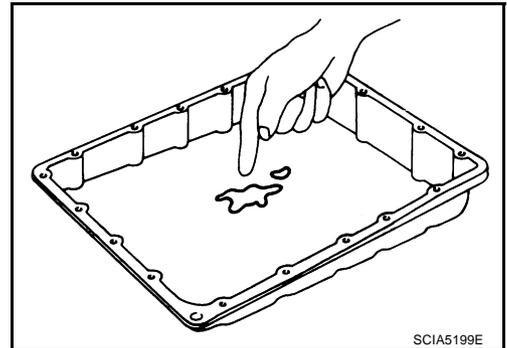
7. Remove clips (1), oil pan (2) and oil pan gasket.

- ⇐: Vehicle front
- ←: Oil pan mounting bolt
- Drain plug (3)



8. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF 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.

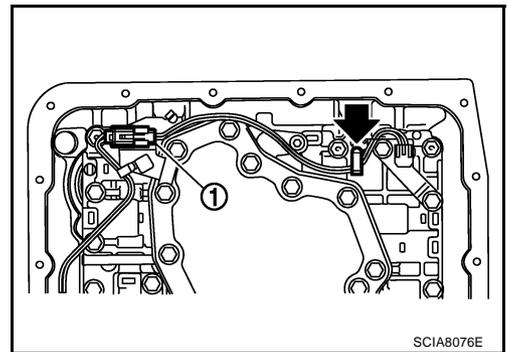
- If frictional material is detected, perform A/T fluid cooler cleaning. Refer to [AT-14, "A/T Fluid Cooler Cleaning"](#).



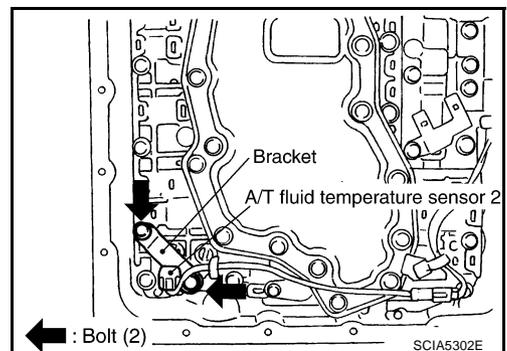
9. Disconnect A/T fluid temperature sensor 2 connector (1).

- CAUTION:**  
Be careful not to damage connector.

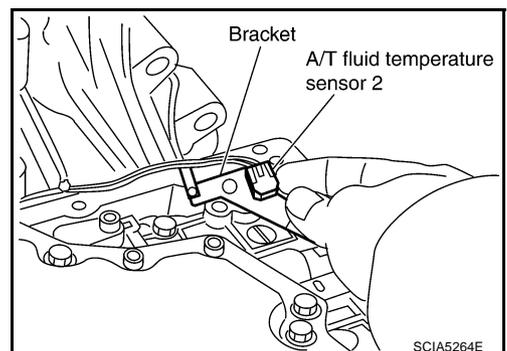
10. Straighten terminal clip (⇐) to free A/T fluid temperature sensor 2 harness.



11. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



12. Remove bracket from A/T fluid temperature sensor 2.



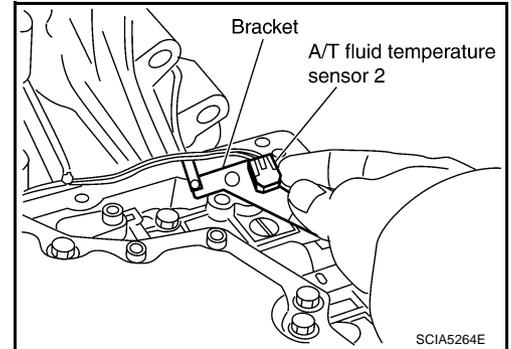
# ON-VEHICLE SERVICE

## Installation

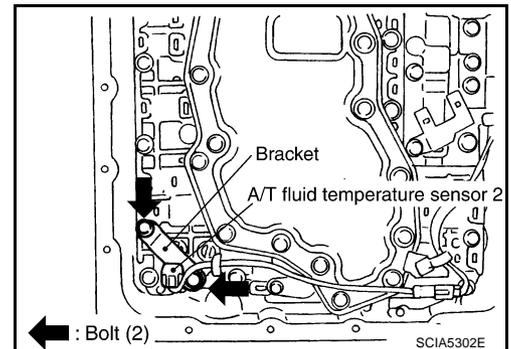
### CAUTION:

After completing installation, check A/T fluid leakage and A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .

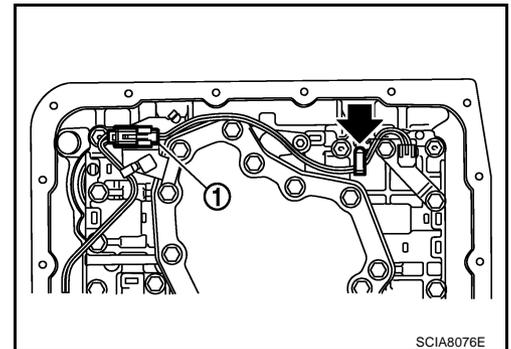
1. Install A/T fluid temperature sensor 2 to bracket.



2. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM, and then tighten A/T fluid temperature sensor 2 bolt to the specified torque. Refer to [AT-215, "COMPONENTS"](#) .



3. Connect A/T fluid temperature sensor 2 connector (1).
4. Securely fasten A/T fluid temperature sensor 2 harness with terminal clip (←).



5. Install oil pan to transmission case.

- a. Install oil pan gasket to oil pan.

### CAUTION:

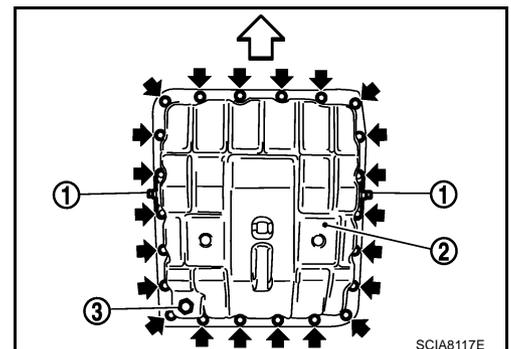
- Do not reuse oil pan gasket.
- Install it in the direction to align hole positions.
- Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.

- b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

- ←: Vehicle front
- ←: Oil pan mounting bolt

### CAUTION:

- Install it so that drain plug (3) comes to the position as shown in the figure.
- Be careful not to pinch harness.



## ON-VEHICLE SERVICE

- Complete remove all moisture, oil and old gasket, etc. from oil pan mounting surface.

c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to [AT-215, "COMPONENTS"](#) .

**CAUTION:**

**Do not reuse oil pan mounting bolts.**

6. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to [AT-215, "COMPONENTS"](#) .

**CAUTION:**

**Do not reuse drain plug gasket.**

7. Install bracket (2) from transmission assembly. Refer to [AT-215, "COMPONENTS"](#) .

- ⇐: Vehicle front

- ←: Bolt

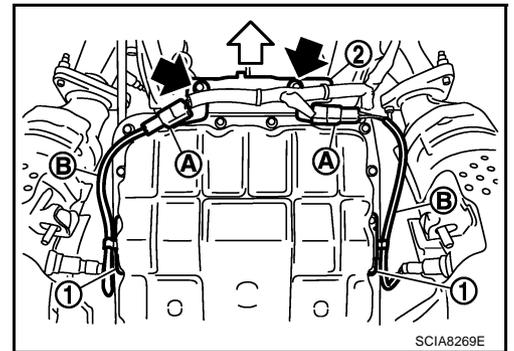
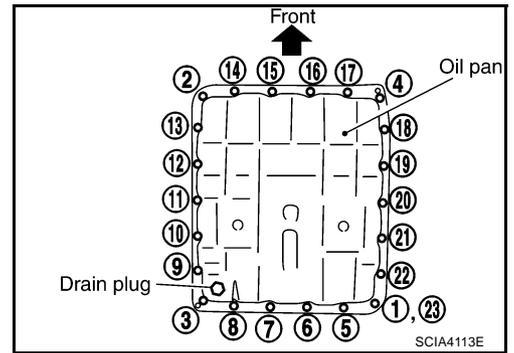
8. Install heated oxygen sensor 2 harness (B) from clips (1).

9. Connect heated oxygen sensor 2 harness connectors (A).

10. Install exhaust mounting bracket. Refer to [EX-3, "Removal and Installation"](#) .

11. Pour ATF into A/T assembly. Refer to [AT-12, "Changing A/T Fluid"](#) .

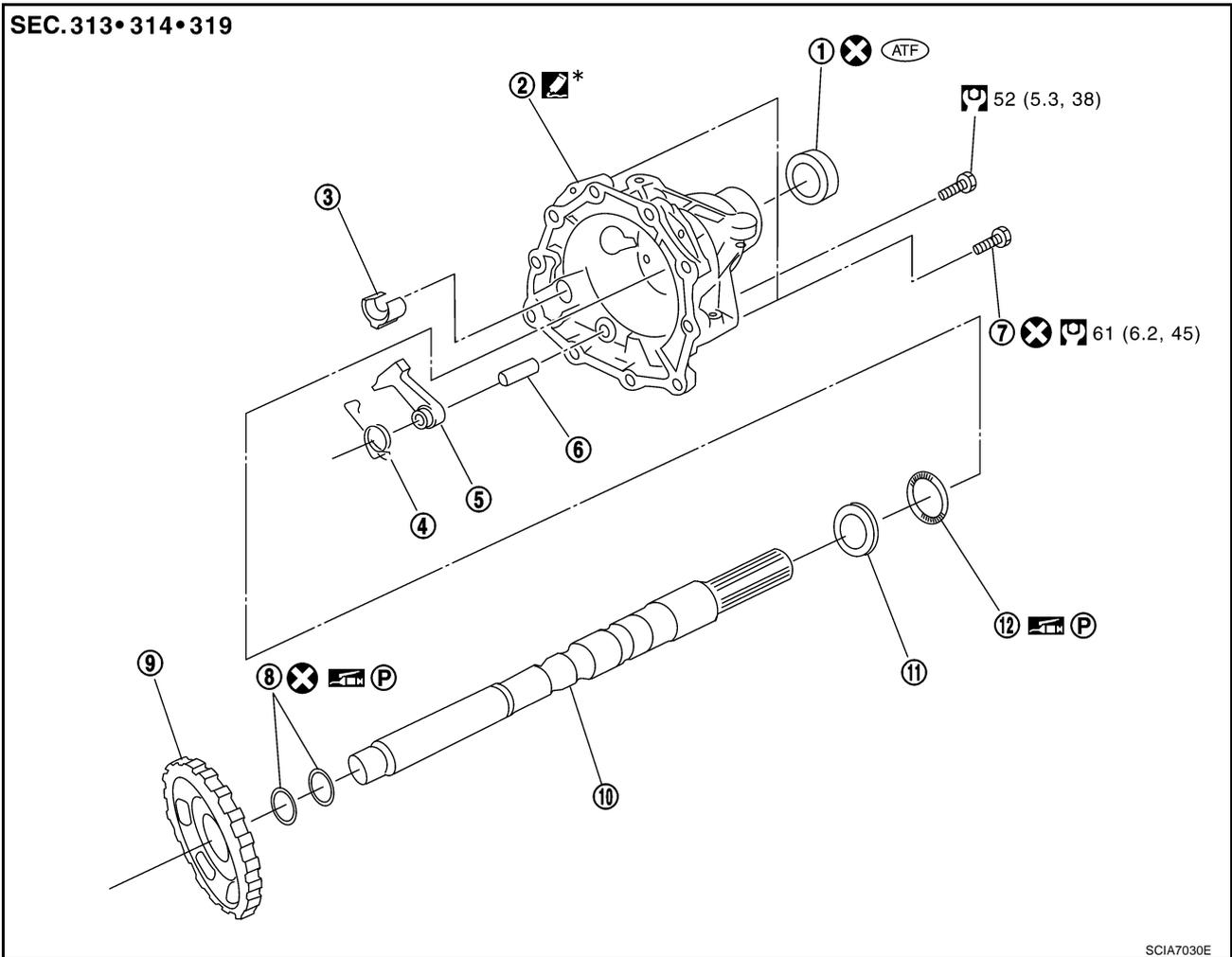
12. Connect the battery cable to the negative terminal.



## Parking Components COMPONENTS

NCS00093

A  
B  
AT  
D  
E  
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G  
H  
I  
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K  
L  
M



- |                      |                   |                             |
|----------------------|-------------------|-----------------------------|
| 1. Rear oil seal     | 2. Rear extension | 3. Parking actuator support |
| 4. Return spring     | 5. Parking pawl   | 6. Pawl shaft               |
| 7. Self-sealing bolt | 8. Seal ring      | 9. Parking gear             |
| 10. Output shaft     | 11. Bearing race  | 12. Needle bearing          |

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to [GI-11, "Components"](#) .

However, refer to the following for others.

: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .

### REMOVAL

1. Drain ATF through drain hole.
2. Remove exhaust front tube and center muffler with power tool. Refer to [EX-3, "Removal and Installation"](#) .
3. Remove rear propeller shaft. Refer to [PR-6, "Removal and Installation"](#) .

**CAUTION:**

**Do not impact or damage propeller shaft tube.**

4. Remove control rod. Refer to [AT-205, "Control Rod Removal and Installation"](#) .
5. Support A/T assembly with a transmission jack.

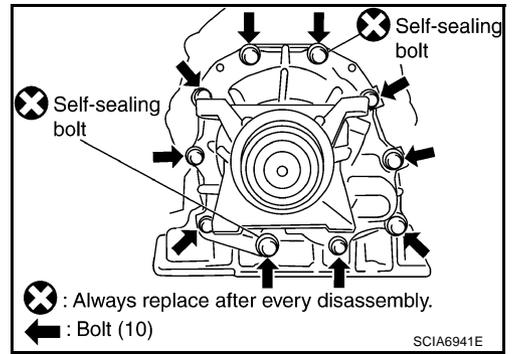
**CAUTION:**

**When setting transmission jack, be careful not to allow it to collide against drain plug.**

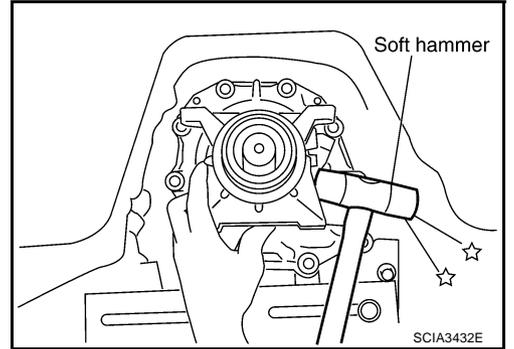
6. Remove rear engine mounting member with power tool. Refer to [AT-242, "Removal and Installation"](#) .

# ON-VEHICLE SERVICE

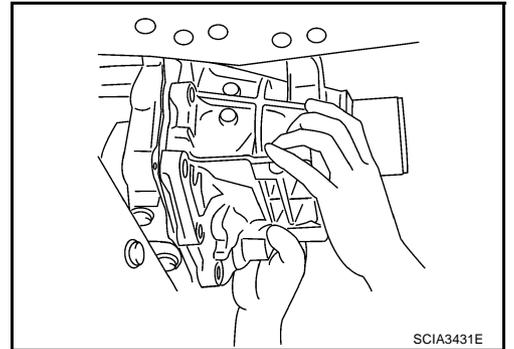
7. Remove tightening bolts for rear extension assembly and transmission case.



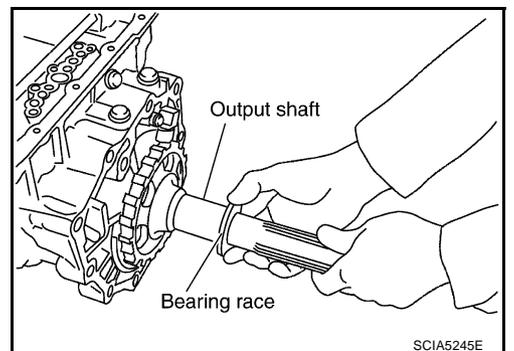
8. Tap rear extension assembly with soft hammer.



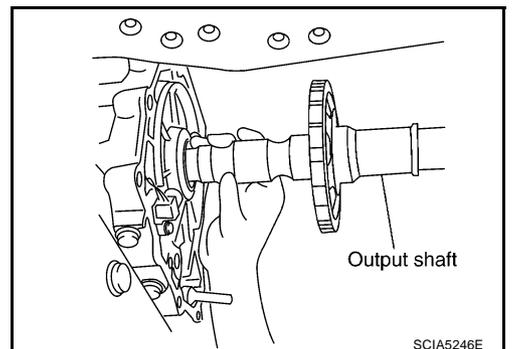
9. Remove rear extension assembly from transmission case. (With needle bearing.)



10. Remove bearing race from output shaft.

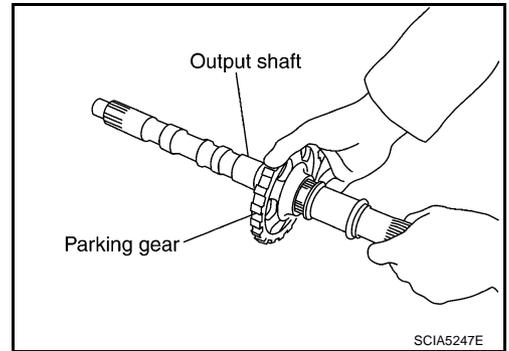


11. Remove output shaft from transmission case by rotating left/right.

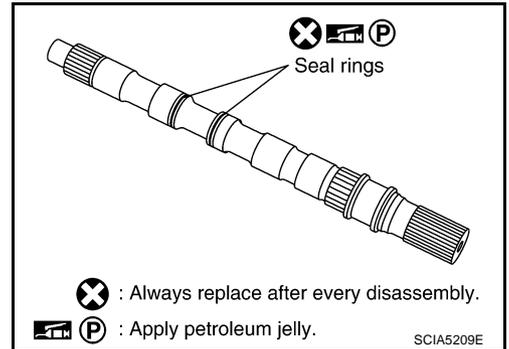


# ON-VEHICLE SERVICE

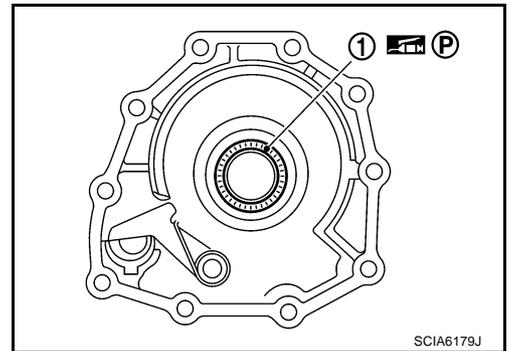
12. Remove parking gear from output shaft.



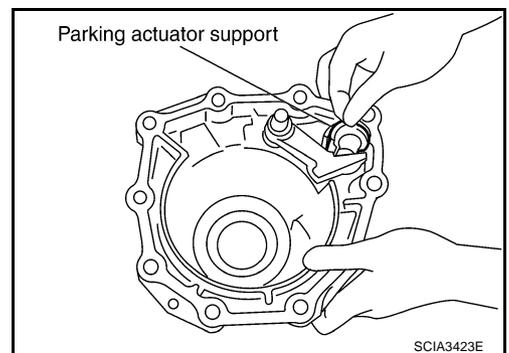
13. Remove seal rings from output shaft.



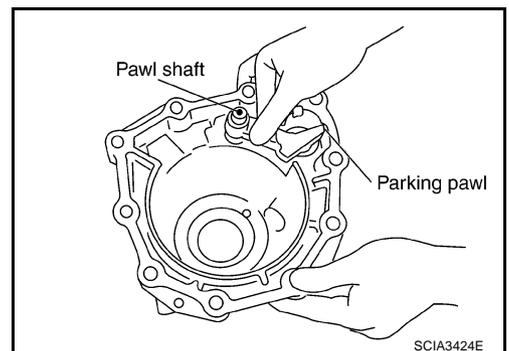
14. Remove needle bearing (1) from rear extension.



15. Remove parking actuator support from rear extension.

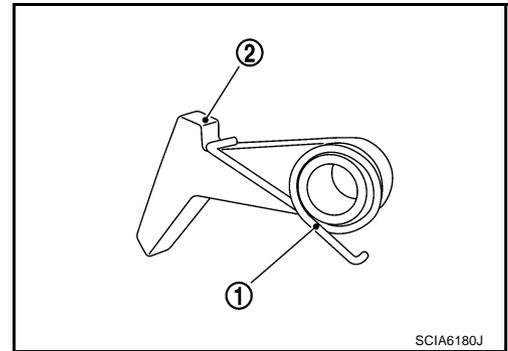


16. Remove parking pawl (with return spring) and pawl shaft from rear extension.



## ON-VEHICLE SERVICE

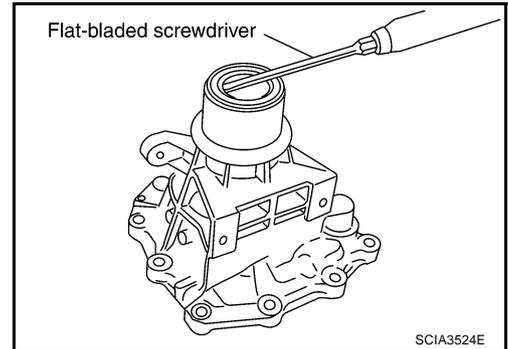
17. Remove return spring (1) from parking pawl (2).



18. Remove rear oil seal from rear extension.

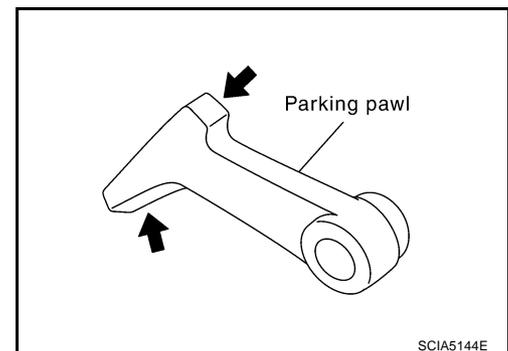
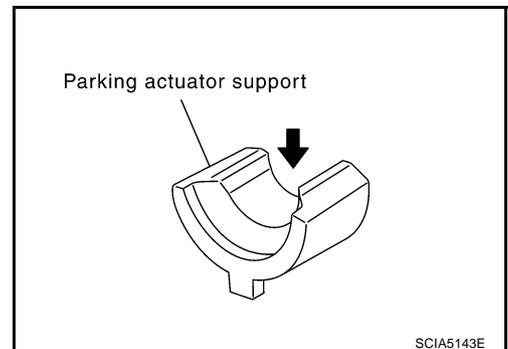
**CAUTION:**

**Be careful not to scratch rear extension.**



### INSPECTION

- If the contact surface on parking actuator support, parking pawl, etc. has excessive wear, abrasion, bend, or any other damage, replace the components.



# ON-VEHICLE SERVICE

## INSTALLATION

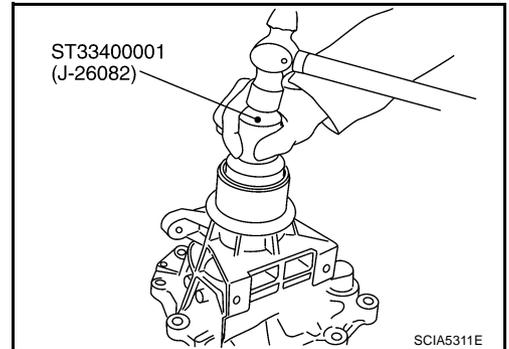
### CAUTION:

After completing installation, check A/T position, A/T fluid leakage and A/T fluid level. Refer to [AT-206](#), "[Checking of A/T Position](#)", [AT-12](#), "[Checking A/T Fluid](#)".

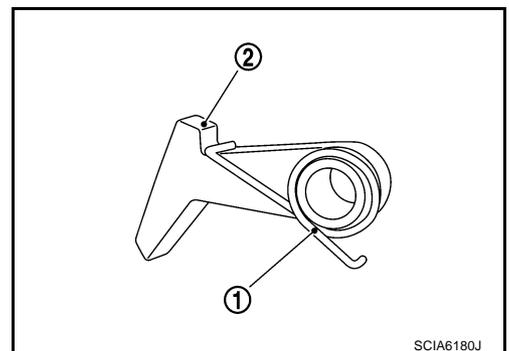
1. As shown in the figure, use a drift to drive rear oil seal into the rear extension until it is flush.

### CAUTION:

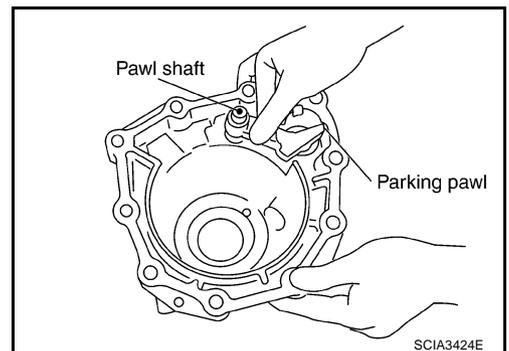
- Do not reuse rear oil seal.
- Apply ATF to rear oil seal.



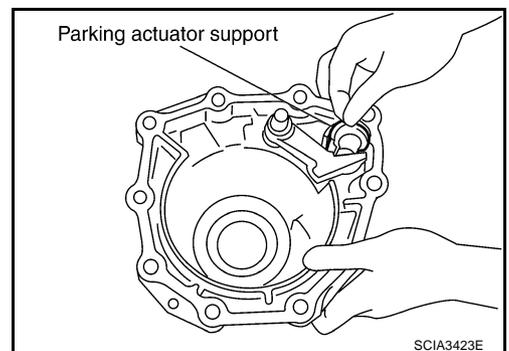
2. Install return spring (1) to parking pawl (2).



3. Install parking pawl (with return spring) and pawl shaft to rear extension.



4. Install parking actuator support to rear extension.



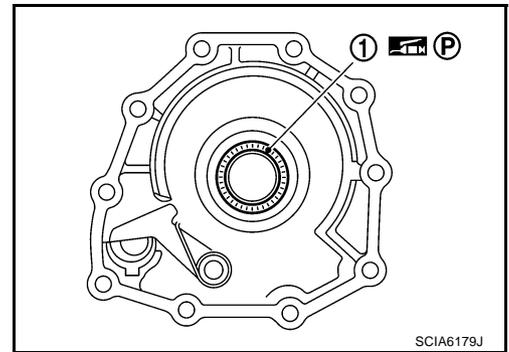
A  
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## ON-VEHICLE SERVICE

5. Install needle bearing (1) to rear extension.

**CAUTION:**

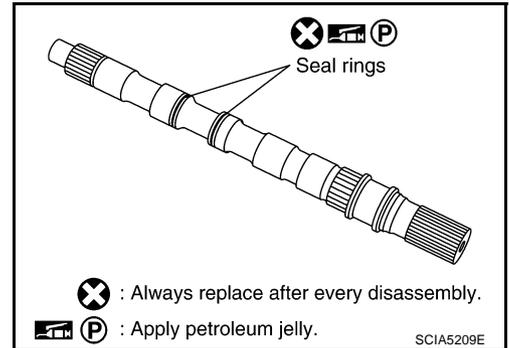
- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#) .
- Apply petroleum jelly to needle bearing.



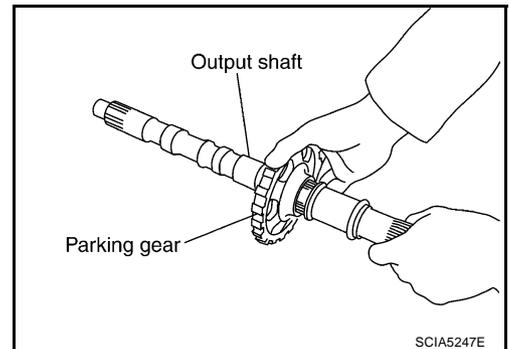
6. Install seal rings in output shaft.

**CAUTION:**

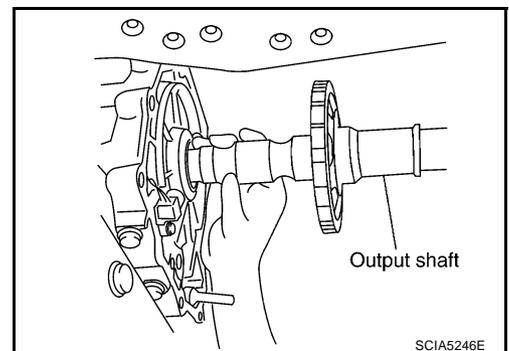
- Do not reuse seal rings.
- Apply petroleum jelly to seal rings.



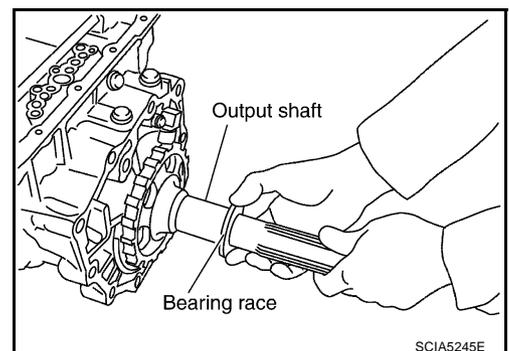
7. Install parking gear to output shaft.



8. Install output shaft to transmission case.



9. Install bearing race to output shaft.

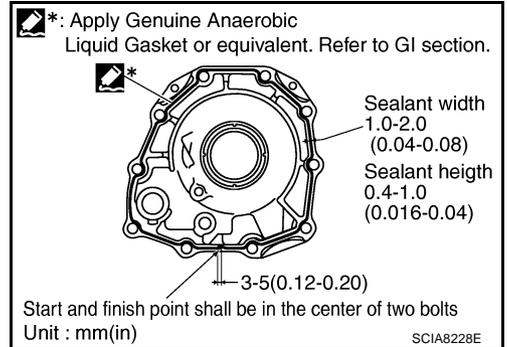


## ON-VEHICLE SERVICE

10. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .) to rear extension assembly as shown in the figure.

**CAUTION:**

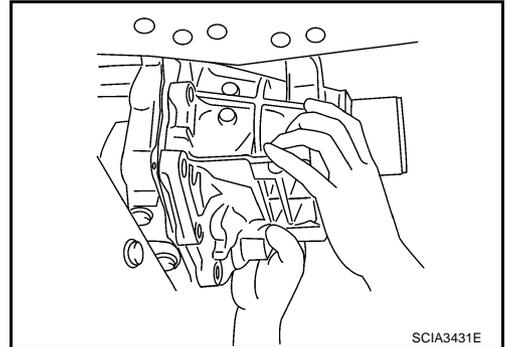
Completely remove all moisture, oil and old sealant, etc. from transmission case and rear extension assembly mounting surfaces.



11. Install rear extension assembly to transmission case. (With needle bearing.)

**CAUTION:**

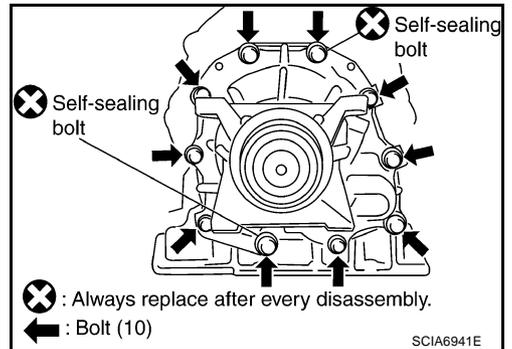
Insert the tip of parking rod between parking pawl and parking actuator support when assembling rear extension assembly.



12. Tighten rear extension assembly mounting bolts to the specified torque. Refer to [AT-227, "COMPONENTS"](#) .

**CAUTION:**

Do not reuse self-sealing bolts.



13. Install rear engine mounting member. Refer to [AT-242, "Removal and Installation"](#) .

14. Install control rod. Refer to [AT-205, "Control Rod Removal and Installation"](#) .

15. Install rear propeller shaft. Refer to [PR-6, "Removal and Installation"](#) .

**CAUTION:**

Do not impact or damage propeller shaft tube.

16. Install exhaust front tube and center muffler. Refer to [EX-3, "Removal and Installation"](#) .

17. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to [AT-215, "COMPONENTS"](#) .

**CAUTION:**

Do not reuse drain plug gasket.

18. Pour ATF into A/T assembly. Refer to [AT-12, "Changing A/T Fluid"](#) .

# ON-VEHICLE SERVICE

NCS00094

## Rear Oil Seal REMOVAL

1. Remove exhaust front tube and center muffler with power tool. Refer to [EX-3, "Removal and Installation"](#) .
2. Remove rear propeller shaft. Refer to [PR-6, "Removal and Installation"](#) .

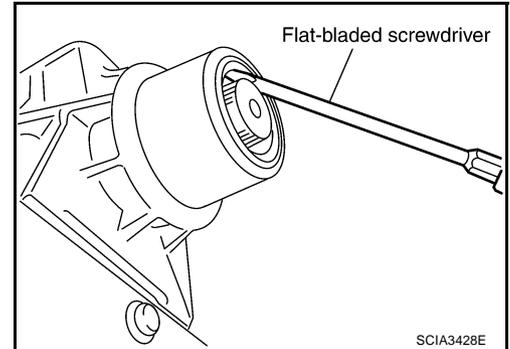
**CAUTION:**

**Do not impact or damage propeller shaft tube.**

3. Remove rear oil seal using a flat-bladed screwdriver.

**CAUTION:**

**Be careful not to scratch rear extension assembly.**



## INSTALLATION

**CAUTION:**

**After completing installation, check A/T fluid leakage and A/T fluid level. Refer to [AT-12, "Checking A/T Fluid"](#) .**

1. As shown in the figure, use the drift to drive rear oil seal into rear extension assembly until it is flush.

**CAUTION:**

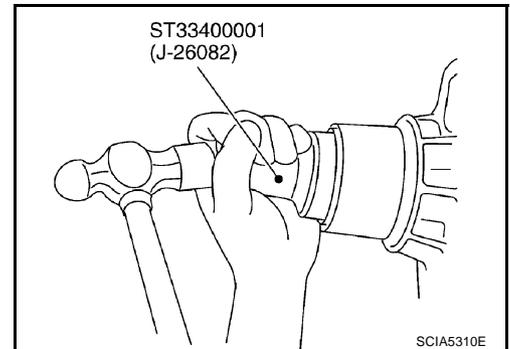
- Do not reuse rear oil seal.
- Apply ATF to rear oil seal.

2. Install rear propeller shaft. Refer to [PR-6, "Removal and Installation"](#) .

**CAUTION:**

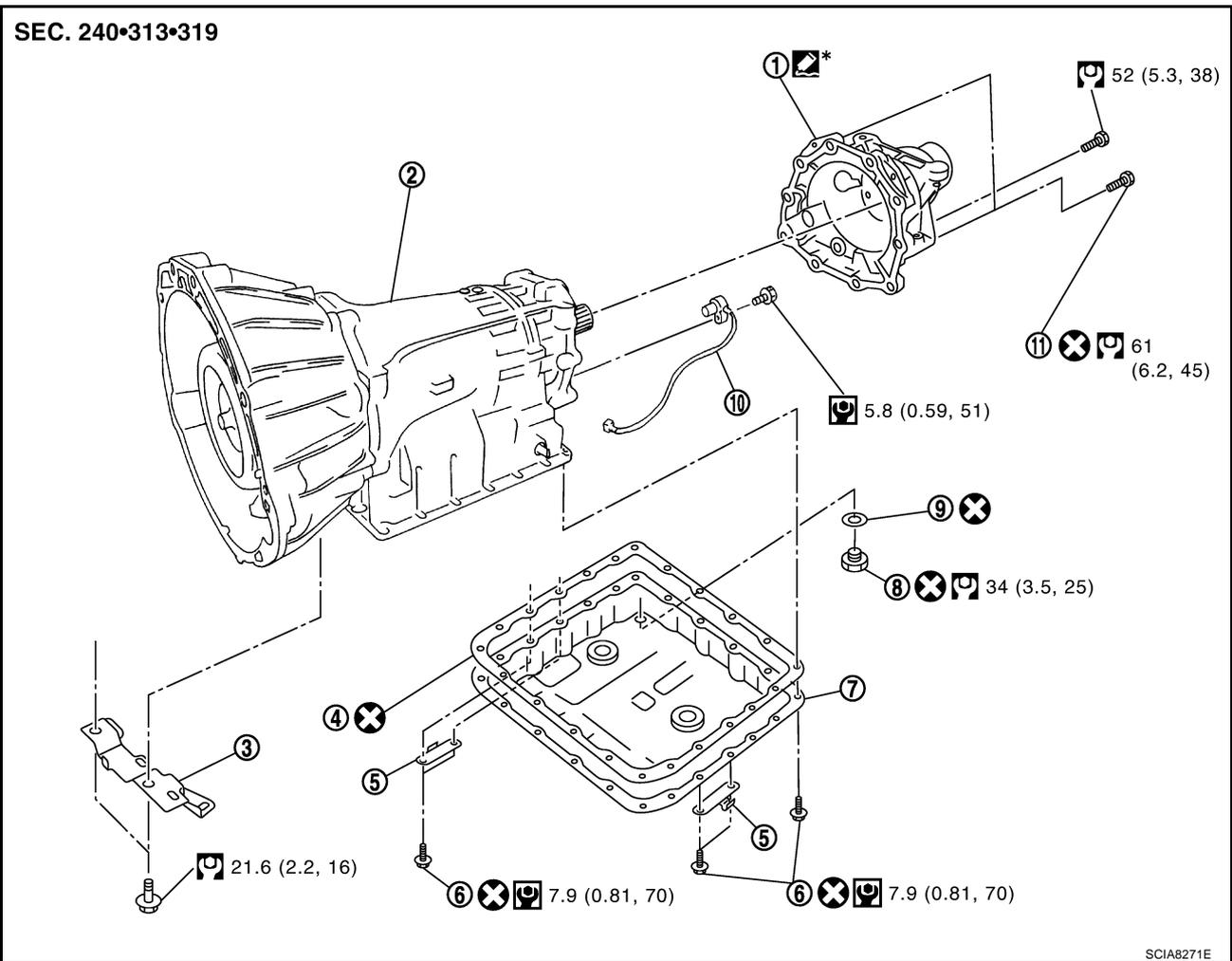
**Do not impact or damage propeller shaft tube.**

3. Install exhaust front tube and center muffler. Refer to [EX-3, "Removal and Installation"](#) .



## Revolution Sensor COMPONENTS

NCS00095



- |                       |                       |                          |
|-----------------------|-----------------------|--------------------------|
| 1. Rear extension     | 2. A/T                | 3. Bracket               |
| 4. Oil pan gasket     | 5. Clip               | 6. Oil pan mounting bolt |
| 7. Oil pan            | 8. Drain plug         | 9. Drain plug gasket     |
| 10. Revolution sensor | 11. Self-sealing bolt |                          |

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to [GI-11, "Components"](#).

However, refer to the following for others.

: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#).

### REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain hole.
3. Remove exhaust front tube and center muffler with power tool. Refer to [EX-3, "Removal and Installation"](#).
4. Remove rear propeller shaft. Refer to [PR-6, "Removal and Installation"](#).

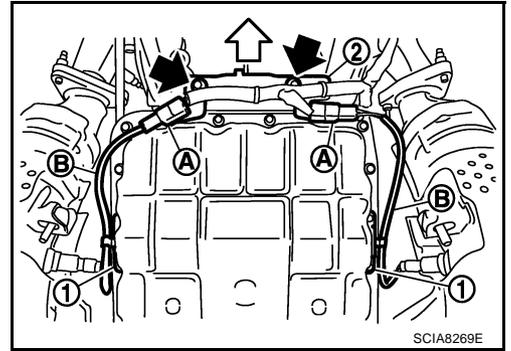
#### **CAUTION:**

**Do not impact or damage propeller shaft tube.**

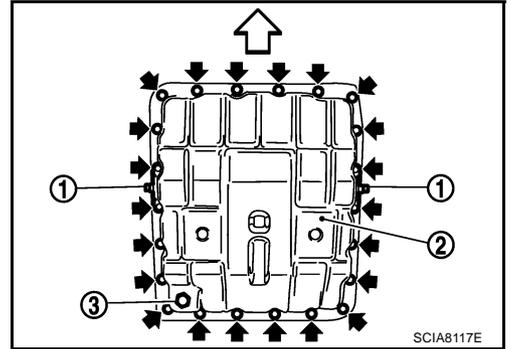
5. Remove control rod. Refer to [AT-205, "Control Rod Removal and Installation"](#).
6. Remove exhaust mounting bracket. Refer to [EX-3, "Removal and Installation"](#).

## ON-VEHICLE SERVICE

7. Disconnect heated oxygen sensor 2 harness connectors (A).
  - ⇐: Vehicle front
  - ←: Bolt
8. Remove heated oxygen sensor 2 harness (B) from clips (1).
9. Remove bracket (2) from transmission assembly.



10. Remove clip (1), oil pan (2) and oil pan gasket.
  - ⇐: Vehicle front
  - ←: Oil pan mounting bolt
  - ○: Drain plug (3)



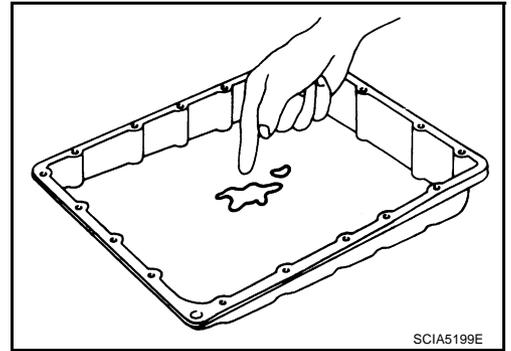
11. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.

● **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to [AT-14, "A/T Fluid Cooler Cleaning"](#).**

12. Support transmission assembly with a transmission jack.

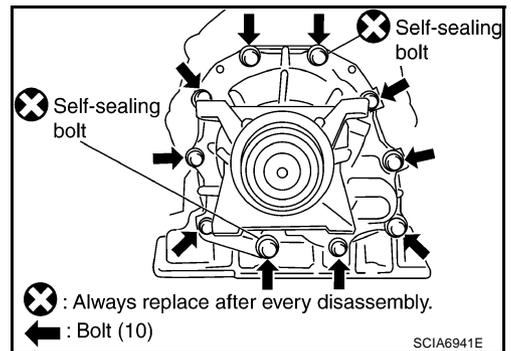
**CAUTION:**

**When setting transmission jack, place wooden blocks to prevent from damaging control valve with TCM and transmission case.**



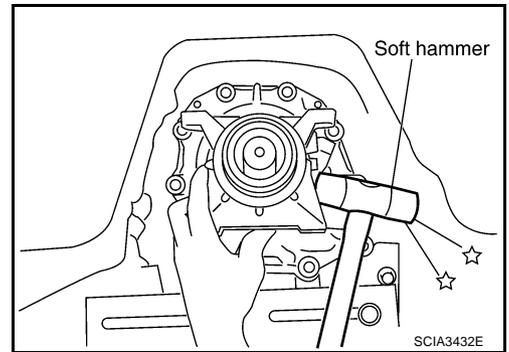
13. Remove rear engine mounting member with power tool. Refer to [AT-242, "Removal and Installation"](#).

14. Remove tightening bolts for rear extension assembly and transmission case.

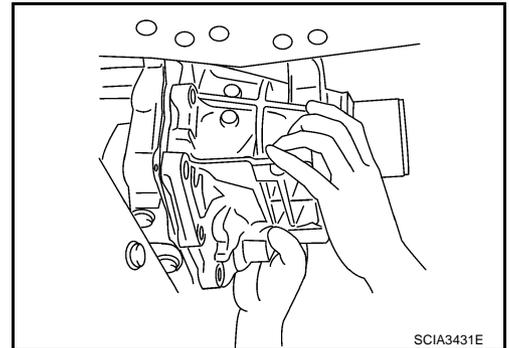


# ON-VEHICLE SERVICE

15. Tap rear extension assembly with soft hammer.

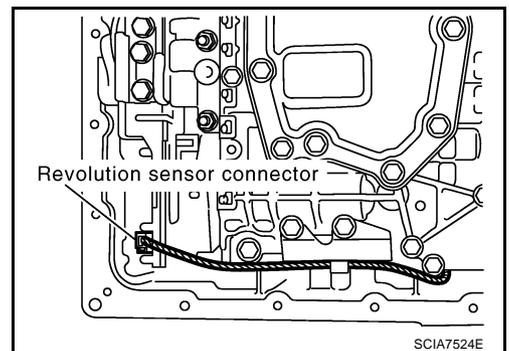


16. Remove rear extension assembly from transmission case. (With needle bearing.)

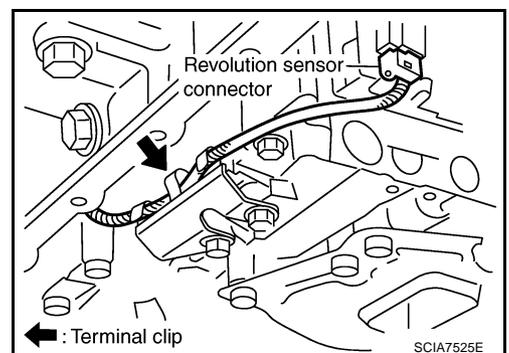


17. Disconnect revolution sensor connector.

**CAUTION:**  
Be careful not to damage connector.



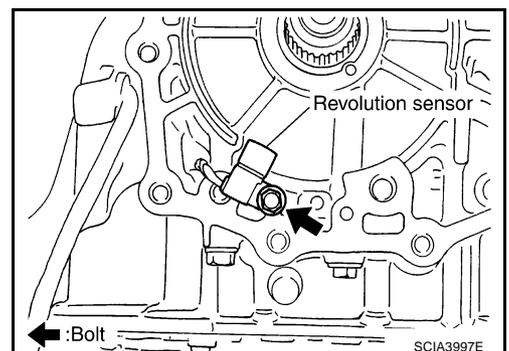
18. Straighten terminal clip to free revolution sensor harness.



19. Remove revolution sensor from transmission case.

**CAUTION:**

- Do not subject it to impact by dropping or hitting it.
- Do not disassemble.
- Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.
- Do not place in an area affected by magnetism.



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# ON-VEHICLE SERVICE

## INSTALLATION

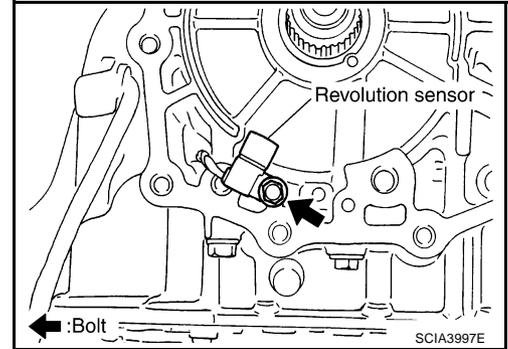
### CAUTION:

After completing installation, check A/T position, A/T fluid leakage and A/T fluid level. Refer to [AT-206, "Checking of A/T Position"](#) , [AT-12, "Checking A/T Fluid"](#) .

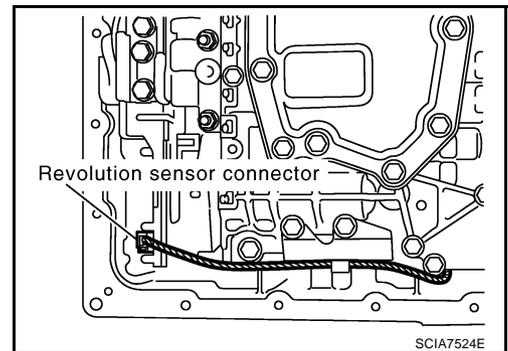
1. Install revolution sensor in transmission case, and then tighten a revolution sensor mounting bolt to the specified torque. Refer to [AT-235, "COMPONENTS"](#) .

### CAUTION:

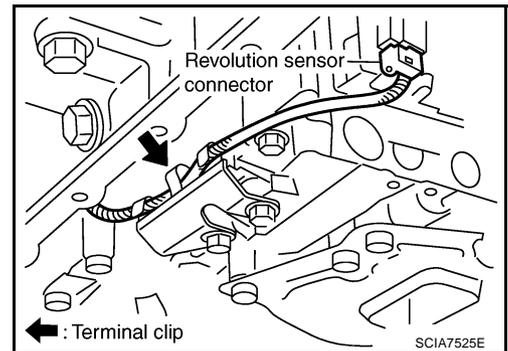
- Do not subject it to impact by dropping or hitting it.
- Do not disassemble.
- Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.
- Do not place in an area affected by magnetism.



2. Connect revolution sensor connector.



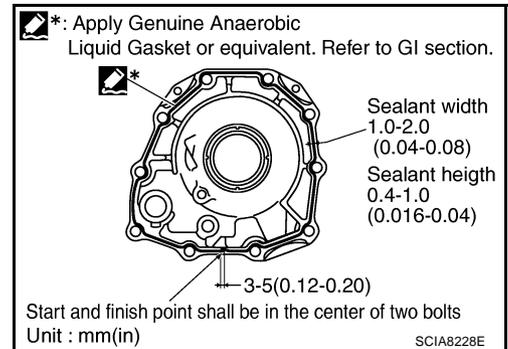
3. Securely fasten revolution sensor harness with clip.



4. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .) to rear extension assembly as shown in illustration.

### CAUTION:

Completely remove all moisture, oil and old sealant, etc. from transmission case and rear extension assembly mounting surfaces.

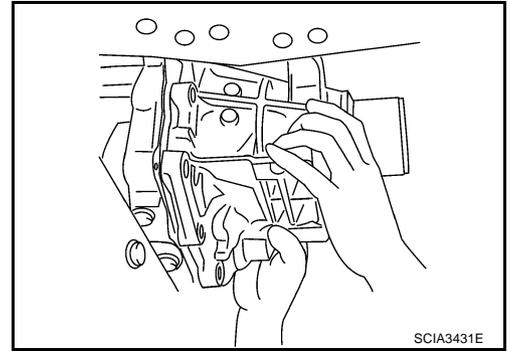


## ON-VEHICLE SERVICE

5. Install rear extension assembly to transmission case. (With needle bearing.)

**CAUTION:**

Insert the tip of parking rod between parking pawl and parking actuator support when assembling rear extension assembly.



6. Tighten rear extension assembly mounting bolts to the specified torque. Refer to [AT-235, "COMPONENTS"](#).

**CAUTION:**

**Do not reuse self-sealing bolts.**

7. Install rear engine mounting member. Refer to [AT-242, "Removal and Installation"](#).

8. Install oil pan to transmission case.

- a. Install oil pan gasket to oil pan.

**CAUTION:**

- Do not reuse oil pan gasket.

- Install it in the direction to align hole positions.

- Completely remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.

- b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

- ↔: Vehicle front

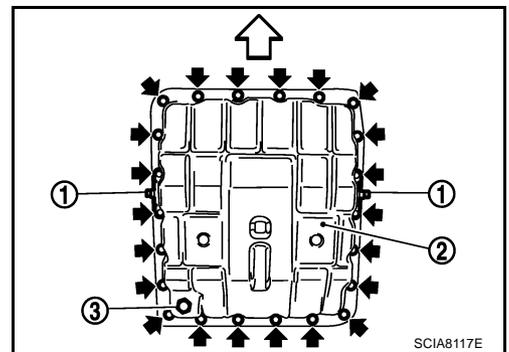
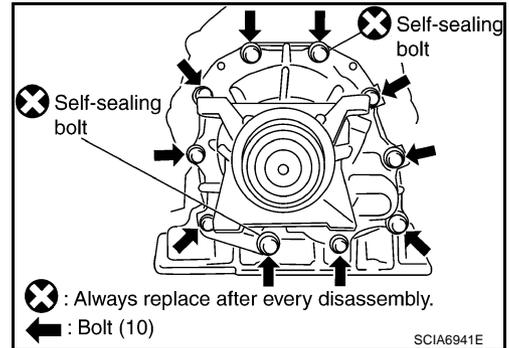
- ←: Oil pan mounting bolt

**CAUTION:**

- Install it so that drain plug (3) comes to the position as shown in the figure.

- Be careful not to pinch harness.

- Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.



- c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to [AT-235, "COMPONENTS"](#).

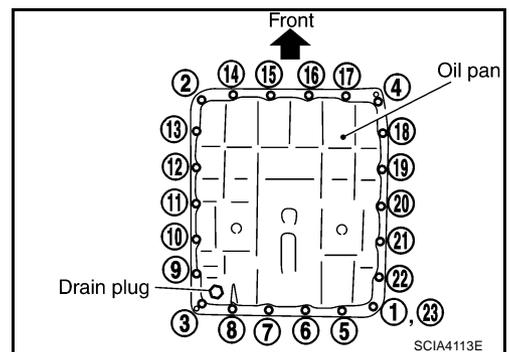
**CAUTION:**

**Do not reuse oil pan mounting bolts.**

9. Install drain plug gasket and drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to [AT-235, "COMPONENTS"](#).

**CAUTION:**

**Do not reuse drain plug gasket.**



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## ON-VEHICLE SERVICE

10. Install bracket (2) from transmission assembly. Refer to [AT-215, "COMPONENTS"](#).

-  Vehicle front
-  Bolt

11. Install heated oxygen sensor 2 harness (B) from clips (1).

12. Connect heated oxygen sensor 2 harness connectors (A).

13. Install exhaust mounting bracket. Refer to [EX-3, "Removal and Installation"](#).

14. Install control rod. Refer to [AT-205, "Control Rod Removal and Installation"](#).

15. Install rear propeller shaft. Refer to [PR-6, "Removal and Installation"](#).

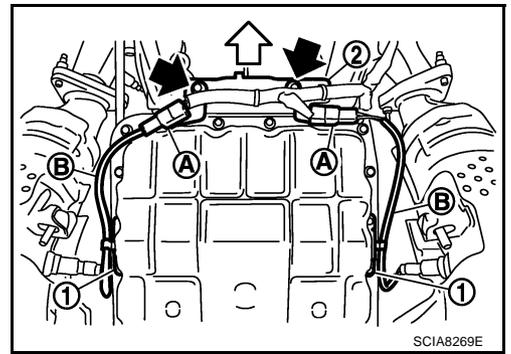
**CAUTION:**

**Do not impact or damage propeller shaft tube.**

16. Install exhaust front tube and center muffler. Refer to [EX-3, "Removal and Installation"](#).

17. Pour ATF into A/T assembly. Refer to [AT-12, "Changing A/T Fluid"](#).

18. Connect the battery cable to the negative terminal.



# AIR BREATHER HOSE

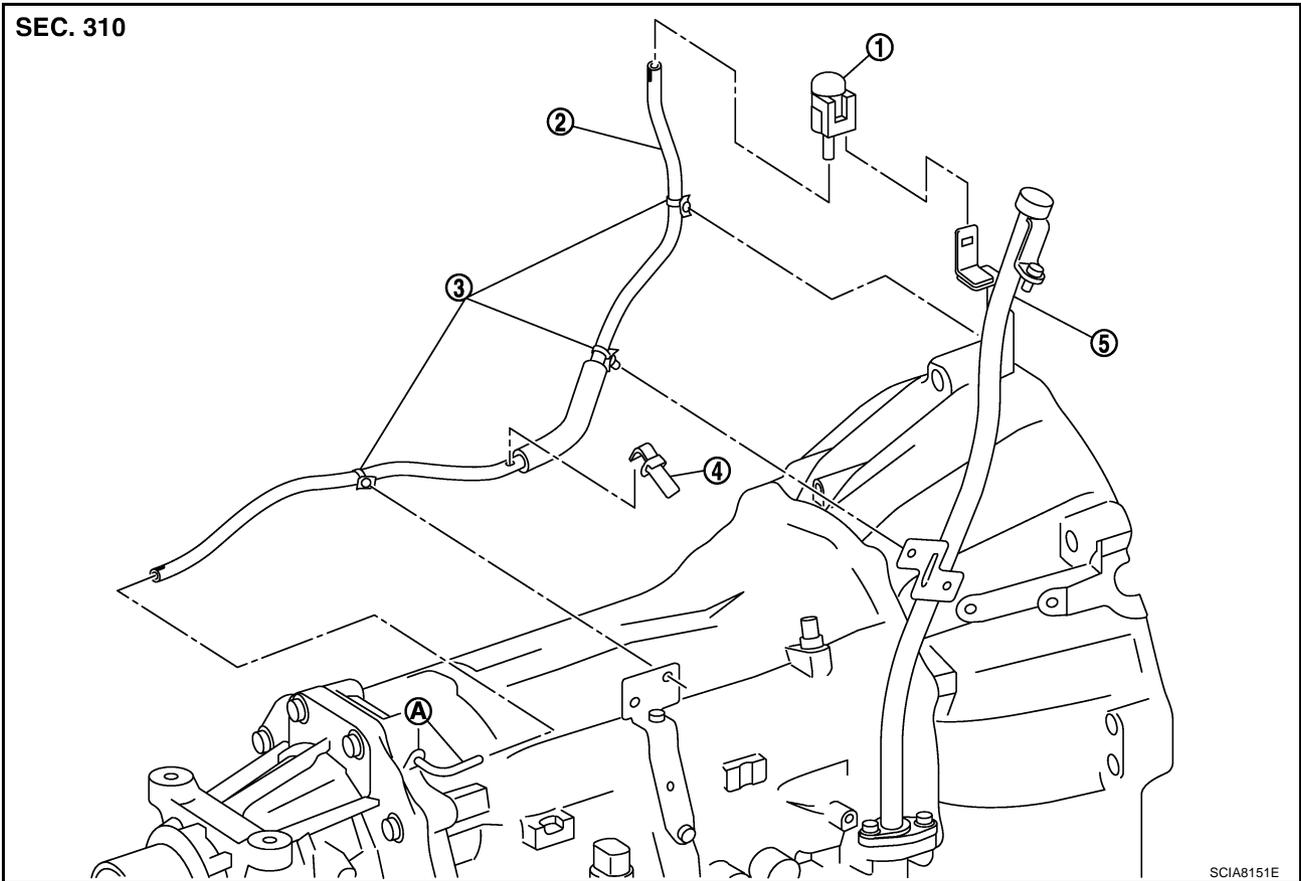
PFP:31098

## AIR BREATHER HOSE

### Removal and Installation

NCS00096

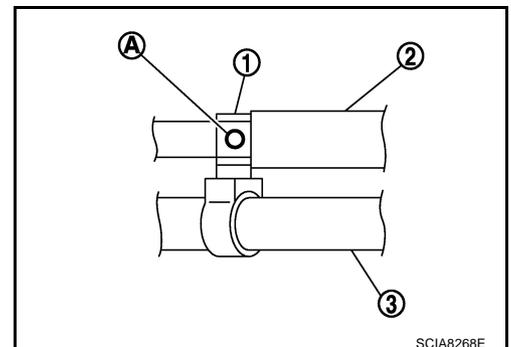
Refer to the figure below for air breather hose removal and installation procedure.



1. Air breather box
2. Air breather hose
3. Clip
4. Clip
5. A/T fluid charging pipe
- A. Air breather tube

#### CAUTION:

- When installing an air breather hose, do not to crush or block by folding or bending the hose.
- When inserting air breather hose to air breather tube, be sure to insert it fully until its end reaches the tube bend R portion.
- Install A/T air breather hose to air breather tube so that the paint mark is facing upward.
- Ensure clips are securely installed to brackets when installing A/T breather hose to brackets.
- When inserting air breather hose to air breather box, be sure to insert it fully until its end reaches the stop.
- Install A/T air breather hose to air breather box so that the paint mark is facing backward.
- Install clip (1) at the paint mark (A).
- Air breather hose (2)
- Harness (3)



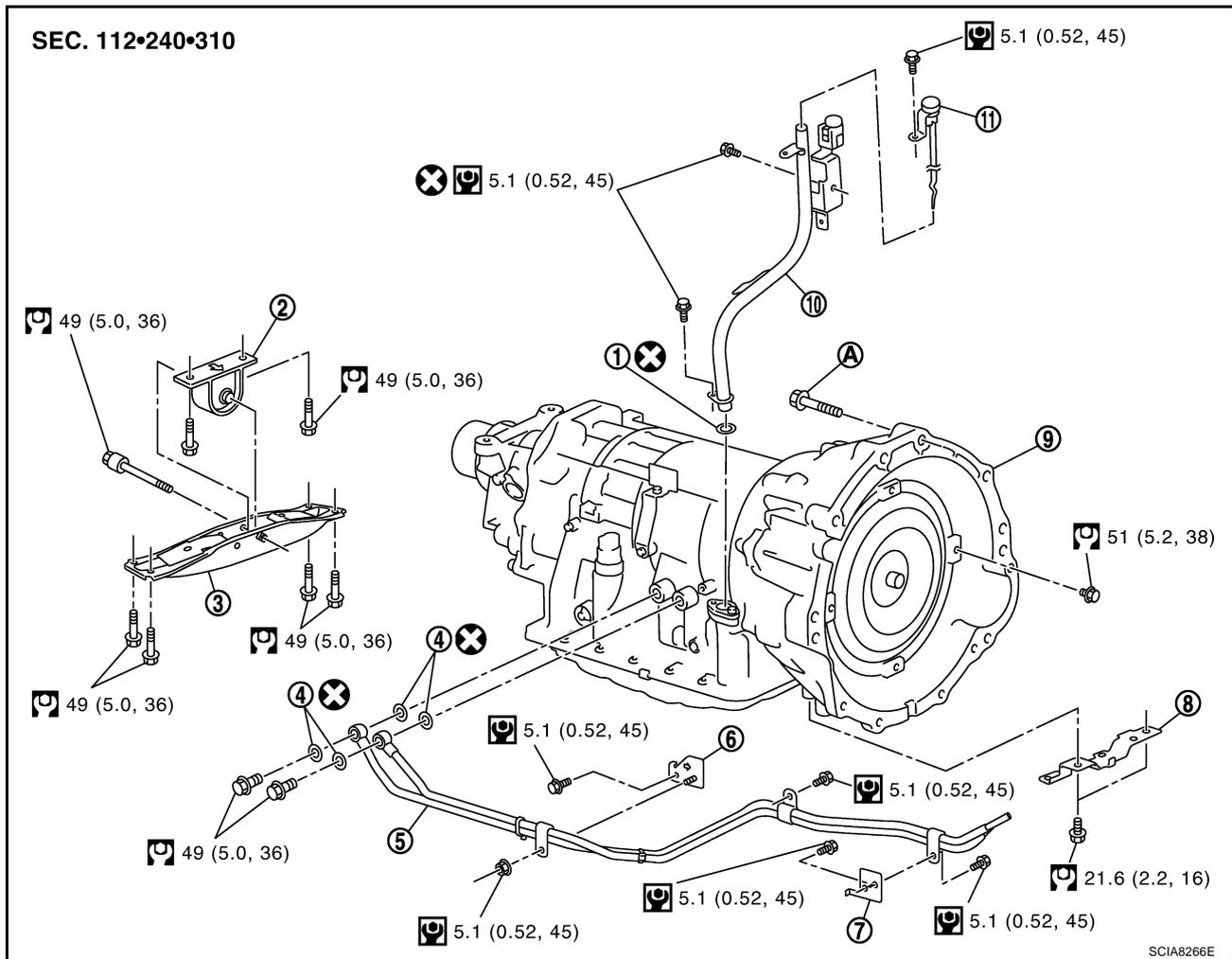
# TRANSMISSION ASSEMBLY

PFP:31020

## TRANSMISSION ASSEMBLY

### Removal and Installation

NCS00097



- |                             |                                     |                                |
|-----------------------------|-------------------------------------|--------------------------------|
| 1. O-ring                   | 2. Engine mounting insulator (rear) | 3. Rear engine mounting member |
| 4. Copper washer            | 5. Fluid cooler tube                | 6. Bracket                     |
| 7. Bracket                  | 8. Bracket                          | 9. A/T assembly                |
| 10. A/T fluid charging pipe | 11. A/T fluid level gauge           |                                |

A. For tightening torque, refer to [AT-244, "INSTALLATION"](#).

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to [GI-11, "Components"](#).

## REMOVAL

### CAUTION:

- When removing A/T assembly from engine assembly, first remove crankshaft position sensor (POS) from A/T assembly.
- Be careful not to damage sensor edge.

1. Disconnect the battery cable from the negative terminal.
2. Remove tower bar with power tool. Refer to [FSU-20, "Removal and Installation"](#).
3. Remove engine under covers with power tool.
4. Remove exhaust mounting bracket. Refer to [EX-3, "Removal and Installation"](#).

# TRANSMISSION ASSEMBLY

5. Disconnect heated oxygen sensor 2 harness connectors (A).

- ↶: Vehicle front

- ←: Bolt

6. Remove heated oxygen sensor 2 harness (B) from clips (1).

7. Remove bracket (2) from transmission assembly.

8. Remove front cross bar with power tool. Refer to [FSU-8, "Components"](#).

9. Remove exhaust front tube and center muffler with power tool. Refer to [EX-3, "Removal and Installation"](#).

10. Remove three way catalyst (right bank) and three way catalyst (left bank). Refer to [EM-22, "Removal and Installation"](#).

11. Remove crankshaft position sensor (POS) (1). Refer to [EM-26, "Removal and Installation"](#).

- Three way catalyst (right bank) (2)

**CAUTION:**

- Do not subject it to impact by dropping or hitting it.

- Do not disassemble.

- Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.

- Do not place in an area affected by magnetism.

12. Remove rear propeller shaft. Refer to [PR-6, "Removal and Installation"](#).

**CAUTION:**

**Do not impact, or damage propeller shaft tube.**

13. Remove control rod. Refer to [AT-205, "Control Rod Removal and Installation"](#).

14. Disconnect the following:

- A/T assembly harness connector

- S terminal connector (A)

- EPS solenoid valve harness connector (B)

15. Remove starter motor with power tool. Refer to [SC-17, "Removal and Installation"](#).

16. Remove A/T fluid level gauge.

17. Remove A/T fluid charging pipe

18. Remove O-ring from A/T fluid charging pipe.

19. Remove fluid cooler tube according to the following procedure.

a. Remove mounting nuts of the engine mounting insulator (LH) and engine mounting insulator (RH) on the undersurface of the vehicle. Refer to [EM-101, "Removal and Installation"](#).

b. Push engine assembly upward from the vehicle with transmission jack to create clearance for removing fluid cooler tube.

**CAUTION:**

**Be careful with hoses and harness when pushing up the engine assembly.**

c. Remove fluid cooler tube.

20. Plug up openings such as A/T fluid charging pipe hole, etc.

21. Remove rear plate cover from converter housing. Refer to [EM-26, "Removal and Installation"](#).

22. Turn crankshaft, and remove the four tightening bolts for drive plate and torque converter.

**CAUTION:**

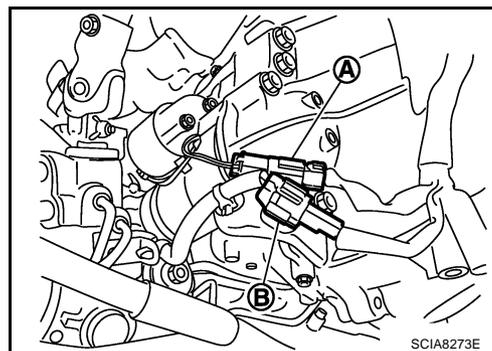
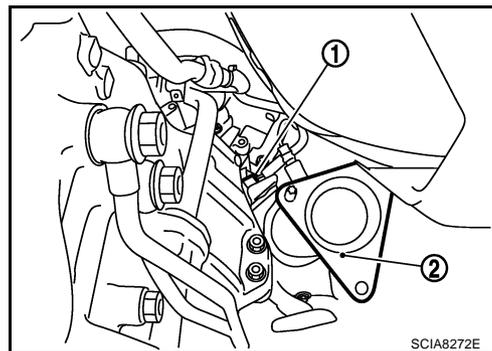
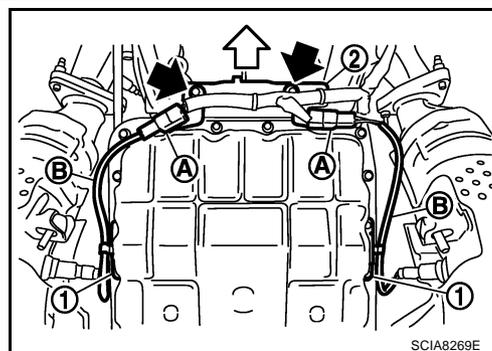
**When turning crankshaft, turn it clockwise as viewed from the front of the engine.**

23. Support A/T assembly with a transmission jack.

**CAUTION:**

**When setting the transmission jack, be careful not to allow it to collide against the drain plug.**

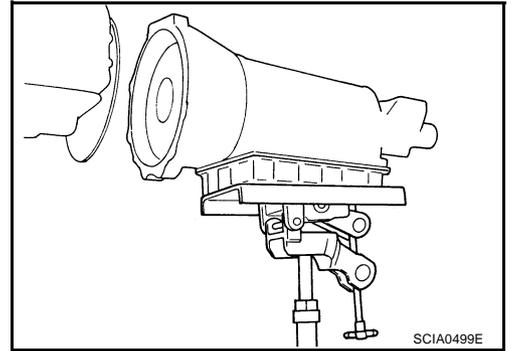
24. Remove rear engine mounting member with power tool. Refer to [AT-242, "Removal and Installation"](#).



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# TRANSMISSION ASSEMBLY

25. Remove engine mounting insulator (rear) with power tool. Refer to [AT-242, "Removal and Installation"](#) .
26. Remove bolts fixing A/T assembly to engine assembly with power tool.
27. Remove A/T assembly from vehicle with a transmission jack.
  - **Secure torque converter to prevent it from dropping.**
  - **Secure A/T assembly to a transmission jack.**
28. Remove air breather hose. Refer to [AT-241, "Removal and Installation"](#) .

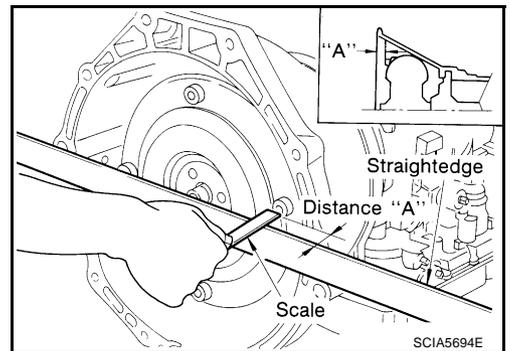


## INSPECTION

### Installation and Inspection of Torque Converter

- After inserting a torque converter to a A/T, be sure to check distance "A" to ensure it is within the reference value limit.

**Distance "A": 25.0 mm (0.98 in) or more**

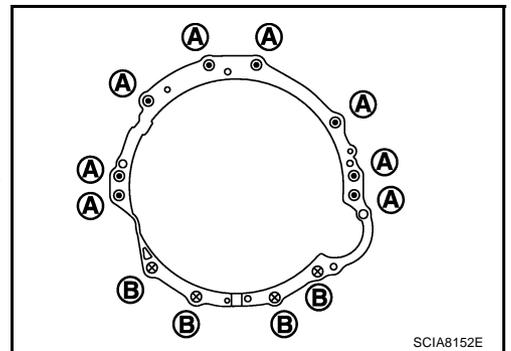


## INSTALLATION

Install the removed parts in the reverse order of the removal, while paying attention to the following work.

- When installing A/T assembly to the engine assembly, attach the fixing bolts in accordance with the following standard.
  - ⊗: Engine to transmission
  - ⊙: Transmission to engine

Bolt symbol	A	B
Number of bolts	8	4
Bolt length mm (in)	65 (2.56)	35 (1.38)
Tightening torque N·m (kg·m, ft·lb)	75 (7.7, 55)	46.6 (4.8, 34)

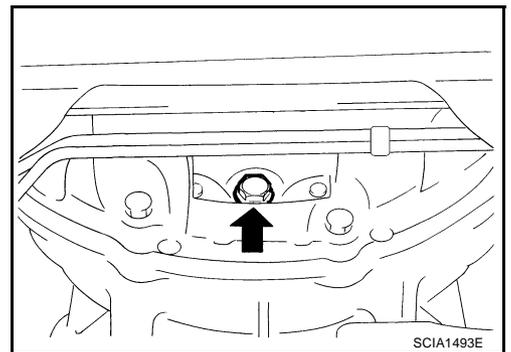


- Align the positions of tightening bolts for drive plate with those of the torque converter, and temporarily tighten the bolts. Then tighten the bolts with the specified torque.

 : **51 N·m (5.2 kg·m, 38 ft·lb)**

### CAUTION:

- **When turning crankshaft, turn it clockwise as viewed from the front of the engine.**
- **When tightening the tightening bolts for torque converter after fixing crankshaft pulley bolts, be sure to confirm the tightening torque of crankshaft pulley mounting bolts. Refer to [EM-53, "TIMING CHAIN"](#) .**
- **After converter is installed to drive plate, rotate crankshaft several turns and check to be sure that transmission rotates freely without binding.**
- Install crankshaft position sensor (POS). Refer to [EM-26, "Removal and Installation"](#) .



# TRANSMISSION ASSEMBLY

- 
- After completing installation, check A/T fluid leakage, A/T fluid level and A/T position. Refer to [AT-12](#), ["Checking A/T Fluid"](#), [AT-206](#), ["Checking of A/T Position"](#).

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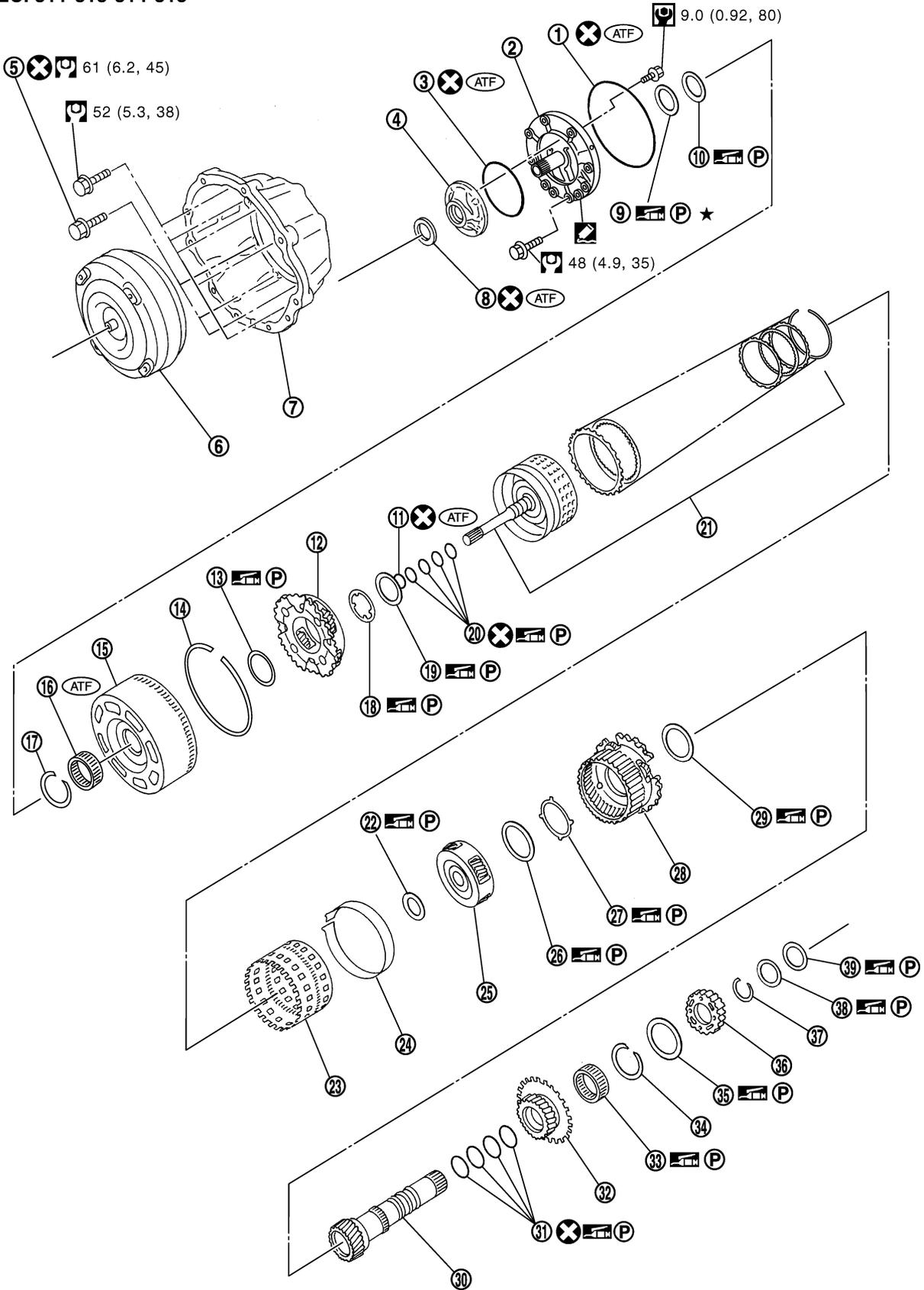
# OVERHAUL

## OVERHAUL Components

PF0:0000

NCS00098

### SEC. 311•313•314•315



SCIA7983E

# OVERHAUL

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- |                           |                              |                                     |
|---------------------------|------------------------------|-------------------------------------|
| 1. O-ring                 | 2. Oil pump cover            | 3. O-ring                           |
| 4. Oil pump housing       | 5. Self-sealing bolt         | 6. Torque converter                 |
| 7. Converter housing      | 8. Oil pump housing oil seal | 9. Bearing race                     |
| 10. Needle bearing        | 11. O-ring                   | 12. Front carrier assembly          |
| 13. Needle bearing        | 14. Snap ring                | 15. Front sun gear                  |
| 16. 3rd one-way clutch    | 17. Snap ring                | 18. Bearing race                    |
| 19. Needle bearing        | 20. Seal ring                | 21. Input clutch assembly           |
| 22. Needle bearing        | 23. Rear internal gear       | 24. Brake band                      |
| 25. Mid carrier assembly  | 26. Needle bearing           | 27. Bearing race                    |
| 28. Rear carrier assembly | 29. Needle bearing           | 30. Mid sun gear                    |
| 31. Seal ring             | 32. Rear sun gear            | 33. 1st one-way clutch              |
| 34. Snap ring             | 35. Needle bearing           | 36. High and low reverse clutch hub |
| 37. Snap ring             | 38. Bearing race             | 39. Needle bearing                  |

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to [GI-11, "Components"](#) .

However, refer to the following for others.

 : Apply Genuine RTV silicone sealant or equivalent. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .

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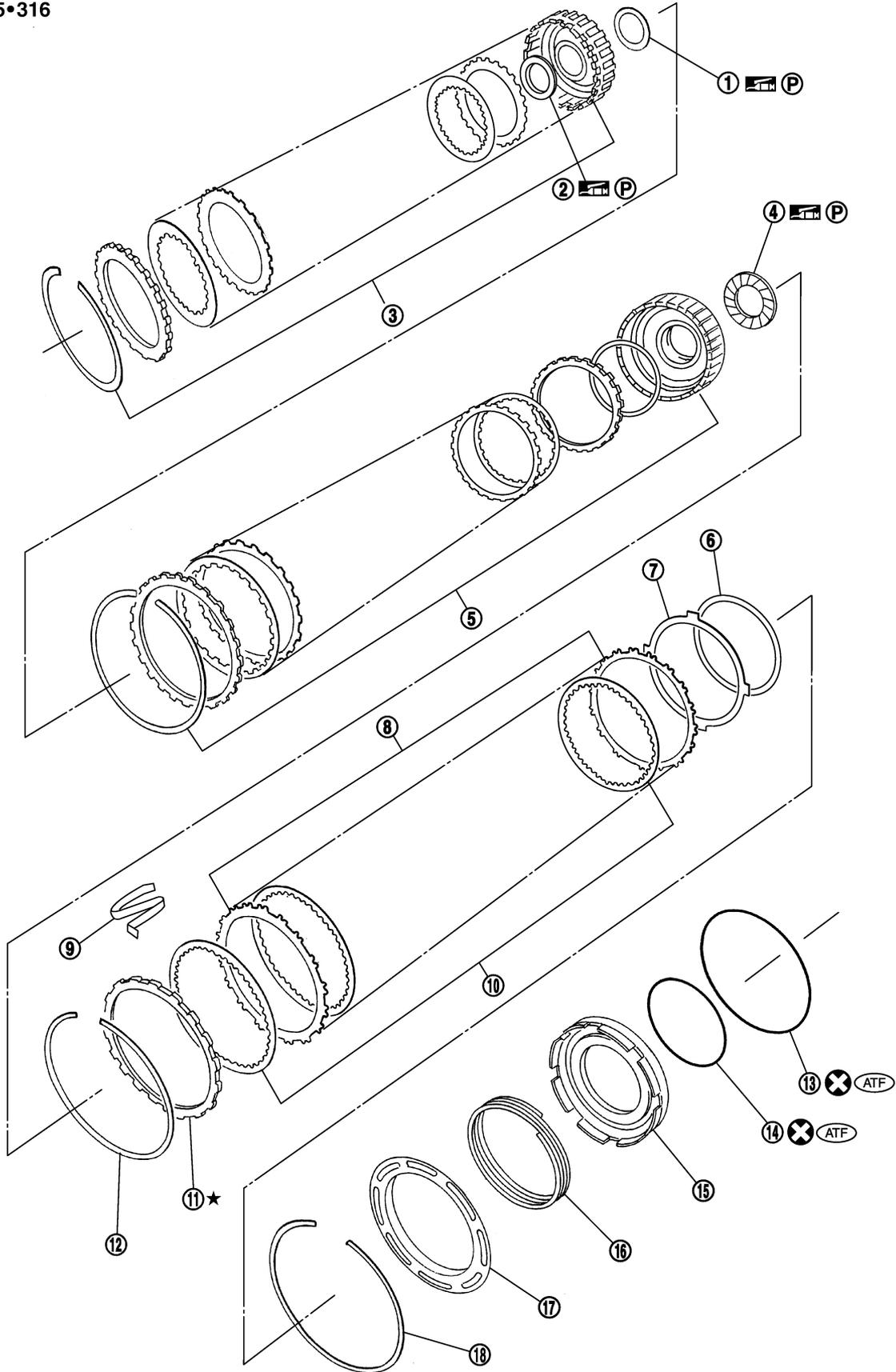
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# OVERHAUL

SEC.315•316



SCIA8377E

- |                             |                               |   |
|-----------------------------|-------------------------------|---|
| 1. Needle bearing           | 2. Bearing race               | 3. High and low reverse clutch assembly |
| 4. Needle bearing           | 5. Direct clutch assembly     | 6. Reverse brake dish plate             |
| 7. Reverse brake dish plate | 8. Reverse brake driven plate | 9. N-spring                             |

# OVERHAUL

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|-------------------------------|-----------------------------------|--------------------------|
| 10. Reverse brake drive plate | 11. Reverse brake retaining plate | 12. Snap ring            |
| 13. D-ring                    | 14. D-ring                        | 15. Reverse brake piston |
| 16. Return spring             | 17. Spring retainer               | 18. Snap ring            |

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to [GI-11, "Components"](#).

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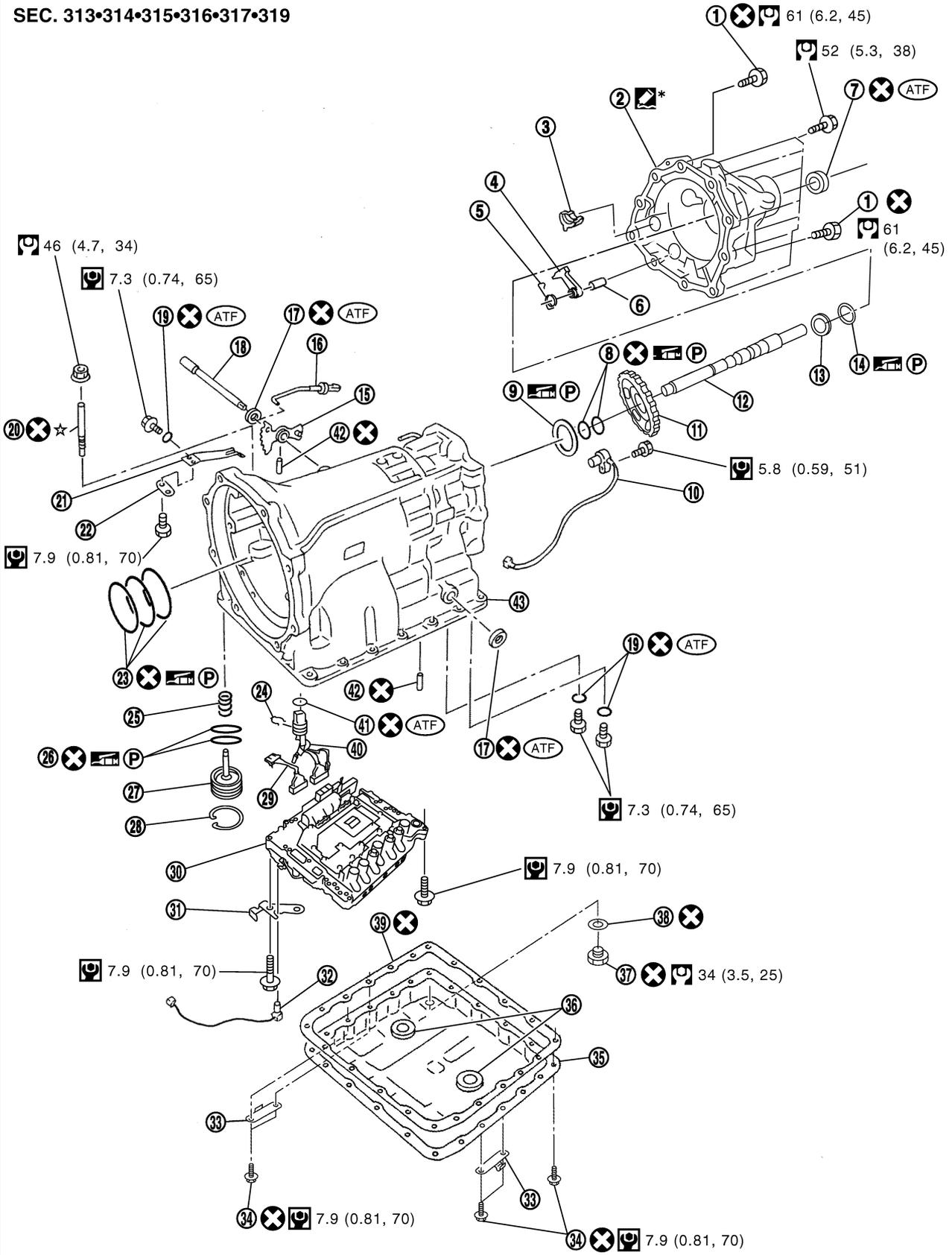
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# OVERHAUL

SEC. 313•314•315•316•317•319



SCIA8110E

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|----------------------|-------------------|-----------------------------|
| 1. Self-sealing bolt | 2. Rear extension | 3. Parking actuator support |
| 4. Parking pawl      | 5. Return spring  | 6. Pawl shaft               |
| 7. Rear oil seal     | 8. Seal ring      | 9. Needle bearing           |

# OVERHAUL

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- |                            |                                    |                            |
|----------------------------|------------------------------------|----------------------------|
| 10. Revolution sensor      | 11. Parking gear                   | 12. Output shaft           |
| 13. Bearing race           | 14. Needle bearing                 | 15. Manual plate           |
| 16. Parking rod            | 17. Manual shaft oil seal          | 18. Manual shaft           |
| 19. O-ring                 | 20. Band servo anchor end pin      | 21. Detent spring          |
| 22. Spacer                 | 23. Seal ring                      | 24. Snap ring              |
| 25. Return spring          | 26. O-ring                         | 27. Servo assembly         |
| 28. Snap ring              | 29. Sub-harness                    | 30. Control valve with TCM |
| 31. Bracket                | 32. A/T fluid temperature sensor 2 | 33. Clip                   |
| 34. Oil pan mounting bolt  | 35. Oil pan                        | 36. Magnet                 |
| 37. Drain plug             | 38. Drain plug gasket              | 39. Oil pan gasket         |
| 40. Terminal cord assembly | 41. O-ring                         | 42. Retaining pin          |
| 43. Transmission case      |                                    |                            |

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to [GI-11, "Components"](#) .

However, refer to the following for others.

 : Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .

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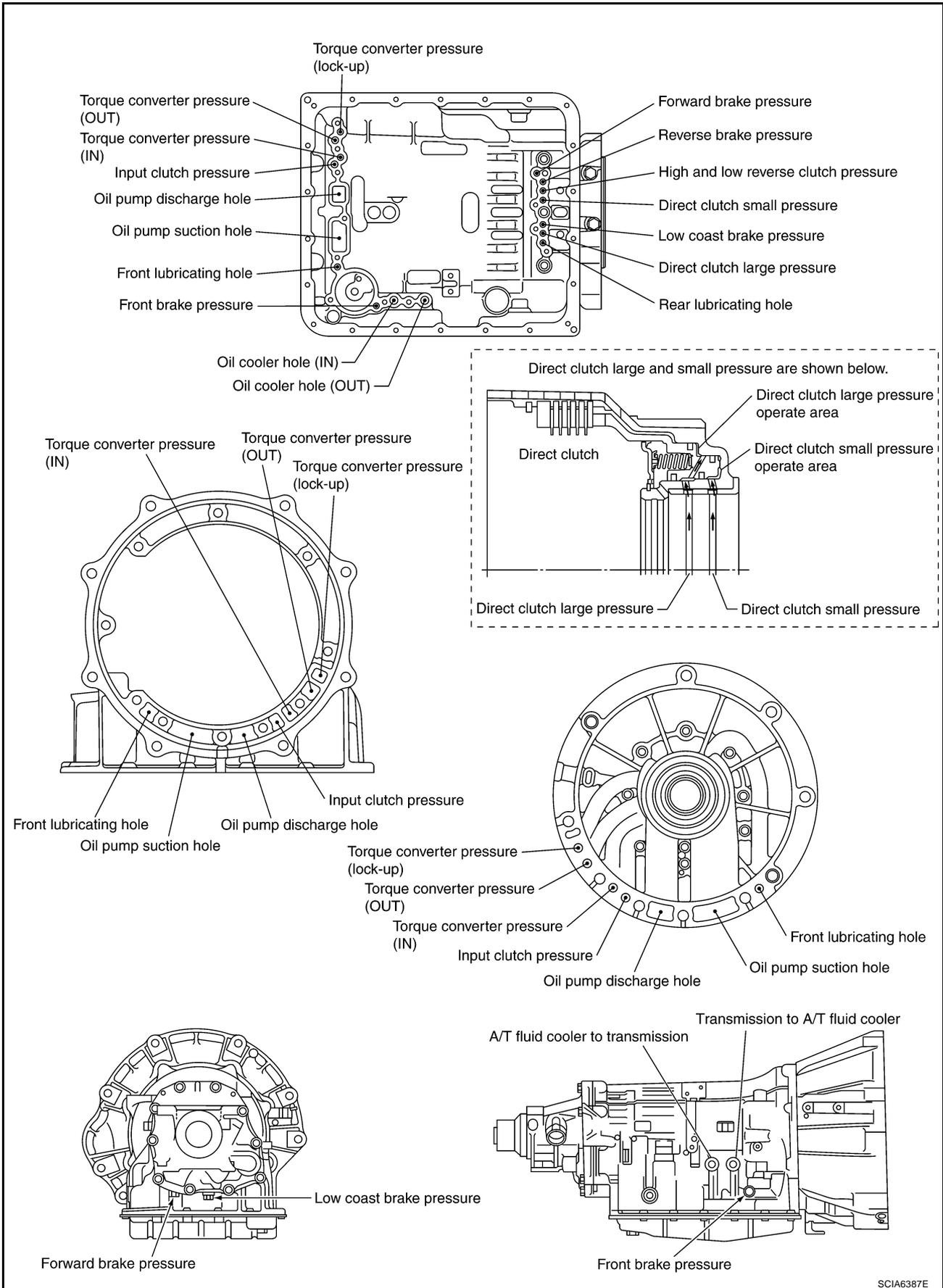
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# OVERHAUL

## Oil Channel

NCS00099

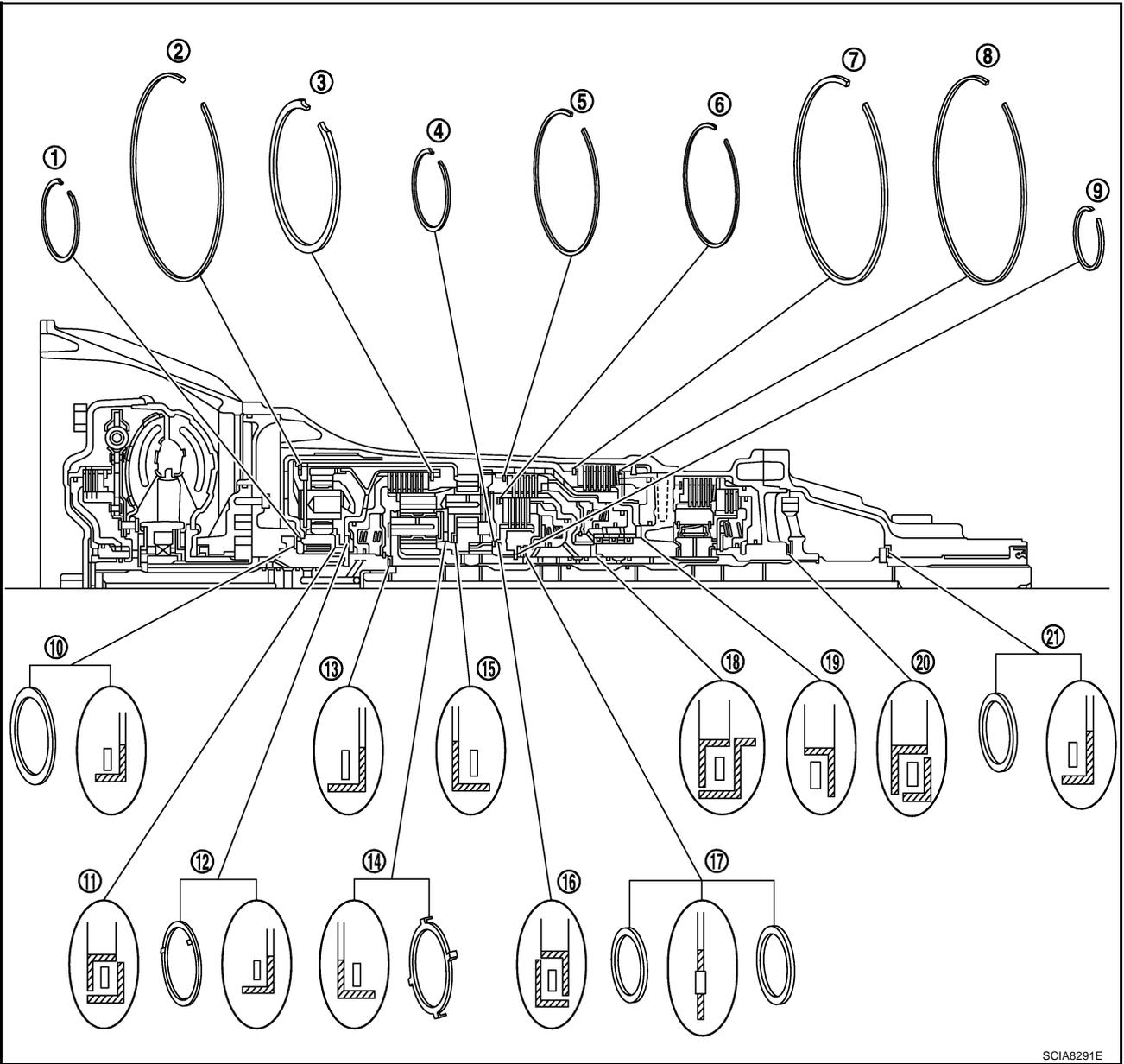


SCIA6387E

# OVERHAUL

## Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

NCS0009A



SCIA8291E

Snap ring		Needle bearing	
Item number	Outer diameter mm (in)	Item number	Outer diameter mm (in)
1	67.5 (2.657)	10	80 (3.15)
2	182.4 (7.181)	11	77 (3.03)
3	171.5 (6.751)	12	77 (3.03)
4	70.5 (2.775)	13	47 (1.85)
5	169 (6.653)	14	84 (3.31)
6	134.3 (5.287)	15	84 (3.31)
7	180.5 (7.106)	16	92 (3.62)
8	181 (7.125)	17	60 (2.36)
9	48.4 (1.905)	18	63 (2.48)
—	—	19	92 (3.62)

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# OVERHAUL

Snap ring			Needle bearing		
Item number	Outer diameter	mm (in)	Item number	Outer diameter	mm (in)
—	—		20	65	(2.56)
—	—		21	60	(2.36)

## DISASSEMBLY

PF3:31020

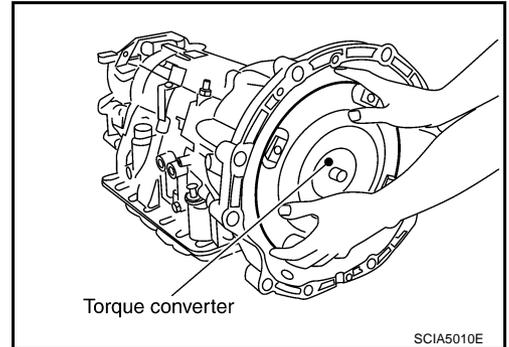
### Disassembly

NCS0009B

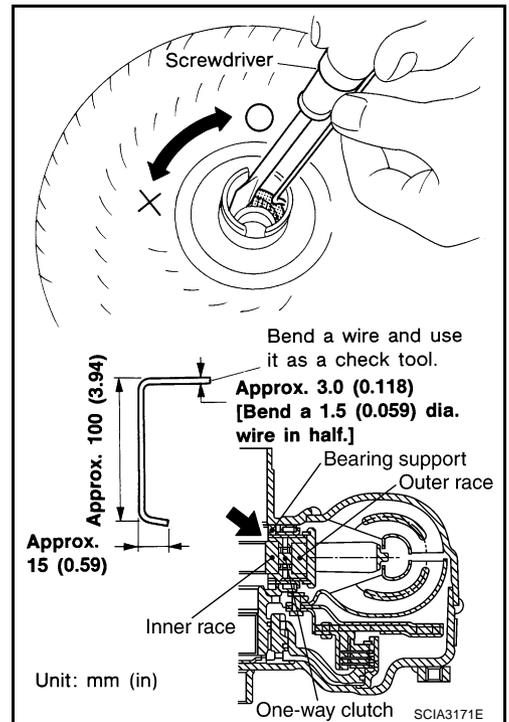
**CAUTION:**

Do not disassemble parts behind Drum Support. Refer to [AT-17, "Cross-sectional View"](#) .

1. Drain ATF through drain hole.
2. Remove torque converter by holding it firmly and turing while pulling straight out.



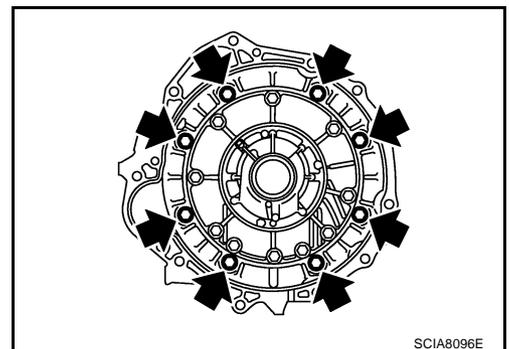
3. Check torque converter one-way clutch using check tool as shown at figure.
  - a. Insert check tool into the groove of bearing support built into one-way clutch outer race.
  - b. When fixing bearing support with check tool, rotate one-way clutch spline using screwdriver.
  - c. Check that inner race rotates clockwise only. If not, replace torque converter assembly.



4. Remove tightening bolts (⬅) for converter housing and transmission case.
5. Remove converter housing from transmission case.

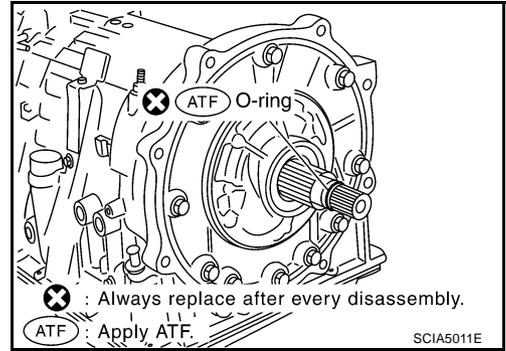
**CAUTION:**

Be careful not to scratch converter housing.

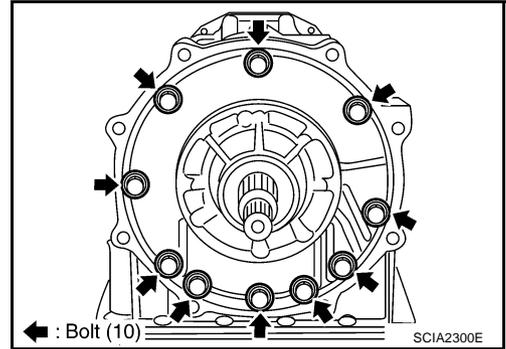


# DISASSEMBLY

6. Remove O-ring from input clutch assembly.



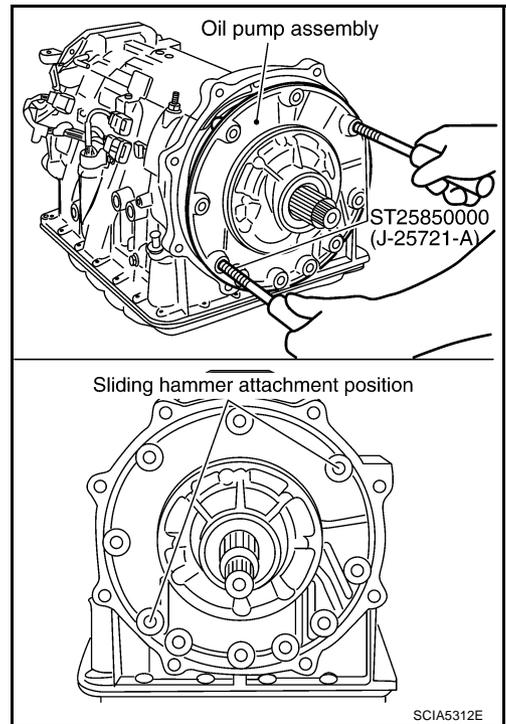
7. Remove tightening bolts for oil pump assembly and transmission case.



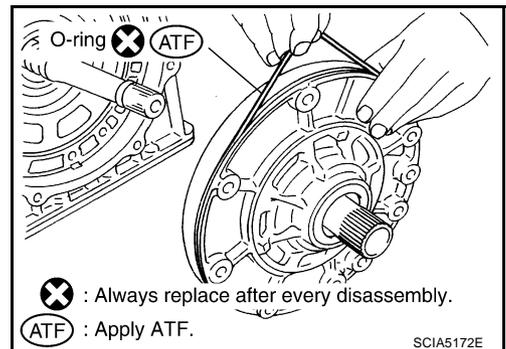
8. Attach the sliding hammers to oil pump assembly and extract it evenly from transmission case.

**CAUTION:**

- Fully tighten sliding hammer screw.
- Make sure that bearing race is installed to the oil pump assembly edge surface.

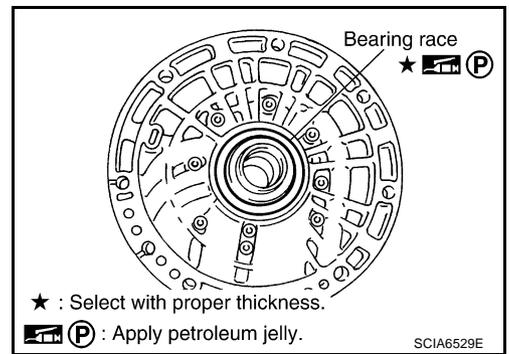


9. Remove O-ring from oil pump assembly.

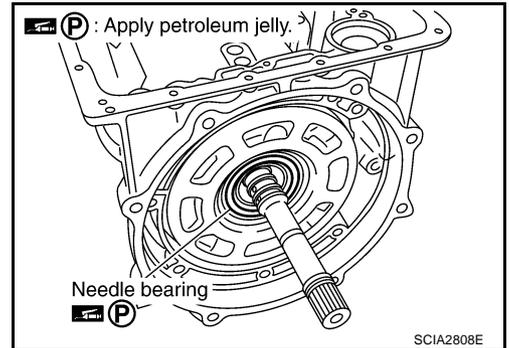


# DISASSEMBLY

10. Remove bearing race from oil pump assembly.



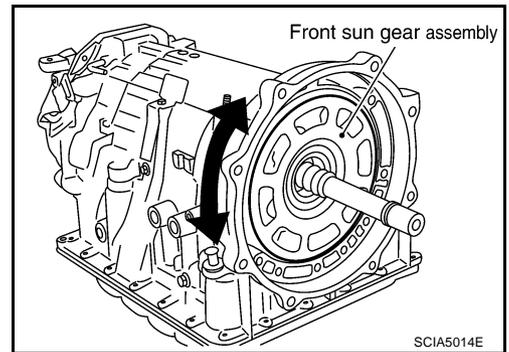
11. Remove needle bearing from front sun gear.



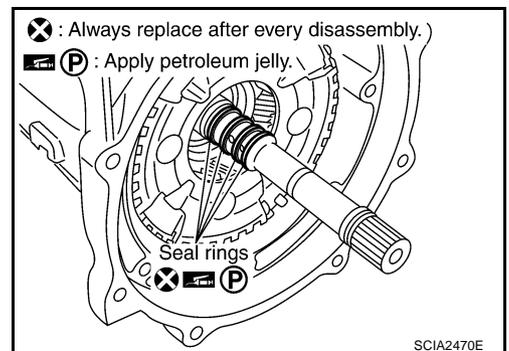
12. Remove front sun gear assembly from front carrier assembly.

**NOTE:**

Remove front sun gear by rotating left/right.



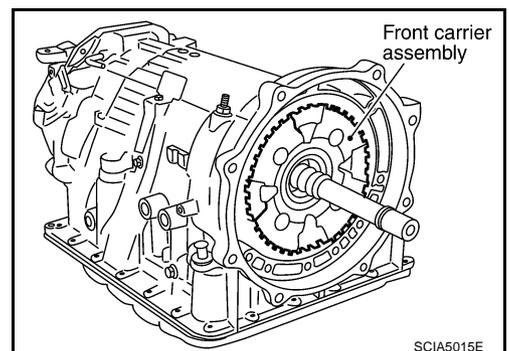
13. Remove seal rings from input clutch assembly.



14. Remove front carrier assembly from rear carrier assembly. (With input clutch assembly and rear internal gear.)

**CAUTION:**

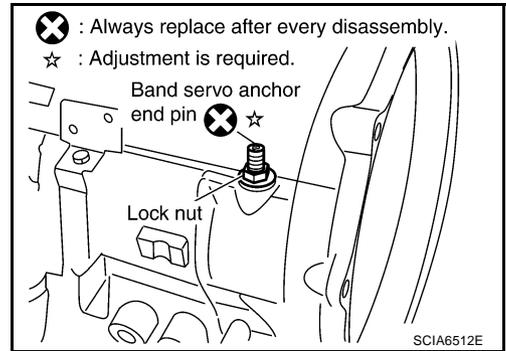
Be careful to remove it with needle bearing.



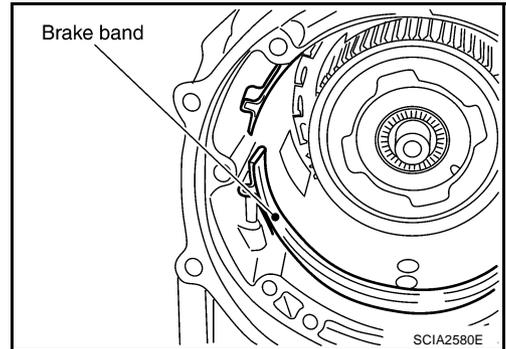
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## DISASSEMBLY

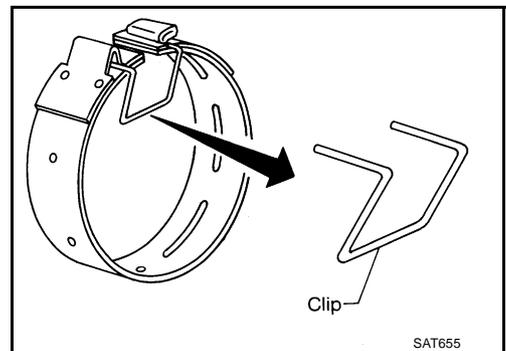
15. Loosen lock nut and remove band servo anchor end pin from transmission case.



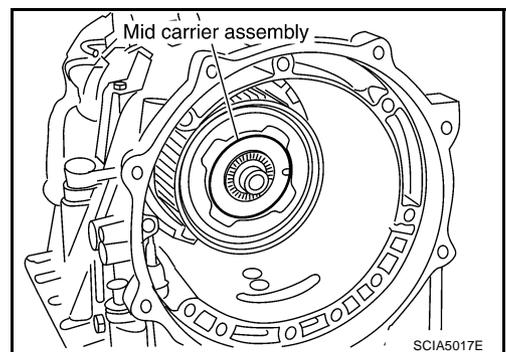
16. Remove brake band from transmission case.



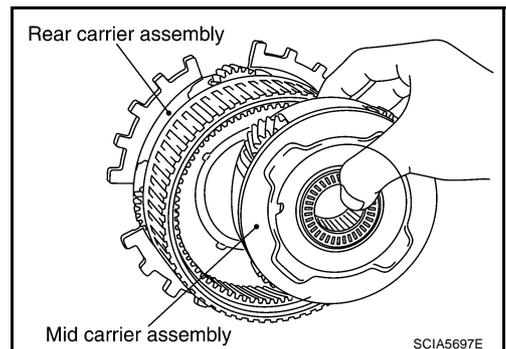
- To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown in the figure at right. Leave the clip in position after removing the brake band.
- Check brake band facing for damage, cracks, wear or burns.



17. Remove mid carrier assembly and rear carrier assembly as a unit.

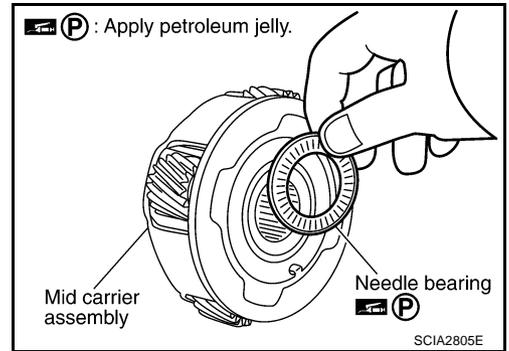


18. Remove mid carrier assembly from rear carrier assembly.

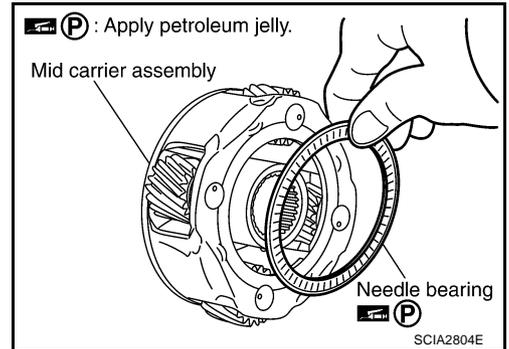


# DISASSEMBLY

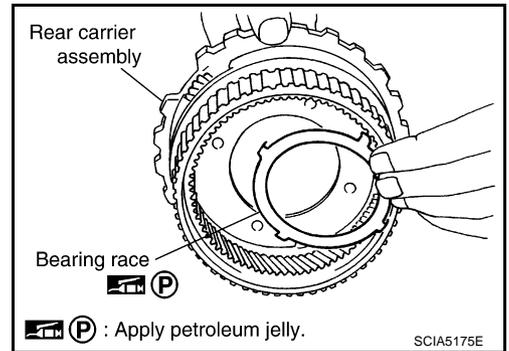
19. Remove needle bearing (front side) from mid carrier assembly.



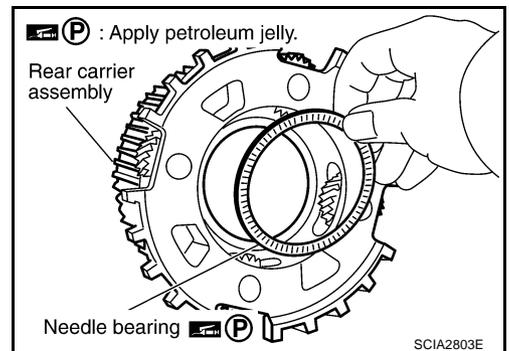
20. Remove needle bearing (rear side) from mid carrier assembly.



21. Remove bearing race from rear carrier assembly.



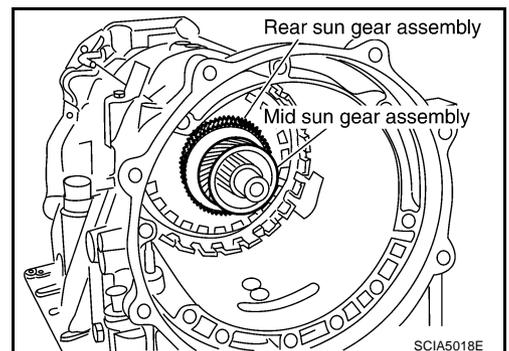
22. Remove needle bearing from rear carrier assembly.



23. Remove mid sun gear assembly, rear sun gear assembly and high and low reverse clutch hub as a unit.

**CAUTION:**

**Be careful to remove them with bearing race and needle bearing.**



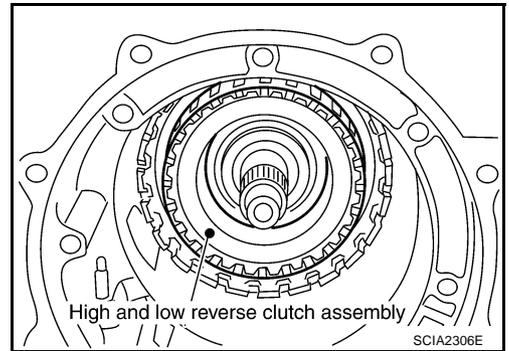
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## DISASSEMBLY

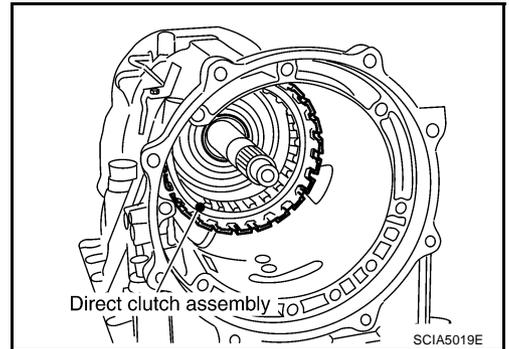
24. Remove high and low reverse clutch assembly from direct clutch assembly.

**CAUTION:**

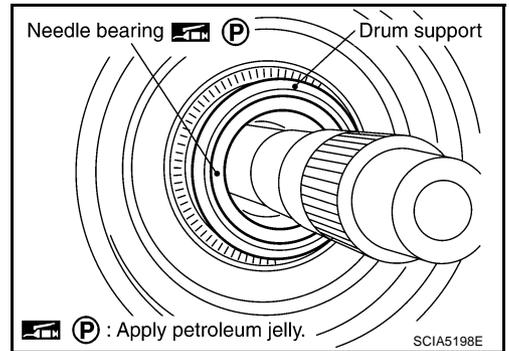
Make sure that needle bearing is installed to high and low reverse clutch assembly edge surface.



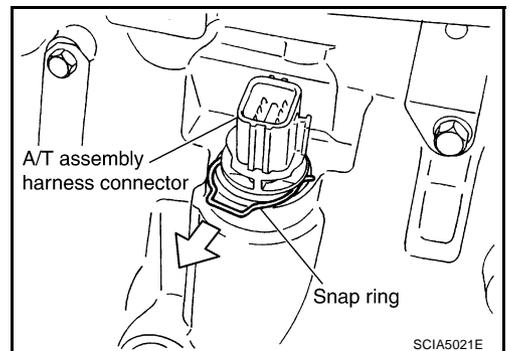
25. Remove direct clutch assembly from reverse brake.



26. Remove needle bearing from drum support.



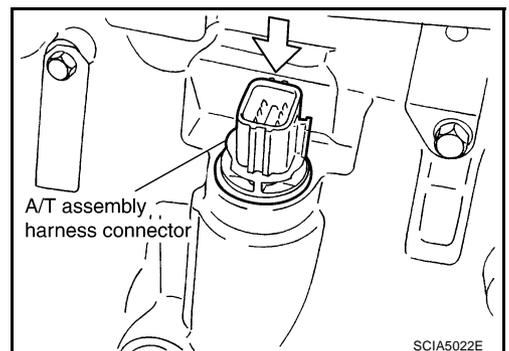
27. Remove snap ring from A/T assembly harness connector.



28. Push A/T assembly harness connector.

**CAUTION:**

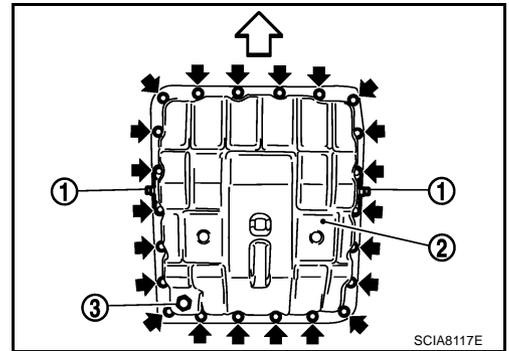
Be careful not to damage connector.



# DISASSEMBLY

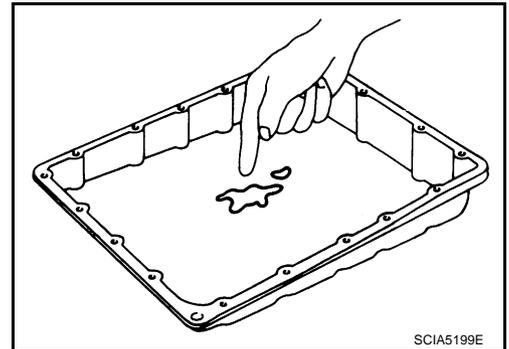
29. Remove clips (1), oil pan (2) and oil pan gasket.

- ↔: Front
- ←: Oil pan mounting bolt
- ○: Drain bolt (3)

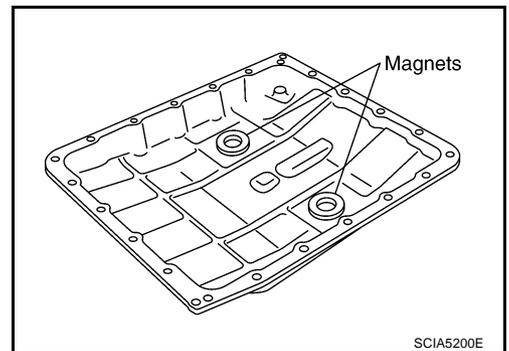


30. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.

- If frictional material is detected, perform A/T fluid cooler cleaning. Refer to [AT-14, "A/T Fluid Cooler Cleaning"](#).



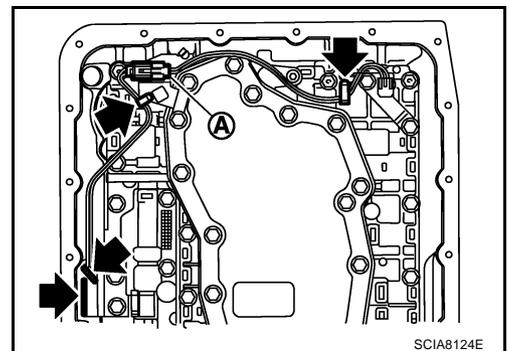
31. Remove magnets from oil pan.



32. Disconnect A/T fluid temperature sensor 2 connector (A).

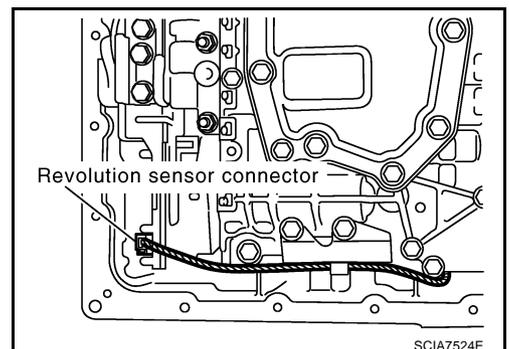
- CAUTION:**  
Be careful not to damage connector.

33. Straighten terminal clips (←) to free terminal cord assembly and A/T fluid temperature sensor 2 harness.



34. Disconnect revolution sensor connector.

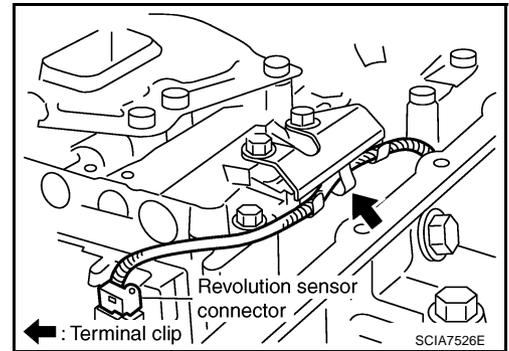
- CAUTION:**  
Be careful not to damage connector.



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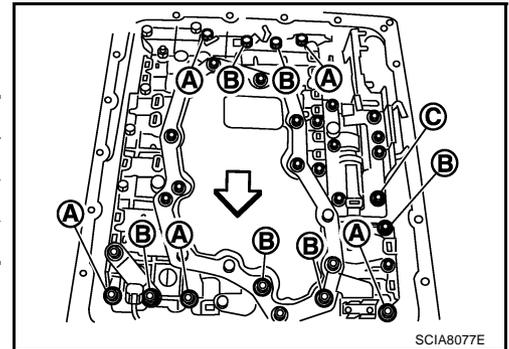
35. Straighten terminal clip to free revolution sensor harness.



36. Remove bolts (A), (B) and (C) from control valve with TCM.

● ←: Front

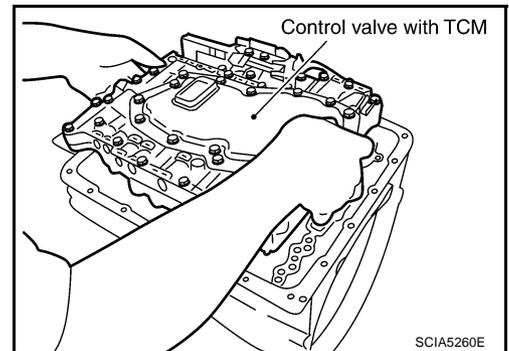
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



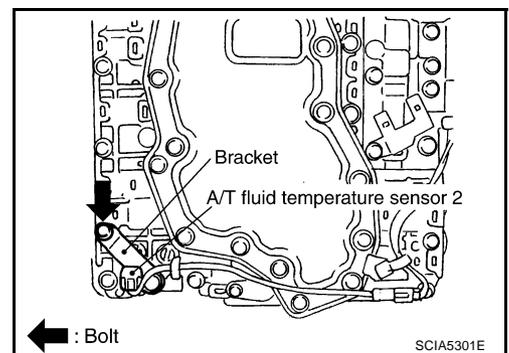
37. Remove control valve with TCM from transmission case.

**CAUTION:**

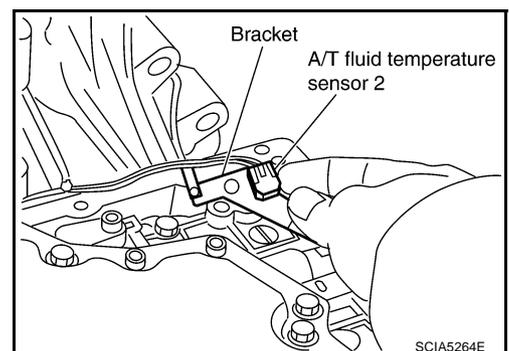
**When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.**



38. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.

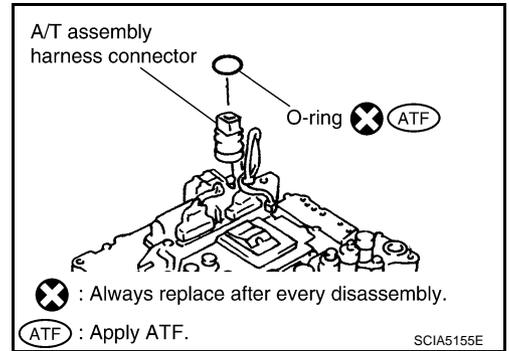


39. Remove bracket from A/T fluid temperature sensor 2.



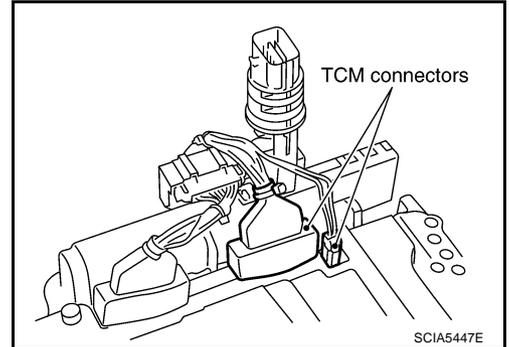
# DISASSEMBLY

40. Remove O-ring from A/T assembly harness connector.

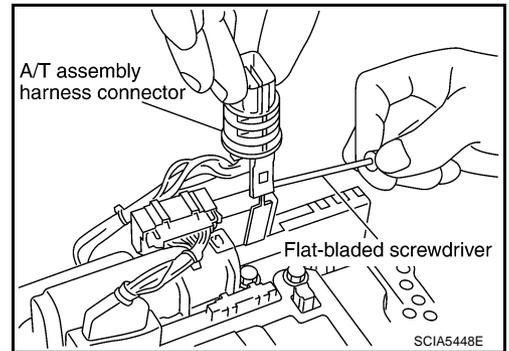


41. Disconnect TCM connectors.

**CAUTION:**  
Be careful not to damage connectors.

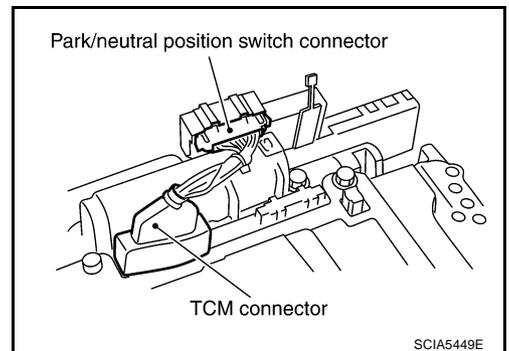


42. Remove A/T assembly harness connector from control valve with TCM using a flat-bladed screwdriver.

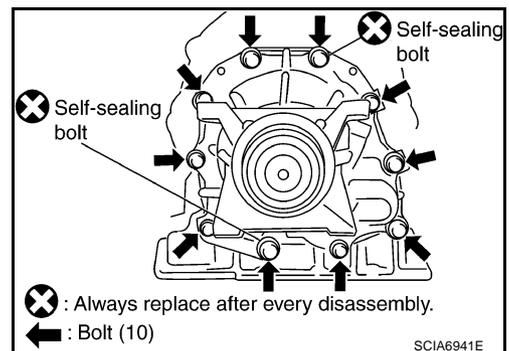


43. Disconnect TCM connector and park/neutral position switch connector.

**CAUTION:**  
Be careful not to damage connectors.



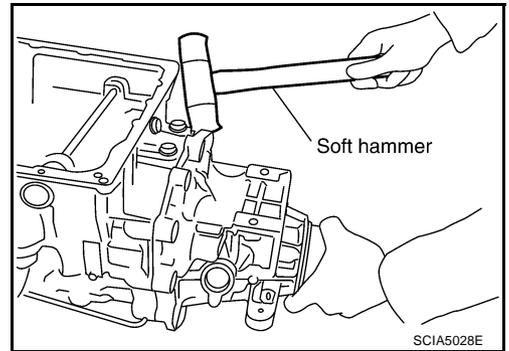
44. Remove tightening bolts for rear extension assembly and transmission case.



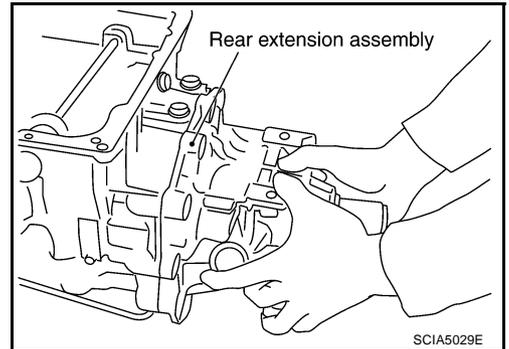
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# DISASSEMBLY

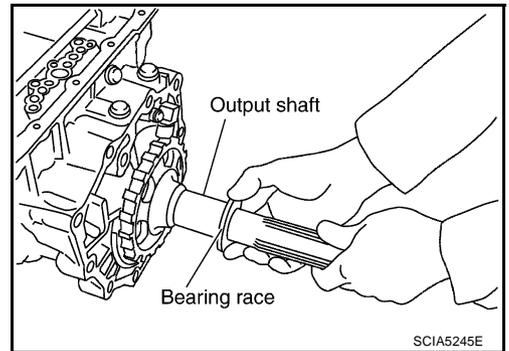
45. Tap rear extension assembly with soft hammer.



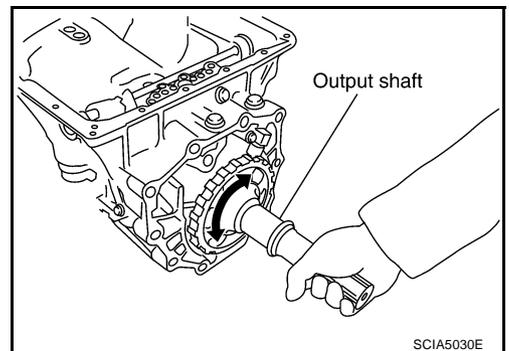
46. Remove rear extension assembly from transmission case. (With needle bearing)



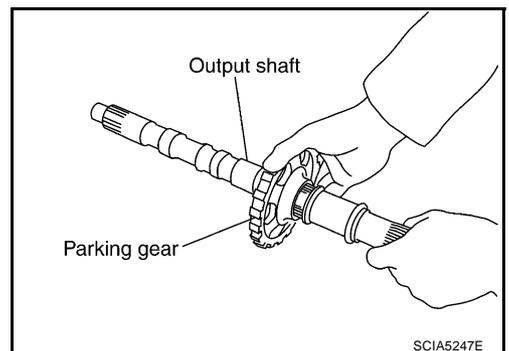
47. Remove bearing race from output shaft.



48. Remove output shaft from transmission case by rotating left/right.

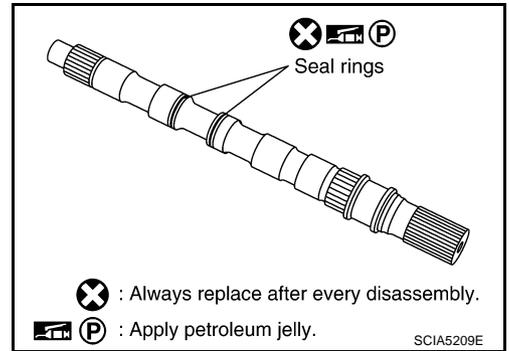


49. Remove parking gear from output shaft.

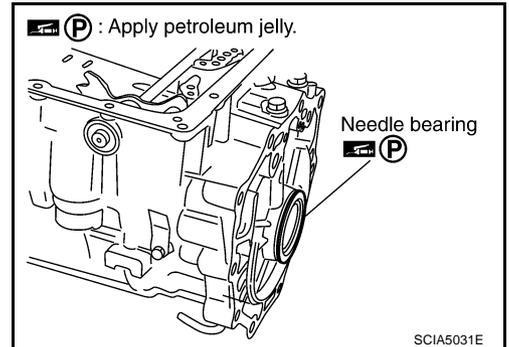


# DISASSEMBLY

50. Remove seal rings from output shaft.



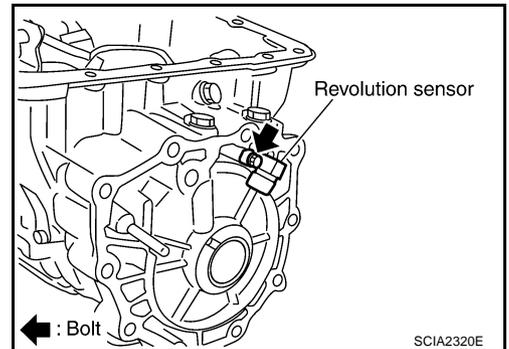
51. Remove needle bearing from transmission case.



52. Remove revolution sensor from transmission case.

**CAUTION:**

- Do not subject it to impact by dropping or hitting it.
- Do not disassemble.
- Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.
- Do not place in an area affected by magnetism.



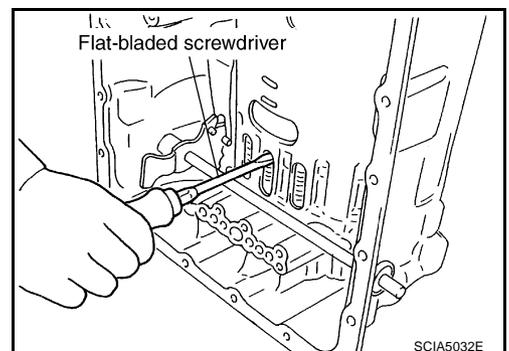
53. Remove reverse brake snap ring (fixing plate) using 2 flat-bladed screwdrivers.

**NOTE:**

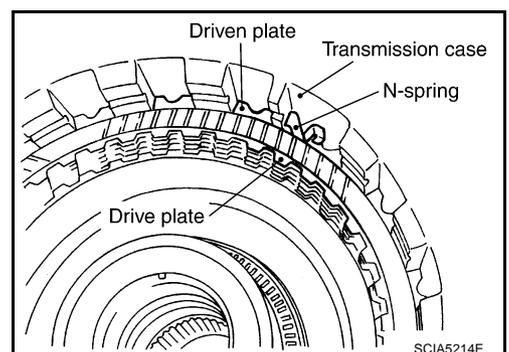
Press out snap ring from transmission case oil pan side gap using a flat-bladed screwdriver, and remove it using another screwdriver.

54. Remove reverse brake retaining plate from transmission case.

- Check facing for burns, cracks or damage. If necessary, replace the plate.



55. Remove N-spring from transmission case.



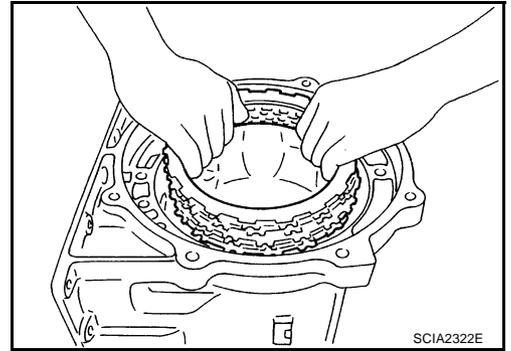
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# DISASSEMBLY

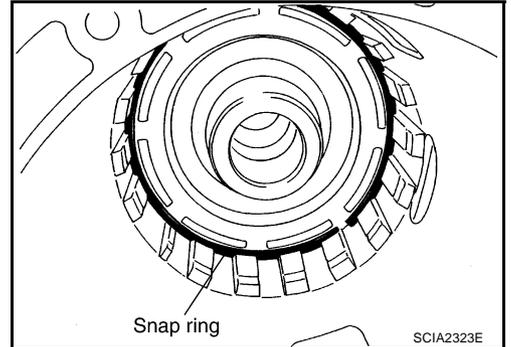
56. Remove reverse brake drive plates, driven plates and dish plates from transmission case.

**CAUTION:**

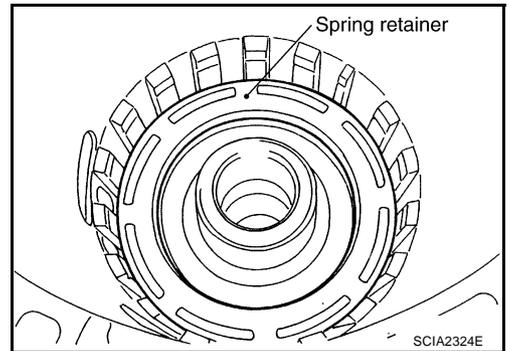
**Be careful to remove it with N-spring.**



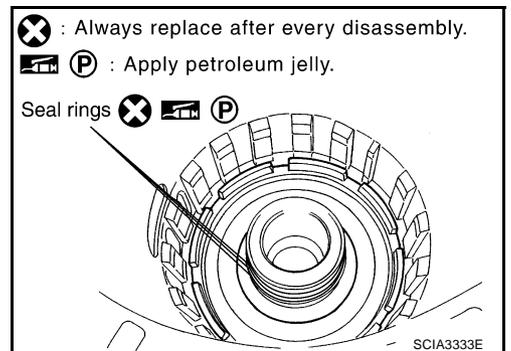
57. Remove snap ring (fixing spring retainer) using a flat-bladed screwdriver.



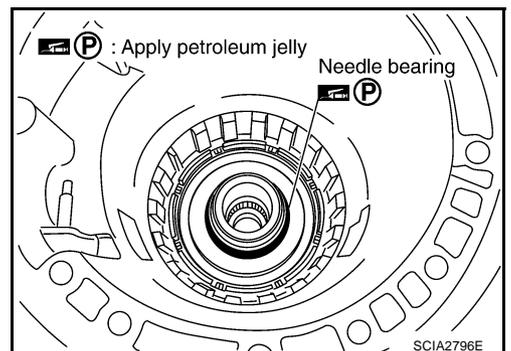
58. Remove spring retainer and return spring from transmission case.



59. Remove seal rings from drum support.



60. Remove needle bearing from drum support edge surface.

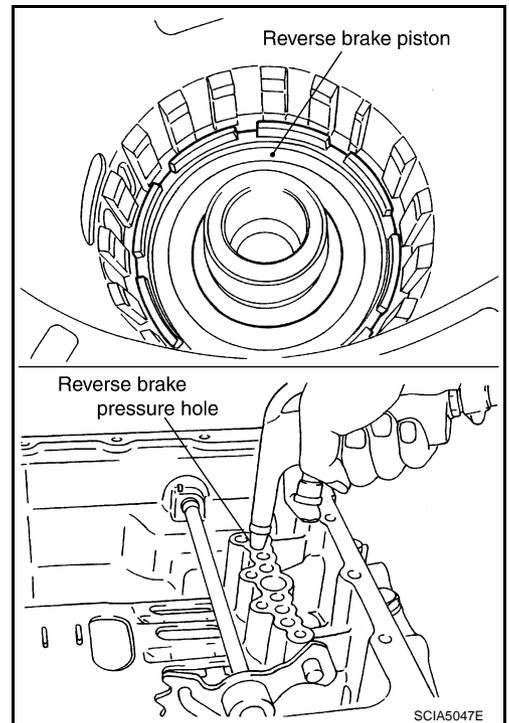


# DISASSEMBLY

61. Remove reverse brake piston from transmission case with compressed air. Refer to [AT-252, "Oil Channel"](#) .

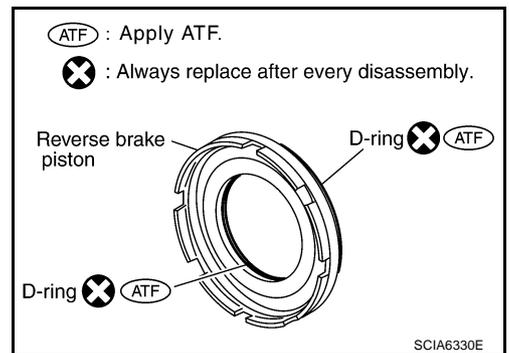
**CAUTION:**

Care should be taken not to abruptly blow air. It makes pistons incline, as the result, it becomes hard to disassemble the pistons.



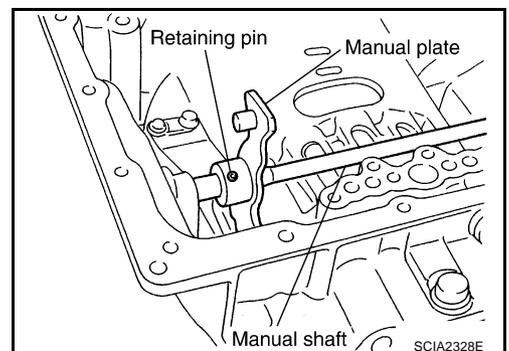
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62. Remove D-rings from reverse brake piston.



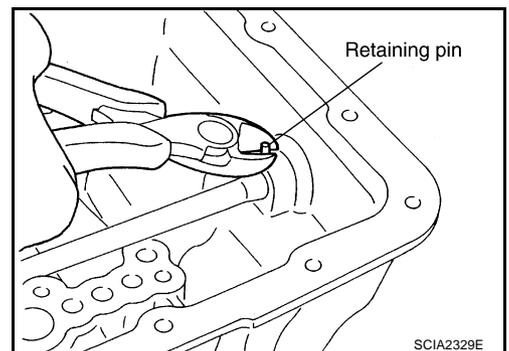
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63. Use a pin punch [4 mm (0.16 in) dia. commercial service tool] to knock out retaining pin.



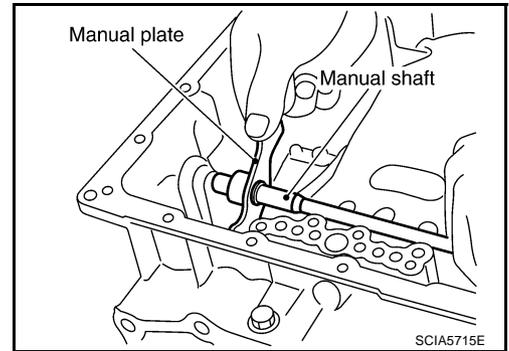
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64. Remove manual shaft retaining pin using pair of nippers.

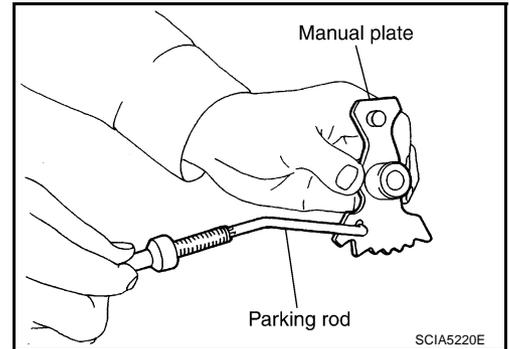


# DISASSEMBLY

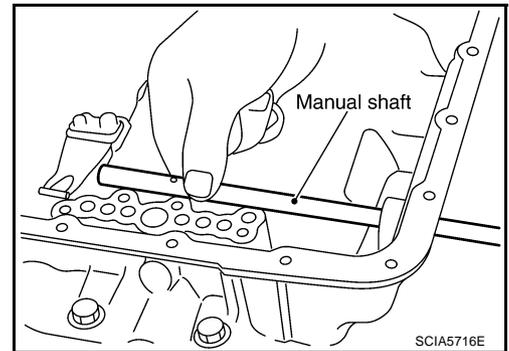
65. Remove manual plate (with parking rod) from manual shaft.



66. Remove parking rod from manual plate.

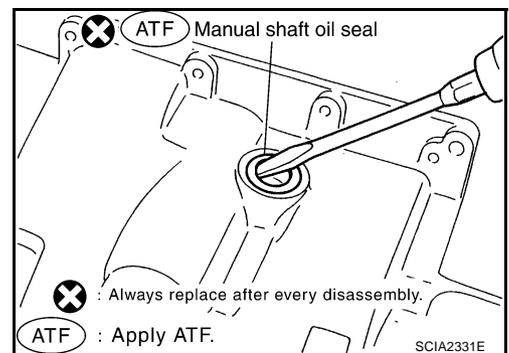


67. Remove manual shaft from transmission case.

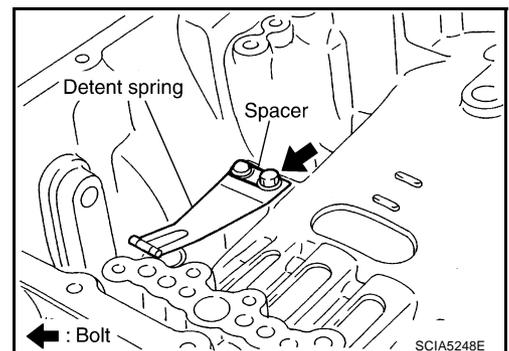


68. Remove manual shaft oil seals using a flat-bladed screwdriver.

**CAUTION:**  
Be careful not to scratch transmission case.

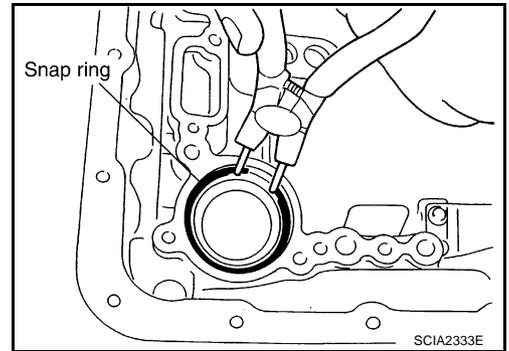


69. Remove detent spring and spacer from transmission case.

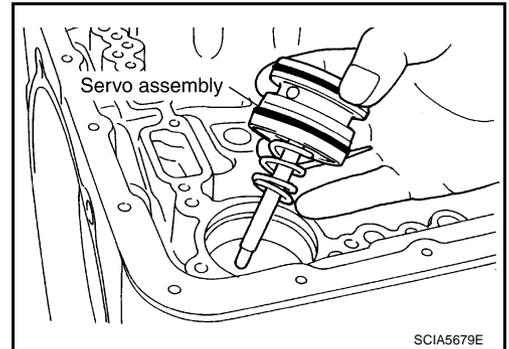


# DISASSEMBLY

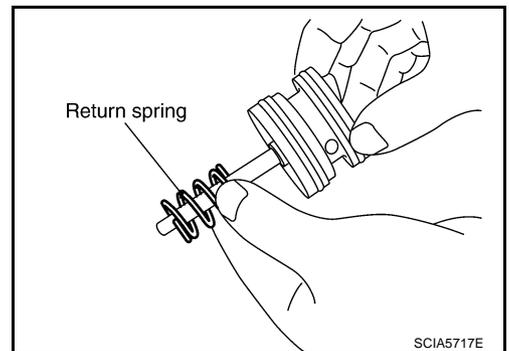
70. Remove snap ring from transmission case using pair of snap ring pliers.



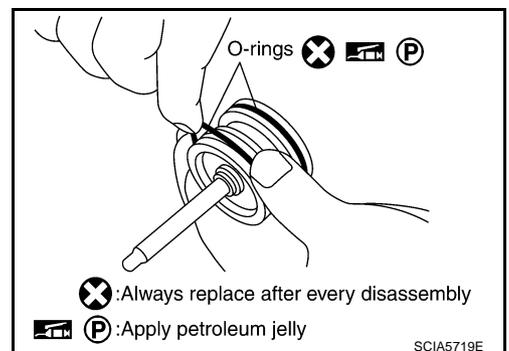
71. Remove servo assembly (with return spring) from transmission case.



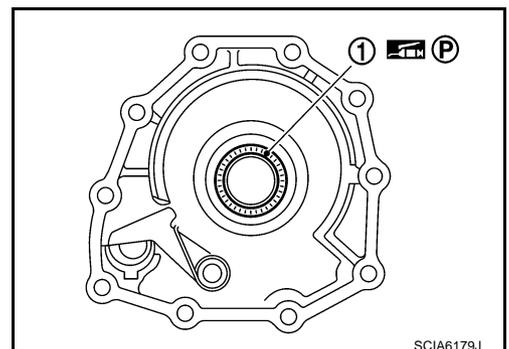
72. Remove return spring from servo assembly.



73. Remove O-rings from servo assembly.



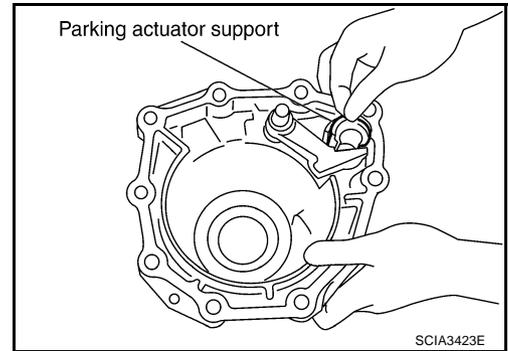
74. Remove needle bearing (1) from rear extension.



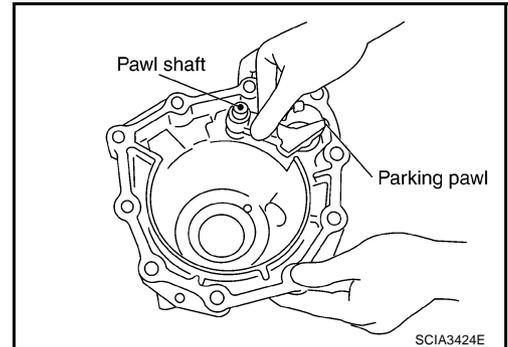
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## DISASSEMBLY

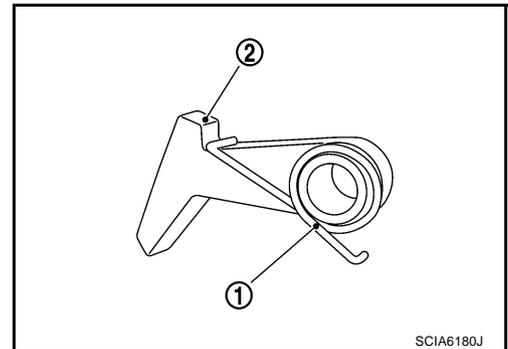
75. Remove parking actuator support from rear extension.



76. Remove parking pawl (with return spring) and pawl shaft from rear extension.

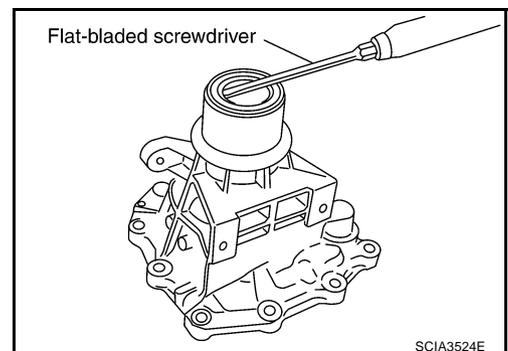


77. Remove return spring (1) from parking pawl (2).



78. Remove rear oil seal from rear extension.

**CAUTION:**  
**Be careful not to scratch rear extension.**



# REPAIR FOR COMPONENT PARTS

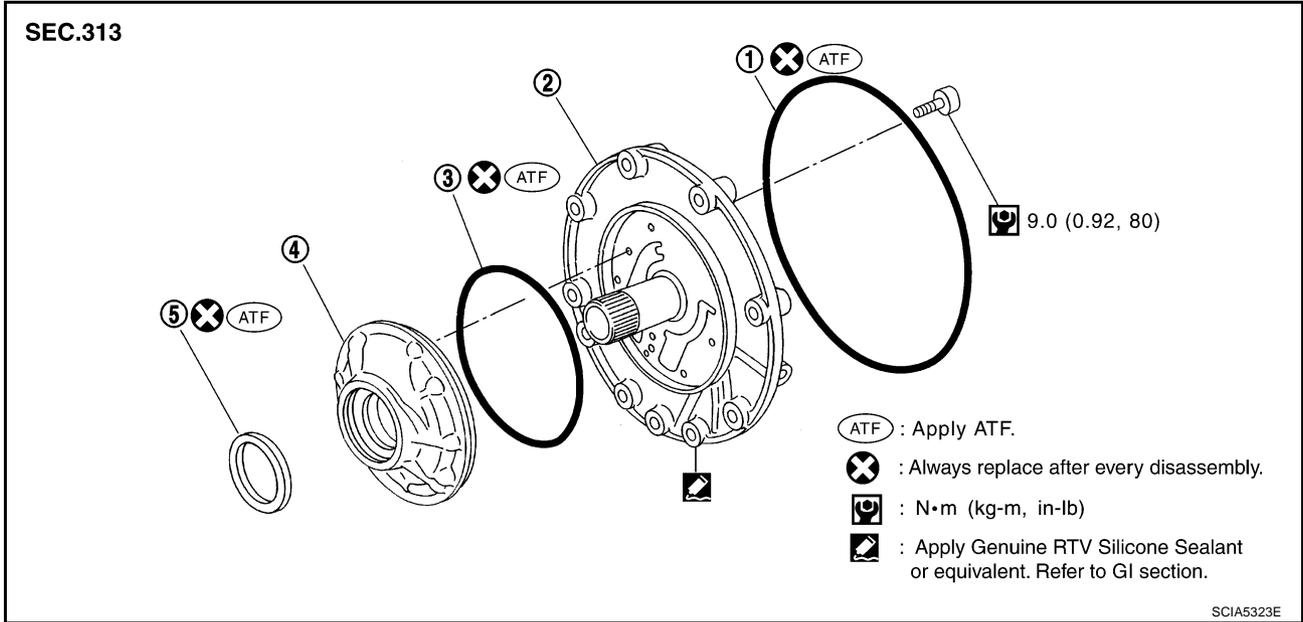
## REPAIR FOR COMPONENT PARTS

PFP:00000

### Oil Pump COMPONENTS

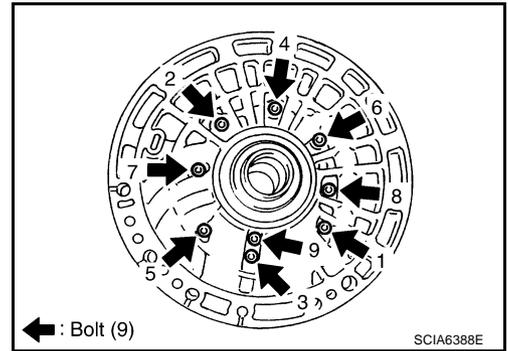
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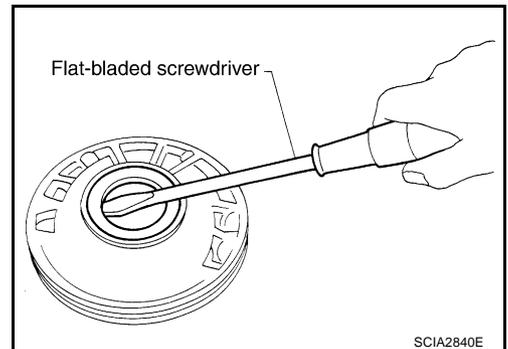
### DISASSEMBLY

1. Remove oil pump housing from oil pump cover.



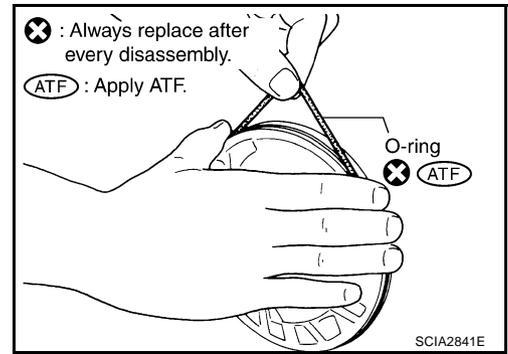
2. Remove oil pump housing oil seal using a flat-bladed screwdriver.

**CAUTION:**  
Be careful not to scratch oil pump housing.



## REPAIR FOR COMPONENT PARTS

3. Remove O-ring from oil pump housing.



4. Remove O-ring from oil pump cover.

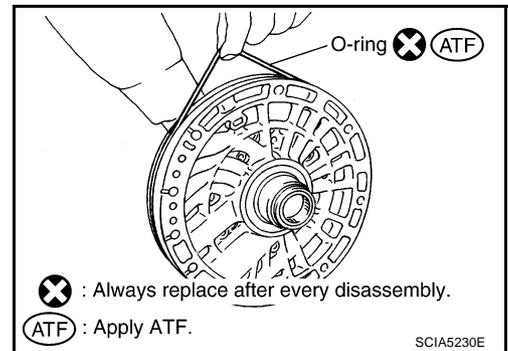


### ASSEMBLY

1. Install O-ring to oil pump cover.

**CAUTION:**

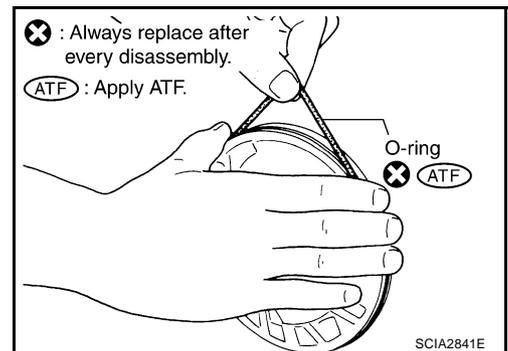
- Do not reuse O-ring.
- Apply ATF to O-ring.



2. Install O-ring to oil pump housing.

**CAUTION:**

- Do not reuse O-ring.
- Apply ATF to O-ring.

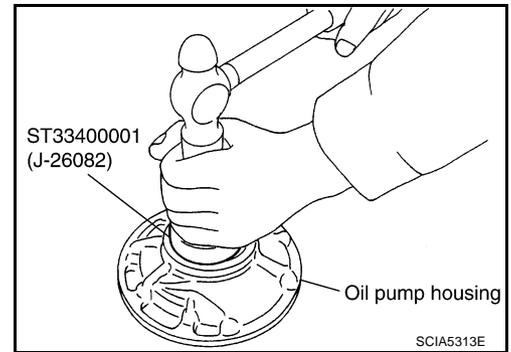


## REPAIR FOR COMPONENT PARTS

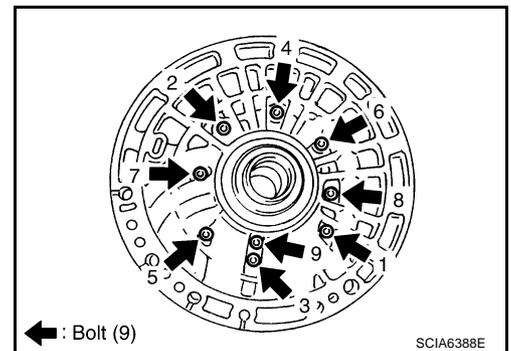
3. Install oil pump housing oil seal to the oil pump housing until it is flush using the drift.

**CAUTION:**

- Do not reuse oil seal.
- Apply ATF to oil seal.



4. Install oil pump housing to oil pump cover.
5. Tighten bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to [AT-271](#), "[COMPONENTS](#)".

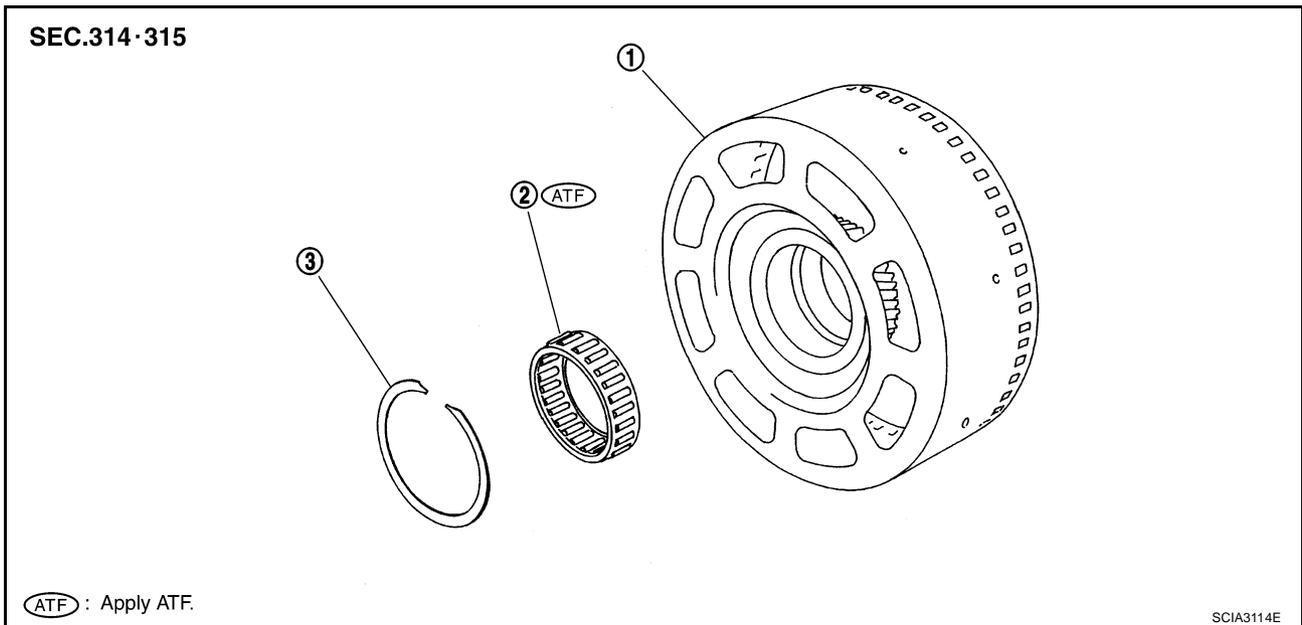


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# REPAIR FOR COMPONENT PARTS

## Front Sun Gear, 3rd One-way Clutch COMPONENTS

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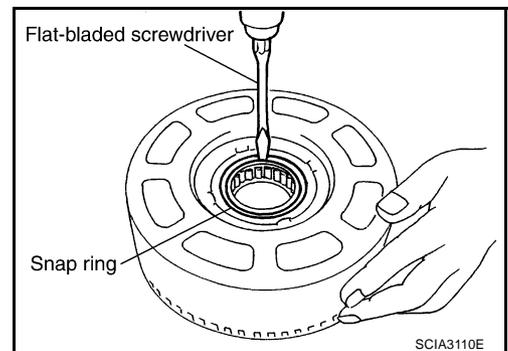
1. Front sun gear

2. 3rd one-way clutch

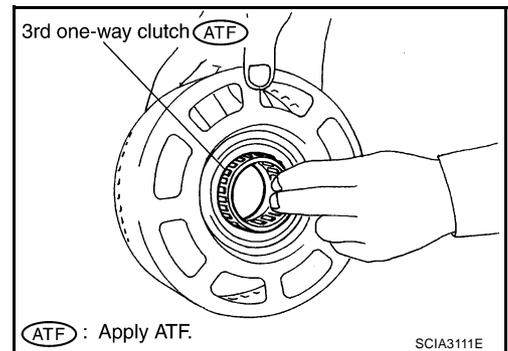
3. Snap ring

### DISASSEMBLY

1. Remove snap ring from front sun gear using a flat-bladed screwdriver.



2. Remove 3rd one-way clutch from front sun gear.



# REPAIR FOR COMPONENT PARTS

## INSPECTION

### 3rd One-way Clutch

- Check frictional surface for wear or damage.

**CAUTION:**

If necessary, replace 3rd one-way clutch.

### Front Sun Gear Snap Ring

- Check for deformation, fatigue or damage.

**CAUTION:**

If necessary, replace snap ring.

### Front Sun Gear

- Check for deformation, fatigue or damage.

**CAUTION:**

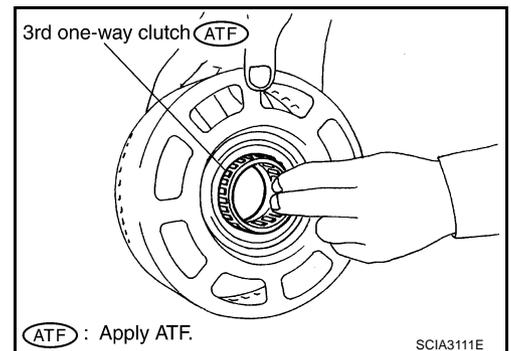
If necessary, replace front sun gear.

## ASSEMBLY

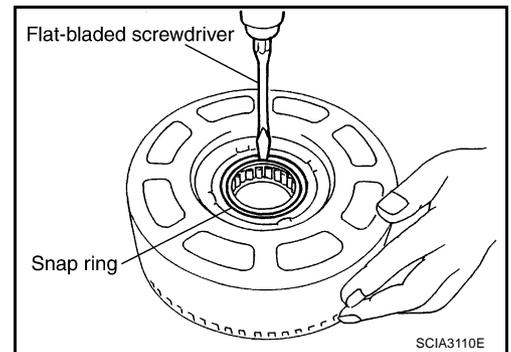
1. Install 3rd one-way clutch in front sun gear.

**CAUTION:**

Apply ATF to 3rd one-way clutch.



2. Install snap ring in front sun gear using a flat-bladed screwdriver.



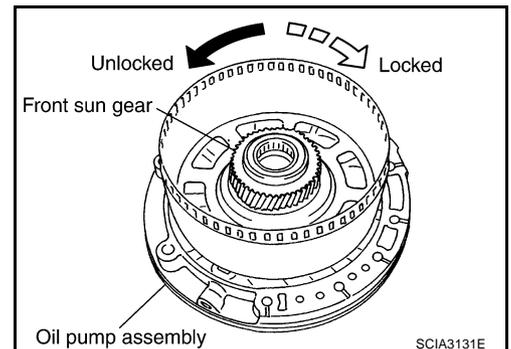
3. Check operation of 3rd one-way clutch.

- a. Hold oil pump assembly and turn front sun gear.

- b. Check 3rd one-way clutch for correct locking and unlocking directions.

**CAUTION:**

If not as shown in the figure, check installation direction of 3rd one-way clutch.



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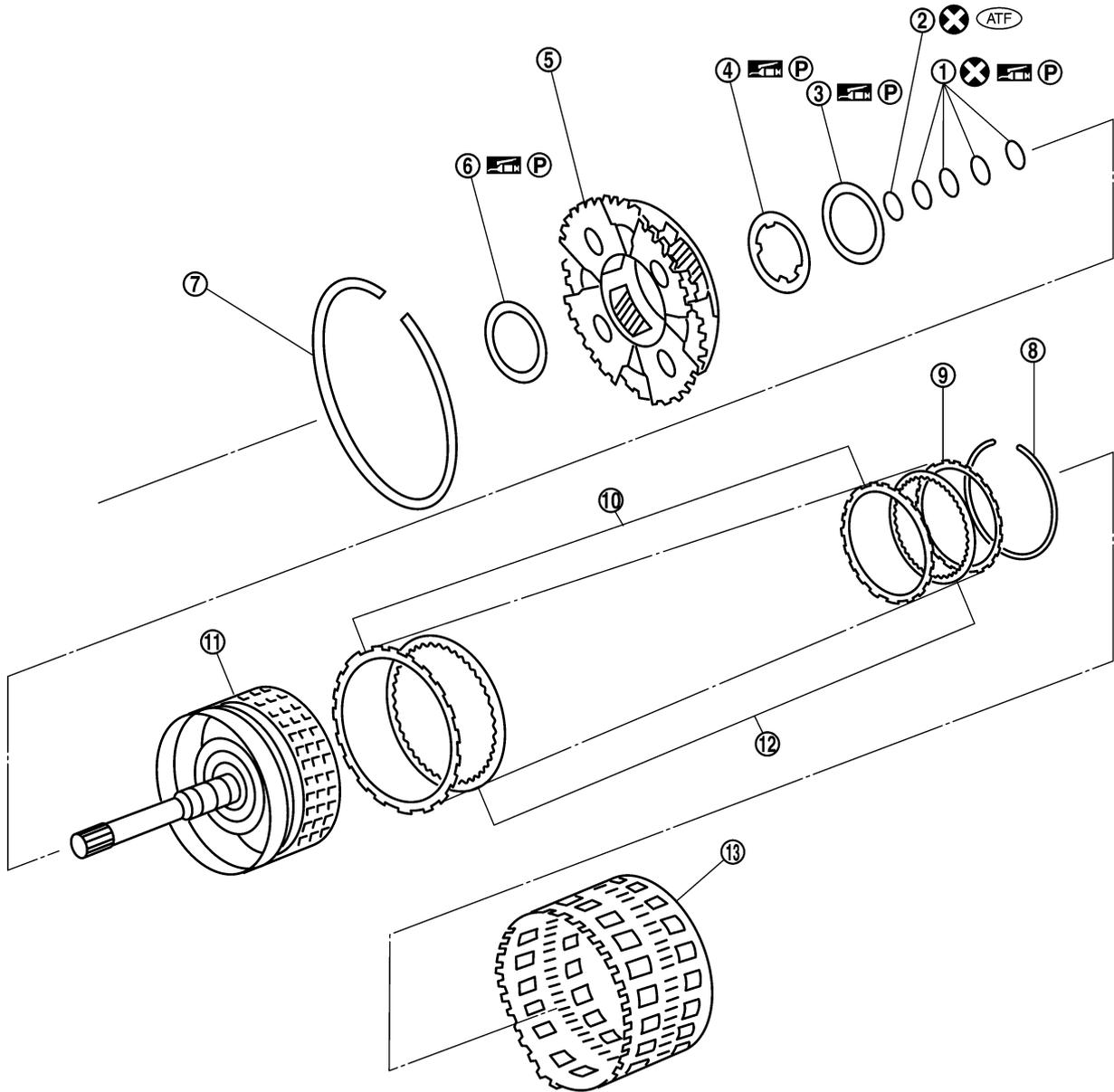
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# REPAIR FOR COMPONENT PARTS

## Front Carrier, Input Clutch, Rear Internal Gear COMPONENTS

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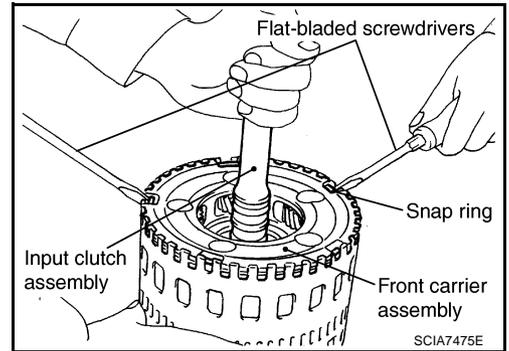
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|------------------------|---------------------------|--------------------|
| 1. Seal ring           | 2. O-ring                 | 3. Needle bearing  |
| 4. Bearing race        | 5. Front carrier assembly | 6. Needle bearing  |
| 7. Snap ring           | 8. Snap ring              | 9. Retaining plate |
| 10. Driven plate       | 11. Input clutch drum     | 12. Drive plate    |
| 13. Rear internal gear |                           |                    |

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to [GI-11, "Components"](#).

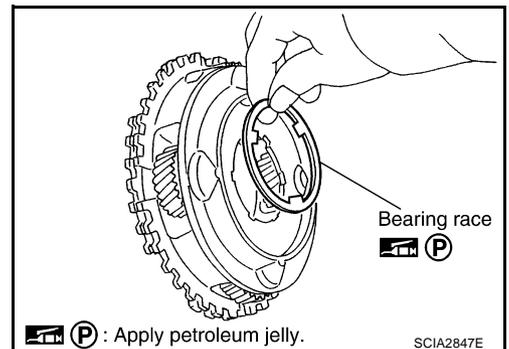
# REPAIR FOR COMPONENT PARTS

## DISASSEMBLY

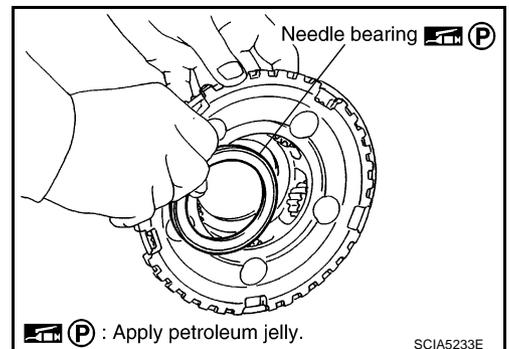
1. Compress snap ring using 2 flat-bladed screwdrivers.
2. Remove front carrier assembly and input clutch assembly from rear internal gear.
3. Remove front carrier assembly from input clutch assembly.



- a. Remove bearing race from front carrier assembly.

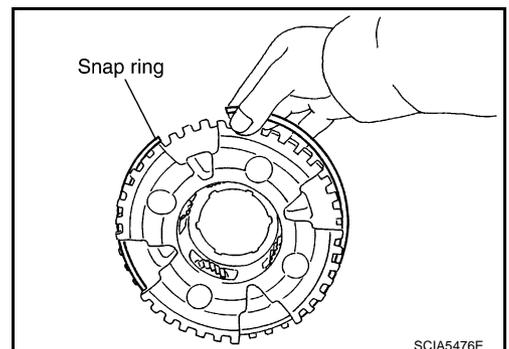


- b. Remove needle bearing from front carrier assembly.



- c. Remove snap ring from front carrier assembly.

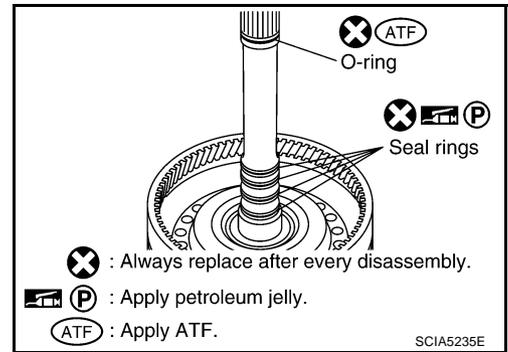
**CAUTION:**  
Do not expand snap ring excessively.



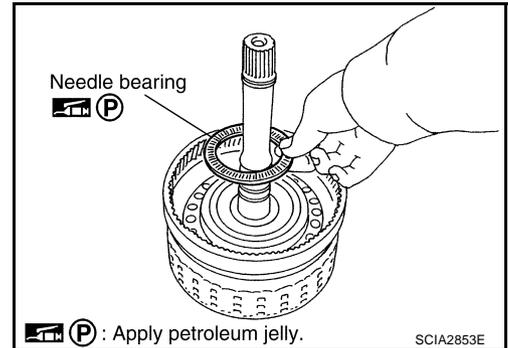
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## REPAIR FOR COMPONENT PARTS

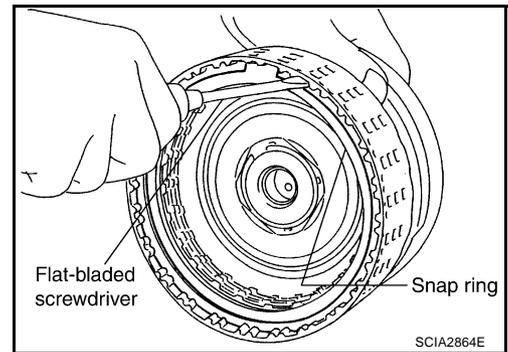
4. Disassemble input clutch assembly.
  - a. Remove O-ring and seal rings from input clutch assembly.



- b. Remove needle bearing from input clutch assembly.



- c. Remove snap ring from input clutch drum using a flat-bladed screwdriver.
  - d. Remove retaining plate, drive plates and driven plates from input clutch drum.



### INSPECTION

#### Front Carrier Snap Ring

- Check for deformation, fatigue or damage.

**CAUTION:**

If necessary, replace snap ring.

#### Input Clutch Snap Ring

- Check for deformation, fatigue or damage.

**CAUTION:**

If necessary, replace input clutch assembly.

#### Input Clutch Drum

- Check for deformation, fatigue or damage or burns.

**CAUTION:**

If necessary, replace input clutch assembly.

#### Input Clutch Drive Plates

- Check facing for burns, cracks or damage.

**CAUTION:**

If necessary, replace input clutch assembly.

#### Input Clutch Retaining Plate and Driven Plates

- Check facing for burns, cracks or damage.

# REPAIR FOR COMPONENT PARTS

**CAUTION:**

If necessary, replace input clutch assembly.

## Front Carrier

- Check for deformation, fatigue or damage.

**CAUTION:**

If necessary, replace front carrier assembly.

## Rear Internal Gear

- Check for deformation, fatigue or damage.

**CAUTION:**

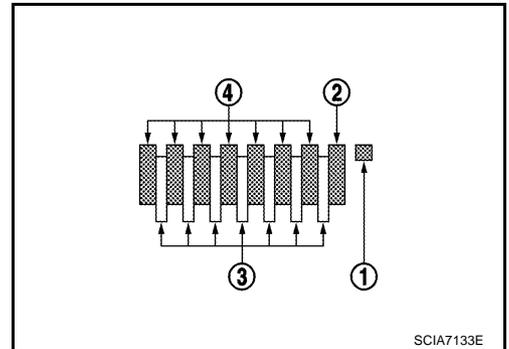
If necessary, replace rear internal gear.

## ASSEMBLY

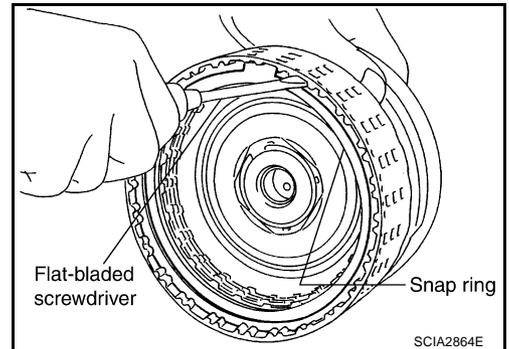
1. Install input clutch.
  - a. Install driven plates, drive plates and retaining plate in input clutch drum.
    - Snap ring (1)
    - Retaining plate (2)
    - Drive plate (3)
    - Driven plate (4)
    - Drive plate/Driven plate: 7/7

**CAUTION:**

Take care with order of plates.



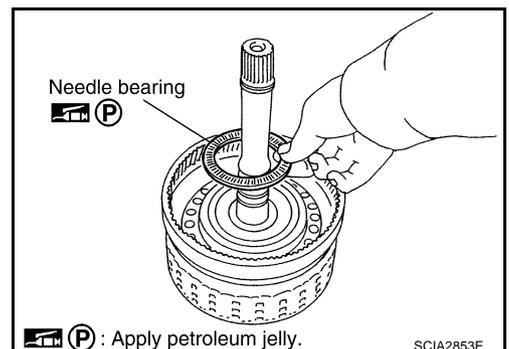
- b. Install snap ring in input clutch drum using a flat-bladed screwdriver.



- c. Install needle bearing in input clutch assembly.

**CAUTION:**

- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#).
- Apply petroleum jelly to needle bearing.



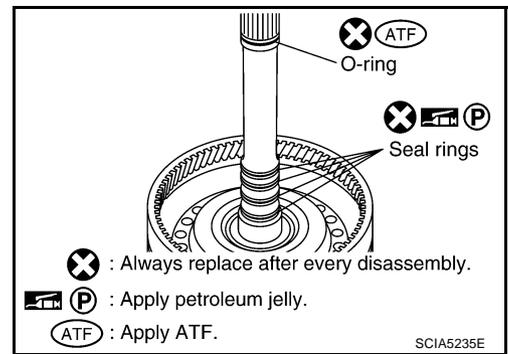
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## REPAIR FOR COMPONENT PARTS

- d. Install O-ring and seal rings in input clutch assembly.

**CAUTION:**

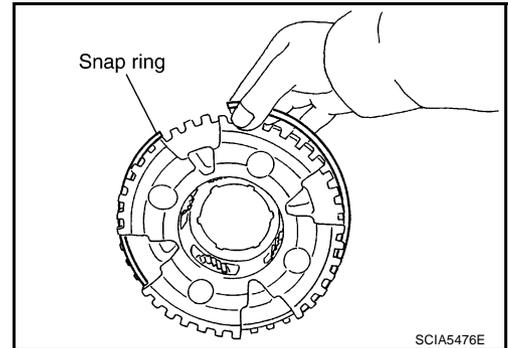
- Do not reuse O-ring and seal rings.
- Apply ATF to O-ring.
- Apply petroleum jelly to seal rings.



2. Install front carrier assembly.
- a. Install snap ring to front carrier assembly.

**CAUTION:**

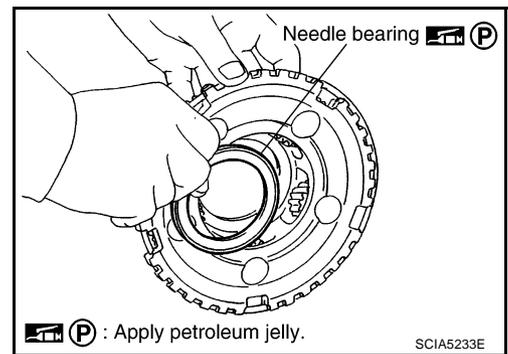
**Do not expand snap ring excessively.**



- b. Install needle bearing in front carrier assembly.

**CAUTION:**

- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#) .
- Apply petroleum jelly to needle bearing.

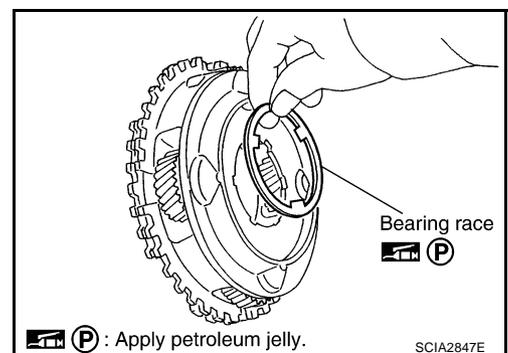


- c. Install bearing race in front carrier assembly.

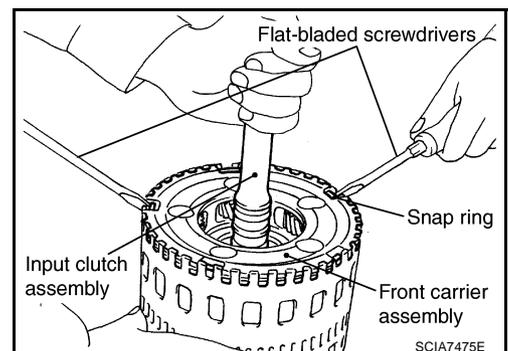
**CAUTION:**

**Apply petroleum jelly to bearing race.**

- d. Install front carrier assembly to input clutch assembly.



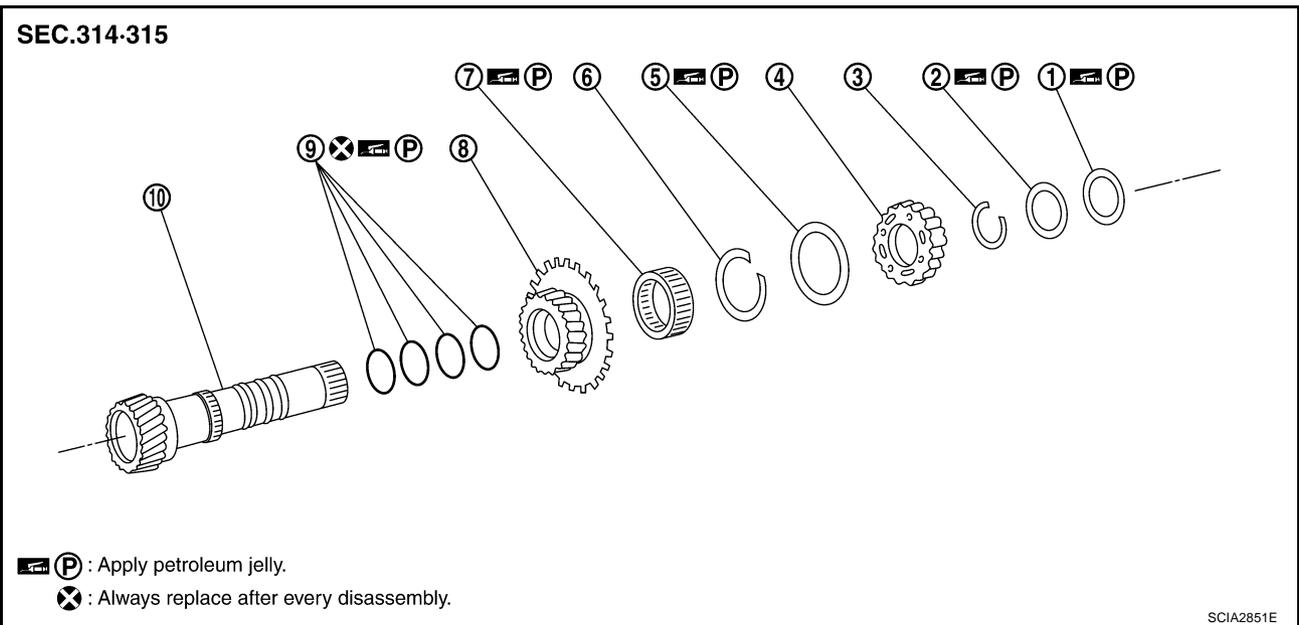
3. Compress snap ring using 2 flat-bladed screwdrivers.
4. Install front carrier assembly and input clutch assembly to rear internal gear.



# REPAIR FOR COMPONENT PARTS

## Mid Sun Gear, Rear Sun Gear, High and Low Reverse Clutch Hub COMPONENTS

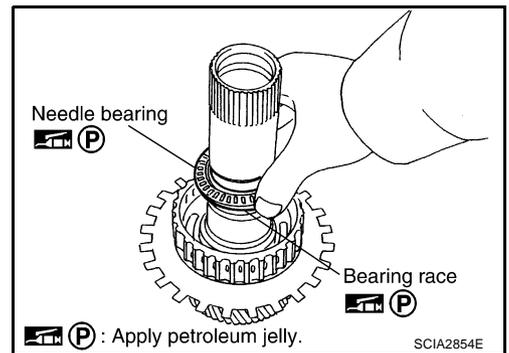
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- |                                    |                   |              |
|------------------------------------|-------------------|--------------|
| 1. Needle bearing                  | 2. Bearing race   | 3. Snap ring |
| 4. High and low reverse clutch hub | 5. Needle bearing | 6. Snap ring |
| 7. 1st one-way clutch              | 8. Rear sun gear  | 9. Seal ring |
| 10. Mid sun gear                   |                   |              |

### DISASSEMBLY

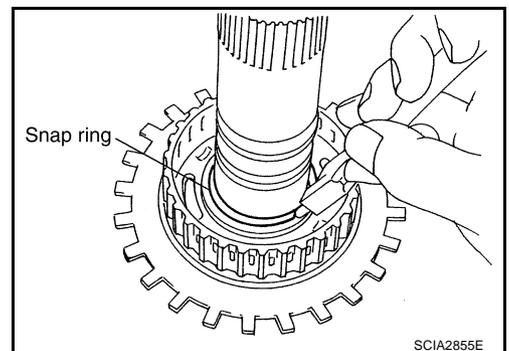
1. Remove needle bearing and bearing race from high and low reverse clutch hub.



2. Remove snap ring from mid sun gear assembly using pair of snap ring pliers.

### CAUTION:

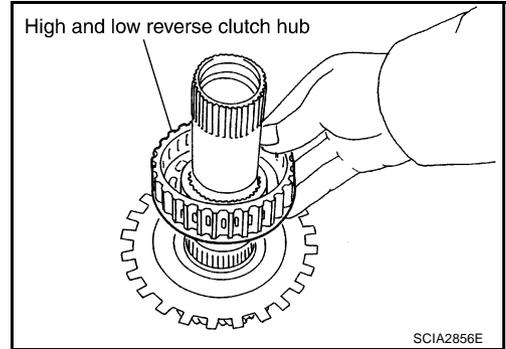
Do not expand snap ring excessively.



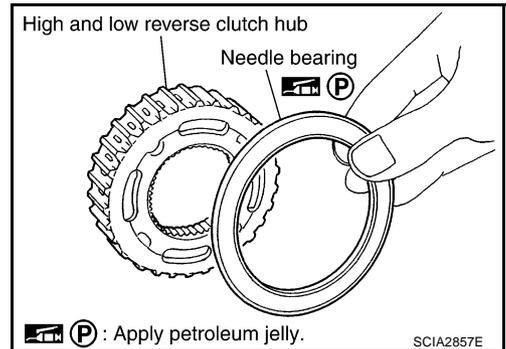
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## REPAIR FOR COMPONENT PARTS

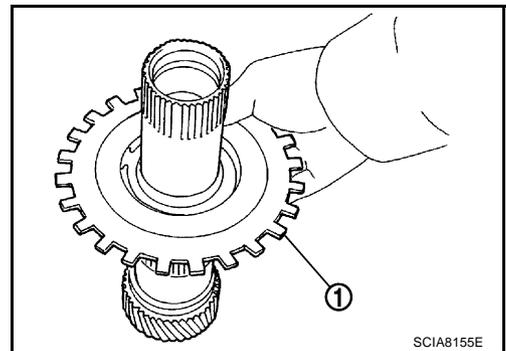
3. Remove high and low reverse clutch hub from mid sun gear assembly.



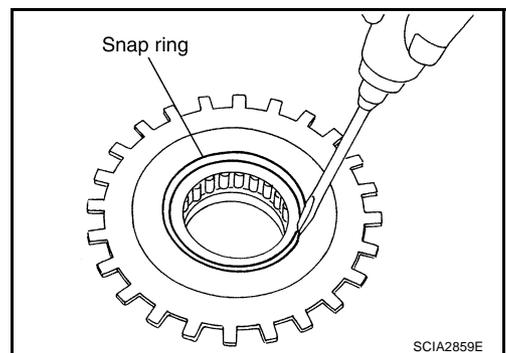
- a. Remove needle bearing from high and low reverse clutch hub.



4. Remove rear sun gear assembly (1) from mid sun gear assembly.

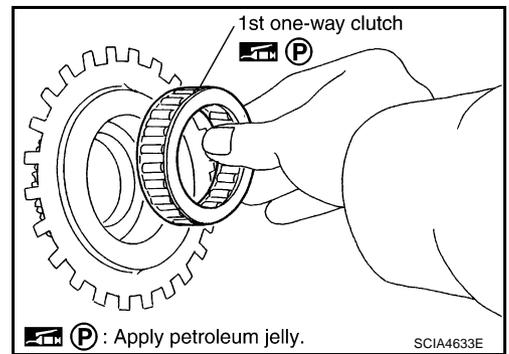


- a. Remove snap ring from rear sun gear using a flat-bladed screwdriver.

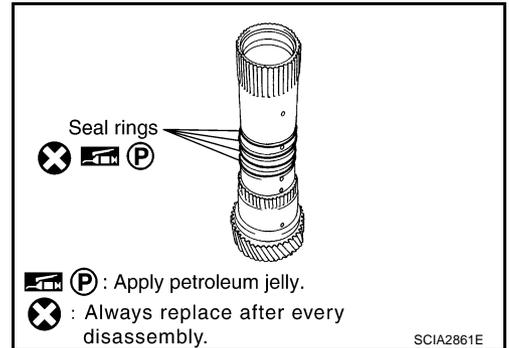


# REPAIR FOR COMPONENT PARTS

- b. Remove 1st one-way clutch from rear sun gear.



5. Remove seal rings from mid sun gear.



## INSPECTION

### High and Low Reverse Clutch Hub Snap Ring, Rear Sun Gear Snap Ring

- Check for deformation, fatigue or damage.

**CAUTION:**

If necessary, replace snap ring.

### 1st One-way Clutch

- Check frictional surface for wear or damage.

**CAUTION:**

If necessary, replace 1st one-way clutch.

### Mid Sun Gear

- Check for deformation, fatigue or damage.

**CAUTION:**

If necessary, replace mid sun gear.

### Rear Sun Gear

- Check for deformation, fatigue or damage.

**CAUTION:**

If necessary, replace rear sun gear.

### High and Low Reverse Clutch Hub

- Check for deformation, fatigue or damage.

**CAUTION:**

If necessary, replace high and low reverse clutch hub.

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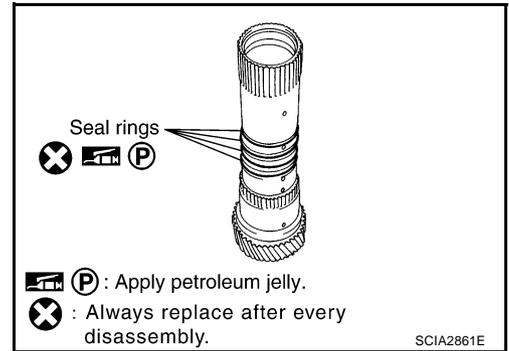
# REPAIR FOR COMPONENT PARTS

## ASSEMBLY

1. Install seal rings to mid sun gear.

**CAUTION:**

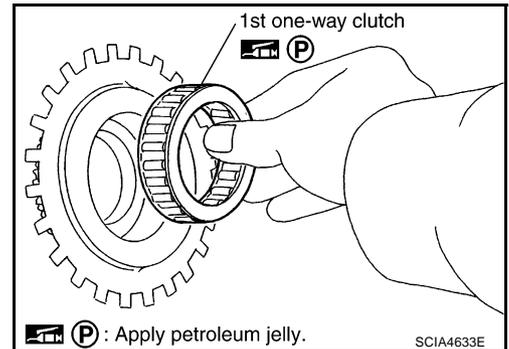
- Do not reuse seal rings.
- Apply petroleum jelly to seal rings.



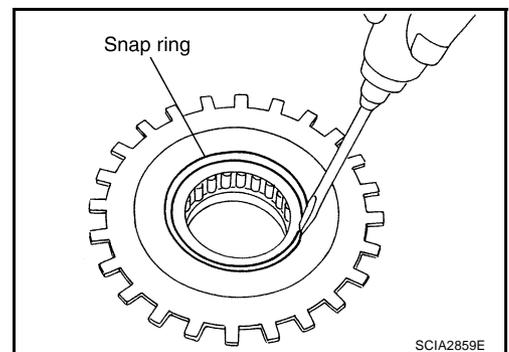
2. Install 1st one-way clutch to rear sun gear.

**CAUTION:**

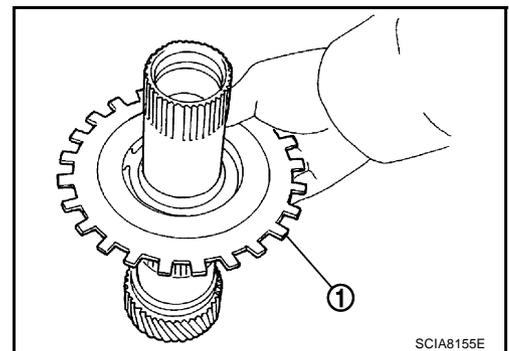
- Apply petroleum jelly to 1st one-way clutch.



3. Install snap ring to rear sun gear using a flat-bladed screwdriver.



4. Install rear sun gear assembly (1) to mid sun gear assembly.

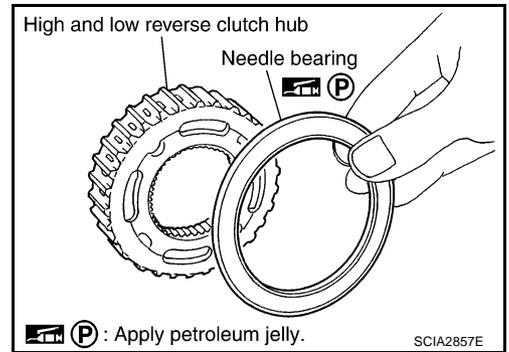


## REPAIR FOR COMPONENT PARTS

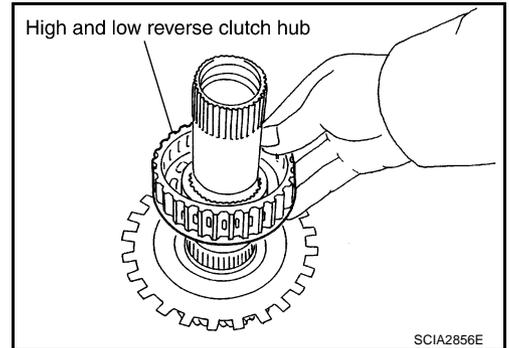
5. Install needle bearing to high and low reverse clutch hub.

**CAUTION:**

- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#).
- Apply petroleum jelly to needle bearing.



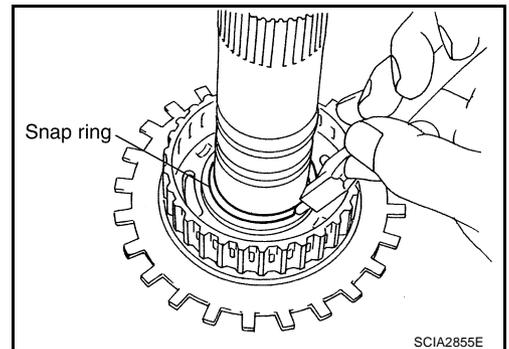
6. Install high and low reverse clutch hub to mid sun gear assembly.



7. Install snap ring to mid sun gear assembly using pair of snap ring pliers.

**CAUTION:**

Do not expand snap ring excessively.

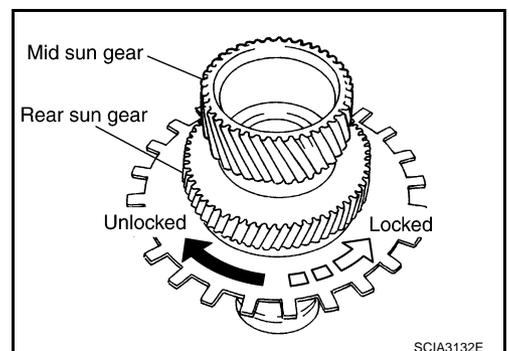


8. Check operation of 1st one-way clutch.

- Hold mid sun gear and turn rear sun gear.
- Check 1st one-way clutch for correct locking and unlocking directions.

**CAUTION:**

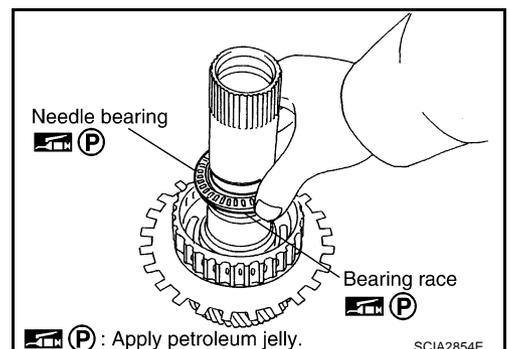
If not as shown in illustration, check installation direction of 1st one-way clutch.



9. Install bearing race and needle bearing to high and low reverse clutch hub.

**CAUTION:**

- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#).
- Apply petroleum jelly to needle bearing.

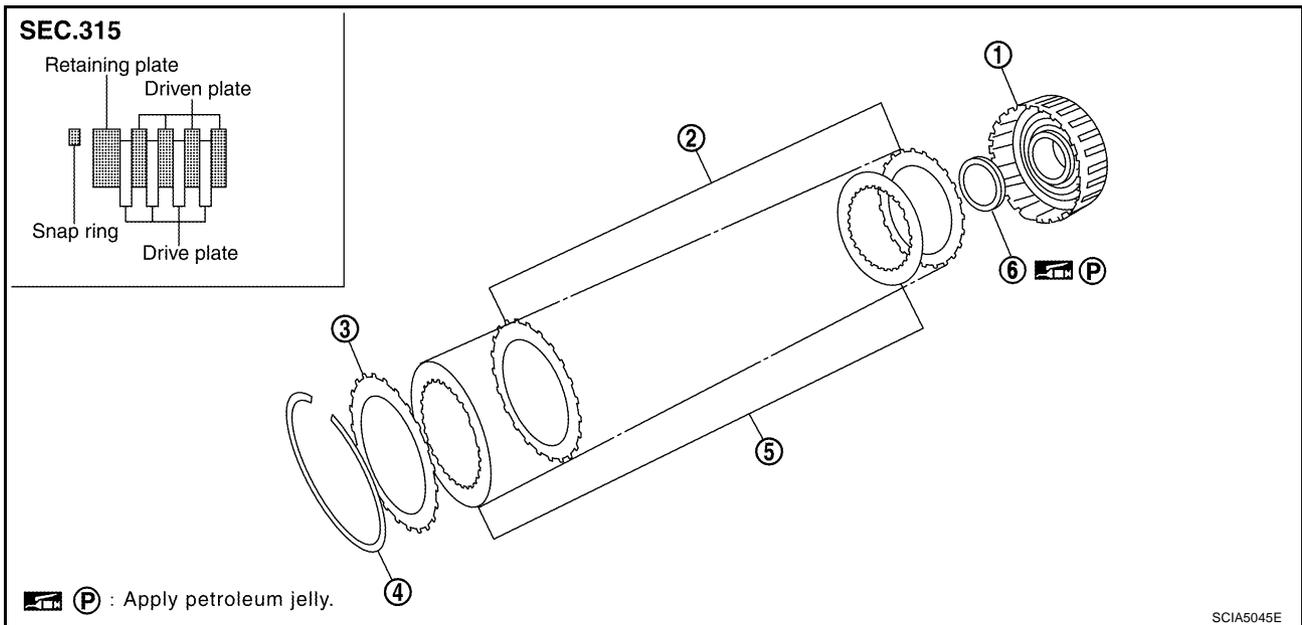


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# REPAIR FOR COMPONENT PARTS

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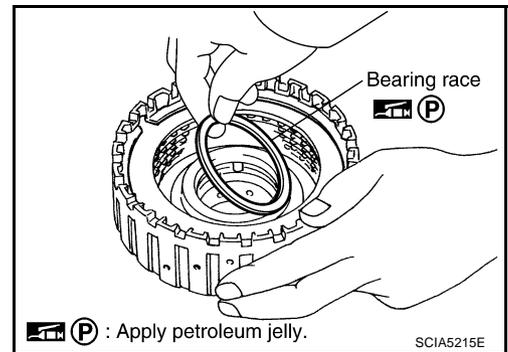
## High and Low Reverse Clutch COMPONENTS



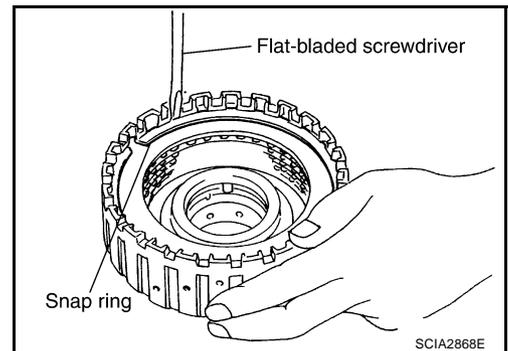
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|-------------------------------------|-----------------|--------------------|
| 1. High and low reverse clutch drum | 2. Driven plate | 3. Retaining plate |
| 4. Snap ring                        | 5. Drive plate  | 6. Bearing race    |

### DISASSEMBLY

1. Remove bearing race from high and low reverse clutch drum.



2. Remove snap ring from high and low reverse clutch drum using a flat-bladed screwdriver.
3. Remove retaining plate, drive plates and driven plates from high and low reverse clutch drum.



# REPAIR FOR COMPONENT PARTS

## INSPECTION

Check the following, and replace high and low reverse clutch assembly if necessary.

### High and Low Reverse Clutch Snap Ring

- Check for deformation, fatigue or damage.

### High and Low Reverse Clutch Drive Plates

- Check facing for burns, cracks or damage.

### High and Low Reverse Clutch Retaining Plate and Driven Plates

- Check facing for burns, cracks or damage.

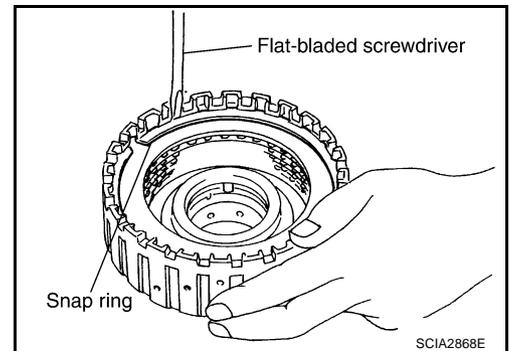
## ASSEMBLY

1. Install driven plates, drive plates and retaining plate in high and low reverse clutch drum.

### **CAUTION:**

**Take care with order of plates.**

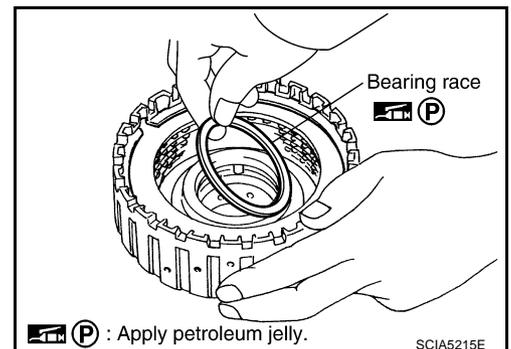
2. Install snap ring in high and low reverse clutch drum using a flat-bladed screwdriver.



3. Install bearing race to high and low reverse clutch drum.

### **CAUTION:**

**Apply petroleum jelly to bearing race.**

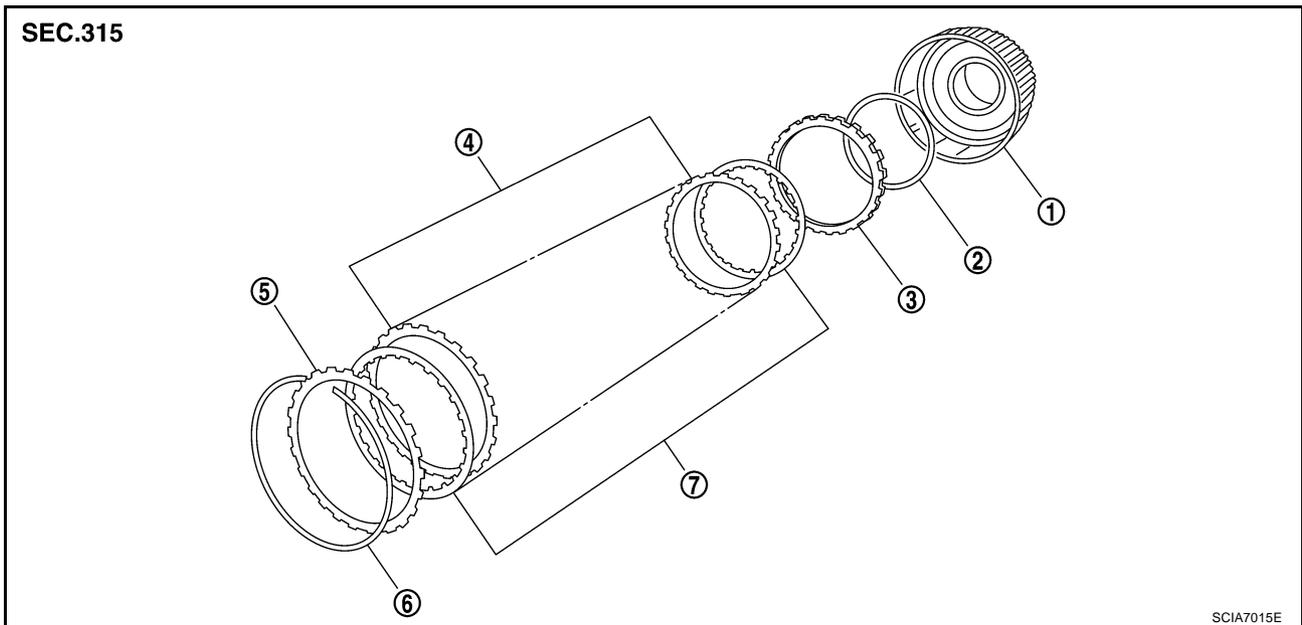


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# REPAIR FOR COMPONENT PARTS

## Direct Clutch COMPONENTS

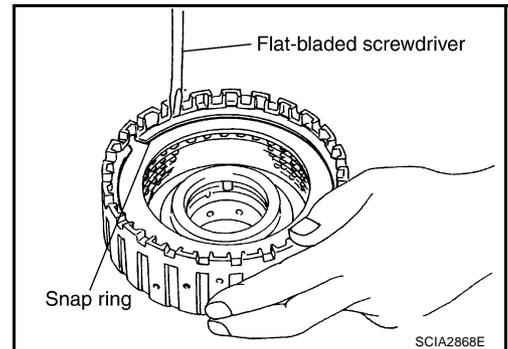
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|-----------------------|--------------------|--------------------|
| 1. Direct clutch drum | 2. Dish plate      | 3. Retaining plate |
| 4. Driven plate       | 5. Retaining plate | 6. Snap ring       |
| 7. Drive plate        |                    |                    |

### DISASSEMBLY

1. Remove snap ring from direct clutch drum using a flat-bladed screwdriver.
2. Remove retaining plates, drive plates, driven plates and dish plate from direct clutch drum.



### INSPECTION

Check the following, and replace direct clutch assembly if necessary.

#### Direct Clutch Snap Ring

- Check for deformation, fatigue or damage.

#### Direct Clutch Drive Plates

- Check facing for burns, cracks or damage.

#### Direct Clutch Retaining Plate, Driven Plates and Dish Plate

- Check facing for burns, cracks or damage.

# REPAIR FOR COMPONENT PARTS

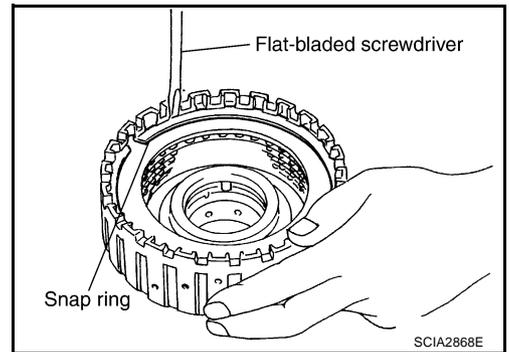
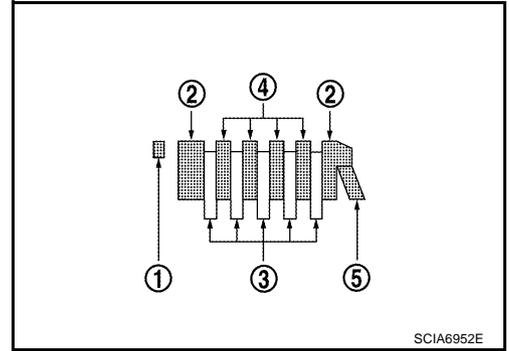
## ASSEMBLY

1. Install dish plate, retaining plates, driven plates and drive plates in direct clutch drum.
  - Snap ring (1)
  - Retaining plate (2)
  - Drive plate (3)
  - Driven plate (4)
  - Dish plate (5)
  - Drive plate/Driven plate: 5/4

**CAUTION:**

**Take care with order of plates.**

2. Install snap ring in direct clutch drum using a flat-bladed screwdriver.



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# ASSEMBLY

## ASSEMBLY

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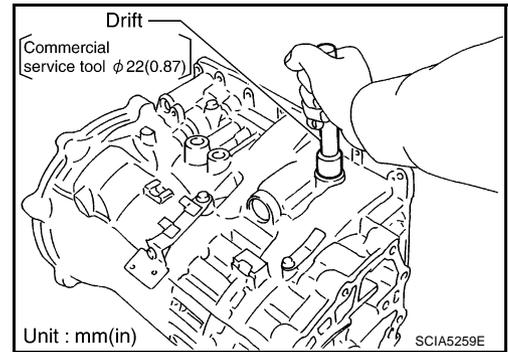
### Assembly (1)

NCS0009I

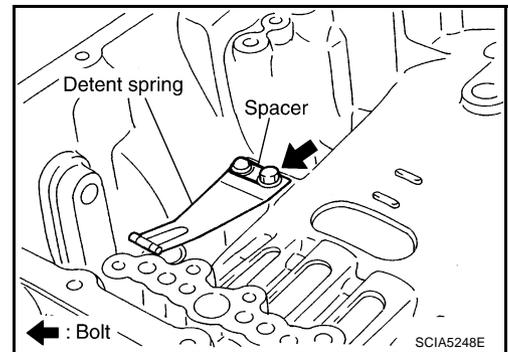
1. As shown in the right figure, use a drift [commercial service tool: 22 mm (0.87 in) dia.] to drive manual shaft oil seals into transmission case until it is flush.

**CAUTION:**

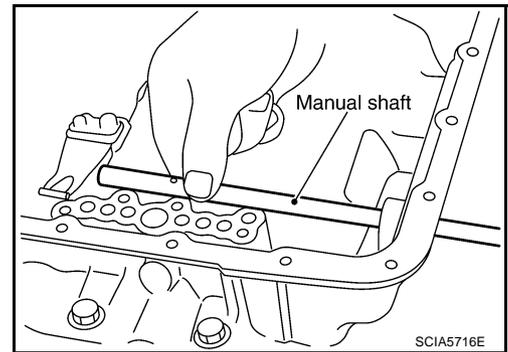
- Do not reuse manual shaft oil seals.
- Apply ATF to manual shaft oil seals.



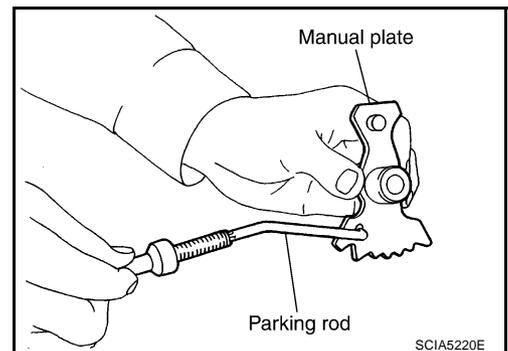
2. Install detent spring and spacer to transmission case, and then tighten mounting bolt to the specified torque. Refer to [AT-246](#), "[Components](#)".



3. Install manual shaft to transmission case.

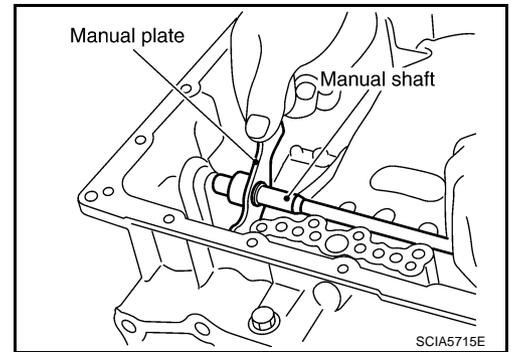


4. Install parking rod to manual plate.



# ASSEMBLY

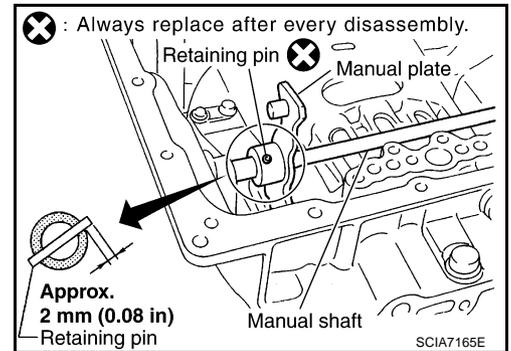
5. Install manual plate (with parking rod) to manual shaft.



6. Install retaining pin into manual plate and manual shaft.  
 a. Fit pinhole of manual plate to pinhole of manual shaft with a pin punch.  
 b. Tap retaining pin into manual plate using a hammer.

**CAUTION:**

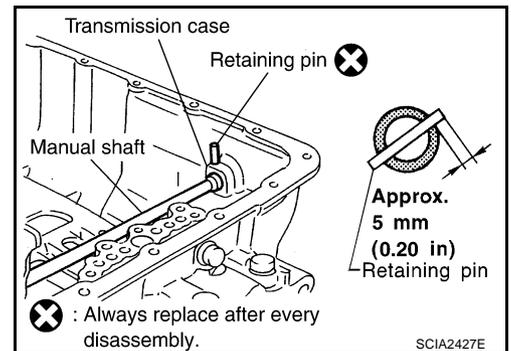
- Do not reuse retaining pin.
- Drive retaining pin to  $2 \pm 0.5$  mm ( $0.08 \pm 0.020$  in) over manual plate.



7. Install retaining pin into transmission case and manual shaft.  
 a. Fit pinhole of transmission case to pinhole of manual shaft with a pin punch.  
 b. Tap the retaining pin into transmission case using a hammer.

**CAUTION:**

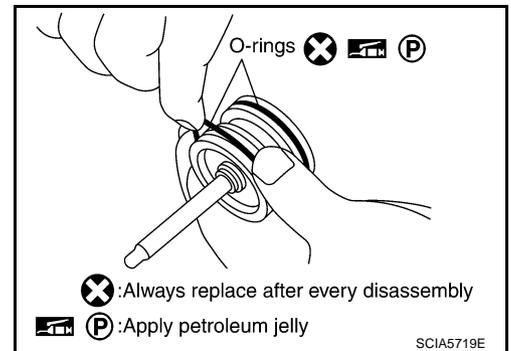
- Do not reuse retaining pin.
- Drive retaining pin to  $5 \pm 1$  mm ( $0.20 \pm 0.04$  in) over transmission case.



8. Install O-rings to servo assembly.

**CAUTION:**

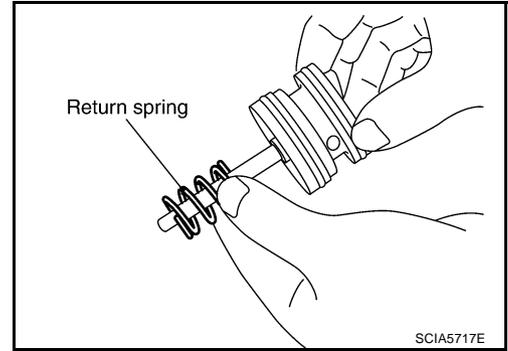
- Do not reuse O-rings.
- Apply petroleum jelly to O-rings.



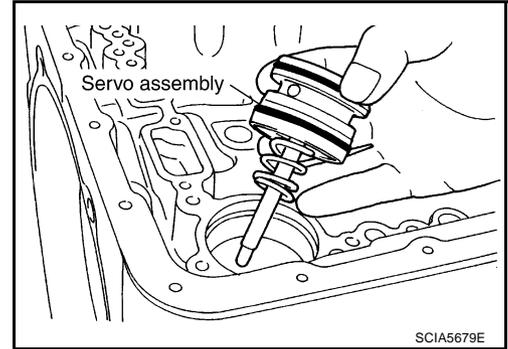
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# ASSEMBLY

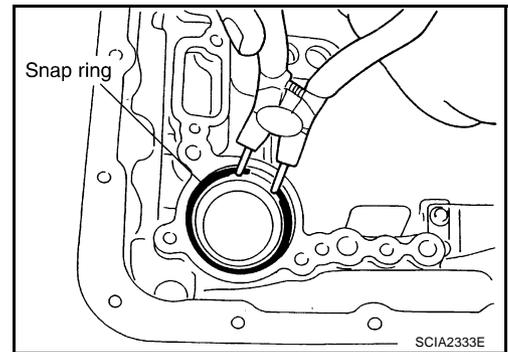
9. Install return spring to servo assembly.



10. Install servo assembly in transmission case.



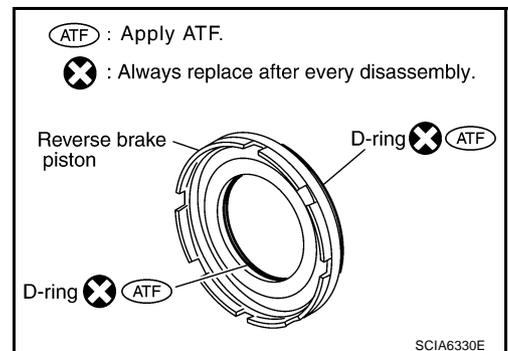
11. Install snap ring to transmission case using pair of snap ring pliers.



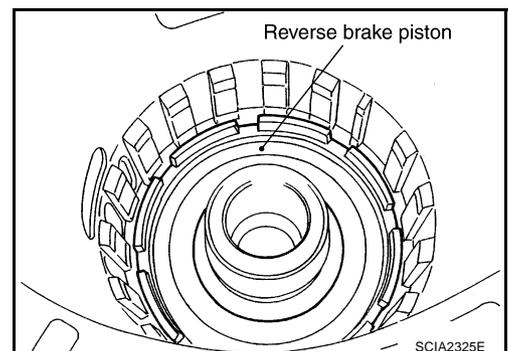
12. Install D-rings in reverse brake piston.

**CAUTION:**

- Do not reuse D-rings.
- Apply ATF to D-rings.



13. Install reverse brake piston in transmission case.

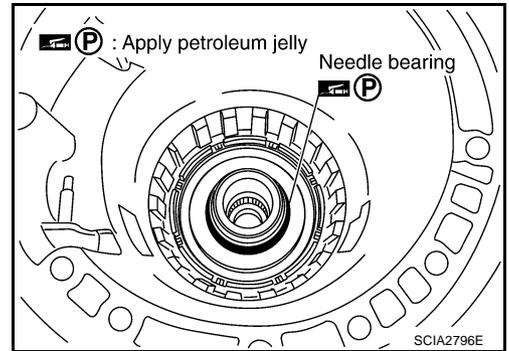


# ASSEMBLY

14. Install needle bearing to drum support edge surface.

**CAUTION:**

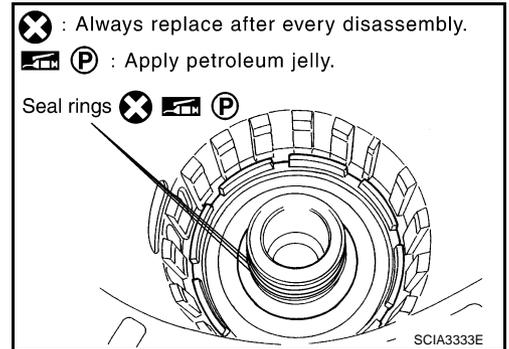
- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#).
- Apply petroleum jelly to needle bearing.



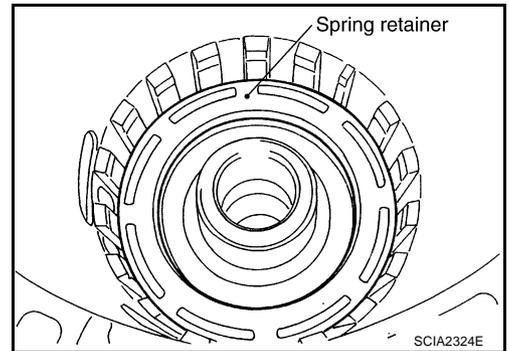
15. Install seal rings to drum support.

**CAUTION:**

- Do not reuse seal rings.
- Apply petroleum jelly to seal rings.



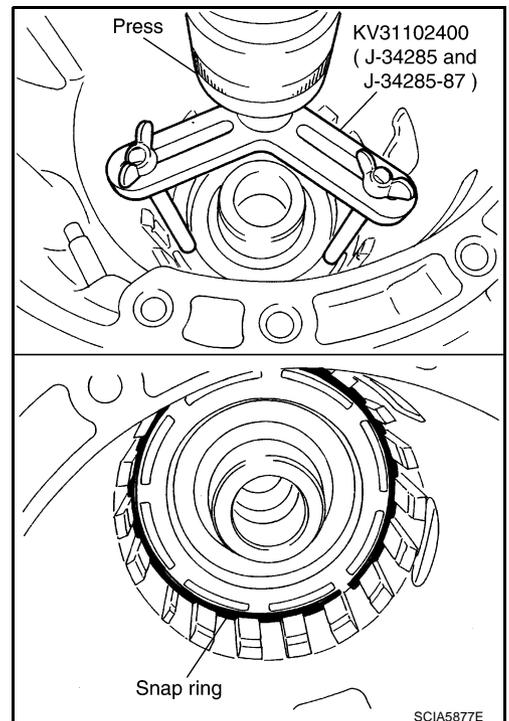
16. Install return spring and spring retainer in transmission case.



17. Set the SST on spring retainer and install snap ring (fixing spring retainer) in transmission case while compressing return spring.

**CAUTION:**

Securely assemble them using a flat-bladed screwdriver so that snap ring tension is slightly weak.



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# ASSEMBLY

18. Install reverse brake retaining plate, drive plates, driven plates and dish plates in transmission case.

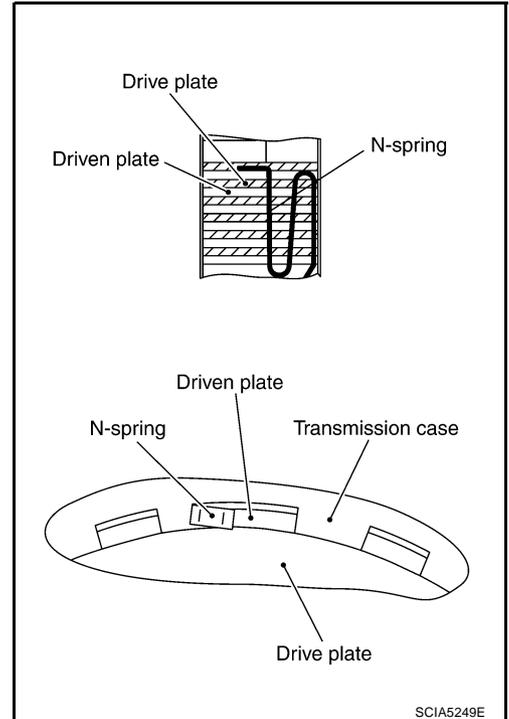
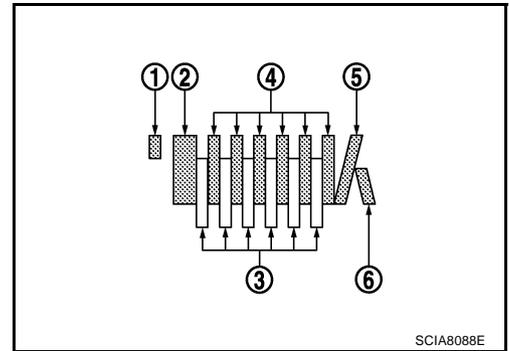
- Snap ring (1)
- Retaining plate (2)
- Drive plate (3)
- Driven plate (4)
- Dish plate (5)
- Dish plate (6)
- Driveplate/Driven plate: 6/6

**CAUTION:**

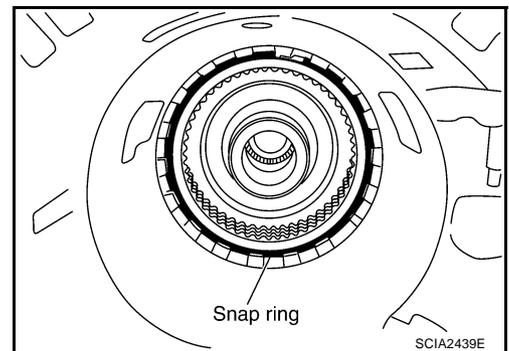
**Take care with order of plates.**

19. Assemble N-spring.

20. Install reverse brake retaining plate in transmission case.



21. Install snap ring in transmission case.

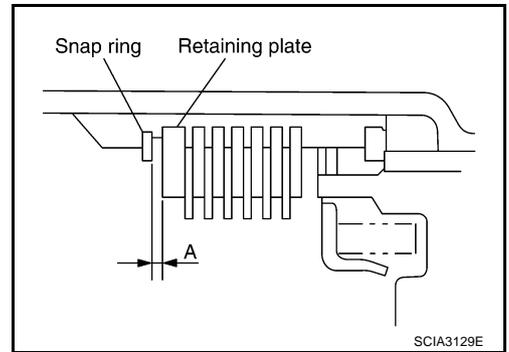


# ASSEMBLY

22. Measure clearance between retaining plate and snap ring. If not within specified clearance, select proper retaining plate. Refer to "Parts Information" for retaining plate selection.

**Specified clearance "A":**

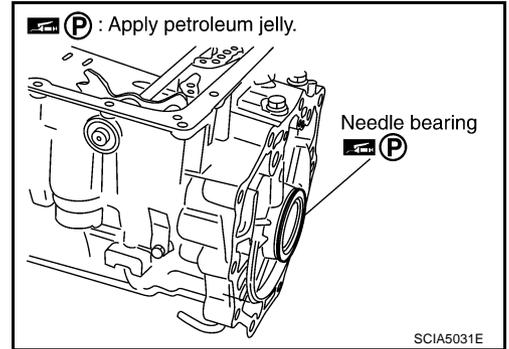
Refer to [AT-312, "Reverse Brake"](#) .



23. Install needle bearing to transmission case.

**CAUTION:**

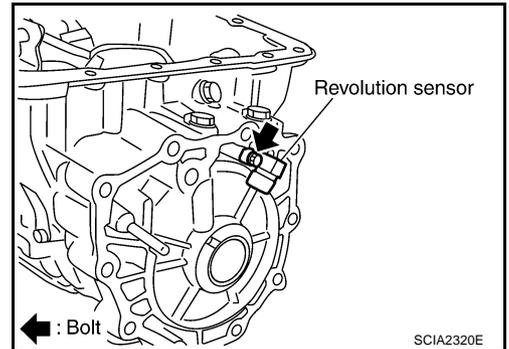
- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#) .
- Apply petroleum jelly to needle bearing.



24. Install revolution sensor to transmission case, and then tighten mounting bolt to the specified torque. Refer to [AT-246, "Components"](#) .

**CAUTION:**

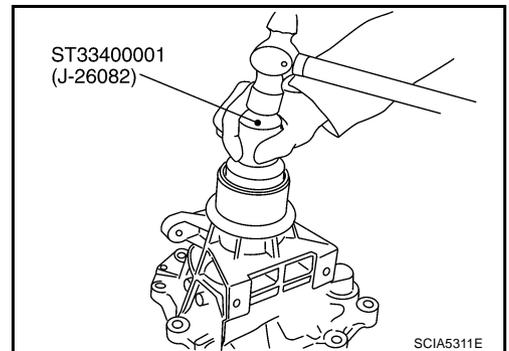
- Do not subject it to impact by dropping or hitting it.
- Do not disassemble.
- Do not allow metal filings, etc. to get on the sensor's front edge magnetic area.
- Do not place in an area affected by magnetism.



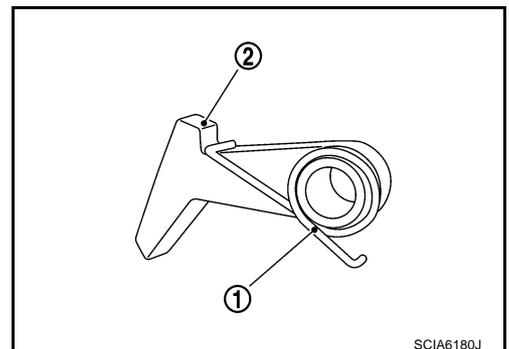
25. As shown in the figure, drive rear oil seal into rear extension until it is flush using a drift.

**CAUTION:**

- Do not reuse rear oil seal.
- Apply ATF to rear oil seal.



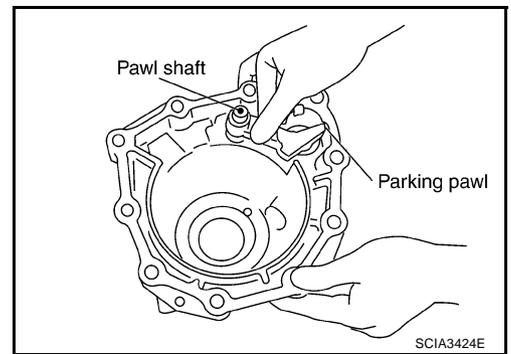
26. Install return spring (1) to parking pawl (2).



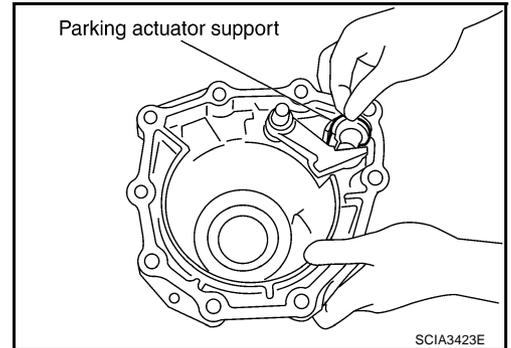
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# ASSEMBLY

27. Install parking pawl (with return spring) and pawl shaft to rear extension.



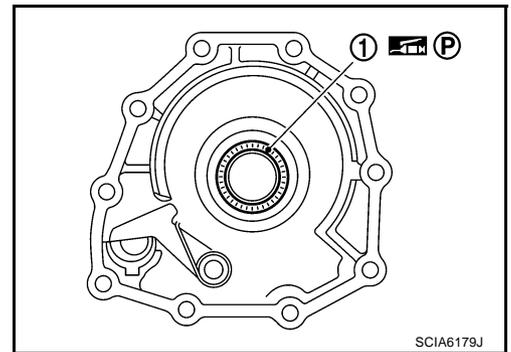
28. Install parking actuator support to rear extension.



29. Install needle bearing (1) to rear extension.

**CAUTION:**

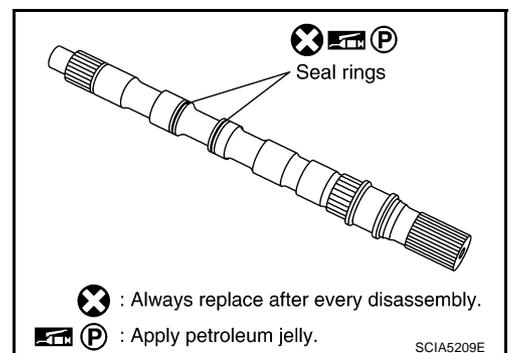
- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#) .
- Apply petroleum jelly to needle bearing.



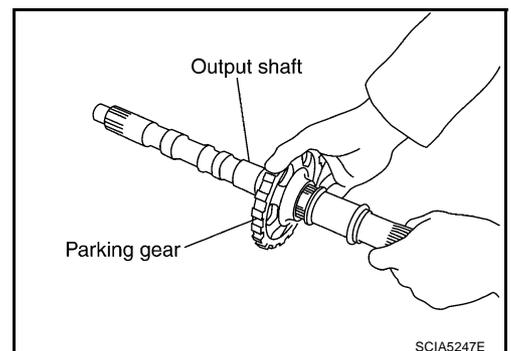
30. Install seal rings to output shaft.

**CAUTION:**

- Do not reuse seal rings.
- Apply petroleum jelly to seal rings.



31. Install parking gear to output shaft.

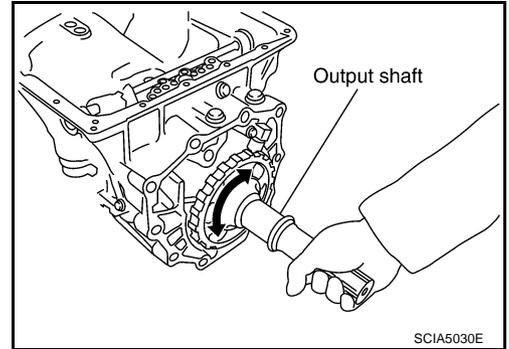


# ASSEMBLY

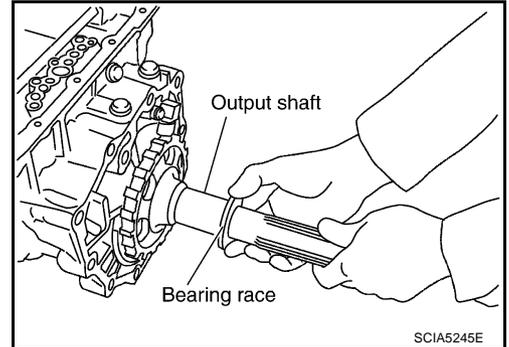
32. Install output shaft in transmission case.

**CAUTION:**

Be careful not to mistake front for rear because both sides looks similar. (Thinner end is front side.)



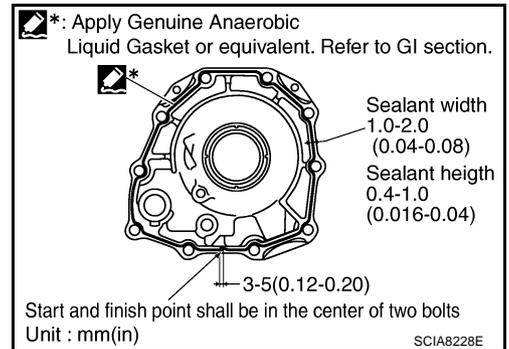
33. Install bearing race to output shaft.



34. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .) to rear extension assembly as shown in the figure.

**CAUTION:**

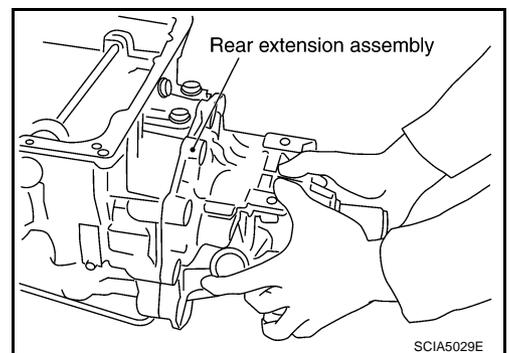
Completely remove all moisture, oil and old sealant, etc. from transmission case and rear extension assembly mounting surfaces.



35. Install rear extension assembly to transmission case.

**CAUTION:**

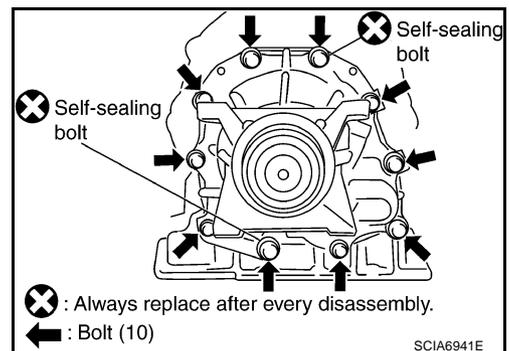
Insert the tip of parking rod between parking pawl and the parking actuator support when assembling rear extension assembly.



36. Tighten rear extension assembly mounting bolts to the specified torque. Refer to [AT-246, "Components"](#) .

**CAUTION:**

Do not reuse self-sealing bolts.



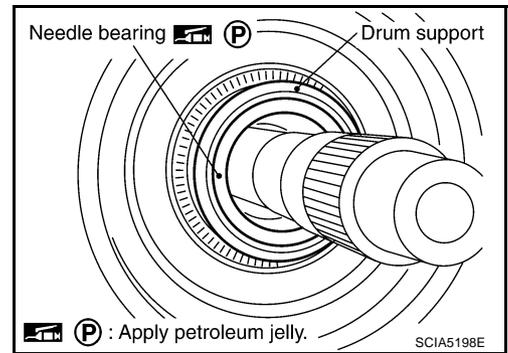
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# ASSEMBLY

37. Install needle bearing in drum support.

**CAUTION:**

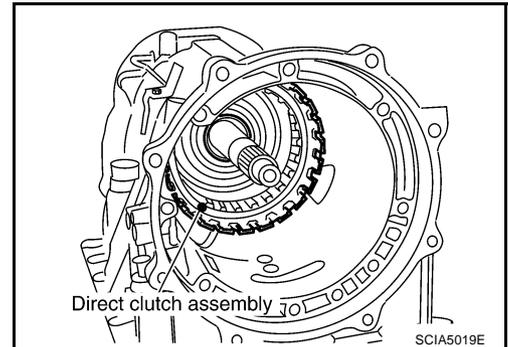
- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#).
- Apply petroleum jelly to needle bearing.



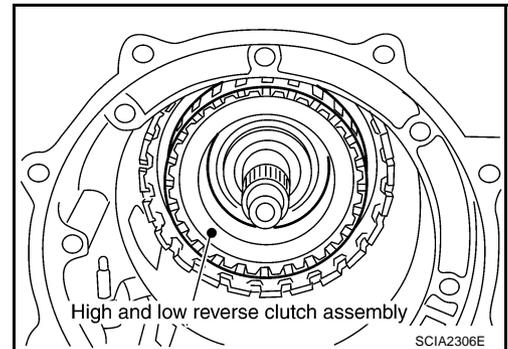
38. Install direct clutch assembly in reverse brake.

**CAUTION:**

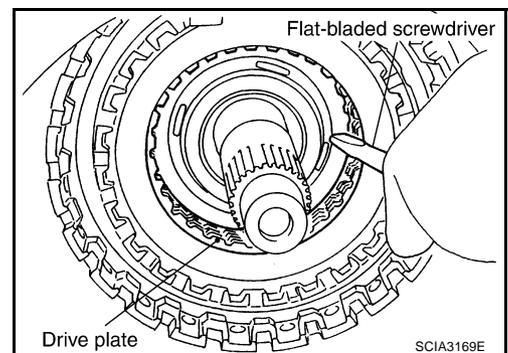
Make sure that drum support edge surface and direct clutch inner boss edge surface come to almost same place.



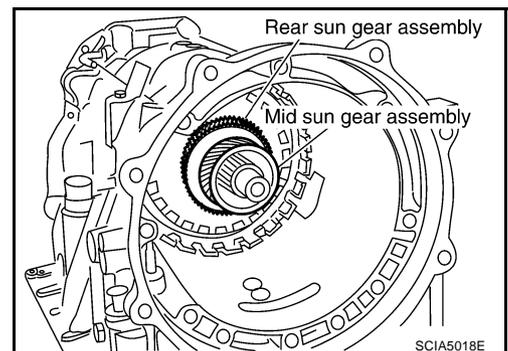
39. Install high and low reverse clutch assembly in direct clutch.



40. Align drive plate using a flat-bladed screwdriver.



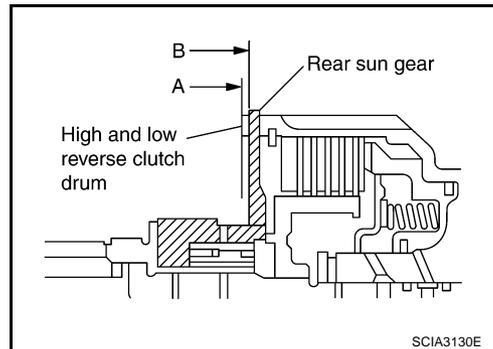
41. Install high and low reverse clutch hub, mid sun gear assembly and rear sun gear assembly as a unit.



# ASSEMBLY

## CAUTION:

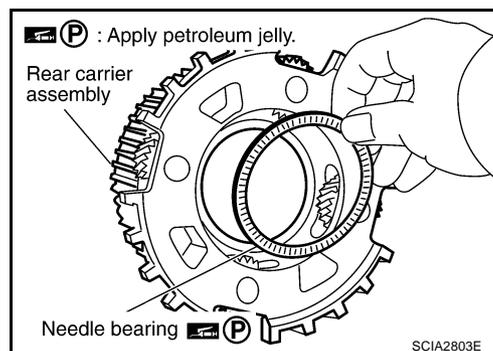
Make sure that portion "A" of high and low reverse clutch drum protrudes approximately 2 mm (0.08 in) beyond portion "B" of rear sun gear.



42. Install needle bearing in rear carrier assembly.

## CAUTION:

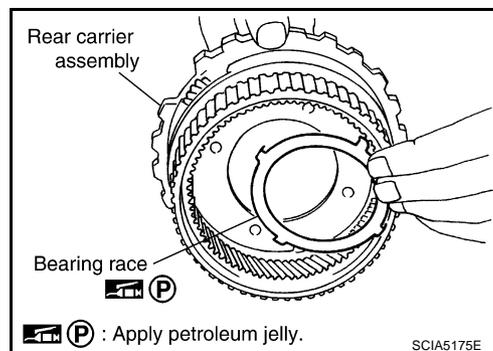
- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#).
- Apply petroleum jelly to needle bearing.



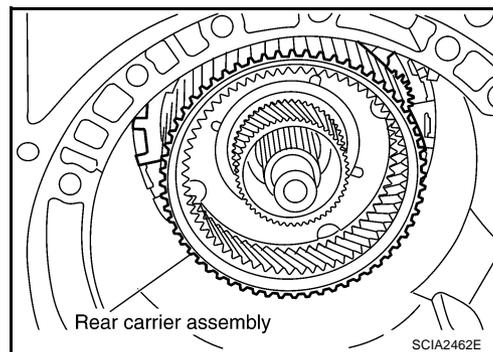
43. Install bearing race in rear carrier assembly.

## CAUTION:

Apply petroleum jelly to bearing race.



44. Install rear carrier assembly in direct clutch drum.



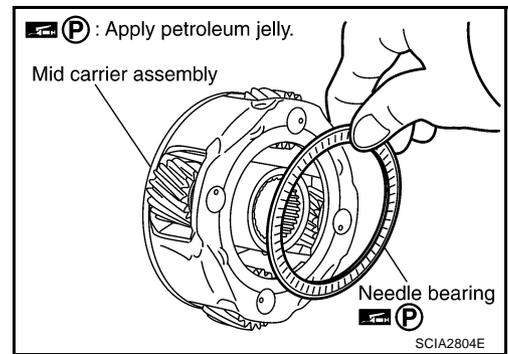
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# ASSEMBLY

45. Install needle bearing (rear side) to mid carrier assembly.

**CAUTION:**

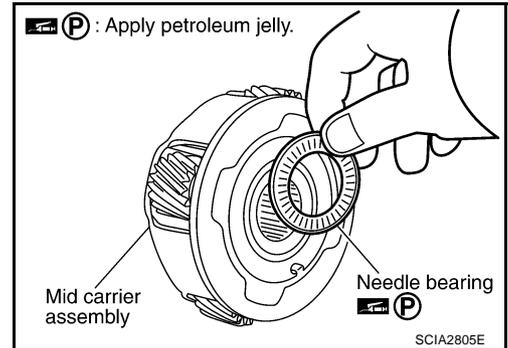
- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#) .
- Apply petroleum jelly to needle bearing.



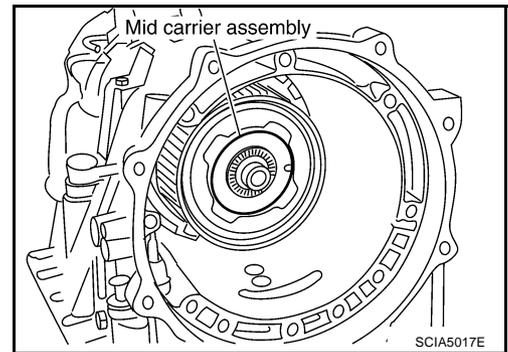
46. Install needle bearing (front side) to mid carrier assembly.

**CAUTION:**

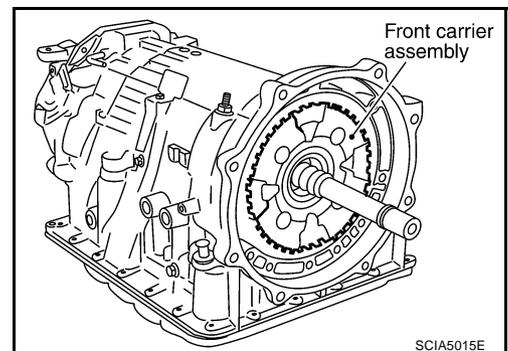
- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#) .
- Apply petroleum jelly to needle bearing.



47. Install mid carrier assembly in rear carrier assembly.



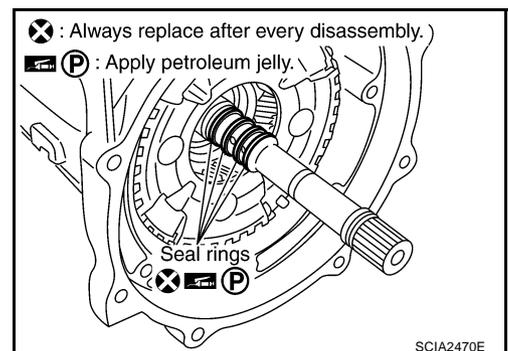
48. Install front carrier assembly, input clutch assembly and rear internal gear as a unit.



49. Install seal rings in input clutch assembly.

**CAUTION:**

- Do not reuse seal rings.
- Apply petroleum jelly to seal rings.

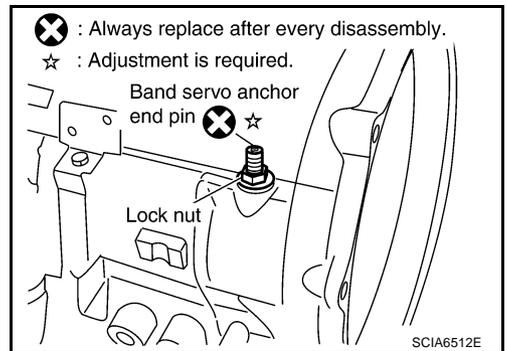


# ASSEMBLY

50. Install band servo anchor end pin and lock nut in transmission case.

**CAUTION:**

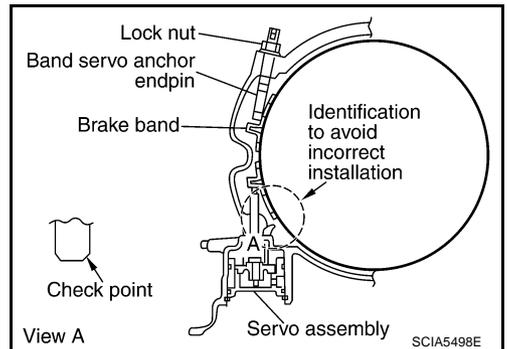
Do not reuse band servo anchor end pin.



51. Install brake band in transmission case.

**CAUTION:**

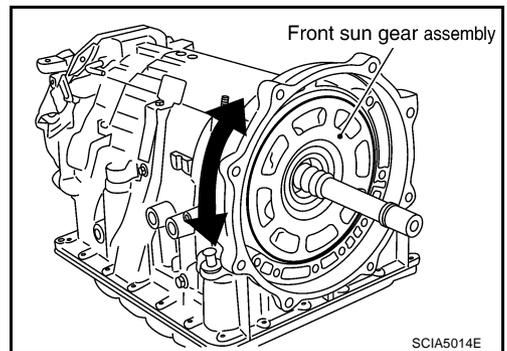
Assemble it so that identification to avoid incorrect installation faces servo side.



52. Install front sun gear to front carrier assembly.

**CAUTION:**

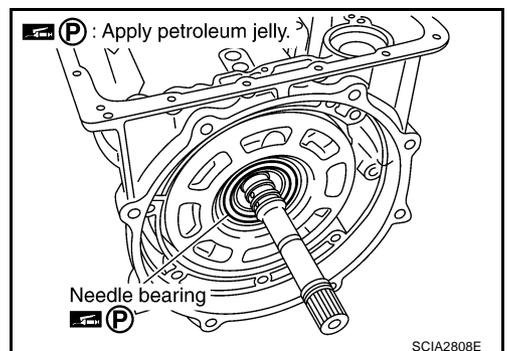
Apply ATF to front sun gear bearing and 3rd one-way clutch end bearing.



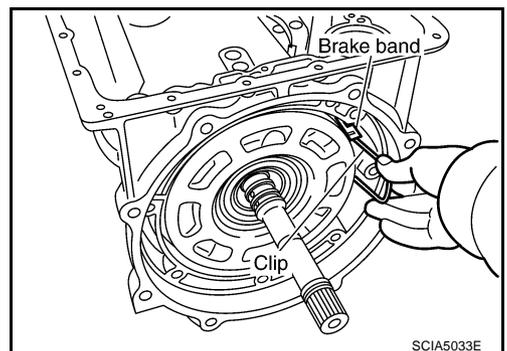
53. Install needle bearing to front sun gear.

**CAUTION:**

- Take care with the direction of needle bearing. Refer to [AT-253, "Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings"](#).
- Apply petroleum jelly to needle bearing.



54. Adjust brake band tilting using a clip so that brake band contacts front sun gear drum evenly.



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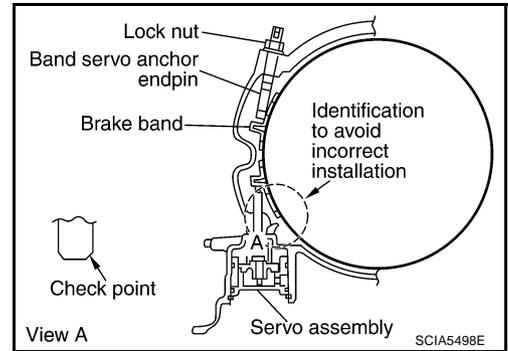
# ASSEMBLY

55. Adjust brake band.

- a. Loosen lock nut.
- b. Tighten band servo anchor end pin to the specified torque.

 : 5.0 N·m (0.51 kg·m, 44 in·lb)

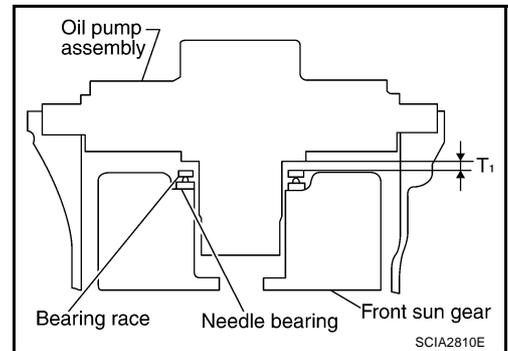
- c. Back of band servo anchor end pin three turns.
- d. Holding band servo anchor end pin, tighten lock nut to the specified torque. Refer to [AT-246, "Components"](#).



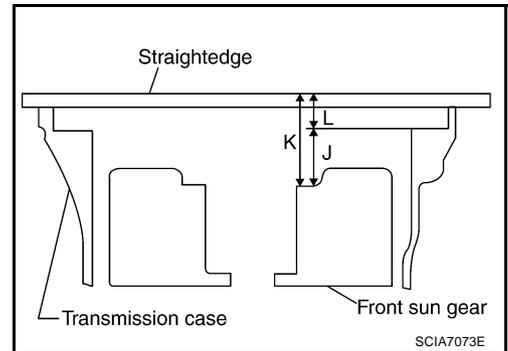
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## Adjustment TOTAL END PLAY

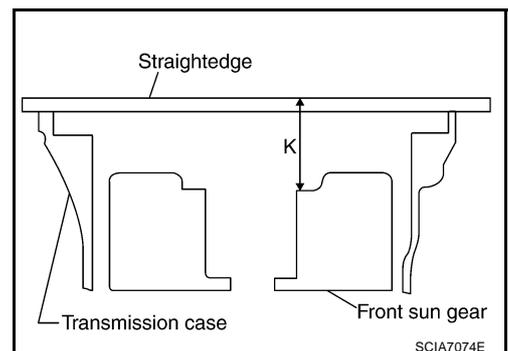
- Measure clearance between front sun gear and bearing race for oil pump cover.
- Select proper thickness of bearing race so that end play is within specifications.



1. Measure dimensions "K" and "L" and then calculate dimension "J".



- a. Measure dimension "K".



# ASSEMBLY

- b. Measure dimension "L".
- c. Calculate dimension "J".

**"J": Distance between oil pump fitting surface of transmission case and needle bearing mating surface of front sun gear.**

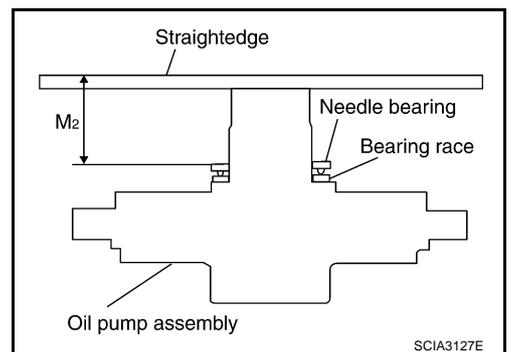
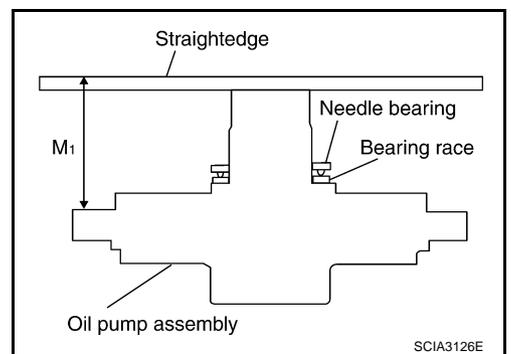
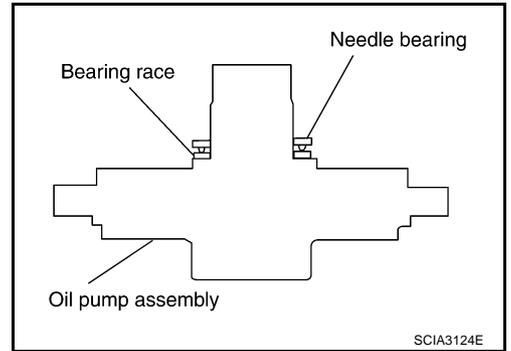
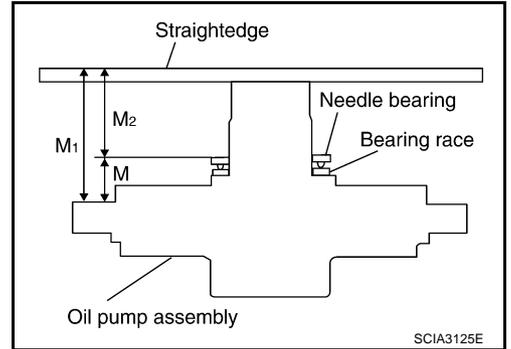
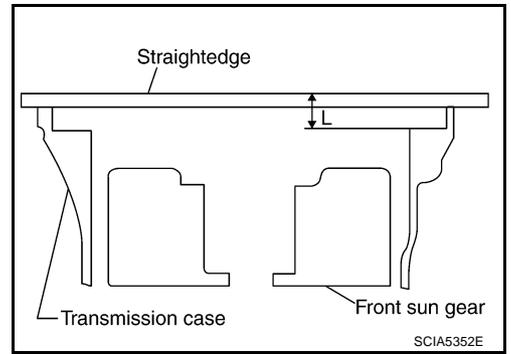
$$J = K - L$$

- 2. Measure dimensions "M1" and "M2" and then calculate dimension "M".

- a. Place bearing race and needle bearing on oil pump assembly.

- b. Measure dimension "M1".

- c. Measure dimension "M2".



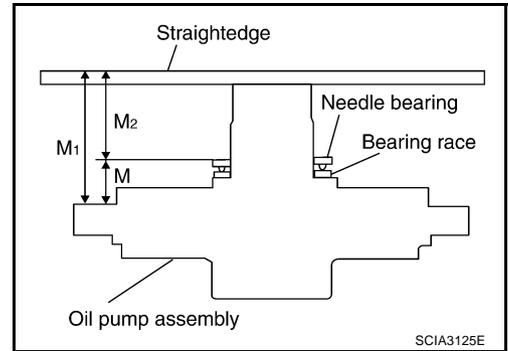
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# ASSEMBLY

d. Calculate dimension "M".

**"M": Distance between transmission case fitting surface of oil pump and needle bearing on oil pump.**

$$M = M_1 - M_2$$



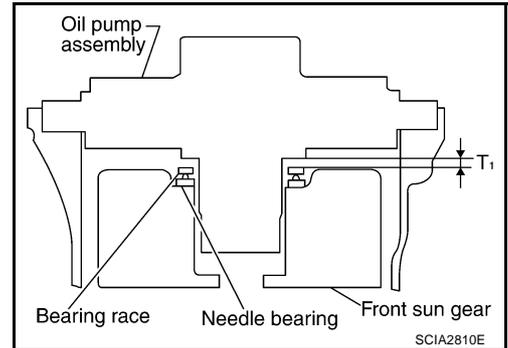
3. Adjust total end play "T1".

$$T_1 = J - M$$

**Total end play "T1":**

**Refer to AT-312, "Total End Play" .**

- Select proper thickness of bearing race so that total end play is within specifications. Refer to "Parts Information" for bearing race selection.

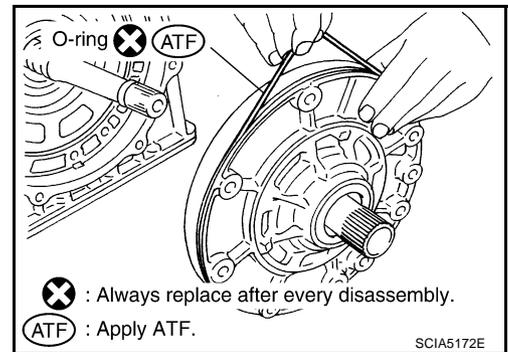


## Assembly (2)

1. Install O-ring to oil pump assembly.

**CAUTION:**

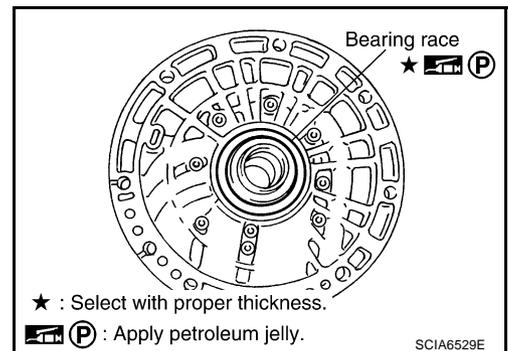
- Do not reuse O-ring.
- Apply ATF to O-ring.



2. Install bearing race to oil pump assembly.

**CAUTION:**

**Apply petroleum jelly to bearing race.**

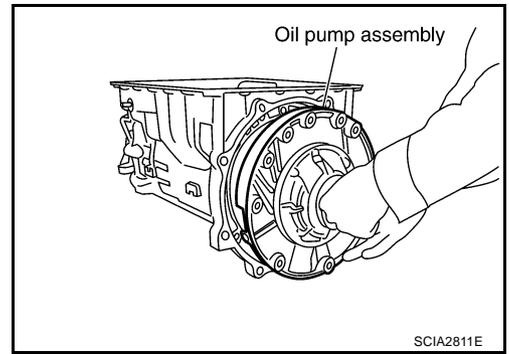


# ASSEMBLY

3. Install oil pump assembly in transmission case.

**CAUTION:**

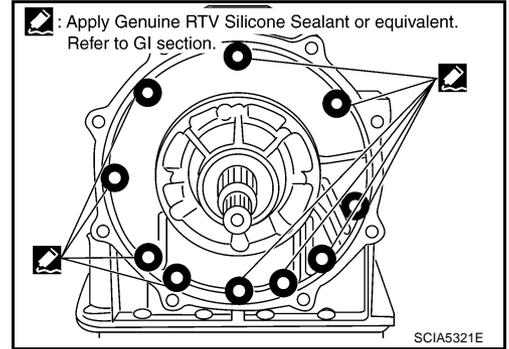
Apply ATF to oil pump bearing.



4. Apply recommended sealant (Genuine RTV Silicone Sealant or equivalent. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#) .) to oil pump assembly as shown in the figure.

**CAUTION:**

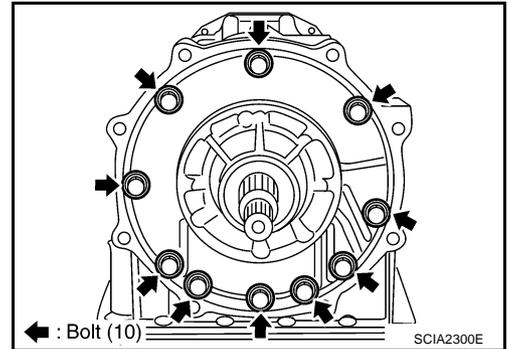
Completely remove all moisture, oil and old sealant, etc. from the oil pump mounting bolts and oil pump mounting bolt mounting surfaces.



5. Tighten oil pump mounting bolts to the specified torque. Refer to [AT-246, "Components"](#) .

**CAUTION:**

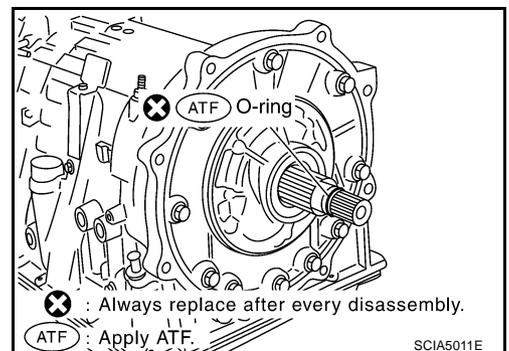
Apply ATF to oil pump bushing.



6. Install O-ring to input clutch assembly.

**CAUTION:**

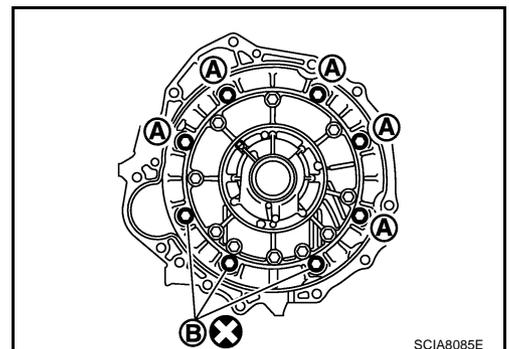
- Do not reuse O-ring.
- Apply ATF to O-ring.



7. Install converter housing to transmission case, and then tighten converter housing bolts (A) and self-sealing bolts (B) to the specified torque. Refer to [AT-246, "Components"](#) .

**CAUTION:**

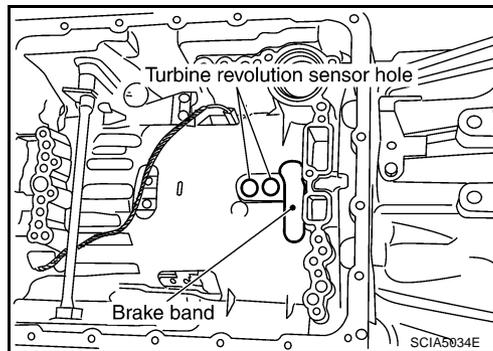
Do not reuse self-sealing bolts (B).



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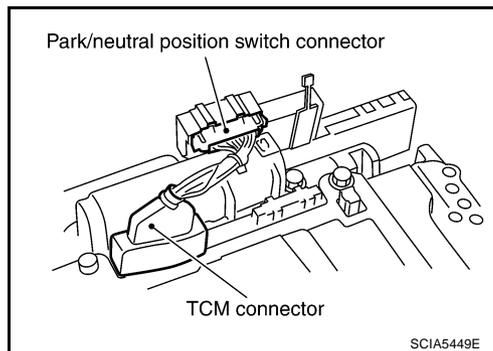
# ASSEMBLY

8. Make sure that brake band does not close turbine revolution sensor hole.

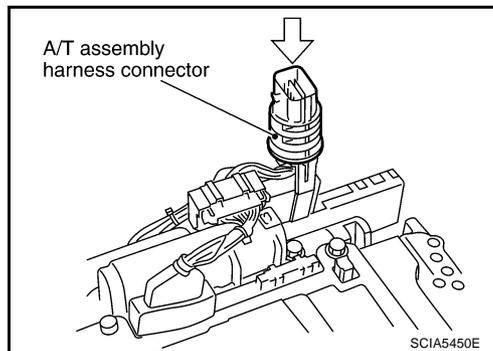


9. Install control valve with TCM.

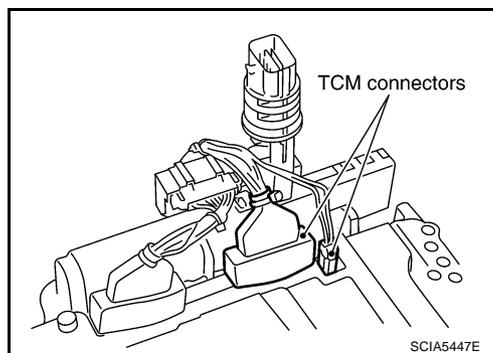
- a. Connect TCM connector and park/neutral position switch connector.



- b. Install A/T assembly harness connector from control valve with TCM.



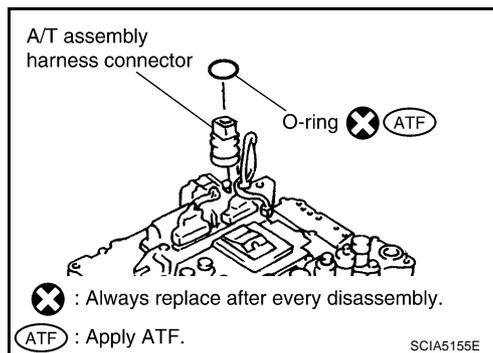
- c. Connect TCM connectors.



- d. Install O-ring to A/T assembly harness connector.

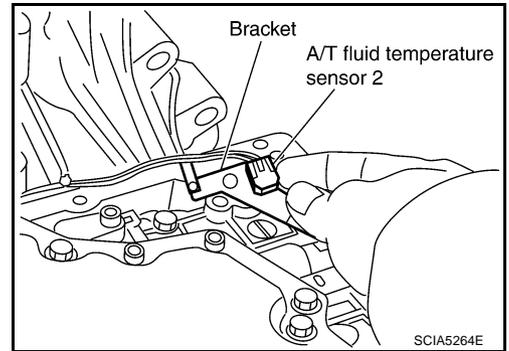
**CAUTION:**

- Do not reuse O-ring.
- Apply ATF to O-ring.



# ASSEMBLY

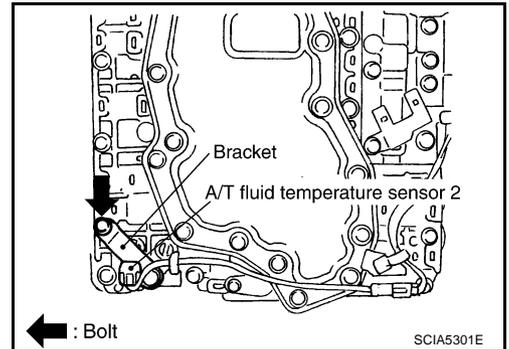
e. Install A/T fluid temperature sensor 2 to bracket.



f. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM, and then tighten mounting bolt to the specified torque. Refer to [AT-246, "Components"](#).

**CAUTION:**

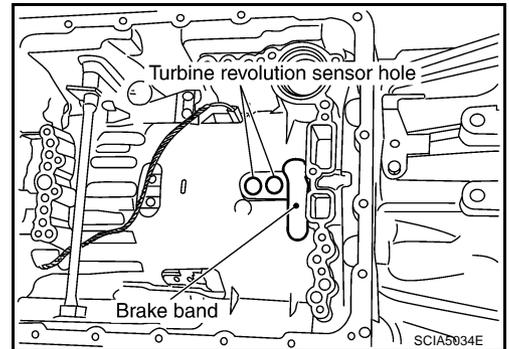
**Adjust bolt hole of bracket to bolt hole of control valve with TCM.**



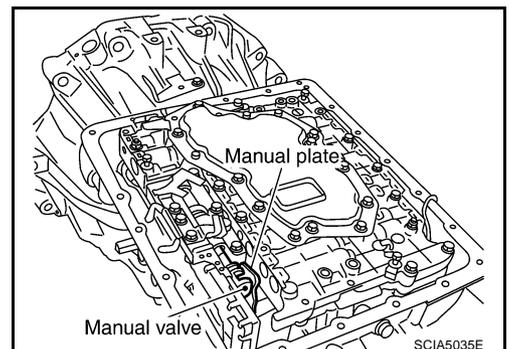
g. Install control valve with TCM in transmission case.

**CAUTION:**

- Make sure that turbine revolution sensor securely installs turbine revolution sensor hole.
- Hang down revolution sensor harness toward outside so as not to disturb installation of control valve with TCM.
- Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.



- Assemble it so that manual valve cutout is engaged with manual plate projection.



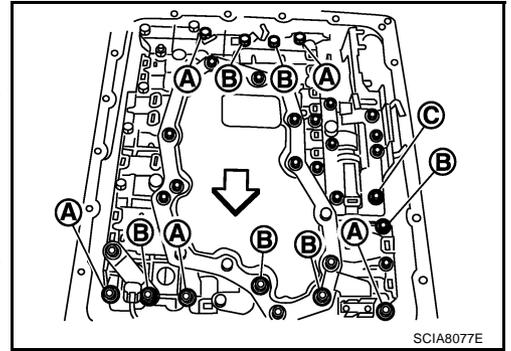
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# ASSEMBLY

h. Install bolts (A), (B) and (C) to control valve with TCM.

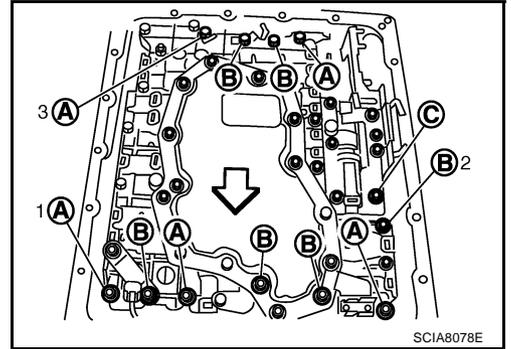
- ←: Front

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



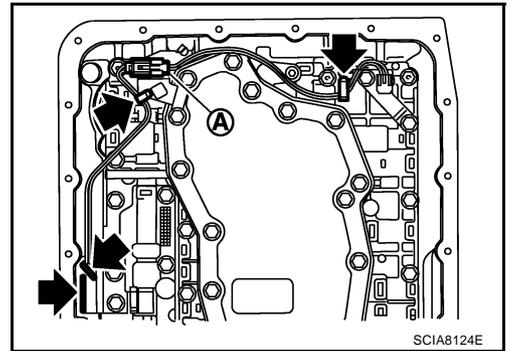
i. Tighten bolt 1, 2 and 3 temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts to the specified torque. Refer to [AT-246, "Components"](#).

- ←: Front

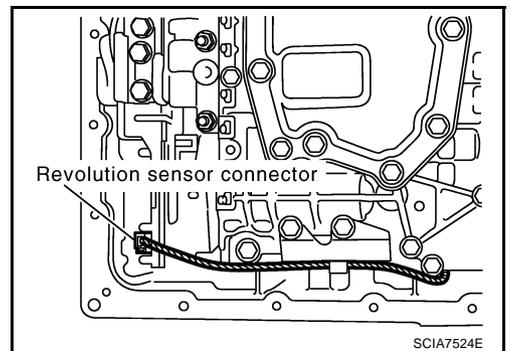


10. Connect A/T fluid temperature sensor 2 connector (A).

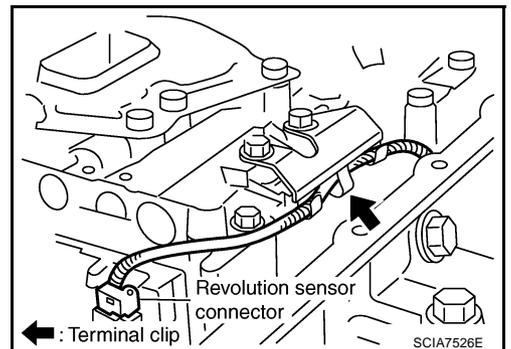
11. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips (←).



12. Connect revolution sensor connector.



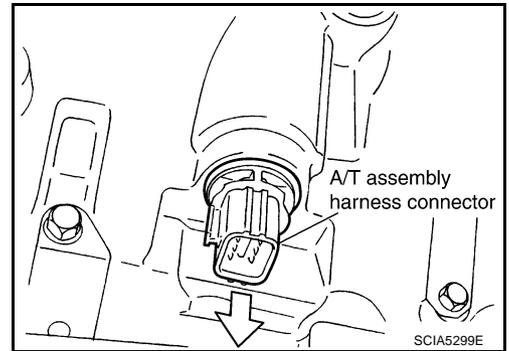
13. Securely fasten revolution sensor harness with terminal clip.



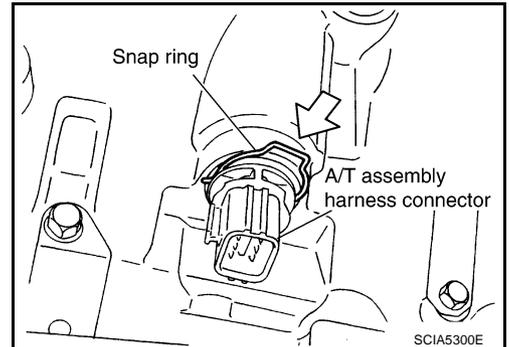
# ASSEMBLY

14. Pull down A/T assembly harness connector.

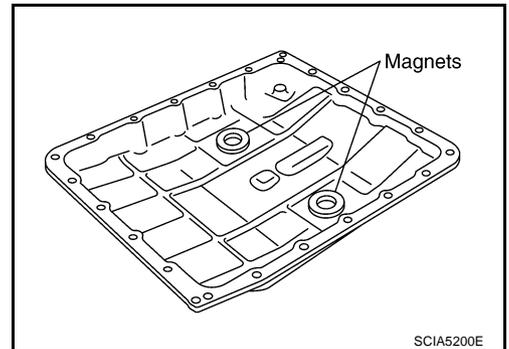
**CAUTION:**  
Be careful not to damage connector.



15. Install snap ring to A/T assembly harness connector.



16. Install magnets in oil pan.



17. Install oil pan to transmission case.

- a. Install oil pan gasket to oil pan.

**CAUTION:**

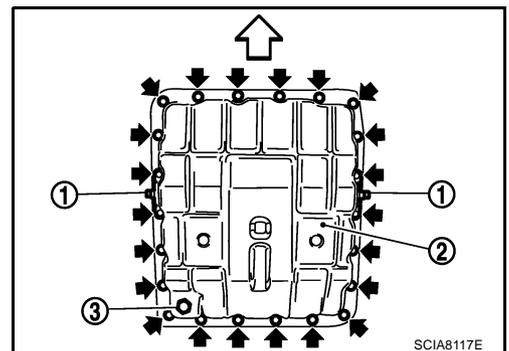
- Do not reuse oil pan gasket.
- Install it in the direction to align hole positions.
- Completely remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.

- b. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

- ⇐: Front
- ←: Oil pan mounting bolt

**CAUTION:**

- Install it so that drain plug (3) comes to the position as shown in the figure.
- Be careful not to pinch harnesses.
- Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.



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# ASSEMBLY

- c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to [AT-246, "Components"](#).

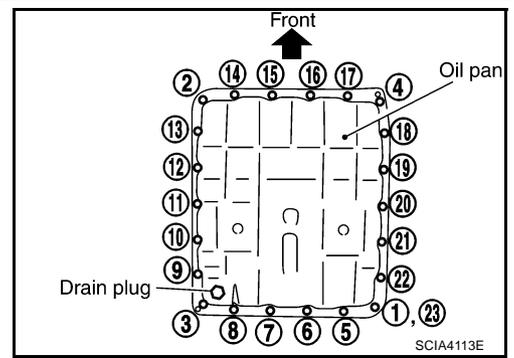
**CAUTION:**

**Do not reuse oil pan mounting bolts.**

18. Install drain plug to oil pan, and then tighten drain plug to the specified torque. Refer to [AT-246, "Components"](#).

**CAUTION:**

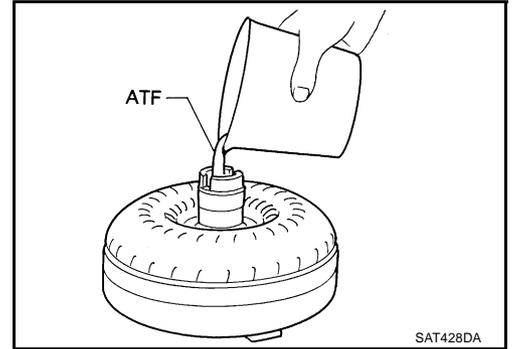
**Do not reuse drain plug gasket.**



19. Install torque converter.

- a. Pour ATF into torque converter.

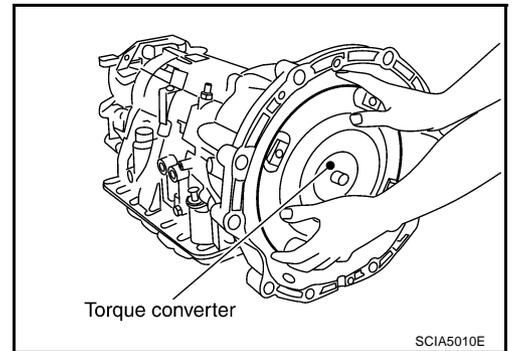
- Approximately 2 liter (2-1/8 US qt, 1-3/4 Imp qt) of ATF is required for a new torque converter.
- When reusing old torque converter, add the same amount of ATF as was drained.



- b. Install torque converter while aligning notches of torque converter with notches of oil pump.

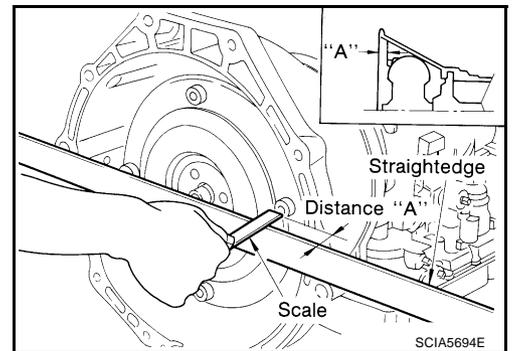
**CAUTION:**

**Install torque converter while rotating it.**



- c. Measure distance "A" to check that torque converter is in proper position.

**Distance "A": 25.0 mm (0.98 in) or more**



# SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

PPF:00030

### General Specifications

NCS0009L

Applied model	VQ35HR engine		
Automatic transmission model	RE5R05A		
Transmission model code number	98X5B		
Stall torque ratio	1.74 : 1		
Transmission gear ratio	1st	3.842	
	2nd	2.353	
	3rd	1.529	
	4th	1.000	
	5th	0.839	
	Reverse	2.765	
Recommended fluid	Genuine NISSAN Matic J ATF <sup>*1</sup>		
Fluid capacity	10.3 liter (10-7/8 US qt, 9-1/8 Imp qt) <sup>*2</sup>		

#### CAUTION:

- Use only Genuine NISSAN Matic J ATF. Do not mix with other fluid.
- Using A/T fluid other than Genuine NISSAN Matic J ATF will cause deterioration driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty.
- <sup>\*1</sup>: Refer to [MA-11, "Fluids and Lubricants"](#).
- <sup>\*2</sup>: The fluid capacity is the reference value. Check the fluid level with A/T fluid level gauge.

### Vehicle Speed at Which Gear Shifting Occurs

NCS0009M

Throttle position	Vehicle speed km/h (MPH)							
	D1 → D2	D2 → D3	D3 → D4	D4 → D5	D5 → D4	D4 → D3	D3 → D2	D2 → D1
Full throttle	50 – 54 (31 – 34)	97 – 105 (60 – 65)	154 – 164 (96 – 102)	224 – 234 (139 – 145)	220 – 230 (137 – 143)	145 – 155 (90 – 96)	86 – 94 (53 – 58)	39 – 43 (24 – 27)
Half throttle	29 – 33 (18 – 21)	63 – 69 (39 – 43)	100 – 108 (62 – 67)	136 – 144 (85 – 89)	88 – 96 (55 – 60)	64 – 72 (40 – 45)	28 – 34 (17 – 21)	9 – 13 (6 – 8)

- At half throttle, the accelerator opening is 4/8 of the full opening.

### Vehicle Speed at Which Lock-up Occurs/Releases

NCS0009N

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up ON	Lock-up OFF
Closed throttle	62 – 70 (39 – 44)	59 – 67 (37 – 42)
Half throttle	136 – 144 (85 – 89)	88 – 96 (55 – 60)

- At closed throttle, the accelerator opening is less than 1/8 condition. (Closed throttle position signal: OFF)
- At half throttle, the accelerator opening is 4/8 of the full opening.

### Stall Speed

NCS0009O

Stall speed	2,700 – 3,000 rpm
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### Line Pressure

NCS0009P

Engine speed	Line pressure kPa (kg/cm <sup>2</sup> , psi)	
	"R" position	"D" and "M" positions
At idle speed	425 – 465 (4.3 – 4.7, 62 – 67)	379 – 428 (3.9 – 4.4, 55 – 62)
At stall speed	1,605 – 1,950 (16.4 – 19.9, 233 – 283)	1,310 – 1,500 (13.4 – 15.3, 190 – 218)

# SERVICE DATA AND SPECIFICATIONS (SDS)

## A/T Fluid Temperature Sensor

NCS0009Q

Name	Condition	CONSULT-III "DATA MONITOR" (Approx.)	Resistance (Approx.)
A/T fluid temperature sensor 1	0°C (32°F)	3.3 V	15 kΩ
	20°C (68°F)	2.7 V	6.5 kΩ
	80°C (176°F)	0.9 V	0.9 kΩ
A/T fluid temperature sensor 2	0°C (32°F)	3.3 V	10 kΩ
	20°C (68°F)	2.5 V	4 kΩ
	80°C (176°F)	0.7 V	0.5 kΩ

## Turbine Revolution Sensor

NCS0009R

Name	Condition	Data (Approx.)
Turbine revolution sensor 1	When running at 50 km/h (31 MPH) in 4th speed with the closed throttle position signal OFF.	1.3 kHz
Turbine revolution sensor 2	When moving at 20 km/h (12 MPH) in 1st speed with the closed throttle position signal OFF.	

## Vehicle Speed Sensor A/T (Revolution Sensor)

NCS0009S

Name	Condition	Data (Approx.)
Revolution sensor	When moving at 20 km/h (12 MPH).	185 Hz

## Reverse Brake

NCS0009T

Model code number	98X5B	
Number of drive plates	6	
Number of driven plates	6	
Clearance mm (in)	Standard	0.7 – 1.1 (0.028 – 0.043)

## Total End Play

NCS0009U

Total end play mm (in)	0.25 – 0.55 (0.0098 – 0.0217)
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