SECTION AT
AUTOMATIC TRANSAXLE

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INDEX FOR DTC

PFP:00024

Alphabetical Index

ECS00A0H

NOTE:
If DTC U1000 is displayed with other DTCs, first perform the trouble diagnosis for DTC U1000. Refer to AT-86 .

Items (CONSULT-II screen terms)	DTC		Reference page
	OBD-II	Except OBD-II	
	CONSULT-II GST*1	CONSULT-II only "TRANSMISSION"	
A/T 1ST GR FNCTN	P0731	P0731	AT-118
A/T 2ND GR FNCTN	P0732	P0732	AT-121
A/T 3RD GR FNCTN	P0733	P0733	AT-127
A/T 4TH GR FNCTN	P0734	P0734	AT-133
A/T 5TH GR FNCTN	P0735	P0735	AT-138
A/T TCC S/V FNCTN	P0744	P0744	AT-144
ATF TEMP SEN/CIRC	P0710	P0710	AT-98
CAN COMM CIRCUIT	U1000	U1000	AT-86
ELEC TH CONTROL	—	P1726	AT-212
ENG SPD INP PERFOR	—	P0726	AT-116
FLUID TEMP SEN	P0711	P0711	AT-103
MANUAL MODE SWITCH	—	P0826	AT-201
PC SOL A(L/PRESS)	P0745	P0745	AT-147
PC SOL B(SFT/PRS)	P0775	P0775	AT-182
PC SOL C(TCC&SFT)	P0795	P0795	AT-191
PC SOL C STC ON	P0797	P0797	AT-196
PNP SW/CIRC	P0705	P0705	AT-93
SHIFT	P0780	P0780	AT-187
SHIFT SOL A	P0750	P0750	AT-152
SHIFT SOL B	P0755	P0755	AT-157
SHIFT SOL C	P0760	P0760	AT-162
SHIFT SOL D	P0765	P0765	AT-172
SHIFT SOL E	P0770	P0770	AT-177
SFT SOL C STUCK ON	P0762	P0762	AT-167
TCM POWER INPT SIG	P0882	P0882	AT-207
TCM PROCESSOR	—	P0613	AT-91
TURBINE SENSOR	P0717	P0717	AT-108
VEH SPD SE/CIR-MTR	—	P0500	AT-89
VHCL SPEED SEN-A/T	P0722	P0722	AT-112

*1: These numbers are prescribed by SAE J2012.

DTC No. Index

ECS00A0I

NOTE:
If DTC U1000 is displayed with other DTCs, first perform the trouble diagnosis for DTC U1000. Refer to AT-86 .

DTC		Items (CONSULT-II screen terms)	Reference page
OBD-II	Except OBD-II		
CONSULT-II GST*1	CONSULT-II only "TRANSMIS-SION"		
—	P0500	VEH SPD SE/CIR-MTR	AT-89
—	P0613	TCM PROCESSOR	AT-91
P0705	P0705	PNP SW/CIRC	AT-93
P0710	P0710	ATF TEMP SEN/CIRC	AT-98
P0711	P0711	FLUID TEMP SEN	AT-103
P0717	P0717	TURBINE SENSOR	AT-108
P0722	P0722	VHCL SPEED SEN-A/T	AT-112
—	P0726	ENG SPD INP PERFOR	AT-116
P0731	P0731	A/T 1ST GR FNCTN	AT-118
P0732	P0732	A/T 2ND GR FNCTN	AT-121
P0733	P0733	A/T 3RD GR FNCTN	AT-127
P0734	P0734	A/T 4TH GR FNCTN	AT-133
P0735	P0735	A/T 5TH GR FNCTN	AT-138
P0744	P0744	A/T TCC S/V FNCTN	AT-144
P0745	P0745	PC SOL A(L/PRESS)	AT-147
P0750	P0750	SHIFT SOL A	AT-152
P0755	P0755	SHIFT SOL B	AT-157
P0760	P0760	SHIFT SOL C	AT-162
P0762	P0762	SFT SOL C STUCK ON	AT-167
P0765	P0765	SHIFT SOL D	AT-172
P0770	P0770	SHIFT SOL E	AT-177
P0775	P0775	PC SOL B(SFT/PRS)	AT-182
P0780	P0780	SHIFT	AT-187
P0795	P0795	PC SOL C(TCC&SFT)	AT-191
P0797	P0797	PC SOL C STC ON	AT-196
—	P0826	MANUAL MODE SWITCH	AT-201
P0882	P0882	TCM POWER INPT SIG	AT-207
—	P1726	ELEC TH CONTROL	AT-212
U1000	U1000	CAN COMM CIRCUIT	AT-86

*1: These numbers are prescribed by SAE J2012.

PRECAUTIONS

PFP:00001

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

ECS00A0J

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

ECS00A0K

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

CAUTION:

- **Be sure to turn the ignition switch “OFF” and disconnect the negative battery cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to light up.**
- **Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to light up due to 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 for A/T Assembly or TCM Replacement

ECS00A0L

- When replacing A/T assembly or TCM, refer to the pattern table below and initialize TCM if necessary.

TCM INITIALIZATION PATTERNS

TCM	A/T assembly	Erasing EEPROM in TCM	Remarks
Replaced with new one	Not replaced	Not required	Not required because the EEPROM in TCM is in the default state.
	Replaced with new or old one		
Not replaced	Replaced with new or old one	Required	Required because data cannot be conformed to previous data written in the EEPROM in TCM.
Replaced with old one	Not replaced		
	Replaced with new or old one		

NOTE:
"Old one" is the TCM or A/T assembly that has been used on other vehicles.

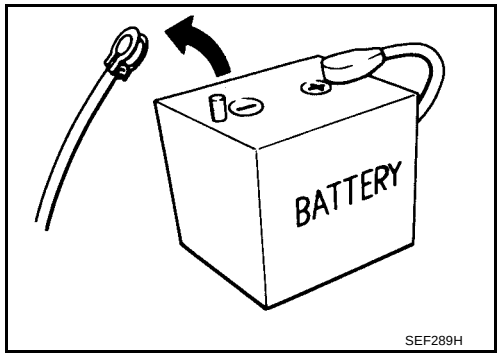
METHOD FOR TCM INITIALIZATION

1. Perform "CONSULT-II SETTING PROCEDURE". Refer to AT-78, "CONSULT-II SETTING PROCEDURE".
2. Set the vehicle following the items listed below.
   - Ignition switch "ON".
   - Selector lever "P" or "N" position.
   - Engine not running.
   - Vehicle speed is 0 km/h (0 MPH).
   - Ignition voltage is more than 10.5V.
   - Malfunction was not detected.
3. Touch "WORK SUPPORT".
4. Touch "INITIALIZATION".
5. Initialize TCM following the direction in display.

Precautions

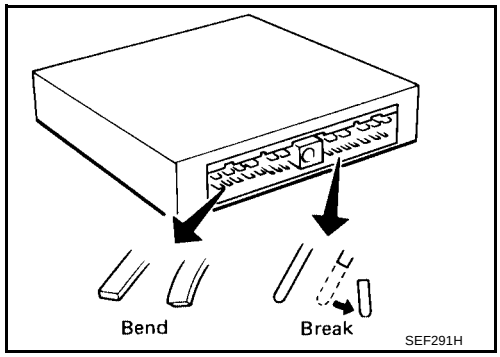
ECS00A0M

- **Before connecting or disconnecting the TCM harness connector, turn ignition switch “OFF” and disconnect negative battery cable. Because battery voltage is applied to TCM even if ignition switch is turned “OFF”.**



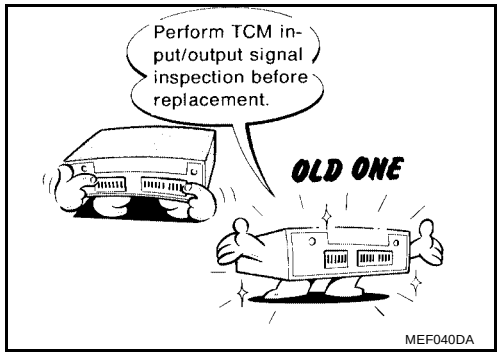
SEF289H

- **When connecting or disconnecting pin connectors into or from TCM, take care not to damage pin terminals (bend or break).**
  Make sure that there are not any bends or breaks on TCM pin terminal, when connecting pin connectors.



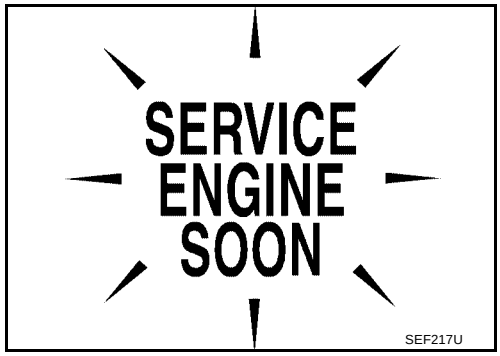
SEF291H

- **Before replacing TCM, perform TCM input/output signal inspection and make sure whether TCM functions properly or not.** **AT-75, "TCM INSPECTION TABLE"**.



MEF040DA

- **After performing each TROUBLE DIAGNOSIS, perform “DTC (Diagnostic Trouble Code) CONFIRMATION PROCEDURE”.**
  The DTC should not be displayed in the “DTC CONFIRMATION PROCEDURE” if the repair is completed.



SEF217U

- Always use the specified brand of A/T fluid. Refer to MA-9, "Fluids and Lubricants" .
- Use paper rags not cloth rags during work.
- After replacing the A/T fluid, dispose of the waste oil using the methods prescribed by law, ordinance, etc.
- Before proceeding with disassembly, thoroughly clean the outside of the transaxle. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Disassembly should be done in a clean work area.

- Use lint-free cloth or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transaxle.
- Place disassembled parts in order for easier and proper assembly.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the transaxle is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Do not use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- After overhaul, refill the transaxle with new ATF.
- When the A/T drain plug is removed, only some of the fluid is drained. Old A/T fluid will remain in torque converter and ATF cooling system.
  Always follow the procedures under “Changing A/T Fluid” in the AT section when changing A/T fluid. Refer to AT-15, "Changing A/T Fluid" , AT-15, "Checking A/T Fluid" .

Service Notice or Precautions

ECS00A0N

ATF COOLER SERVICE

If A/T fluid contains frictional material (clutches, bands, etc.), or if an A/T is repaired, overhauled, or replaced, inspect and clean the A/T oil cooler mounted in the radiator or replace the radiator. Flush cooler lines using cleaning solvent and compressed air after repair. Check Service Bulletins for latest A/T oil cooler cleaning procedure. 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-78, "SELF-DIAG 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-44, "HOW TO ERASE DTC" to complete the repair and avoid unnecessary blinking of the MIL.
- For details of OBD-II, refer to EC-48, "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-64, "HARNESS CONNECTOR" .**

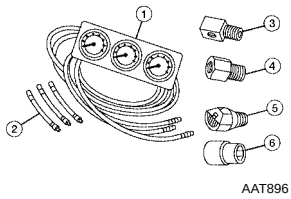
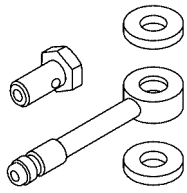
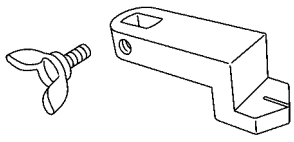
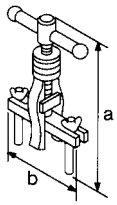
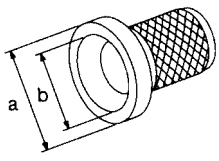
PREPARATION

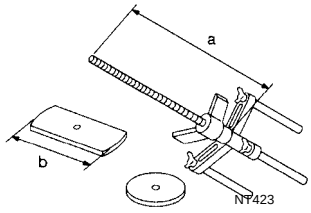
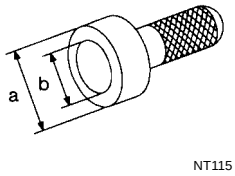
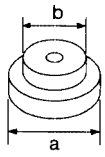
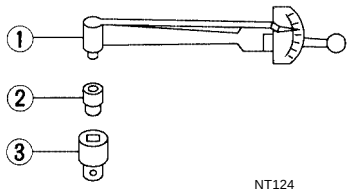
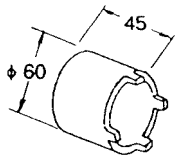
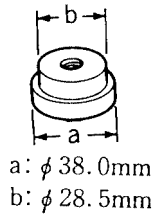
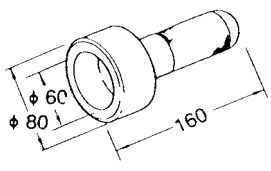
PFP:00002

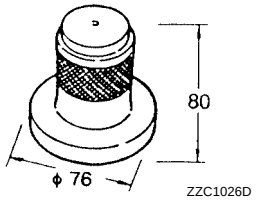
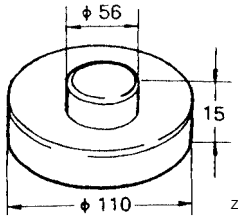
Special Service Tools

ECS00A0P

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

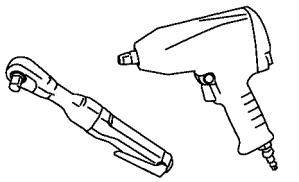
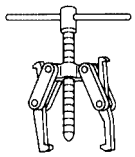
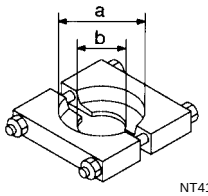
Tool number (Kent-Moore No.) Tool name	Description
— (J-34301-C) Oil pressure gauge set 1 — (J-34301-1) Oil pressure gauge 2 — (J-34301-2) Hoses 3 — (J-34298) Adapter 4 — (J-34282-2) Adapter 5 — (790-301-1230-A) 60° Adapter 6 — (J-34301-15) Square socket  AAT896	Measuring line pressure
KV311J0010 (J-45542) Adapter  SCIA3019E	Measuring line pressure
KV991J0060 (J-45404) Alignment tool  SCIA3018E	Adjusting park/neutral position (PNP) switch
ST33290001 (J-34286) Puller  NT414	● Removing oil pump assembly ● Removing thrust roller bearing **a: 250 mm (9.84 in)** **b: 160 mm (6.30 in)**
ST33400001 (J-26082) Drift  NT086	Installing differential side oil seals **a: 60 mm (2.36 in) dia.** **b: 74 mm (1.85 in) dia.**

Tool number (Kent-Moore No.) Tool name		Description
KV31102400 (J-34285 and J-34285-87) Clutch spring compressor		Removing and installing return springs **a: 320 mm (12.60 in)** **b: 174 mm (6.85 in)**
ST30720000 (J-25405) Drift		● Installing oil seal ● Installing tapered roller bearing **a: 77 mm (3.03 in) dia.** **b: 55.5 mm (2.185 in) dia.**
ST30612000 (J-25742-2) Drift		Removing outer race and adjust shim **a: 62 mm (2.44 in) dia.** **b: 40 mm (1.57 in) dia.**
ST3127S000 (J-25765-A) Preload gauge 1 GG91030000 (J-25765-A) Torque wrench 2 HT62940000 (—) Socket adapter 3 HT62900000 (—) Socket adapter		Checking differential side bearing preload
KV40102500 (J-28815) Drift		
ST33061000 (J-8107-2) Drift		● Removing tapered roller bearing ● Removing manual valve oil seal
KV38100500 (—) Drift		Installing tapered roller bearing

Tool number (Kent-Moore No.) Tool name	Description
KV40100621 (J-25273) Drift  ZZC1026D	Installing outer race and adjust shim
ST30022000 (—) Drift  ZZC0255D	

Commercial Service Tools

ECS00A0Q

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts
Puller  NT077	Removing tapered roller bearing **a: 60 mm (2.36 in) dia.** **b: 35 mm (1.38 in) dia.**
Puller  NT411	

A/T FLUID

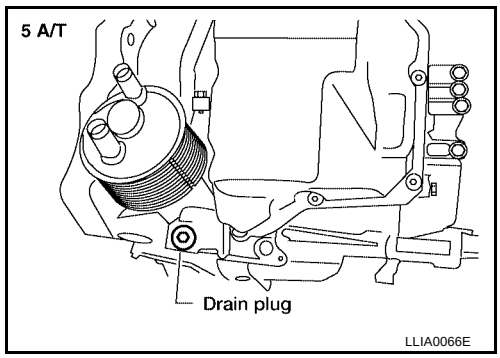
PFP:KLE40

Changing A/T Fluid

ECS00EMV

1. Run the engine to warm up the transaxle until the fluid is at full operating temperature of 50° - 80°C (122° - 176°F).
2. Stop the engine.
3. Drain the A/T fluid by removing the drain plug. Reinstall the drain plug to the specified torque using a new drain washer.

   Drain plug : Refer to AT-249, "Components" .



4. Refill the transaxle with new specified A/T fluid through the A/T fluid charging pipe. Always refill the transaxle with the same volume amount that was drained out.

   CAUTION:
   Do not overfill the transaxle.

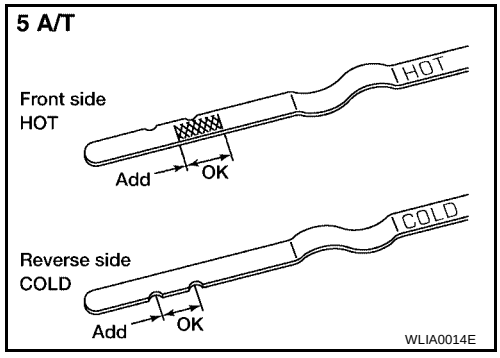
   Fluid grade and capacity : Refer to MA-9, "Fluids and Lubricants" .

5. Run the engine at idle speed for five minutes.
6. Check fluid level and condition. Refer to AT-15, "Checking A/T Fluid" . If the fluid is still contaminated, repeat step 2 through 5.

Checking A/T Fluid

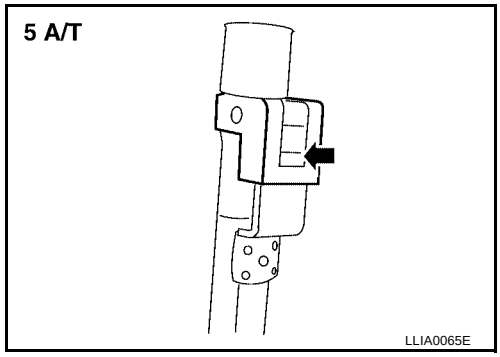
ECS00EMW

1. Warm up the engine.
2. Check for any transaxle fluid leaks.
3. Before driving, the fluid level can be checked at fluid temperatures of 30° - 50°C (86° - 122°F) using the “COLD” range on the A/T fluid level gauge.



   a. Park the vehicle on a level surface and set parking brake.
   b. Start the engine and move the transaxle selector lever through each gear position. Leave the selector lever in the “P” park position.
   c. Check the fluid level with the engine idling.
   d. Remove the A/T fluid level gauge and wipe it clean with a lint-free paper.
   e. Re-insert the A/T fluid level gauge into the charging pipe as far as it will go.
   f. Remove the A/T fluid level gauge and note the reading. If the reading is at or below the low side of the range, add the necessary specified A/T fluid through the A/T fluid charging pipe.

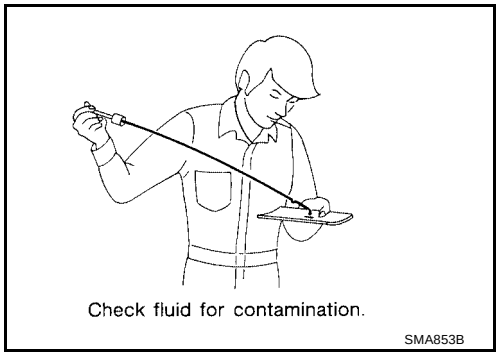
      CAUTION:
      Do not overfill the transaxle.



4. Drive the vehicle for approximately 5 minutes at moderate speeds.
5. Re-check the fluid level at fluid temperatures of 50° - 80°C (122° - 176°F) using the “HOT” range on the A/T fluid level gauge.

   CAUTION:
   Firmly secure the A/T fluid level gauge into the A/T fluid charging pipe using the attached stopper, this will provide an accurate reading on the gauge, and will keep the gauge in position while driving.
6. Check the fluid for the following conditions:

- If the fluid is very dark or smells burned, refer to the AT section for checking the operation of the transaxle. Flush the AT fluid cooling system after repairing the transaxle.



A/T Fluid Cooler Cleaning

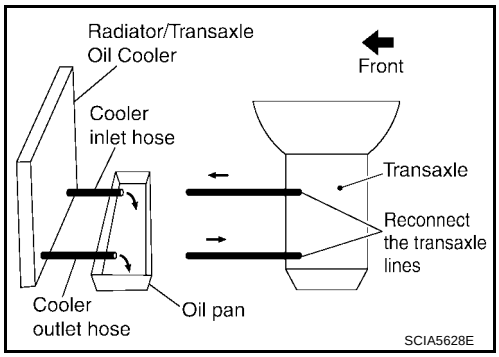
ECS00EMX

Whenever an automatic transaxle is repaired, overhauled, or 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 A/T fluid. In either case, malfunction of the newly serviced A/T may result.
Debris, if present, may build up as A/T fluid 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

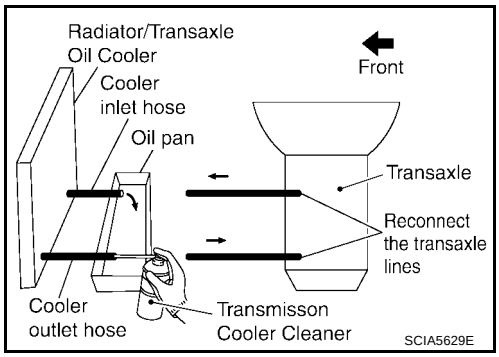
1. Position an oil pan under the automatic transaxle's inlet and outlet cooler hoses.
2. Identify the inlet and outlet fluid cooler hoses.
3. Disconnect the fluid cooler inlet and outlet rubber hoses from the steel cooler tubes or bypass valve.

   NOTE:
   Replace the cooler hoses if rubber material from the hose remains on the tube fitting.
4. Allow any A/T fluid that remains in the cooler hoses to drain into the oil pan.

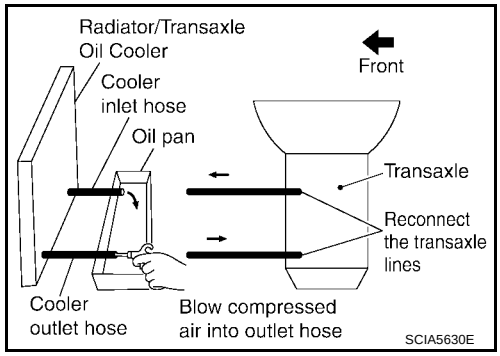


5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray 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 fluid flows out of the cooler inlet hose for 5 seconds.



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.



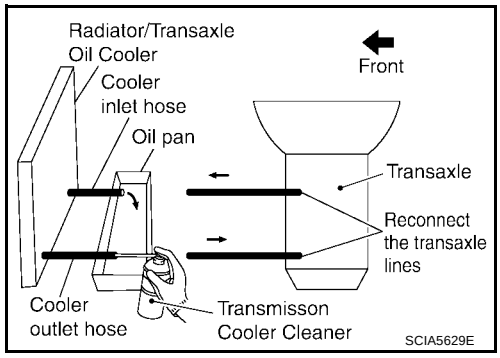
9. Blow compressed air regulated to 5 - 9 kg/cm^2 (70 - 130 psi) through the cooler outlet hose for 10 seconds to force out any remaining fluid.
10. Repeat steps 5 through 9 three additional times.
11. Position an oil pan under the banjo bolts that connect the fluid cooler steel lines to the transaxle.
12. Remove the banjo bolts.
13. Flush each steel line from the cooler side back toward the transaxle by spraying Transmission Cooler Cleaner in a continuous stream for 5 seconds.
14. Blow compressed air regulated to 5 - 9 kg/cm^2 (70 - 130 psi) through each steel line from the cooler side back toward the transaxle for 10 seconds to force out any remaining fluid.
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 A/T fluid cooler diagnosis procedure. Refer to AT-17, "A/T FLUID COOLER DIAGNOSIS PROCEDURE" .

A/T FLUID COOLER DIAGNOSIS PROCEDURE

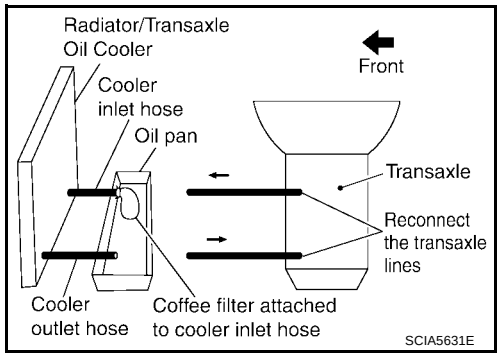
NOTE:
Insufficient cleaning of the cooler inlet hose exterior may lead to inaccurate debris identification.

1. Position an oil pan under the automatic transaxle's 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.

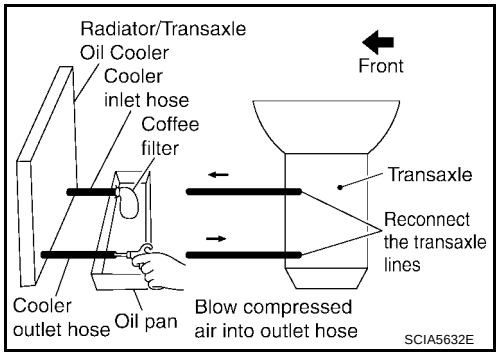
   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray cooler cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Do not breath vapors or spray mist.**
4. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until fluid 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.



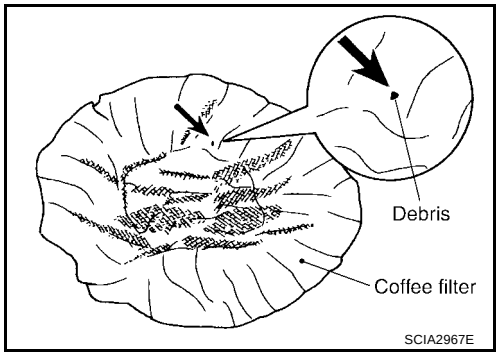
6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 - 9 kg/cm^2 (70 - 130 psi) through the cooler outlet hose to force any remaining A/T fluid into the coffee filter.
9. Remove the coffee filter from the end of the cooler inlet hose.
10. Perform A/T fluid cooler inspection procedure. Refer to AT-18, "A/T FLUID COOLER INSPECTION PROCEDURE" .



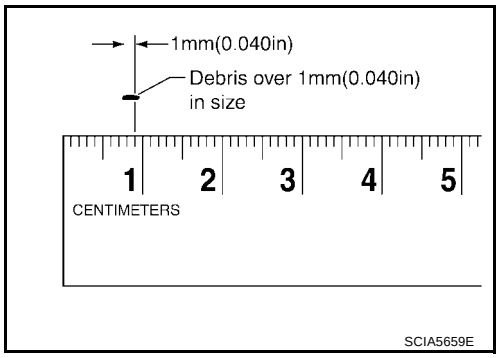
A/T FLUID COOLER INSPECTION PROCEDURE

1. Inspect the coffee filter for debris.

a. If small metal debris less than 1mm (0.040 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 1mm (0.040 in) in size and/or peeled clutch facing material is found in the coffee filter, the fluid cooler is not serviceable. The A/T fluid cooler/radiator must be replaced and the inspection procedure is ended. Refer to CO-13, "Removal and Installation" .



A/T FLUID COOLER FINAL INSPECTION

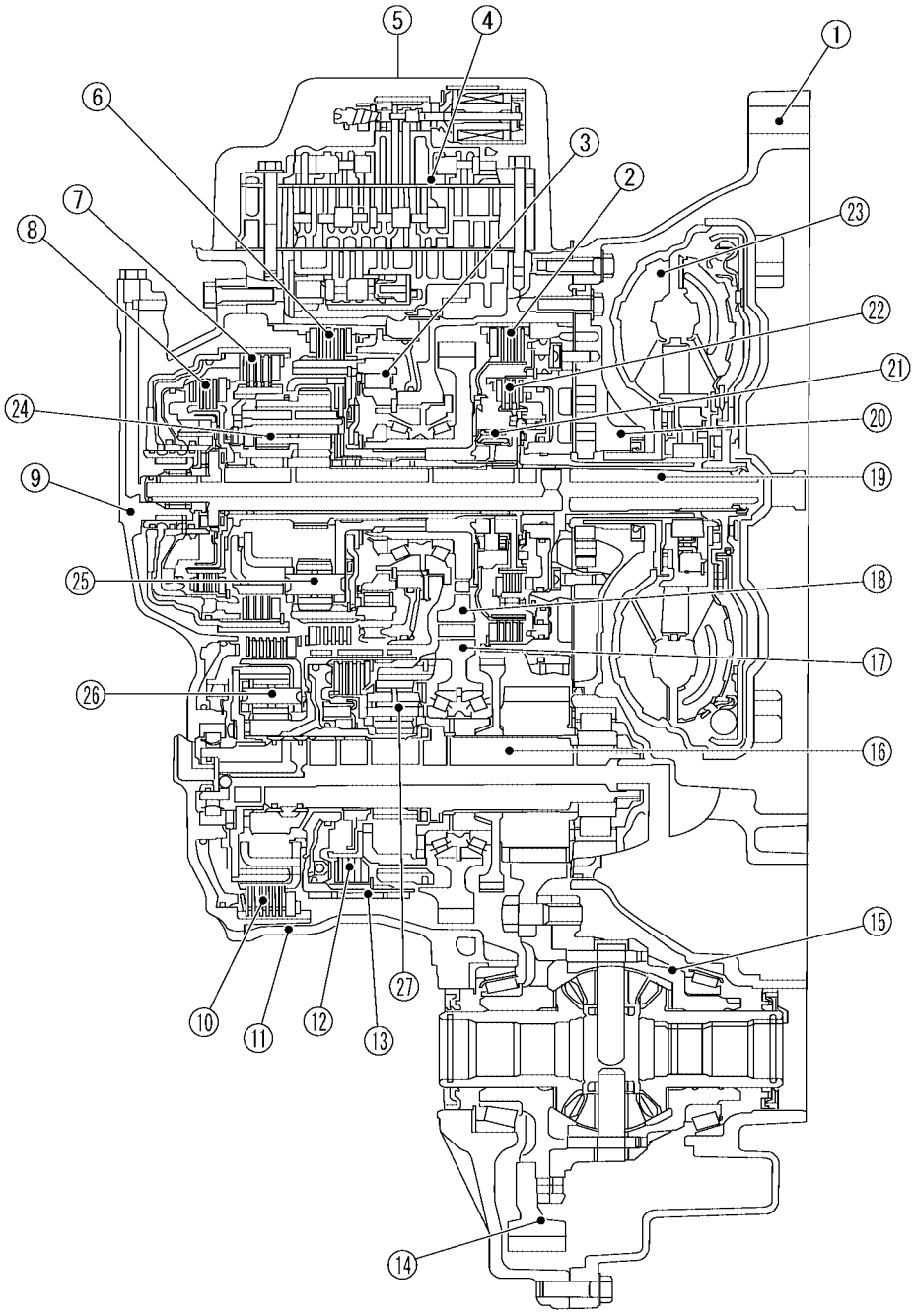
After performing all procedures, ensure that all remaining oil is cleaned from all components.

A/T CONTROL SYSTEM

PFP:31036

Cross-Sectional View

ECS00A0T



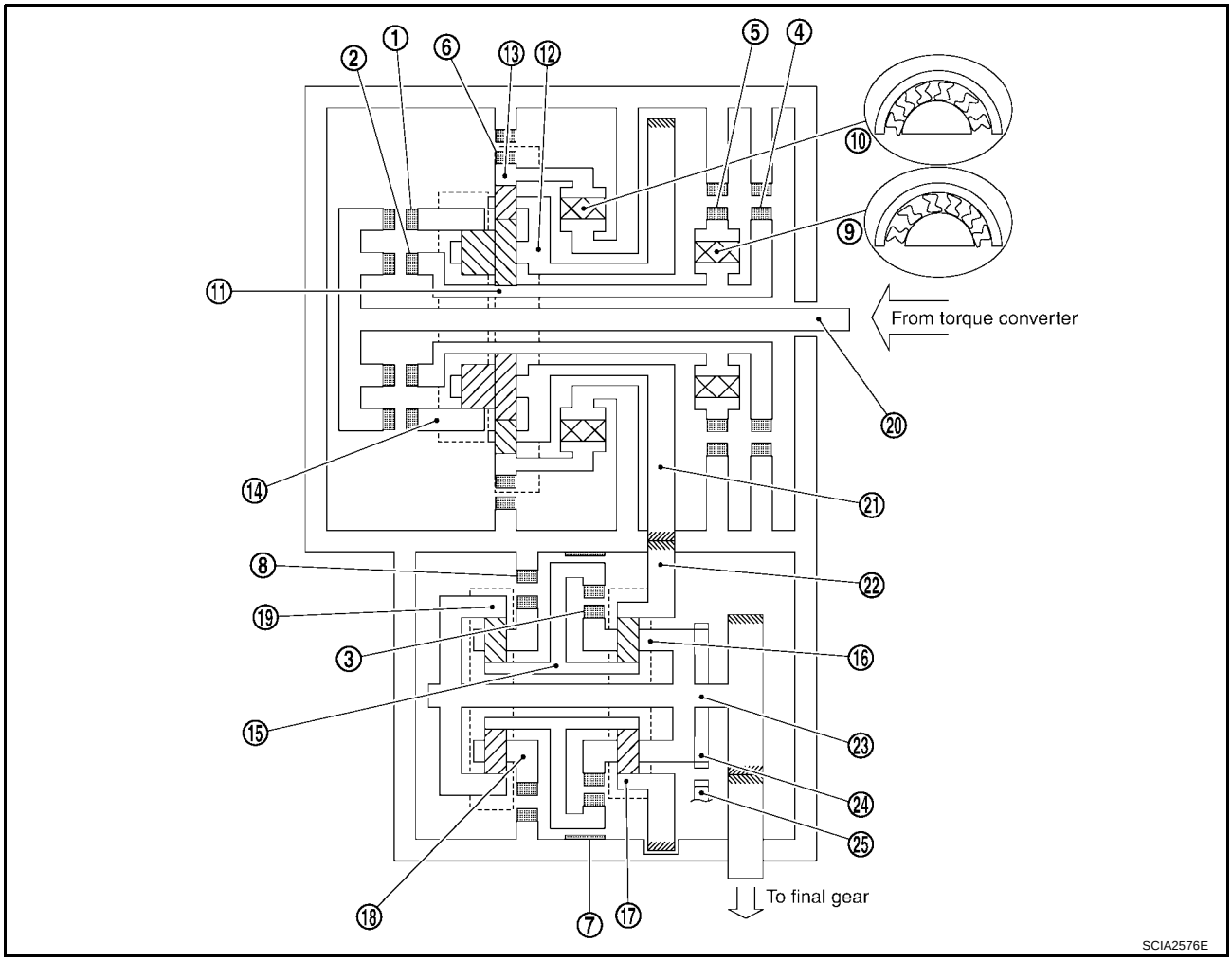
SCIA2575E

1. Converter housing
2. 2nd brake
3. One-way clutch No. 2
4. Control valve assembly
5. Side cover
6. 1st and reverse brake
7. Forward clutch
8. Direct clutch
9. Transaxle case cover
10. B5 brake
11. Transaxle case
12. U/D clutch
13. U/D brake
14. Final gear
15. Differential case
16. Output shaft
17. Counter driven gear
18. Counter drive gear
19. Input shaft
20. Oil pump
21. One-way clutch No. 1
22. 2nd coast brake
23. Torque converter
24. Main rear planetary gear
25. Main front planetary gear
26. U/D rear planetary gear
27. U/D front planetary gear

Shift Mechanism

ECS00A0U

CONSTRUCTION



1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

FUNCTION OF CLUTCH AND BRAKE

Clutch and brake components	Abbr.	Function
Forward clutch **1**	F/C	Connect input shaft **20** to main rear internal gear **10** .
Direct clutch **2**	D/C	Connect input shaft **20** to main sun gear **11** .
U/D clutch **3**	U/D.C	Connect U/D sun gear **15** to U/D front planetary carrier **16** .
2nd coast brake **4**	2nd C/B	Lock main sun gear **11** .
2nd brake **5**	2nd/B	Lock counterclockwise rotation of main sun gear **11** .
1st and reverse brake **6**	1st & R/B	Lock main front internal gear **13** .
U/D brake **7**	U/D.B	Lock U/D sun gear **15** .
B5 brake **8**	B5/B	Lock U/D rear planetary carrier **18** .
One-way clutch No. 1 **9**	O.C1	Lock counterclockwise rotation of main sun gear **11** , when 2nd brake **5** operations.
One-way clutch No. 2 **10**	O.C2	Lock counterclockwise rotation of main front internal gear **13** .

CLUTCH AND BAND CHART

Shift position		Clutch			Brake					One-way clutch		Remarks
		F/C **1**	D/C **2**	U/D.C **3**	2nd C/B **4**	2nd/B **5**	1st & R/B **6**	U/D.B **7**	B5/B **8**	O.C1 **9**	O.C2 **10**	
P									○			PARK POSITION
R			○				○		○			REVERSE POSITION
N									○			NEUTRAL POSITION
D	1st	○							○		○	Automatic shift 1 ⇔ 2 ⇔ 3 ⇔ 4 ⇔ 5
	1 ⇔ 2	○			△	△			○	△	△	
	2nd	○			○	○			○	○		
	2 ⇔ 3	○			○	○		△	△	○		
	3rd	○			○	○		○		○		
	3 ⇔ 4	○		△	○	○		△		○		
	4th	○		○	○	○				○		
	4 ⇔ 5	○	△	○	△	○				△		
	5th	○	○	○		○						
M5	5th	○	○	○		○						Locks in 5th gear*
M4	4th	○		○	○	○				○		Locks in 4th gear*
M3	3rd	○			○	○		○		○		Locks in 3rd gear*
M2	2nd	○			○	○			○	○		Locks in 2nd gear*
M1	1st	○					○		○		○	Locks in 1st gear*

○: Operates

△: In transition between applied and released.

*: Except when automated up/down shift control and up/down shift permission control are activated. Refer to AT-40, "MANUAL MODE" .

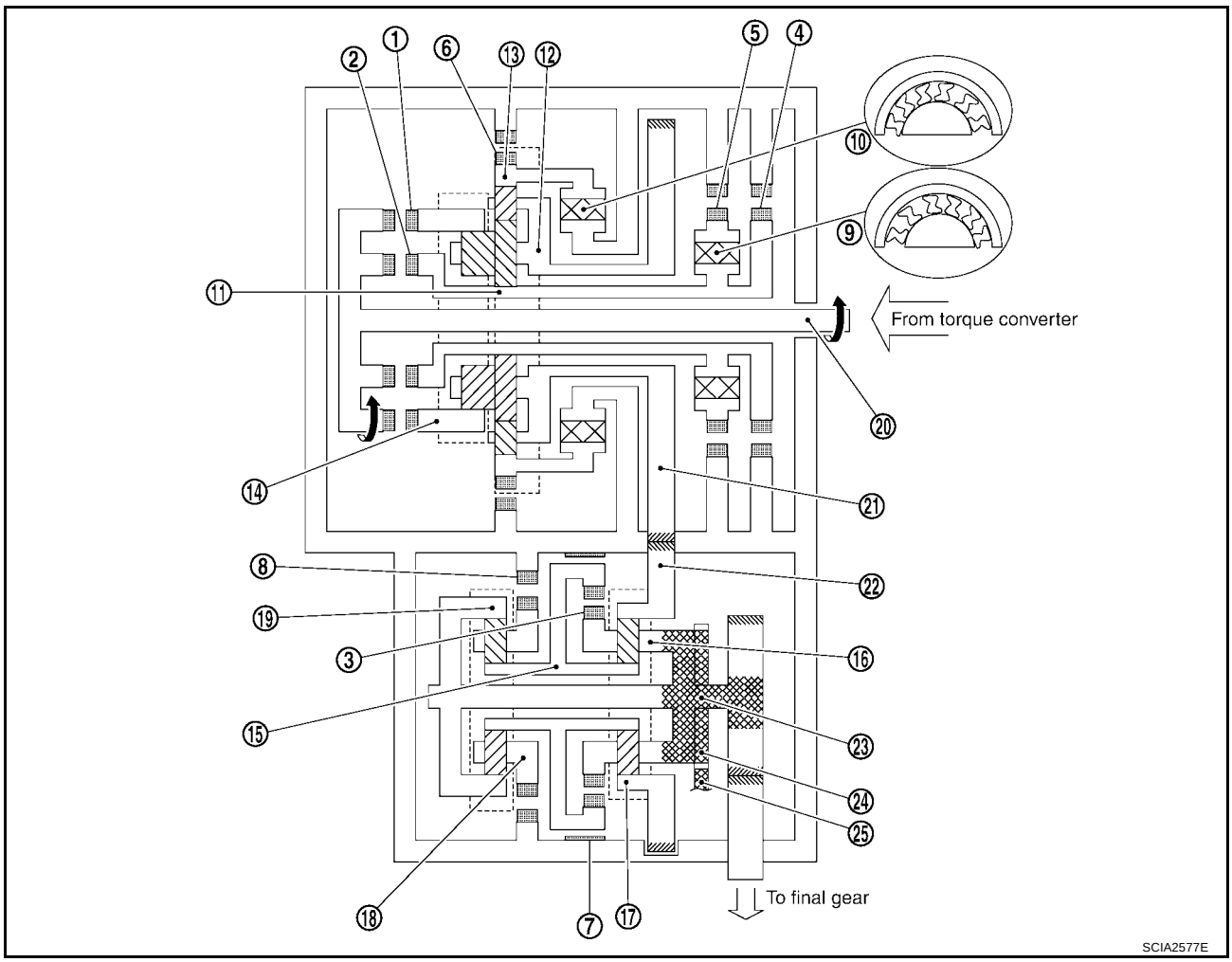
POWER TRANSMISSION

“N” position

Since both the forward clutch and the direct clutch 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 clutch and the direct clutch are released, so torque from the input shaft drive is not transmitted to the output shaft.
- The parking pole linked with the selector lever meshes with the parking gear and fastens the output shaft mechanically.

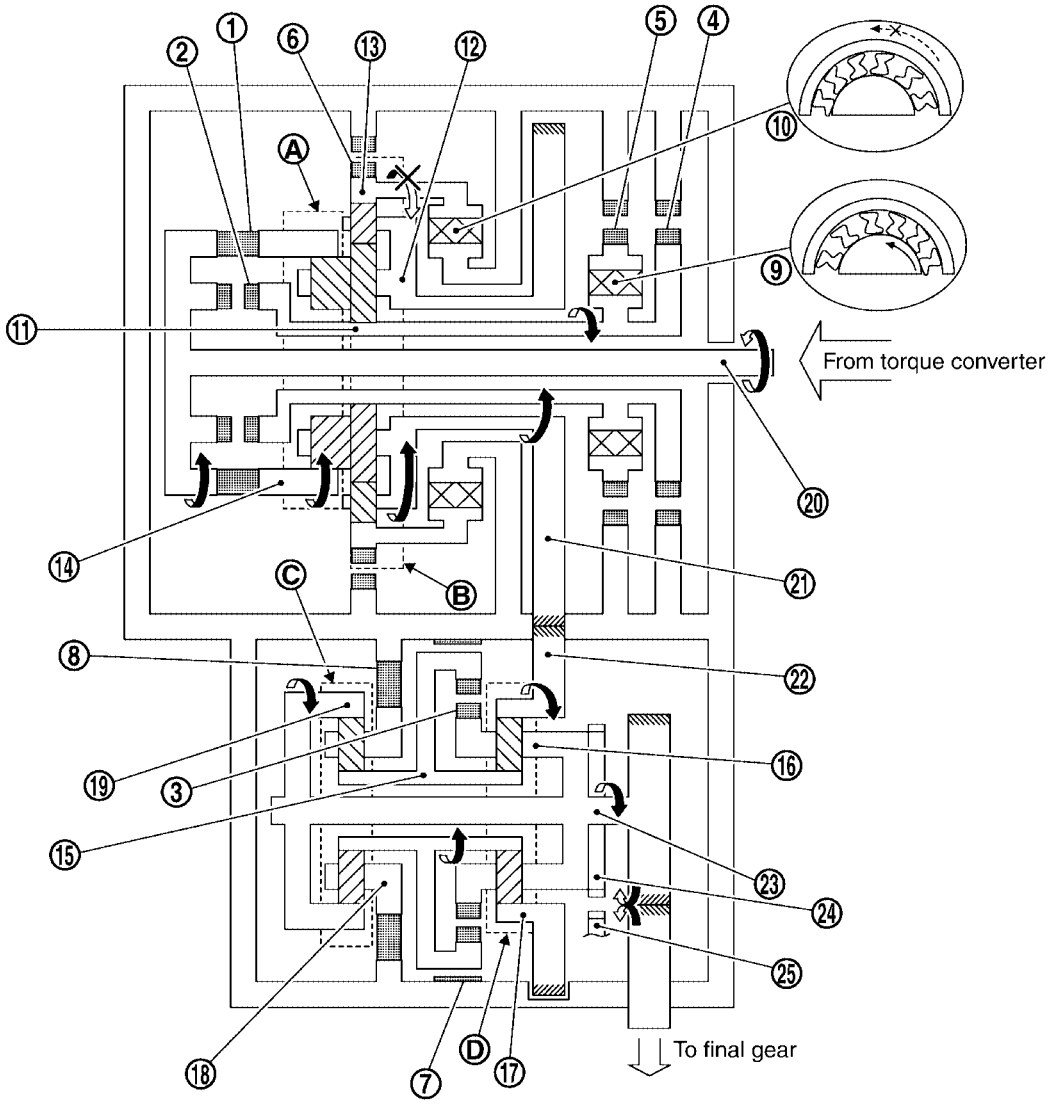


1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“D” position 1st gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Main rear internal gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself clockwise for rear planetary pinion and one.
6. Main front small planetary pinion gear rotates itself counterclockwise.
7. Main front internal gear is going to rotates counterclockwise.
8. One-way clutch No. 2 operates. (Lock counterclockwise rotation of main front internal gear.)
9. Main planetary carrier revolves clockwise due to reaction force of front small planetary pinion gear.
10. Counter drive gear rotates clockwise for main planetary carrier and one.
11. Counter driven gear rotates counterclockwise.
12. U/D front internal gear rotates counterclockwise for counter driven gear and one.
13. U/D front planetary pinion gear rotates itself counterclockwise.
14. U/D sun gear rotates clockwise.
15. U/D rear planetary pinion gear rotates itself counterclockwise.
16. B5 brake operate. (Lock rotation of U/D rear planetary carrier.)
17. U/D rear internal gear rotates counterclockwise.
18. U/D front planetary carrier and output shaft rotates counterclockwise for U/D rear internal gear and one.
19. Final gear clockwise.

- During deceleration, main front internal gear clockwise due to rotation itself clockwise of main front small planetary pinion gear, but driving force loses due to free of one-way clutch No. 2. Therefore, engine brake does not operate.



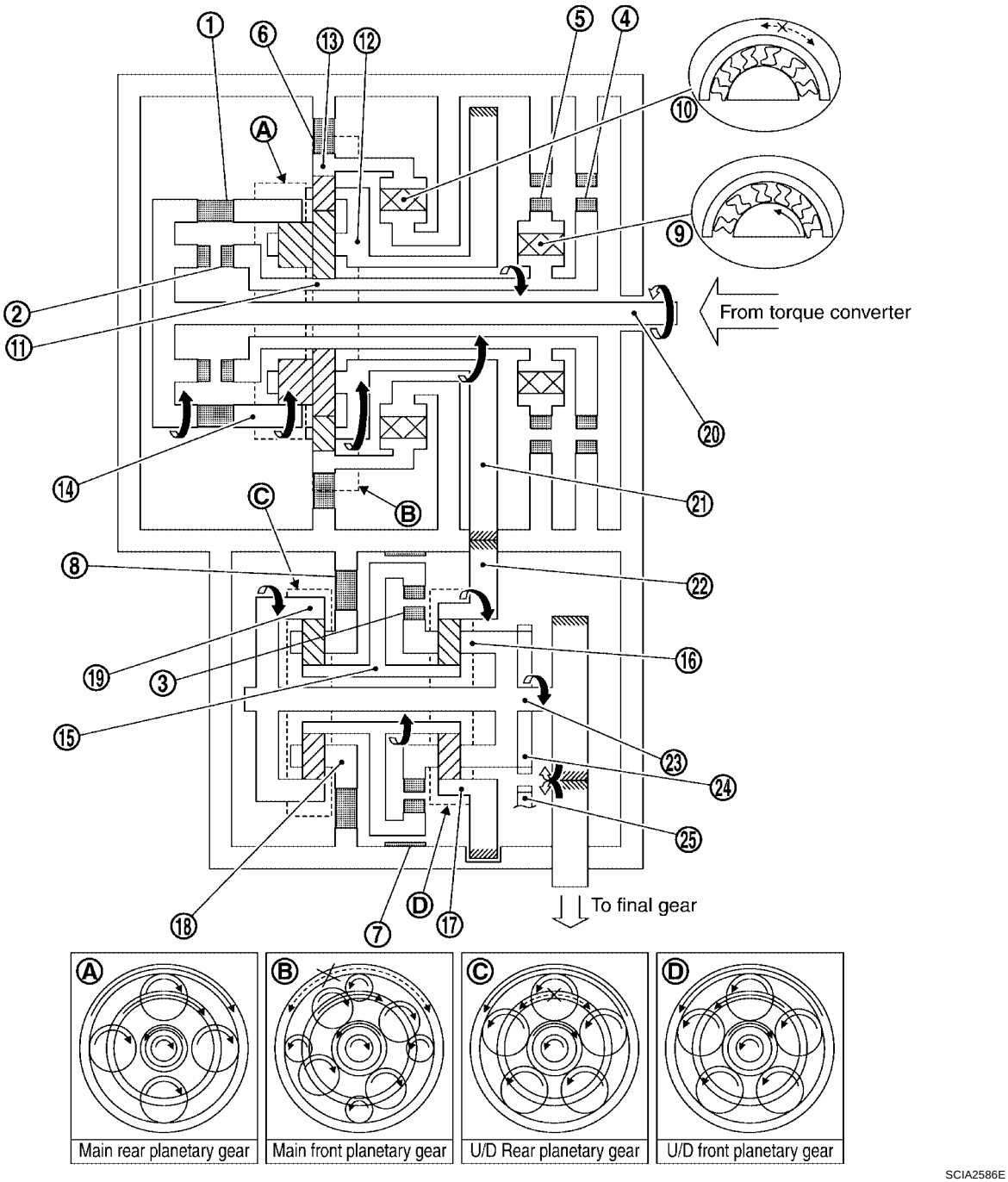
SCIA2585E

1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“M1” position 1st gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Main rear internal gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself clockwise for rear planetary pinion gear and one.
6. Main front small planetary pinion gear rotates itself counterclockwise.
7. Main front internal gear is going to rotates counterclockwise.
8. 1st and reverse brake operates. (Lock rotation of main front internal gear.)
9. Main planetary carrier revolves clockwise due to reaction force of front small planetary pinion gear.
10. Counter drive gear rotates clockwise for main planetary carrier and one.
11. Counter driven gear rotates counterclockwise.
12. U/D front internal gear rotates counterclockwise for counter driven gear and one.
13. U/D front planetary pinion gear rotates itself counterclockwise.
14. U/D sun gear rotates clockwise.
15. U/D rear planetary pinion gear rotates itself counterclockwise.
16. B5 brake operate. (Lock rotation of U/D rear planetary carrier.)
17. U/D rear internal gear rotates counterclockwise.
18. U/D front planetary carrier and output shaft rotates counterclockwise for U/D rear internal gear and one.
19. Final gear clockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.



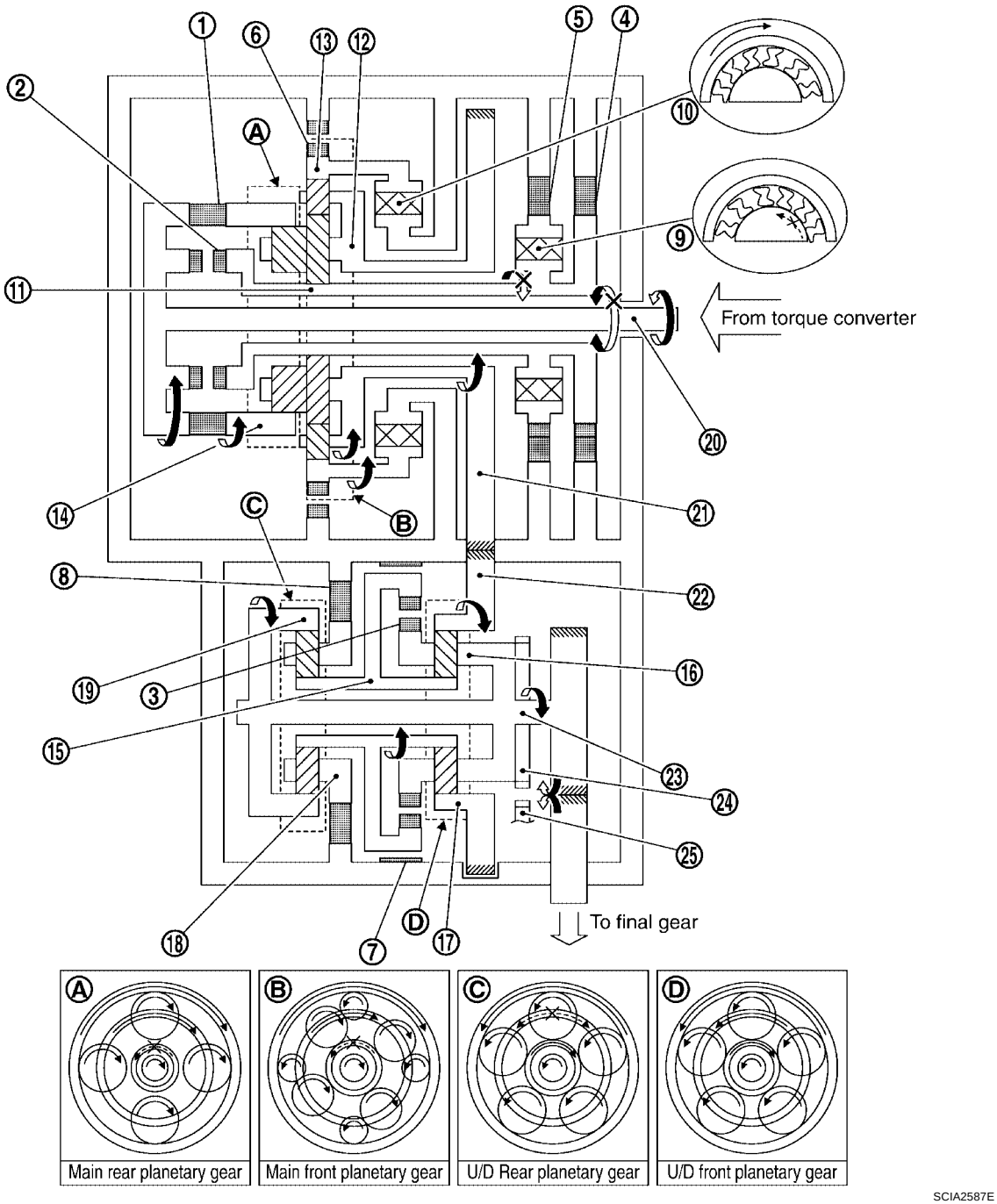
SCIA2586E

1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“D”, “M2” positions 2nd gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Main rear internal gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself clockwise for rear planetary pinion and one.
6. 2nd brake and 2nd coast brake operates.
7. One-way clutch No. 1 operates. (Lock rotation of main sun gear.)
8. Main planetary carrier revolves clockwise due to reaction force of front large planetary pinion gear.
9. Counter drive gear rotates clockwise for main planetary carrier and one.
10. Counter driven gear rotates counterclockwise.
11. U/D front internal gear rotates counterclockwise for counter driven gear and one.
12. U/D front planetary pinion gear rotates itself counterclockwise.
13. U/D sun gear rotates clockwise.
14. U/D rear planetary pinion gear rotates itself counterclockwise.
15. B5 brake operate. (Lock rotation of U/D rear planetary carrier.)
16. U/D rear internal gear rotates counterclockwise.
17. U/D front planetary carrier and output shaft rotates counterclockwise for U/D rear internal gear and one.
18. Final gear clockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.



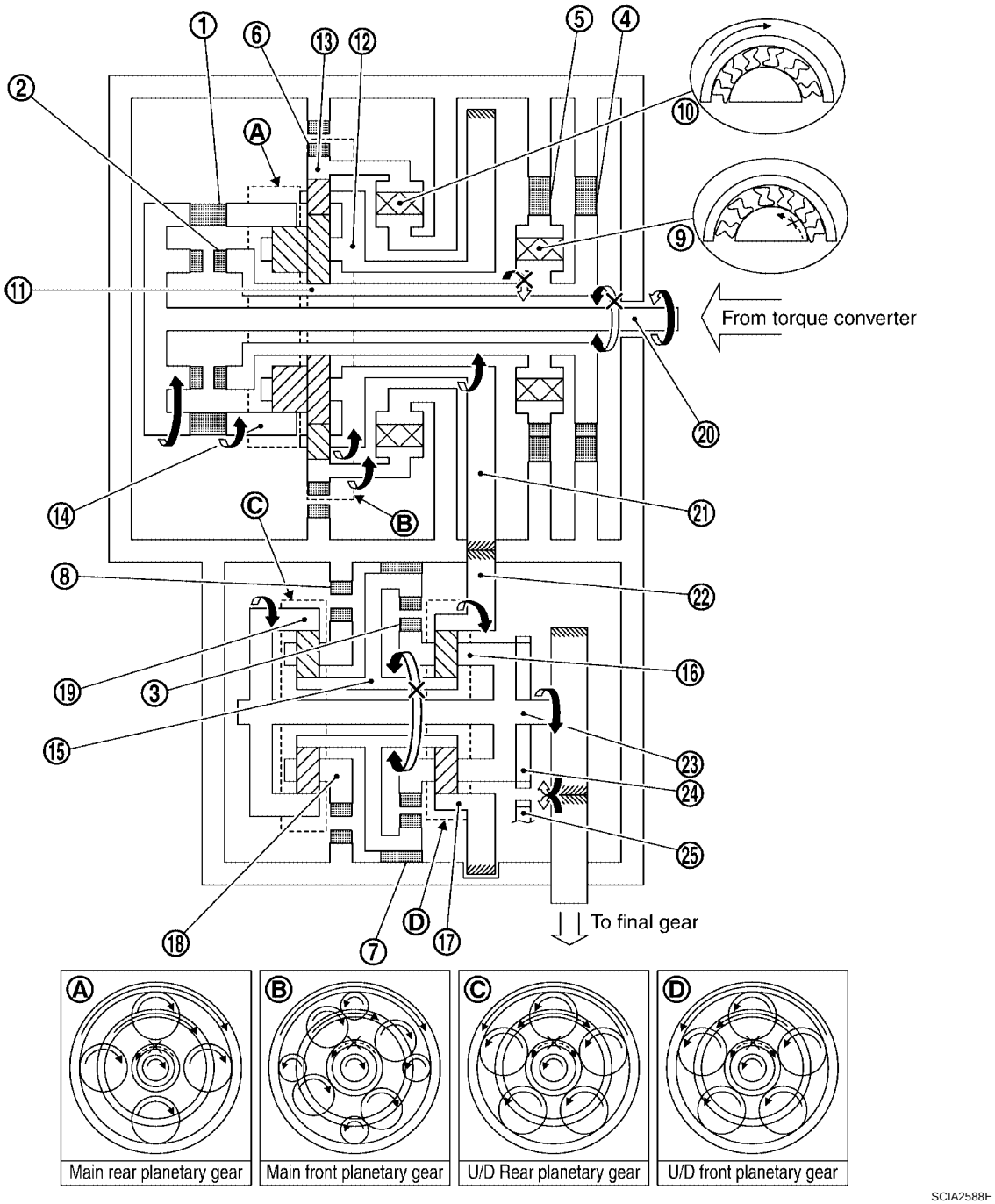
SCIA2587E

1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“D”, “M3” positions 3rd gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Main rear internal gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself clockwise for rear planetary pinion and one.
6. 2nd brake and 2nd coast brake operates.
7. One-way clutch No. 1 operates. (Lock rotation of main sun gear.)
8. Main planetary carrier revolves clockwise due to reaction force of front large planetary pinion gear.
9. Counter drive gear rotates clockwise for main planetary carrier and one.
10. Counter driven gear rotates counterclockwise.
11. U/D front internal gear rotates counterclockwise for counter driven gear and one.
12. U/D front planetary pinion gear rotates itself counterclockwise.
13. U/D brake operate. (Lock rotation of U/D sun gear.)
14. U/D front planetary carrier revolves counterclockwise due to reaction force of U/D front planetary pinion gear.
15. U/D rear internal gear and output shaft rotates counterclockwise for U/D front planetary carrier and one.
16. Final gear clockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.



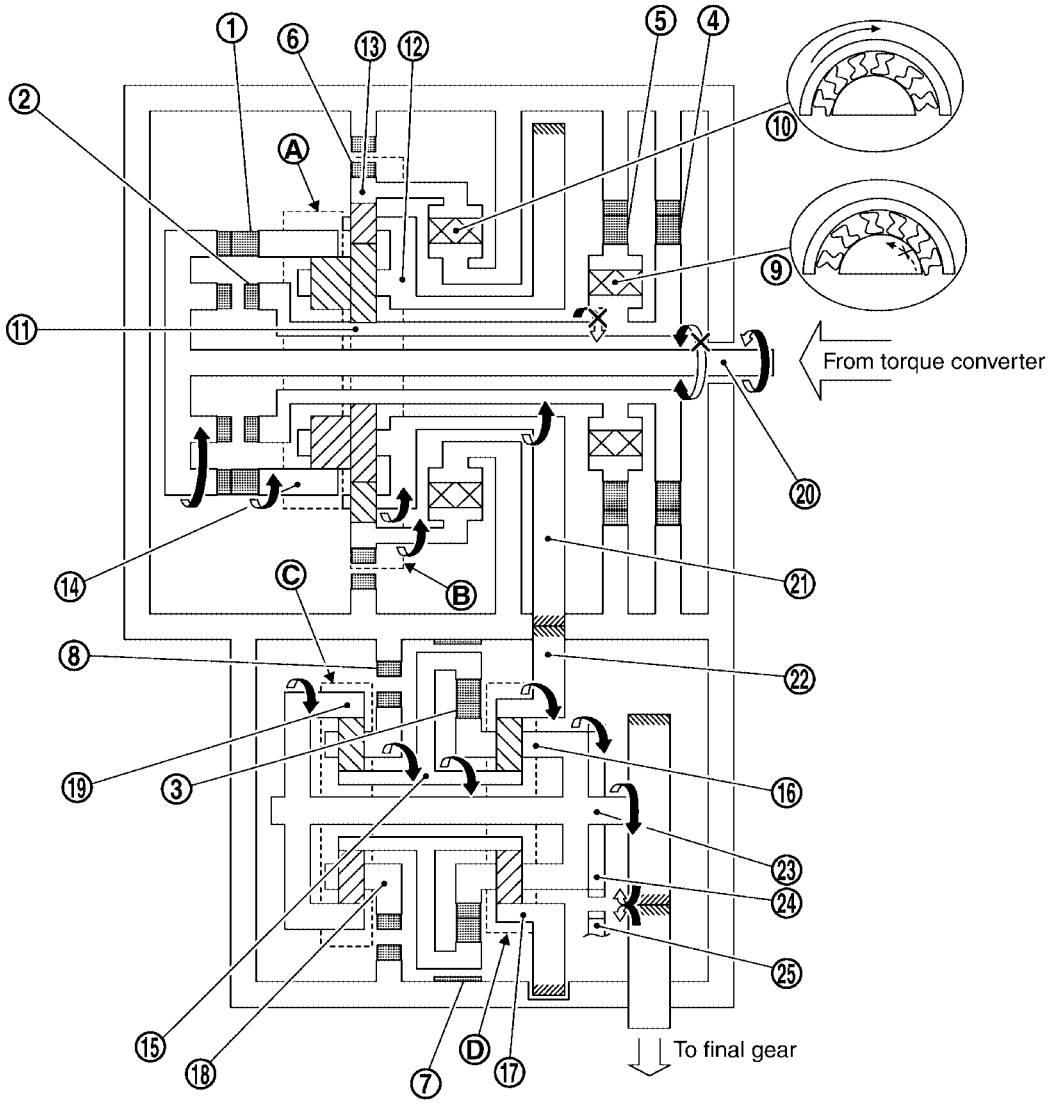
SCIA2588E

1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“D”, “M4” positions 4th gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Main rear internal gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself clockwise for rear planetary pinion and one.
6. 2nd brake and 2nd coast brake operates.
7. One-way clutch No. 1 operates. (Lock rotation of main sun gear.)
8. Main planetary carrier revolves clockwise due to reaction force of front large planetary pinion gear.
9. Counter drive gear rotates clockwise for main planetary carrier and one.
10. Counter driven gear rotates counterclockwise.
11. U/D front internal gear rotates counterclockwise for counter driven gear and one.
12. U/D clutch operate. (Connect U/D sun gear to U/D front planetary carrier.)
13. U/D front planetary pinion gear cannot rotate itself, and U/D unit rotates counterclockwise as one.
14. Output shaft rotates counterclockwise for U/D unit and one.
15. Final gear clockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.



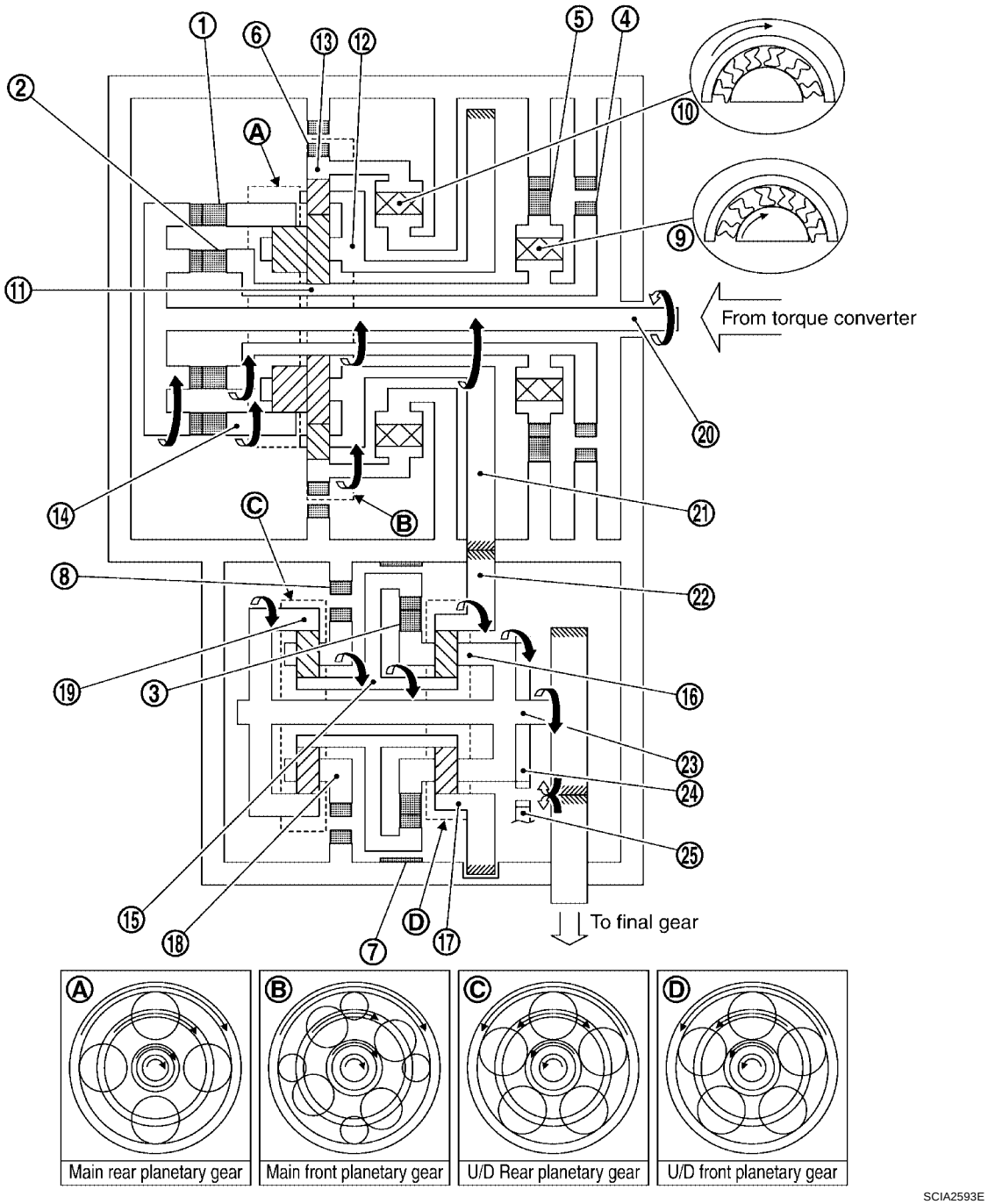
SCIA2592E

1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“D”, “M5” positions 5th gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Direct clutch operates. (Connect input shaft to main sun gear.)
4. Main rear planetary pinion gear cannot rotate itself, and main rear planetary unit rotates clockwise as one.
5. Main front large planetary pinion gear cannot rotate itself for main rear planetary pinion gear and one, and main front planetary unit rotates clockwise as one.
6. Counter drive gear rotates clockwise for main front planetary unit and one.
7. Counter driven gear rotates counterclockwise.
8. U/D front internal gear rotates counterclockwise for counter driven gear and one.
9. U/D clutch operate. (Connect U/D sun gear to U/D front planetary carrier.)
10. U/D front planetary pinion gear cannot rotate itself, and U/D unit rotates counterclockwise as one.
11. Output shaft rotates counterclockwise for U/D unit and one.
12. Final gear clockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.



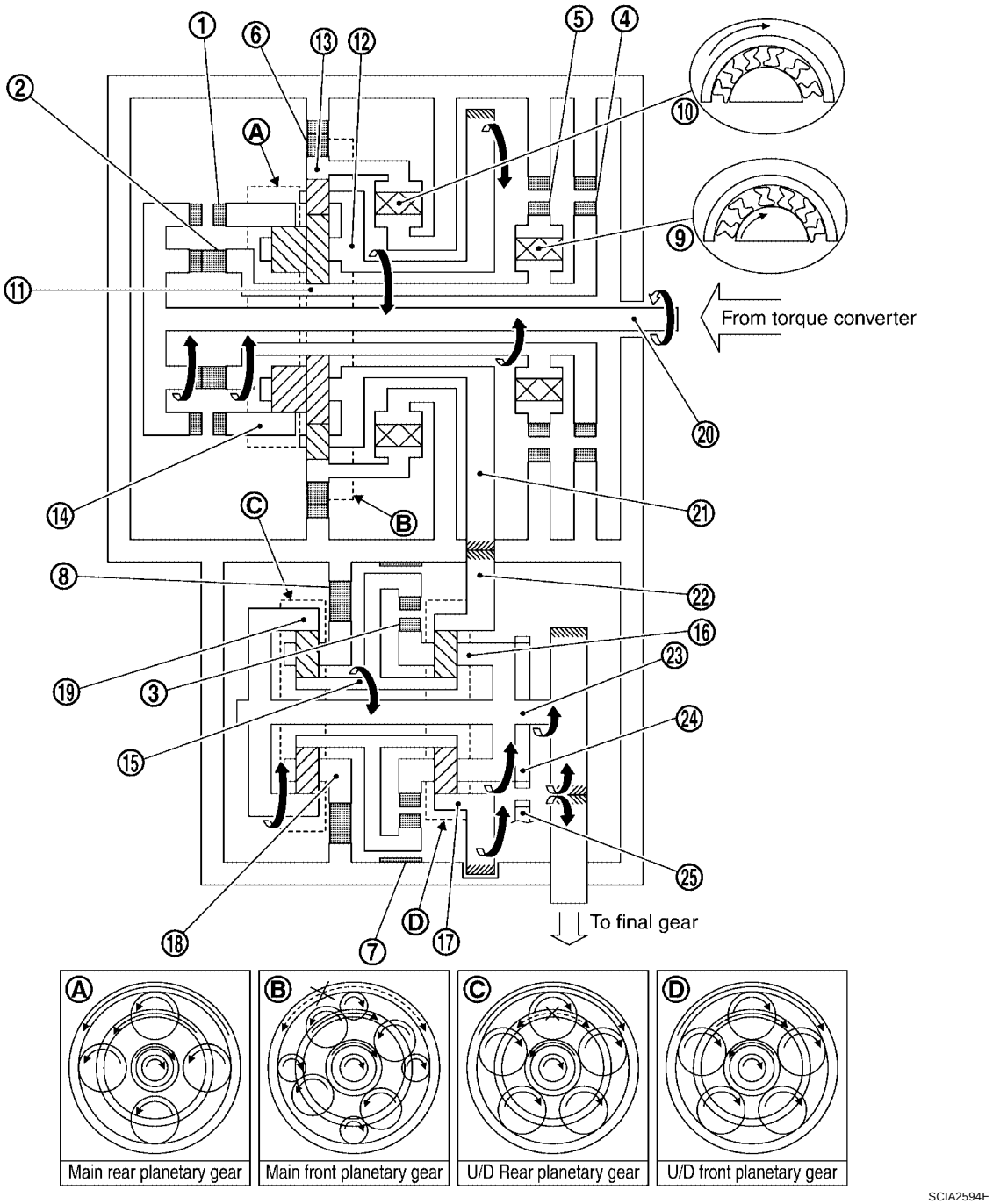
SCIA2593E

1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“R” position

1. Input shaft rotates clockwise.
2. Direct clutch operates. (Connect input shaft to main sun gear.)
3. Main sun gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself counterclockwise for rear planetary pinion gear and one.
6. Main front small planetary pinion gear rotates itself clockwise.
7. 1st and reverse brake operates. (Lock rotation of main front internal gear.)
8. Main planetary carrier revolves counterclockwise due to reaction force of front small planetary pinion gear.
9. Counter drive gear rotates counterclockwise for main planetary carrier and one.
10. Counter driven gear rotates clockwise.
11. U/D front internal gear rotates clockwise for counter driven gear and one.
12. U/D front planetary pinion gear rotates itself clockwise.
13. U/D sun gear rotates counterclockwise.
14. U/D rear planetary pinion gear rotates itself clockwise.
15. B5 brake operate. (Lock rotation of U/D rear planetary carrier.)
16. U/D rear internal gear rotates clockwise.
17. U/D front planetary carrier and output shaft rotates clockwise for U/D rear internal gear and one.
18. Final gear counterclockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.



SCIA2594E

1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

TCM Function

ECS00A0V

The function of the TCM is to:

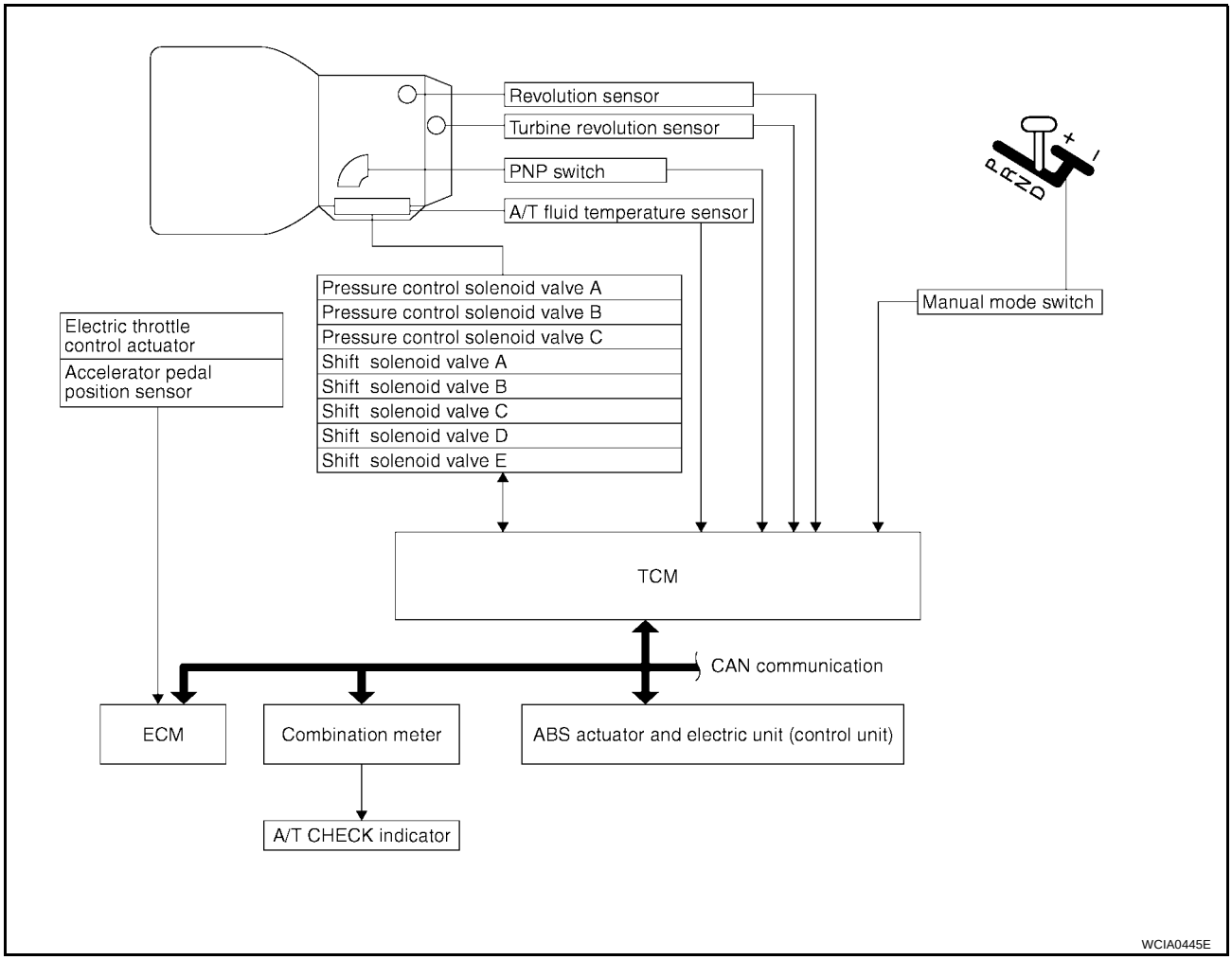
- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids.

CONTROL SYSTEM OUTLINE

The automatic transaxle 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 SIGNAL)		TCM		ACTUATORS
PNP switch Throttle angle signal Throttle position signal Engine speed signal Engine torque signal A/T fluid temperature sensor Revolution sensor Turbine revolution sensor Vehicle speed signal Manual mode switch signal Stop lamp switch signal	⇒	Shift control Line pressure control Lock-up control Engine brake control Timing control Fail-safe control Self-diagnosis CONSULT-II communication line CAN communication line On board diagnosis	⇒	Shift solenoid valve A Shift solenoid valve B Shift solenoid valve C Shift solenoid valve D Shift solenoid valve E Pressure control solenoid valve A Pressure control solenoid valve B Pressure control solenoid valve C A/T CHECK indicator lamp

CONTROL SYSTEM DIAGRAM



Input/Output Signal of TCM

ECS00A0W

Control item			Line pressure control	Vehicle speed control	Shift control	Lock-up control	Engine brake control	Fail-safe function (*3)	Self-diagnostics function
Input	Throttle angle signal(*5)		X	X	X	X	X	X	X
	Throttle position signal(*5)		X(*2)	X(*2)		X	X(*2)		X(*4)
	Revolution sensor		X	X	X	X	X	X	X
	Turbine revolution sensor		X	X	X		X	X	X
	Vehicle speed signal MTR(*1) (*5)		X	X	X	X		X	X
	Engine speed signals(*5)			X	X	X		X	X
	Engine torque signals(*5)		X	X	X	X	X		X
	PNP switch		X	X	X	X	X	X	X(*4)
	Manual mode switch			X	X		X	X	X
	Stop lamp switch signal(*5)			X		X	X		X(*4)
	A/T fluid temperature sensor			X	X	X	X	X	X
	ASCD	Operation signal(*5)		X		X	X		
		Overdrive cancel signal(*5)		X		X	X		
	TCM power supply voltage signal		X	X	X	X	X	X	X
Output	Shift solenoid valve A/B/C/D/E			X	X			X	X
	Pressure control solenoid valve A		X	X	X	X	X	X	X
	Pressure control solenoid valve B			X	X		X	X	X
	Pressure control solenoid valve C				X	X		X	X
	Self-diagnostics table(*5)								X

*1: Spare for revolution sensor
*2: Spare for throttle angle 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: CAN communications.

CAN Communication

ECS00A0X

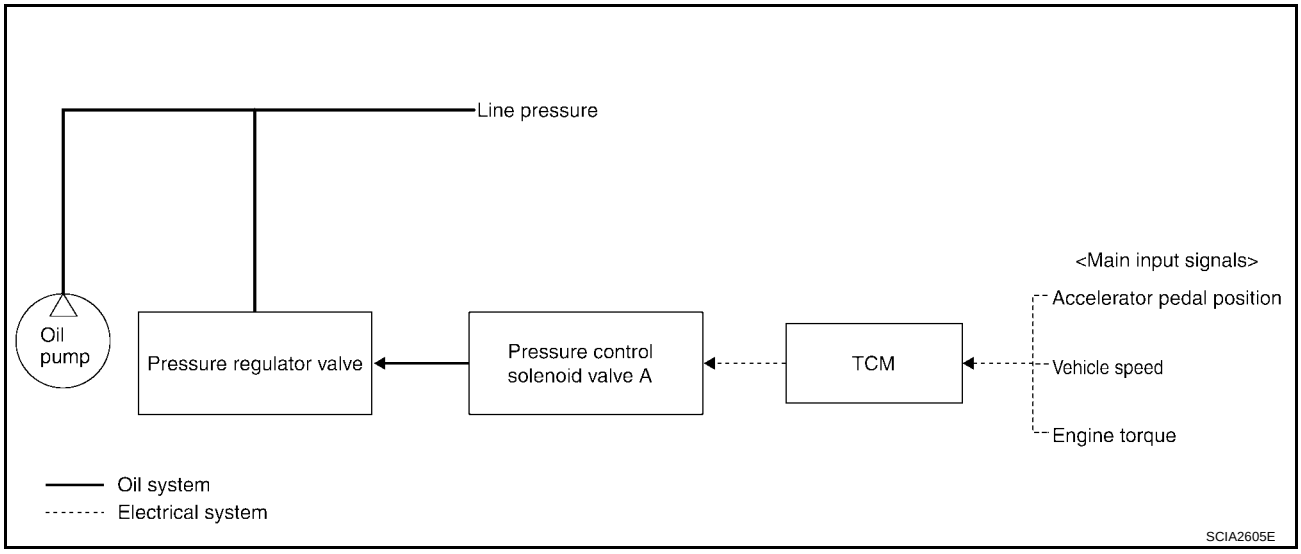
SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
For details, refer to LAN-25, "CAN COMMUNICATION" .

Line Pressure Control

ECS00A0Y

- The pressure control solenoid valve A controls linear line pressure by control signal from TCM and line pressure for clutches and brakes to reduce shift shock.
- This pressure control solenoid valve A 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.



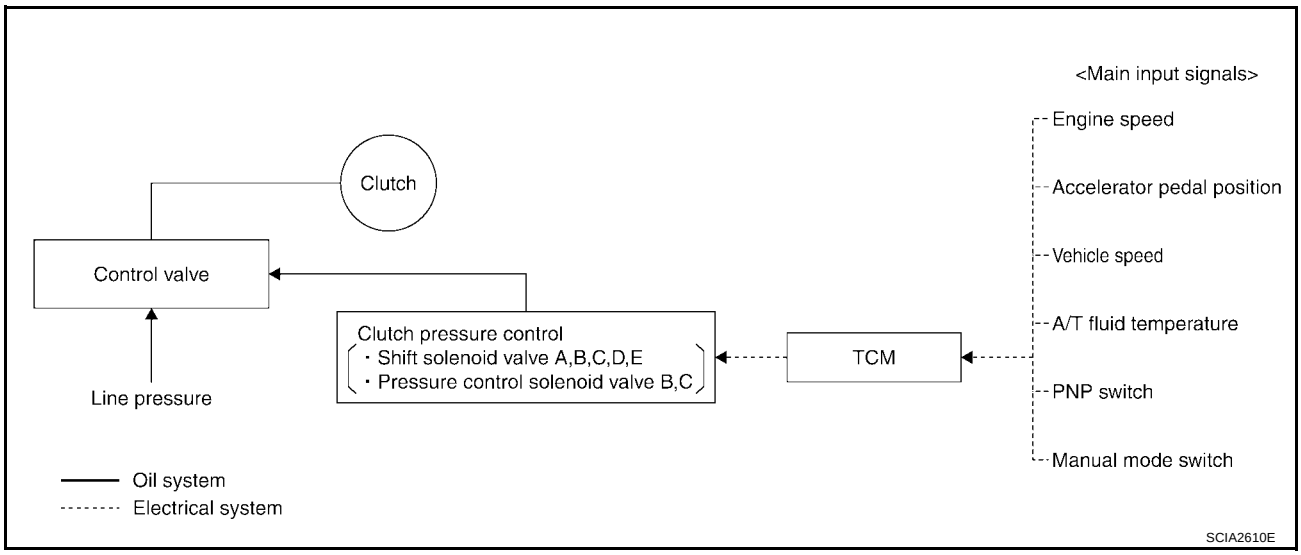
LINE PRESSURE CONTROL IS BASED ON THE TCM LINE PRESSURE CHARACTERISTIC PATTERN

In order to obtain the most appropriate line pressure characteristic to meet the current driving state, the TCM controls the pressure control solenoid valve A current and thus controls the line pressure.

Shift Control

ECS00A0Z

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.



Basically TCM programmed for economy mode, but TCM changes to several shift schedule automatically according to specified condition.

SPECIAL SHIFT MODE

Upslope Mode

When TCM detects upslope from load of engine torque and decrease of acceleration, this mode changes shift points in high-speed side according to the upslope degree and avoids busy shift of A/T.

Downslope Mode

When TCM detects downslope from increase of acceleration with accelerator full close, this mode operates moderate engine brake by changing shift points in high-speed side.

Hot Mode Control

This control lowers ATF temperature by changing shift points when the temperature is extremely high.

MANUAL MODE

Driver oneself can select favorite gear and enjoy sports driving of manual transmission sense by shifting lever from D position to manual mode position and + (up shift) / - (down shift). But lock-up control is operated automatically. Shift control is operated again by shifting from manual gear position to D position. Following control is operated when manual mode.

Automated Up Shift Control

In order to avoid the over speed of the engine, up shift operate automatically, if it becomes over a constant vehicle speed.

Automated Down Shift Control

In order to avoid the stall of the engine, down shift operate automatically, if it becomes under a constant vehicle speed.

Up Shift Permission Control

In order to avoid the stall of the engine, up shift is done only at over a constant vehicle speed.

Down Shift Permission Control

In order to avoid the over speed of the engine, down shift is done only at under a constant vehicle speed.

UP/DOWN SHIFT LEARNING CONTROL

This control learns the pressure to each clutch or brake in order to reduce shifting shock at each shifting (Up, Down, Manual down, Coast down).

N-D SHIFT CONTROL

This control improves the N-D shift quality due to controlling line pressure solenoid valve according to forward clutch piston stroke learned in N-D shift learning control and applying best hydraulic pressure to forward clutch at N-D shift.

N-D SHIFT LEARNING CONTROL

This control learns the forward clutch hydraulic pressure due to monitoring a forward clutch engaging time and a rotation change rate.

N-R SHIFT CONTROL

This control improves the N-R shift quality due to controlling shift pressure solenoid valve according to direct clutch piston stroke learned in N-R shift learning control and applying best hydraulic pressure to direct clutch at N-R shift.

N-R SHIFT LEARNING CONTROL

This control learns the direct clutch hydraulic pressure due to monitoring a direct clutch engaging time and a rotation change rate.

TORQUE REDUCTION CONTROL

This control improves the shift quality due to sending torque reduction request signal from TCM to ECM and cutting engine torque increase of shift at N-D shift, N-R shift and 1 $\Leftrightarrow$ 2 $\Leftrightarrow$ 3 $\Leftrightarrow$ 4 $\Leftrightarrow$ 5.
If accelerator pedal is depressed rapidly, this control establishes the upper limit value of engine torque and avoids engine flare at 2 $\Leftrightarrow$ 3, 3 $\Leftrightarrow$ 4 and 4 $\Rightarrow$ 2 of clutch to clutch shift.

Lock-Up Control

ECS00A10

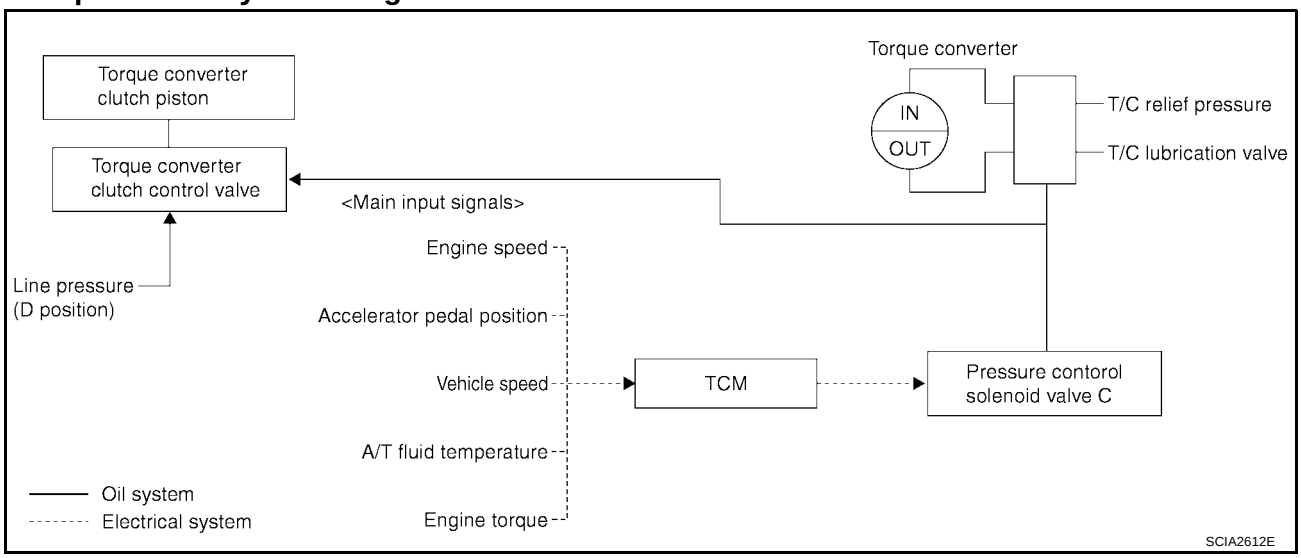
The torque converter clutch piston in the torque converter is engaged to eliminate torque converter slip to increase power transmission efficiency.
The torque converter clutch control valve operation is controlled by the pressure control solenoid valve C, which is controlled by a signal from TCM, and the torque converter clutch control valve engages or releases the torque converter clutch piston.

Lock-up Operation Condition Table

Selector lever	D position		M5 position	M4 position	M3 position
Gear position	5	4	5	4	3
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 pressure control solenoid valve C 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 pressure control solenoid valve C and lock-up apply pressure is generated.
  In this way, the torque converter clutch piston is pressed and coupled.

SMOOTH LOCK-UP CONTROL

When shifting from the lock-up released state to the lock-up applied state, the current output to the pressure control solenoid valve C 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 pressure control solenoid valve C is varied to steadily increase the pressure control solenoid valve C 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 pressure control solenoid valve C 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.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

PFP:00028

Introduction

ECS00A11

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-78, "SELF-DIAG RESULT MODE" .

OBD-II Function for A/T System

ECS00A12

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

ECS00A13

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)

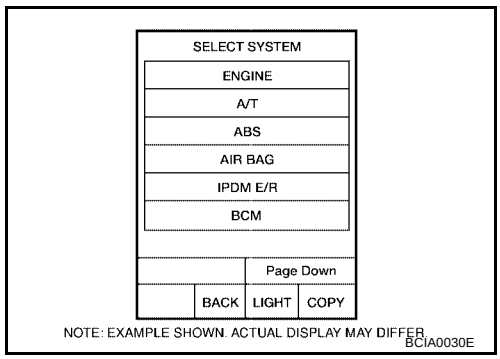
ECS00A14

HOW TO READ DTC AND 1ST TRIP DTC

DTC and 1st trip DTC can be read by the following methods.
(with CONSULT-II or GST GST) CONSULT-II or GST (Generic Scan Tool) Examples: P0705, P0710 etc.
These DTC are prescribed by SAE J2012.
(CONSULT-II also displays the malfunctioning component or system.)

- **1st trip DTC No. is the same as DTC No.**
- **Output of the diagnostic trouble code indicates that the indicated circuit has a malfunction. However, in case of the Mode II and GST, they do not indicate whether the malfunction is still occurring or occurred in the past and returned to normal.**
  CONSULT-II can identify them as shown below, therefore, CONSULT-II (if available) is recommended.

A sample of CONSULT-II display for DTC and 1st trip DTC is shown on the next page. DTC or 1st trip DTC of a malfunction is displayed in SELF-DIAGNOSTIC RESULTS mode for “ENGINE” with CONSULT-II. Time data indicates how many times the vehicle was driven after the last detection of a DTC.



NOTE: EXAMPLE SHOWN. ACTUAL DISPLAY MAY DIFFER
BCIA0030E

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

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

SAT015K

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

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

SAT016K

Freeze Frame Data and 1st Trip Freeze Frame Data

The ECM has a memory function, which stores the driving condition such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed and vehicle speed at the moment the ECM detects a malfunction.
Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data, and the data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-II or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-II screen, not on the GST. For detail, refer to EC-53, "FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA" .
Only one set of freeze frame data (either 1st trip freeze frame data or freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MIL on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

Priority	Items	
1	Freeze frame data	Misfire — DTC: P0300 - 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-II, 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-II or GST is easier and quicker than switching the mode selector on the ECM.**

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to EC-49, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS" .

- **Diagnostic trouble codes (DTC)**
- **1st trip diagnostic trouble codes (1st trip DTC)**
- **Freeze frame data**

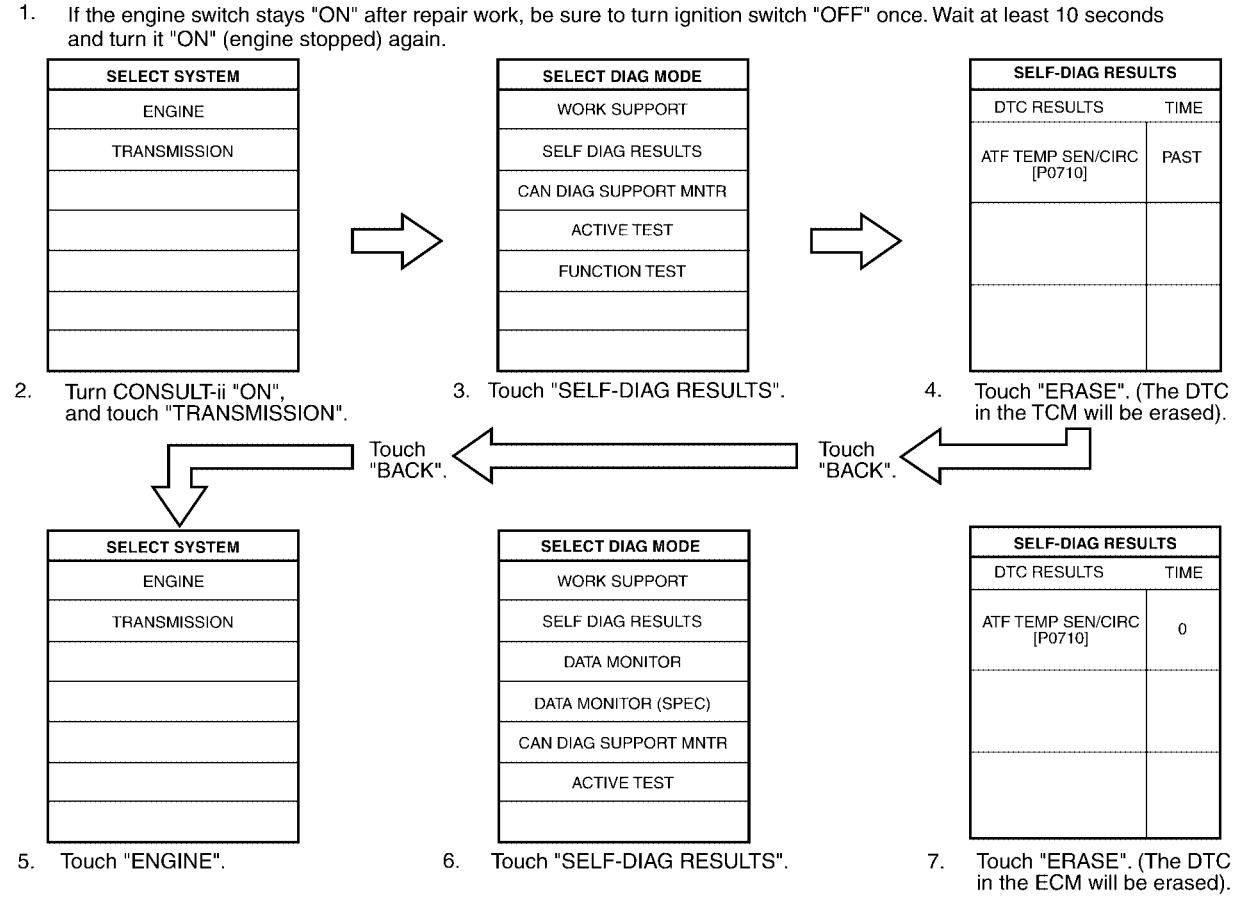
- **1st trip freeze frame data**
- **System readiness test (SRT) codes**
- **Test values**

HOW TO ERASE DTC (WITH CONSULT-II)

- **If a DTC is displayed for both ECM and TCM, it is necessary to be erased for both ECM and TCM.**

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

How to erase DTC (With CONSULT-II)



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. Erase DTC with TCM. Refer to AT-85, "Erase self-diagnosis" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Select Mode 4 with Generic Scan Tool (GST). For details, refer to EC-130, "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. Erase DTC with TCM. Refer to AT-85, "Erase self-diagnosis" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Erase DTC with ECM. Refer to EC-61, "How to Erase DTC" .

Malfunction Indicator Lamp (MIL)

ECS00A15

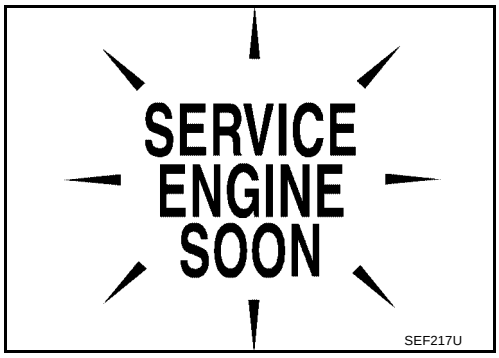
DESCRIPTION

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-40, "WARNING LAMPS" , or see EC-63, "Malfunction Indicator Lamp (MIL)" .

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.



TROUBLE DIAGNOSIS

PFP:00004

DTC Inspection Priority Chart

ECS00A16

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

NOTE:
If DTC U1000 is displayed with other DTCs, first perform the trouble diagnosis for DTC U1000. Refer to AT-86 .

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

Fail-Safe

ECS00A17

The TCM has an electrical fail-safe mode. This mode makes it possible to operate even if there is a malfunction in a main electronic control input/output signal circuit.
In fail-safe mode, a driving condition is selected according to the malfunctioning location, and line pressure is set at the maximum. For this reason, the customer will be subjected to uncomfortable “slipping” or “poor acceleration” of the vehicle.
In that case, handle according to the “diagnostics flow” (Refer to AT-51).

FAIL-SAFE FUNCTION

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

NOTE:
Line pressure is set at the maximum in fail-safe mode. Although gear position differs depending on the type of fail-safe modes, CONSULT-II indicates “5th”.

DTC	Malfunction items	Fail-safe*
P0500	Vehicle speed signal	No learning control.
P0613	TCM processor	Fail-safe mode 4
P0705	PNP switch	Fail-safe mode 4
P0710	ATF temperature sensor circuit	Sets ATF temperature data at 111°C (232°F) after 15 minutes. Inhibits lock-up control.
P0711	ATF temperature sensor function	Sets ATF temperature data at 111°C (232°F) after 15 minutes. Inhibits lock-up control.
P0717	Turbine revolution sensor	Fail-safe mode 1
P0722	Revolution sensor	Uses vehicle speed signal from combination meter as a substitute. Inhibits learning control.
P0726	Engine speed signal input circuit performance	Fail-safe mode 1
P0731	1st gear function	No 1st gear, no control for N-D shift.
P0732	2nd gear function	Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping.
P0733	3rd gear function	Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping.
P0734	4th gear function	Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping.
P0735	5th gear function	Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping.
P0744	Lock-up function	Fail-safe mode 1
P0745	Pressure control solenoid valve A	Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping.

DTC	Malfunction items	Fail-safe*
P0750	Shift solenoid valve A	Any one of fail-safe modes ● Fail-safe mode 1 ● Fail-safe mode 7. Also, ECM restricts input torque to prevent clutch slipping.
P0755	Shift solenoid valve B	Any one of fail-safe modes ● Fail-safe mode 1 ● Fail-safe mode 8
P0760	Shift solenoid valve C	Any one of fail-safe modes ● Fail-safe mode 2 ● Fail-safe mode 5 ● Fail-safe mode 9
P0762	Shift solenoid valve C stuck ON	Fail-safe mode 2. Also, ECM restricts engine torque to prevent clutch slipping.
P0765	Shift solenoid valve D	Any one of fail-safe modes ● Fail-safe mode 1 ● Fail-safe mode 10. Also, ECM restricts input torque to prevent clutch slipping.
P0770	Shift solenoid valve E	Any one of fail-safe modes ● Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping. ● Fail-safe mode 6. Also, ECM restricts engine torque to prevent clutch slipping.
P0775	Pressure control solenoid valve B	Fail-safe mode 3
P0780	Shift function	Fail-safe mode 1. Also, ECM restricts input torque to prevent clutch slipping.
P0795	Pressure control solenoid valve C	Fail-safe mode 1
P0797	Pressure control solenoid valve C stuck ON	Fail-safe mode 1
P0826	Manual mode switch	No manual mode control.
P0882	TCM power input signal	Fail-safe mode 1
P1726	Electric throttle control	● The accelerator opening angle is controlled by ECM according to a pre-determined accelerator angle to make driving possible. ● No lock-up, no learning control.
U1000	CAN communication circuit	Any one of fail-safe modes ● Fail-safe mode 1 ● Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping. ● No learning control. ● No lock-up, no learning control, no special shift mode control.

*: For fail-safe modes 1 to 10, refer to AT-48, "Fail-safe mode list" .

Fail-safe mode list

Fail-safe mode	Selector lever	Gear position*1	Shift solenoid valve					Pressure control solenoid valve		
			A	B	C	D	E	A	B	C
Fail-safe mode 1	D position	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	2nd	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF

Fail-safe mode	Selector lever	Gear position*1	Shift solenoid valve					Pressure control solenoid valve		
			A	B	C	D	E	A	B	C
Fail-safe mode 2 (CONSULT-II displays “8”)	D position	3rd	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	2nd	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
Fail-safe mode 3	D position	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	2nd	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
Fail-safe mode 4	D position	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Fail-safe mode 5	D position	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
Fail-safe mode 6	D position	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	2nd	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
Fail-safe mode 7	D position	4th	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	2nd	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
	R position	Reverse*2	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
Fail-safe mode 8 (CONSULT-II displays “1”)	D position	5th	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	(2nd)*3	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
Fail-safe mode 9 (CONSULT-II displays “8”)	D position	4th	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
Fail-safe mode 10 (CONSULT-II displays “6”)	D position	4th	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	3rd	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
	R position	Reverse*2	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF

*1: CONSULT-II indicates “5th”.
*2: Reverse gear ratio difference (Gear ratio: 3.342)
*3: 3rd gear ratio difference (Gear ratio: 2.301)

How To Perform Trouble Diagnosis For Quick and Accurate Repair

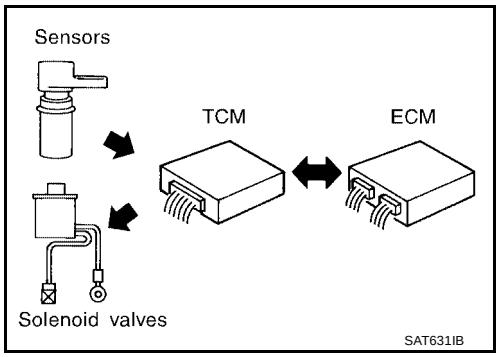
ECS00A18

INTRODUCTION

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

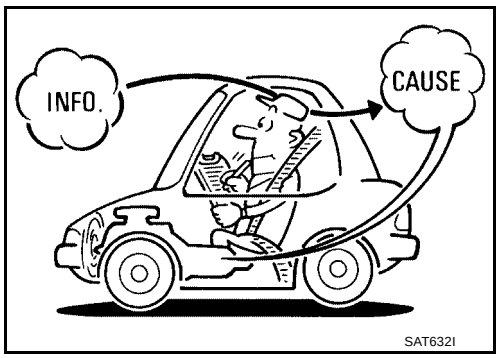
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.

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 an 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.

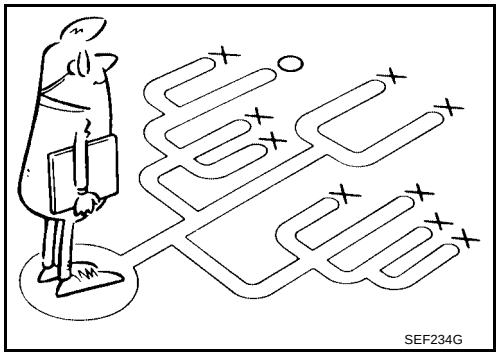
A visual check only may not find the cause of the errors. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the AT-51, "WORK FLOW" .



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-52) should be used.

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

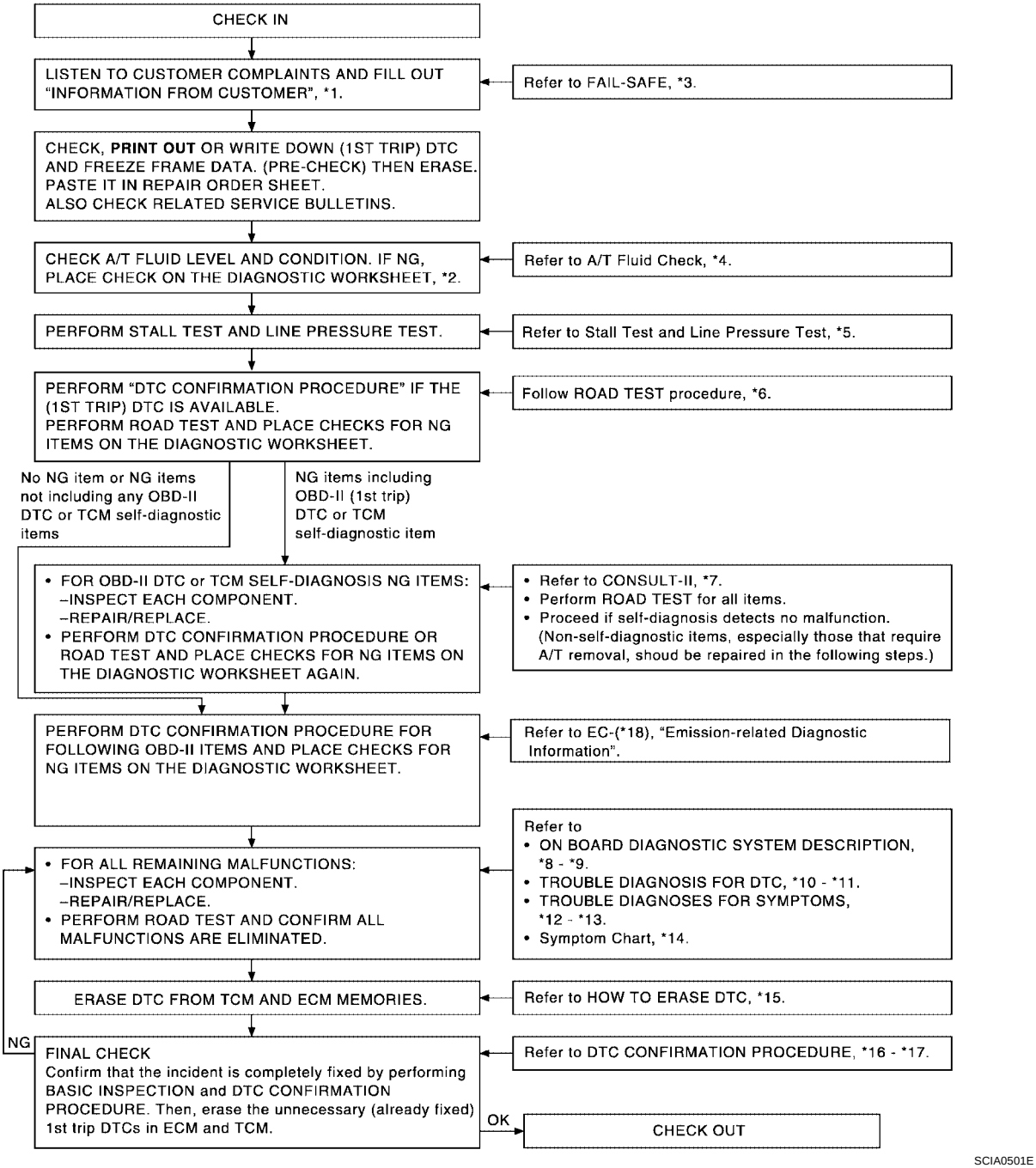
Also check related Service bulletins.



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, “Information From Customer” (Refer to AT-52) and “Diagnostic Worksheet” (Refer to AT-52), to perform the best troubleshooting possible.

Work Flow Chart



SCIA0501E

*1. AT-52 *2. AT-52 *3. AT-47
*4. AT-57 *5. AT-57, AT-59 *6. AT-60
*7. AT-77 *8. AT-43 *9. AT-46
*10. AT-86 *11. AT-212 *12. AT-213
*13. AT-232 *14. AT-67 *15. AT-44
*16. AT-86 *17. AT-212 *18. EC-49

DIAGNOSTIC WORKSHEET

Information From Customer

KEY POINTS

- **WHAT**..... Vehicle & A/T model
- **WHEN**..... Date, Frequencies
- **WHERE**..... Road conditions
- **HOW**..... Operating conditions, Symptoms

Customer name MR/MS	Model & Year	VIN
Trans. Model	Engine	Mileage
Incident Date	Manuf. Date	In Service Date
Frequency	❑ Continuous ❑ Intermittent (times a day)	
Symptoms	❑ Vehicle does not move. (❑ Any position ❑ Particular position)	
	❑ No up-shift (❑ 1st → 2nd ❑ 2nd → 3rd ❑ 3rd → 4th ❑ 4th → 5th)	
	❑ No down-shift (❑ 5th → 4th ❑ 4th → 3rd ❑ 3rd → 2nd ❑ 2nd → 1st)	
	❑ Lock-up malfunction	
	❑ Shift point too high or too low.	
	❑ Shift shock or slip (❑ N → D ❑ Lock-up ❑ Any drive position)	
	❑ Noise or vibration	
	❑ No kick down	
	❑ No pattern select	
	❑ Others ( )	
Malfunction indicator lamp (MIL)	❑ Continuously lit	❑ Not lit
A/T Check indicator lamp	❑ Continuously lit	❑ Not lit

Diagnostic Worksheet Chart

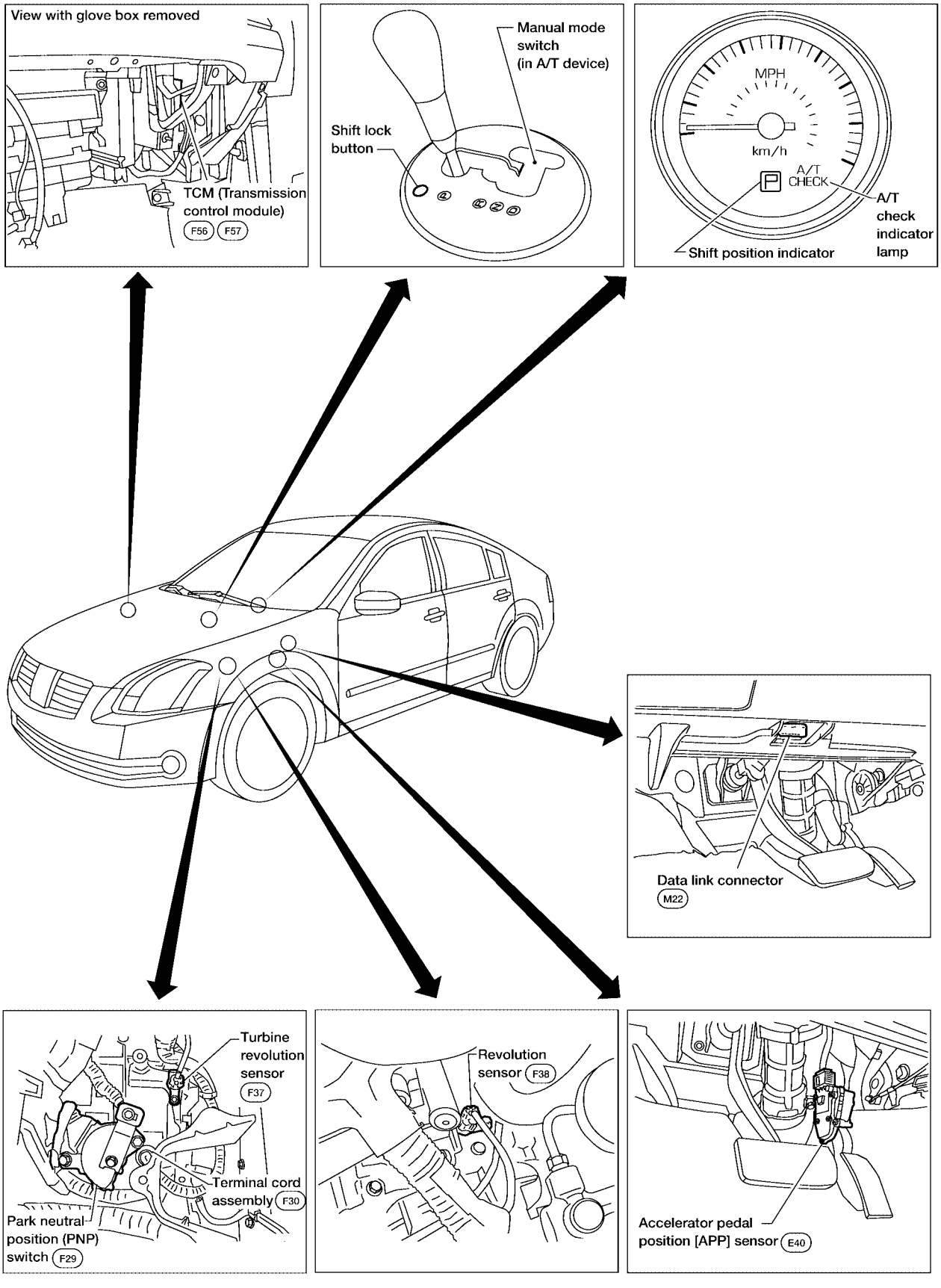
1	❑ Read the item on cautions concerning fail-safe and understand the customer's complaint.			AT-47
2	❑ A/T fluid inspection			AT-57
		❑ Leak (Repair leak location.) ❑ State ❑ Amount		
3	❑ Stall test, time lag test and line pressure test			AT-57, AT-59
		❑ Stall test		
			❑ Engine ❑ Torque converter one-way clutch ❑ Line pressure is low ❑ Forward clutch ❑ Direct clutch ❑ 1st and reverse brake	❑ B5 brake ❑ One-way clutch No. 2 ❑ Oil pump ❑ Oil strainer ❑ Oil leak for each range circuit
		❑ Time lag test		
			❑ Line pressure is low ❑ Forward clutch ❑ Direct clutch ❑ 1st and reverse brake ❑ One-way clutch No. 2	❑ Oil pump ❑ Oil strainer ❑ Oil leak for “D” position circuit ❑ Oil leak for “R” position circuit
		❑ Line pressure inspection - Suspected part:		

4	❑ Perform all road tests and enter checks in required inspection items.			AT-60
	4-1.	Check before engine is started		AT-61
		❑ The A/T CHECK Indicator Lamp does come on. AT-213 . ❑ Perform self-diagnostics. Enter checks for detected items.		
			❑ Vehicle speed sensor·MTR. AT-89 . ❑ TCM processor. AT-91 . ❑ PNP switch. AT-93 . ❑ A/T fluid temperature sensor circuit. AT-98 . ❑ A/T fluid temperature sensor performance. AT-103 . ❑ Turbine revolution sensor circuit. AT-108 . ❑ Vehicle speed sensor·A/T (revolution sensor) circuit. AT-112 . ❑ Engine speed input circuit performance. AT-116 . ❑ 1st gear function. AT-118 . ❑ 2nd gear function. AT-121 . ❑ 3rd gear function. AT-127 . ❑ 4th gear function. AT-133 . ❑ 5th gear function. AT-138 . ❑ Lock-up function. AT-144 . ❑ Shift function. AT-187 . ❑ Pressure control solenoid valve A. AT-147 . ❑ Pressure control solenoid valve B. AT-182 . ❑ Pressure control solenoid valve C. AT-191 . ❑ Shift solenoid valve A. AT-152 . ❑ Shift solenoid valve B. AT-157 . ❑ Shift solenoid valve C. AT-162 . ❑ Shift solenoid valve D. AT-172 . ❑ Shift solenoid valve E. AT-177 . ❑ Pressure control solenoid valve C stuck ON. AT-196 . ❑ Shift solenoid valve C stuck ON. AT-167 . ❑ Manual mode switch circuit. AT-201 . ❑ TCM power input signal. AT-207 . ❑ Electric throttle control system. AT-212 . ❑ CAN communication. AT-86 . ❑ Battery ❑ Other	
	4-2.	Idle inspection		AT-61
		❑ Engine Cannot Be Started in “P” and “N” Position. AT-215 . ❑ In “ P” Position, Vehicle Moves When Pushed. AT-215 . ❑ In “N” Position Vehicle Moves. AT-216 . ❑ Large Shock “N” to “D” Position. AT-217 . ❑ Vehicle Does Not Creep Backward In “R” Position. AT-218 . ❑ Vehicle does Not Creep Forward In “D” Position. AT-219 .		
	4-3.	Driving tests		AT-63
		Part 1		
		❑ Vehicle Cannot Be Started From D1. AT-220 . ❑ A/T Does Not Shift: D1 → D2. AT-220 . ❑ A/T Does Not Shift: D2 → D3. AT-221 . ❑ A/T Does Not Shift: D3 → D4. AT-222 . ❑ A/T Does Not Shift: D4 → D5. AT-223 . ❑ A/T Does Not Perform Lock-up. AT-224 ❑ A/T Does Not Hold Lock-up Condition. AT-225 . ❑ Lock-up Is Not Released. AT-226 .		

		Part 2		
		❑ Vehicle Cannot Be Started From D1. AT-220 . ❑ A/T Does Not Shift: D1 → D2. AT-220 . ❑ A/T Does Not Shift: D2 → D3. AT-221 . ❑ A/T Does Not Shift: D3 → D4. AT-222 .		AT-64
		Part 3		
		❑ Cannot Be Changed To Manual Mode. AT-227 . ❑ A/T Does Not Shift: 5th gear → 4th gear. AT-228 . ❑ A/T Does Not Shift: 4th gear → 3rd gear. AT-229 . ❑ A/T Does Not Shift: 3rd gear → 2nd gear. AT-229 . ❑ A/T Does Not Shift: 2nd gear → 1st gear. AT-230 . ❑ Vehicle Does Not Decelerate By Engine Brake. AT-231 . ❑ Perform self-diagnostics Enter checks for detected items.		AT-65
4	4-3		❑ Vehicle speed sensor·MTR. AT-89 . ❑ TCM processor. AT-91 . ❑ PNP switch. AT-93 . ❑ A/T fluid temperature sensor circuit. AT-98 . ❑ A/T fluid temperature sensor performance. AT-103 . ❑ Turbine revolution sensor circuit. AT-108 . ❑ Vehicle speed sensor·A/T (revolution sensor) circuit. AT-112 . ❑ Engine speed input circuit performance. AT-116 . ❑ 1st gear function. AT-118 . ❑ 2nd gear function. AT-121 . ❑ 3rd gear function. AT-127 . ❑ 4th gear function. AT-133 . ❑ 5th gear function. AT-138 . ❑ Lock-up function. AT-144 . ❑ Shift function. AT-187 . ❑ Pressure control solenoid valve A. AT-147 . ❑ Pressure control solenoid valve B. AT-182 . ❑ Pressure control solenoid valve C. AT-191 . ❑ Shift solenoid valve A. AT-152 . ❑ Shift solenoid valve B. AT-157 . ❑ Shift solenoid valve C. AT-162 . ❑ Shift solenoid valve D. AT-172 . ❑ Shift solenoid valve E. AT-177 . ❑ Pressure control solenoid valve C stuck ON. AT-196 . ❑ Shift solenoid valve C stuck ON. AT-167 . ❑ Manual mode switch circuit. AT-201 . ❑ TCM power input signal. AT-207 . ❑ Electric throttle control system. AT-212 . ❑ CAN communication. AT-86 . ❑ Battery ❑ Other	
5	❑ Inspect each system for items found to be NG in the self-diagnostics and repair or replace the malfunction parts.			
6	❑ Perform all road tests and enter the checks again for the required items.			AT-60
7	❑ For any remaining NG items, perform the “diagnostics procedure” and repair or replace the malfunction parts. See the chart for diagnostics by symptoms. (This chart also contains other symptoms and inspection procedures.)			AT-67
8	❑ Erase the results of the self-diagnostics from the TCM.			AT-85

A/T Electrical Parts Location

ECS00A19



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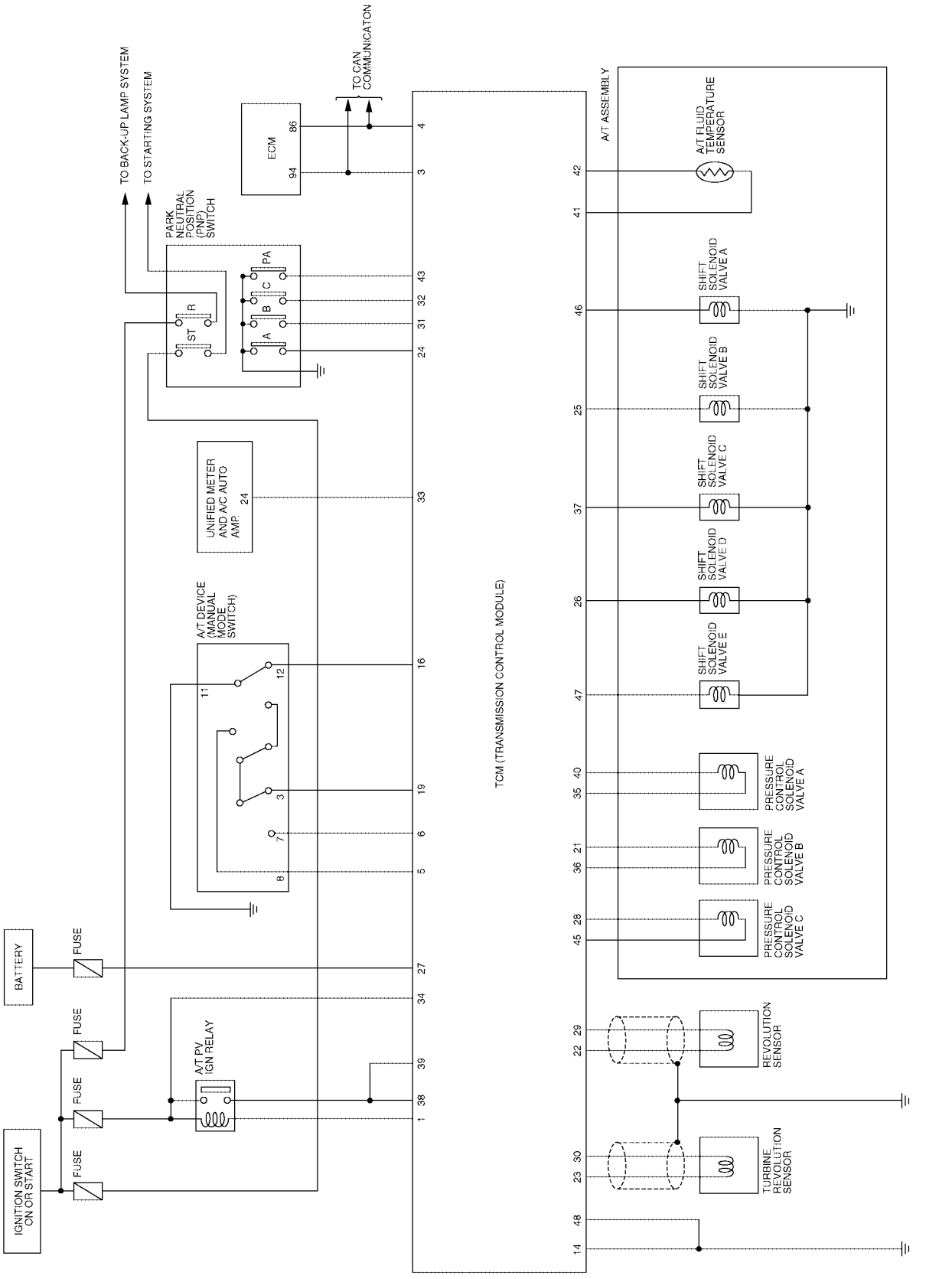
Circuit Diagram

ECS00A1A



BCWA0467E

Inspections Before Trouble Diagnosis

ECS00A1B

A/T FLUID CHECK

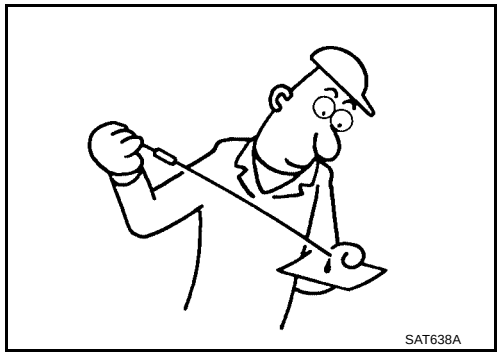
Fluid leakage and fluid level check

- Inspect for fluid leakage and check the fluid level. Refer to AT-15, "Checking A/T Fluid" .

Fluid condition check

Inspect the fluid condition.

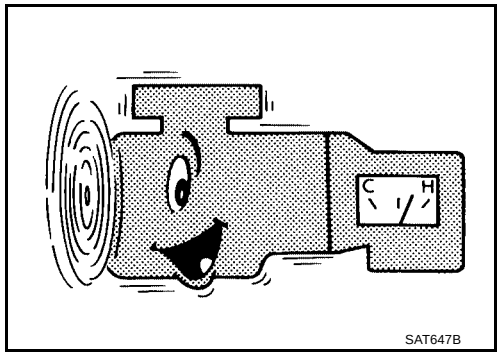
Fluid status	Conceivable Cause	Required Operation
Varnished (viscous varnish state)	Clutch, brake scorched	Replace the A/T fluid and check the A/T main unit and the vehicle for malfunctions (wire harnesses, cooler pipes, etc.)
Milky white or cloudy	Water in the fluid	Replace the A/T fluid and check for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


SAT638A

STALL TEST

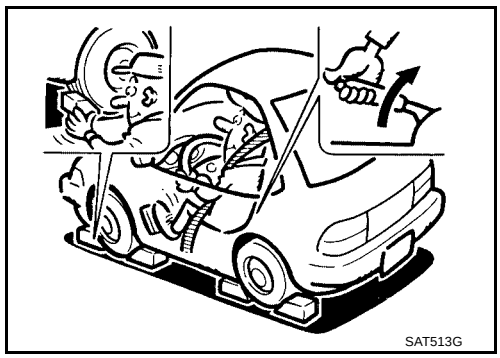
Stall test procedure

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 A/T fluid. Replenish if necessary.
3. Switch of A/C and light etc. are off.



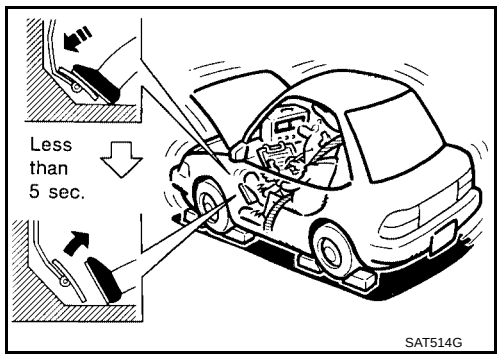
SAT647B

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


SAT513G

5. Engine start, apply foot brake, and place selector lever in “D” position.
6. While holding down the foot brake, gradually press down the accelerator pedal.
7. Quickly read off the stall speed, then quickly remove your foot from the accelerator pedal.

   CAUTION:
   Do not hold down the accelerator pedal for more than 5 seconds during this test.
8. Move the selector lever to the “N” position.
9. Cool down the A/T fluid.



SAT514G

CAUTION:
Run the engine at idle for at least one minute.

10. Repeat step 5 through 9 with selector lever in “manual mode” and “R” positions.

Stall speed: 2,430 - 2,730 rpm

Judgement stall test

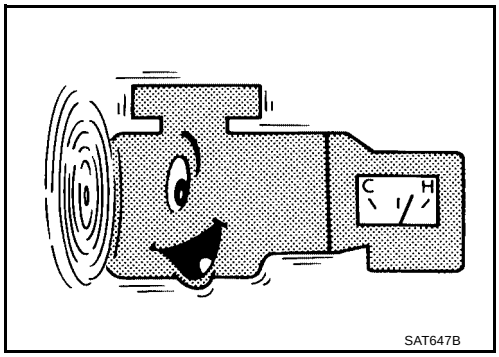
	Selector lever position		Possible cause
	D, M	R	
Stall rotation	H	O	● Line pressure is low (pressure control solenoid valve A malfunction, primary regulator valve malfunction) ● Forward clutch (slipping) ● One-way clutch No. 2
	O	H	● Line pressure is low (pressure control solenoid valve A malfunction, primary regulator valve malfunction) ● Direct clutch (slipping) ● 1st and reverse brake (slipping)
	L	L	● Engine or torque converter one-way clutch
	H	H	● Line pressure is low (pressure control solenoid valve A malfunction, primary regulator valve malfunction) ● B5 brake (slipping) ● Oil pump ● Oil strainer (clogging) ● Oil leak for each range circuit

O: Stall speed within standard value position
H: Stall speed higher than standard value
L: Stall speed lower than standard value

TIME LAG TEST

Time lag test procedure

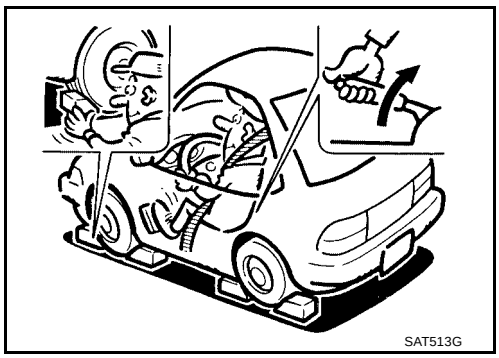
1. Inspect the amount of engine oil. Replenish the engine oil if necessary.
2. Drive for about 10 minutes to warm up the vehicle so that the A/T fluid temperature is 50 to 80°C (122 to 176°F). Check the amount of A/T fluid. Replenish if necessary.
3. Switch of A/C and light etc. are off.



SAT647B

4. Securely engage the parking brake so that the tires do not turn.
5. Engine start, apply foot brake.
6. Measure time lag by using stopwatch from moment when shift lever is shifted in “N” to “D” position and “N” to “R” position until moment slightly shock can be felt.

CAUTION:
- **Make sure to take 3 measurement and take the average value.**
- **Make sure to keep interval for more than one minute between time lag tests.**
  (That purpose is to remove clutch/brake pressure was left unfinished.)


SAT513G

Time lag:

"N" to "D" position: Less than 0.7 sec.

"N" to "R" position: Less than 1.2 sec.

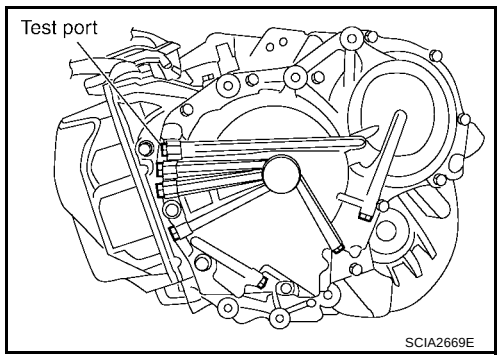
Judgement time lag test

Result of time lag test	Possible cause
Longer than standards "N" to "D" position	● Line pressure is low (pressure control solenoid valve A malfunction, primary regulator valve malfunction) ● Forward clutch (slipping) ● One-way clutch No. 2 ● Oil leak for "D" range circuit
Longer than standards "N" to "R" position	● Line pressure is low ● Direct clutch (slipping) ● 1st and reverse brake (slipping) ● Oil leak for "R" range circuit ● Oil pump ● Oil strainer (clogging)

LINE PRESSURE TEST

Line pressure test port

Location of line pressure test port is show in the figure.

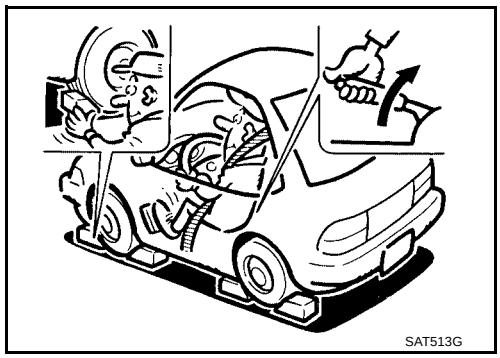


Line pressure test procedure

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 A/T fluid reaches in range of 50 to 80°C (122 to 176°F), then inspect the amount of A/T fluid and replenish if necessary.

   NOTE:
   The automatic fluid temperature rises in range of 50 to 80°C (122 to 176°F) during 10 minutes of driving.
3. Switch of A/C and light etc. are off.
4. After warming up A/T, remove the oil pressure detection plug and install the oil pressure gauge [SST: (J34301-C)] and adapter [SST: (J45542)].

   CAUTION:
   Make sure to check no oil leak after installing oil pressure gage.
5. Securely engage the parking brake so that the tires do not turn.

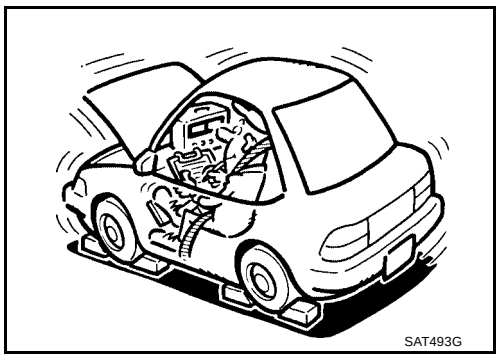


6. Start the engine, then measure the line pressure at both idle and the stall speed.

   CAUTION:
   - **Keep the brake pedal pressed all the way down during measurement.**
   - **When measuring the line pressure at the stall speed, refer to AT-57, "STALL TEST" .**

7. After the measurements are complete, install the oil pressure detection plug and tighten to the specified torque.

   :5.9 - 8.8 N·m (0.61 - 0.89 kg-m, 53 - 77 in-lb)


SAT493G

CAUTION:
Do not reuse O-ring.

Line pressure

Engine speed	Line pressure kPa (kg/cm^2 , psi)	
	D, M positions	R position
At idle speed	333 - 392 (3.4 - 4.0, 48 - 57)	500 - 608 (5.1 - 6.2, 73 - 88)
At stall speed	1,285 - 1,393 (13.1 - 14.2, 186 - 202)	1,706 - 1,981 (17.4 - 20.2, 247 - 287)

Judgement of line pressure test

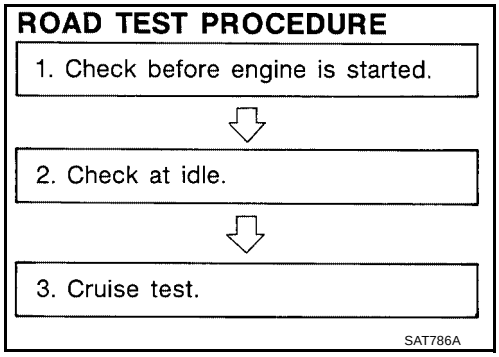
Judgement	Possible cause
Higher than standards both “D”, “M” and “R” positions	● Pressure control solenoid valve A malfunction ● Primary regulator valve malfunction
Lower than standards both “D”, “M” and “R” positions	● Pressure control solenoid valve A malfunction ● Primary regulator valve malfunction ● Oil pump malfunction ● B5 bake malfunction ● Oil leak for each range circuit malfunction
Lower than standards only “D” position	● Oil leak for “D” range circuit malfunction ● Forward clutch malfunction
Lower than standards only “R” position	● Oil leak for “R” range circuit malfunction ● Direct clutch malfunction ● 1st and reverse brake malfunction

ROAD TEST

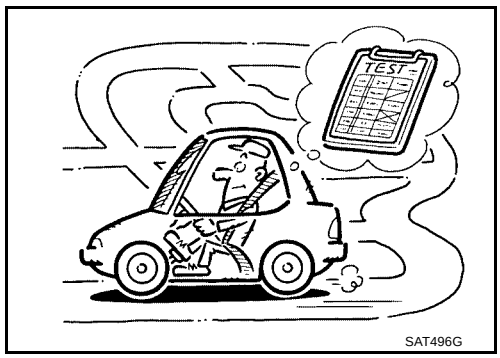
Description

- The road test inspects overall performance of the A/T and analyzes possible malfunction causes.
- The road test is perform in the following three stages.

1. Check before engine is started. Refer to AT-61 .
2. Check at idle. Refer to AT-61 .
3. Cruise test
   - Inspect all the items from Part 1 to Part 3. Refer to AT-63 , AT-64 , AT-65 .



- 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.



Check Before Engine is Started

ECS00A1C

1. CHECK A/T CHECK INDICATOR LAMP

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 the self-diagnostics and record all NG items on the diagnostics worksheet. Refer to AT-78 , AT-83 .
3. Go to AT-61, "Check at Idle" .

No >> Stop the road test and go to AT-213, "A/T CHECK Indicator Lamp does not come on" .

Check at Idle

ECS00A1D

1. CHECK STARTING THE ENGINE

1. Park vehicle on level surface.
2. Move selector lever to “P” position.
3. Turn ignition switch “OFF”.
4. Turn ignition switch “START”.

Does the engine start?

Yes >> GO TO 2.
No >> Stop the road test and go to AT-215, "Engine Cannot Be Started In “P” or “N” Position" .

2. CHECK STARTING THE ENGINE

1. Turn ignition switch “ACC”.
2. Move selector lever in “D” or “R” position.
3. Turn ignition switch “START”.

Does the engine start in either position?

Yes >> Stop the road test and go to AT-215, "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. Disengage 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 “Vehicle moves when pushed in “P” position” on the diagnostics worksheet, then continue the road test.
No >> GO TO 4.

4. CHECK “N” POSITION FUNCTIONS

1. Start the engine.
2. Move selector lever to “N” position.
3. Disengage the parking brake.

Does vehicle move forward or backward?

Yes >> Enter a check mark at “Vehicle moves in “N” position” on the diagnostics worksheet, then continue the road test.
No >> GO TO 5.

5. CHECK SHIFT SHOCK

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

When the transaxle is shifted from “N” to “D”, is there an excessive shock?

Yes >> Enter a check mark at “Large shock when shifted from N to D” on the diagnostics worksheet, then continue the road test.
No >> GO TO 6.

6. CHECK “R” POSITION FUNCTIONS

1. Engage the brake.
2. Move selector lever to “R” position.
3. Disengage the brake for 4 to 5 seconds.

Does the vehicle creep backward?

Yes >> GO TO 7.
No >> Enter a check mark at “Vehicle does not creep backward in R position” on the diagnostics worksheet, then continue the road test.

7. CHECK “D” POSITION FUNCTIONS

Inspect whether the vehicle moves forward when the transaxle is put into the “D” position.

Does the vehicle move forward in the “D” positions?

Yes >> Go to AT-63, "Cruise Test - Part 1" , AT-64, "Cruise Test - Part 2" , and AT-65, "Cruise Test - Part 3" .
No >> Enter a check mark at “Vehicle does not move forward in D positions” on the diagnostics worksheet, then continue the road test.

Cruise Test - Part 1

ECS00A1E

1. CHECK STARTING OUT FROM D1

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

With CONSULT-II

Read off the gear positions.

Starts from D1?

Yes >> GO TO 2.
No >> Enter a check mark at “Vehicle cannot be started from D1” on the diagnostics 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-66 .

With CONSULT-II

Read the gear position, throttle degree of opening, and vehicle speed.

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

Yes >> GO TO 3.
No >> Enter a check mark at “A/T does not shift D1 → D2” on the diagnostics 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-66 .

With CONSULT-II

Read the gear position, throttle degree of opening, and vehicle speed.

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

Yes >> GO TO 4.
No >> Enter a check mark at “A/T does not shift D2 → D3” on the diagnostics 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-66 .

With CONSULT-II

Read the gear position, throttle degree of opening, and vehicle speed.

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

Yes >> GO TO 5.
No >> Enter a check mark at “A/T does not shift D3 → D4” on the diagnostics worksheet, then continue the road test.

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-66 .

With CONSULT-II

Read the gear position, throttle degree of opening, and vehicle speed.

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

Yes >> GO TO 6.

No >> Enter a check mark at “A/T does not shift D4 → D5” on the diagnostics worksheet, then continue the road test.

6. CHECK LOCK-UP

When releasing accelerator pedal from D5, check lock-up from D5 to L/U.

- Refer to AT-66 .

With CONSULT-II

Read the lock-up status.

Does it lock-up?

Yes >> GO TO 7.

No >> Enter a check mark at “A/T does not perform lock-up” on the diagnostics worksheet, then continue the road test.

7. CHECK LOCK-UP HOLD

Does it maintain lock-up status?

Yes >> GO TO 8.

No >> Enter a check mark at “A/T hold does not lock-up condition” on the diagnostics worksheet, then continue the road test.

8. CHECK LOCK-UP RELEASE

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

With CONSULT-II

Read the lock-up status.

Does lock-up cancel?

Yes >> 1. Stop the vehicle.
2. Go to Cruise test - Part 2 (Refer to AT-64).

No >> Enter a check mark at “Lock-up is not released” on the diagnostics worksheet, then continue the road test. Go to Cruise test - Part 2 (Refer to AT-64).

Cruise Test - Part 2

ECS00A1F

1. CHECK STARTING FROM D1

1. Move selector lever the “D” position.
2. Accelerate at half throttle.

With CONSULT-II

Read the gear position.

Does it start from D1?

Yes >> GO TO 2.

No >> Enter a check mark at “Vehicle cannot be started from D1” on the diagnostics 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 transaxle shifts up (D1 → D2) at the correct speed.

- Refer to AT-66 .

With CONSULT-II

Read the gear position, accelerator angle and vehicle speed.

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

Yes >> GO TO 3.

No >> Enter a check mark at “Vehicle does not shift D1 → D2” on the diagnostics 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 transaxle shifts up (D2 → D3) at the correct speed.

- Refer to AT-66 .

With CONSULT-II

Read the gear position, accelerator angle and vehicle speed.

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

Yes >> GO TO 4.

No >> Enter a check mark at “Vehicle does not shift D2 → D3” on the diagnostics worksheet, then continue the road test.

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

When the transaxle changes speed D2 → D3, return the accelerator pedal.

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

Yes >> 1. Stop the vehicle.
2. Go to Cruise test - Part 3 (Refer to AT-65).

No >> Enter a check mark at “Vehicle does not shift D3 → D4” on the diagnostics worksheet, then continue the road test.

Cruise Test - Part 3

ECS00A1G

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 “Cannot be changed to manual mode” on diagnostics worksheet.

2. CHECK SHIFT-DOWN

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

With CONSULT-II

Read the gear position.

Is downshifting correctly performed?

Yes >> GO TO 3.

No >> Enter a check mark at “Vehicle does not shift” at the corresponding position (5th → 4th, 4th → 3rd, 3rd → 2nd, 2nd → 1st) on the diagnostics worksheet, then continue the road test.

3. CHECK ENGINE BRAKE

Does engine braking effectively reduce speed in M1 position?

Yes >> 1. Stop the vehicle.
2. Perform the self-diagnostics. Refer to AT-78, "SELF-DIAG RESULT MODE" , AT-83, "Diagnostic Procedure Without CONSULT-II" .

No >> Enter a check mark at “Vehicle does not decelerate by engine brake” on the diagnostics worksheet, then continue trouble diagnosis.

Shift Schedule

ECS00A1H

VEHICLE SPEED WHEN SHIFTING GEARS

Accelerator angle	Vehicle speed km/h (MPH) (Approx.)							
	D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
100 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
90 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
80 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
70 %	59 (37)	95 (59)	147 (91)	217 (135)	197 (122)	141 (88)	81 (50)	41 (25)
60 %	59 (37)	95 (59)	147 (91)	217 (135)	190 (118)	135 (84)	76 (47)	41 (25)
50 %	59 (37)	90 (56)	137 (85)	202 (126)	176 (109)	123 (76)	69 (43)	41 (25)
40 %	50 (31)	82 (51)	117 (73)	172 (107)	148 (92)	92 (57)	54 (34)	32 (20)
30 %	37 (23)	62 (39)	87 (54)	127 (79)	105 (65)	59 (37)	35 (22)	19 (12)
20 %	27 (17)	44 (27)	59 (37)	87 (54)	60 (37)	40 (25)	22 (14)	8 (5)
10 %	19 (12)	27 (17)	35 (22)	55 (34)	44 (27)	32 (20)	22 (14)	8 (5)

VEHICLE SPEED WHEN PERFORMING AND RELEASING COMPLETE LOCK-UP

Accelerator angle	Vehicle speed km/h (MPH) (Approx.)	
	Lock-up “ON”	Lock-up “OFF”
50 %	217 (135)	195 (121)
15%	108 (67)	70 (43)
0 - 8 %	66 (41)	63 (39)

- Lock-up vehicle speed indicates the speed in D position.
- Perform lock-up inspection after warming up engine.
- Lock-up vehicle speed may vary depending on the driving conditions and circumstances.

VEHICLE SPEED WHEN PERFORMING AND RELEASING SLIP LOCK-UP

Accelerator angle	Gear position	Vehicle speed km/h (MPH) (Approx.)	
		Slip lock-up “ON”	Slip lock-up “OFF”
0 - 10 %	4th	41 (25)	38 (24)
	5th	53 (33)	50 (31)

- Slip lock-up vehicle speed indicates the speed in D position.
- Perform slip lock-up inspection after warming up engine.

- Slip lock-up vehicle speed may vary depending on the driving conditions and circumstances.

Symptom Chart

ECS00A1I

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

CAUTION:
Do not remove or disassemble any RE5F22A model transaxle parts unless specified to do so in AT section.

Symptom	Condition	Diagnostic Item	Reference page
With selector lever in D position, driving is not possible.	ON vehicle	1. Fluid level and state	AT-57
		2. Control cable and PNP switch adjustment	AT-244, AT-241
		3. TCM	AT-74
		4. Pressure control solenoid valve A	AT-147
		5. Control valve assembly	AT-244
	OFF vehicle	6. Torque converter	AT-246
		7. Forward and direct clutch assembly	AT-256
		8. B5 brake	AT-283
		9. One-way clutch No.2	AT-256
With selector lever in R position, driving is not possible.	ON vehicle	1. Fluid level and state	AT-57
		2. Control cable and PNP switch adjustment	AT-244, AT-241
		3. TCM	AT-74
		4. Shift solenoid valve A	AT-152
		5. Shift solenoid valve B	AT-157
		6. Pressure control solenoid valve A	AT-147
		7. Control valve assembly	AT-244
	OFF vehicle	8. Torque converter	AT-256
		9. Forward and direct clutch assembly	AT-256
		10. 1st and reverse brake	AT-256
		11. B5 brake	AT-283
No shock at all or the clutch slips when vehicle changes speed.	ON vehicle	1. Fluid level and state	AT-57
		2. Control cable and PNP switch adjustment	AT-244, AT-241
		3. TCM	AT-74
		4. Shift solenoid valve A	AT-152
		5. Shift solenoid valve B	AT-157
		6. Shift solenoid valve E	AT-177
		7. Pressure control solenoid valve A	AT-147
		8. Pressure control solenoid valve C	AT-191
		9. Control valve assembly	AT-244
	OFF vehicle	10. Accumulator	AT-256

Symptom	Condition	Diagnostic Item	Reference page
Time lag is large. (“N” →“ D” position)	ON vehicle	1. Fluid level and state	AT-57
		2. Actual engine torque signal	AT-116
		3. Turbine revolution sensor	AT-108
		4. TCM	AT-74
		5. Control valve assembly	AT-244
	OFF vehicle	6. Accumulator	AT-256
		7. Forward and direct clutch assembly	AT-256
Time lag is large. (“N” →“ R” position)	ON vehicle	1. Fluid level and state	AT-57
		2. Actual engine torque signal	AT-116
		3. Turbine revolution sensor	AT-108
		4. TCM	AT-74
		5. Shift solenoid valve E	AT-177
		6. Control valve assembly	AT-244
	OFF vehicle	7. Forward and direct clutch assembly	AT-256
		8. 1st and reverse brake	AT-256
Engine does not start in “N”, “P” position.	ON vehicle	1. Ignition switch and starter	PG-4, SC-8
		2. Control cable adjustment	AT-244
		3. PNP switch	AT-93
Engine starts in positions other than “N” or “P”.	ON vehicle	1. Ignition switch and starter	PG-4, SC-8
		2. Control cable adjustment	AT-244
		3. PNP switch	AT-93
Engine stalls when selector lever shifted “N” → “D”, “R”.	ON vehicle	1. Fluid level and state	AT-57
		2. TCM	AT-74
		3. Shift solenoid valve D	AT-172
		4. Pressure control solenoid valve C	AT-191
		5. Control valve assembly	AT-244
Engine stall when vehicle slow down.	ON vehicle	1. Fluid level and state	AT-57
		2. TCM	AT-74
		3. Shift solenoid valve D	AT-172
		4. Shift solenoid valve E	AT-177
		5. Pressure control solenoid valve C	AT-191
		6. Control valve assembly	AT-244
Acceleration is extremely poor.	ON vehicle	1. Fluid level and state	AT-57
		2. Control cable and PNP switch adjustment	AT-244, AT-241
		3. Engine speed signal	AT-116
		4. Electric throttle control signal	AT-212

Symptom	Condition	Diagnostic Item	Reference page
Gear does not change from $D_1 \rightarrow D_2$ or from $M_1 \rightarrow M_2$.	ON vehicle	1. Fluid level and state	AT-57
		2. TCM	AT-74
		3. Electric throttle control signal	AT-212
		4. Shift solenoid valve A	AT-152
		5. Shift solenoid valve B	AT-157
		6. Shift solenoid valve C	AT-162
		7. Shift solenoid valve D	AT-172
		8. Control valve assembly	AT-244
	OFF vehicle	9. 2nd coast brake	AT-275, AT-281
		10. 2nd brake	AT-275
		11. One-way clutch No.1	AT-281
		12. One-way clutch No.2	AT-256
Gear does not change from $D_2 \rightarrow D_3$ or from $M_2 \rightarrow M_3$.	ON vehicle	1. Fluid level and state	AT-57
		2. TCM	AT-74
		3. Electric throttle control signal	AT-212
		4. Shift solenoid valve B	AT-157
		5. Shift solenoid valve C	AT-162
		6. Shift solenoid valve D	AT-172
		7. Pressure control solenoid valve A	AT-147
		8. Control valve assembly	AT-244
	OFF vehicle	9. U/D brake	AT-256
		10. B5 brake	AT-283
Gear does not change from $D_3 \rightarrow D_4$ or from $M_3 \rightarrow M_4$.	ON vehicle	1. Fluid level and state	AT-57
		2. TCM	AT-74
		3. Electric throttle control signal	AT-212
		4. Shift solenoid valve B	AT-157
		5. Shift solenoid valve C	AT-162
		6. Shift solenoid valve D	AT-172
		7. Control valve assembly	AT-244
	OFF vehicle	8. U/D clutch	AT-256
		9. U/D brake	AT-256
Gear does not change from $D_4 \rightarrow D_5$ or from $M_4 \rightarrow M_5$.	ON vehicle	1. Fluid level and state	AT-57
		2. TCM	AT-74
		3. Electric throttle control signal	AT-212
		4. Shift solenoid valve B	AT-157
		5. Shift solenoid valve C	AT-162
		6. Control valve assembly	AT-244
	OFF vehicle	7. Forward and direct clutch assembly	AT-256
		8. 2nd coast brake	AT-275, AT-281
		9. One-way clutch No.1	AT-281

Symptom	Condition	Diagnostic Item	Reference page
In D or M range, does not downshift to 1st gear.	ON vehicle	1. Fluid level and state	AT-57
		2. TCM	AT-74
		3. Electric throttle control signal	AT-212
		4. Shift solenoid valve A	AT-152
		5. Shift solenoid valve B	AT-157
		6. Shift solenoid valve C	AT-162
		7. Shift solenoid valve D	AT-172
		8. Control valve assembly	AT-244
	OFF vehicle	9. 2nd coast brake	AT-275, AT-281
		10. 2nd brake	AT-275
		11. One-way clutch No.1	AT-281
		12. One-way clutch No.2	AT-256
In D or M range, does not downshift to 2nd gear.	ON vehicle	1. Fluid level and state	AT-57
		2. TCM	AT-74
		3. Electric throttle control signal	AT-212
		4. Shift solenoid valve B	AT-157
		5. Shift solenoid valve C	AT-162
		6. Shift solenoid valve D	AT-172
		7. Pressure control solenoid valve A	AT-147
		8. Control valve assembly	AT-244
	OFF vehicle	9. U/D brake	AT-256
		10. B5 brake	AT-283
In D or M range, does not downshift to 3rd gear.	ON vehicle	1. Fluid level and state	AT-57
		2. TCM	AT-74
		3. Electric throttle control signal	AT-212
		4. Shift solenoid valve B	AT-157
		5. Shift solenoid valve C	AT-162
		6. Shift solenoid valve D	AT-172
		7. Control valve assembly	AT-244
	OFF vehicle	8. U/D clutch	AT-256
		9. U/D brake	AT-256
In D or M range, does not downshift to 4th gear.	ON vehicle	1. Fluid level and state	AT-57
		2. TCM	AT-74
		3. Electric throttle control signal	AT-212
		4. Shift solenoid valve B	AT-157
		5. Shift solenoid valve C	AT-162
		6. Control valve assembly	AT-244
	OFF vehicle	7. Forward and direct clutch assembly	AT-256
		8. 2nd coast brake	AT-275, AT-281
		9. One-way clutch No.1	AT-281

Symptom	Condition	Diagnostic Item	Reference page
Does not lock-up or lock-up is not released.	ON vehicle	1. Fluid level and state	AT-57
		2. Stop lamp switch signal	AT-232
		3. ATF temperature sensor	AT-98
		4. TCM	AT-74
		5. Shift solenoid valve C	AT-162
		6. Shift solenoid valve D	AT-172
		7. Pressure control solenoid valve C	AT-191
		8. Control valve assembly	AT-244
	OFF vehicle	9. Torque converter	AT-246
Engine brake does not work.	ON vehicle	1. Fluid level and state	AT-57
		2. TCM	AT-74
		3. Shift solenoid valve E	AT-177
		4. Electric throttle control signal	AT-212
		5. Control valve assembly	AT-244
	OFF vehicle	6. 2nd coast brake	AT-275, AT-281
		7. U/D brake	AT-256
		8. B5 brake	AT-283
Shift point is high or low.	ON vehicle	1. Pressure control solenoid valve A	AT-147
		2. Engine speed signal	AT-116
		3. Electric throttle control signal	AT-212
		4. Revolution sensor	AT-112
		5. TCM	AT-74
		6. Control valve assembly	AT-244
Large shock. (“N” →“ D” position)	ON vehicle	1. Fluid level and state	AT-57
		2. Actual engine torque signal	AT-116
		3. Turbine revolution sensor	AT-108
		4. ATF temperature sensor	AT-98
		5. Shift solenoid valve A	AT-152
		6. Shift solenoid valve B	AT-157
		7. Pressure control solenoid valve A	AT-147
		8. TCM	AT-74
		9. Control valve assembly	AT-244
	OFF vehicle	10. Accumulator	AT-256
		11. Forward and direct clutch assembly	AT-256

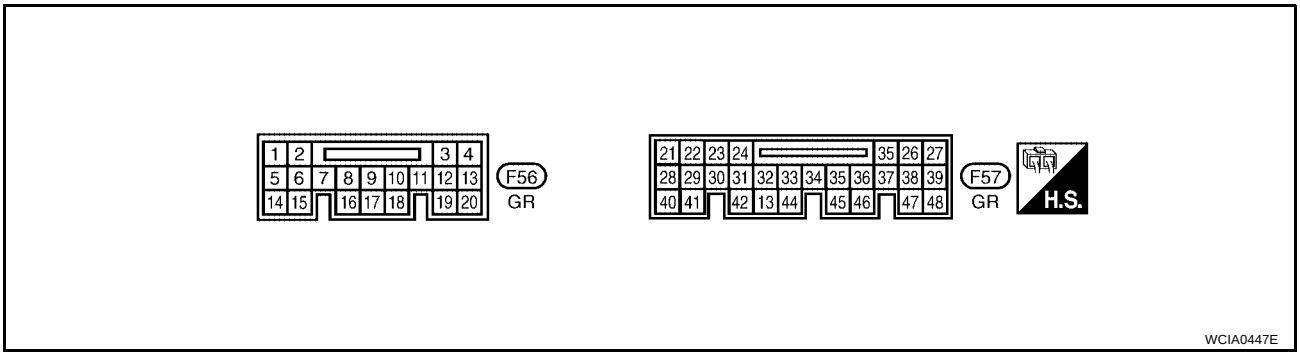
Symptom	Condition	Diagnostic Item	Reference page
Large shock. (“N” →“ R” position)	ON vehicle	1. Fluid level and state	AT-57
		2. Actual engine torque signal	AT-116
		3. Turbine revolution sensor	AT-108
		4. ATF temperature sensor	AT-98
		5. Shift solenoid valve E	AT-177
		6. Pressure control solenoid valve B	AT-182
		7. TCM	AT-74
		8. Control valve assembly	AT-244
	OFF vehicle	9. Forward and direct clutch assembly	AT-256
		10. 1st and reverse brake	AT-256
Shock is too large when shift up.	ON vehicle	1. Fluid level and state	AT-57
		2. Actual engine torque signal	AT-116
		3. Turbine revolution sensor	AT-108
		4. ATF temperature sensor	AT-98
		5. TCM power input signal	AT-207
		6. Shift solenoid valve A	AT-152
		7. Shift solenoid valve B	AT-157
		8. Shift solenoid valve C	AT-162
		9. Shift solenoid valve D	AT-172
		10. Shift solenoid valve E	AT-177
		11. Pressure control solenoid valve A	AT-147
		12. Pressure control solenoid valve B	AT-182
		13. Pressure control solenoid valve C	AT-191
		14. TCM	AT-74
		15. Control valve assembly	AT-244
Shock is too large for coast down.	ON vehicle	1. Fluid level and state	AT-57
		2. Actual engine torque signal	AT-116
		3. Turbine revolution sensor	AT-108
		4. ATF temperature sensor	AT-98
		5. TCM power input signal	AT-207
		6. Shift solenoid valve A	AT-152
		7. Shift solenoid valve B	AT-157
		8. Shift solenoid valve C	AT-162
		9. Shift solenoid valve D	AT-172
		10. Shift solenoid valve E	AT-177
		11. Pressure control solenoid valve A	AT-147
		12. Pressure control solenoid valve B	AT-182
		13. Pressure control solenoid valve C	AT-191
		14. TCM	AT-74
		15. Control valve assembly	AT-244

Symptom	Condition	Diagnostic Item	Reference page
Shock is too large for kick down.	ON vehicle	1. Fluid level and state	AT-57
		2. Actual engine torque signal	AT-116
		3. Turbine revolution sensor	AT-108
		4. ATF temperature sensor	AT-98
		5. TCM power input signal	AT-207
		6. Shift solenoid valve A	AT-152
		7. Shift solenoid valve B	AT-157
		8. Shift solenoid valve C	AT-162
		9. Shift solenoid valve D	AT-172
		10. Shift solenoid valve E	AT-177
		11. Pressure control solenoid valve A	AT-147
		12. Pressure control solenoid valve B	AT-182
		13. Pressure control solenoid valve C	AT-191
		14. TCM	AT-74
		15. Control valve assembly	AT-244
Strange noise in “R”,“N” or“ D” position.	ON vehicle	1. Fluid level and state	AT-57
		2. Control valve assembly	AT-244
	OFF vehicle	3. Torque converter	AT-256
		4. Parking component	AT-275
		5. Gear system	AT-256
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	AT-93
		2. Control cable adjustment	AT-244
		3. Control valve assembly	AT-244
	OFF vehicle	4. Parking component	AT-275
Vehicle runs with transaxle in “ P” position.	ON vehicle	1. Fluid level and state	AT-57
		2. PNP switch	AT-93
		3. Control cable and PNP switch adjustment	AT-244, AT-241
		4. Line pressure test	AT-59
Vehicle runs with transaxle in “N” position.	ON vehicle	1. Fluid level and state	AT-57
		2. PNP switch	AT-93
		3. Control cable and PNP switch adjustment	AT-244, AT-241
		4. Line pressure test	AT-59

TCM Input/Output Signal Reference Values

ECS00A1J

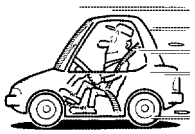
TCM TERMINAL CONNECTOR LAYOUT



TCM INSPECTION TABLE

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

Terminal	Wire color	Item	Condition		Data (Approx.)
1	L/B	A/T PV IGN relay		When turning ignition switch ON.	0 - 1.5V
				When turning ignition switch OFF.	0V
3	L	CAN-H	–		–
4	P	CAN-L	–		–
5	R/G	Manual mode switch UP (+)		Selector lever: + side	0V
				Other than the above	Battery voltage
6	L/R	Manual mode switch DOWN (-)		Selector lever: - side	0V
				Other than the above	Battery voltage
14	B	Ground	Always		0V
16	SB	Manual mode switch AUTO		Selector lever: “P”, “R”, “N” or “D” position	0V
				Selector lever: Manual shift gate position	Battery voltage
19	V/R	Manual mode switch MANUAL		Selector lever: Manual shift gate position (neutral)	0V
				Other than the above	Battery voltage
21	G/B	Pressure control solenoid valve B ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
22	L	Revolution sensor power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
23	G	Turbine revolution sensor power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
24	O/L	PNP switch A		Selector lever: “P” and “R” position	0V
				Other than the above	Battery voltage
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V
26	V/W	Shift solenoid valve D		When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
				When shift solenoid valve D does not operate.	0V
27	Y/R	Power supply (Memory back-up)	Always		Battery voltage

Terminal	Wire color	Item	Condition		Data (Approx.)
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
29	B/W	Revolution sensor		When moving at 20 km/h (12 MPH) in 1st gear.	119Hz
30	R	Turbine revolution sensor		When moving at 20 km/h (12 MPH) in 1st gear.	371Hz
31	BR	PNP switch B		Selector lever: “R”, “N”, “D” and manual mode position	0V
				Other than the above	Battery voltage
32	P/B	PNP switch C		Selector lever: “D” and manual mode position	0V
				Other than the above	Battery voltage
33	LG	PNP switch PN		Selector lever: “P” and “N” position	Battery voltage
				Other than the above	0V
34	Y	Power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
36	O/B	Pressure control solenoid valve B		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V
38	R/Y	Power supply (A/T PV IGN relay)		When turning ignition switch ON.	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
39	R/Y	Power supply (A/T PV IGN relay)		When turning ignition switch ON.	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V

Terminal	Wire color	Item	Condition		Data (Approx.)	
41	R/Y	Fluid temperature sensor		When ATF temperature 0°C (32°F)	4.0V	9.8 kΩ
				When ATF temperature 20°C (68°F)	3.0V	4.2 kΩ
				When ATF temperature 80°C (176°F)	0.8V	0.54 kΩ
				When ATF temperature 100°C (212°F)	0.5V	0.31 kΩ
42	LG	Fluid temperature sensor ground	Always		0V	
43	V/W	PNP switch PA		Selector lever: “P” and “N” position	0V	
				Other than the above	Battery voltage	
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz	
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage	
				When shift solenoid valve A does not operate.	0V	
47	BR/Y	Shift solenoid valve E		When shift solenoid valve E operates. (When driving in reverse gear.)	Battery voltage	
				When shift solenoid valve E does not operate.	0V	
48	B	Ground	Always		0V	

CONSULT-II Function (TRANSMISSION)

ECS00A1K

CONSULT-II can display each diagnostic item using the diagnostic test modes shown following.

TCM diagnostic mode	Description
WORK SUPPORT	Supports inspections and adjustments. Commands are transmitted to the TCM for setting the status suitable for required operation, input/output signals are received from the TCM and received data is displayed.
SELF-DIAG RESULTS	Displays TCM self-diagnosis results.
DATA MONITOR	Displays TCM input/output data in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
FUNCTION TEST	Conducted by CONSULT-II instead of a technician to determine whether each system is "OK" or "NG".
ECU PART NUMBER	TCM part number can be read.

After performing “SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)” (Refer to AT-78), place check marks for results on the AT-52, "DIAGNOSTIC WORKSHEET" . Reference pages are provided following the items.

NOTICE:

1. The CONSULT-II electrically displays shift timing and lock-up timing (that is, operation timing of each solenoid).
   Check for time difference between actual shift timing and the CONSULT-II display. If the difference is noticeable, mechanical parts (except solenoids, sensors, etc.) may be malfunctioning. Check mechanical parts using applicable diagnostic procedures.
2. Shift schedule (which implies gear position) displayed on CONSULT-II and that indicated in Service Manual may differ slightly. This occurs because of the following reasons:

- Actual shift schedule has more or less tolerance or allowance,
- Shift schedule indicated in Service Manual refers to the point where shifts start, and
- Gear position displayed on CONSULT-II indicates the point where shifts are completed.

3. Display of solenoid valves on CONSULT-II changes at the start of shifting, while gear position is displayed upon completion of shifting (which is computed by TCM).

4. Additional CONSULT-II information can be found in the Operation Manual supplied with the CONSULT-II unit.

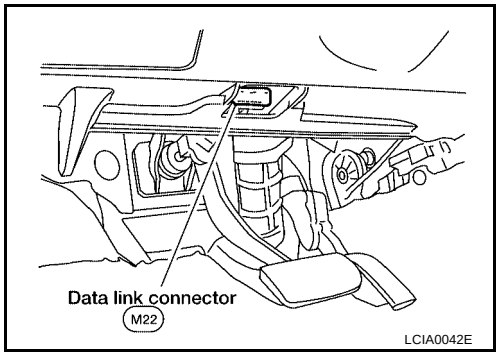
CONSULT-II SETTING PROCEDURE

CAUTION:

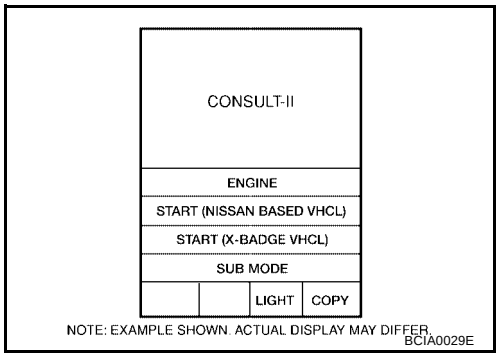
If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

- For details, refer to the separate “CONSULT-II Operations Manual”.

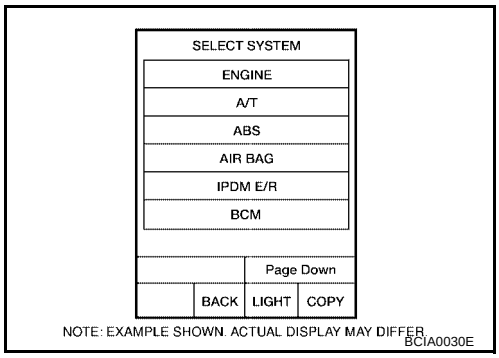
1. Turn ignition switch “OFF”.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector, which is located in driver instrument panel (lower).
3. Turn ignition switch “ON”. (Do not start engine.)



4. Touch “START (NISSAN BASED VHCL)”.



5. Touch “A/T”.
   If “A/T” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .
6. Perform each diagnostic test mode according to each service procedure.



WORK SUPPORT MODE

Work item

Work item	Condition	Usage
INITIALIZATION	Under the following conditions. ● Ignition switch “ON”. ● Selector lever “P” or “N” position. ● Engine not running. ● Vehicle speed is 0 km/h (0 MPH). ● Ignition voltage is more than 10.5V. ● Malfunction was not detected.	Use to initialize TCM in a case of replacing transaxle or TCM. Refer to AT-8, "Precautions for A/T Assembly or TCM Replacement" .

SELF-DIAG RESULT MODE

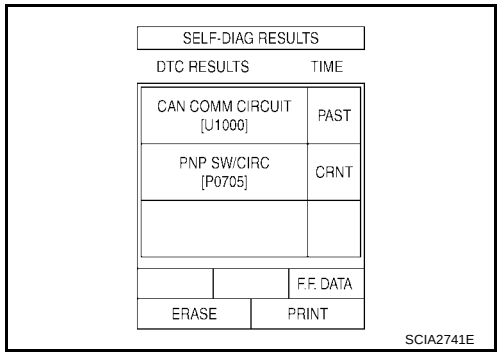
Operation procedure

1. Perform “CONSULT-II SETTING PROCEDURE”. Refer to AT-78, "CONSULT-II SETTING PROCEDURE" .

2. Touch “SELF-DIAG RESULTS”.
Display shows malfunction experienced since the last erasing operation.

NOTE:

- **The details for “TIME” are as follow:**
  - **“CRNT”: Error currently detected with TCM.**
  - **“PAST”: Error detected in the past and memorized with TCM.**
- **Touch “F.F.DATA” on “SELF-DIAG RESULTS” screen to display freeze frame data. Freeze frame data shows driving condition when malfunction is detected.**
  For freeze frame data items, refer to AT-79, "Display item list" .



Display item list

X: Applicable —: Not applicable

Items (CONSULT-II screen terms)	Malfunction is detected when...	TCM self-diagnosis		OBD-II (DTC)
		A/T CHECK indicator lamp*3	“TRANSMISSION” with CONSULT-II	MIL indicator lamp*1 , “ENGINE” with CONSULT-II or GST
CAN COMM CIRCUIT	● When a malfunction is detected in CAN communications	X	U1000*4	U1000*4
VEH SPD SE/CIR-MTR	● ECM detects a malfunction in vehicle speed sensor signal, after that TCM inputs the result by CAN communication.	X	P0500	P0500
TCM PROCESSOR	● TCM processor is malfunctioning.	—	P0613	—
PNP SW/CIRC	● PNP switch signals input with impossible pattern	X	P0705	P0705
ATF TEMP SEN/CIRC	● Normal voltage is not applied to ATF temperature sensor due to open, short, and so on. ● During running, the ATF temperature sensor signal voltage is excessively high or low.	X	P0710	P0710
FLUID TEMP SEN	● ATF temperature signal does not change.	—	P0711	P0711*2
TURBINE SENSOR	● Signal from turbine revolution sensor does not input due to open, short, and so on. ● Unexpected signal input during running.	X	P0717	P0717
VHCL SPEED SEN-A/T	● Signal from revolution sensor does not input due to open, short, and so on. ● Unexpected signal input during running.	X	P0722	P0722
ENG SPD INP PERFOR	● Malfunction is detected in engine speed signal, actual engine torque signal or torque reduction signal that is output from ECM through CAN communication.	X	P0726	P0726
A/T 1ST GR FNCTN	● A/T cannot be shifted to the 1st gear position even if electrical circuit is good.	X	P0731	P0731*2
A/T 2ND GR FNCTN	● A/T cannot be shifted to the 2nd gear position even if electrical circuit is good.	X	P0732	P0732*2
A/T 3RD GR FNCTN	● A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.	X	P0733	P0733*2
A/T 4TH GR FNCTN	● A/T cannot be shifted to the 4th gear position even if electrical circuit is good.	X	P0734	P0734*2
A/T 5TH GR FNCTN	● A/T cannot be shifted to the 5th gear position even if electrical circuit is good.	X	P0735	P0735*2
A/T TCC S/V FNCTN	● A/T cannot perform lock-up even if electrical circuit is good.	X	P0744	P0744*2

Items (CONSULT-II screen terms)	Malfunction is detected when...	TCM self-diagnosis		OBD-II (DTC)
		A/T CHECK indicator lamp*3	"TRANSMISSION" with CONSULT-II	MIL indicator lamp*1 , "ENGINE" with CONSULT-II or GST
PC SOL A(L/PRESS)	● Normal voltage is not applied to solenoid due to open, short, and so on. ● TCM detects as irregular by comparing target value with monitor value.	X	P0745	P0745
SHIFT SOL A		X	P0750	P0750
SHIFT SOL B		X	P0755	P0755
SHIFT SOL C		X	P0760	P0760
SFT SOL C STUCK ON	● Condition of shift solenoid valve C is different from monitor value, and relation between gear position and actual gear ratio is irregular.	X	P0762	P0762*2
SHIFT SOL D	● Normal voltage is not applied to solenoid due to open, short, and so on. ● TCM detects as irregular by comparing target value with monitor value.	X	P0765	P0765
SHIFT SOL E		X	P0770	P0770
PC SOL B(SFT/PRS)		X	P0775	P0775
SHIFT	● No rotation change occurs between input (turbine revolution sensor) and output (revolution sensor) and shifting time is long. ● Shifting ends immediately. ● Condition in malfunction engine revs up usually shifting.	X	P0780	P0780*2
PC SOL C(TCC&SFT)	● Normal voltage is not applied to solenoid due to open, short, and so on. ● TCM detects as irregular by comparing target value with monitor value.	X	P0795	P0795
PC SOL C STC ON	● Condition of pressure control solenoid valve C is different from monitor value, and relation between gear position and actual gear ratio or lock-up status is irregular.	X	P0797	P0797*2
MANUAL MODE SWITCH	● Manual mode switch signal is incorrectly input due to open, short, and so on.	—	P0826	—
TCM POWER INPT SIG	● Voltage supplied to TCM is too low.	—	P0882	P0882
ELEC TH CONTROL	● The electric throttle control system for ECM is in a malfunction, after that TCM inputs the result by CAN commnication.	X	P1726	P1726
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	● No NG item has been detected.	—	X	X

*1: Refer to AT-46, "Malfunction Indicator Lamp (MIL)" .
*2: These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.
*3: Indicate it when performing TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS). Refer to AT-83, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .
*4: If DTC U1000 is displayed with other DTCs, first perform the trouble diagnosis for DTC U1000. Refer to AT-86 .

DATA MONITOR MODE

Operation procedure

1. Perform "CONSULT-II SETTING PROCEDURE". Refer to AT-78, "CONSULT-II SETTING PROCEDURE" .
2. Touch "DATA MONITOR".

NOTE:
When malfunction is detected, CONSULT-II performs REAL-TIME DIAGNOSIS.
Also, any malfunction detected while in this mode will be displayed at real time.

Display item list

X: Standard —: Not applicable

Monitored item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
VHCL/S SE-A/T (km/h)	X	X	X	Vehicle speed recognized by the TCM.
VHCL/S SE-MTR* (km/h)	X	—	X	
FLUID TEMP SE* (V)	X	—	X	
FLUID TEMP* (°C)	—	—	X	
COOLAN TEMP* (°C)	—	—	X	Displays status of engine coolant temperature. Signal input with CAN communication line.
BATTERY VOLT* (V)	X	—	X	
ENGINE SPEED* (rpm)	X	X	X	Signal input with CAN communication line.
TURBINE REV* (rpm)	X	—	X	Turbine revolution computed from signal of turbine revolution sensor is displayed.
OUTPUT REV* (rpm)	—	—	X	Output revolution computed from signal of revolution sensor is displayed.
PNP SW A* (ON/OFF)	X	—	X	
PNP SW B* (ON/OFF)	X	—	X	
PNP SW C* (ON/OFF)	X	—	X	
PNP SW PA* (ON/OFF)	X	—	X	
PNP SW PN (ON/OFF)	X	—	X	
MANU MODE SW* (ON/OFF)	X	—	X	
NON M-MODE SW* (ON/OFF)	X	—	X	
UP SW* (ON/OFF)	X	—	X	
DOWN SW* (ON/OFF)	X	—	X	
RANGE SLCT SW (ON/OFF)	X	—	X	Not mounted but displayed.
BRAKE SW* (ON/OFF)	X	—	X	This means stop lamp switch signal via CAN communication line.
CLSO THL POS (ON/OFF)	X	—	X	Signal input with CAN communication line.
ASCD SIGNAL (ON/OFF)	X	—	X	
ASCD OD OFF (ON/OFF)	X	—	X	
ABS SIGNAL (ON/OFF)	X	—	X	
TCS SIGNAL (ON/OFF)	X	—	X	
TCS GEAR HOLD (ON/OFF)	X	—	X	
TCS SFT CNG (ON/OFF)	—	—	X	Requests TCM for shift schedule change.
LOCK-UP* (ON/OFF)	—	—	X	Always “ON” during lock-up, regardless of types.
SLCT LVR POSI*	—	—	X	Displays “##” in manual mode or when unknown.
MANU GR POSI	—	—	X	Displays “##” in non-manual mode or when unknown.

Monitored item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
GEAR*	—	—	X	Indicates current gear position. Also when setting in P or N position, indicate by shift solenoid valves. Displays “##” in R position or when unknown.
NEXT GR POSI	—	—	X	Displays “##” in R position or when unknown.
REDCT DEM SIG (ON/OFF)	—	—	X	Displays status of engine torque reduction demand signal.
TC SLIP RATIO	—	—	X	
SLIP REV (rpm)	—	—	X	Difference between engine speed and torque converter input shaft speed.
ACCELE ANGLE* (%)	X	X	X	Degree of opening for accelerator recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
PC SOL A OUT* (A)	—	—	X	
PC SOL A MON* (A)	—	X	X	
PC SOL B OU*T (A)	—	—	X	
PC SOL B MON* (A)	—	X	X	
PC SOL C OUT* (A)	—	—	X	
PC SOL C MON* (A)	—	X	X	
SFT SOL A OUT* (ON/OFF)	—	—	X	
SFT SOL B OUT* (ON/OFF)	—	—	X	
SFT SOL C OUT* (ON/OFF)	—	—	X	
SFT SOL D OUT* (ON/OFF)	—	—	X	
SFT SOL E OUT* (ON/OFF)	—	—	X	
SFT SOL A MON* (ON/OFF)	—	X	X	
SFT SOL B MON* (ON/OFF)	—	X	X	
SFT SOL C MON* (ON/OFF)	—	X	X	
SFT SOL D MON* (ON/OFF)	—	X	X	
SFT SOL E MON* (ON/OFF)	—	X	X	
G-RATE (G)	—	—	X	
F-SAFE MODE (OK/1 to 10)	—	X	X	Numbers indicate types of fail-safe modes. Refer to AT-48, "Fail-safe mode list" .
VDC SIGNAL (ON/OFF)	X	—	X	Signal input with CAN communication line.
SHIFT SCHDULE	—	—	X	The details for data of shift schedule are as follow: NOR: Normal mode UP1: Upslope 1 mode UP2: Upslope 2 mode (steeper than “UP1”) DOWN: Downslope mode HOT1: Hot 1 mode HOT2: Hot 2 mode (higher temperature than “HOT1”)

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

*: Also, the items appear on CONSULT-II screen in freeze frame data mode of self-diagnostic results only if DTC is detected. For details, refer to AT-78, "SELF-DIAG RESULT MODE" .

ACTIVE TEST MODE

Test item

Test item	Condition	Description
SHIFT SOLENOID A	Under the following conditions. ● Ignition switch “ON” ● Selector lever “P” or “N” position ● Engine not running ● Vehicle speed is 0 km/h (0 MPH). ● Ignition voltage is more than 10.5V. ● Malfunction was not detected.*	Each shift solenoid operate ON/OFF by receiving the drive signal.
SHIFT SOLENOID B		
SHIFT SOLENOID C		
SHIFT SOLENOID D		
SHIFT SOLENOID E		
PRESSURE CONTROL SOL A		Each pressure control solenoid is activated by receiving the drive signal.
PRESSURE CONTROL SOL B		
PRESSURE CONTROL SOL C		

*: Except when P0711, P0731, P0732, P0733, P0734, P0735, P0744, P0762, P0780 or P0797 is detected.

NOTE:
Approximately 10 seconds after the operation is begun, “TEST IS STOPPED” will be displayed.

Diagnostic Procedure Without CONSULT-II

ECS00A1L

OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)

Refer to EC-130, "Generic Scan Tool (GST) Function" .

OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer toEC-63, "Malfunction Indicator Lamp (MIL)" .

TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Description

As a method for locating the suspect system, when the self-diagnostics start signal is input, the memory for the malfunction location is output and the 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.)
5. Does A/T CHECK indicator lamp come on for about 2 seconds?

Yes or No

Yes >> GO TO 2.
No >> GO TO AT-213, "A/T CHECK Indicator Lamp does not come on" .

2. JUDGEMENT PROCEDURE

NOTE:
After turning ignition switch “ON” (at step 6), perform within 2 seconds (while A/T CHECK indicator lamp come on.).

1. Turn ignition switch “OFF”.
2. Push 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. Move the selector lever to the “N” position and release brake pedal. (Stop lamp switch signal “OFF”.)
8. Move the selector lever to “D” position and depress brake pedal. (Stop lamp switch signal “ON”.)
9. Release brake pedal. (Stop lamp switch signal “OFF”.)
10. Depress accelerator pedal fully and release it.

>> GO TO 3.

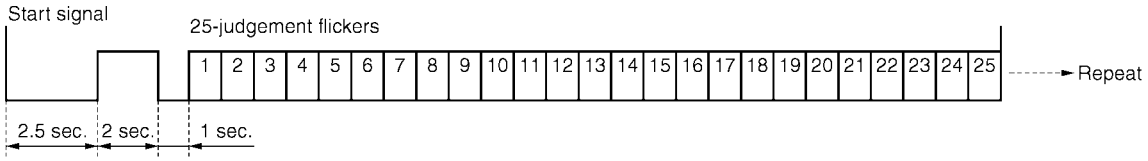
3. CHECK SELF-DIAGNOSIS CODE

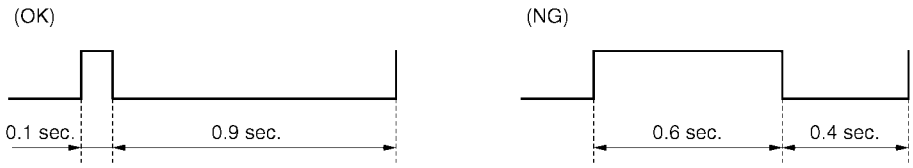
Check A/T CHECK indicator lamp. Refer to AT-85, "Judgement self-diagnosis code" .
If the system does not go into self-diagnostics, refer to AT-232, "TCM Self-diagnosis Does Not Activate" .

>> **DIAGNOSIS END**

Judgement self-diagnosis code

When a malfunction is detected, the malfunction route is indicated by longer illumination of the indicator lamp.





1	Revolution sensor	14	Engine speed signal
2	Turbine revolution sensor	15	Vehicle speed signal
3	Pressure control solenoid valve A	16	CAN communication
4	Pressure control solenoid valve B	17	1st gear function
5	Pressure control solenoid valve C	18	2nd gear function
6	Shift solenoid valve A	19	3rd gear function
7	Shift solenoid valve B	20	4th gear function
8	Shift solenoid valve C	21	5th gear function
9	Shift solenoid valve D	22	Shift solenoid valve C stuck ON
10	Shift solenoid valve E	23	Shift function
11	PNP switch	24	Lock-up function
12	A/T fluid temperature sensor	25	Pressure contnal solenoid valve C stuck ON
13	Electric throttle control system		

If the lamp flashes at 4Hz frequency, the most likely cause is EEP ROM error (Poor memory back up).

SCIA2758E

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 executing self-diagnostics or by erasing the memory using the CONSULT-II.

DTC U1000 CAN COMMUNICATION LINE

PFP:23710

Description

ECS00A1M

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

ECS00A1N

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

Possible Cause

ECS00A1O

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

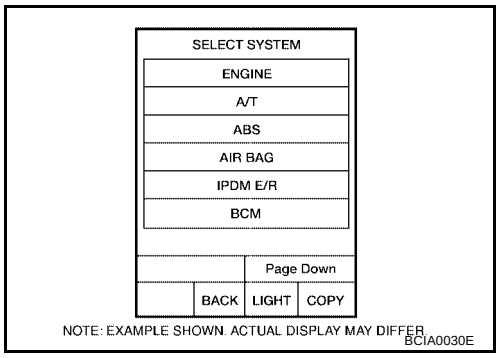
DTC Confirmation Procedure

ECS00A1P

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following condition for at least 6 seconds.
   SLCT LVR POSI: “D” position
5. If DTC is detected, go to AT-88, "Diagnostic Procedure" .



WITH GST

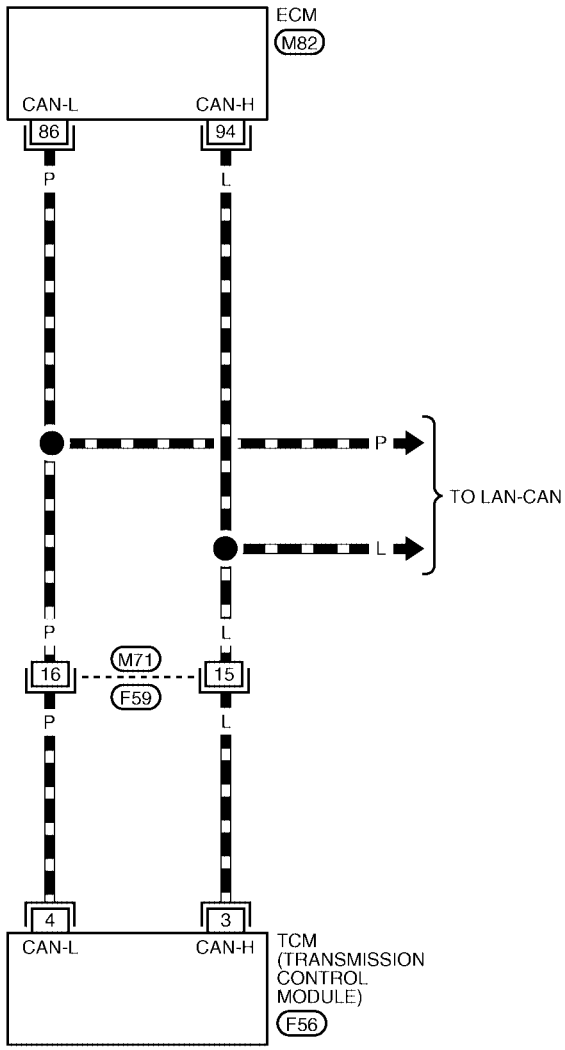
Follow the procedure “WITH CONSULT-II”.

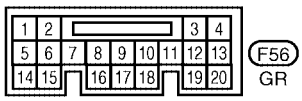
Wiring Diagram — AT — CAN

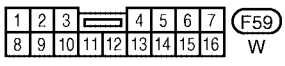
ECS00A1Q

AT-CAN-01

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







REFER TO THE FOLLOWING.
M82 - ELECTRICAL UNITS

BCWA0442E

TCM terminals and data are reference value.

Terminal	Wire color	Item	Condition	Data (Approx.)
3	L	CAN H	–	–
4	P	CAN L	–	–

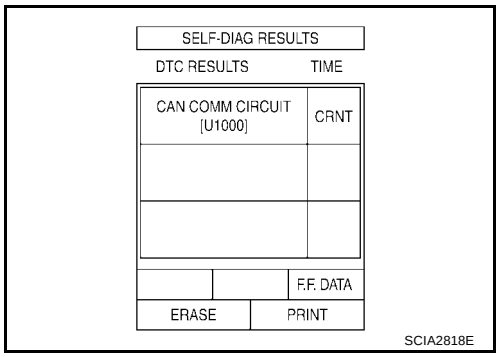
Diagnostic Procedure

ECS00A1R

1. CHECK CAN COMMUNICATION CIRCUIT

With CONSULT-II

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



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

Yes >> Print out CONSULT-II screen, GO TO LAN section. Refer to LAN-25, "CAN COMMUNICATION" .

No >> **INSPECTION END**

DTC P0500 VEHICLE SPEED SENSOR MTR

PFP:24814

Description

ECS00A1S

The vehicle speed sensor·MTR signal is transmitted from unified meter and A/C amp. to TCM by CAN communication line. The signal functions as an auxiliary device to the revolution sensor when it is malfunctioning. The TCM will then use the vehicle speed sensor·MTR signal.

On Board Diagnosis Logic

ECS00A1T

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “VEH SPD SE/CIR-MTR” with CONSULT-II or 15th judgement flicker without CONSULT-II 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

ECS00A1U

- Harness or connectors
  (The signal circuit is open or shorted.)
- Unified meter and A/C amp.
- ABS actuator and electric unit (control unit)
- Wheel sensor

DTC Confirmation Procedure

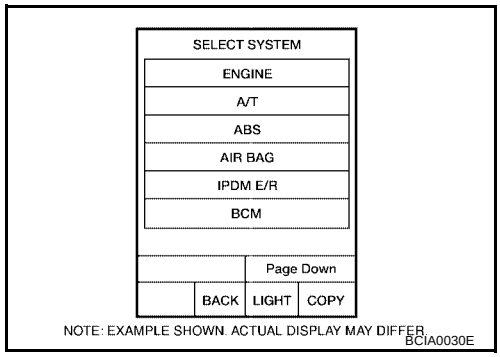
ECS00A1V

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-II

1. Turn ignition switch “ON” and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Start engine.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   VHCL/S SE-A/T: 30 km/h (17 MPH) or more
   ACCELE ANGLE: 10 % or less
4. If DTC is detected, go to AT-90, "Diagnostic Procedure" .



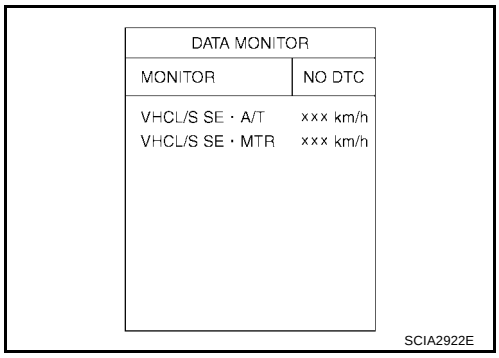
Diagnostic Procedure

ECS00A1W

1. CHECK INPUT SIGNALS

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle, and then make sure that the values of “VHCL/S SE-A/T” and “VHCL/S SE-MTR” are same.



OK or NG

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

2. CHECK DTC WITH ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Refer to BRC-10, "TROUBLE DIAGNOSIS" (with TCS/ABS) or BRC-54, "TROUBLE DIAGNOSIS" (with VDC/TCS/ABS).

OK or NG

OK >> GO TO 3.
NG >> If NG, recheck pin terminals for damage or loose connection with harness connector.

3. CHECK DTC WITH UNIFIED METER AND A/C AMP.

Refer to DI-5, "COMBINATION METERS" .

OK or NG

OK >> GO TO 4.
NG >> If NG, recheck pin terminals for damage or loose connection with harness connector.

4. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-89, "DTC Confirmation Procedure" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

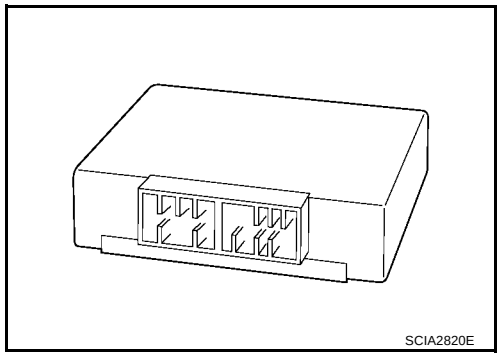
DTC P0613 TCM PROCESSOR

PFP:31036

Description

ECS00A1X

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



On Board Diagnosis Logic

ECS00A1Y

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “TCM PROCESSOR” with CONSULT-II is detected when TCM processor is malfunctioning.

Possible Cause

ECS00A1Z

TCM

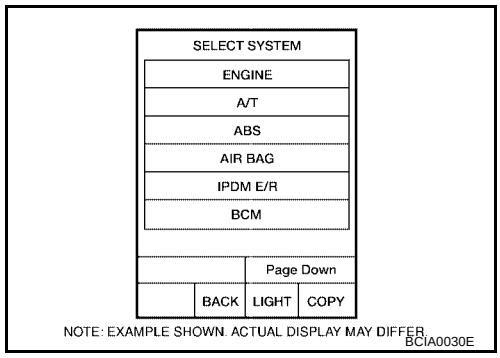
DTC Confirmation Procedure

ECS00A20

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Run engine for at least 2 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-92, "Diagnostic Procedure" .



Diagnostic Procedure

ECS00A21

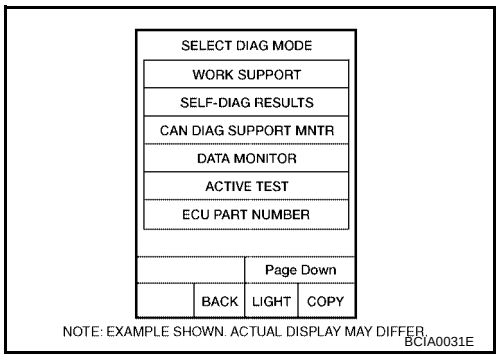
1. CHECK DTC

With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “SELF-DIAG RESULTS” mode in CONSULT-II.
3. Touch “ERASE”.
4. Turn ignition switch “OFF” and wait at least 10 seconds.
5. Perform DTC confirmation procedure, AT-91, "DTC Confirmation Procedure" .

Is the “TCM PROCESSOR” displayed again?

YES >> Replace TCM.
NO >> **INSPECTION END**



NOTE: EXAMPLE SHOWN. ACTUAL DISPLAY MAY DIFFER.
BCIA0031E

DTC P0705 PARK/NEUTRAL POSITION SWITCH

PFP:32006

Description

ECS00A22

- The park/neutral position (PNP) switch includes a transmission position switch.
- The transmission range switch detects the selector lever position and sends a signal to the TCM.
- TCM judges the selector lever position by the park/neutral position (PNP) switch signal.

Selector lever	PNP switch A	PNP switch B	PNP switch C	PNP switch PA	PNP switch PN
P	ON	OFF	OFF	ON	ON
R	ON	ON	OFF	OFF	OFF
N	OFF	ON	OFF	ON	ON
D	OFF	ON	ON	OFF	OFF

On Board Diagnosis Logic

ECS00A23

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “PNP SW/CIRC” with CONSULT-II or P0705 without CONSULT-II is detected when PNP switch signals input with impossible pattern.

Possible Cause

ECS00A24

- Harness or connectors
  [The park/neutral position (PNP) switch and TCM circuit is open or shorted.]
- Park/neutral position (PNP) switch

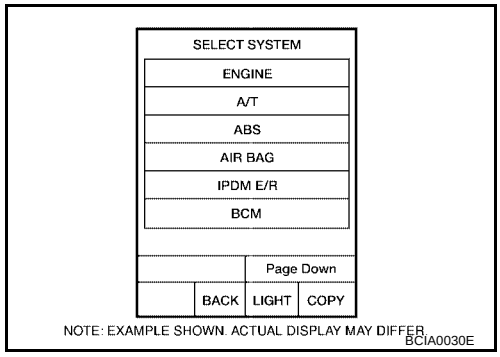
DTC Confirmation Procedure

ECS00A25

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Move selector lever to each position.
   SLCT LVR POSI: “P”, “R”, “N” or “D” position
4. Wait for at least 5 consecutive seconds at each position.
5. If DTC is detected, go to AT-95, "Diagnostic Procedure" .



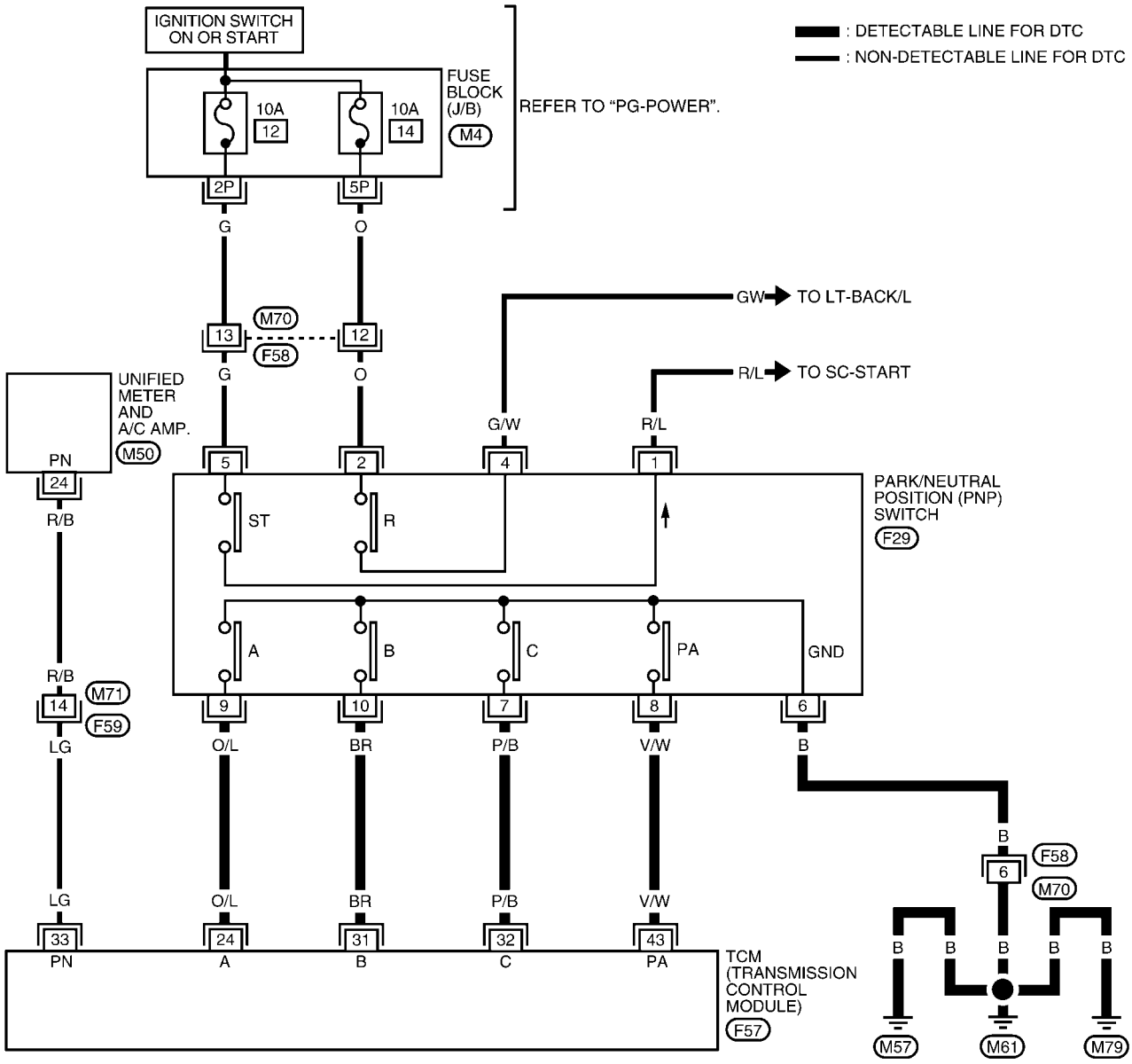
WITH GST

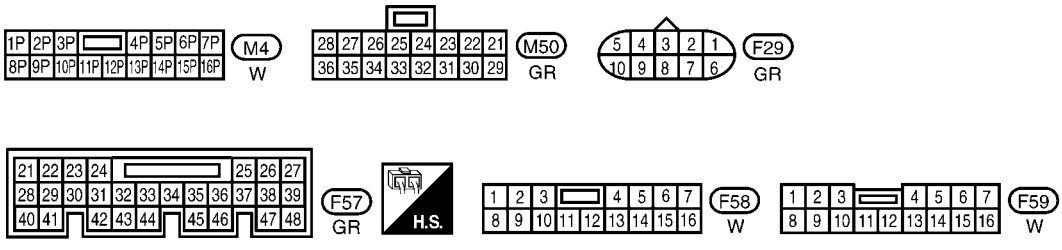
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — PNP/SW

ECS00A26

AT-PNP/SW-01





BCWA0495E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
24	O/L	PNP switch A		Selector lever: “P” and “R” position	0V
				Other than the above	Battery voltage
31	BR	PNP switch B		Selector lever: “R”, “N”, “D” and manual mode position	0V
				Other than the above	Battery voltage
32	P/B	PNP switch C		Selector lever: “D” and manual mode position	0V
				Other than the above	Battery voltage
33	LG	PNP switch PN		Selector lever: “P” and “N” position	Battery voltage
				Other than the above	0V
43	V/W	PNP switch PA		Selector lever: “P” and “N” position	0V
				Other than the above	Battery voltage

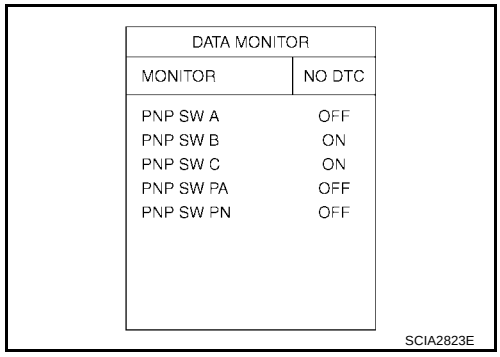
Diagnostic Procedure

ECS00A27

1. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

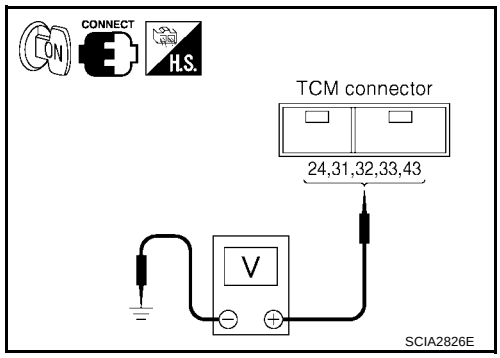
1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Move selector lever to “P”, “N”, “R” and “D” position and check the value of “PNP SW A”, “PNP SW B”, “PNP SW C”, “PNP SW PA” and “PNP SW PN”.



Selector lever	“PNP SW A”	“PNP SW B”	“PNP SW C”	“PNP SW PA”	“PNP SW PN”
P	ON	OFF	OFF	ON	ON
R	ON	ON	OFF	OFF	OFF
N	OFF	ON	OFF	ON	ON
D	OFF	ON	ON	OFF	OFF

Without CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Move selector lever to “P“, “R”, “N”, or “D” position and check voltage between the TCM connector terminals and ground.



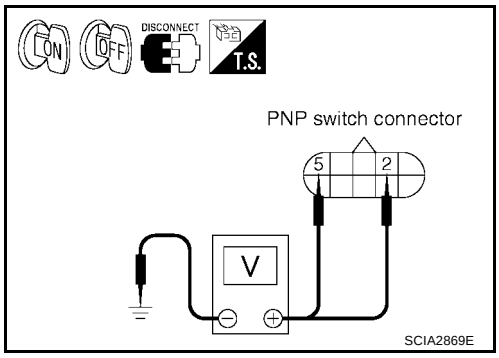
Selector lever	Connector No.	F57			
	Terminal				
	24 - Ground	31 - Ground	32 - Ground	33 - Ground	43 - Ground
P	0V	Battery voltage	Battery voltage	Battery voltage	0V
R	0V	0V	Battery voltage	0V	Battery voltage
N	Battery voltage	0V	Battery voltage	Battery voltage	0V
D	Battery voltage	0V	0V	0V	Battery voltage

OK or NG

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

2. CHECK PNP SWITCH POWER SOURCE CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the PNP switch connector.
3. Turn ignition switch “ON”. (Do not start engine.)
4. Check voltage between PNP switch connector terminals 2, 5 and ground.



Connector	Terminal	Voltage
F29	2 - Ground	Battery voltage
	5 - Ground	

5. Turn ignition switch “OFF”.
6. Check voltage between PNP switch connector terminals 2, 5 and ground.

Connector	Terminal	Voltage
F29	2 - Ground	0V
	5 - Ground	

7. If OK, check harness for short-circuit to ground or power source.

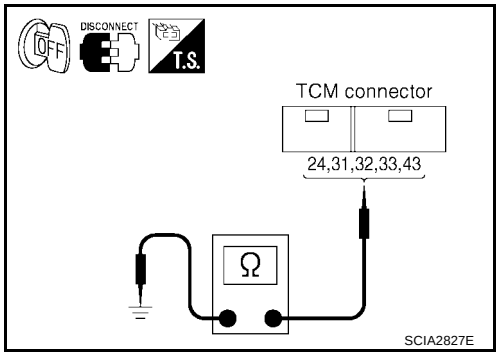
OK or NG

OK >> GO TO 3.
NG >> Check the following. If any items are damaged, repair or replace damaged parts.

- Harness for short or open between ignition switch and PNP switch
- Ignition switch and fuse
  Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .

3. CHECK HARNESS BETWEEN TCM AND PNP SWITCH

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector and PNP switch connector.
3. Check continuity between TCM connector terminals 24, 31, 32, 43 and ground.



Connector	Terminal	Condition	Continuity
F57	24 - Ground	Selector lever: “P” and “R” position	Yes
		Other than the above	No
	31 - Ground	Selector lever: “R”, “N”, “D” and manual mode position	Yes
		Other than the above	No
	32 - Ground	Selector lever: “D” and manual mode position	Yes
		Other than the above	No
	43 - Ground	Selector lever: “P” and “N” position	Yes
		Other than the above	No

4. If OK, check the following.

- Harness for short-circuit to ground or power source.
- Open or short-circuit in the harness between unified meter and A/C auto amp. and TCM.

OK or NG

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

4. DETECT MALFUNCTIONING ITEM

Check the following.

- Open or short-circuit in the harness between TCM and PNP switch A, B, C, PA.
- Open or short-circuit in the harness for ground of PNP switch.
- PNP switch. Refer to AT-97, "Component Inspection" .

OK or NG

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

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-93, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 6.

6. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

Component Inspection

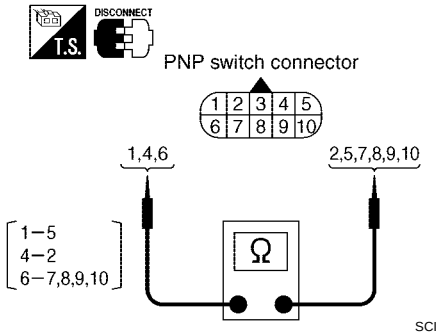
ECS00A28

PNP SWITCH

1. Check continuity between PNP switch terminals while moving selector lever. Refer to the following table.

Circuit	Starter		Reverse		Position				
	+	−	+	−	−	A	B	C	PA
Terminal No. / Lever position	5	1	2	4	6	9	10	7	8
P	○	○			○	○			○
R			○	○	○	○	○		
N	○	○			○		○		○
D					○		○	○	

○—○ : Continuity



2. If NG, check again with control cable disconnected. (Refer to Step 1 above.)
3. If OK on step 2, adjust control cable. Refer to AT-244, "Control Cable Adjustment" .
4. If NG on step 2, remove park/neutral position (PNP) switch from A/T and check continuity of park/neutral position (PNP) switch terminals. (Refer to step 1 above.)
5. If OK on step 4, adjust park/neutral position (PNP) switch. Refer to AT-241, "Park/Neutral Position (PNP) Switch Adjustment" .
6. If NG on step 4, replace park/neutral position (PNP) switch.

DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

PFP:31940

Description

ECS00A29

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

On Board Diagnosis Logic

ECS00A2A

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF TEMP SEN/CIRC” with CONSULT-II or P0710 without CONSULT-II is detected under the following conditions.
  - When normal voltage not applied to ATF temperature sensor due to open, short, and so on.
  - When during running, the ATF temperature sensor signal voltage is excessively high or low.

Possible Cause

ECS00A2B

- Harness or connectors
  (The sensor circuit is open or shorted.)
- A/T fluid temperature sensor

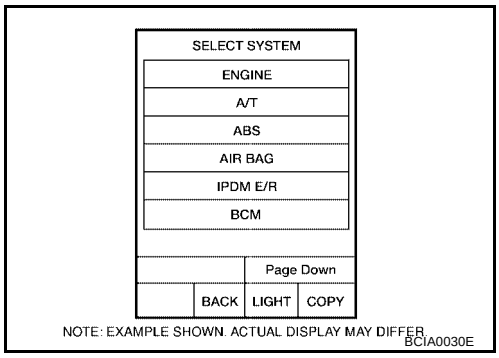
DTC Confirmation Procedure

ECS00A2C

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Warm up engine so that engine coolant temperature is more than 50°C (122°F).
   COOLAN TEMP: More than 50°C (122°F)
5. Maintain the following conditions for at least 16 minutes (Total). (It is not necessary to drive vehicle.)
   COOLAN TEMP: More than 50°C (122°F)
   SLCT LVR POSI: “D” position
6. If DTC is detected, go to AT-100, "Diagnostic Procedure" .



WITH GST

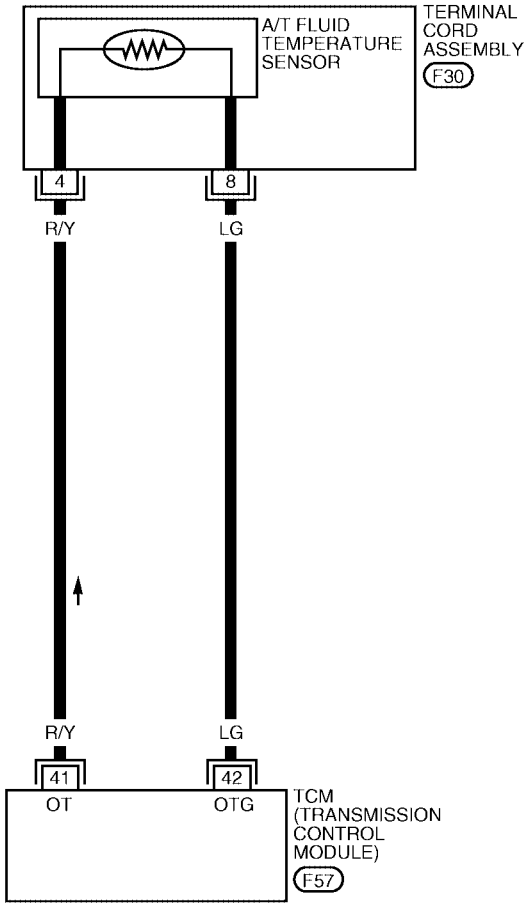
Follow the procedure “With CONSULT-II”.

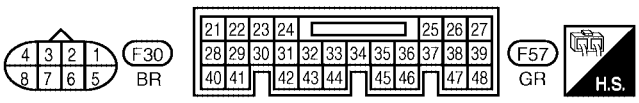
Wiring Diagram — AT — FTS

ECS00A2D

AT-FTS-01

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





BCWA0267E

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

Terminal	Wire color	Item	Condition		Data (Approx.)	
41	R/Y	Fluid temperature sensor		When ATF temperature 0°C (32°F)	4.0V	9.8 kΩ
				When ATF temperature 20°C (68°F)	3.0V	4.2 kΩ
				When ATF temperature 80°C (176°F)	0.8V	.54 kΩ
				When ATF temperature 100°C (212°F)	0.5V	.31 kΩ
42	LG	Fluid temperature sensor ground	Always		0V	

Diagnostic Procedure

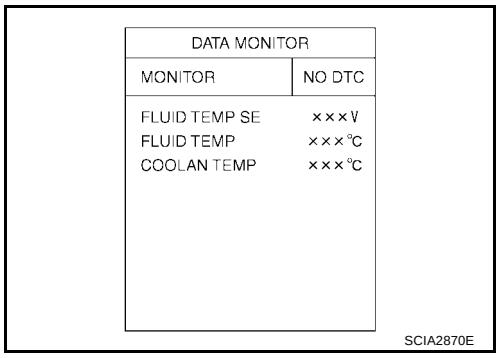
ECS00A2E

1. CHECK FLUID TEMPERATURE SENSOR SIGNAL

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Read out the value of “FLUID TEMP SE”.

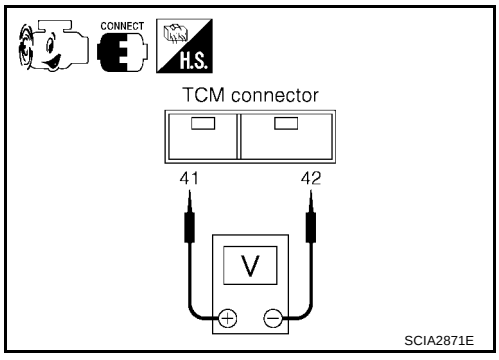
Item name	Condition	Display value (Approx.)
Fluid temperature sensor	0°C (32°F)	4.0V
	20°C (68°F)	3.0V
	80°C (176°F)	0.8V
	100°C (212°F)	0.5V



Without CONSULT-II

1. Start engine.
2. Check voltage between TCM connector terminals 41 and 42 while warming up A/T. Refer to AT-99, "Wiring Diagram — AT — FTS" .

Connector	Terminal	Temperature	Voltage (Approx.)
F57	41 - 42 (ground)	0°C (32°F)	4.0V
		20°C (68°F)	3.0V
		80°C (176°F)	0.8V
		100°C (212°F)	0.5V



3. Turn ignition switch “OFF”.
4. Disconnect the TCM connector.
5. Check if there is continuity between the connector terminal and ground.

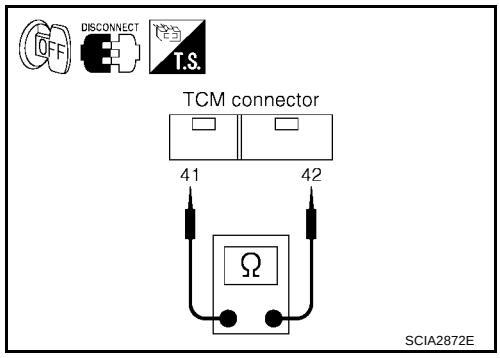
OK or NG

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

2. CHECK FLUID TEMPERATURE SENSOR CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between terminals 41 and 42.

Connector	Terminal	Temperature	Resistance (Approx.)
F57	41 - 42 (ground)	0°C (32°F)	9.8 kΩ
		20°C (68°F)	4.2 kΩ
		80°C (176°F)	0.54 kΩ
		100°C (212°F)	0.31 kΩ



4. Check if there is continuity between the connector terminal and ground.

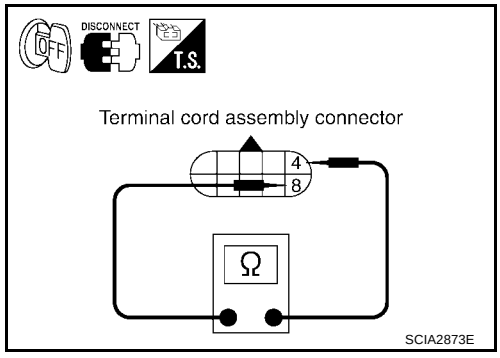
OK or NG

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

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

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 4 and 8.

Connector	Terminal	Temperature	Resistance (Approx.)
F30	4 - 8	0°C (32°F)	9.8 kΩ
		20°C (68°F)	4.2 kΩ
		80°C (176°F)	0.54 kΩ
		100°C (212°F)	0.31 kΩ



OK or NG

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

4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

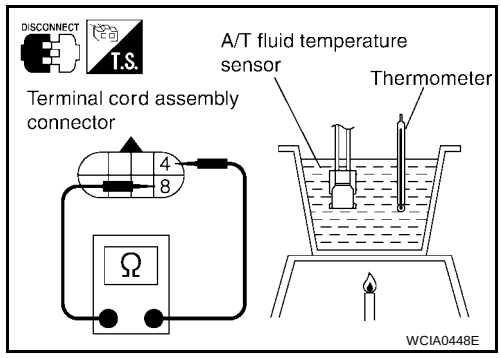
OK or NG

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

5. CHECK A/T FLUID TEMPERATURE SENSOR

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect A/T fluid temperature sensor.
3. Check resistance between terminals 4 and 8.

Connector	Terminal	Temperature	Resistance
F30	4 - 8	10°C (50°F)	5.80 - 7.09kΩ
		110°C (230°F)	0.23 - 0.26kΩ



OK or NG

OK >> GO TO 6.
NG >> Repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

6. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-98, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 7.

7. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

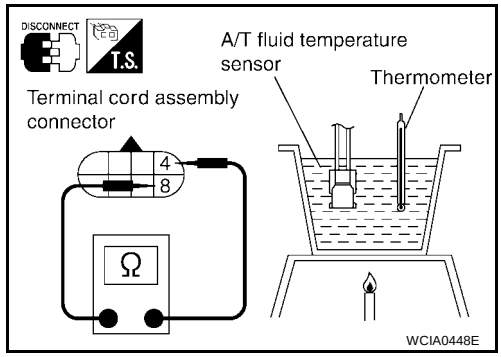
Component Inspection

ECS00A2F

A/T FLUID TEMPERATURE SENSOR

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect A/T fluid temperature sensor.
3. Check resistance between terminals 4 and 8.

Connector	Terminal	Temperature	Resistance
F30	4 - 8	10°C (50°F)	5.80 - 7.09kΩ
		110°C (230°F)	0.23 - 0.26kΩ



4. If NG, repair and replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

DTC P0711 FLUID TEMPERATURE SENSOR PERFORMANCE

PFP:31940

Description

ECS00A2G

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

On Board Diagnosis Logic

ECS00A2H

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “FLUID TEMP SEN” with CONSULT-II or P0711 without CONSULT-II is detected when ATF temperature signal does not change.

Possible Cause

ECS00A2I

- Harness or connectors
  (The sensor circuit is open or shorted.)
- A/T fluid temperature sensor

DTC Confirmation Procedure

ECS00A2J

CAUTION:

Always drive vehicle at a safe speed.

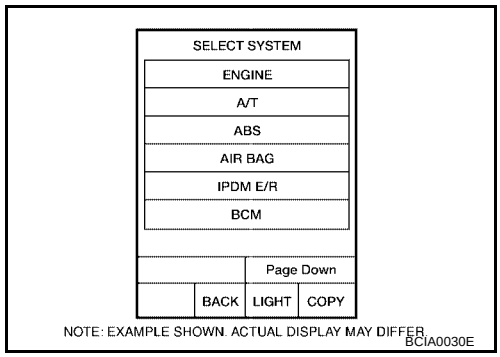
NOTE:

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 15 minutes (Total). (It is not necessary to maintain continuously.)
   VHCL SPEED SE-A/T: 40 km/h (25 MPH) or more
   SLCT LVR POSI: “D” position
5. If DTC is detected, go to AT-105, "Diagnostic Procedure" .



WITH GST

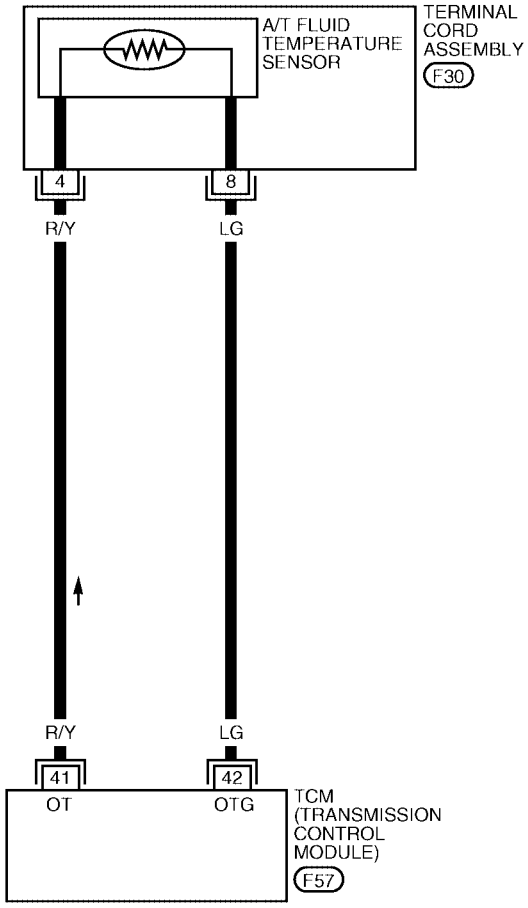
Follow the procedure “With CONSULT-II”.

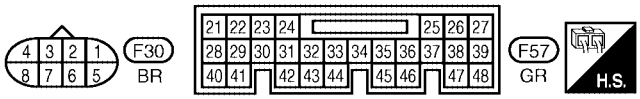
Wiring Diagram — AT — FTSP

ECS00A2K

AT-FTSP-01

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





BCWA0268E

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

Terminal	Wire color	Item	Condition		Data (Approx.)	
41	R/Y	Fluid temperature sensor		When ATF temperature 0°C (32°F)	4.0V	9.8 kΩ
				When ATF temperature 20°C (68°F)	3.0V	4.2 kΩ
				When ATF temperature 80°C (176°F)	0.8V	0.54 kΩ
				When ATF temperature 100°C (212°F)	0.5V	0.31 kΩ
42	LG	Fluid temperature sensor ground	Always		0V	

Diagnostic Procedure

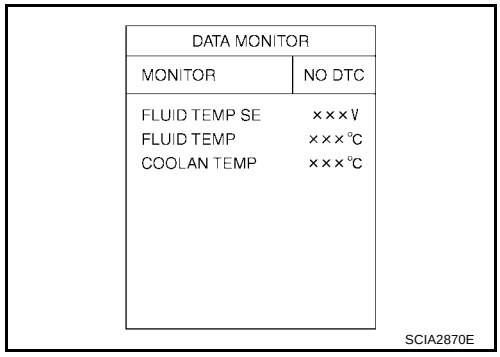
ECS00A2L

1. CHECK FLUID TEMPERATURE SENSOR SIGNAL

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Read out the value of “FLUID TEMP SE”.

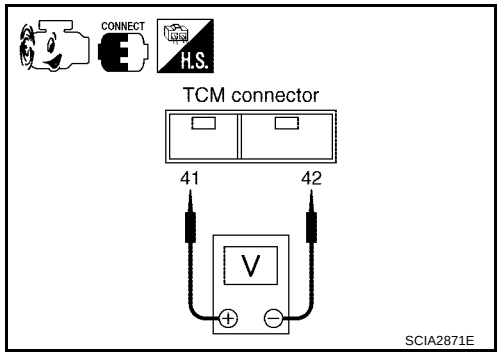
Item name	Condition	Display value (Approx.)
Fluid temperature sensor	0°C (32°F)	4.0V
	20°C (68°F)	3.0V
	80°C (176°F)	0.8V
	100°C (212°F)	0.5V



Without CONSULT-II

1. Start engine.
2. Check voltage between TCM connector terminals 41 and 42 while warming up A/T. Refer to AT-104, "Wiring Diagram — AT — FTSP" .

Connector	Terminal	Temperature	Voltage (Approx.)
F57	41 - 42 (ground)	0°C (32°F)	4.0V
		20°C (68°F)	3.0V
		80°C (176°F)	0.8V
		100°C (212°F)	0.5V



3. Turn ignition switch “OFF”.
4. Disconnect the TCM connector.
5. Check if there is continuity between the connector terminal and ground.

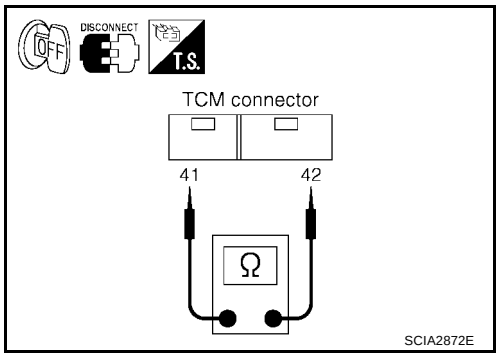
OK or NG

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

2. CHECK FLUID TEMPERATURE SENSOR CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between terminals 41 and 42.

Connector	Terminal	Temperature	Resistance (Approx.)
F57	41 - 42 (ground)	0°C (32°F)	9.8 kΩ
		20°C (68°F)	4.2 kΩ
		80°C (176°F)	0.54 kΩ
		100°C (212°F)	0.31 kΩ



4. Check if there is continuity between the connector terminal and ground.

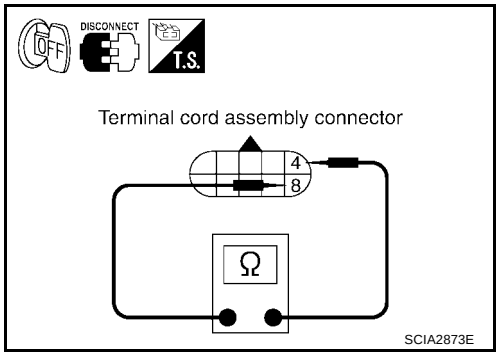
OK or NG

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

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

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 4 and 8.

Connector	Terminal	Temperature	Resistance (Approx.)
F30	4 - 8	0°C (32°F)	9.8 kΩ
		20°C (68°F)	4.2 kΩ
		80°C (176°F)	0.54 kΩ
		100°C (212°F)	0.31 kΩ



4. Reinstall any part removed.

OK or NG

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

4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

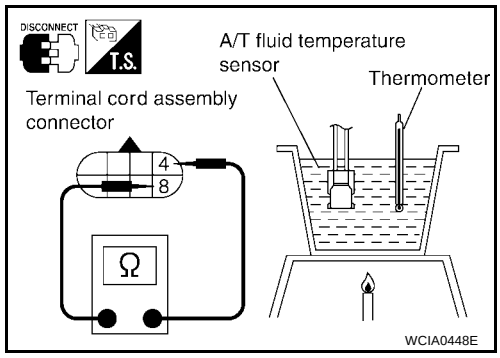
OK or NG

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

5. CHECK A/T FLUID TEMPERATURE SENSOR

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect A/T fluid temperature sensor.
3. Check resistance between terminals 4 and 8.

Connector	Terminal)	Temperature	Resistance
F30	4 - 8	10°C (50°F)	5.80 - 7.09kΩ
		110°C (230°F)	0.23 - 0.26kΩ



OK or NG

OK >> GO TO 6.
NG >> Repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

6. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-103, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 7.

7. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

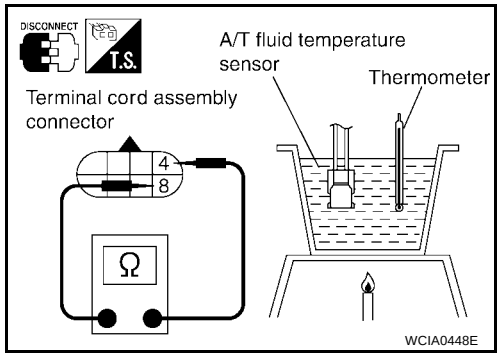
Component Inspection

ECS00A2M

A/T FLUID TEMPERATURE SENSOR

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect A/T fluid temperature sensor.
3. Check resistance between terminals 4 and 8.

Connector	Terminal	Temperature	Resistance
F30	4 - 8	10°C (50°F)	5.80 - 7.09kΩ
		110°C (230°F)	0.23 - 0.26kΩ



4. If NG, repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

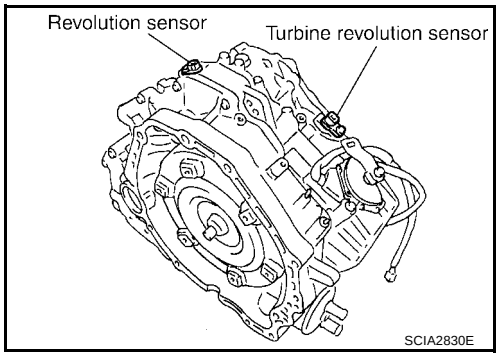
DTC P0717 TURBINE REVOLUTION SENSOR CIRCUIT

PFP:31935

Description

ECS00A2N

- The turbine revolution sensor detects forward clutch drum rpm (revolutions per minute). It is located on the input side of the automatic transaxle. The revolution sensor is located on the output side of the automatic transaxle. With the two sensors, input and output rpms are accurately detected. The result is optimal shift timing during deceleration and improved shifting.
- Hall IC is installed in turbine revolution sensor, it itself handles in pulse of rectangular wave signal and transmits it to TCM due to hall effect. TCM recognizes the pulse with input rpm speed. Size of output doesn't depend on a rotation number and is fixed.



On Board Diagnosis Logic

ECS00A2O

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “TURBINE SENSOR” with CONSULT-II or P0717 without CONSULT-II is detected under the following conditions.
  - When signal from turbine revolution sensor does not input due to open, short, and so on.
  - When unexpected signal input during running.

Possible Cause

ECS00A2P

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

DTC Confirmation Procedure

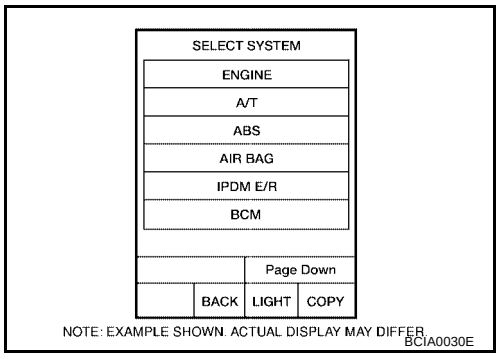
ECS00A2Q

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 1 consecutive minute.
   FLUID TEMP: More than 20°C (68°F)
   VHCL/S SE-A/T: 70 km/h (43 MPH) or more
   SLCT LVR POSI: “D” position
   GEAR: Except 1st position
5. If DTC is detected, go to AT-110, "Diagnostic Procedure" .



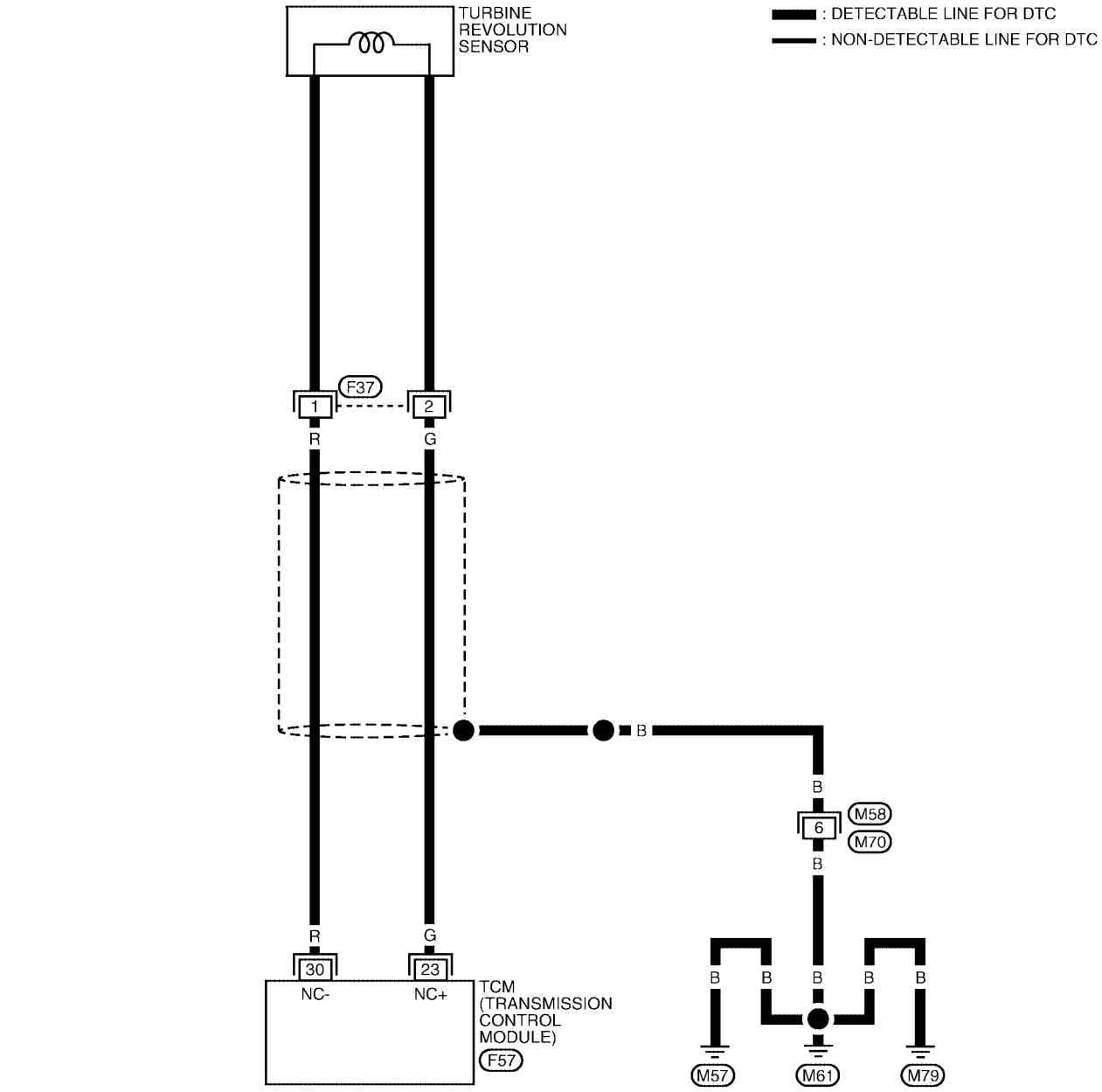
WITH GST

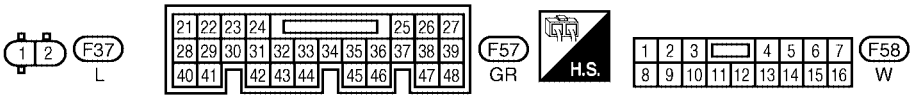
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — TRSC

ECS00A2R

AT-TRSC-01





BCWA0269E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
23	G	Turbine revolution sensor power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
30	R	Turbine revolution sensor		When moving at 20 km/h (12 MPH) in 1st gear.	371Hz

Diagnostic Procedure

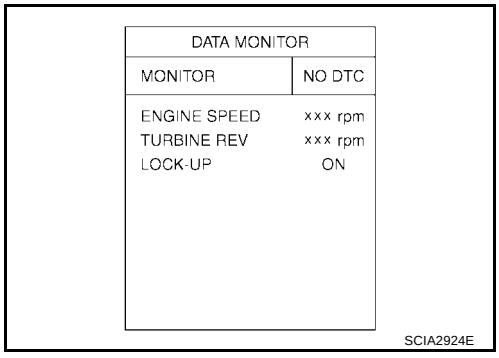
ECS00A2S

1. CHECK TURBINE REVOLUTION SENSOR CIRCUIT

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “TURBINE REV”.

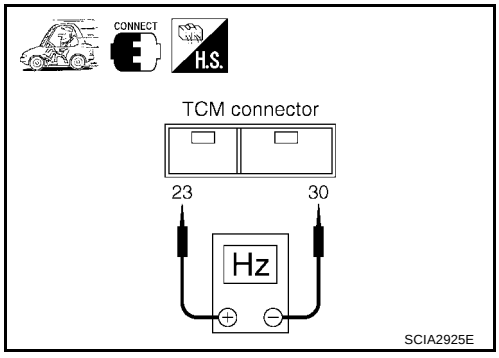
Monitor item	Condition	Specification
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 23 and 30.

Connector	Terminal	Condition	Data (Approx.)
F57	23 - 30 (ground)	When moving at 20 km/h (12 MPH) in 1st gear.	371 Hz



OK or NG

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

2. DETECT MALFUNCTIONING ITEM

Check the following.

- Open or short-circuit in the harness between TCM and turbine revolution sensor.
- Turbine revolution sensor. Refer to AT-111, "Component Inspection" .

OK or NG

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

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-108, "DTC Confirmation Procedure" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

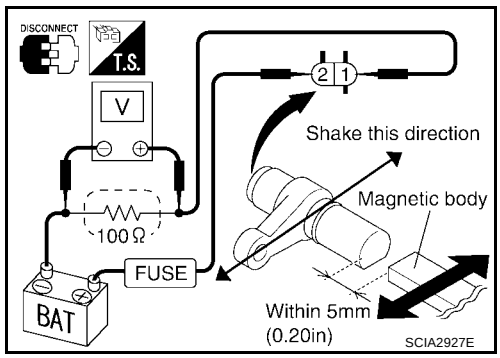
Component Inspection

ECS00A2T

TURBINE REVOLUTION SENSOR

1. Remove turbine revolution sensor.
2. Connect 12V power supply and 100 Ω resistance to the terminal. (Do not mistake polarity)
3. Inspect the voltage of HIGH and LOW signal by shaking magnetic body from side to side at turbine revolution sensor tip [gap is within 5 mm (0.20 in)].

CAUTION:
Make sure to shake direction from bolt hole to sensor-self when shaking magnetic body. If not, voltage value cannot change.



Signal	Voltage (Approx.)
HIGH	1.2 - 1.6V
LOW	0.4 - 0.8V

4. If NG, replace turbine revolution sensor.

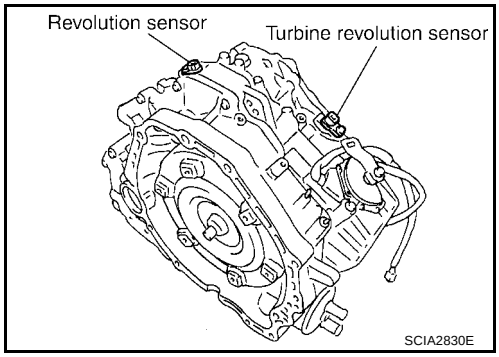
DTC P0722 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR) CIRCUIT

PFP:31935

Description

ECS00A2U

- The revolution sensor detects the revolution of the idler gear parking pawl lock gear and emits a pulse signal. The pulse signal is sent to the TCM which converts it into vehicle speed.
- Hall IC is installed in revolution sensor, it itself handles in pulse of rectangular wave signal and transmits it to TCM due to hall effect. TCM recognizes the pulse with vehicle speed. Size of output doesn't depend on a rotation number and is fixed.



On Board Diagnosis Logic

ECS00A2V

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “VHCL SPEED SEN-A/T” with CONSULT-II or P0722 without CONSULT-II is detected under the following conditions.
  - When signal from revolution sensor does not input due to open, short, and so on.
  - When unexpected signal input during running.

Possible Cause

ECS00A2W

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

DTC Confirmation Procedure

ECS00A2X

CAUTION:

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

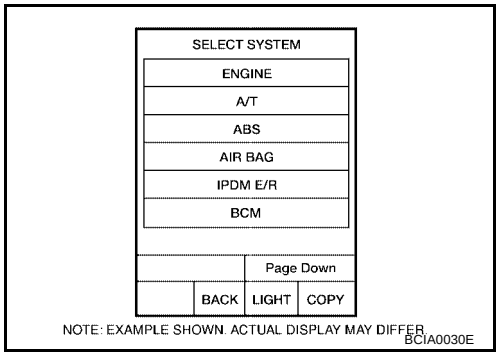
NOTE:

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
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-114, "Diagnostic Procedure" .
   If the check result is OK, go to following step.
5. Maintain the following conditions for at least 2 consecutive minutes.
   FLUID TEMP: More than 20°C (68°F)
   VHCL/S SE-A/T: 70 km/h (43 MPH) or more
   SLCT LVR POSI: “D” position
   If the check result is NG, go to AT-114, "Diagnostic Procedure" .

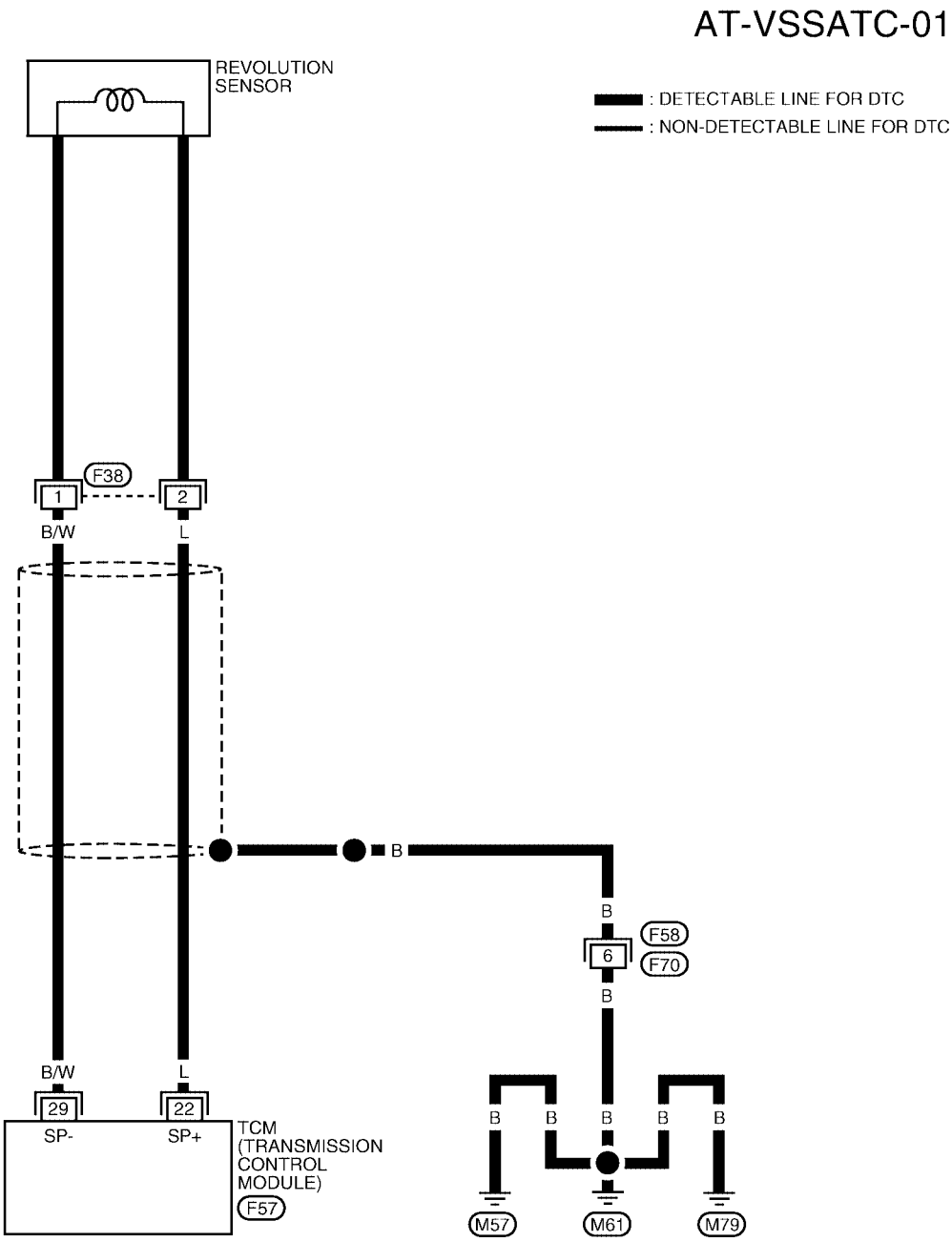


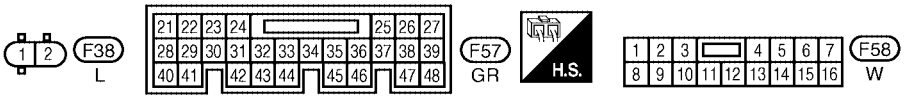
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — VSSATC

ECS00A2Y





BCWA0444E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
22	L	Revolution sensor power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
29	B/W	Revolution sensor		When moving at 20 km/h (12 MPH) in 1st gear.	119Hz

Diagnostic Procedure

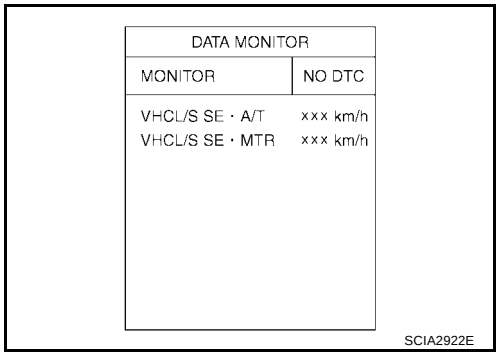
ECS00A2Z

1. CHECK REVOLUTION SENSOR CIRCUIT

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “VHCL/S SE-AT”.

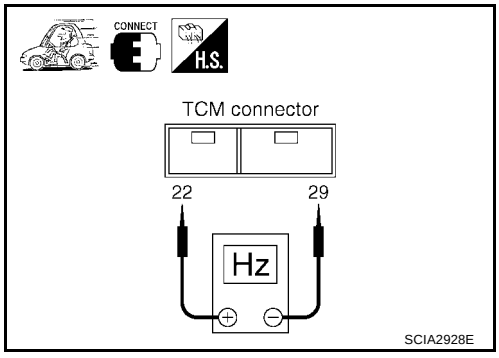
Monitor item	Condition	Specification
VHCL/S SE-AT	During driving	Approximately matches the speedometer reading.



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 22 and 29.

Connector	Terminal	Condition	Data (Approx.)
F57	22 - 29(ground)	When moving at 20 km/h (12 MPH) in 1st gear.	119 Hz



OK or NG

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

2. DETECT MALFUNCTIONING ITEM

Check the following.

- Open or short-circuit in the harness between TCM and revolution sensor.
- Revolution sensor. Refer to AT-115, "Component Inspection" .

OK or NG

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

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-112, "DTC Confirmation Procedure" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

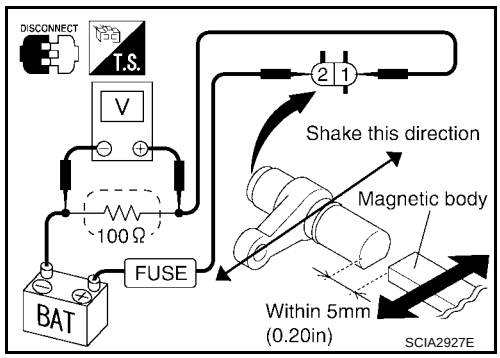
Component Inspection

ECS00A30

REVOLUTION SENSOR

1. Remove revolution sensor.
2. Connect 12V power supply and 100 Ω resistance to the terminal. (Do not mistake polarity)
3. Inspect the voltage of HIGH and LOW signal by shaking magnetic body from side to side at revolution sensor tip [gap is within 5mm (0.20 in)].

CAUTION:
Make sure to shake direction from bolt hole to sensor-self when shaking magnetic body. If not, voltage value cannot change.



Signal	Voltage (Approx.)
HIGH	1.2 - 1.6V
LOW	0.4 - 0.8V

4. If NG, replace revolution sensor.

DTC P0726 ENGINE SPEED INPUT CIRCUIT PERFORMANCE

PFP:31036

Description

ECS00A31

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

On Board Diagnosis Logic

ECS00A32

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “ENG SPD INP PERFOR” with CONSULT-II or 14th judgement flicker without CONSULT-II is detected when malfunction is detected in engine speed signal, actual engine torque signal or torque reduction signal that is output from ECM through CAN communication.

Possible Cause

ECS00A33

- Harness or connectors
  (The signal circuit is open or shorted.)
- ECM

DTC Confirmation Procedure

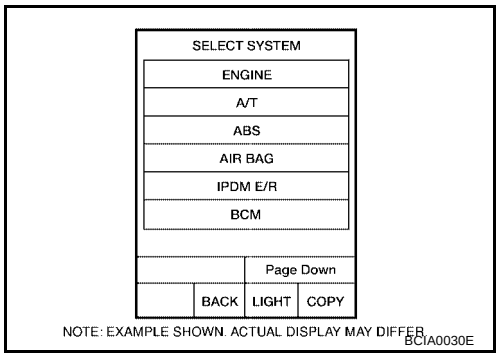
ECS00A34

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-II

1. Turn ignition switch “ON” and select “A/T” with “DATA MONITOR” mode in CONSULT-II.
2. Start engine.
3. Drive vehicle and maintain the following conditions for at least 10 consecutive seconds.
   VHCL/S SE-A/T: 10 km/h (6 MPH) or more
   ACCELE ANGLE: More than 10 %
   SLCT LVR POSI: “D” position
4. If DTC is detected, go to AT-116, "Diagnostic Procedure" .



Diagnostic Procedure

ECS00A35

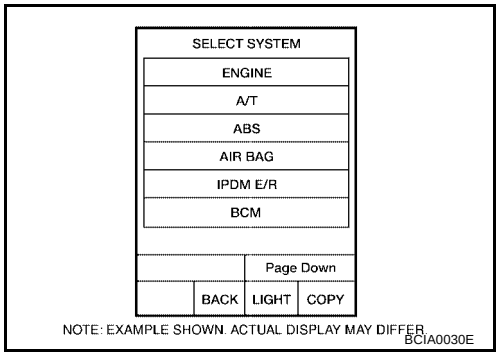
1. CHECK DTC WITH ECM

With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “ENGINE” with “SELF-DIAG RESULTS” mode in CONSULT-II. Refer to AT-77, "CONSULT-II Function (TRANSMISSION)" .

OK or NG

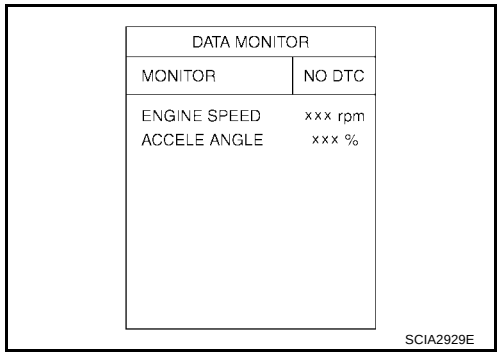
OK >> GO TO 2.
NG >> Check the DTC detected item, go to AT-5, "INDEX FOR DTC" .
- If CAN communication line is detected, go to AT-86, "DTC U1000 CAN COMMUNICATION LINE" .



2. CHECK DTC WITH TCM

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. While monitoring “ENGINE SPEED”, check for engine speed change corresponding to “ACCELE ANGLE”.



OK or NG

OK >> GO TO 3.
NG >> Check the ignition signal circuit.
- Refer to EC-673, "IGNITION SIGNAL" .

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-116, "DTC Confirmation Procedure" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

DTC P0731 A/T 1ST GEAR FUNCTION

PFP:31940

Description

ECS00A36

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

Gear position		Shift solenoid valve				
		A	B	C	D	E
1st	D	ON (Closed)	ON (Open)	ON (Open)	OFF (Open)	OFF (Closed)
	M1	ON (Closed)	ON (Open)	ON (Open)	OFF (Open)	ON (Open)

On Board Diagnosis Logic

ECS00A37

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 1ST GR FNCTN” with CONSULT-II or P0731 without CONSULT-II is detected when A/T cannot be shifted to the 1st gear position even if electrical circuit is good.

Possible Cause

ECS00A38

- Shift solenoid valve A
  (Off stick.)
- 2nd brake
- 2nd coast brake
- One-way clutch No.1
- One-way clutch No.2
- Hydraulic control circuit

DTC Confirmation Procedure

ECS00A39

CAUTION:

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

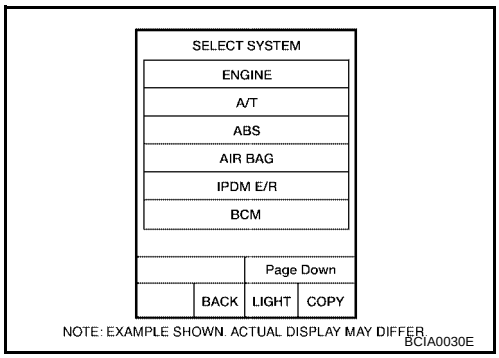
NOTE:

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-II

1. Start engine and select “A/T” with “DATA MONITOR” mode in CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to maintain the following conditions for at least 12 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 1st position
   [Vehicle speed and accelerator angle: 1st gear position retainable condition. (Refer to AT-315, "VEHICLE SPEED WHEN SHIFTING GEARS" .)]
   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-120, "Diagnostic Procedure" .

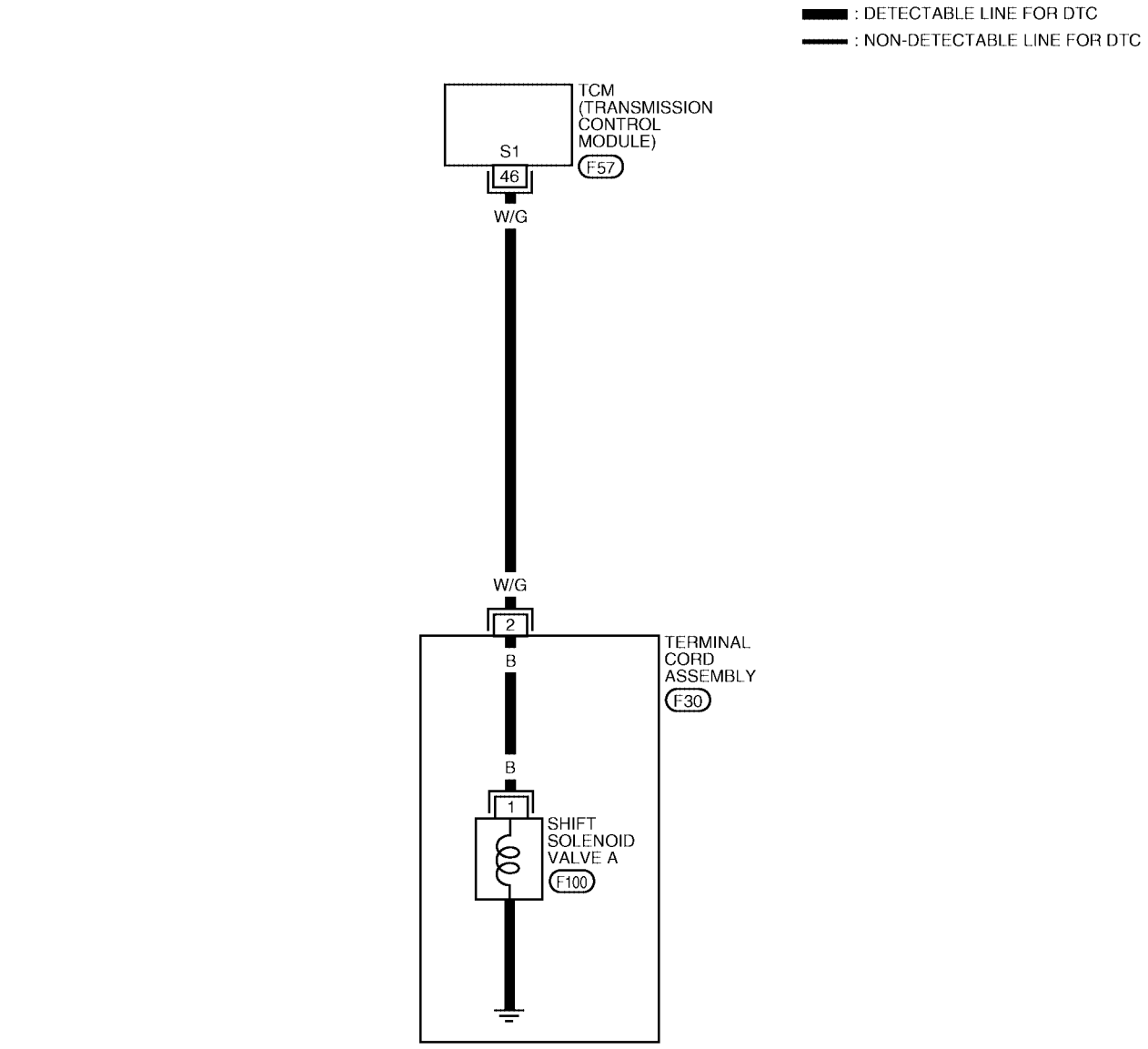
WITH GST

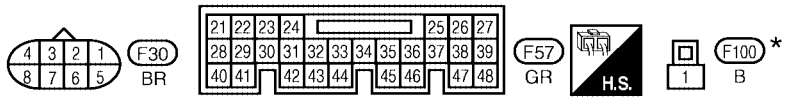
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — 1STSIG

ECS00A3A

AT-1STSIG-01





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

BCWA0445E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
				When shift solenoid valve A does not operate.	0V

Diagnostic Procedure

ECS00A3B

1. CHECK SHIFT SOLENOID VALVE A CIRCUIT

Perform “Diagnostic Procedure” for DTC P0750. Refer to AT-154, "Diagnostic Procedure" .

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassembly A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following item:

- 2nd brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" .
- 2nd coast brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" , AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- One-way clutch No.1. Refer to AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- One-way clutch No.2. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-118, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace control valve assembly. Refer to AT-244, "Control Valve Assembly" .

DTC P0732 A/T 2ND GEAR FUNCTION

PFP:31940

Description

ECS00A3C

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

Gear position		Shift solenoid valve				
		A	B	C	D	E
2nd	D	OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	OFF (Closed)
	M2	OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	OFF (Closed)

On Board Diagnosis Logic

ECS00A3D

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 2ND GR FNCTN” with CONSULT-II or P0732 without CONSULT-II is detected when A/T cannot be shifted to the 2nd gear position even if electrical circuit is good.

Possible Cause

ECS00A3E

- Shift solenoid valve A
  (On stick.)
- Shift solenoid valve B
  (On stick.)
- Shift solenoid valve C
  (Off stick.)
- Shift solenoid valve D
  (On stick.)
- Pressure control solenoid valve A
  (On stick.)
- Pressure control solenoid valve C
  (On stick.)
- U/D brake
- 2nd coast brake
- 2nd brake
- One-way clutch No.1
- One-way clutch No.2
- B5 brake
- Hydraulic control circuit

DTC Confirmation Procedure

ECS00A3F

CAUTION:

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

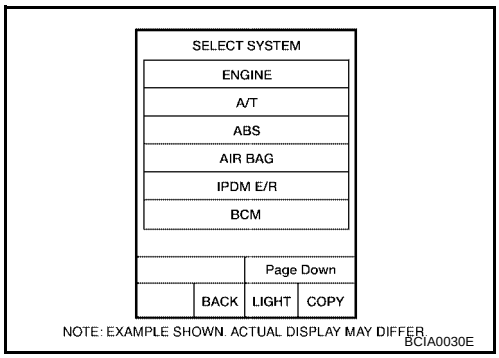
NOTE:

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-II

1. Start engine and select “A/T” with “DATA MONITOR” mode in CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to maintain the following conditions for at least 12 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 2nd position
   [Vehicle speed and accelerator angle: 2nd gear position retainable condition. (Refer to AT-315, "VEHICLE SPEED WHEN SHIFTING GEARS" .)]
   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-125, "Diagnostic Procedure" .



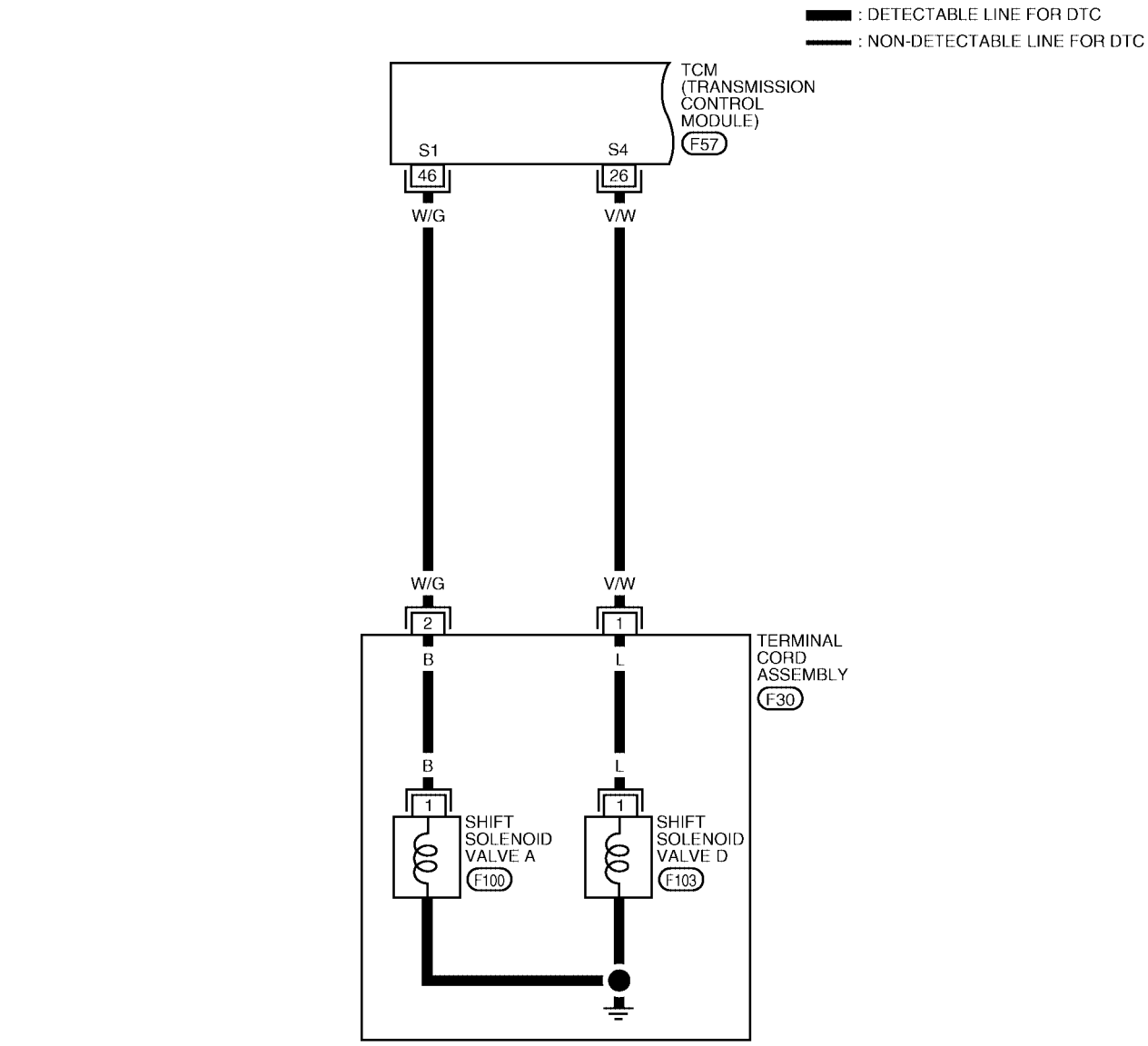
WITH GST

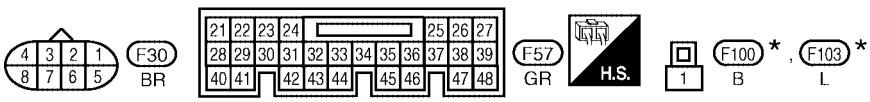
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — 2NDSIG

ECS00A3G

AT-2NDSIG-01

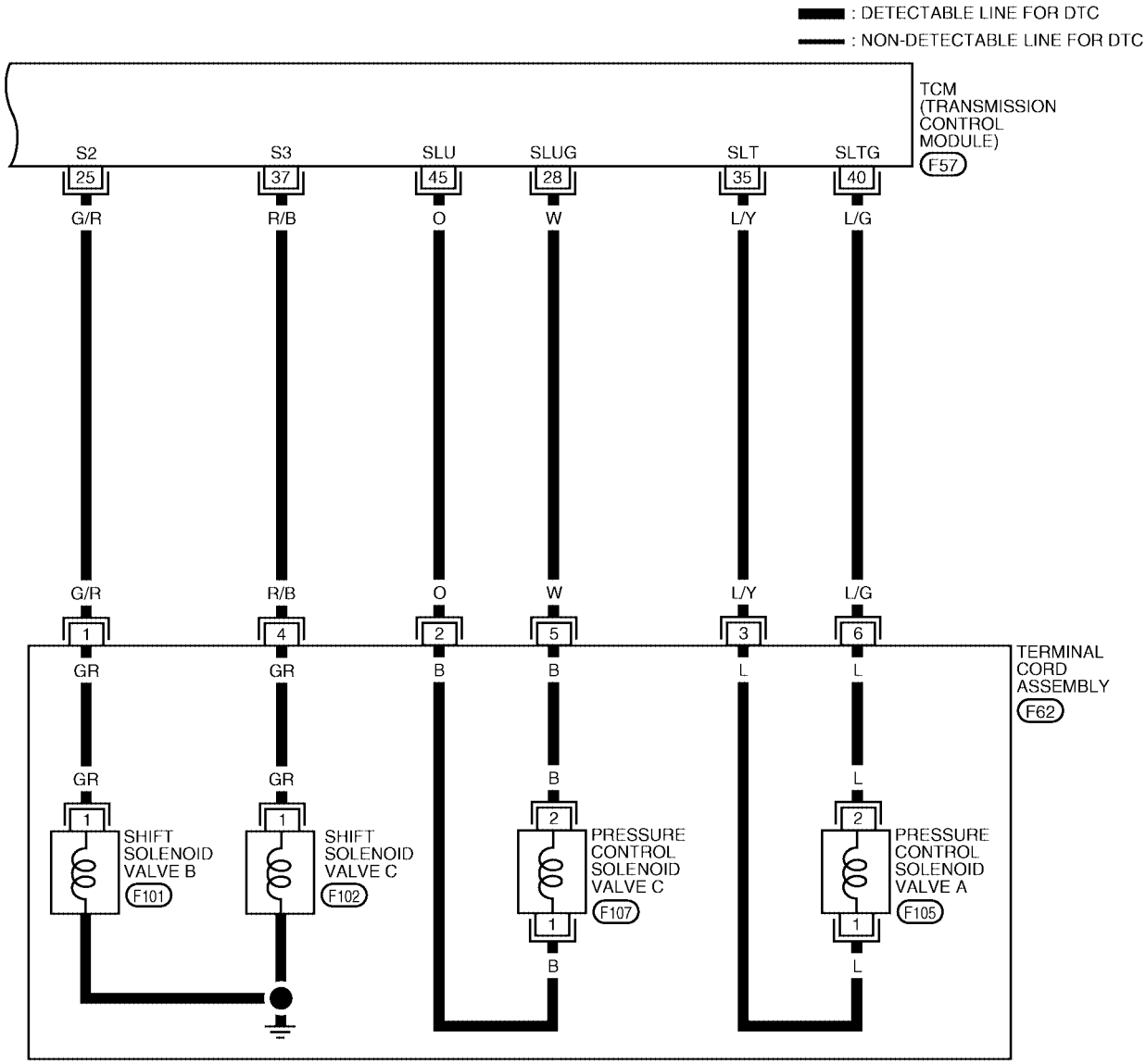


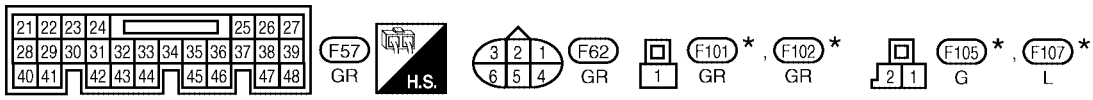


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

BCWA0446E

AT-2NDSIG-02





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

BCWA0447E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V
26	V/W	Shift solenoid valve D		When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
				When shift solenoid valve D does not operate.	0V
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
				When shift solenoid valve A does not operate.	0V

Diagnostic Procedure

ECS00A3H

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0750 SHIFT SOLENOID VALVE A” (Refer to AT-154, "Diagnostic Procedure" .)
- “DTC P0755 SHIFT SOLENOID VALVE B” (Refer to AT-159, "Diagnostic Procedure" .)
- “DTC P0760 SHIFT SOLENOID VALVE C” (Refer to AT-164, "Diagnostic Procedure" .)
- “DTC P0765 SHIFT SOLENOID VALVE D” (Refer to AT-174, "Diagnostic Procedure" .)

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK EACH PRESSURE CONTROL SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0745 PRESSURE CONTROL SOLENOID VALVE A” (Refer to AT-149, "Diagnostic Procedure" .)
- “DTC P0795 PRESSURE CONTROL SOLENOID VALVE C” (Refer to AT-193, "Diagnostic Procedure" .)

OK or NG

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

3. CHECK MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassembly A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following item:

- U/D brake. Refer to AT-256, "DISASSEMBLY" .
- 2nd coast brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" , AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- 2nd brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" .
- One-way clutch No.1. Refer to AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- One-way clutch No.2. Refer to AT-256, "DISASSEMBLY" .
- B5 brake. Refer to AT-283, "Transaxle Case Cover & B5 Brake" .

OK or NG

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

4. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-121, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace control valve assembly. Refer to AT-244, "Control Valve Assembly" .

DTC P0733 A/T 3RD GEAR FUNCTION

PFP:31940

Description

ECS00A3I

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

Gear position		Shift solenoid valve				
		A	B	C	D	E
3rd	D	OFF (Open)	OFF (Closed)	ON (Open)	ON (Closed)	OFF (Closed)
	M3	OFF (Open)	OFF (Closed)	ON (Open)	ON (Closed)	OFF (Closed)

On Board Diagnosis Logic

ECS00A3J

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 3RD GR FNCTN” with CONSULT-II or P0733 without CONSULT-II is detected when A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.

Possible Cause

ECS00A3K

- Shift solenoid valve A
  (On stick.)
- Shift solenoid valve B
  (On stick.)
- Shift solenoid valve C
  (Off stick.)
- Shift solenoid valve D
  (Off stick.)
- Pressure control solenoid valve A
  (On stick.)
- B5 brake
- U/D clutch
- U/D brake
- Hydraulic control circuit

DTC Confirmation Procedure

ECS00A3L

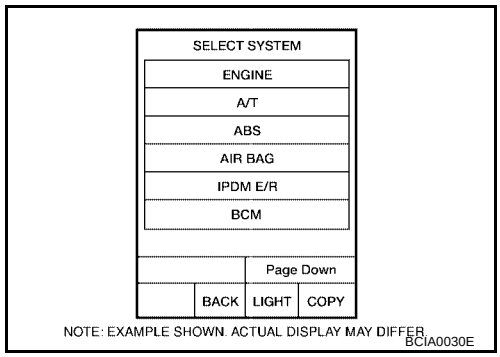
CAUTION:

- **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-II

1. Start engine and select “A/T” with “DATA MONITOR” mode in CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to maintain the following conditions for at least 10 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 3rd position



[Vehicle speed and accelerator angle: 3rd gear position retainable condition. (Refer to AT-315, "VEHICLE SPEED WHEN SHIFTING GEARS" .)]
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-131, "Diagnostic Procedure" .

WITH GST

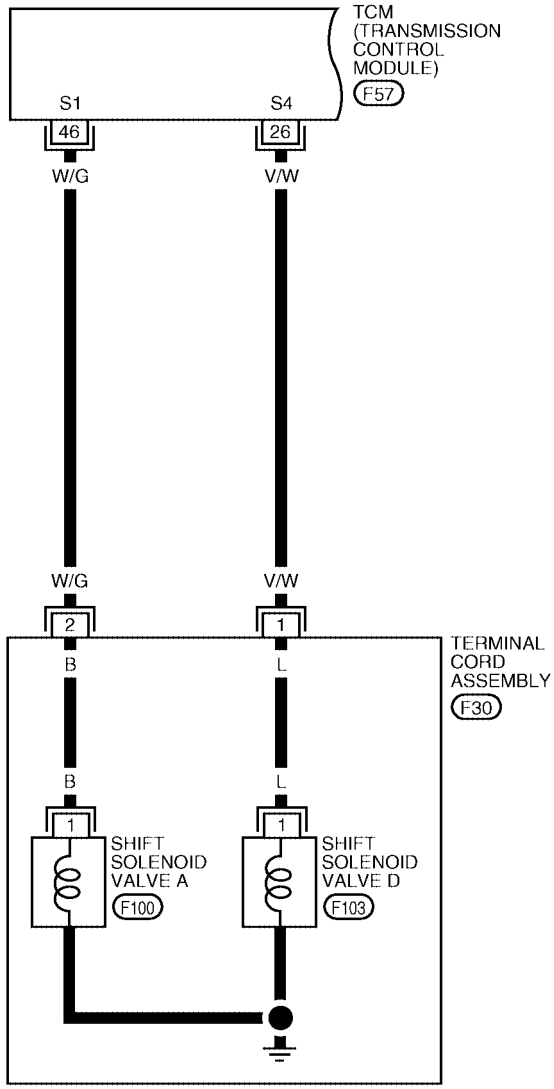
Follow the procedure “With CONSULT-II”.

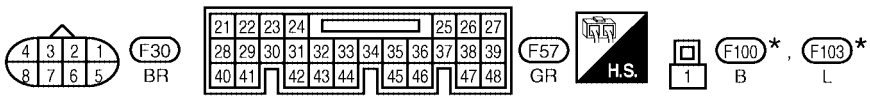
Wiring Diagram — AT — 3RDSIG

ECS00A3M

AT-3RDSIG-01

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

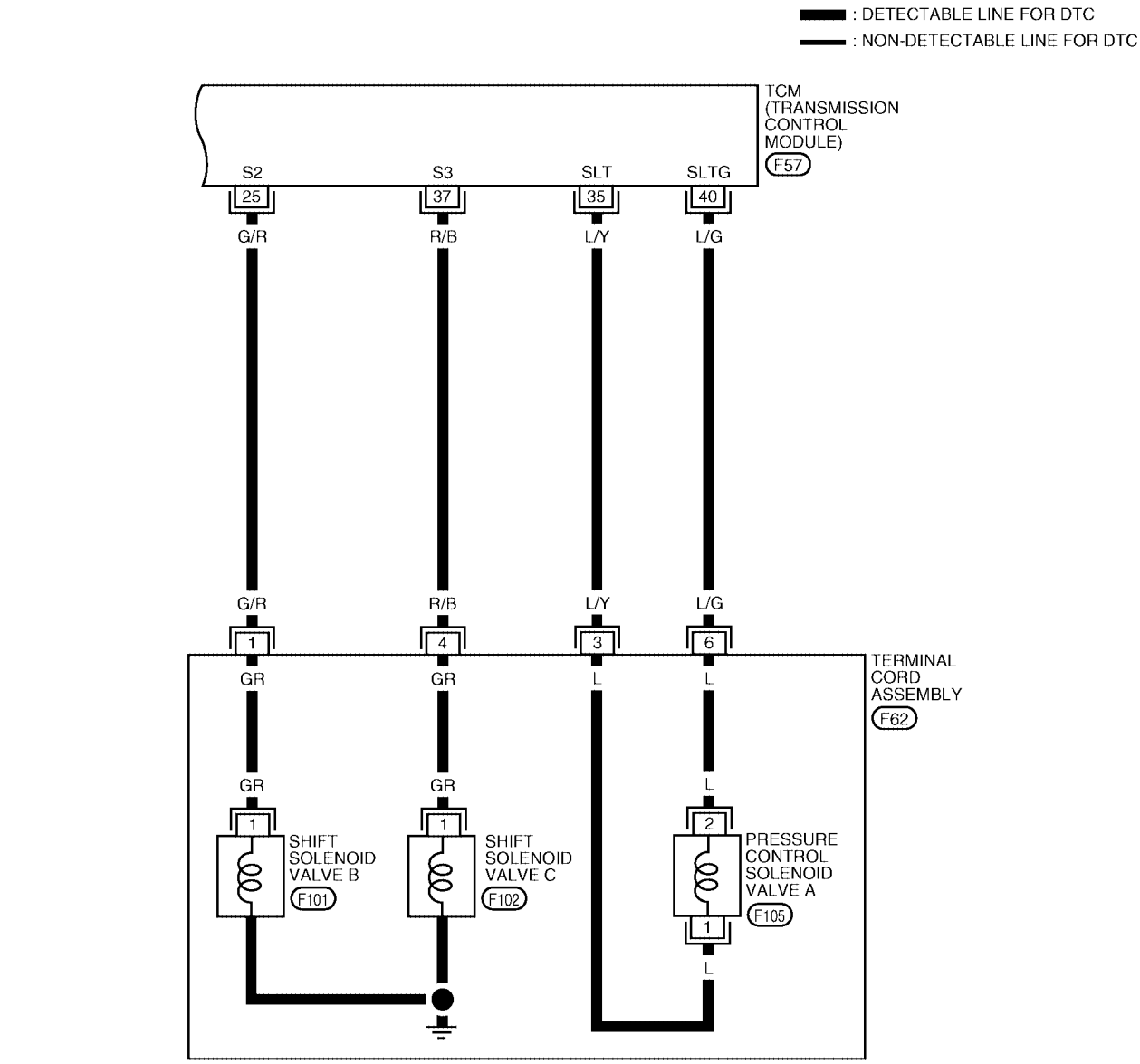


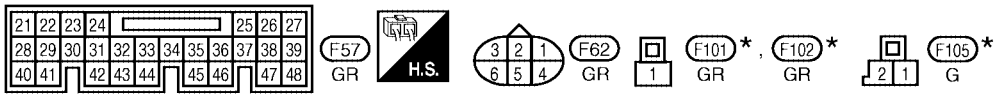


★: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

BCWA0448E

AT-3RDSIG-02





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

BCWA0449E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V
26	V/W	Shift solenoid valve D		When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
				When shift solenoid valve D does not operate.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
				When shift solenoid valve A does not operate.	0V

Diagnostic Procedure

ECS00A3N

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0750 SHIFT SOLENOID VALVE A” (Refer to AT-154, "Diagnostic Procedure" .)
- “DTC P0755 SHIFT SOLENOID VALVE B” (Refer to AT-159, "Diagnostic Procedure" .)
- “DTC P0760 SHIFT SOLENOID VALVE C” (Refer to AT-164, "Diagnostic Procedure" .)
- “DTC P0765 SHIFT SOLENOID VALVE D” (Refer to AT-174, "Diagnostic Procedure" .)

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK PRESSURE CONTROL SOLENOID VALVE A CIRCUIT

Perform “Diagnostic Procedure” for DTC P0745. Refer to AT-149, "Diagnostic Procedure" .

OK or NG

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

3. CHECK MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassembly A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following item:

- B5 brake. Refer to AT-283, "Transaxle Case Cover & B5 Brake" .
- U/D clutch. Refer to AT-256, "DISASSEMBLY" .
- U/D brake. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

4. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-127, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

DTC P0734 A/T 4TH GEAR FUNCTION

PFP:31940

Description

ECS00A3O

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

Gear position		Shift solenoid valve				
		A	B	C	D	E
4th	D	OFF (Open)	OFF (Closed)	OFF (Closed)	ON (Closed)	OFF (Closed)
	M4	OFF (Open)	OFF (Closed)	OFF (Closed)	ON (Closed)	OFF (Closed)

On Board Diagnosis Logic

ECS00A3P

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 4TH GR FNCTN” with CONSULT-II or P0734 without CONSULT-II is detected when A/T cannot be shifted to the 4th gear position even if electrical circuit is good.

Possible Cause

ECS00A3Q

- Shift solenoid valve A
  (On stick.)
- Shift solenoid valve B
  (On stick.)
- Shift solenoid valve C
  (On stick.)
- Pressure control solenoid valve A
  (On stick.)
- Forward and direct clutch assembly
- U/D clutch
- U/D brake
- 2nd coast brake
- One-way clutch No.1
- Hydraulic control circuit

DTC Confirmation Procedure

ECS00A3R

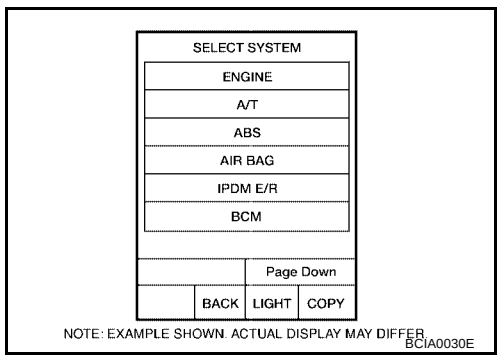
CAUTION:

- **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-II

1. Start engine and select “A/T” with “DATA MONITOR” mode in CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to maintain the following conditions for at least 10 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 4th position



[Vehicle speed and accelerator angle: 4th gear position retainable condition. (Refer to AT-315, "VEHICLE SPEED WHEN SHIFTING GEARS" .)]
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-136, "Diagnostic Procedure" .

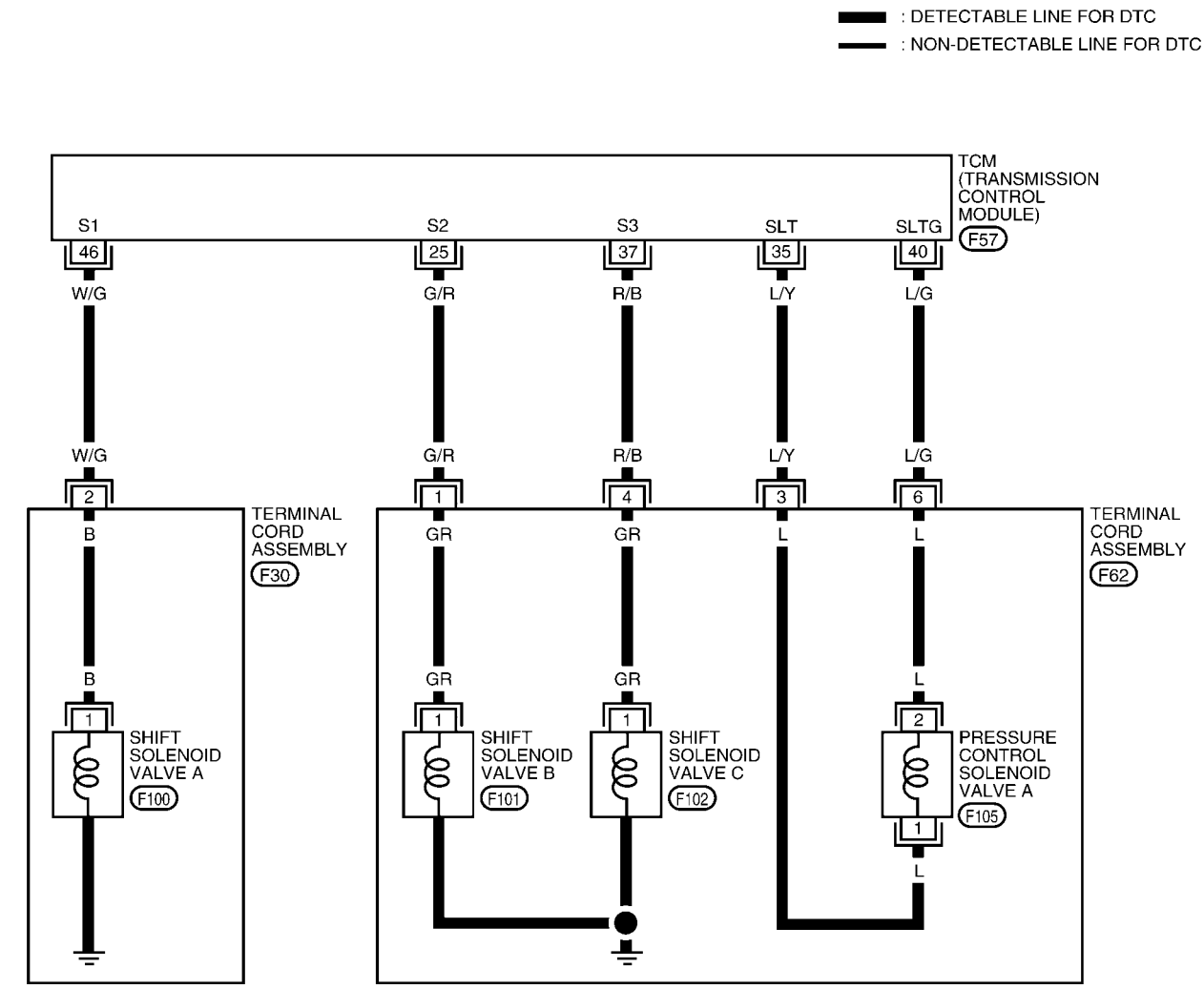
WITH GST

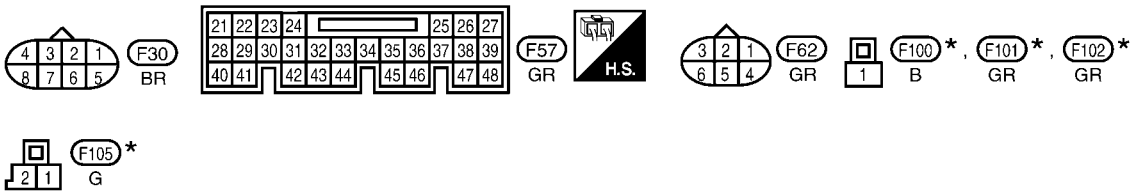
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — 4THSIG

ECS00A3S

AT-4THSIG-01





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

BCWA0450E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
				When shift solenoid valve A does not operate.	0V

Diagnostic Procedure

ECS00A3T

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0750 SHIFT SOLENOID VALVE A” (Refer to AT-154, "Diagnostic Procedure" .)
- “DTC P0755 SHIFT SOLENOID VALVE B” (Refer to AT-159, "Diagnostic Procedure" .)
- “DTC P0760 SHIFT SOLENOID VALVE C” (Refer to AT-164, "Diagnostic Procedure" .)

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK PRESSURE CONTROL SOLENOID VALVE A CIRCUIT

Perform “Diagnostic Procedure” for DTC P0745. Refer to AT-149, "Diagnostic Procedure" .

OK or NG

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

3. CHECK MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassembly A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following item:

- Forward and direct clutch assembly. Refer to AT-256, "DISASSEMBLY" .
- 2nd coast brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" , AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- U/D brake. Refer to AT-256, "DISASSEMBLY" .
- U/D clutch. Refer to AT-256, "DISASSEMBLY" .
- One-way clutch No.1. Refer to AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .

OK or NG

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

4. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-133, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

DTC P0735 A/T 5TH GEAR FUNCTION

PFP:31940

Description

ECS00A3U

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

Gear position		Shift solenoid valve				
		A	B	C	D	E
5th	D	OFF (Open)	ON (Open)	OFF (Closed)	ON (Closed)	OFF (Closed)
	M5	OFF (Open)	ON (Open)	OFF (Closed)	ON (Closed)	OFF (Closed)

On Board Diagnosis Logic

ECS00A3V

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 5TH GR FNCTN” with CONSULT-II or P0735 without CONSULT-II is detected when A/T cannot be shifted to the 5th gear position even if electrical circuit is good.

Possible Cause

ECS00A3W

- Shift solenoid valve B
(Off stick.)
- Shift solenoid valve C
(On stick.)
- Shift solenoid valve E
(On stick.)
- Pressure control solenoid valve A
(On stick.)
- Pressure control solenoid valve B
(On stick.)
- Forward and direct clutch assembly
- Direct clutch
- 2no coast brake
- One-way clutch No.1
- Hydraulic control circuit

DTC Confirmation Procedure

ECS00A3X

CAUTION:

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

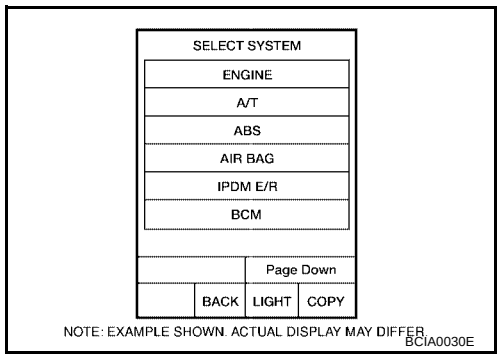
NOTE:

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-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to maintain the following conditions for at least 12 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 5th position
   [Vehicle speed and accelerator angle: 5th gear position retainable condition. (Refer to AT-315, "VEHICLE SPEED WHEN SHIFTING GEARS" .)]
   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-142, "Diagnostic Procedure" .



WITH GST

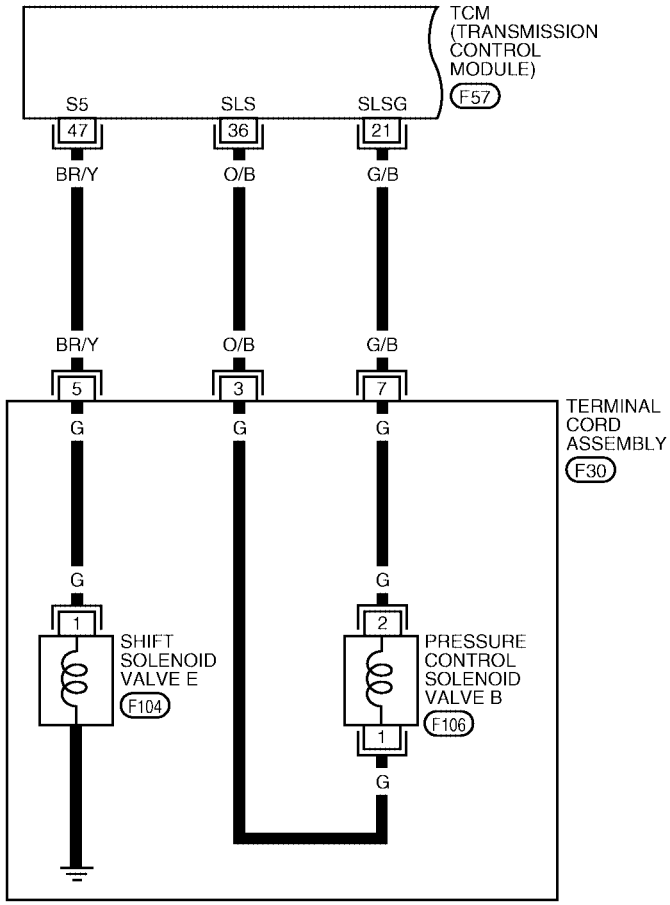
Follow the procedure “With CONSULT-II”.

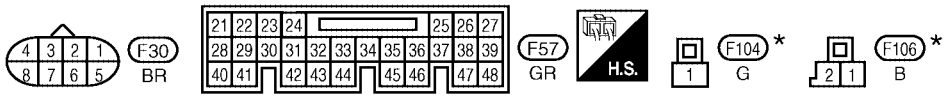
Wiring Diagram — AT — 5THSIG

ECS00A3Y

AT-5THSIG-01

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



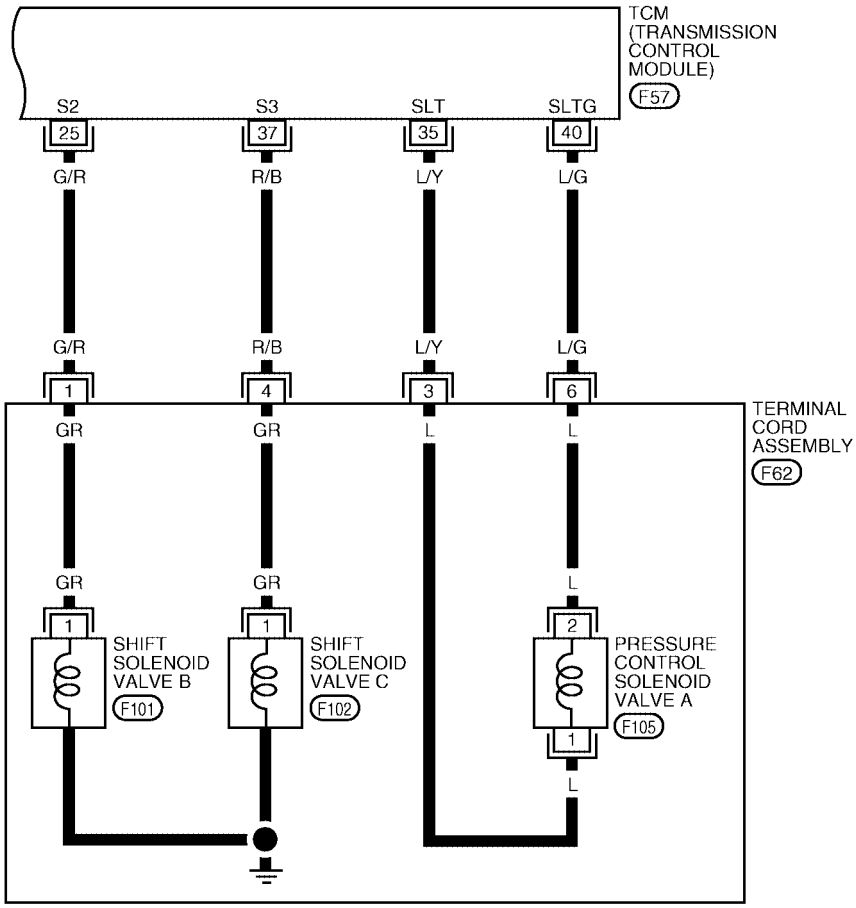


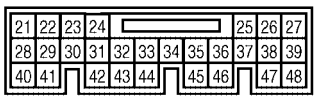
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

BCWA0451E

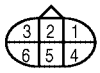
AT-5THSIG-02

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





F57
GR



F62
GR

F101 *
GR

, F102 *
GR

F105 *
G

★: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

BCWA0452E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
21	G/B	Pressure control solenoid valve B ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
36	O/B	Pressure control solenoid valve B		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
47	BR/Y	Shift solenoid valve E		When shift solenoid valve E operates. (When driving in reverse gear.)	Battery voltage
				When shift solenoid valve E does not operate.	0V

Diagnostic Procedure

ECS00A3Z

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0755 SHIFT SOLENOID VALVE B” (Refer to AT-159, "Diagnostic Procedure" .)
- “DTC P0760 SHIFT SOLENOID VALVE C” (Refer to AT-164, "Diagnostic Procedure" .)
- “DTC P0770 SHIFT SOLENOID VALVE E” (Refer to AT-179, "Diagnostic Procedure" .)

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK EACH PRESSURE CONTROL SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0745 PRESSURE CONTROL SOLENOID VALVE A” (Refer to AT-149, "Diagnostic Procedure" .)
- “DTC P0775 PRESSURE CONTROL SOLENOID VALVE B” (Refer to AT-184, "Diagnostic Procedure" .)

OK or NG

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

3. CHECK MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassembly A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following item:

- Forward and direct clutch assembly. Refer to AT-256, "DISASSEMBLY" .
- 2nd brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" .
- One-way clutch No.1. Refer to AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .

OK or NG

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

4. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-138, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

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

PFP:31940

Description

ECS00A40

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the torque converter clutch does not lock up as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning oil pump or torque converter clutch, etc.

On Board Diagnosis Logic

ECS00A41

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T TCC S/V FNCTN” with CONSULT-II or P0744 without CONSULT-II is detected when A/T cannot perform lock-up even if electrical circuit is good.

Possible Cause

ECS00A42

- Shift solenoid valve D
  (Off stick.)
- Pressure control solenoid valve C
  (Off stick.)
- Torque converter clutch
- Hydraulic control circuit

DTC Confirmation Procedure

ECS00A43

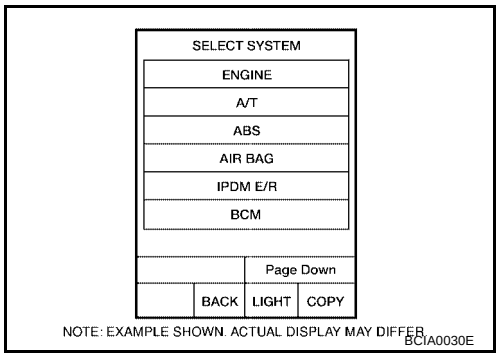
CAUTION:

- **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-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to more than 100 km/h (62 MPH) and maintain the following conditions for at least 12 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 5th position
   SLIP REV: Less than 100 rpm
   ACCELE ANGLE: More than 5 %
   LOCK-UP: ON (Refer to AT-316, "VEHICLE SPEED WHEN PERFORMING AND RELEASING COMPLETE LOCK-UP" .)
   [Vehicle speed: Constant speed of more than 100 km/h (62 MPH).]
   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-146, "Diagnostic Procedure" .

WITH GST

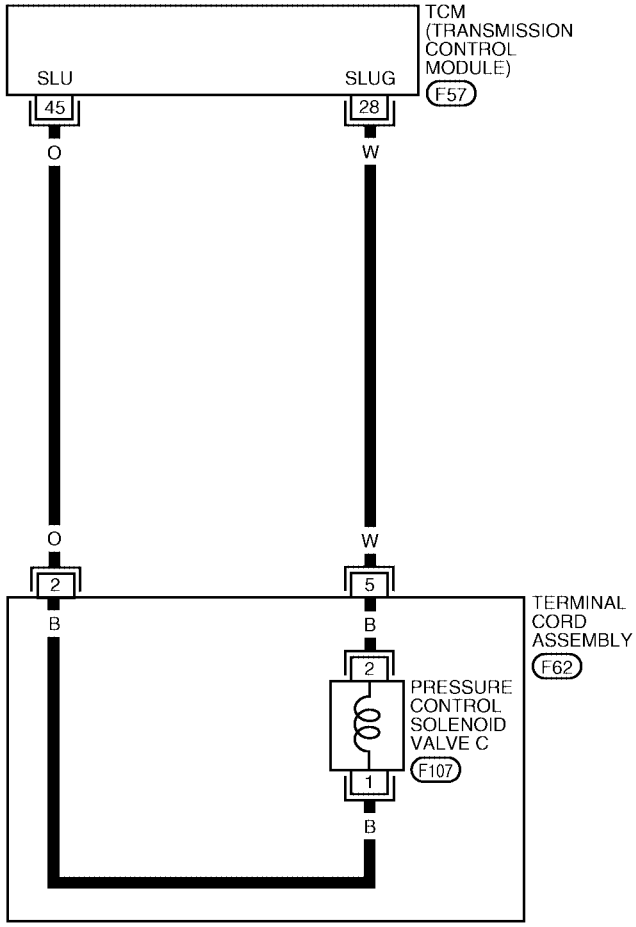
Follow the procedure “With CONSULT-II”.

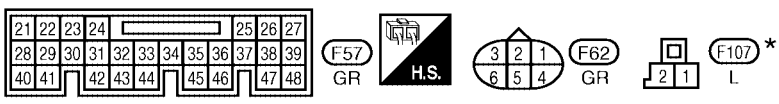
Wiring Diagram — AT — TCCSIG

ECS00A44

AT-TCCSIG-01

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





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

BCWA0279E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz

Diagnostic Procedure

ECS00A45

1. CHECK SHIFT SOLENOID VALVE D CIRCUIT

Perform “Diagnostic Procedure” for DTC P0765. Refer to AT-174, "Diagnostic Procedure" .

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK PRESSURE CONTROL SOLENOID VALVE C CIRCUIT

Perform “Diagnostic Procedure” for DTC P0795. Refer to AT-193, "Diagnostic Procedure" .

OK or NG

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

3. CHECK MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassembly A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following item:

– Torque converter clutch. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

4. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-144, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

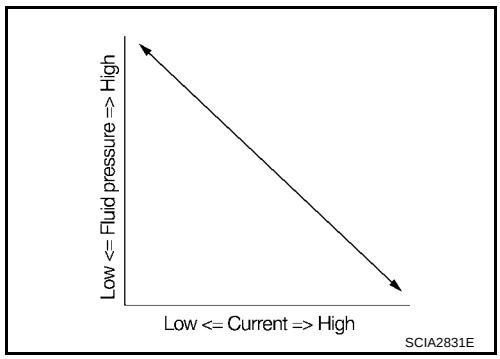
DTC P0745 PRESSURE CONTROL SOLENOID VALVE A (LINE PRESSURE)

PFP:31940

Description

ECS00A46

- The pressure control solenoid valve A is normally high, 3-port linear pressure control solenoid.
- The pressure control solenoid valve A regulates the oil pump discharge pressure to suit the driving condition in response to a signal sent from the TCM.



On Board Diagnosis Logic

ECS00A47

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “PC SOL A(L/PRESS)” with CONSULT-II or P0745 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ECS00A48

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Pressure control solenoid valve A

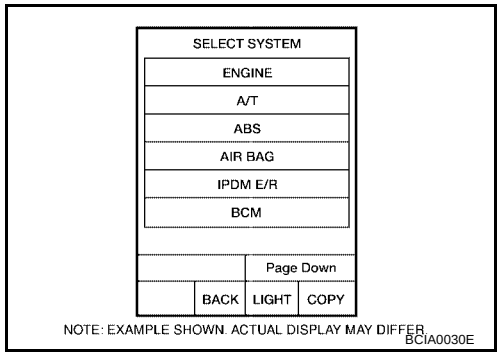
DTC Confirmation Procedure

ECS00A49

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Run engine for at least 13 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-149, "Diagnostic Procedure" .



WITH GST

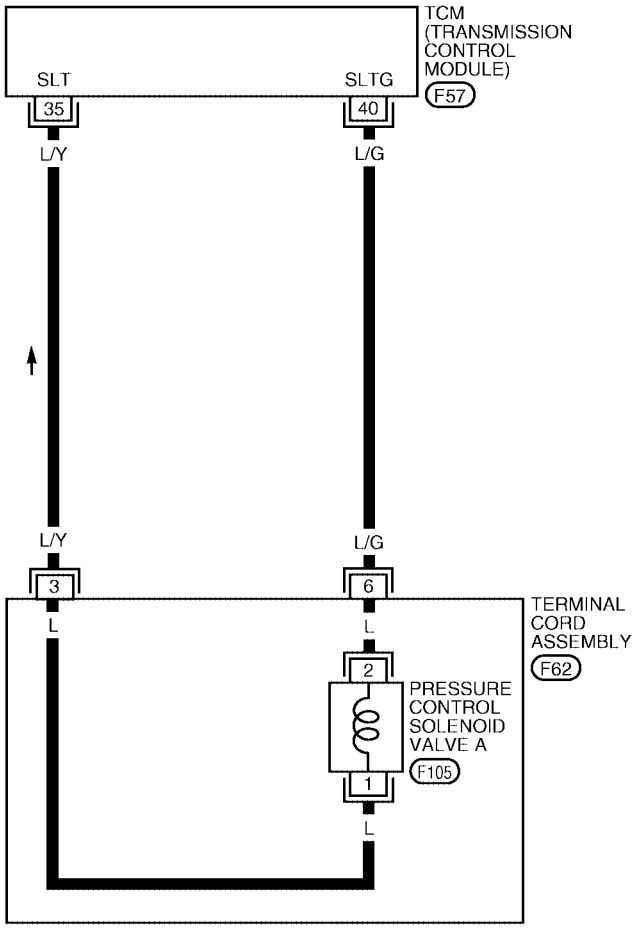
Follow the procedure “With CONSULT-II”.

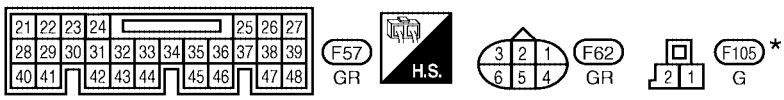
Wiring Diagram — AT — PC/A

ECS00A4A

AT-PC/A-01

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





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

BCWA0280E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V

Diagnostic Procedure

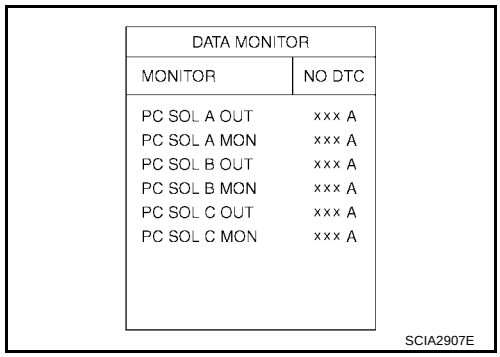
ECS00A4B

1. CHECK PRESSURE CONTROL SOLENOID VALVE A SIGNAL

With CONSULT-II

1. After warming up the engine and transaxle, turn ignition switch “OFF”.
2. Turn ignition switch “ON”. (Do not start engine.)
3. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
4. Read out the value of “PC SOL A OUT” and “PC SOL A MON”.

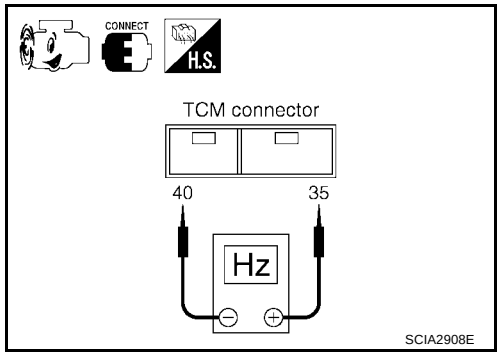
Monitor item	Condition	Display value (Approx.)
● PC SOL A OUT ● PC SOL A MON	When releasing accelerator pedal with setting selector lever to “P” position.	1.00 A
	When depressing accelerator pedal fully setting selector lever to “P” position.	0.32 A



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 35 and 40.

Connector	Terminal	Condition	Data (Approx.)
F57	35 - 40	When engine is running with idle speed and setting selector lever to “P” position.	300 Hz



OK or NG

OK >> GO TO 7.
NG >> GO TO 2.

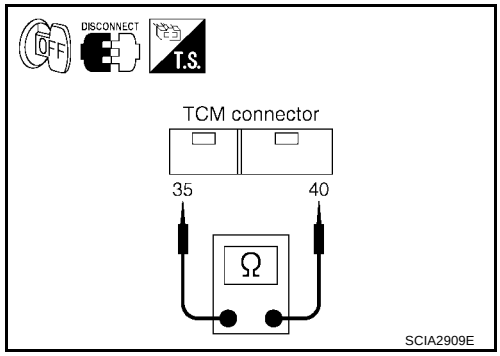
2. CHECK PRESSURE CONTROL SOLENOID VALVE A CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminals 35 and 40.

Connector	Terminal	Condition	Resistance (Approx.)
F57	35 - 40	Temperature: 20°C (68°F)	5.0 - 5.6 Ω

OK or NG

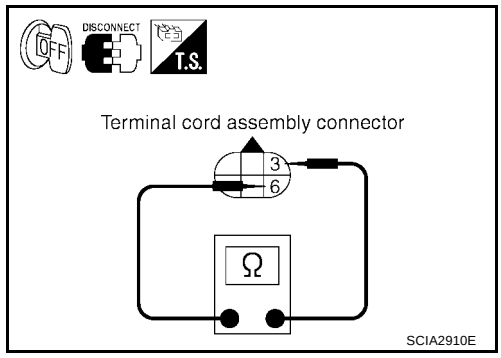
OK >> GO TO 7.
NG >> GO TO 3.



3. CHECK TERMINAL CORD ASSEMBLY WITH PRESSURE CONTROL SOLENOID VALVE A

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 3 and 6.

Connector	Terminal	Condition	Resistance (Approx.)
F62	3 - 6	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



OK or NG

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

4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

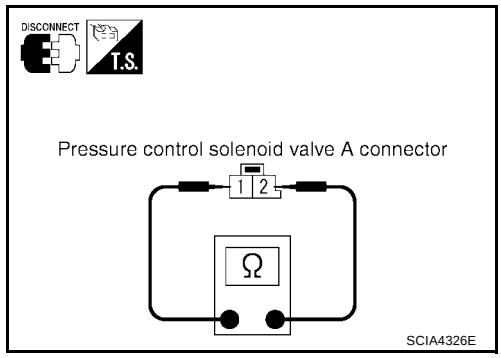
OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

5. CHECK PRESSURE CONTROL SOLENOID VALVE A

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect pressure control solenoid valve A harness connector.
3. Check resistance between terminals 1 and 2.

Connector	Terminal	Condition	Resistance (Approx.)
F105	1 - 2	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



OK or NG

OK >> GO TO 6.
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

6. CHECK HARNESS BETWEEN TERMINAL CORD ASSEMBLY AND PRESSURE CONTROL SOLENOID VALVE A

Check the following.

- Open or short-circuit in the harness between terminal cord assembly and pressure control solenoid valve A.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

7. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-147, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

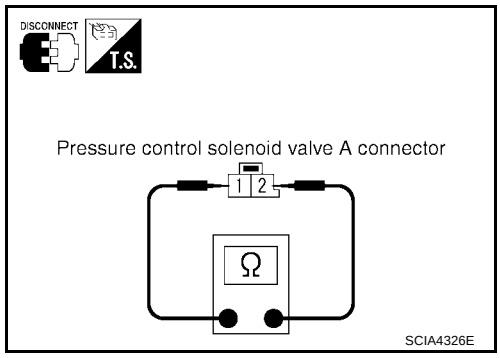
Component Inspection

ECS00A4C

PRESSURE CONTROL SOLENOID VALVE A

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect pressure control solenoid valve A harness connector.
3. Check resistance between terminals 1 and 2.

Connector	Terminal	Condition	Resistance (Approx.)
F105	1 - 2	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



4. If NG, replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

DTC P0750 SHIFT SOLENOID VALVE A

PFP:31940

Description

ECS00A4D

- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve A is a normally open, ON-OFF type solenoid.

Gear position	D_1 , M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	OFF (Open)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

ECS00A4E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT SOL A” with CONSULT-II or P0750 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ECS00A4F

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve A

DTC Confirmation Procedure

ECS00A4G

CAUTION:

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

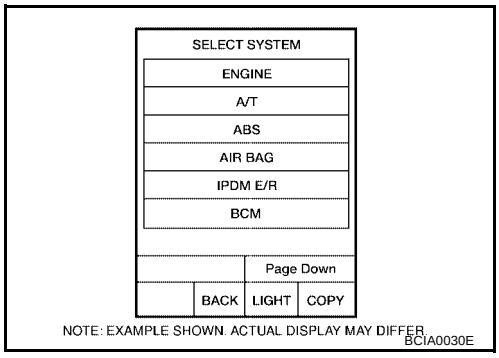
NOTE:

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 1st ⇒ 2nd position
5. If DTC is detected, go to AT-154, "Diagnostic Procedure" .



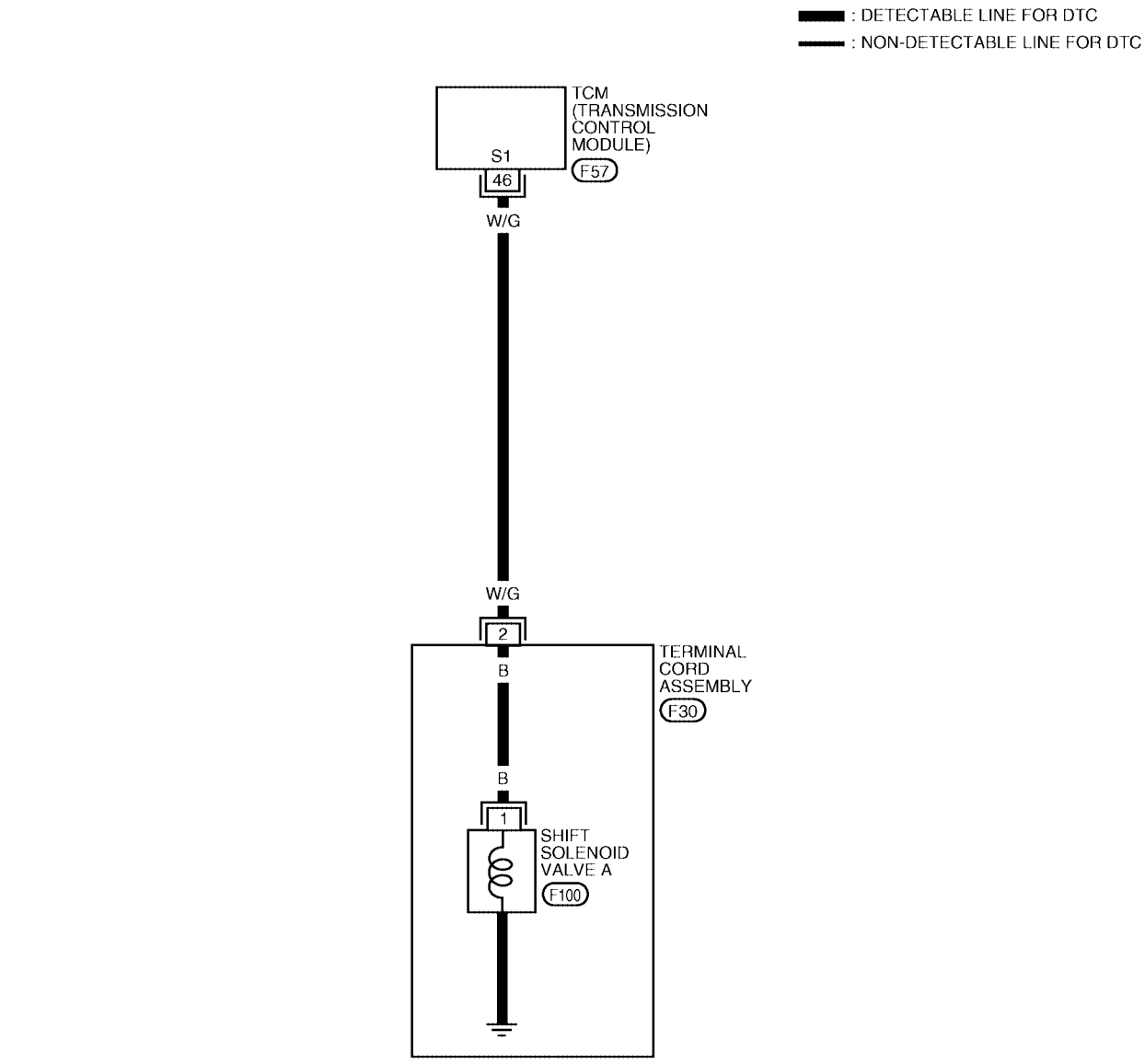
WITH GST

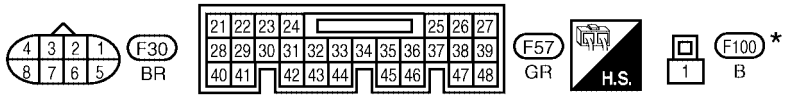
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — SSV/A

ECS00A4H

AT-SSV/A-01





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

BCWA0455E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
				When shift solenoid valve A does not operate.	0V

Diagnostic Procedure

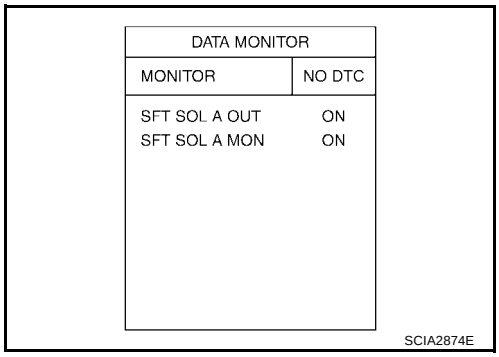
ECS00A4I

1. CHECK SHIFT SOLENOID VALVE A SIGNAL

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL A OUT” and “SFT SOL A MON”.

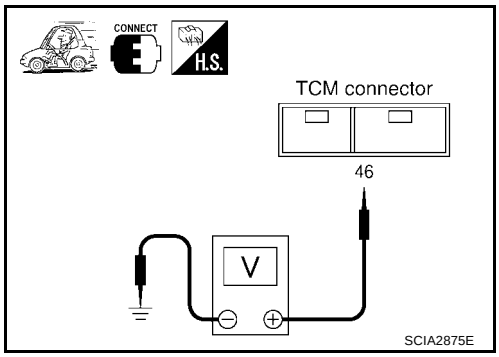
Monitor item	Condition	Indication
● SFT SOL A OUT ● SFT SOL A MON	When shift solenoid valve A operates. (When driving in 1st gear.)	ON
	When shift solenoid valve A does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal	Condition	Voltage (Approx.)
F57	46 - Ground	When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
		When shift solenoid valve A does not operate.	0V



OK or NG

OK >> GO TO 7.
NG >> GO TO 2.

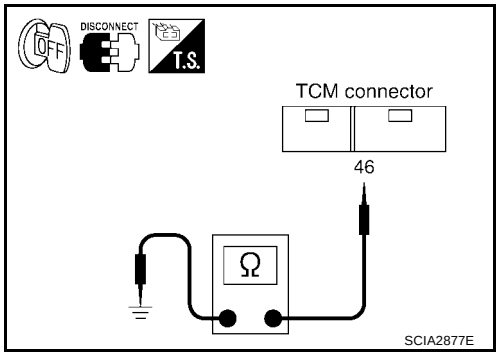
2. CHECK SHIFT SOLENOID VALVE A CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 46 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F57	46 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

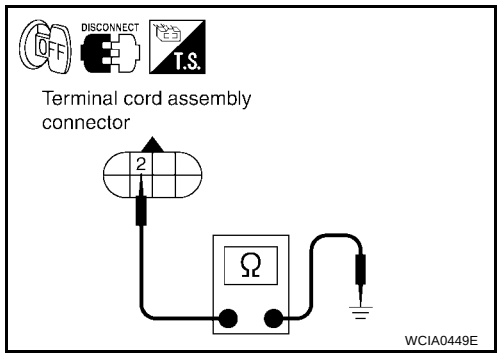
OK >> GO TO 7.
NG >> GO TO 3.



3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE A

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 2 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F30	2 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



OK or NG

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

4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

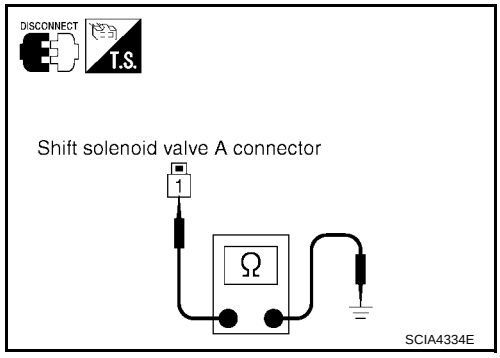
OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

5. CHECK SHIFT SOLENOID VALVE A

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve A harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F100	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



OK or NG

OK >> GO TO 6.
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

6. CHECK HARNESS BETWEEN TERMINAL CORD ASSEMBLY AND SHIFT SOLENOID VALVE A

Check the following.

- Open or short-circuit in the harness between terminal cord assembly and shift solenoid valve A.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

7. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-152, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

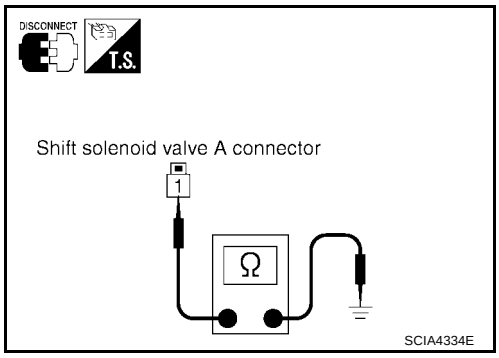
Component Inspection

ECS00A4J

SHIFT SOLENOID VALVE A

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve A harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F100	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



4. If NG, replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

DTC P0755 SHIFT SOLENOID VALVE B

PFP:31940

Description

ECS00A4K

- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve B is a normally closed, ON-OFF type solenoid.

Gear position	D_1 , M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve B	ON (Open)	OFF (Closed)	OFF (Closed)	OFF (Closed)	ON (Open)	OFF (Closed)

On Board Diagnosis Logic

ECS00A4L

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT SOL B” with CONSULT-II or P0755 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ECS00A4M

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve B

DTC Confirmation Procedure

ECS00A4N

CAUTION:

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

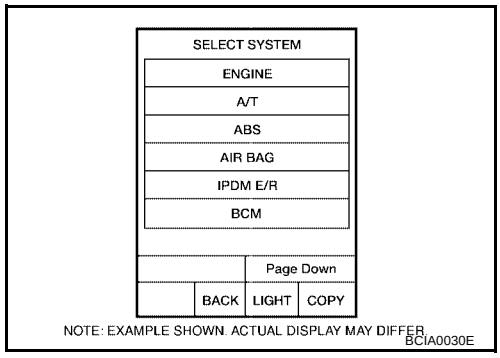
NOTE:

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 1st ⇒ 2nd and 4th ⇒ 5th position
5. If DTC is detected, go to AT-159, "Diagnostic Procedure" .



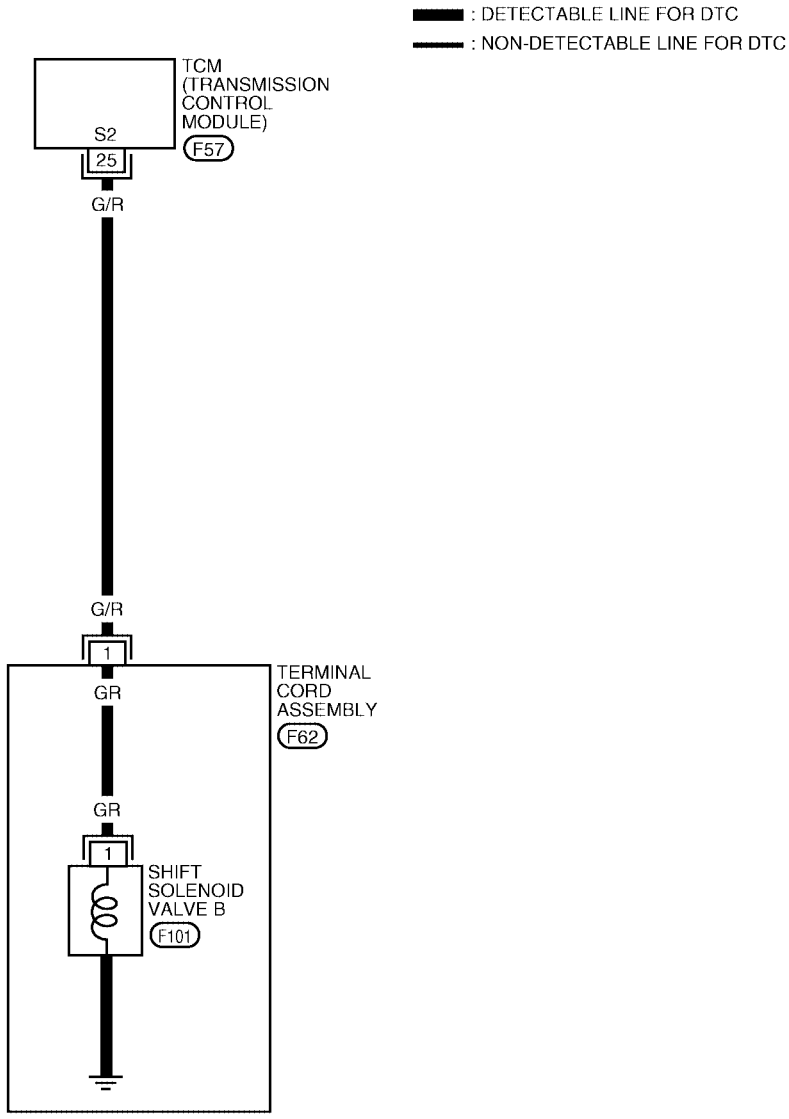
WITH GST

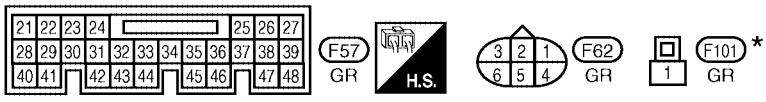
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — SSV/B

ECS00A4O

AT-SSV/B-01





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

BCWA0456E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V

Diagnostic Procedure

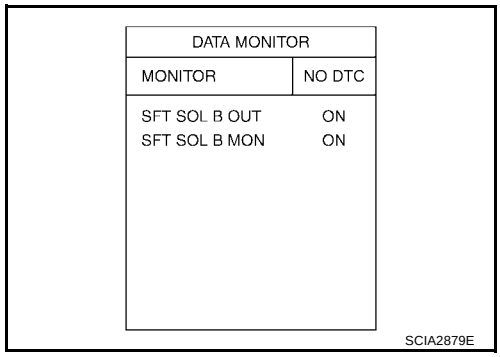
ECS00A4P

1. CHECK SHIFT SOLENOID VALVE B SIGNAL

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL B OUT” and “SFT SOL B MON”.

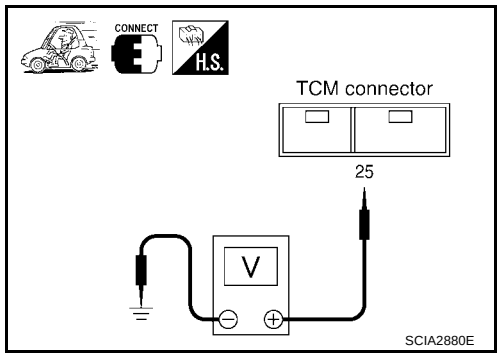
Monitor item	Condition	Indication
● SFT SOL B OUT ● SFT SOL B MON	When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	ON
	When shift solenoid valve B does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal	Condition	Voltage (Approx.)
F57	25 - Ground	When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
		When shift solenoid valve B does not operate.	0V



OK or NG

OK >> GO TO 7.
NG >> GO TO 2.

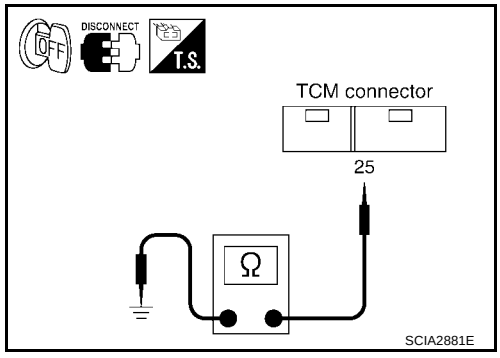
2. CHECK SHIFT SOLENOID VALVE B CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 25 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F57	25 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

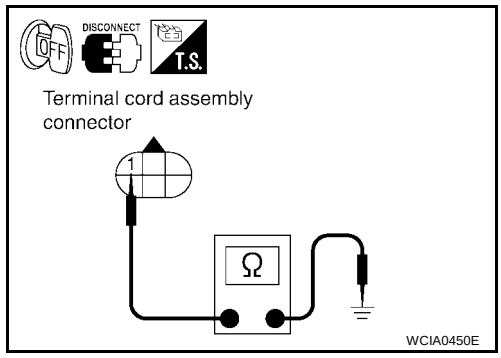
OK >> GO TO 7.
NG >> GO TO 3.



3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE B

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F62	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



OK or NG

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

4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

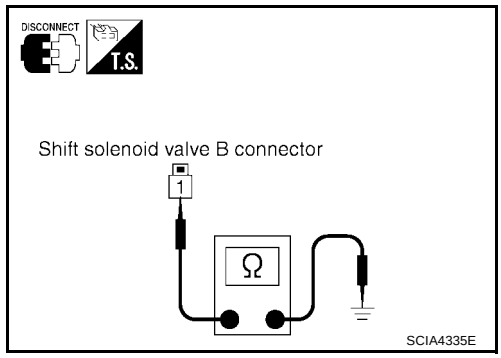
OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

5. CHECK SHIFT SOLENOID VALVE B

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve B harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F101	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



OK or NG

OK >> GO TO 6.
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

6. CHECK HARNESS BETWEEN TERMINAL CORD ASSEMBLY AND SHIFT SOLENOID VALVE B

Check the following.

- Open or short-circuit in the harness between terminal cord assembly and shift solenoid valve B.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

7. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-157, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

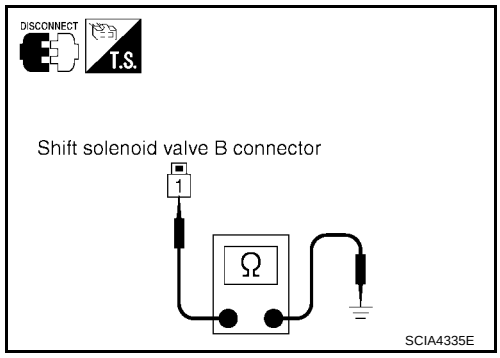
Component Inspection

ECS00A4Q

SHIFT SOLENOID VALVE B

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve B harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F101	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



4. If NG, replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

DTC P0760 SHIFT SOLENOID VALVE C

PFP:31940

Description

ECS00A4R

- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve C is a normally closed, ON-OFF type solenoid.

Gear position	D_1 , M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve C	ON (Open)	ON (Open)	ON (Open)	OFF (Closed)	OFF (Closed)	ON (Open)

On Board Diagnosis Logic

ECS00A4S

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT SOL C” with CONSULT-II or P0760 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ECS00A4T

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve C

DTC Confirmation Procedure

ECS00A4U

CAUTION:

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

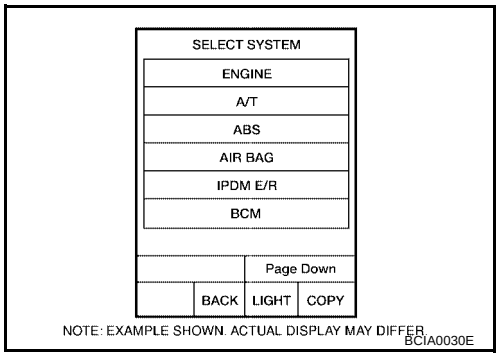
NOTE:

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 3rd ⇒ 4th position
5. If DTC is detected, go to AT-164, "Diagnostic Procedure" .



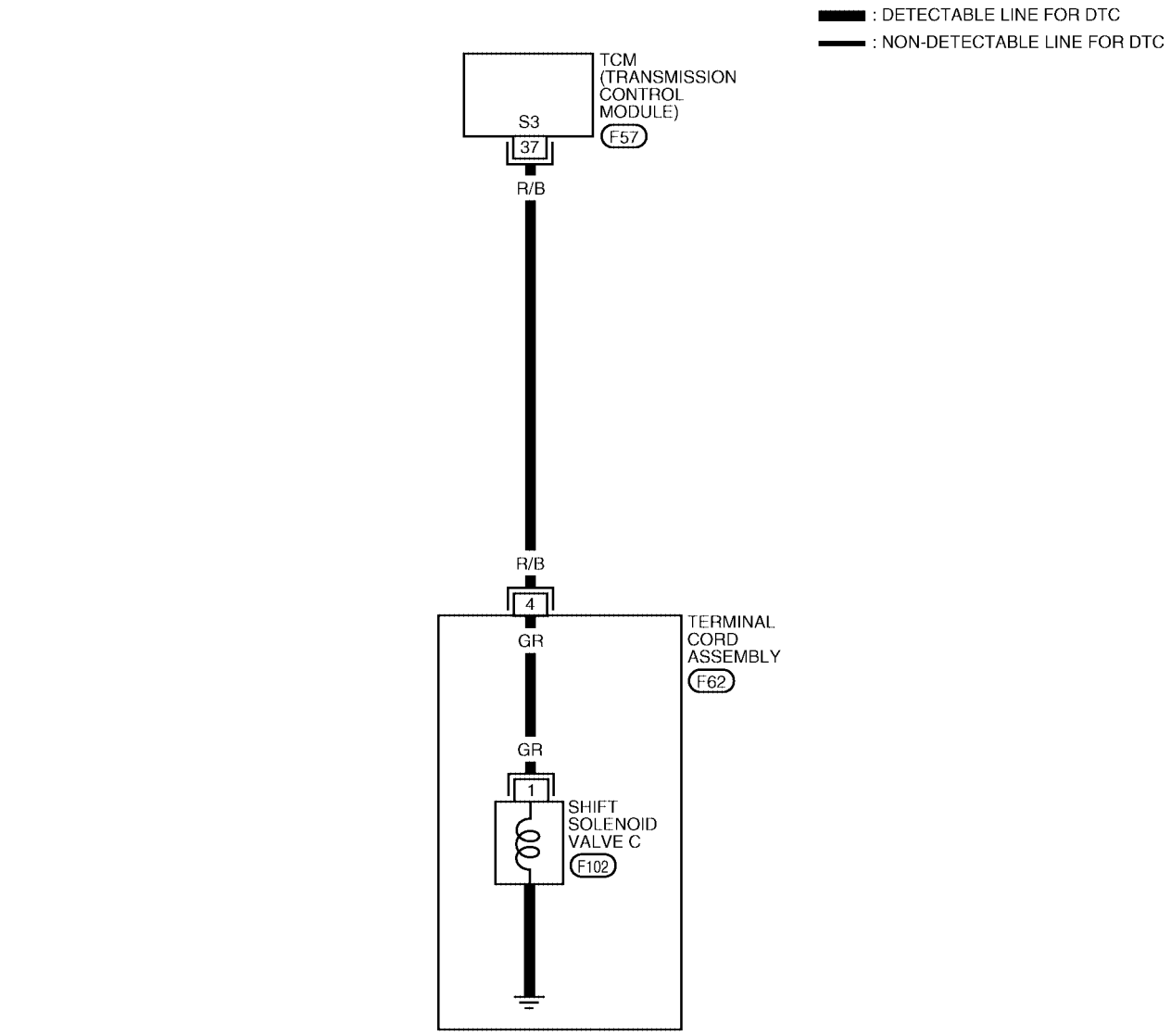
WITH GST

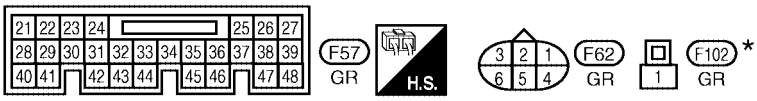
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — SSV/C

ECS00A4V

AT-SSV/C-01





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

BCWA0457E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V

Diagnostic Procedure

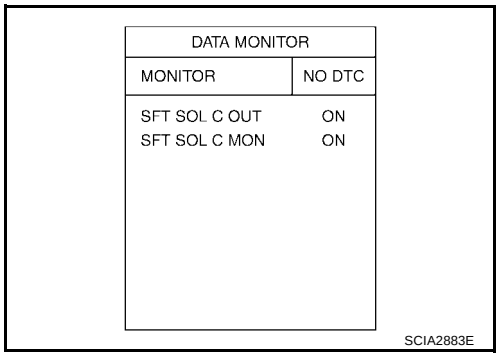
ECS00A4W

1. CHECK SHIFT SOLENOID VALVE C SIGNAL

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL C OUT” and “SFT SOL C MON”.

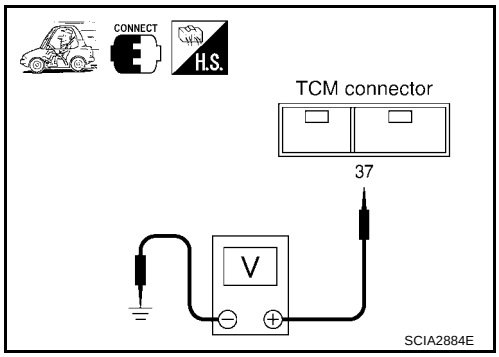
Monitor item	Condition	Indication
● SFT SOL C OUT ● SFT SOL C MON	When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	ON
	When shift solenoid valve C does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal	Condition	Voltage (Approx.)
F57	37 - Ground	When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
		When shift solenoid valve C does not operate.	0V



OK or NG

OK >> GO TO 7.
NG >> GO TO 2.

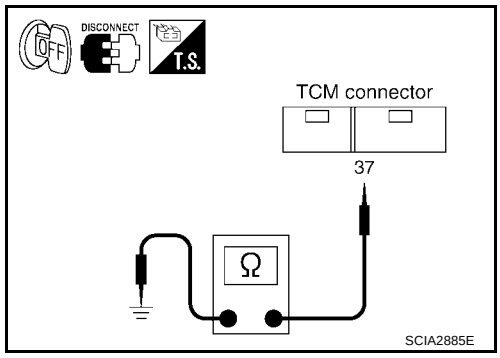
2. CHECK SHIFT SOLENOID VALVE C CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 37 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F57	37 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

OK >> GO TO 7.
NG >> GO TO 3.



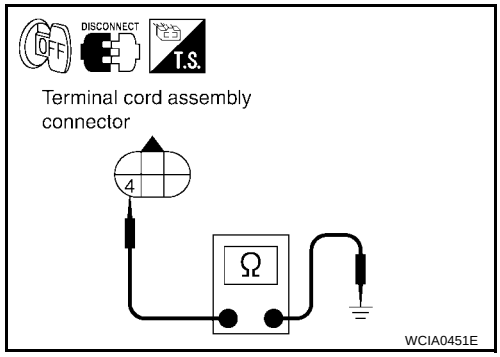
3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE C

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 4 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F62	4 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

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



4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

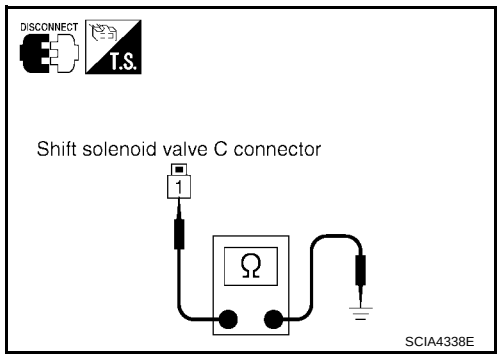
5. CHECK SHIFT SOLENOID VALVE C

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve C harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F102	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

OK >> GO TO 6.
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .



6. CHECK HARNESS BETWEEN TERMINAL CORD ASSEMBLY AND SHIFT SOLENOID VALVE C

Check the following.

- Open or short-circuit in the harness between terminal cord assembly and shift solenoid valve C.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace transmission wire.

7. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-162, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

Component Inspection

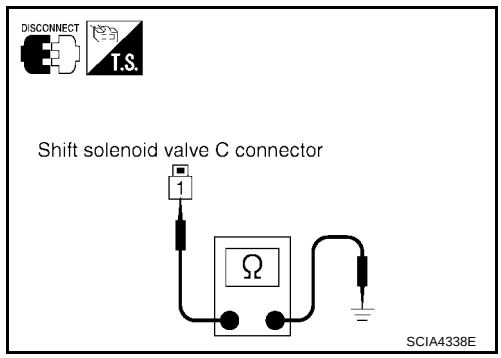
ECS00A4X

SHIFT SOLENOID VALVE C

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve C harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F102	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

4. If NG, replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .



DTC P0762 SHIFT SOLENOID VALVE C STUCK ON

PFP:31940

Description

ECS00A4Y

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.
- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve C is a normally closed, ON-OFF type solenoid.

Gear position	D_1 , M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve C	ON (Open)	ON (Open)	ON (Open)	OFF (Closed)	OFF (Closed)	ON (Open)

On Board Diagnosis Logic

ECS00A4Z

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SFT SOL C STUCK ON” with CONSULT-II or P0762 without CONSULT-II is detected when condition of shift solenoid valve C is different from monitor value, and relation between gear position and actual gear ratio is irregular.

Possible Cause

ECS00A50

- Shift solenoid valve C
  (On stick.)
- Hydraulic control circuit

DTC Confirmation Procedure

ECS00A51

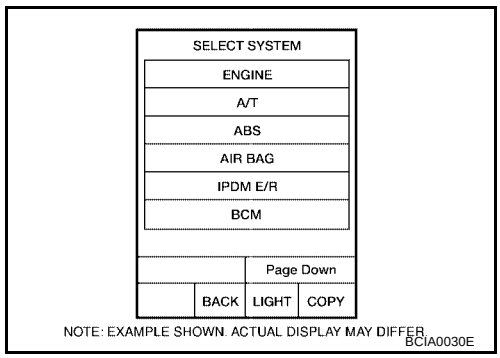
CAUTION:

- **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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 3rd ⇒ 4th position
   ACCELE ANGLE: More than 10 %
5. If DTC is detected, go to AT-169, "Diagnostic Procedure" .



WITH GST

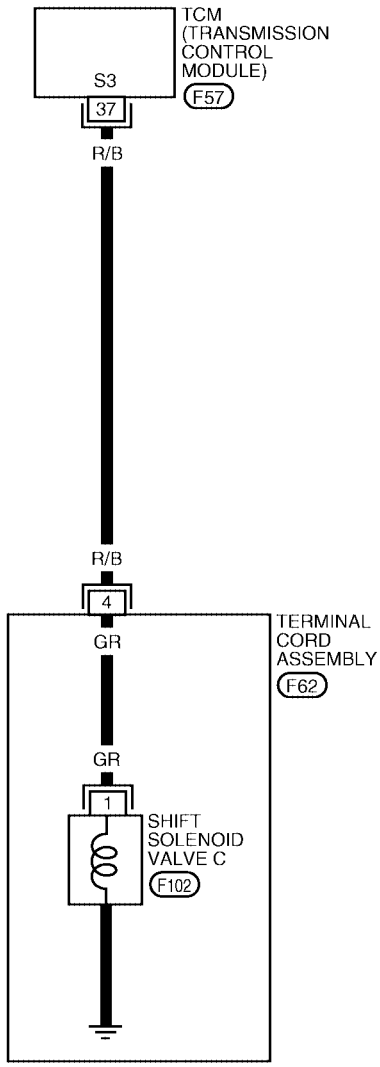
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — SSV/CS

ECS00A52

AT-SSV/CS-01

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



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

BCWA0458E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V

Diagnostic Procedure

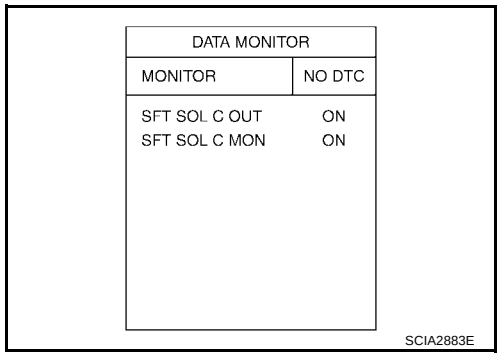
ECS00A53

1. CHECK SHIFT SOLENOID VALVE C SIGNAL

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL C OUT” and “SFT SOL C MON”.

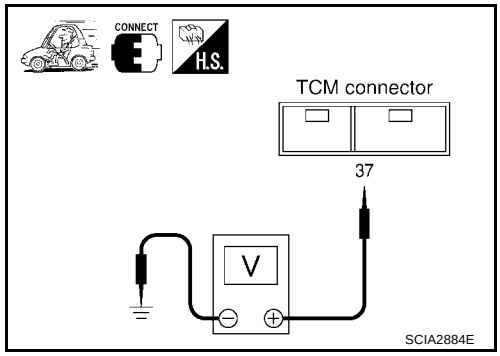
Monitor item	Condition	Indication
● SFT SOL C OUT ● SFT SOL C MON	When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	ON
	When shift solenoid valve C does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal	Condition	Voltage (Approx.)
F57	37 - Ground	When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
		When shift solenoid valve C does not operate.	0V



OK or NG

OK >> GO TO 7.
NG >> GO TO 2.

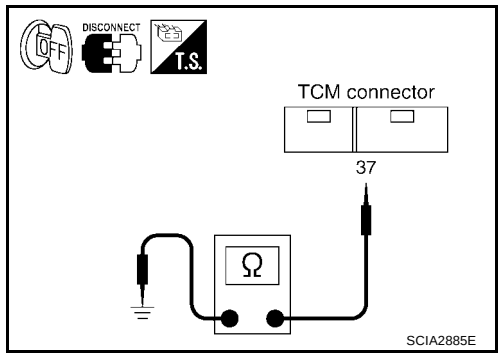
2. CHECK SHIFT SOLENOID VALVE C CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 37 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F57	37 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

OK >> GO TO 7.
NG >> GO TO 3.



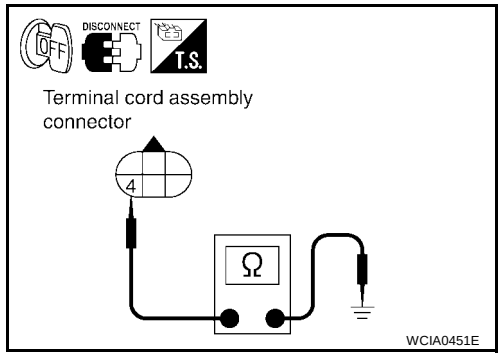
3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE C

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 4 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F62	4 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

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



4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

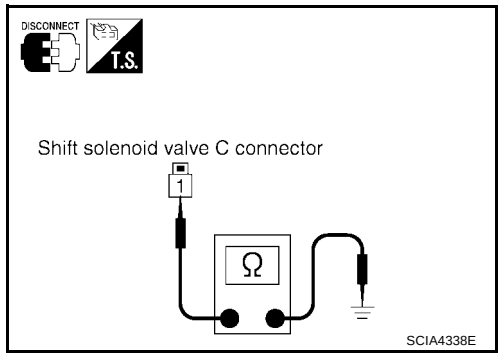
5. CHECK SHIFT SOLENOID VALVE C

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve C harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F102	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

OK >> GO TO 6.
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .



6. CHECK HARNESS BETWEEN TERMINAL CORD ASSEMBLY AND SHIFT SOLENOID VALVE C

Check the following.

- Open or short-circuit in the harness between terminal cord assembly and shift solenoid valve C.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

7. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-167, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

Component Inspection

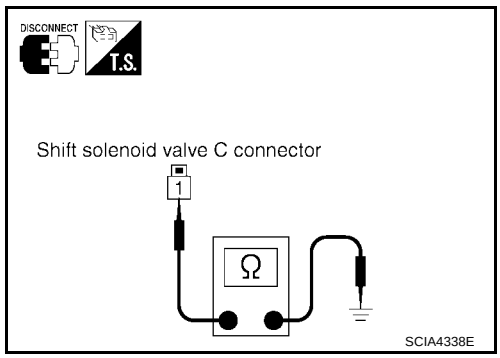
ECS00A54

SHIFT SOLENOID VALVE C

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve C harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F102	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

4. If NG, replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .



DTC P0765 SHIFT SOLENOID VALVE D

PFP:31940

Description

ECS00A55

- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve D is a normally open, ON-OFF type solenoid.

Gear position	D_1 , M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve D	OFF (Open)	OFF (Open)	ON (Closed)	ON (Closed)	ON (Closed)	OFF (Open)

On Board Diagnosis Logic

ECS00A56

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT SOL D” with CONSULT-II or P0765 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ECS00A57

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve D

DTC Confirmation Procedure

ECS00A58

CAUTION:

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

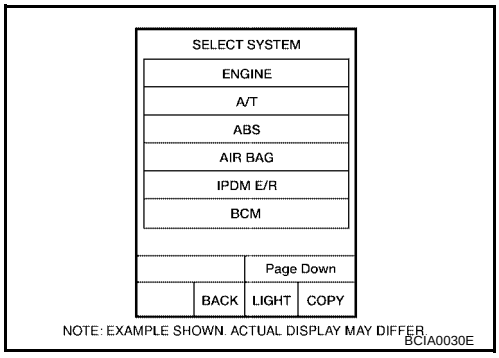
NOTE:

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 2nd ⇒ 3rd position
5. If DTC is detected, go to AT-174, "Diagnostic Procedure" .



WITH GST

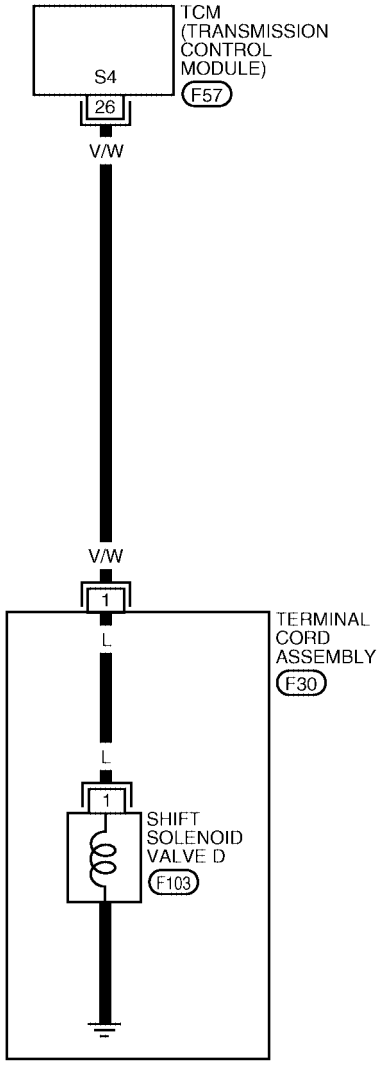
Follow the procedure “With CONSULT-II”.

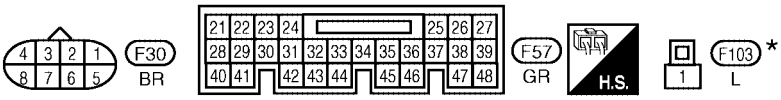
Wiring Diagram — AT — SSV/D

ECS00A59

AT-SSV/D-01

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





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

BCWA0459E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
26	V/W	Shift solenoid valve D		When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
				When shift solenoid valve D does not operate.	0V

Diagnostic Procedure

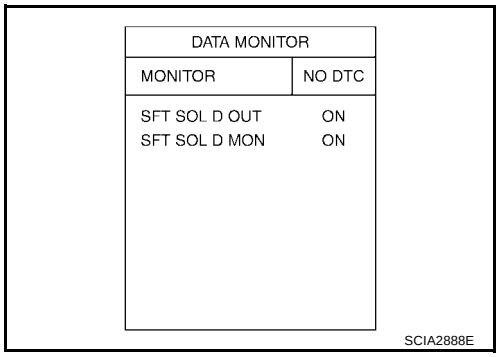
ECS00A5A

1. CHECK SHIFT SOLENOID VALVE D SIGNAL

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL D OUT” and “SFT SOL D MON”.

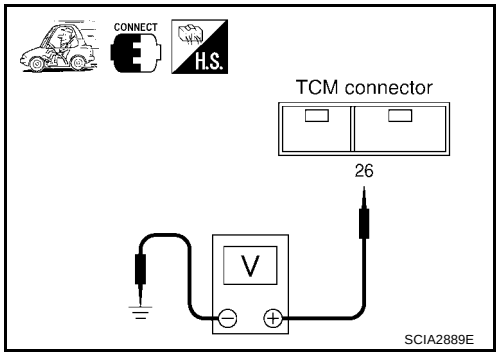
Monitor item	Condition	Indication
● SFT SOL D OUT ● SFT SOL D MON	When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	ON
	When shift solenoid valve D does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal	Condition	Voltage (Approx.)
F57	26 - Ground	When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
		When shift solenoid valve D does not operate.	0V



OK or NG

OK >> GO TO 7.
NG >> GO TO 2.

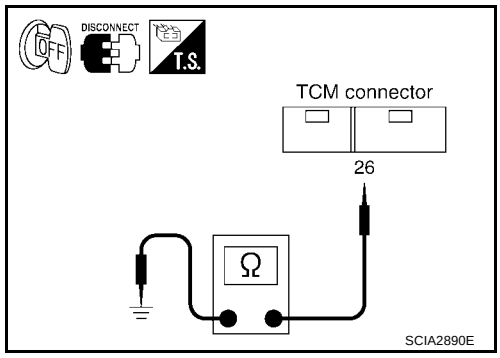
2. CHECK SHIFT SOLENOID VALVE D CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 26 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F57	26 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

OK >> GO TO 7.
NG >> GO TO 3.



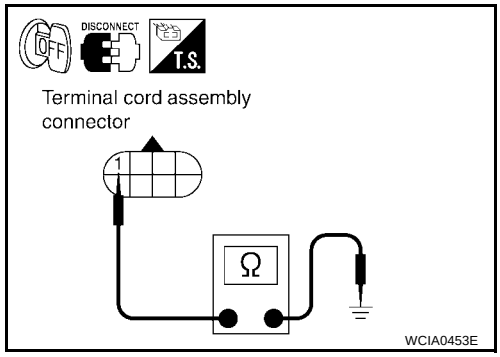
3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE D

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F30	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

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



4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

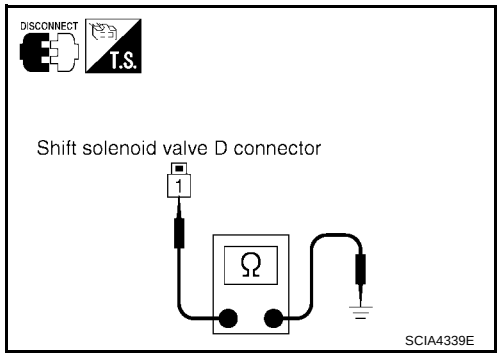
5. CHECK SHIFT SOLENOID VALVE D

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve D harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F103	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

OK >> GO TO 6.
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .



6. CHECK HARNESS BETWEEN TERMINAL CORD ASSEMBLY AND SHIFT SOLENOID VALVE D

Check the following.

- Open or short-circuit in the harness between terminal cord assembly and shift solenoid valve D.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

7. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-172, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

Component Inspection

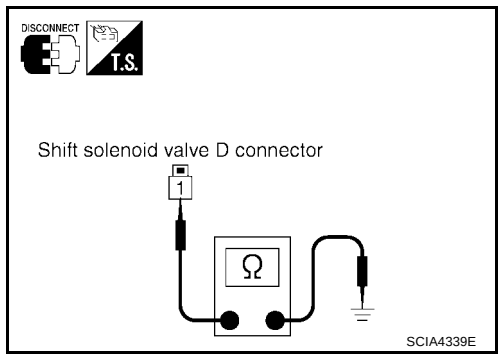
ECS00A5B

SHIFT SOLENOID VALVE D

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve D harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F103	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

4. If NG, replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .



DTC P0770 SHIFT SOLENOID VALVE E

PFP:31940

Description

ECS00A5C

- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve E is a normally closed, ON-OFF type solenoid.

Gear position	D_1	M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve E	OFF (Closed)	ON (Open)	OFF (Closed)	OFF (Closed)	OFF (Closed)	OFF (Closed)	ON (Open)

NOTE:
The condition of shift solenoid valve E is ON (Open) with shifting $D_2 \Leftrightarrow D_3$ and $D_3 \Leftrightarrow D_4$.

On Board Diagnosis Logic

ECS00A5D

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT SOL E” with CONSULT-II or P0770 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ECS00A5E

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve E

DTC Confirmation Procedure

ECS00A5F

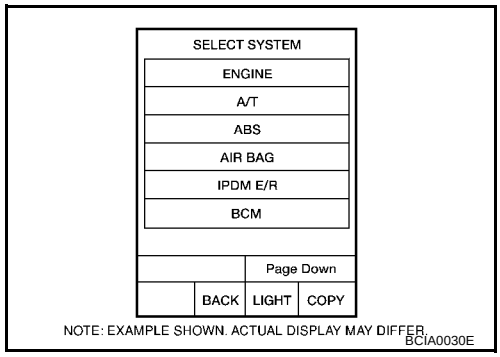
CAUTION:

- **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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Move selector lever between “N” and “R”.
   SLCT LVR POSI: “N” ⇔ “R” position
5. If DTC is detected, go to AT-179, "Diagnostic Procedure" .



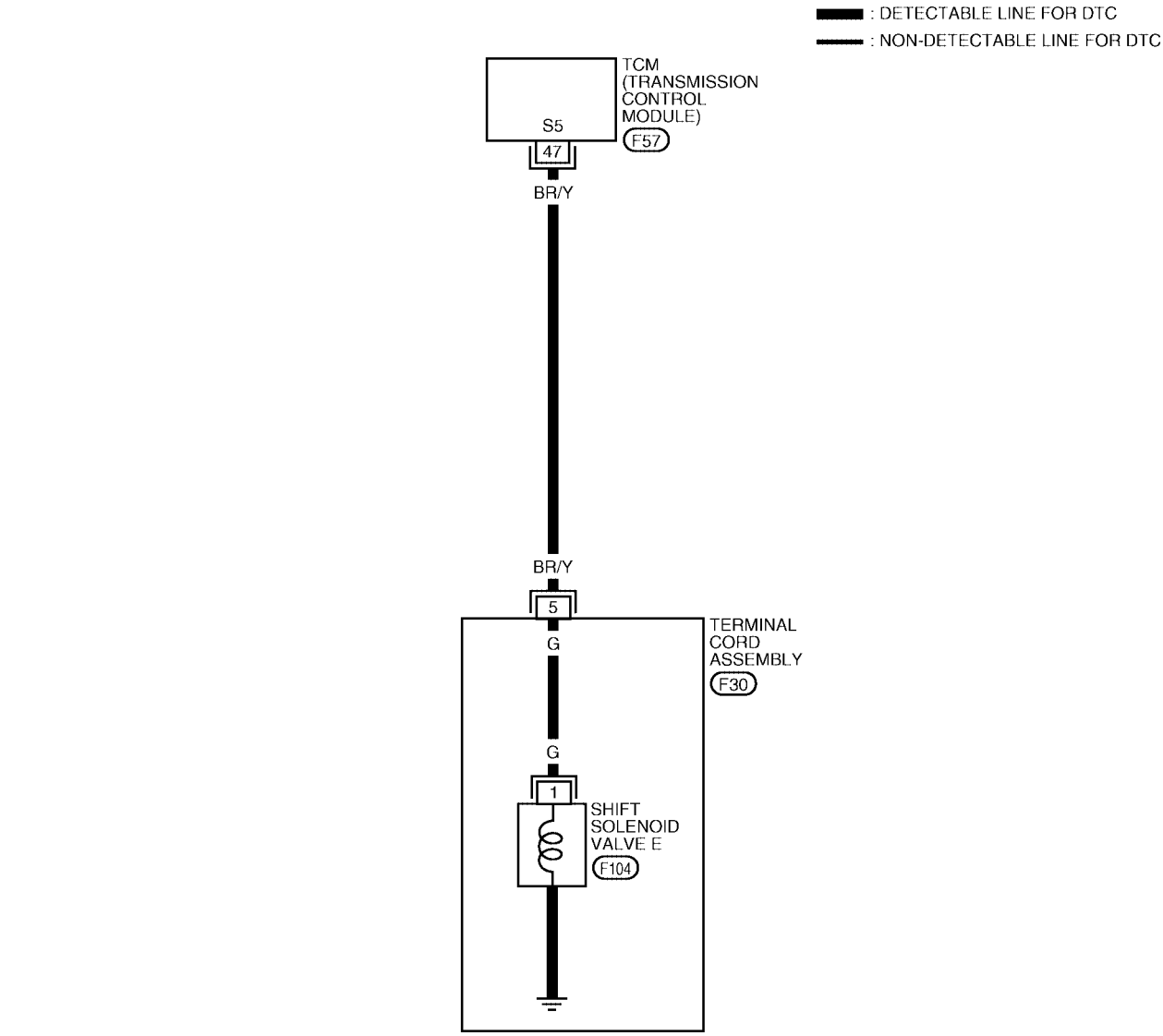
WITH GST

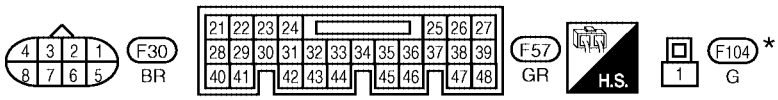
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — SSV/E

ECS00A5G

AT-SSV/E-01





★: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

BCWA0460E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
47	BR/Y	Shift solenoid valve E		When shift solenoid valve E operates. (When driving in reverse gear.)	Battery voltage
				When shift solenoid valve E does not operate.	0V

Diagnostic Procedure

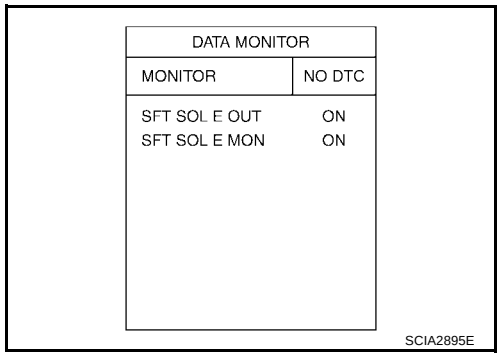
ECS00A5H

1. CHECK SHIFT SOLENOID VALVE E SIGNAL

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL E OUT” and “SFT SOL E MON”.

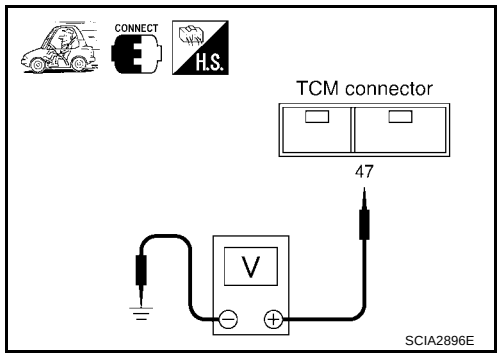
Monitor item	Condition	Indication
● SFT SOL E OUT ● SFT SOL E MON	When shift solenoid valve E operates. (When driving in reverse gear.)	ON
	When shift solenoid valve E does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal	Condition	Voltage (Approx.)
F57	47 - Ground	When shift solenoid valve E operates. (When driving in reverse gear.)	Battery voltage
		When shift solenoid valve E does not operate.	0V



OK or NG

OK >> GO TO 7.
NG >> GO TO 2.

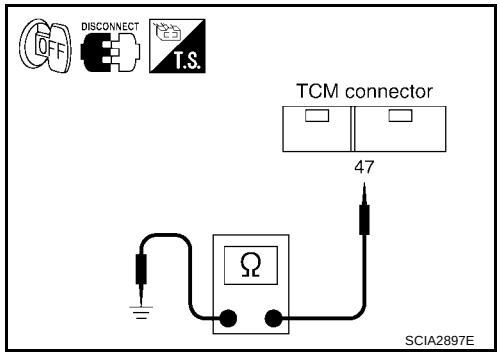
2. CHECK SHIFT SOLENOID VALVE E CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 47 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F57	47 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

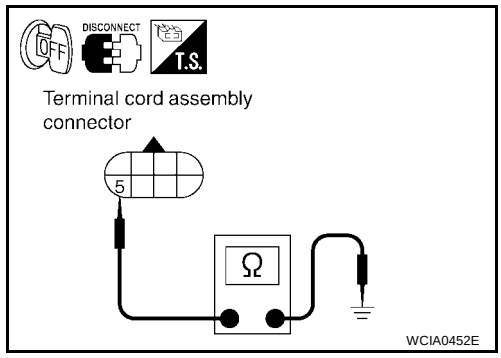
OK >> GO TO 7.
NG >> GO TO 3.



3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE E

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 5 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F30	5 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



OK or NG

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

4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

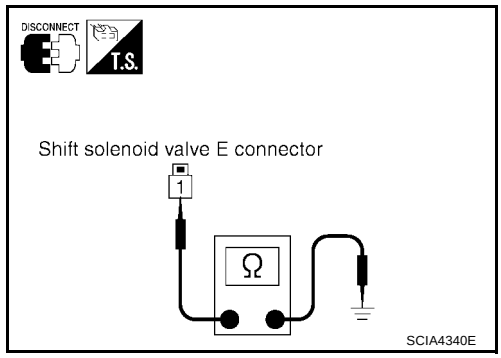
OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

5. CHECK SHIFT SOLENOID VALVE E

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve E harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F104	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



OK or NG

OK >> GO TO 6.
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

6. CHECK HARNESS BETWEEN TERMINAL CORD ASSEMBLY AND SHIFT SOLENOID VALVE E

Check the following.

- Open or short-circuit in the harness between terminal cord assembly and shift solenoid valve E.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

7. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-177, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

Component Inspection

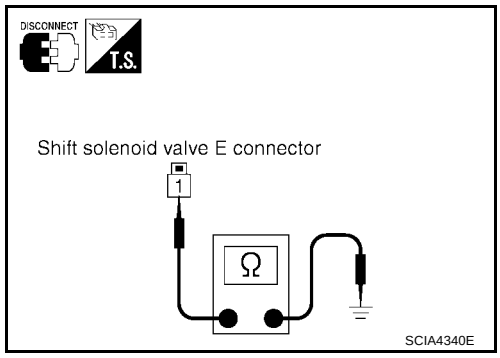
ECS00A5I

SHIFT SOLENOID VALVE E

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect shift solenoid valve E harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal	Condition	Resistance (Approx.)
F104	1 - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

4. If NG, replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .



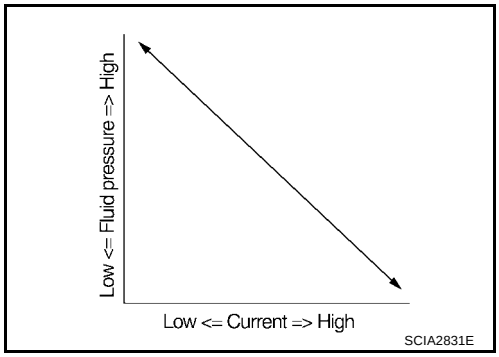
DTC P0775 PRESSURE CONTROL SOLENOID VALVE B (SHIFT PRESSURE)

PFP:31940

Description

ECS00A5J

- The pressure control solenoid valve B is normally high, 3-port linear pressure control solenoid.
- The pressure control solenoid valve B controls linear shift pressure by control signal from TCM and controls 2nd coast brake directly under 2nd, 3rd, 4th and direct clutch directly under 5th and reverse.



On Board Diagnosis Logic

ECS00A5K

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “PC SOL B(SFT/PRS)” with CONSULT-II or P0775 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ECS00A5L

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Pressure control solenoid valve B

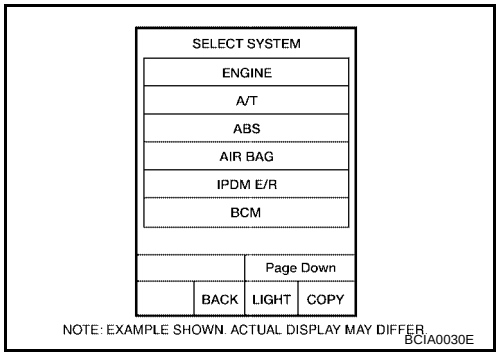
DTC Confirmation Procedure

ECS00A5M

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Run engine for at least 13 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-184, "Diagnostic Procedure" .



WITH GST

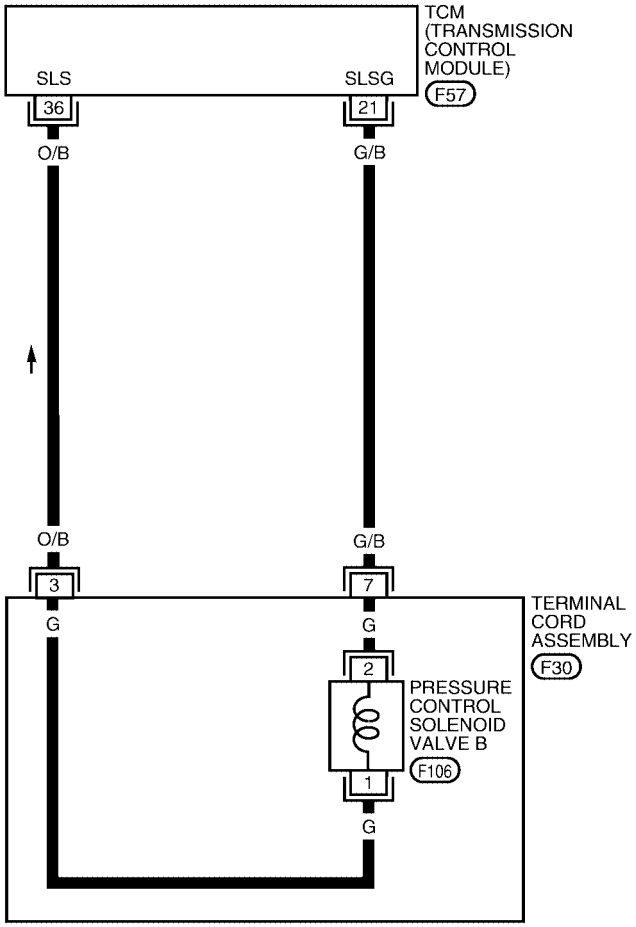
Follow the procedure “With CONSULT-II”.

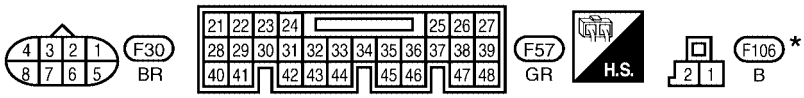
Wiring Diagram — AT — PC/B

ECS00A5N

AT-PC/B-01

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





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

BCWA0461E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
21	G/B	Pressure control solenoid valve B ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
36	O/B	Pressure control solenoid valve B		When engine is running with idle speed and setting selector lever to “P” position.	300Hz

Diagnostic Procedure

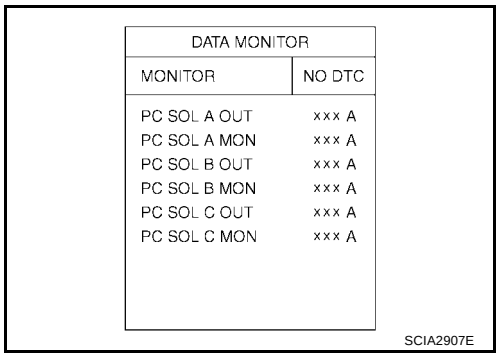
ECS00A5O

1. CHECK PRESSURE CONTROL SOLENOID VALVE B SIGNAL

With CONSULT-II

1. After warming up the engine and transaxle, turn ignition switch “OFF”.
2. Turn ignition switch “ON”. (Do not start engine.)
3. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
4. Read out the value of “PC SOL B OUT” and “PC SOL B MON”.

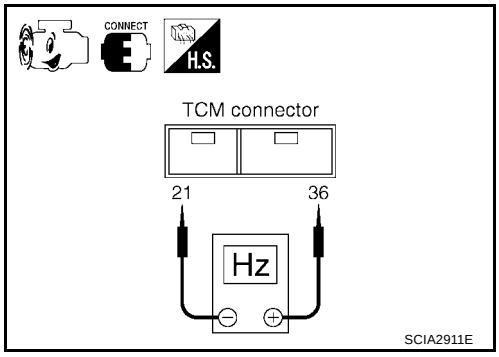
Monitor item	Condition	Display value (Approx.)
● PC SOL B OUT	Selector lever: Manual shift gate position	1.00 A
● PC SOL B MON	Other than the above.	0.30 A



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 21 and 36.

Connector	Terminal	Condition	Data (Approx.)
F57	36 - 21 (Ground)	When engine is running with idle speed and setting selector lever to “P” position.	300 Hz



OK or NG

OK >> GO TO 7.
NG >> GO TO 2.

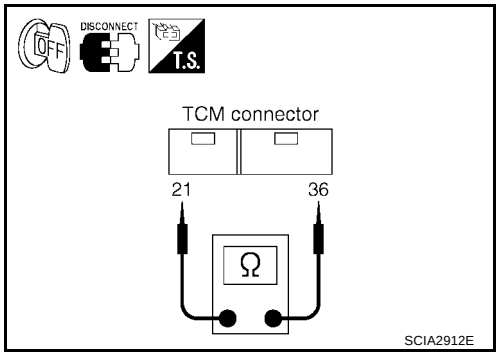
2. CHECK PRESSURE CONTROL SOLENOID VALVE B CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminals 21 and 36.

Connector	Terminal	Condition	Resistance (Approx.)
F57	36 - 21 (Ground)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω

OK or NG

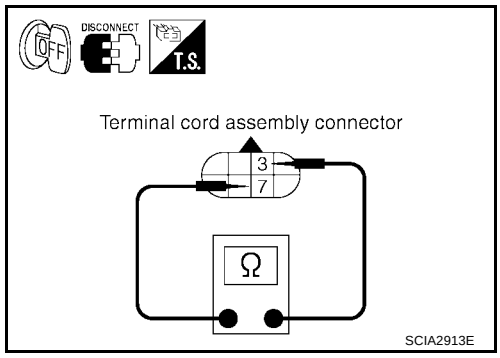
OK >> GO TO 7.
NG >> GO TO 3.



3. CHECK TERMINAL CORD ASSEMBLY WITH PRESSURE CONTROL SOLENOID VALVE B

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 3 and 7.

Connector	Terminal	Condition	Resistance (Approx.)
F62	3 - 7	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



OK or NG

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

4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

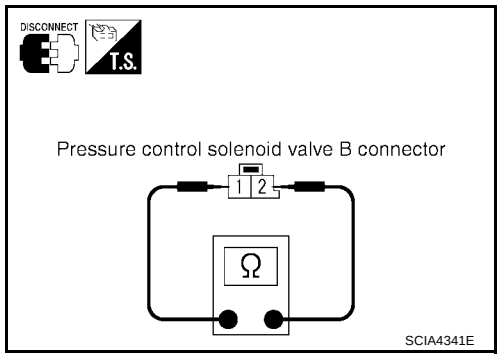
OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

5. CHECK PRESSURE CONTROL SOLENOID VALVE B

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect pressure control solenoid valve B harness connector.
3. Check resistance between terminals 1 and 2.

Connector	Terminal	Condition	Resistance (Approx.)
F106	1 - 2	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



OK or NG

OK >> GO TO 6.
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

6. CHECK HARNESS BETWEEN TERMINAL CORD ASSEMBLY AND PRESSURE CONTROL SOLENOID VALVE B

Check the following.

- Open or short-circuit in the harness between terminal cord assembly and pressure control solenoid valve B.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

7. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-182, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

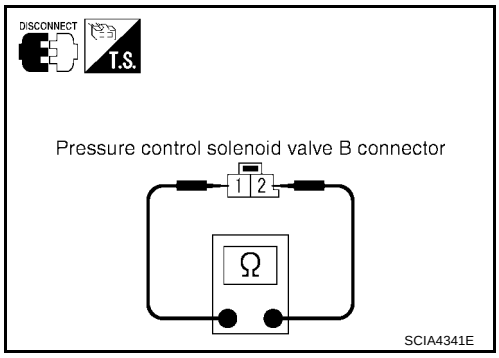
Component Inspection

ECS00A5P

PRESSURE CONTROL SOLENOID VALVE B

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect pressure control solenoid valve B harness connector.
3. Check resistance between terminals 1 and 2.

Connector	Terminal	Condition	Resistance (Approx.)
F106	1 - 2	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



4. If NG, replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

DTC P0780 SHIFT

PFP:31940

Description

ECS00A5Q

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

On Board Diagnosis Logic

ECS00A5R

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT” with CONSULT-II or P0780 without CONSULT-II is detected under the following conditions.
  - When no rotation change occurs between input (turbine revolution sensor) and output (revolution sensor) and shifting time is long.
  - When shifting ends immediately.
  - When engine revs up unusually during shifting.

Possible Cause

ECS00A5S

- Shift solenoid valve D
  (Off error.)
- Shift solenoid valve E
  (Off error.)
- Pressure control solenoid valve A
  (On/Off error.)
- Pressure control solenoid valve B
  (On/Off error.)
- Pressure control solenoid valve C
  (On/Off error.)
- Hydraulic control circuit

DTC Confirmation Procedure

ECS00A5T

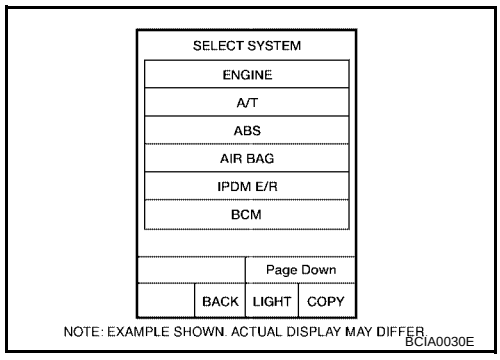
CAUTION:

- **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-II

1. Start engine and select “A/T” with “DATA MONITOR” mode in CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 60°C (140°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 1st ⇒ 2nd ⇒ 3rd ⇒ 4th ⇒ 5th position
   (Vehicle speed: Refer to AT-315, "VEHICLE SPEED WHEN SHIFTING GEARS" .)
4. If DTC is detected, go to AT-190, "Diagnostic Procedure" .



WITH GST

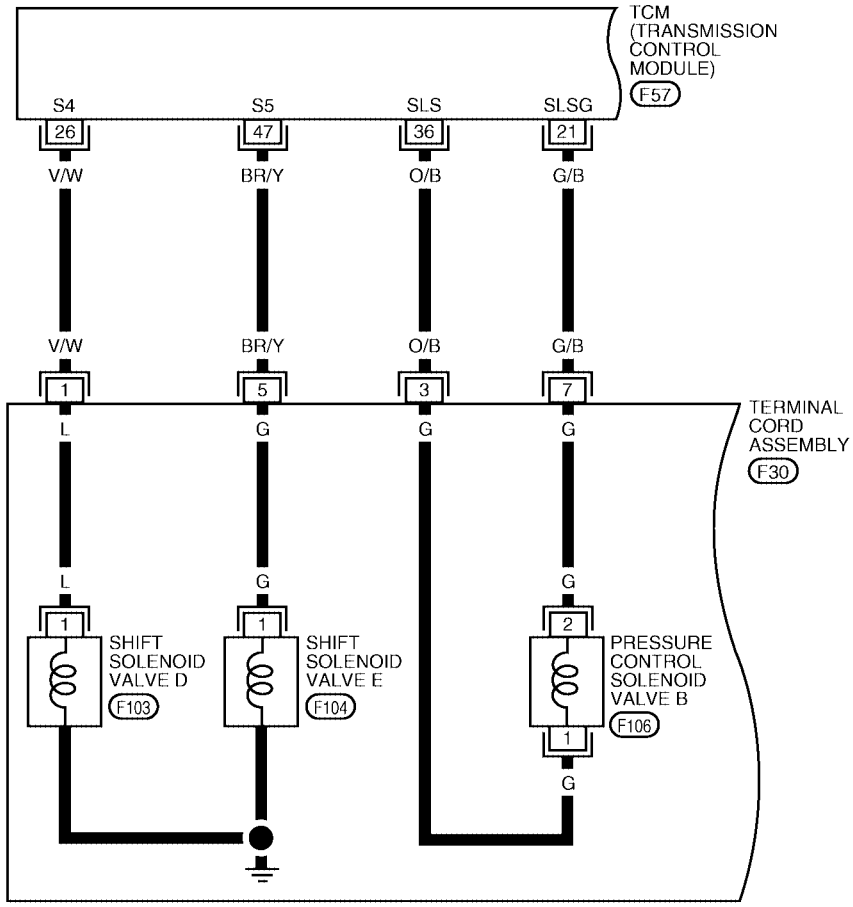
Follow the procedure “With CONSULT-II”.

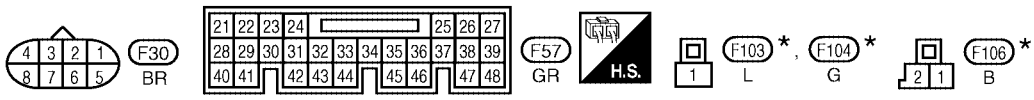
Wiring Diagram — AT — SFTFNC

ECS00A5U

AT-SFTFNC-01

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

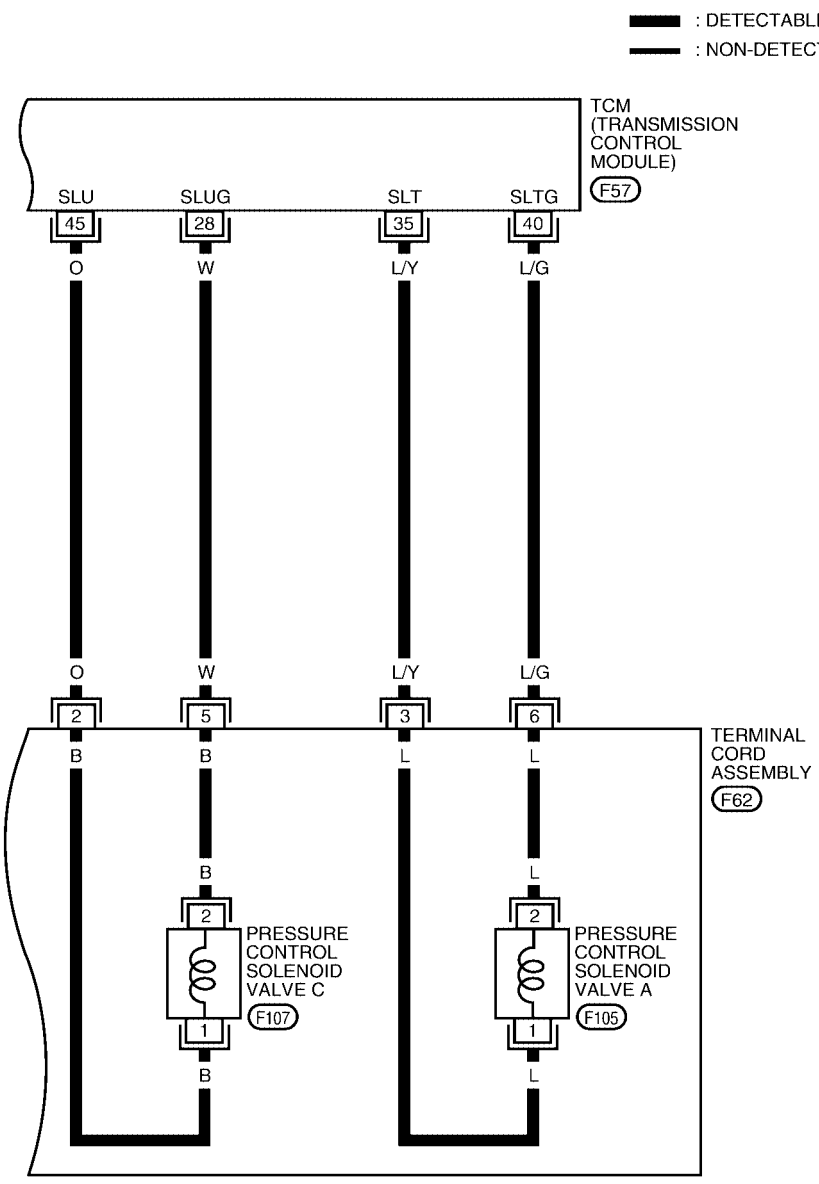


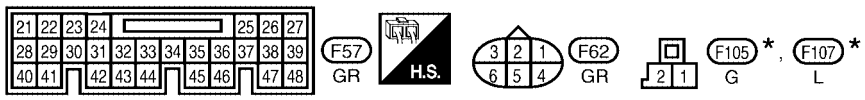


*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

BCWA0462E

AT-SFTFNC-02





★: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

BCWA0289E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
21	G/B	Pressure control solenoid valve B ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
26	V/W	Shift solenoid valve D		When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
				When shift solenoid valve D does not operate.	0V
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
36	O/B	Pressure control solenoid valve B		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
47	BR/Y	Shift solenoid valve E		When shift solenoid valve E operates. (When driving in reverse gear.)	Battery voltage
				When shift solenoid valve E does not operate.	0V

Diagnostic Procedure

ECS00A5V

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0765 SHIFT SOLENOID VALVE D” (Refer to AT-174, "Diagnostic Procedure" .)
- “DTC P0770 SHIFT SOLENOID VALVE E” (Refer to AT-179, "Diagnostic Procedure" .)

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK EACH PRESSURE CONTROL SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0745 PRESSURE CONTROL SOLENOID VALVE A” (Refer to AT-149, "Diagnostic Procedure" .)
- “DTC P0775 PRESSURE CONTROL SOLENOID VALVE B” (Refer to AT-184, "Diagnostic Procedure" .)
- “DTC P0795 PRESSURE CONTROL SOLENOID VALVE C” (Refer to AT-193, "Diagnostic Procedure" .)

OK or NG

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

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-187, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

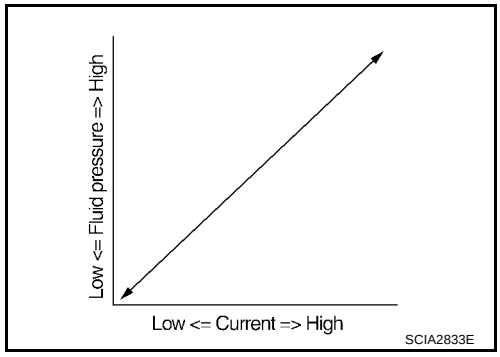
DTC P0795 PRESSURE CONTROL SOLENOID VALVE C (TCC AND SHIFT PRESSURE)

PFP:31940

Description

ECS00A5W

- The pressure control solenoid valve C is normally low, 3-port linear pressure control solenoid.
- The pressure control solenoid valve C is activated to control the apply and release of the 2nd brake and 1st and reverse brake, and torque converter clutch.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- When the accelerator pedal is depressed (less than 1/8) 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.



On Board Diagnosis Logic

ECS00A5X

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “PC SOL C(TCC&SFT)” with CONSULT-II or P0795 without CONSULT-II is detected under the following conditions.

– When normal voltage is not applied to solenoid due to open, short, and so on.
– When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

ECS00A5Y

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Pressure control solenoid valve C

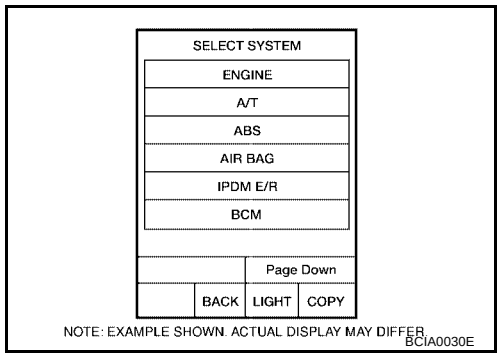
DTC Confirmation Procedure

ECS00A5Z

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Run engine for at least 13 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-193, "Diagnostic Procedure" .



WITH GST

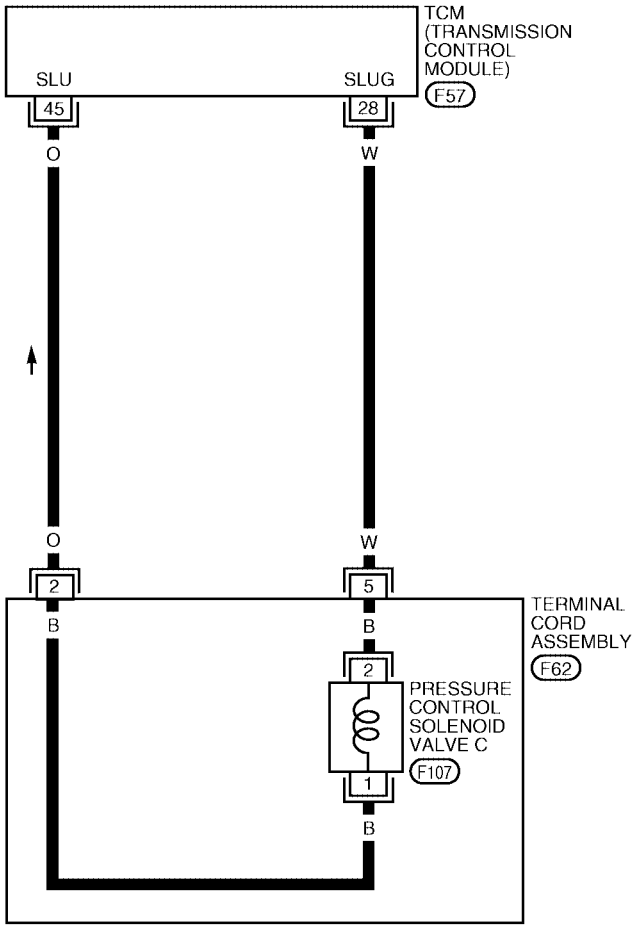
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — PC/C

ECS00A60

AT-PC/C-01

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



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

BCWA0290E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz

Diagnostic Procedure

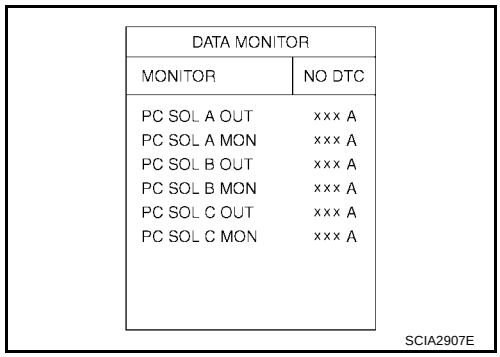
ECS00A61

1. CHECK PRESSURE CONTROL SOLENOID VALVE C SIGNAL

With CONSULT-II

1. After warming up the engine and transaxle, turn ignition switch “OFF”.
2. Turn ignition switch “ON”. (Do not start engine.)
3. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
4. Read out the value of “PC SOL C OUT” and “PC SOL C MON”.

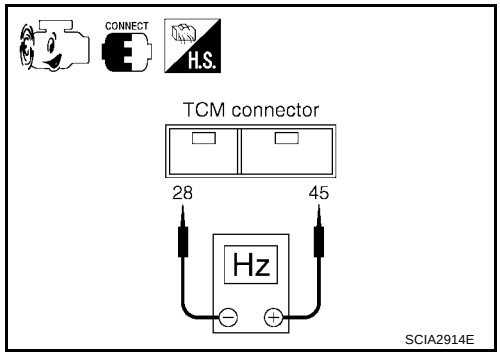
Monitor item	Condition	Display value (Approx.)
● PC SOL C OUT	Selector lever: Manual shift gate position	1.00 A
● PC SOL C MON	Other than the above.	0.20 A



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 28 and 45.

Connector	Terminal	Condition	Data (Approx.)
F57	45 - 28 (Ground)	When engine is running with idle speed and setting selector lever to “P” position.	300 Hz



OK or NG

OK >> GO TO 7.
NG >> GO TO 2.

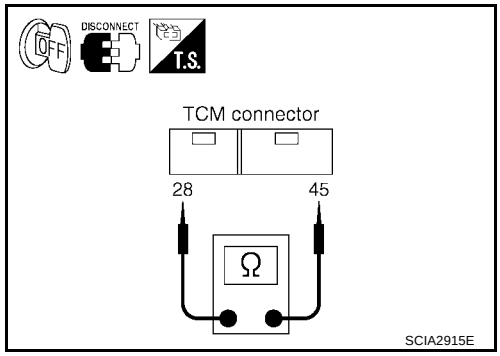
2. CHECK PRESSURE CONTROL SOLENOID VALVE C CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminals 28 and 45.

Connector	Terminal	Condition	Resistance (Approx.)
F57	45 - 28 (Ground)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω

OK or NG

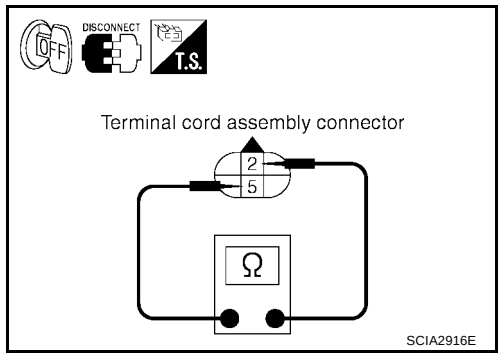
OK >> GO TO 7.
NG >> GO TO 3.



3. CHECK TERMINAL CORD ASSEMBLY WITH PRESSURE CONTROL SOLENOID VALVE C

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 2 and 5.

Connector	Terminal	Condition	Resistance (Approx.)
F62	2 - 5	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



OK or NG

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

4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

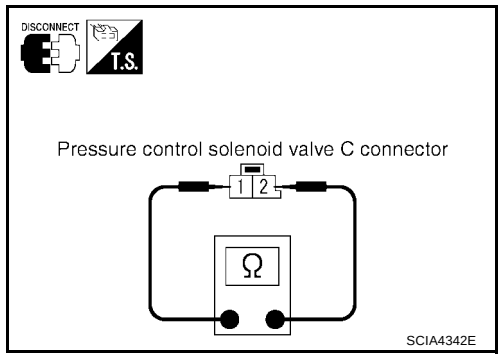
OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

5. CHECK PRESSURE CONTROL SOLENOID VALVE C

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect pressure control solenoid valve C harness connector.
3. Check resistance between terminals 1 and 2.

Connector	Terminal	Condition	Resistance (Approx.)
F107	1 - 2	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



OK or NG

OK >> GO TO 6.
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

6. CHECK HARNESS BETWEEN TERMINAL CORD ASSEMBLY AND PRESSURE CONTROL SOLENOID VALVE C

Check the following.

- Open or short-circuit in the harness between terminal cord assembly and pressure control solenoid valve C.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

7. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-191, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

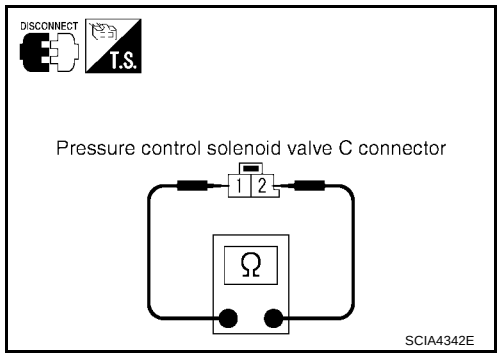
Component Inspection

ECS00A62

PRESSURE CONTROL SOLENOID VALVE C

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect pressure control solenoid valve C harness connector.
3. Check resistance between terminals 1 and 2.

Connector	Terminal	Condition	Resistance (Approx.)
F107	1 - 2	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



4. If NG, replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

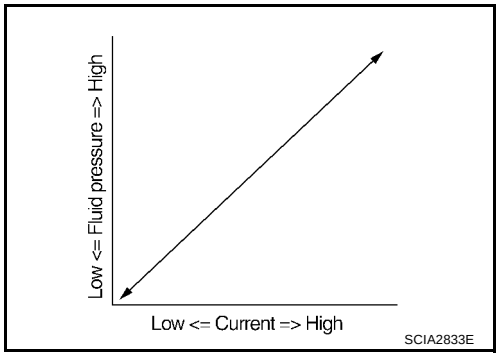
DTC P0797 PRESSURE CONTROL SOLENOID VALVE C STUCK ON

PFP:31940

Description

ECS00A63

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.
- The pressure control solenoid valve C is normally low, 3-port linear pressure control solenoid.
- The pressure control solenoid valve C is activated to control the apply and release of the 2nd brake and 1st and reverse brake, and torque converter clutch.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- When the accelerator pedal is depressed (less than 1/8) 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.



On Board Diagnosis Logic

ECS00A64

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “PC SOL C STC ON” with CONSULT-II or P0797 without CONSULT-II is detected when condition of pressure control solenoid valve C is different from monitor value, and relation between gear position and actual gear ratio or lock-up status is irregular.

Possible Cause

ECS00A65

- Pressure control solenoid valve C
  (On stick.)
- Hydraulic control circuit

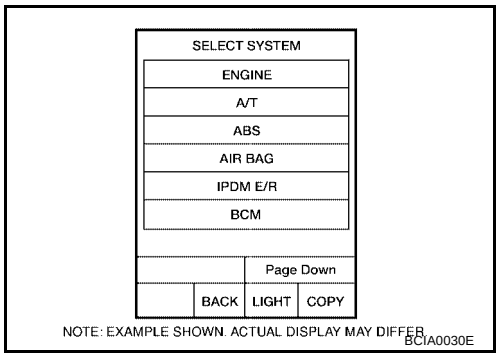
DTC Confirmation Procedure

ECS00A66

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-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Run engine for at least 4 consecutive minutes at idle speed.
5. If DTC is detected, go to AT-198, "Diagnostic Procedure" .



WITH GST

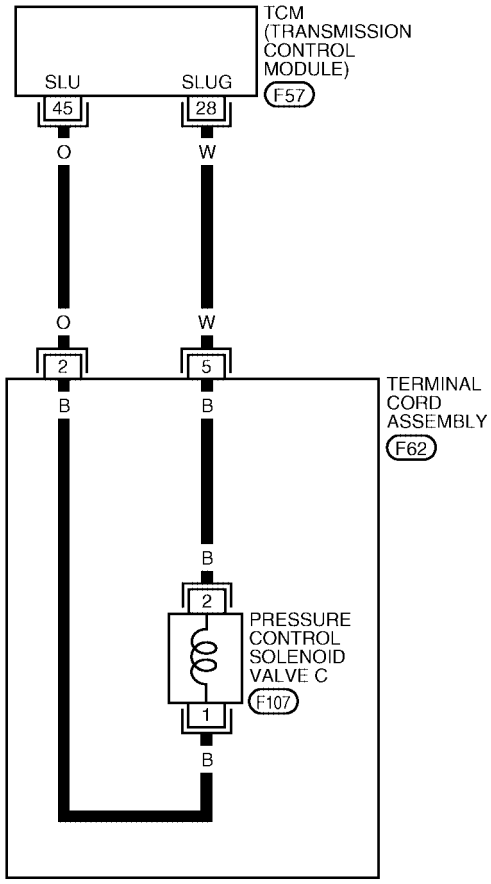
Follow the procedure “With CONSULT-II”.

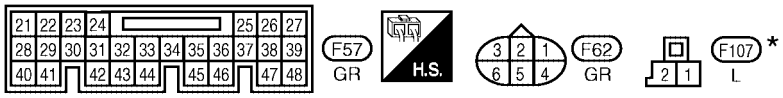
Wiring Diagram — AT — PC/CS

ECS00A67

AT-PC/CS-01

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





★: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

BCWA0291E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz

Diagnostic Procedure

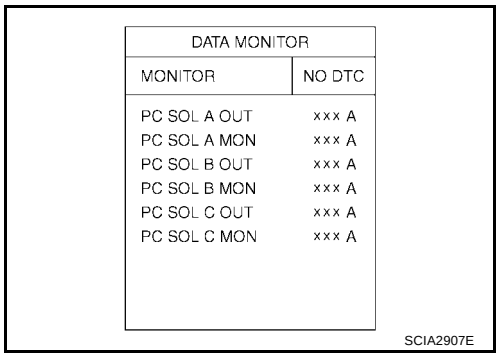
ECS00A68

1. CHECK PRESSURE CONTROL SOLENOID VALVE C SIGNAL

With CONSULT-II

1. After warming up the engine and transaxle, turn ignition switch “OFF”.
2. Turn ignition switch “ON”. (Do not start engine.)
3. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
4. Read out the value of “PC SOL C OUT” and “PC SOL C MON”.

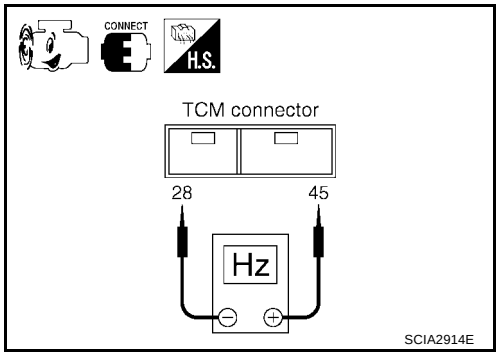
Monitor item	Condition	Display value (Approx.)
● PC SOL C OUT	Selector lever: Manual shift gate position	1.00 A
● PC SOL C MON	Other than the above.	0.20 A



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 28 and 45.

Connector	Terminal	Condition	Data (Approx.)
F57	45 - 28 (Ground)	When engine is running with idle speed and setting selector lever to “P” position.	300 Hz



OK or NG

OK >> GO TO 7.
NG >> GO TO 2.

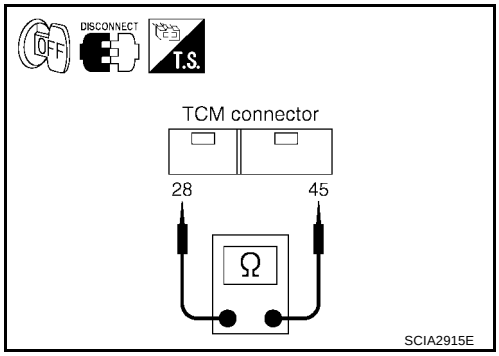
2. CHECK PRESSURE CONTROL SOLENOID VALVE C CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminals 28 and 45.

Connector	Terminal	Condition	Resistance (Approx.)
F57	45 - 28 (Ground)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω

OK or NG

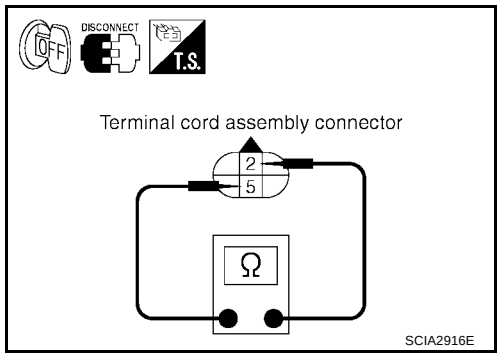
OK >> GO TO 7.
NG >> GO TO 3.



3. CHECK TERMINAL CORD ASSEMBLY WITH PRESSURE CONTROL SOLENOID VALVE C

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 2 and 5.

Connector	Terminal	Condition	Resistance (Approx.)
F62	2 - 5	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



OK or NG

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

4. CHECK HARNESS BETWEEN TCM AND TERMINAL CORD ASSEMBLY

Check the following.

- Open or short-circuit in the harness between TCM and terminal cord assembly.

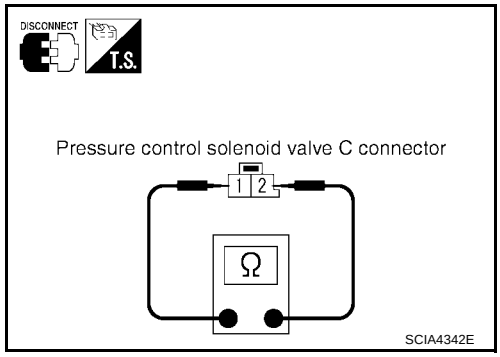
OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

5. CHECK PRESSURE CONTROL SOLENOID VALVE C

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect pressure control solenoid valve C harness connector.
3. Check resistance between terminals 1 and 2.

Connector	Terminal	Condition	Resistance (Approx.)
F107	1 - 2	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



OK or NG

OK >> GO TO 6.
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

6. CHECK HARNESS BETWEEN TERMINAL CORD ASSEMBLY AND PRESSURE CONTROL SOLENOID VALVE C

Check the following.

- Open or short-circuit in the harness between terminal cord assembly and pressure control solenoid valve C.

OK or NG

OK >> GO TO 7.
NG >> Repair or replace transmission wire. Refer to AT-245, "Terminal cord assembly" .

7. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-196, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .

Component Inspection

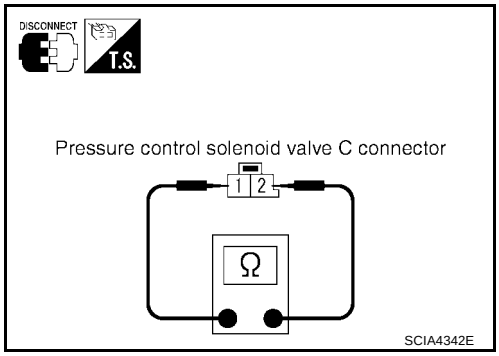
ECS00A69

PRESSURE CONTROL SOLENOID VALVE C

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect pressure control solenoid valve C harness connector.
3. Check resistance between terminals 1 and 2.

Connector	Terminal	Condition	Resistance (Approx.)
F107	1 - 2	Temperature: 20°C (68°F)	5.0 - 5.6 Ω

4. If NG, replace the control valve assembly. Refer to AT-244, "Control Valve Assembly" .



DTC P0826 MANUAL MODE SWITCH CIRCUIT

PFP:34901

Description

ECS00A6A

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 indicator. For inspection, refer to AT-206, "Position Indicator" .

CONSULT-II Reference Value in Data Monitor Mode

ECS00A6B

Monitor Item		Condition	Reference Value
MANU MODE SW	(ON/OFF)	Manual shift gate position (neutral)	ON
		Other than the above	OFF
NON M-MODE SW	(ON/OFF)	Manual shift gate position	OFF
		Other than the above	ON
UP SW	(ON/OFF)	Selector lever: + side	ON
		Other than the above	OFF
DOWN SW	(ON/OFF)	Selector lever: - side	ON
		Other than the above	OFF

On Board Diagnosis Logic

ECS00A6C

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “MANUAL MODE SWITCH” with CONSULT-II is detected when TCM monitors manual mode, non manual mode, up or down switch signals, and judges as irregular when impossible input pattern occurs.

Possible Cause

ECS00A6D

- Harness or connectors
  (These switches circuit is open or shorted.)
- Manual mode switch (built into A/T device)

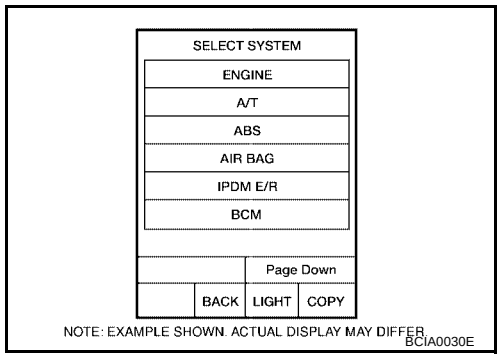
DTC Confirmation Procedure

ECS00A6E

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-II

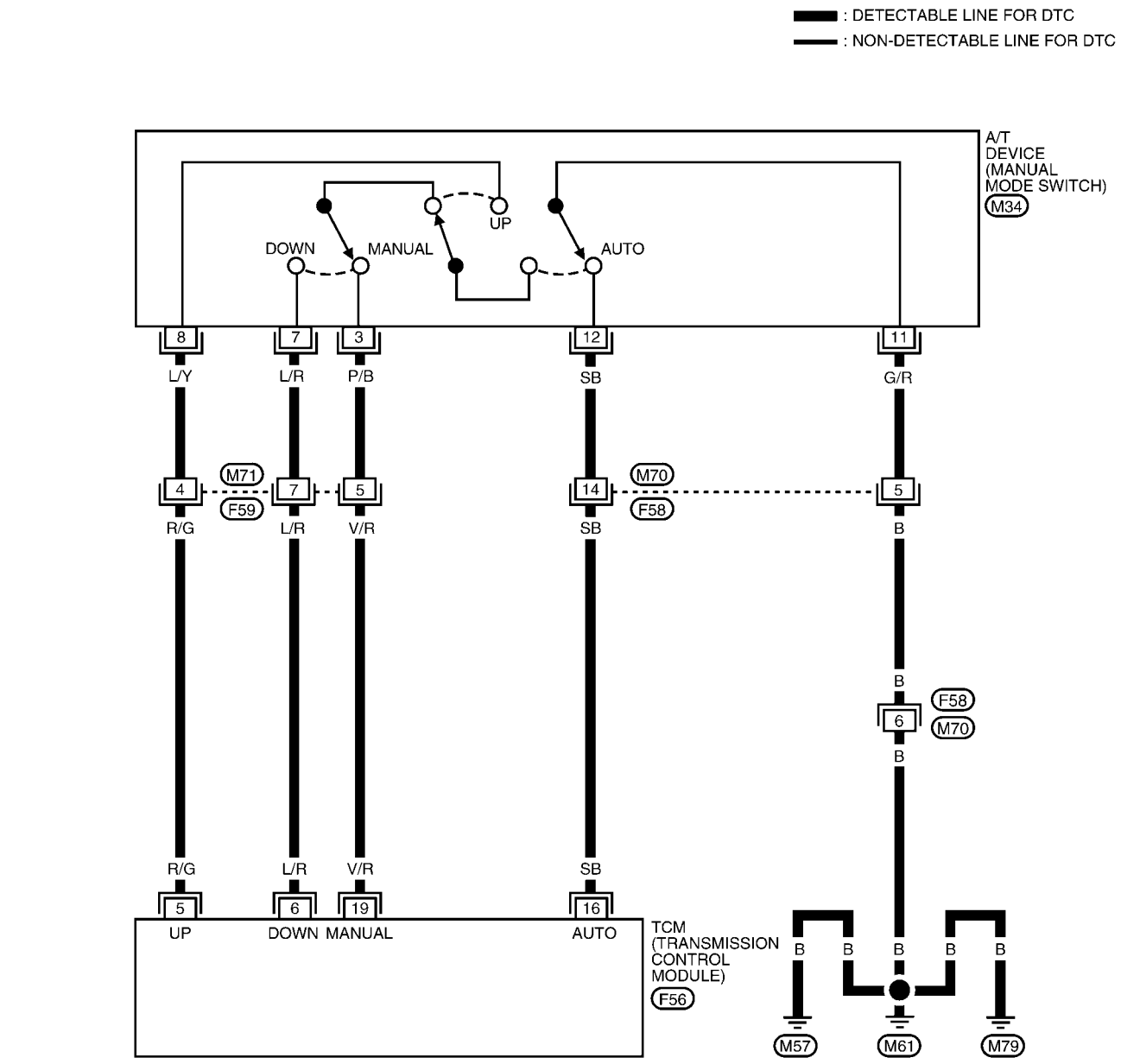
1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Move selector lever to “M” position (manual shift gate position).
4. Shift selector lever into “+ side” and “- side”.
5. Wait for at least 30 consecutive seconds.
6. If DTC is detected, go to AT-204, "Diagnostic Procedure" .

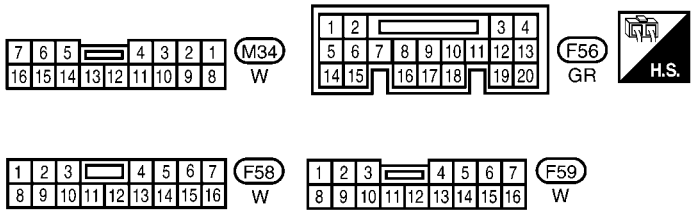


Wiring Diagram — AT — MMSW

ECS00A6F

AT-MMSW-01





BCWA0443E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
5	R/G	Manual mode switch UP (+)		Selector lever: + side	0V
				Other than the above	Battery voltage
6	L/R	Manual mode switch DOWN (-)		Selector lever: - side	0V
				Other than the above	Battery voltage
16	SB	Manual mode switch AUTO		Selector lever: “P”, “R”, “N” or “D” position	0V
				Selector lever: Manual shift gate position	Battery voltage
19	V/R	Manual mode switch MANUAL		Selector lever: Manual shift gate position (neutral)	0V
				Other than the above	Battery voltage

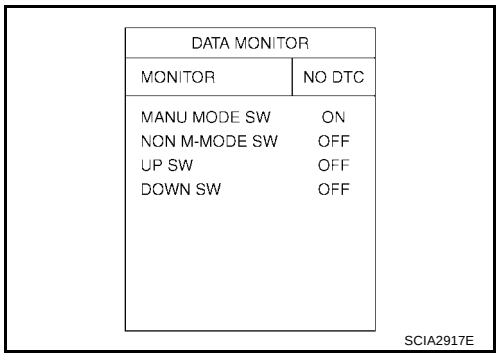
Diagnostic Procedure

ECS00A6G

1. CHECK MANUAL MODE SWITCH CIRCUIT

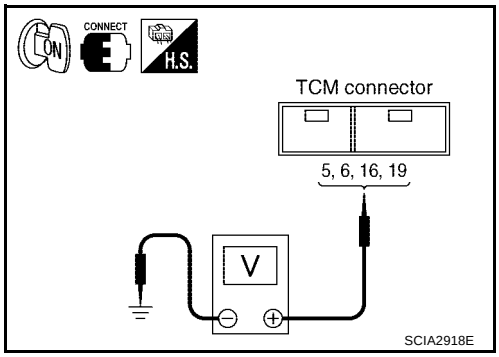
With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Read out ON/OFF switching action of the “MANU MODE SW”, “NON M-MODE SW”, “UP SW”, “DOWN SW”.



Without CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Check voltage between the TCM connector terminals and ground.



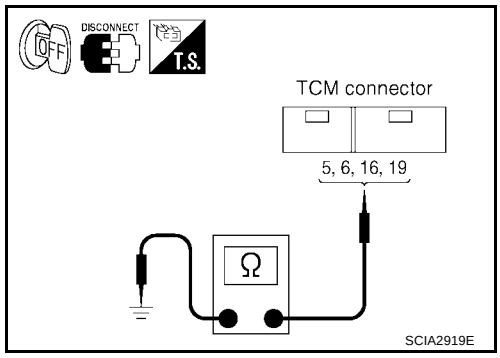
Connector No.	Terminal	Condition	Voltage (Approx.)
F56	5 - Ground	Selector lever: + side	0V
		Other than the above	Battery voltage
	6 - Ground	Selector lever: - side	0V
		Other than the above	Battery voltage
	16 - Ground	Selector lever: “P”, “R”, “N” or “D” position	0V
		Selector lever: Manual shift gate position	Battery voltage
	19 - Ground	Selector lever: Manual shift gate position (neutral)	0V
		Other than the above	Battery voltage

OK or NG

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

2. CHECK HARNESS BETWEEN TCM AND A/T DEVICE (MANUAL MODE SWITCH)

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check the continuity between TCM connector terminals 5, 6, 16, 19 and ground.



Connector No.	Terminal	Condition	Continuity
F56	5 - Ground	Selector lever: + side	Yes
		Other than the above	No
	6 - Ground	Selector lever: - side	Yes
		Other than the above	No
	16 - Ground	Selector lever: “P”, “R”, “N” or “D” position	Yes
		Selector lever: Manual shift gate position	No
	19 - Ground	Selector lever: Manual shift gate position (neutral)	Yes
		Other than the above	No

4. If OK, check harness for short-circuit to ground or power source.

OK or NG

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

3. DETECT MALFUNCTIONING ITEM

Check the following.

- Open or short-circuit in the harness between TCM and A/T device (manual mode switch).
- Open or short-circuit in the harness for ground of manual mode switch.
- Manual mode switch. Refer to AT-206, "Component Inspection" .

OK or NG

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

4. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-201, "DTC Confirmation Procedure" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

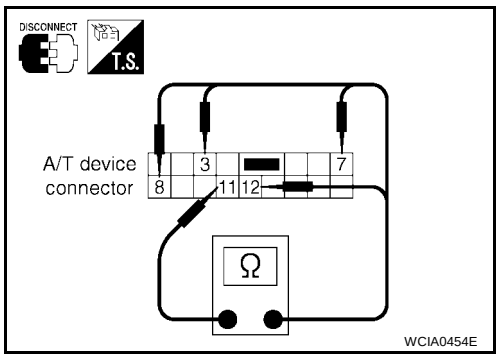
Component Inspection

ECS00A6H

MANUAL MODE SWITCH

Check continuity between terminals.

Item	Position	Connector	Terminal (Unit side)	Continuity
Manual mode (select) switch	Auto	M34	11 - 12	Yes
	Manual		3 - 11	
UP switch	UP		8 - 11	
DOWN switch	DOWN		7 - 11	



Position Indicator

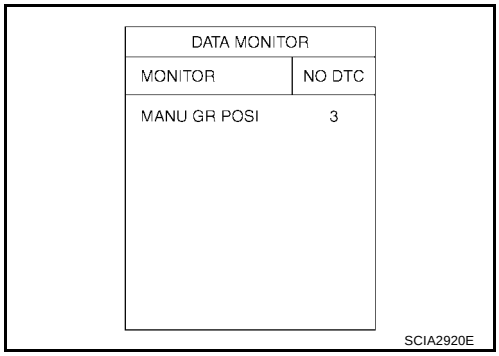
ECS00A6I

DIAGNOSTIC PROCEDURE

1. CHECK INPUT SIGNALS (WITH CONSULT-II)

With CONSULT-II

1. Start engine.
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II and read out the value of “MANU GR POSI”.
3. Drive vehicle in the manual mode, and make sure 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 >> GO TO 2.

2. CHECK DTC WITH TCM

Perform self-diagnosis of TCM. Refer to AT-78, "SELF-DIAG RESULT MODE" .

OK or NG

OK >> Check combination meter. Refer to DI-50, "A/T INDICATOR" .
NG >> Check the malfunctioning system.

DTC P0882 TCM POWER INPUT SIGNAL

PFP:31036

Description

ECS00A6J

When the power supply to the TCM is cut “OFF”, for example because the battery is removed, and the self-diagnostics memory function stops, malfunction is detected.

On Board Diagnosis Logic

ECS00A6K

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “TCM POWER INPT SIG” with CONSULT-II or P0882 without CONSULT-II is detected when voltage supplied to TCM is too low.

Possible Cause

ECS00A6L

- Harness or connectors
  (Battery or ignition switch and TCM circuit is open or shorted.)
- A/T PV IGN relay

DTC Confirmation Procedure

ECS00A6M

CAUTION:

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

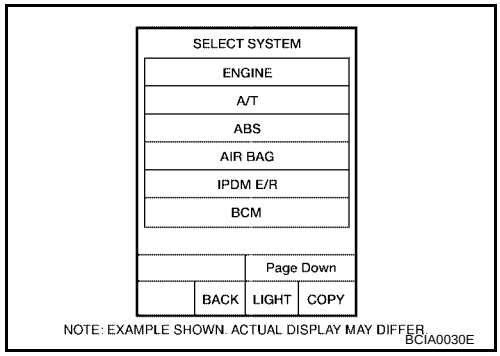
NOTE:

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.

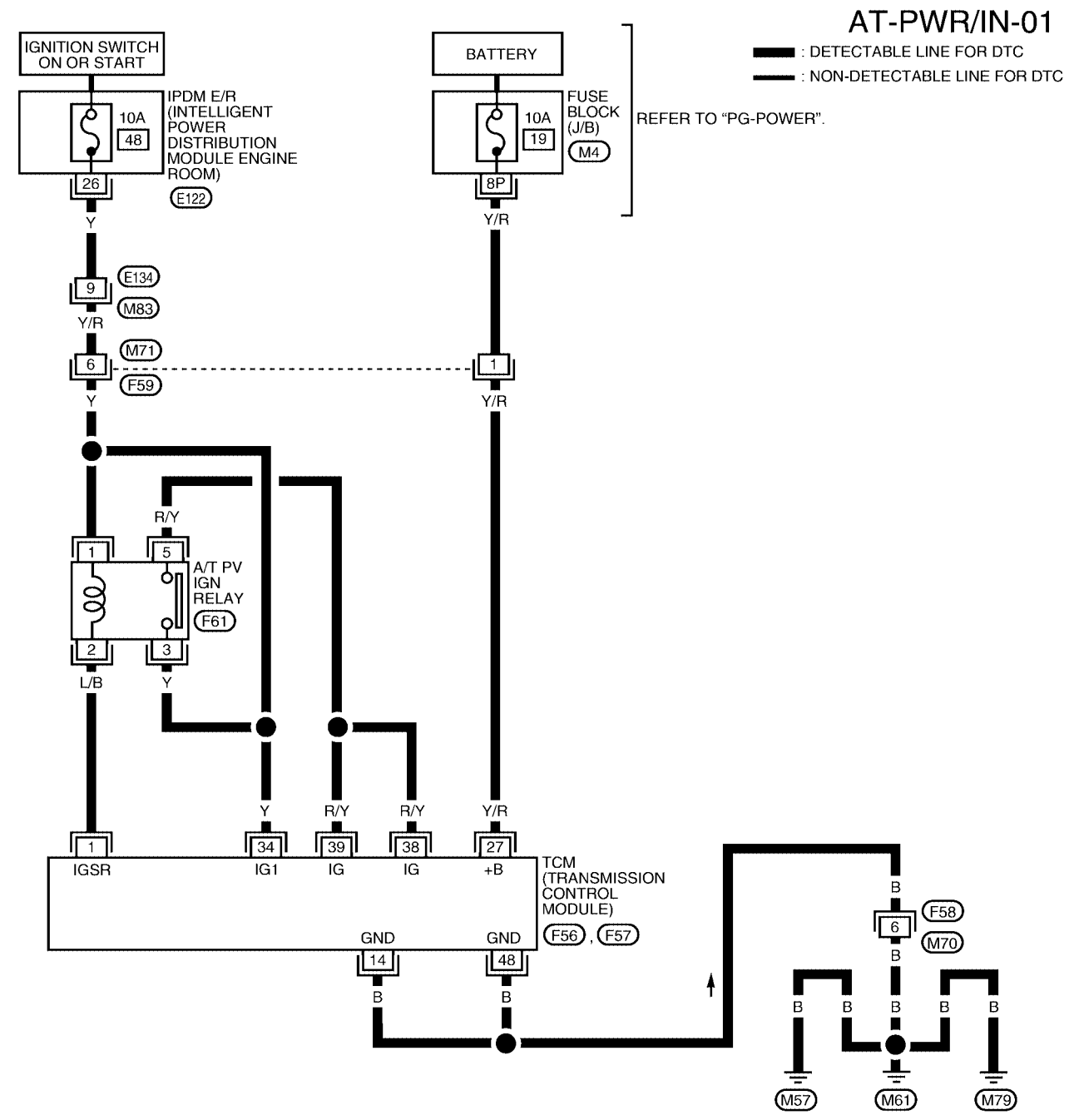
WITH CONSULT-II

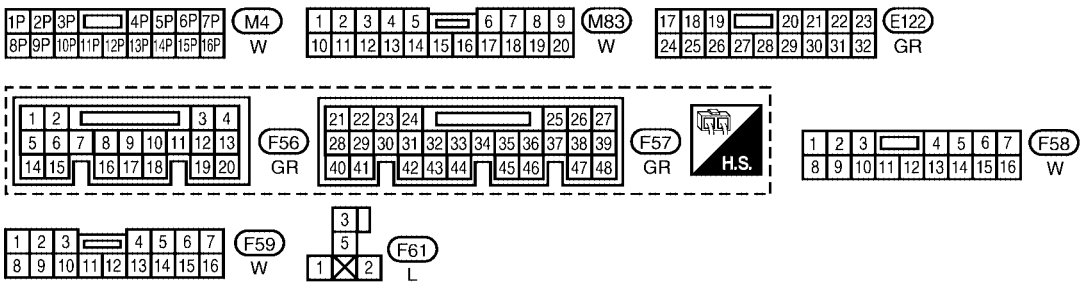
1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Depress accelerator pedal or drive vehicle and maintain the following condition for at least 20 consecutive seconds.
   TURBINE REV: More than 800 rpm
5. If DTC is detected, go to AT-210, "Diagnostic Procedure" .



Wiring Diagram — AT — PWR/IN

ECS00A6N





BCWA0466E

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

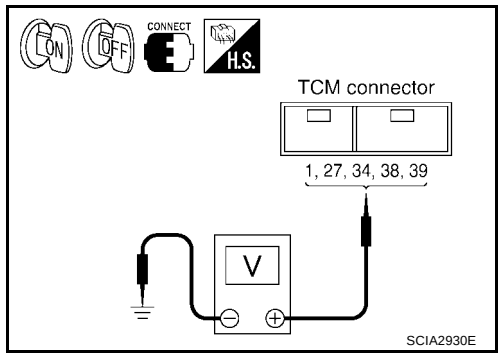
Terminal	Wire color	Item	Condition		Data (Approx.)
1	L/B	A/T PV IGN relay		When turning ignition switch ON.	0 - 1.5V
				When turning ignition switch OFF.	0V
14	B	Ground	Always		0V
27	Y/R	Power supply (Memory back-up)		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	Battery voltage
34	Y	Power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
38	R/Y	Power supply (A/T PV IGN relay)		When turning ignition switch ON.	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
39	R/Y	Power supply (A/T PV IGN relay)		When turning ignition switch ON.	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
48	B	Ground	Always		0V

Diagnostic Procedure

ECS00A6O

1. CHECK TCM POWER SOURCE CIRCUIT

1. Turn ignition switch “ON”. (Do not start engine.)
2. Check voltage between TCM terminals and ground.



Connector	Terminal	Voltage (Approx.)
F56	1 - Ground	0 - 1.5V
F57	27 - Ground	Battery voltage
	34 - Ground	
	38 - Ground	
	39 - Ground	

3. Turn ignition switch “OFF”.
4. Check voltage between TCM terminals and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
F56	1 - Ground	0V
F57	27 - Ground	Battery voltage
	34 - Ground	0V
	38 - Ground	0V
	39 - Ground	0V

OK or NG

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

2. DETECT MALFUNCTIONING ITEM

Check the following:

- Harness for short or open between battery and TCM terminal 27
- Harness for short or open between ignition switch and TCM terminals 1, 34, 38 and 39
- 10A fuse [No. 19, located in the fuse block (J/B) or No. 48, located in the IPDM E/R]
- Ignition switch. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT"
- A/T PV IGN relay. Refer to AT-211, "Component Inspection"

OK or NG

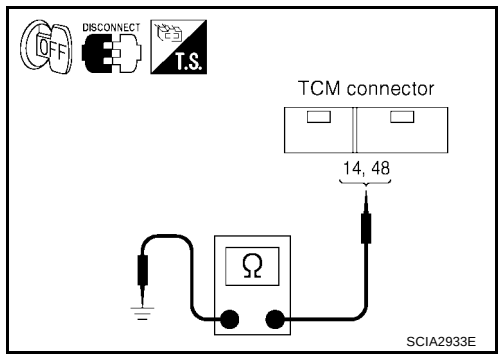
OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect TCM harness connector.
3. Check continuity between TCM terminals 14, 48 and ground.

Continuity should exist.

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



OK or NG

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK DTC

Check again. Refer to AT-207, "DTC Confirmation Procedure" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

Component Inspection

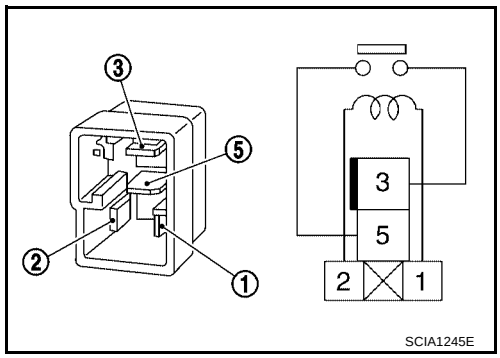
ECS00A6P

A/T PV IGN RELAY

1. Apply 12V direct current between A/T PV IGN relay terminals 1 and 2.
2. Check continuity between relay terminals 3 and 5.

Condition	Continuity
12V direct current supply between terminals 1 and 2	Yes
OFF	No

3. If NG, replace A/T PV IGN relay.



DTC P1726 ELECTRIC THROTTLE CONTROL SYSTEM

PFP:23710

Description

ECS00A6Q

This DTC is displayed with other DTCs regarding ECM. Perform the trouble diagnosis for other DTCs displayed. Refer to AT-47, "TROUBLE DIAGNOSIS" .
When this DTC is detected, lock-up operation and learning control are canceled.

TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

A/T CHECK Indicator Lamp does not come on

ECS00A6R

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 the self-diagnosis. Is a malfunction in the CAN communication indicated in the results?

YES or NO

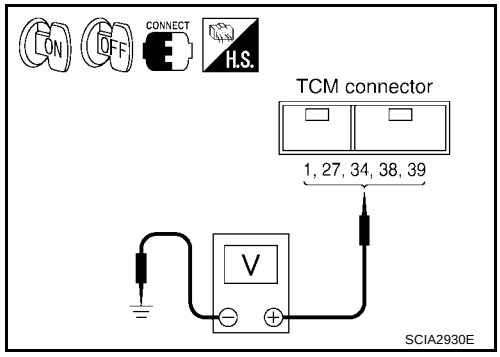
YES >> Check the CAN communication line. Refer to AT-86, "DTC U1000 CAN COMMUNICATION LINE" .

NO >> GO TO 2.

2. CHECK TCM POWER SOURCE CIRCUIT

1. Turn ignition switch "ON". (Do not start engine.)
2. Check voltage between TCM connector terminals and ground. Refer to AT-208, "Wiring Diagram — AT — PWR/IN" .

Connector	Terminal	Voltage (Approx.)
F56	1 - Ground	0 - 1.5V
F57	27 - Ground	Battery voltage
	34 - Ground	
	38 - Ground	
	39 - Ground	



3. Turn ignition switch "OFF".
4. Check voltage between TCM connector terminals and ground. Refer to AT-208, "Wiring Diagram — AT — PWR/IN" .

Connector	Terminal	Voltage (Approx.)
F56	1 - Ground	0V
F57	27 - Ground	Battery voltage
	34 - Ground	0V
	38 - Ground	0V
	39 - Ground	0V

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following:

- Harness for short or open between battery and TCM terminal 27
- Harness for short or open between ignition switch and TCM terminals 1, 34, 38 and 39
- 10A fuse [No. 19, located in the fuse block (J/B) or No. 48, located in the IPDM E/R]
- Ignition switch. Refer to PG-4, "POWER SUPPLY ROUTING CIRCUIT" .
- A/T PV IGN relay. Refer to AT-211, "Component Inspection" .

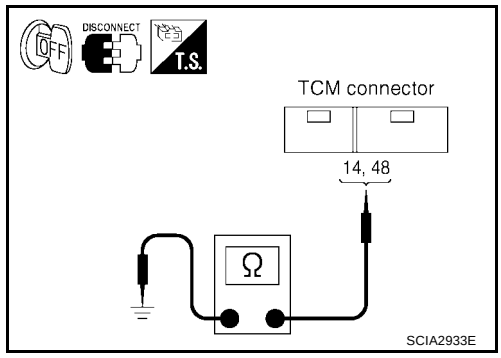
OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

4. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM harness connector.
3. Check continuity between TCM terminals 14, 48 and ground. Refer to AT-208, "Wiring Diagram — AT — PWR/IN" .
4. If OK, check harness for short-circuit to ground or the power source.



OK or NG

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

5. CHECK A/T CHECK INDICATOR LAMP CIRCUIT

1. Turn ignition switch “OFF”.
2. Check the combination meter. Refer to DI-5, "COMBINATION METERS" .

OK or NG

OK >> GO TO 6.
NG >> Replace the combination meter. Refer to DI-28, "Combination Meter" .

6. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 7.

7. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

Engine Cannot Be Started In “P” or “N” Position

ECS00A6S

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 STARTING SYSTEM

Check starting system. Refer to SC-8, "STARTING SYSTEM" .

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK CONTROL CABLE

Check the control cable.

- Refer to AT-244, "Control Cable Adjustment" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control cable. Refer to AT-244, "Control Cable Adjustment" .

3. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis.

Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-93, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
NO >> **INSPECTION END**

In “P” Position, Vehicle Moves When Pushed

ECS00A6T

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 PNP SWITCH CIRCUIT

Perform self-diagnosis.

Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-93, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
NO >> GO TO 2.

2. CHECK CONTROL CABLE

Check the control cable.

- Refer to AT-244, "Control Cable Adjustment" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control cable. Refer to AT-244, "Control Cable Adjustment" .

3. SYMPTOM CHECK

Check again.

OK or NG

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

In “N” Position, Vehicle Moves

ECS00A6U

SYMPTOM:

Vehicle moves forward or backward when selecting “N” position.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis.

Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-93, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
NO >> GO TO 3.

3. CHECK CONTROL CABLE

Check the control cable.

- Refer to AT-244, "Control Cable Adjustment" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control cable. Refer to AT-244, "Control Cable Adjustment" .

4. CHECK SYMPTOM

Check again.

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

Large Shock (“N” to “D” Position)

ECS00A6V

SYMPTOM:

A noticeable shock occurs when the selector lever is shifted from the “N” to “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- Accumulator. Refer to AT-256, "DISASSEMBLY" .
- Forward and direct clutch assembly. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

5. CHECK SYMPTOM

Check again.

OK or NG

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

Vehicle Does Not Creep Backward In “R” Position

ECS00A6W

SYMPTOM:

The vehicle does not creep in the “R” position. Or an extreme lack of acceleration is observed.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK CONTROL CABLE AND PNP SWITCH POSITION

Check the control cable and PNP switch position.

- Refer to AT-244, "Control Cable Adjustment" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control cable and PNP switch position. Refer to AT-244, "Control Cable Adjustment" or AT-241, "Park/Neutral Position (PNP) Switch Adjustment" .

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- Forward and direct clutch assembly. Refer to AT-256, "DISASSEMBLY" .
- 1st and reverse brake. Refer to AT-256, "DISASSEMBLY" .
- B5 brake. Refer to AT-283, "Transaxle Case Cover & B5 Brake" .
- Torque convertor. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

Vehicle Does Not Creep Forward In “D” Position

ECS00A6X

SYMPTOM:

Vehicle does not creep forward when selecting “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK CONTROL CABLE AND PNP SWITCH POSITION

Check the control cable and PNP switch position.

- Refer to AT-244, "Control Cable Adjustment" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control cable and PNP switch position. Refer to AT-244, "Control Cable Adjustment" or AT-241, "Park/Neutral Position (PNP) Switch Adjustment" .

3. CHECK PRESSURE CONTROL SOLENOID VALVE A CIRCUIT

Perform self-diagnosis.

Do the self-diagnostic results indicate pressure control solenoid valve A?

YES >> Check the malfunctioning system. Refer to AT-147, "DTC P0745 PRESSURE CONTROL SOLENOID VALVE A (LINE PRESSURE)" .
NO >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- Forward and direct clutch assembly. Refer to AT-256, "DISASSEMBLY" .
- One-way clutch No.2. Refer to AT-256, "DISASSEMBLY" .
- B5 brake. Refer to AT-283, "Transaxle Case Cover & B5 Brake" .
- Torque convertor. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

Vehicle Cannot Be Started From D1

ECS00A6Y

SYMPTOM:

Vehicle cannot be started from D1 on cruise test - Part 1.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps in “R” position.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-218, "Vehicle Does Not Creep Backward In “R” Position" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. CHECK LINE PRESSURE

Check the line pressure at the engine stall point. Refer to AT-59, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 4.
NG >> Check the malfunctioning item. Refer to AT-60, "Judgement of line pressure test" .

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- Forward and direct clutch assembly. Refer to AT-256, "DISASSEMBLY" .
- One-way clutch No.2. Refer to AT-256, "DISASSEMBLY" .
- B5 brake. Refer to AT-283, "Transaxle Case Cover & B5 Brake" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

A/T Does Not Shift: D1 → D2

ECS00A6Z

SYMPTOM:

The vehicle does not shift-up from the D1 to D2 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-219, "Vehicle Does Not Creep Forward In “D” Position" , AT-220, "Vehicle Cannot Be Started From D_1" .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- One-way clutch No.1. Refer to AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- One-way clutch No.2. Refer to AT-256, "DISASSEMBLY" .
- 2nd coast brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" , AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- 2nd brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

A/T Does Not Shift: $D_2 \rightarrow D_3$

ECS00A70

SYMPTOM:

The vehicle does not shift-up from D_2 to D_3 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-219, "Vehicle Does Not Creep Forward In “D” Position" ,AT-220, "Vehicle Cannot Be Started From D_1" .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- U/D brake. Refer to AT-256, "DISASSEMBLY" .
- B5 brake. Refer to AT-283, "Transaxle Case Cover & B5 Brake" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

A/T Does Not Shift: $D_3 \rightarrow D_4$

ECS00A71

SYMPTOM:

- **The vehicle does not shift-up from the D_3 to D_4 gear at the specified speed.**

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-219, "Vehicle Does Not Creep Forward In “D” Position" , AT-220, "Vehicle Cannot Be Started From D_1" .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- U/D brake. Refer to AT-256, "DISASSEMBLY" .
- U/D clutch. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

A/T Does Not Shift: $D_4 \rightarrow D_5$

ECS00A72

SYMPTOM:

- **The vehicle does not shift-up from the D_4 to D_5 gear at the specified speed.**

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-219, "Vehicle Does Not Creep Forward In “D” Position" ,AT-220, "Vehicle Cannot Be Started From D_1" .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- Forward and direct clutch assembly. Refer to AT-256, "DISASSEMBLY" .
- 2nd coast brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" , AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- One-way clutch No.1. Refer to AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

A/T Does Not Perform Lock-up

ECS00A73

SYMPTOM:

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

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK STOP LAMP SWITCH CIRCUIT

Check the stop lamp switch circuit. Refer to BRC-10, "TROUBLE DIAGNOSIS" (with TCS/ABS) or BRC-54, "TROUBLE DIAGNOSIS" (with VDC/TCS/ABS).

OK or NG

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

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

– Torque converter. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

A/T Does Not Hold Lock-up Condition

ECS00A74

SYMPTOM:

The lock-up condition cannot be maintained for more than 30 seconds.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK STOP LAMP SWITCH CIRCUIT

Check the stop lamp switch circuit. Refer to BRC-10, "TROUBLE DIAGNOSIS" (with TCS/ABS) or BRC-54, "TROUBLE DIAGNOSIS" (with VDC/TCS/ABS).

OK or NG

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

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

– Torque converter. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

Lock-up Is Not Released

ECS00A75

SYMPTOM:

The lock-up condition cannot be cancelled even after releasing the accelerator pedal.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK STOP LAMP SWITCH CIRCUIT

Check the stop lamp switch circuit. Refer to BRC-10, "TROUBLE DIAGNOSIS" (with TCS/ABS) or BRC-54, "TROUBLE DIAGNOSIS" (with VDC/TCS/ABS).

OK or NG

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

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

– Torque converter. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

Cannot Be Changed to Manual Mode

ECS00A76

SYMPTOM:

Does not change to manual mode when manual shift gate is used.

DIAGNOSTIC PROCEDURE

1. CHECK MANUAL MODE SWITCH CIRCUIT

Check the manual mode switch circuit. Refer to AT-201, "DTC P0826 MANUAL MODE SWITCH CIRCUIT" .

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> **INSPECTION END**

A/T Does Not Shift: 5th gear → 4th gear

ECS00A77

SYMPTOM:

When shifted from 5M to 4M position in manual mode, does not downshift from 5th to 4th gear.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- Forward and direct clutch assembly. Refer to AT-256, "DISASSEMBLY" .
- 2nd coast brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" , AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- One-way clutch No.1. Refer to AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

5. CHECK SYMPTOM

Check again.

OK or NG

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

A/T Does Not Shift: 4th gear → 3rd gear

ECS00A78

SYMPTOM:

When shifted from 4M to 3M position in manual mode, does not downshift from 4th to 3rd gear.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- U/D clutch. Refer to AT-256, "DISASSEMBLY" .
- U/D brake. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

5. CHECK SYMPTOM

Check again.

OK or NG

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

A/T Does Not Shift: 3rd gear → 2nd gear

ECS00A79

SYMPTOM:

When shifted from 3M to 2M position in manual mode, does not downshift from 3rd to 2nd gear.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- U/D brake. Refer to AT-256, "DISASSEMBLY" .
- B5 brake. Refer to AT-283, "Transaxle Case Cover & B5 Brake" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

5. CHECK SYMPTOM

Check again.

OK or NG

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

A/T Does Not Shift: 2nd gear → 1st gear

ECS00A7A

SYMPTOM:

When shifted from 2M to 1M position in manual mode, does not downshift from 2nd to 1st gear.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- 2nd coast brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" , AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- 2nd brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" .
- One-way clutch No.1. Refer to AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- One-way clutch No.2. Refer to AT-256, "DISASSEMBLY" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

5. CHECK SYMPTOM

Check again.

OK or NG

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

Vehicle Does Not Decelerate By Engine Brake

ECS00A7B

SYMPTOM:

No engine brake is applied when the gear is shifted from the 2nd to 1st gear.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to AT-57, "A/T FLUID CHECK" .

OK or NG

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

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Do the self-diagnostic results indicate shift solenoid valve E, electric throttle control system?

YES >> Check the malfunctioning system. Refer to AT-177, "DTC P0770 SHIFT SOLENOID VALVE E" , AT-212, "DTC P1726 ELECTRIC THROTTLE CONTROL SYSTEM" .
NO >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to AT-244, "Control Valve Assembly" .
2. Disassemble A/T. Refer to AT-256, "DISASSEMBLY" .
3. Check the following items:

- 2nd coast brake. Refer to AT-275, "Oil Pump, 2nd Coast Brake & 2nd Brake" , AT-281, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1" .
- U/D brake. Refer to AT-256, "DISASSEMBLY" .
- B5 brake. Refer to AT-283, "Transaxle Case Cover & B5 Brake" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

5. CHECK SYMPTOM

Check again.

OK or NG

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

TCM Self-diagnosis Does Not Activate

ECS00A7C

SYMPTOM:
A/T CHECK indicator lamp does not come on in TCM self-diagnostic procedure even if the lamp circuit is good.

DESCRIPTION

- **Park/neutral position (PNP) switch**
  The park/neutral (PNP) switch assembly includes a transmission range switch. The transmission range switch detects the selector lever position and sends a signal to the TCM.
- **Stop lamp switch signal**
  Detects the brake pedal state (stop lamp switch is ON or OFF) and sends a signal via CAN communication line to the TCM.
- **Closed throttle position signal**
  ECM judges throttle opening based on a signal from accelerator pedal position sensor, and sends the signal via CAN communication line to TCM.

DIAGNOSTIC PROCEDURE

1. CHECK PARK/ NEUTRAL POSITION (PNP) SWITCH CIRCUIT

Check the park/neutral position (PNP) switch circuit. Refer to AT-93, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

OK or NG

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK STOP LAMP SWITCH CIRCUIT

Perform self-diagnosis for ABS actuator and electric unit (control unit). Refer to BRC-10, "TROUBLE DIAGNOSIS" (with TCS/ABS) or BRC-54, "TROUBLE DIAGNOSIS" (with VDC/TCS/ABS).

OK or NG

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

3. CHECK CLOSED THROTTLE POSITION SIGNAL CIRCUIT

Perform self-diagnosis for ECM. Refer to EC-49, "Emission-related Diagnostic Information" .

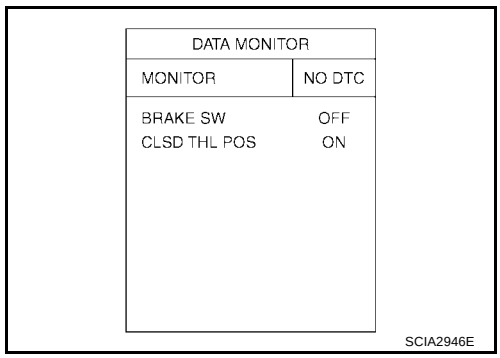
OK or NG

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

4. CHECK DATA MONITOR (WITH CONSULT-II)

With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “A/T” with “DATA MONITOR” mode in CONSULT-II.
3. Depress or release accelerator pedal and read out ON/OFF signaling action of the “CLSD THL POS”.
4. Depress or release brake pedal and read out ON/OFF signaling action of the “BRAKE SW”.



OK or NG

OK >> GO TO 7.
NG >> GO TO 5.

5. CHECK TCM

1. Check TCM input/output signal. Refer to AT-74, "TCM Input/Output Signal Reference Values" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

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

6. CHECK CAN COMMUNICATION LINE

Check the CAN communication line. Refer to AT-86, "DTC U1000 CAN COMMUNICATION LINE" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the TCM.

A/T SHIFT LOCK SYSTEM

PFP:34950

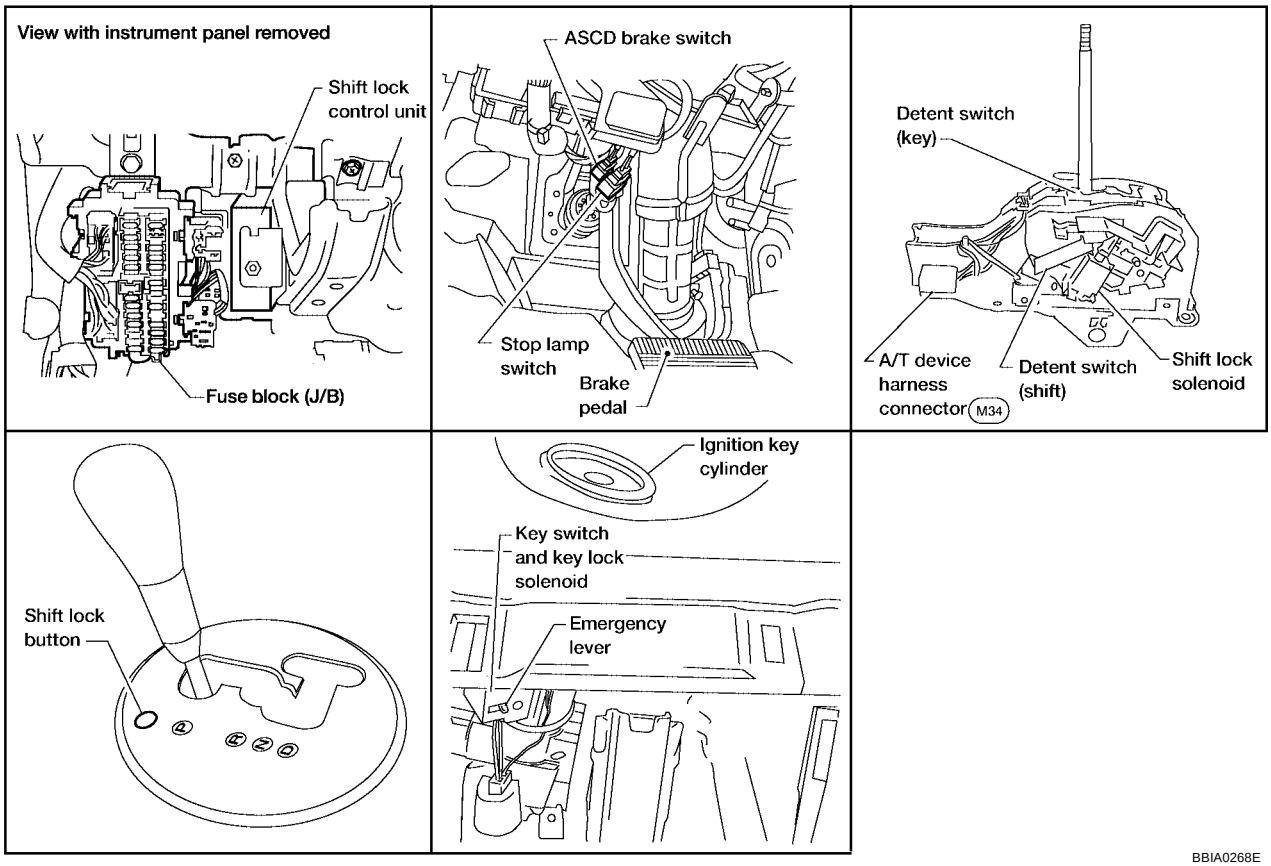
Description

ECS00A7F

- The electrical key interlock mechanism also operates as a shift lock:
  With the key switch turned to ON, the selector lever cannot be shifted from “P” (parking) to any other position unless the brake pedal is depressed.
  With the key removed, the selector lever cannot be shifted from “P” to any other position.
  The key cannot be removed unless the selector lever is placed in “P”.
- The shift lock and key interlock mechanisms are controlled by the ON-OFF operation of the shift lock solenoid and by the operation of the rotator and slider located inside the key cylinder.

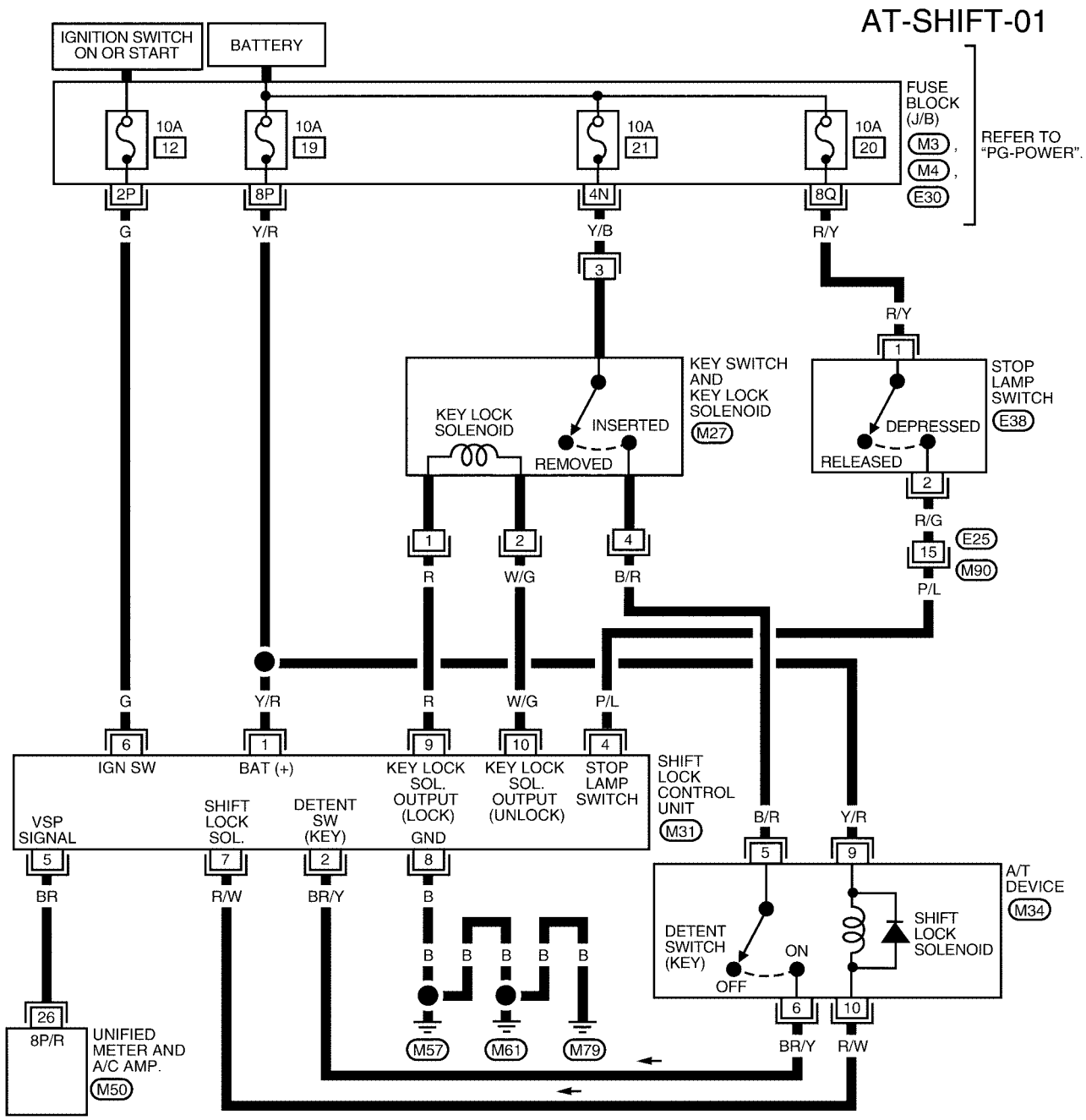
Shift Lock System Electrical Parts Location

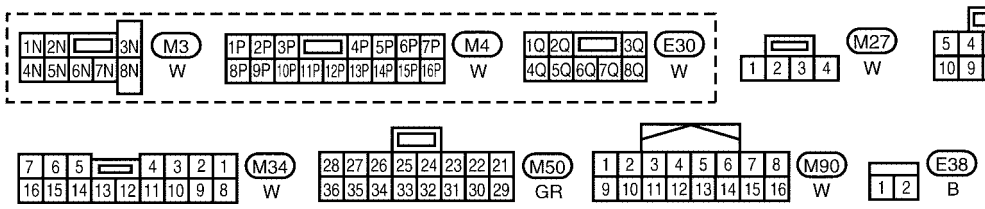
ECS00A7G



Wiring Diagram — AT — SHIFT

ECS00A7H



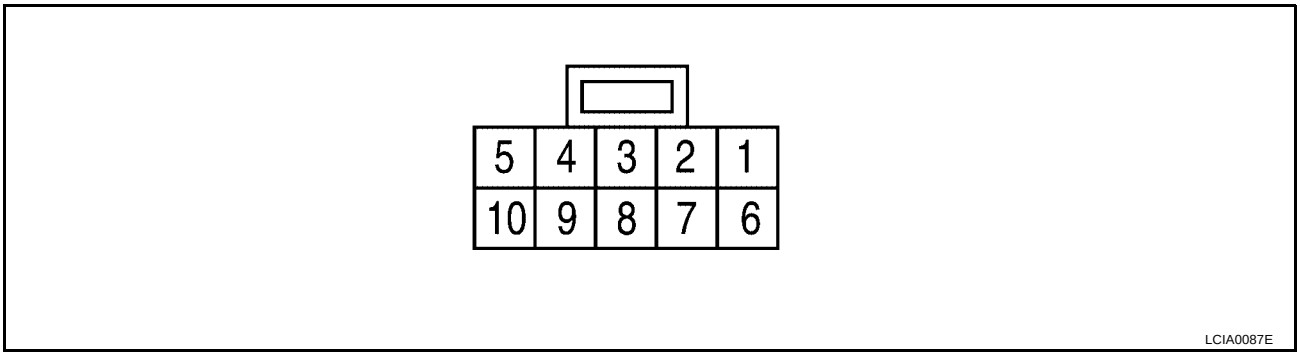


BCWA0519E

Shift Lock Control Unit Reference Values

ECS00A7I

SHIFT LOCK HARNESS CONNECTOR TERMINAL LAYOUT



SHIFT LOCK CONTROL UNIT INSPECTION TABLE

Data are reference values.

Terminal No. (Wire color)		Item	Condition	Judgement standard
(+)	(-)			
1 (Y/R)	8 (B)	Power source	Always	Battery voltage
2 (BR/Y)	8 (B)	Detent switch (key)	The position when the key is inserted and the selector lever is set to a position other than the “P” position, or when it is shifted from the “R” to the “P” position	Battery voltage
			Except the above	Approx. 0V
4 (P/L)	8 (B)	Stop lamp switch	When brake pedal is depressed	Battery voltage
			When brake pedal is released	Approx. 0V
5 (BR)	8 (B)	Vehicle speed signal	—	—
6 (G)	8 (B)	Ignition signal	Ignition switch: “ON”	Battery voltage
			Ignition switch: “OFF”	Approx. 0V
7 (R/W)	8 (B)	Shift lock solenoid	When the brake pedal is depressed	Battery voltage
			Ignition switch: “ON” and vehicle speed is less than 8 km/h (5 MPH)	Approx. 0V
8 (B)	–	Ground	Always	Approx. 0V
9 (R)	8 (B)	Key lock signal	When the selector lever is set to a position other than the “P” position	Battery voltage for approx. 0.1 sec. (Note)
			Except the above	Approx. 0V
10 (W/G)	8 (B)	Key unlock signal	When the selector lever is set to the“ P” position	Battery voltage for approx. 0.1 sec. (Note)
			Except the above	Approx. 0V

NOTE:

Make sure that the pointer swings only momentarily because the output time is so short. If the inspection is done with an oscilloscope, it should be observed that the power source voltage lasts for 3.5 to 10 ms.

Component Inspection

ECS00A7J

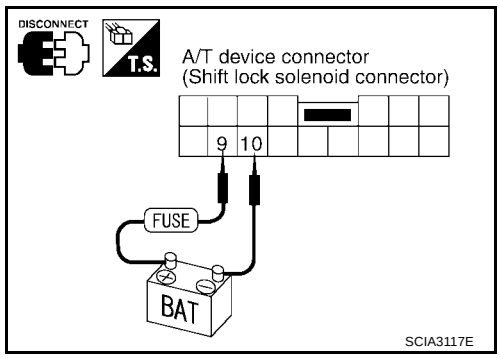
SHIFT LOCK SOLENOID

- Check operation by applying battery voltage to A/T device connector.

CAUTION:

Be sure to apply the voltage of the correct polarity to the respective terminals. Otherwise, the part may be damaged.

Connector	Terminal
M34	9 (Battery voltage) - 10 (Ground)

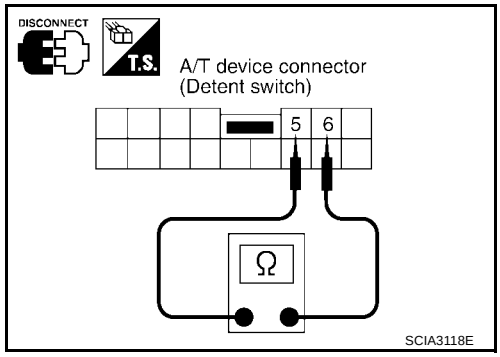


DETENT SWITCH

For Key:

- Check continuity between terminals of the A/T device connector.

Condition	Terminal	Continuity
The position when the selector lever is set to a position other than the “P” position, or when it is shifted from the “R” to the “P” position	5 - 6	Yes
Except the above		No



KEY LOCK SOLENOID

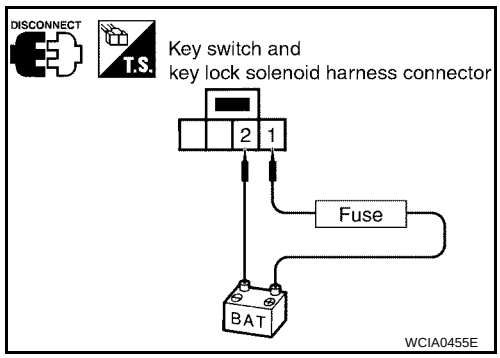
Key Lock

- Check operation by applying battery voltage to key switch and key lock solenoid connector.

CAUTION:

Be careful not to cause burnout of the harness.

Terminal
1 (Battery voltage) - 2 (Ground)



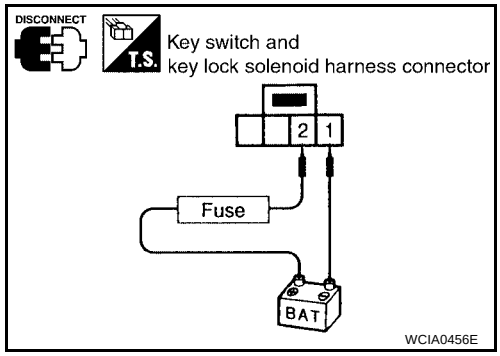
Key Unlock

- Check operation by applying battery voltage to key switch and key lock solenoid connector.

CAUTION:

Be careful not to cause burnout of the harness.

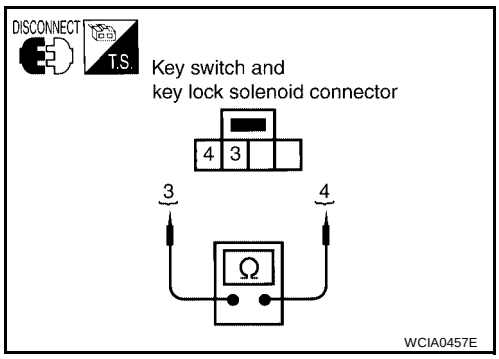
Terminal
2 (Battery voltage) - 1 (Ground)



KEY SWITCH

- Check continuity between terminals of the key switch and key lock solenoid connector.

Condition	Terminal	Continuity
Key inserted	3 - 4	Yes
Key removed		No

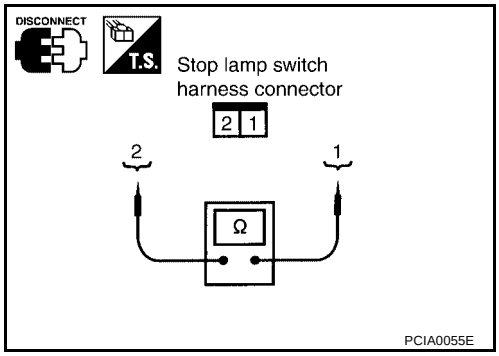


STOP LAMP SWITCH

- Check continuity between terminals of the stop lamp switch connector.

Condition	Terminal	Continuity
When brake pedal is depressed	1 - 2	Yes
When brake pedal is released		No

Check stop lamp switch after adjusting brake pedal. Refer to BR-6, "Inspection and Adjustment" .

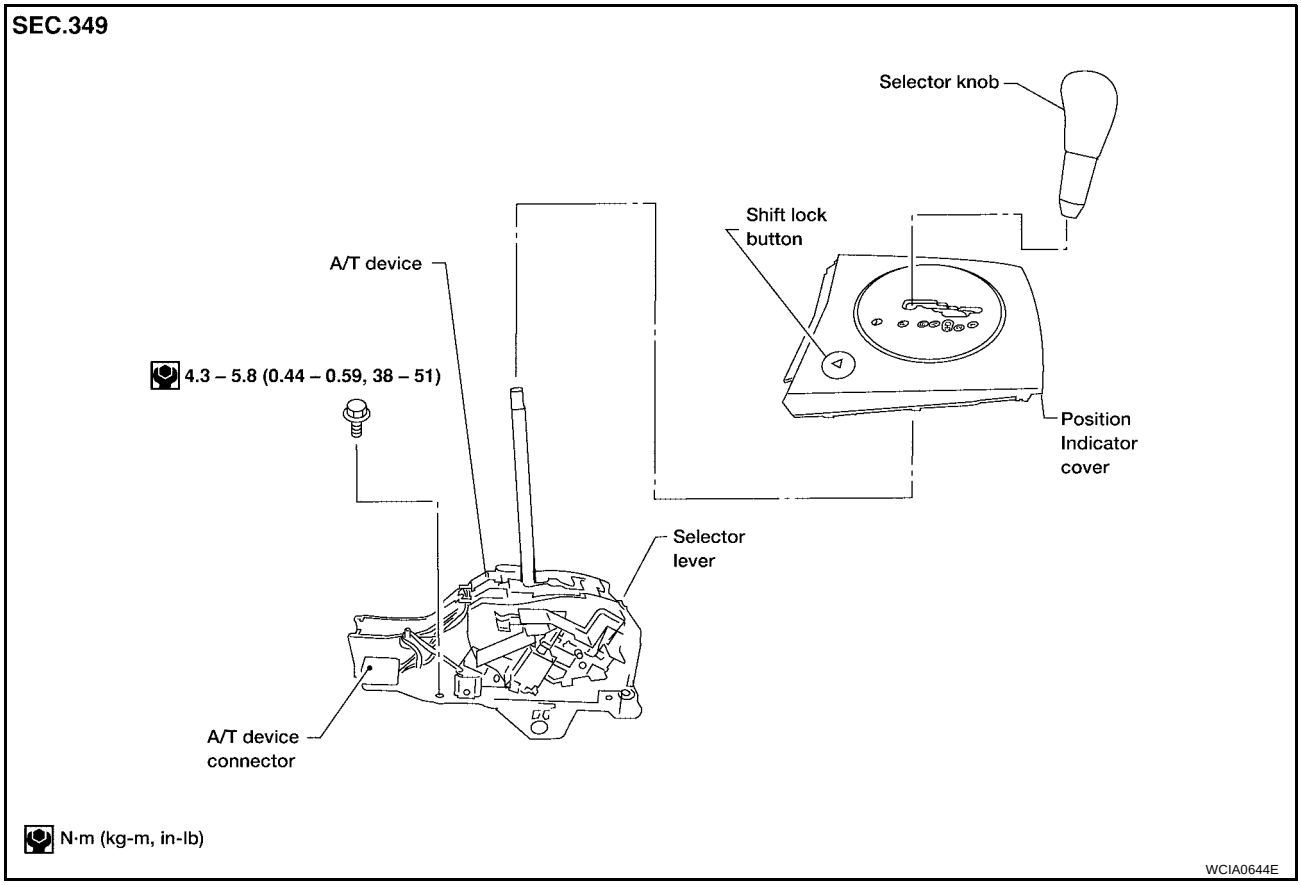


SHIFT CONTROL SYSTEM

PFP:34901

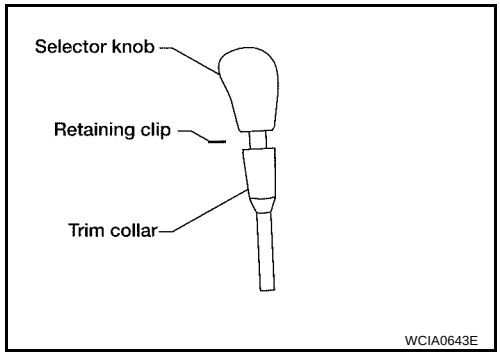
Control Device

ECS00A7D



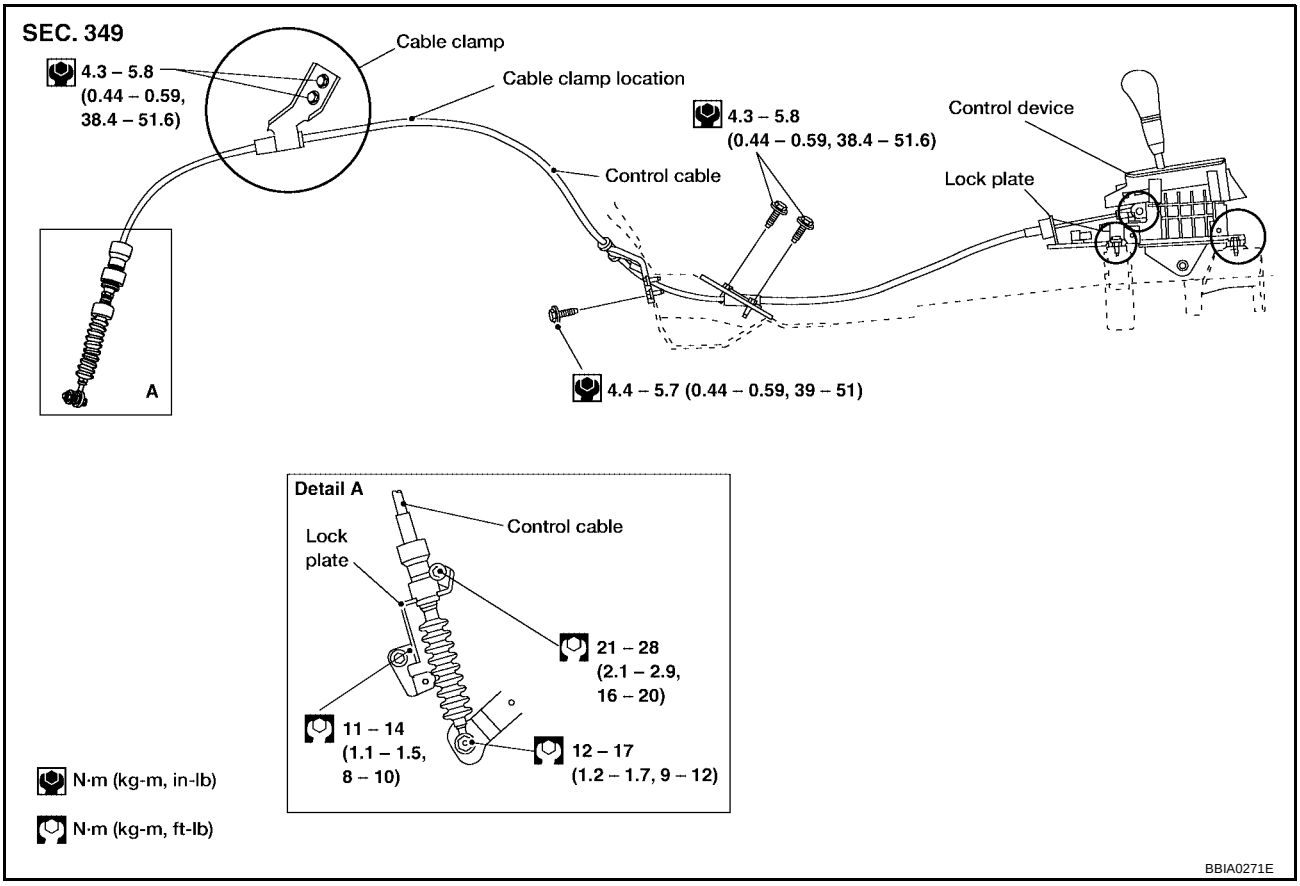
REMOVAL AND INSTALLATION

1. Pull trim collar down.
2. Remove retaining clip.
3. Lift selector knob off shaft.



Control Cable

ECS00A7E



ON-VEHICLE SERVICE

PFP:00000

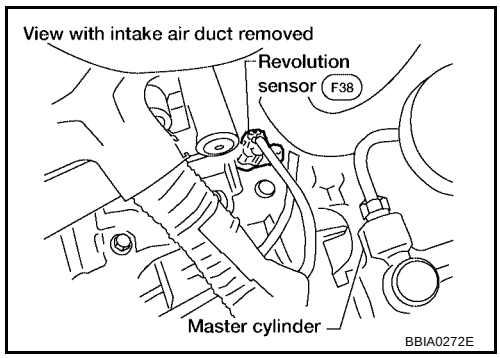
Revolution Sensor Replacement

ECS00BTV

1. Remove intake air duct. Refer to EM-14, "Removal and Installation" .
2. Disconnect electrical connector.
3. Remove bolt and revolution sensor from A/T.

   CAUTION:
   Do not damage the revolution sensor or transaxle case.
4. Installation is in the reverse order of removal.
   - Tighten the revolution sensor bolt to the specified torque. Refer to AT-249, "OVERHAUL" .

   CAUTION:
   - **Do not reuse seal bolt.**
   - **Apply clean ATF to the revolution sensor O-ring before installation.**



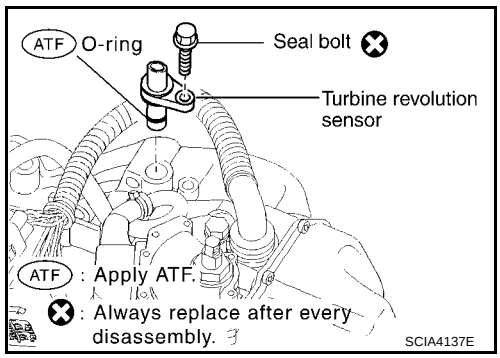
Turbine Revolution Sensor Replacement

ECS00BTW

1. Remove battery and bracket. Refer to SC-7, "REMOVAL" .
2. Disconnect electrical connector.
3. Remove bolt and turbine revolution sensor from A/T.

   CAUTION:
   Do not damage the turbine revolution sensor or transaxle case.
4. Installation is in the reverse order of removal.
   - Tighten the turbine revolution sensor bolt to the specified torque. Refer to AT-249, "OVERHAUL" .

   CAUTION:
   - **Do not reuse seal bolt.**
   - **Apply clean ATF to the turbine revolution sensor O-ring before installation.**

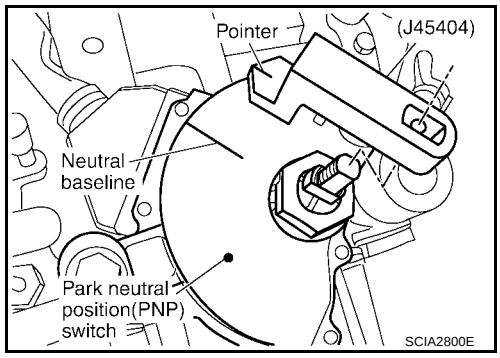


Park/Neutral Position (PNP) Switch Adjustment

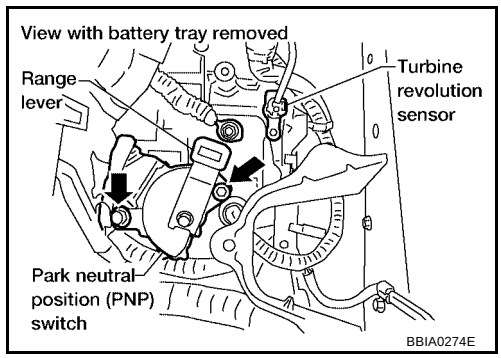
ECS00BTX

1. Remove battery and bracket. Refer to SC-7, "REMOVAL" .
2. Remove cable from range lever.
3. Set range lever in neutral position.
4. Remove range lever and install Tool.

   Tool number : KV991J0060 (J-45404)
5. Loosen park/neutral position (PNP) switch bolts.
6. Adjust PNP switch so that Tool pointer aligns with neutral base line on PNP switch body.



7. Tighten PNP switch bolts. Refer to AT-249, "OVERHAUL" .
8. Reinstall range lever and cable.
9. Adjust control cable. Refer to AT-244, "Control Cable Adjustment" .
10. Reinstall battery and bracket. Refer to SC-7, "INSTALLATION" .
11. Check continuity of PNP switch. Refer to AT-97, "Component Inspection" .



ATF Cooler

ECS00BTY

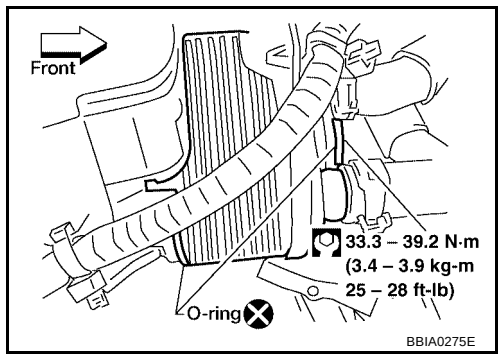
REMOVAL

1. Drain ATF. Refer to AT-15, "Changing A/T Fluid" .
2. Drain engine coolant. Refer to MA-14, "Changing Engine Coolant" .
3. Remove hose clamps and hoses from ATF cooler.
4. Remove bolt from ATF cooler and remove ATF cooler.

INSTALLATION

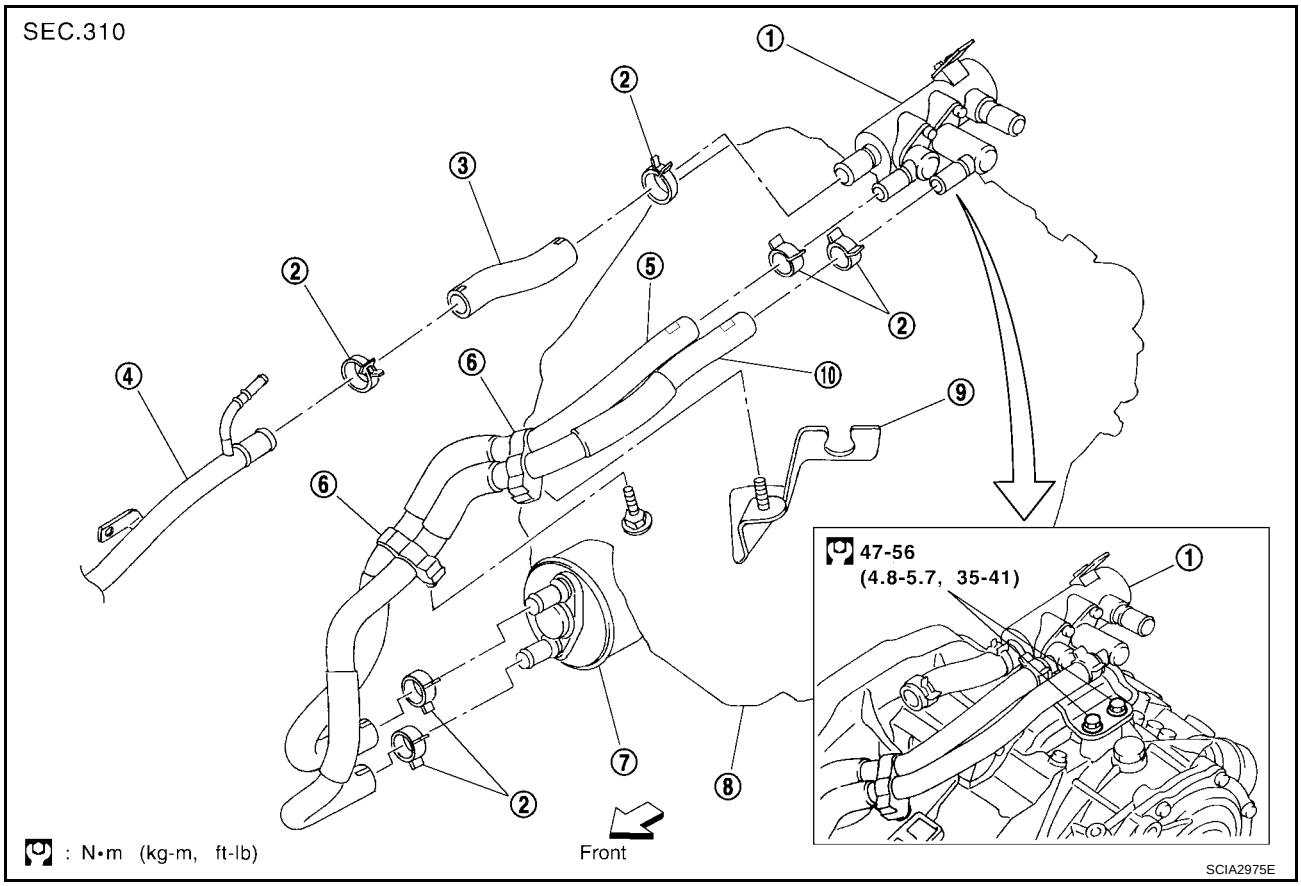
Installation is the reverse order of removal.

CAUTION:
Do not reuse O-rings.



ATF Cooler Valve

ECS00BTZ



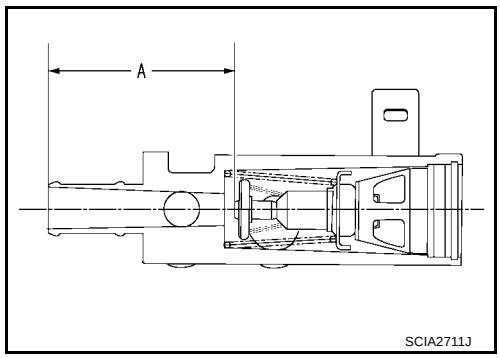
1. ATF cooler valve assembly
2. Hose clamp
3. Heater hose
4. Heater pipe
5. Outlet water hose
6. Hose clip
7. ATF cooler assembly
8. Transaxle assembly
9. Control cable bracket
10. Inlet water hose

COMPONENT INSPECTION

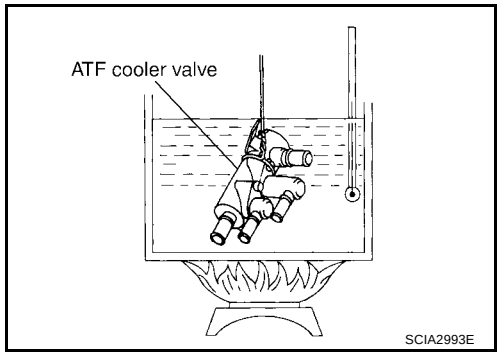
1. Make sure that ATF cooler valve is fully opened at room temperature.

Dimension "A": More than 72.0 mm (2.835 in)

A: Distance between ATF cooler valve port end face and valve shaft end face.



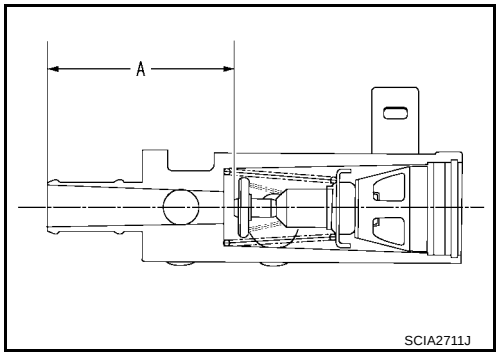
2. Submerge ATF cooler valve in a water-filled container, and then heat it up with temperature of over 82°C (180°F) for 10 minutes more.



3. Make sure that ATF cooler valve is fully closed.

Dimension "A": Less than 66.5 mm (2.618 in)

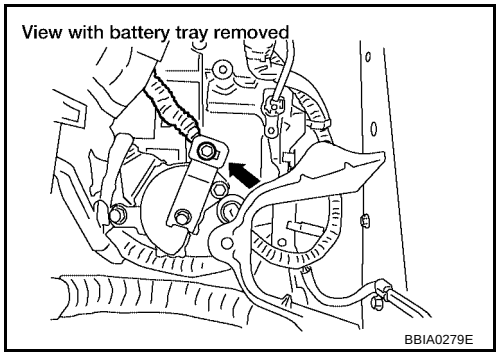
A: Distance between ATF cooler valve port end face and valve shaft end face.



Control Cable Adjustment

ECS00BU0

Move selector lever from the P position to the D position. You should be able to feel the detent in each position. If the detent cannot be felt or the pointer indicating the position is improperly aligned, the control cable needs adjustment.



1. Place selector lever in the P position.

CAUTION:
Turn wheels more than 1/4 turn and apply the parking brake.

2. Loosen control cable lock nut.
3. Using the specified force, push control cable in the direction of the arrow shown.

Specified force : 9.8 N (1.0 kg, 2.2 lb)

4. Tighten control cable lock nut.
5. Move selector lever from P to D position. Make sure that selector lever moves smoothly.
   - **Make sure that the starter operates when the selector lever is placed in the N or P position.**
   - **Make sure that the transmission is locked properly when the selector lever is placed in the P position.**

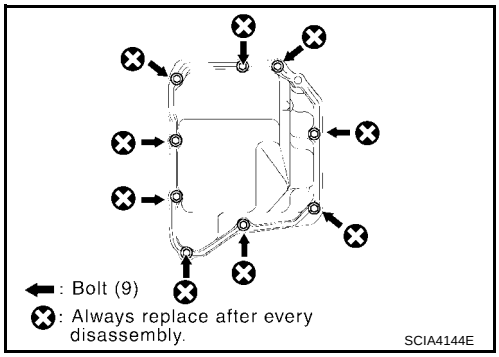
Side cover

ECS00BU1

REMOVAL

1. Remove engine under cover using power tools.
2. Drain ATF. Refer to AT-15, "Changing A/T Fluid" .
3. Remove side cover bolts and side cover.

CAUTION:
Do not reuse sealing bolts



INSTALLATION

Installation is the reverse order of removal.

- Tighten bolts to the specified torque. Refer to AT-249, "Components" .

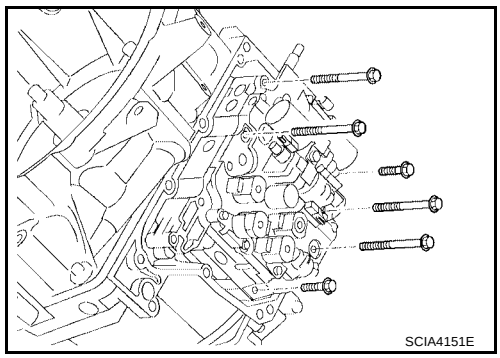
Control Valve Assembly

ECS00BU2

REMOVAL

1. Remove side cover. Refer to AT-244, "Side cover" .
2. Disconnect solenoid valve connectors.

3. Disconnect control valve assembly bolts and remove control valve assembly.

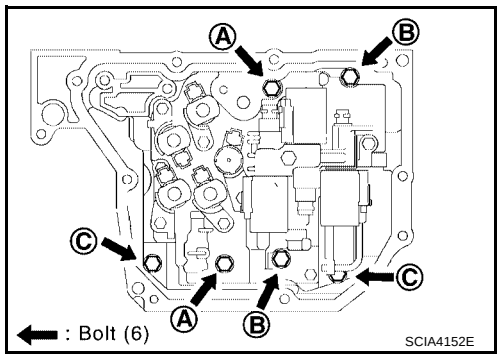


INSTALLATION

Installation is the reverse order of removal.

- Install bolts in the sequence shown.
- Tighten bolts to the specified torque. Refer to AT-249, "Components" .

Bolt symbol	Length mm (in)	Number of bolts
A	55 (2.17)	2
B	50 (1.97)	2
C	16 (0.63)	2

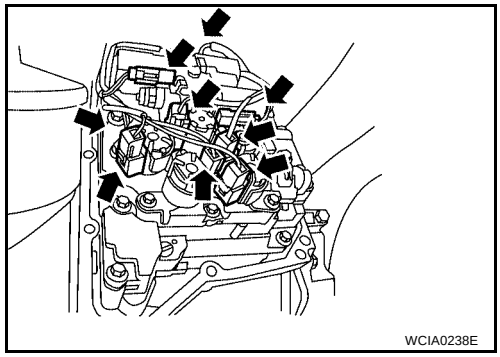


Terminal cord assembly

ECS00BU3

REMOVAL

1. Remove PNP switch. Refer to AT-249, "Components" .
2. Remove side cover. Refer to AT-244, "REMOVAL" .
3. Disconnect solenoid valve connectors.
4. Remove terminal cord assembly.



INSTALLATION

Installation is in the reverse order of removal.

TRANSAXLE ASSEMBLY

PFP:32020

Removal and Installation

ECS00BUS

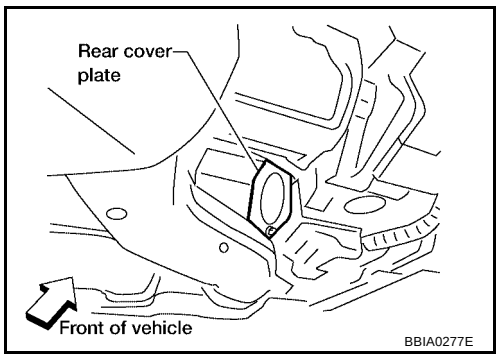
REMOVAL

CAUTION:

- **When removing the transaxle assembly from engine, first remove the crankshaft position sensor from the assembly.**
- **Do not damage sensor edge.**

1. Drain engine coolant. Refer to MA-14, "Changing Engine Coolant" .
2. Remove battery and bracket. Refer to SC-7, "REMOVAL" .
3. Remove air cleaner assembly. Refer to EM-14, "Removal and Installation" .
4. Disconnect the following connectors:
   - terminal cord assembly
   - park/neutral position (PNP) switch
   - revolution sensor
   - mass air flow sensor
   - turbine revolution sensor
   - ground
5. Remove ATF cooler valve assembly bracket bolts.
6. Disconnect ATF cooler hose clips.
7. Disconnect ATF cooler hoses from ATF cooler valve assembly.
8. Disconnect control cable at transaxle side.
9. Drain ATF. Refer to AT-15, "Changing A/T Fluid" .
10. Remove engine undercover.
11. Remove upper transaxle to engine bolts.
12. Support engine. Refer to EM-118, "ENGINE ASSEMBLY" .
13. Remove drive shafts. Refer to FAX-11, "Removal and Installation" .
14. Remove crankshaft position sensor from transaxle.
15. Support transaxle using a suitable jack.
16. Remove starter motor from transaxle. Refer to SC-14, "Removal and Installation" .
17. Remove front suspension member. Refer to FSU-15, "Removal and Installation" .
18. Remove rear cover plate and torque converter to drive plate bolts.

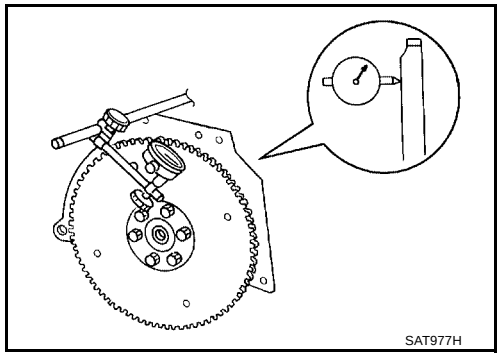
    NOTE:
    Rotate crankshaft for access to torque converter to drive plate bolts.
19. Remove lower transaxle to engine bolts.
20. Lower transaxle while supporting it with a jack.
21. If replacing the transaxle as a unit, remove the LH transaxle mount from the transaxle case.



INSPECTION AFTER REMOVAL

- Check the drive plate runout as shown .
- If this runout is out of allowance, replace drive plate and ring gear. Refer to EM-157, "MISCELLANEOUS COMPONENTS" .
- If the drive plate needs to be replaced, align the crankshaft dowel pin with the correct hole on the drive plate. Refer to EM-144, "Dowel Pin Alignment" .

CAUTION:
Do not allow any magnetic materials to contact the ring gear teeth.


SAT977H

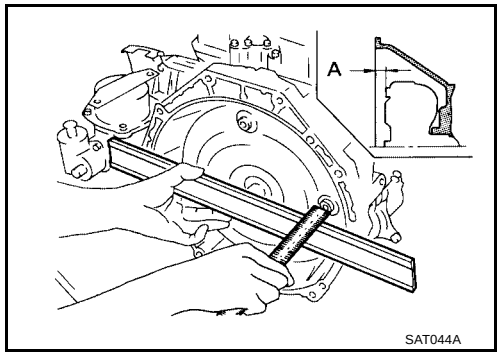
INSTALLATION

CAUTION:

- **When replacing an engine or transmission you must make sure the dowels are installed correctly during re-assembly.**
- **Improper alignment caused by missing dowels may cause vibration, oil leaks or breakage of drive train components.**

1. When connecting torque converter to transaxle, measure distance “A” to be certain that they are correctly assembled.

   Distance “A” : 14.0 mm (0.551 in) or more

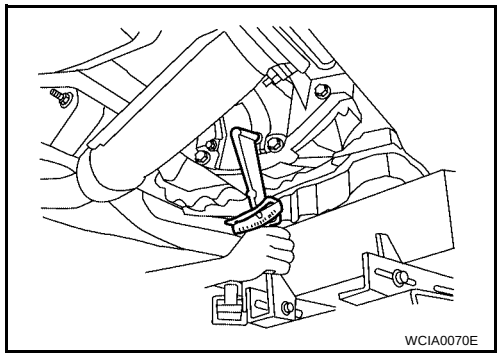


SAT044A

2. Install converter bolts to drive plate.

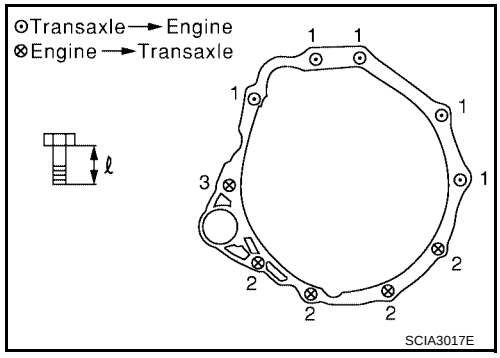
   Converter bolt : 49 - 58 N·m (5.0 - 5.9 kg-m, 37 - 42 ft-lb)

   NOTE:
   With converter installed, rotate crankshaft several turns to check that transaxle rotates freely without binding.


WCIA0070E

3. Tighten bolts securing transaxle.

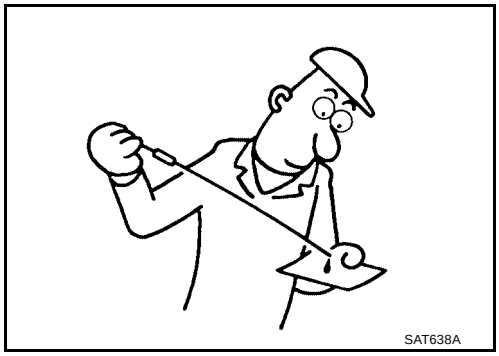
Bolt No.	Tightening torque N·m (kg-m, ft-lb)	ℓ mm (in)
1	70 - 79 (7.2 - 8.0, 52 - 58)	55 (2.17)
2	41.2 - 52.0 (4.2 - 5.3, 31 - 38)	40 (1.57)
3	70 - 79 (7.2 - 8.0, 52 - 58)	55 (2.17)



SCIA3017E

4. Installation of the remaining components is in the reverse order of removal.

- Check fluid level in transaxle.
- Move selector lever through all positions to be sure that transaxle operates correctly.
  With parking brake applied, run engine at idle. Move selector lever through N to D and to R position. A slight shock should be felt through selector knob each time transaxle is shifted.
- When replacing the A/T assembly, initialize TCM. Refer to AT-8, "Precautions for A/T Assembly or TCM Replacement" .
- Perform road test. Refer to AT-60, "ROAD TEST" .



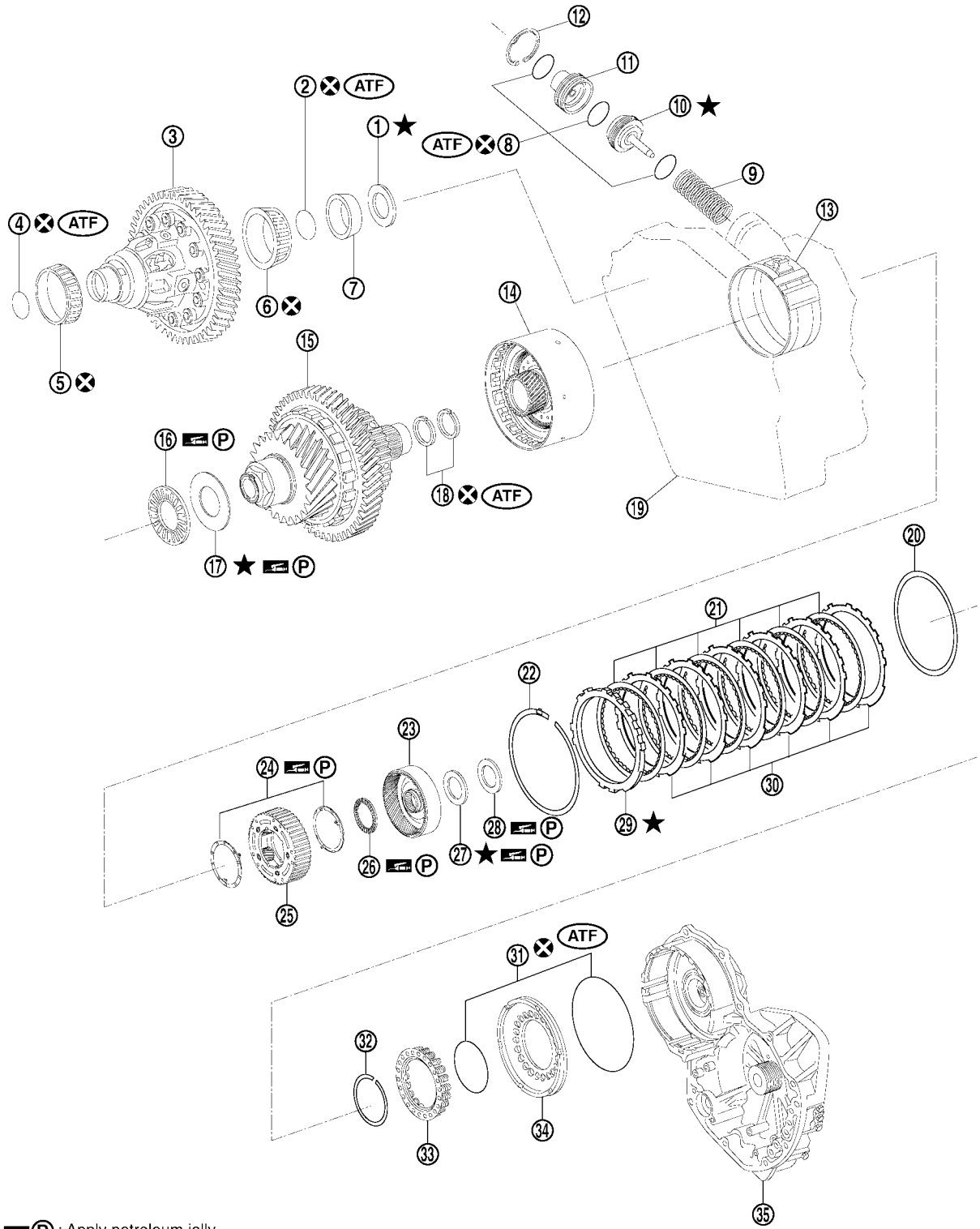
OVERHAUL

PFP:00000

Components

ECS00BU6

SEC.313 · 314 · 315 · 316

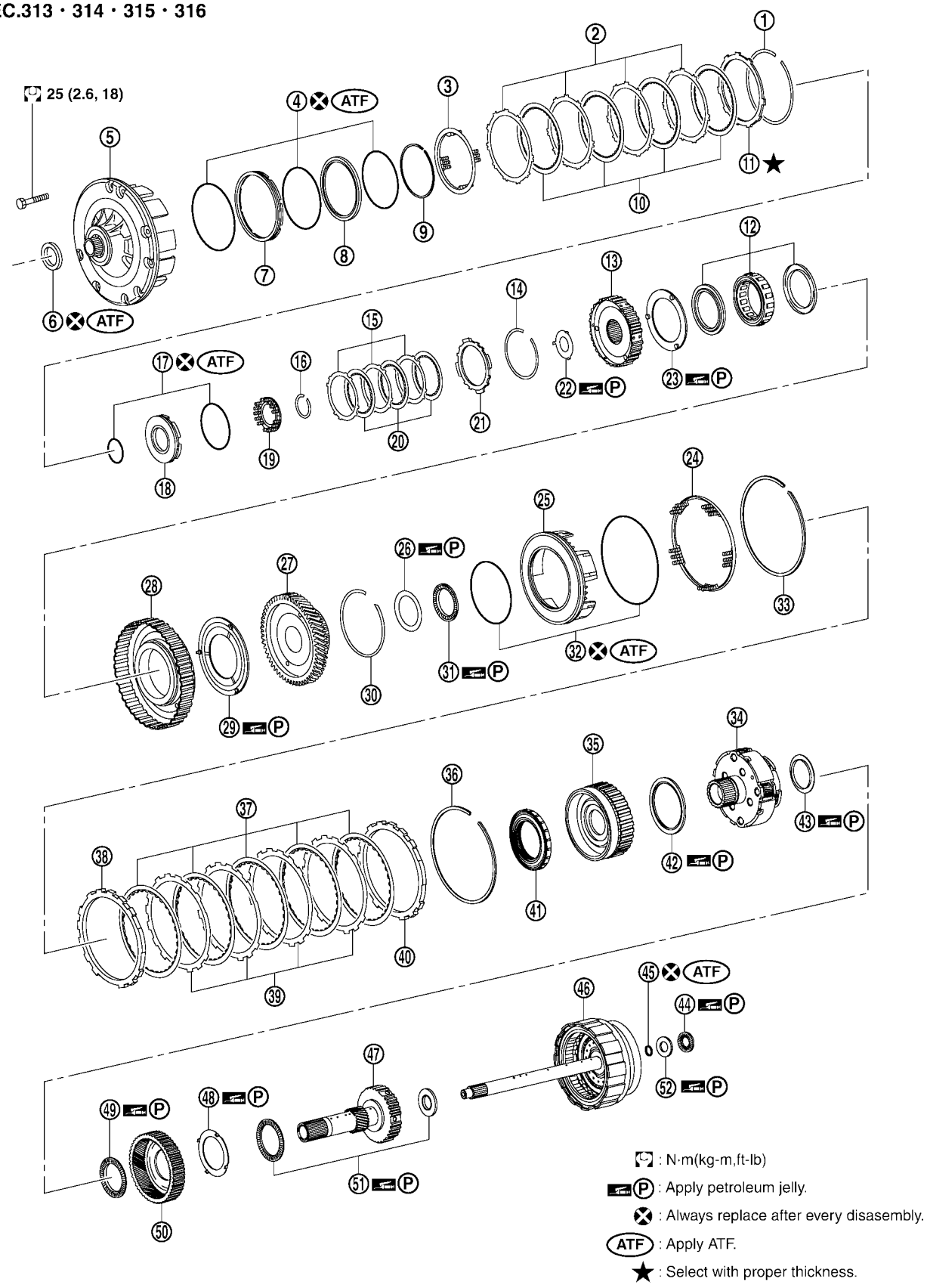


P : Apply petroleum jelly.
ATF : Apply ATF.
★ : Select with proper thickness.
⊗ : Always replace after every disassembly

WCIA0334E

1. Adjust shim
2. O-ring
3. Differential gear assembly
4. O-ring
5. Tapered roller bearing
6. Tapered roller bearing
7. Outer race
8. O-ring
9. Compression spring
10. U/D brake piston assembly
11. U/D brake damper assembly
12. Snap ring
13. U/D brake band assembly
14. U/D clutch assembly
15. U/D gear assembly
16. Thrust needle roller bearing
17. Thrust bearing race
18. Seal ring
19. Transaxle case
20. B5 brake cushion plate
21. B5 brake disc
22. Snap ring
23. U/D RR planetary ring gear sub assembly
24. Thrust bearing race
25. U/D RR planetary carrier assembly
26. Thrust needle roller bearing
27. Thrust bearing race
28. B5 brake flange
29. B5 brake plate
30. O-ring
31. Snap ring
32. Return spring
33. B5 brake piston
34. Transaxle case cover

SEC.313 · 314 · 315 · 316

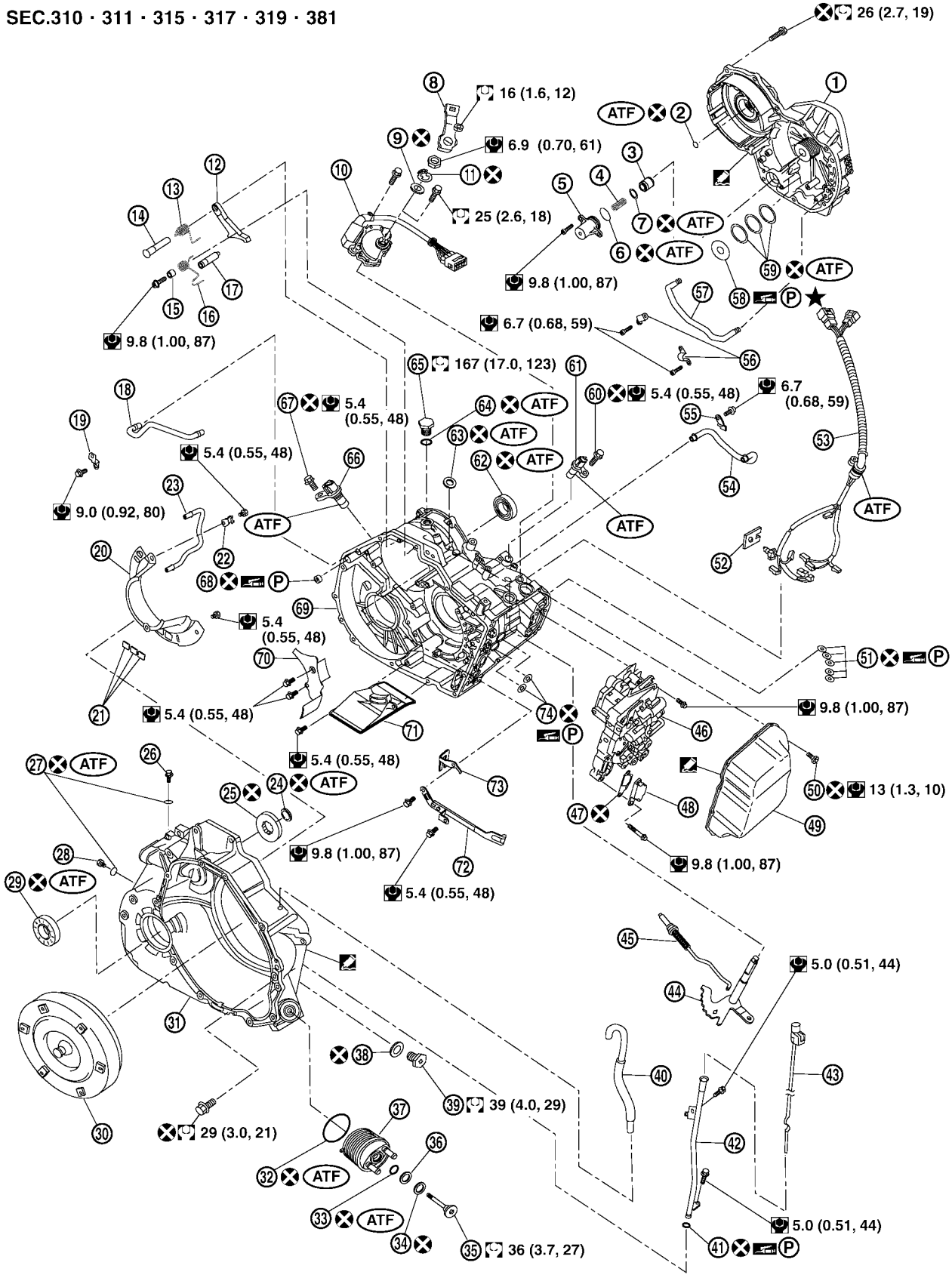


WCIA0385E

1. Snap ring
2. 2nd brake plate
3. Return spring
4. O-ring
5. Oil pump assembly
6. Oil seal
7. 2nd brake piston
8. 2nd brake sleeve
9. Snap ring

10. 2nd brake disc
11. 2nd brake flange
12. One-way clutch No.1
13. 2nd coast brake hub
14. Snap ring
15. 2nd coast brake plate
16. Snap ring
17. O-ring
18. 2nd coast brake piston
19. Return spring
20. 2nd coast brake disc
21. 2nd coast brake flange
22. Thrust washer
23. Thrust washer
24. Return spring
25. 1st and reverse brake piston
26. Thrust bearing race
27. Counter drive gear sub assembly
28. One-way clutch outer race sub assembly
29. Thrust washer
30. Snap ring
31. Thrust bearing
32. O-ring
33. Snap ring
34. Planetary gear assembly
35. FR planetary ring gear assembly
36. Snap ring
37. 1st and reverse brake disc
38. 1st and reverse brake flange
39. 1st and reverse brake plate
40. 1st and reverse brake flange
41. One-way clutch No.2
42. Thrust bearing
43. Thrust bearing race
44. Thrust needle roller bearing
45. Seal ring
46. Forward and direct clutch assembly
47. Planetary sun gear sub assembly
48. Thrust bearing race
49. Thrust needle roller bearing
50. RR planetary ring gear assembly
51. Thrust needle roller bearing
52. Thrust bearing race

SEC.310 · 311 · 315 · 317 · 319 · 381



WCIA0558E

1. Transaxle case cover
2. Seal ring
3. Forward clutch accumulator piston
4. Compression spring
5. Accumulator cover
6. O-ring
7. Seal ring
8. Range lever
9. Washer plate

10. PNP switch
11. Lock washer
12. Parking lock pawl
13. Torsion spring No.1
14. Parking lock pawl shaft
15. Spring guide sleeve
16. Torsion spring No.2
17. Parking lockpin sub assembly
18. U/D brake apply tube sub assembly
19. Tube clamp
20. Oil reservoir plate
21. Oil cleaner magnet
22. Tube clamp
23. Differential gear lube apply tube
24. Seal ring
25. Thrust roller bearing
26. Straight screw plug
27. O-ring
28. Straight screw plug
29. Differential side oil seal
30. Torque converter
31. Transaxle housing
32. O-ring
33. O-ring
34. Spring washer
35. Hexagon bolt
36. Washer
37. ATF cooler assembly
38. gasket
39. Drain plug
40. Breather hose
41. O-ring
42. A/T fluid charging pipe
43. A/T fluid level gauge
44. Manual valve lever sub assembly
45. Parking lock rod sub assembly
46. Control valve assembly
47. Suction cover gasket
48. Suction cover
49. Side cover
50. Seal bolt
51. Governor apply gasket
52. Sensor clamp
53. Transmission wire
54. Transaxle lube apply tube
55. Tube clamp
56. Tube clamp
57. U/D clutch apply tube sub assembly
58. Bearing race
59. Seal ring
60. Seal bolt
61. Turbine revolution sensor
62. Differential side oil seal
63. Manual valve oil seal
64. O-ring
65. Anchor bolt
66. Revolution sensor
67. Seal bolt
68. Governor apply gasket
69. Transaxle case
70. Oil reservoir plate
71. Oil strainer sub assembly
72. Manual detent spring sub assembly
73. Parking lock pawl bracket
74. Governor apply gasket

Locations of Needle Bearings, Bearing Races and Thrust Washers

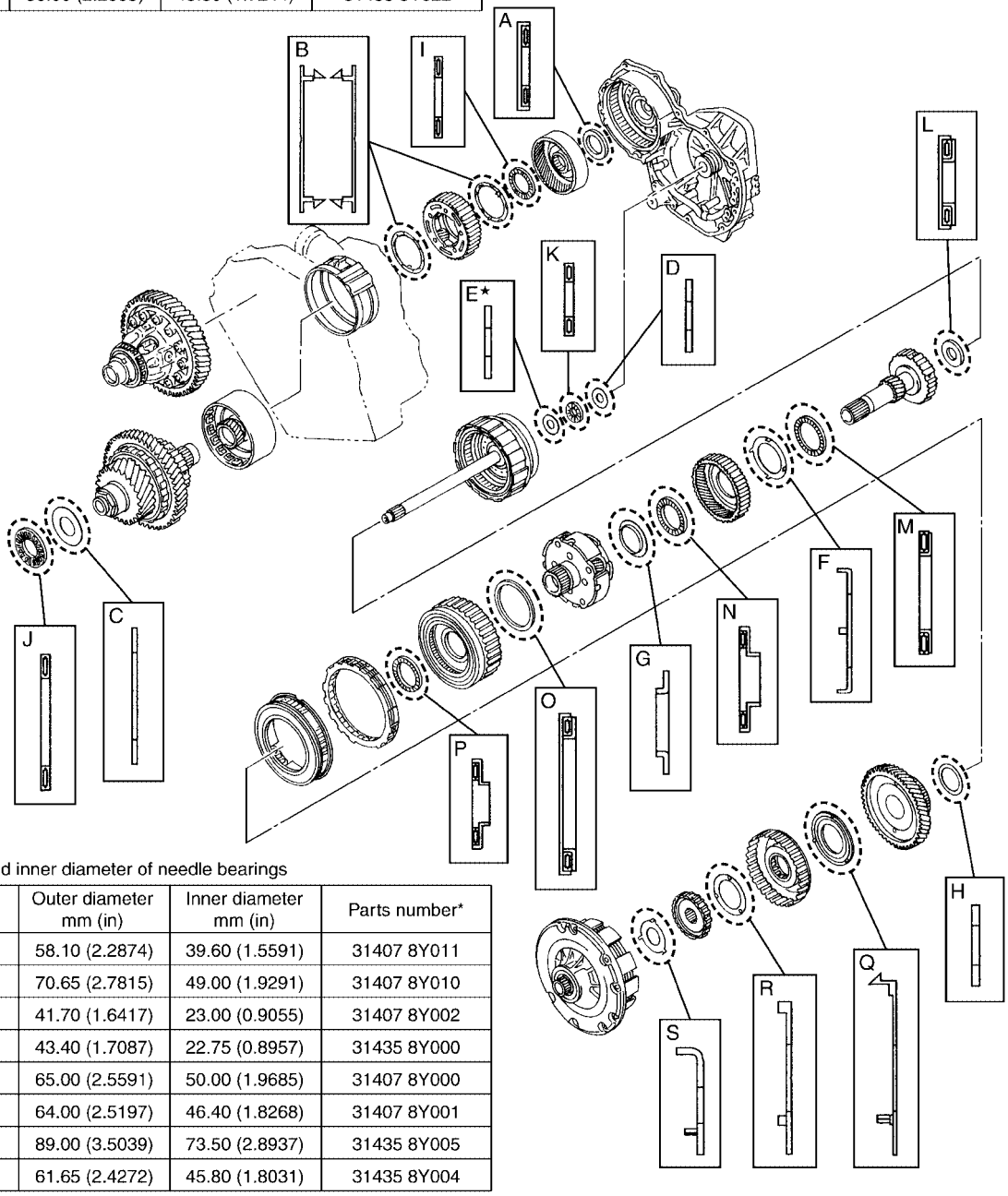
ECS00BU7

Outer and inner diameter of bearing races

Item number	Outer diameter mm (in)	Inner diameter mm (in)	Parts number*
A	57.70 (2.2716)	37.00 (1.4567)	31435 8Y020
B	77.60 (3.0551)	66.80 (2.6299)	31508 8Y010
C	71.00 (2.7953)	49.10 (1.9331)	31435 8Y021
D	41.00 (1.6142)	22.00 (0.8661)	31435 8Y010
E★	41.00 (1.6142)	13.50 (0.5315)	31435 8Y012
F	74.00 (2.9134)	53.00 (2.0866)	31435 8Y001
G	61.00 (2.4016)	43.20 (1.7008)	31435 8Y002
H	58.00 (2.2835)	43.80 (1.7244)	31435 8Y022

Outer and inner diameter of thrust washers

Item number	Outer diameter mm (in)	Inner diameter mm (in)	Parts number*
Q	99.30 (3.9094)	56.50 (2.2244)	31508 8Y000
R	77.30 (3.0433)	56.50 (2.2244)	31508 8Y001
S	74.30 (2.9252)	47.00 (1.8504)	31508 8Y002



Outer and inner diameter of needle bearings

Item number	Outer diameter mm (in)	Inner diameter mm (in)	Parts number*
I	58.10 (2.2874)	39.60 (1.5591)	31407 8Y011
J	70.65 (2.7815)	49.00 (1.9291)	31407 8Y010
K	41.70 (1.6417)	23.00 (0.9055)	31407 8Y002
L	43.40 (1.7087)	22.75 (0.8957)	31435 8Y000
M	65.00 (2.5591)	50.00 (1.9685)	31407 8Y000
N	64.00 (2.5197)	46.40 (1.8268)	31407 8Y001
O	89.00 (3.5039)	73.50 (2.8937)	31435 8Y005
P	61.65 (2.4272)	45.80 (1.8031)	31435 8Y004

★ : Select with proper thickness.
* : Always check with the Parts Department for the latest parts information.

SCIA4478E

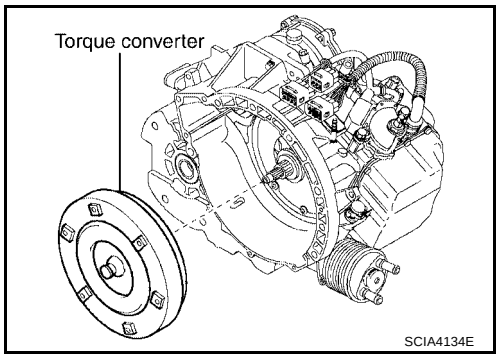
DISASSEMBLY

PFP:31020

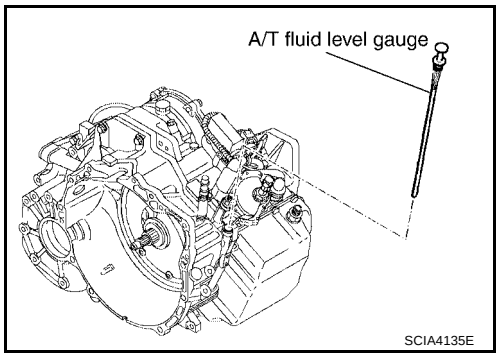
Disassembly

ECS00BU8

1. Drain ATF from transaxle. Refer to AT-15, "A/T FLUID" .
2. Remove torque converter from transaxle case by holding it firmly and turning while pulling straight out.

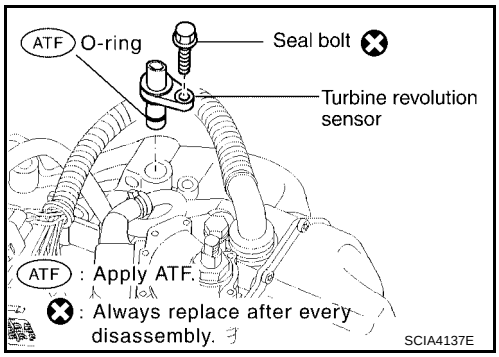


3. Remove A/T fluid level gauge.
4. Remove A/T fluid charging pipe.
5. Remove O-ring from A/T fluid charging pipe.
6. Remove air breather hose.
7. Remove A/T fluid cooler tube.



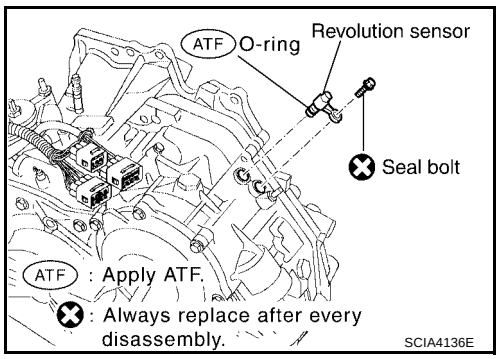
8. Remove turbine revolution sensor.

CAUTION:
Do not damage the turbine revolution sensor and transaxle case.

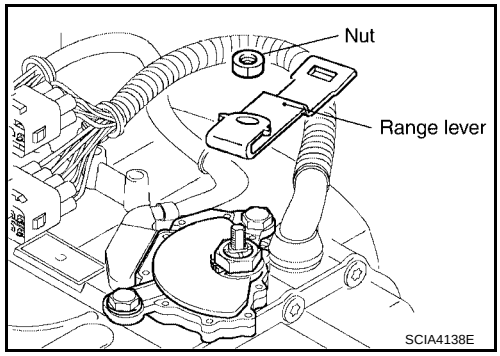


9. Remove revolution sensor.

CAUTION:
Do not damage the revolution sensor and transaxle case.

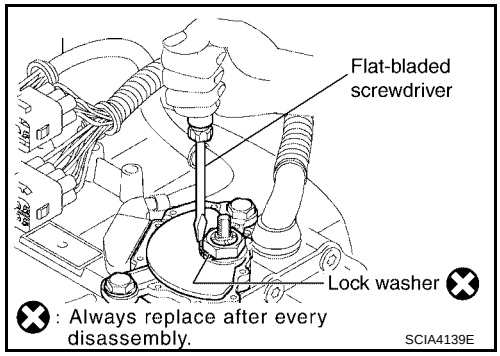


10. Remove nut and range lever.



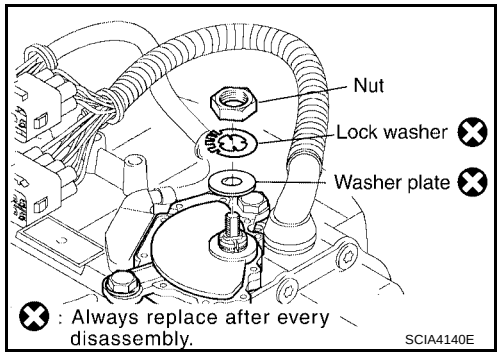
11. Pry off the lock washer using suitable tool.

CAUTION:
Do not reuse lock washer.



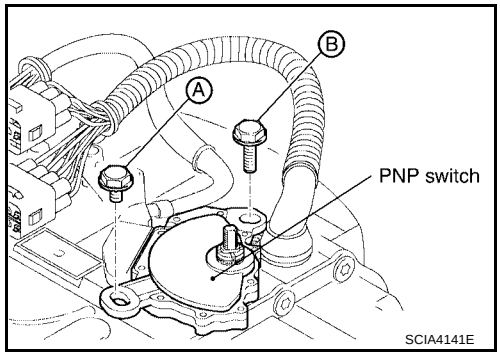
12. Loosen nut and remove lock washer.
13. Remove washer plate.

CAUTION:
Do not reuse washer plate.



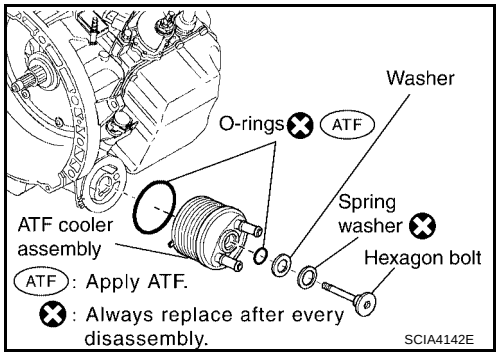
14. Remove PNP switch from transaxle case.

Bolt symbol	Length mm (in)	Number of bolts
A	20 (0.79)	1
B	33 (1.30)	1



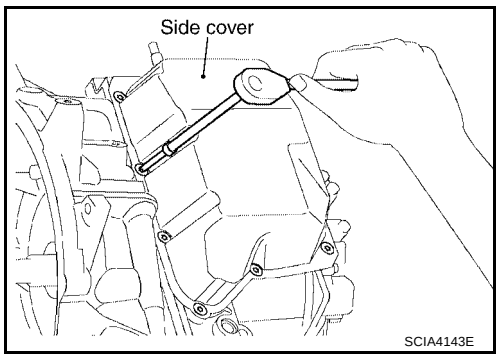
15. Remove hexagon bolt.
16. Remove ATF cooler assembly, washer and spring washer.
17. Remove O-rings from the ATF cooler assembly.

CAUTION:
Do not reuse spring washer or O-rings.

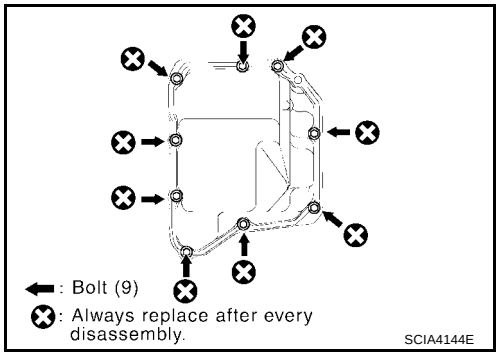


18. Remove side cover.

CAUTION:
- **Do not damage side cover or transaxle case.**

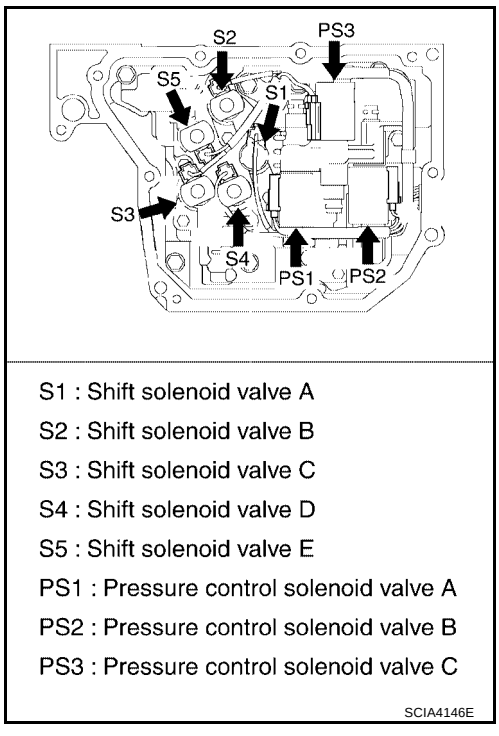


- **Do not reuse seal bolts**

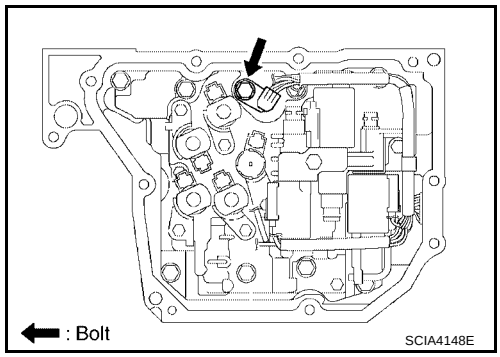


19. Disconnect solenoid connectors.

CAUTION:
Do not damage connector.

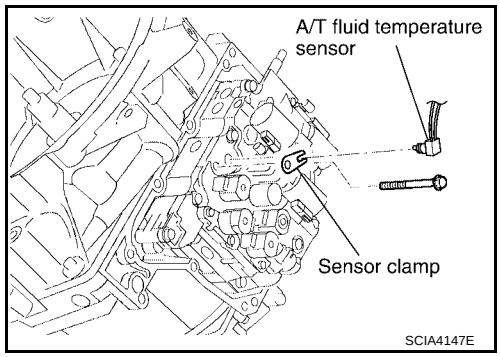


20. Remove sensor clamp bolt.

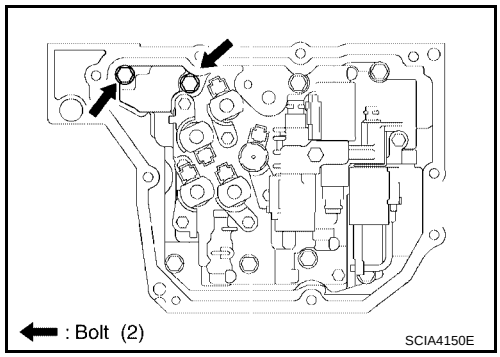


21. Remove sensor clamp and A/T fluid temperature sensor.

CAUTION:
Do not damage A/T fluid temperature sensor.

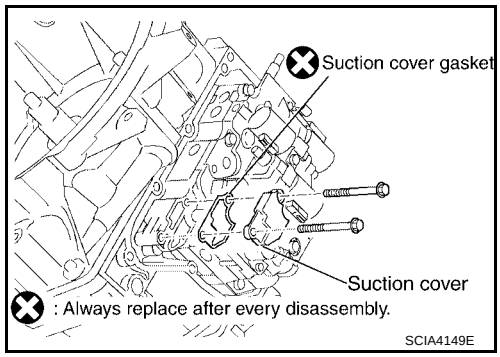


22. Remove suction cover bolts.



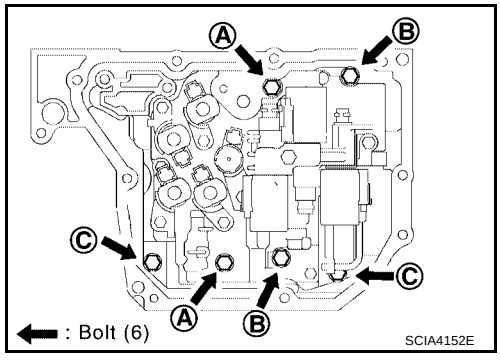
23. Remove suction cover and suction cover gasket.

CAUTION:
Do not reuse gasket.



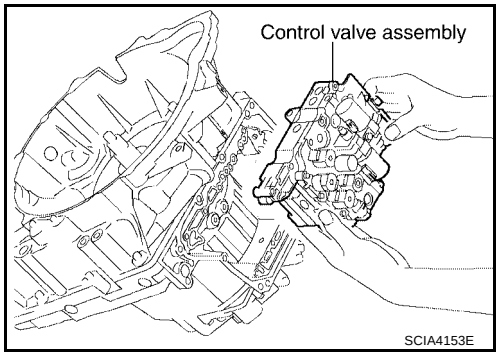
24. Remove control valve assembly bolts from transaxle case.

Bolt symbol	Length mm (in)	Number of bolts
A	55 (2.17)	2
B	50 (1.97)	2
C	16 (0.63)	2



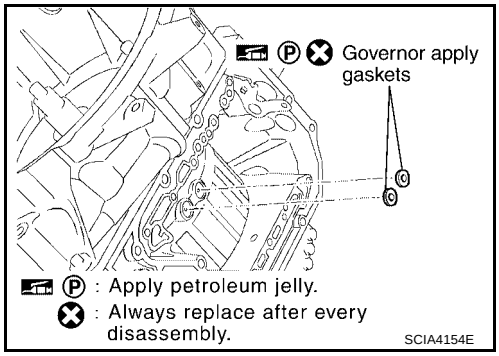
25. While holding control valve assembly, disconnect parking lock rod sub assembly from manual valve lever sub assembly and remove control valve assembly.

NOTE:
Shift position is “N”.



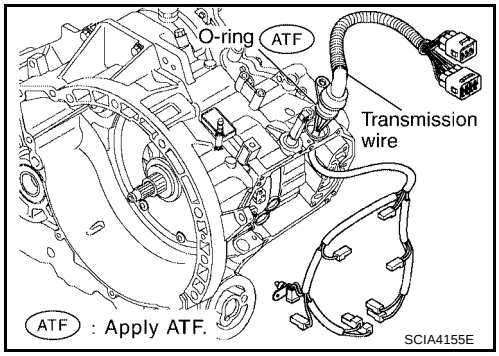
26. Remove governor apply gaskets.

CAUTION:
Do not reuse gaskets.

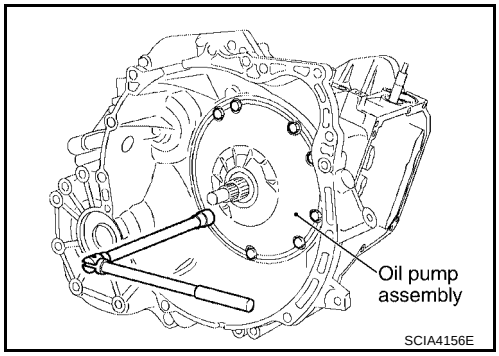


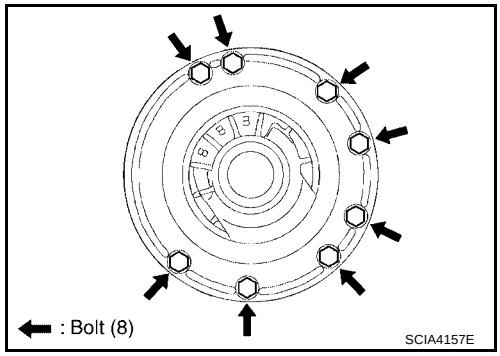
27. Remove terminal cord assembly.

CAUTION:
Do not damage solenoid connectors and A/T fluid temperature sensor.



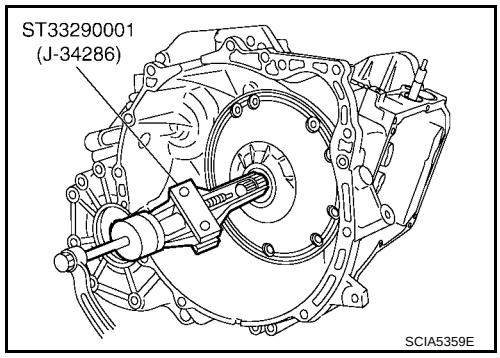
28. Remove oil pump assembly bolts from transaxle case.





29. Remove oil pump assembly using Tool.

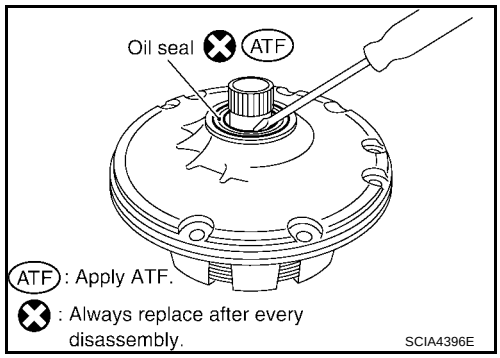
Tool number : ST33290001 (J-34286)



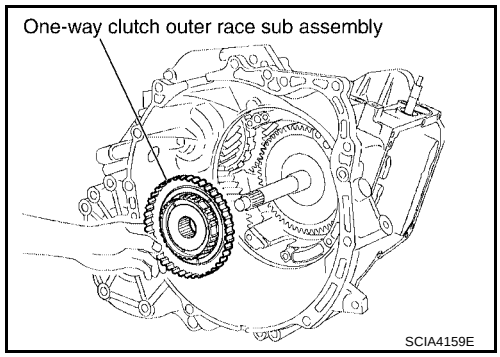
30. Remove oil seal from oil pump assembly using suitable tool.

CAUTION:

- **Do not reuse oil seal.**
- **Do not scratch oil pump assembly.**



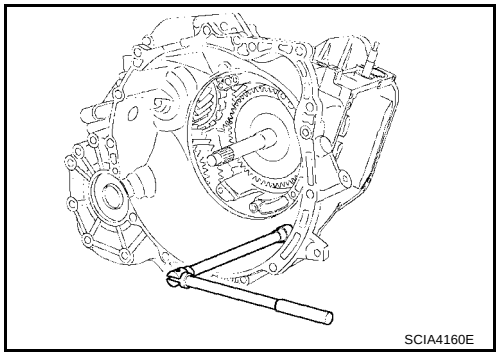
31. Remove one-way clutch outer race sub assembly.
32. Remove thrust washer.

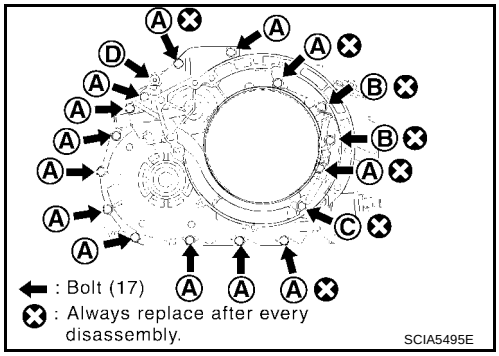


33. Remove transaxle housing bolts from transaxle case.

Bolt symbol	Length mm (in)	Number of bolts
A	30 (1.18)	13
B	35 (1.38)	2
C	45 (1.77)	1
D*	—	1

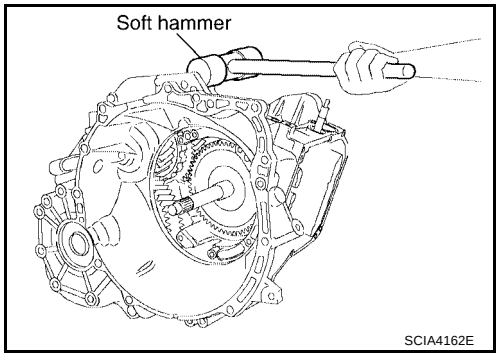
*:Torx bolt


SCIA4160E



SCIA5495E

34. Remove transaxle housing using suitable tool.

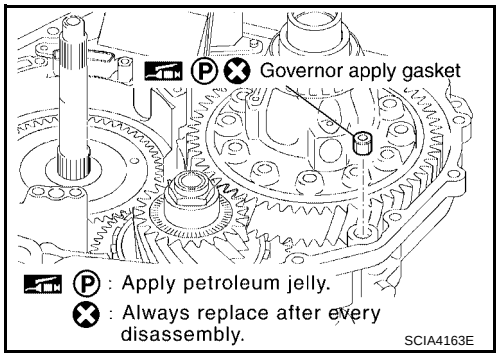


SCIA4162E

35. Remove governor apply gasket and seal ring.

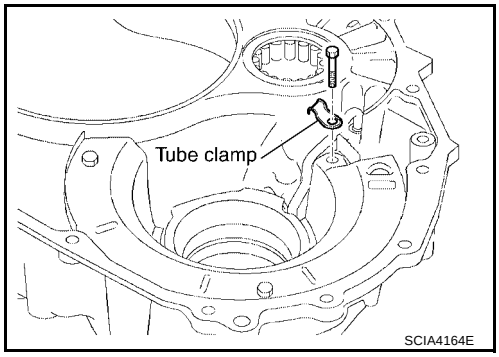
CAUTION:

Do not reuse gasket and seal ring.



SCIA4163E

36. Remove tube clamp.

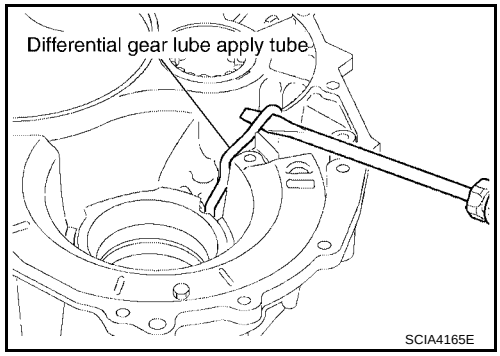


SCIA4164E

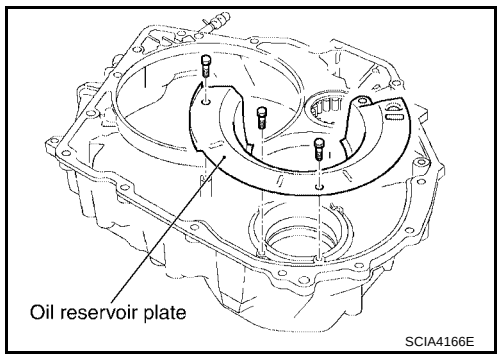
37. Remove differential gear lube apply tube using suitable tool.

CAUTION:

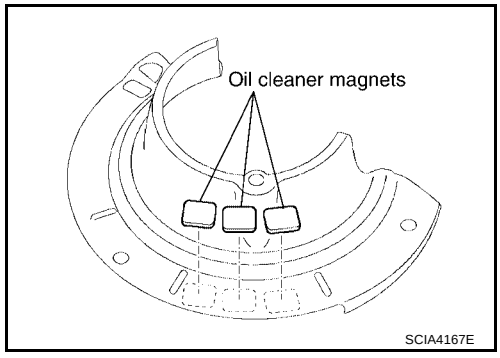
- **Do not bend or damage differential gear lube apply tube.**
- **Do not damage transaxle housing.**



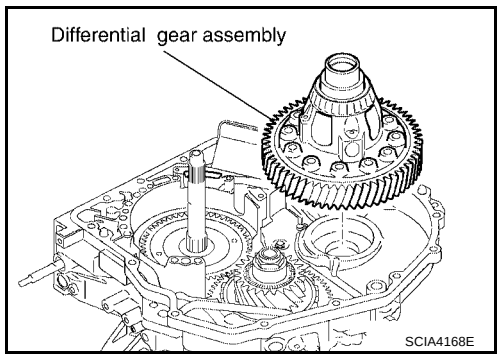
38. Remove oil reservoir plate.



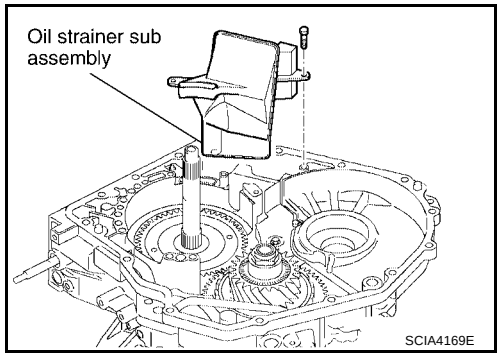
39. Remove oil cleaner magnets from oil reservoir plate.



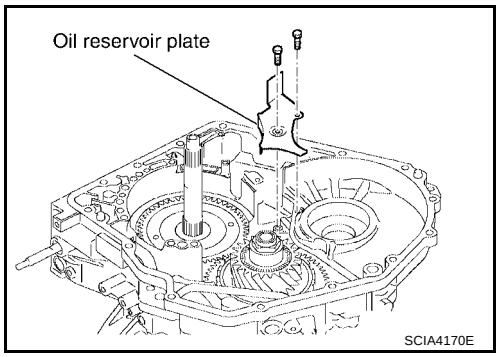
40. Remove differential gear assembly.



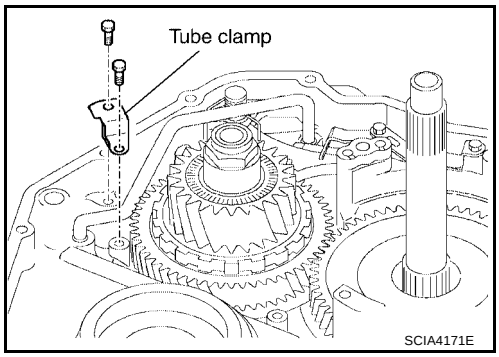
41. Remove oil strainer sub assembly.



42. Remove oil reservoir plate.



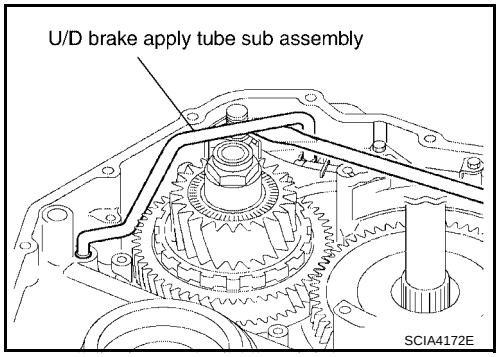
43. Remove tube clamp.



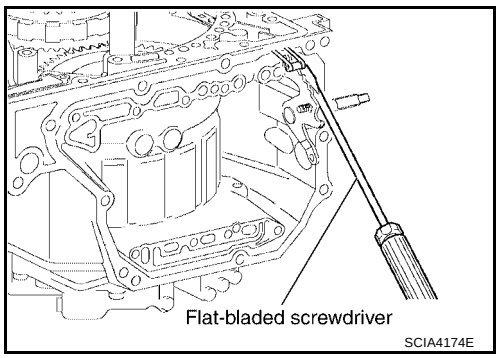
44. Remove U/D brake apply tube sub assembly using suitable tool.

CAUTION:

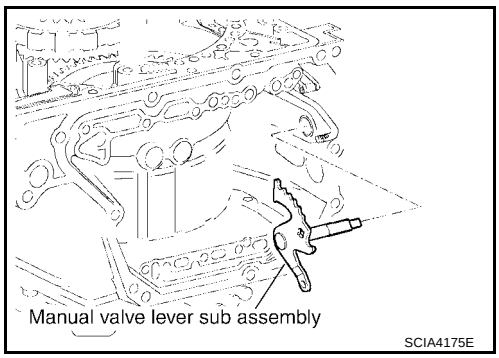
- **Do not bend or damage U/D brake apply tube sub assembly.**
- **Do not damage transaxle case.**



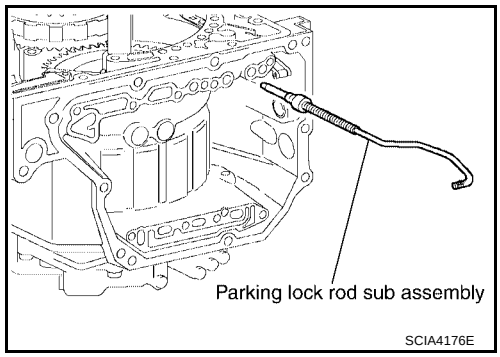
45. Disconnect manual detent spring sub assembly from manual valve lever sub assembly using suitable tool.



46. Remove manual valve lever sub assembly from parking lock rod sub assembly.

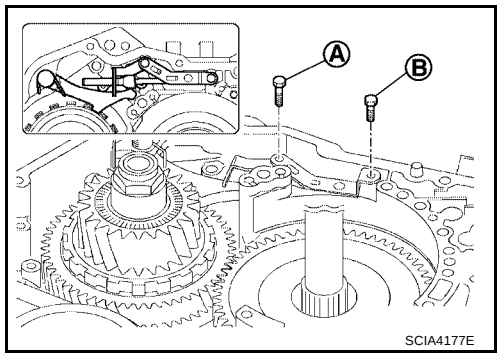


47. Remove parking lock rod sub assembly.

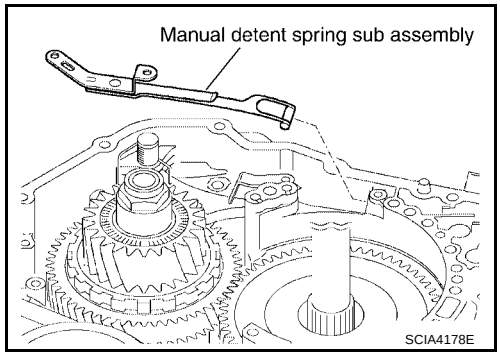


48. Remove bolts for manual detent spring sub assembly.

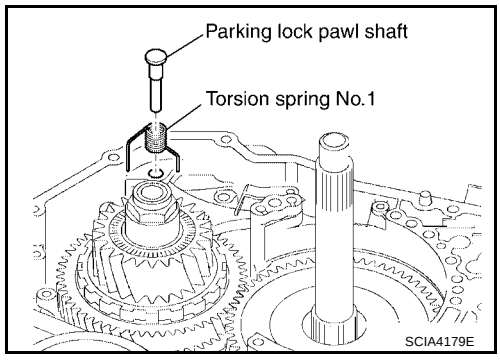
Bolt symbol	Length mm (in)	Number of bolts
A	16.7 (0.657)	1
B	14.0 (0.551)	1



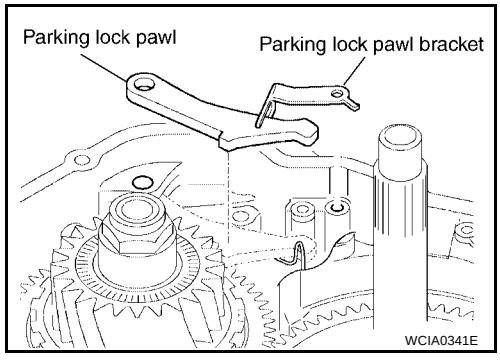
49. Remove manual detent spring sub assembly.



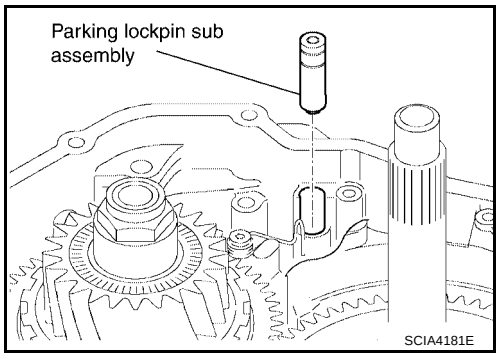
50. Remove parking lock pawl shaft and torsion spring No.1.



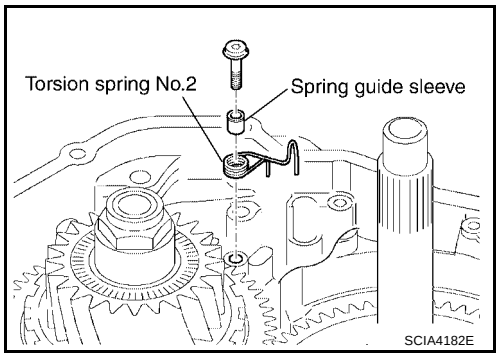
51. Remove parking lock pawl bracket and parking lock pawl.



52. Remove parking lockpin sub assembly.



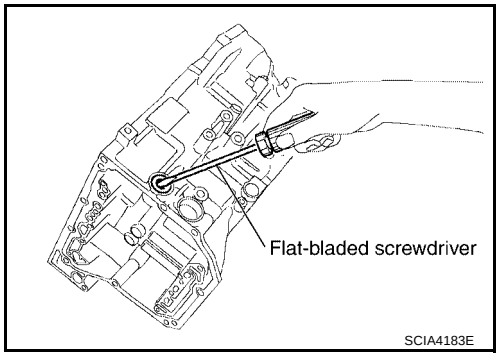
53. Remove spring guide sleeve and torsion spring No.2.



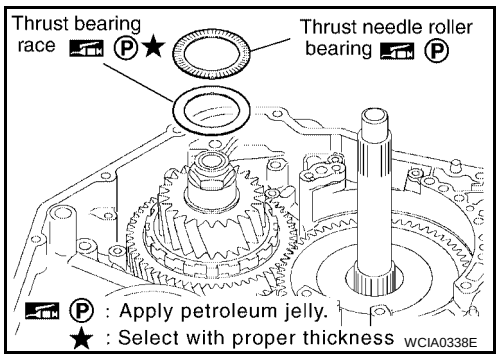
54. Remove manual valve oil seal using suitable tool.

CAUTION:

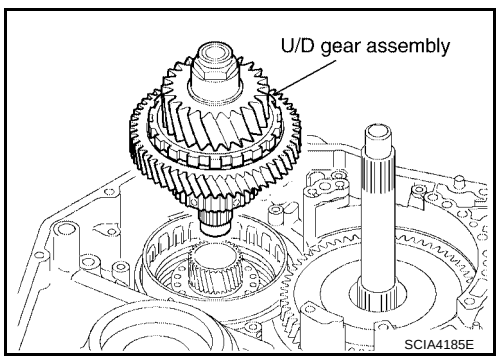
- **Do not reuse oil seal.**
- **Do not damage transaxle case.**



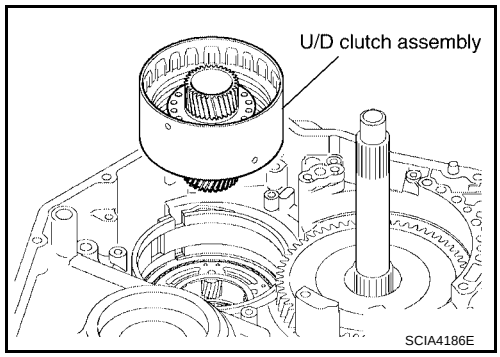
55. Remove thrust needle roller bearing and thrust bearing race from U/D gear assembly.



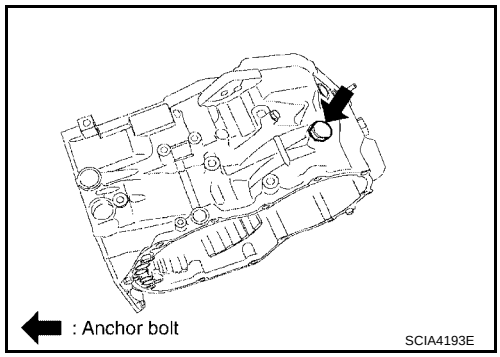
56. Remove U/D gear assembly.
57. Remove seal rings from U/D gear assembly.



58. Remove U/D clutch assembly.

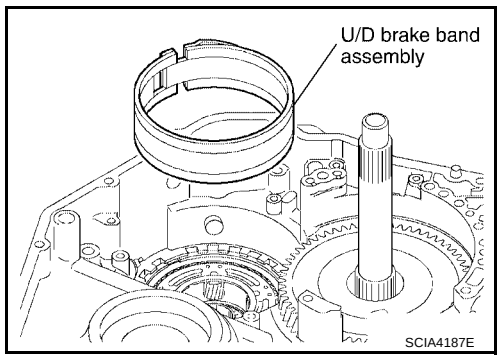


59. Remove anchor bolt.

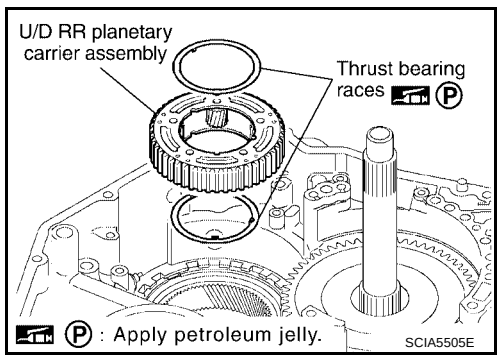


60. Remove U/D brake band assembly.

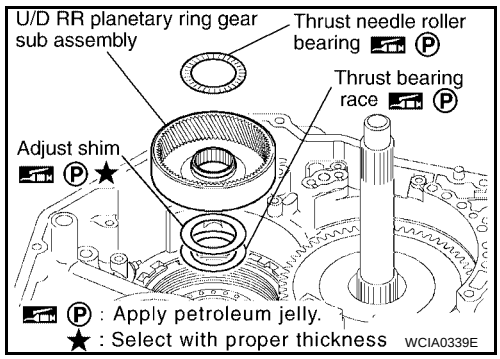
CAUTION:
Do not damage transaxle case.



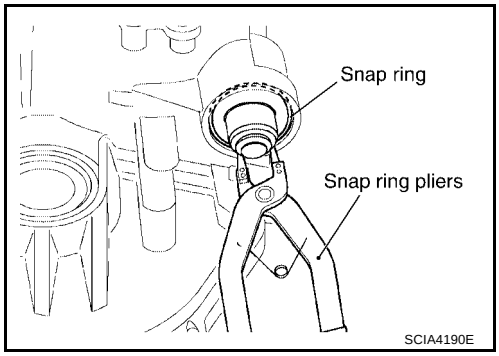
61. Remove U/D RR planetary carrier assembly and thrust bearing races.



62. Remove U/D RR planetary ring gear sub assembly.
63. Remove thrust needle roller bearing adjusting shim and thrust bearing race from U/D RR planetary ring gear sub assembly.

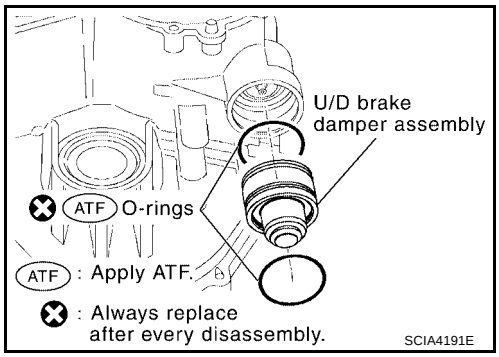


64. Remove snap ring using suitable tool.

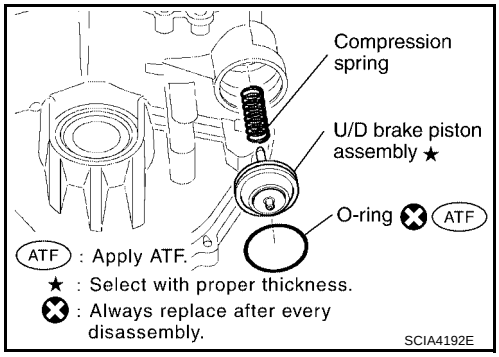


65. Remove U/D brake damper assembly.
66. Remove O-rings from U/D brake damper assembly.

CAUTION:
Do not reuse O-rings.



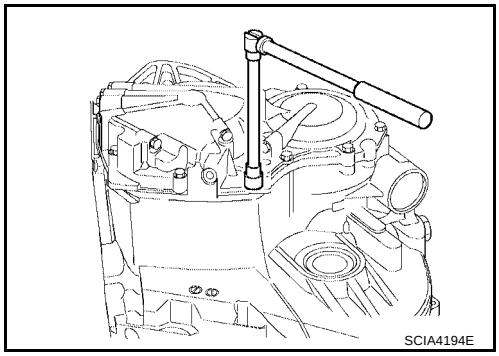
67. Remove U/D brake piston assembly and compression spring.
68. Remove O-ring from U/D brake piston assembly.

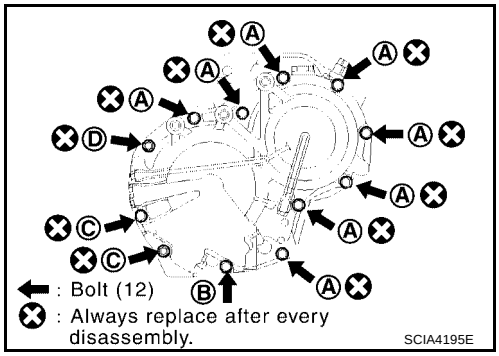


69. Remove transaxle case cover bolts from transaxle case.

Bolt symbol	Length mm (in)	Number of bolts
A	30 (1.18)	8
B	45 (1.77)	2
C	48 (1.89)	2
D*	—	1

*:Stud bolt

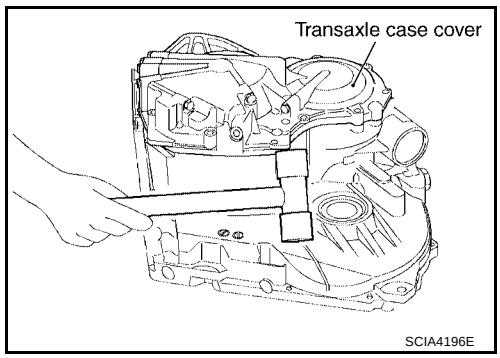




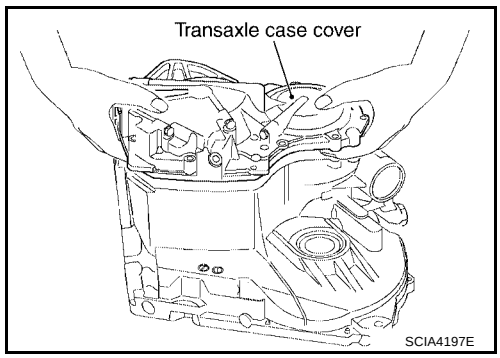
70. Remove the transaxle case cover using suitable tool.

CAUTION:

Do not damage transaxle case cover.



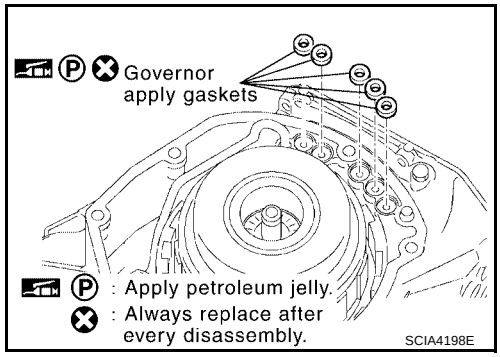
71. Remove transaxle case cover.



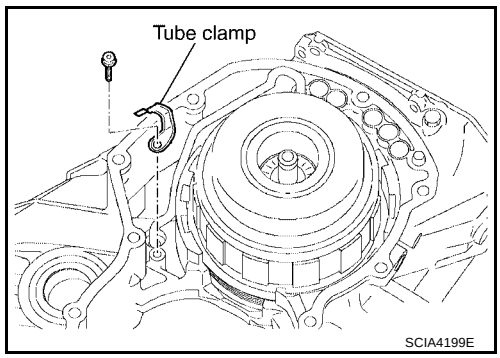
72. Remove governor apply gaskets from transaxle case.

CAUTION:

Do not reuse gaskets.



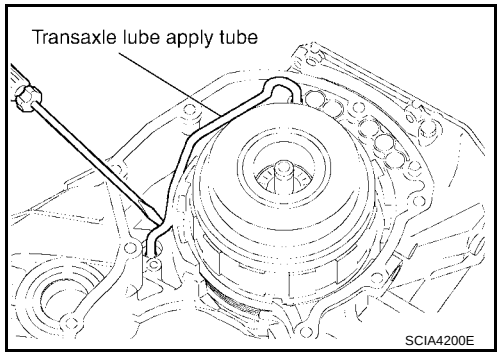
73. Remove tube clamp.



74. Remove transaxle lube apply tube using suitable tool.

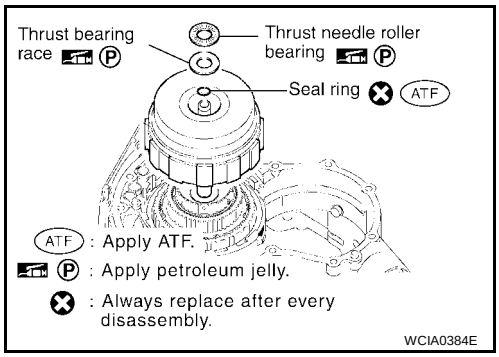
CAUTION:

- **Do not bend or damage transaxle lube apply tube.**
- **Do not damage transaxle case.**

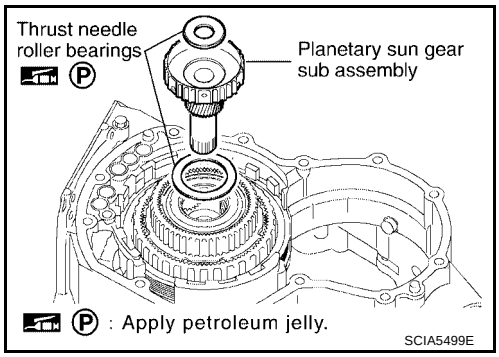


75. Remove forward and direct clutch assembly.
76. Remove thrust bearing race, thrust needle roller bearing and seal ring from forward and direct clutch assembly.

CAUTION:
Do not reuse seal ring.



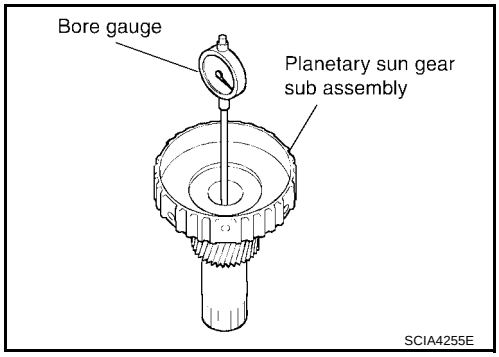
77. Remove planetary sun gear sub assembly and thrust needle roller bearings.

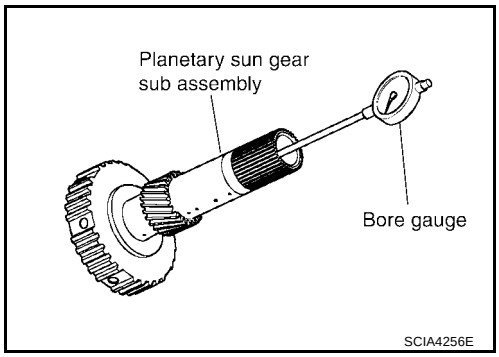


78. Measure the inner diameter of planetary sun gear sub assembly bushing, using suitable bore gauge.

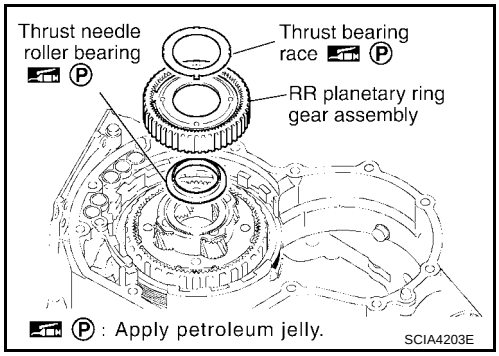
CAUTION:
Measure at different places and take an average. If it is greater than the maximum, replace it with a new planetary sun gear sub assembly.

Standard :22.200 - 22.226mm (0.8740 - 0.8750in)
Allowable limit :22.276 (0.8770in)

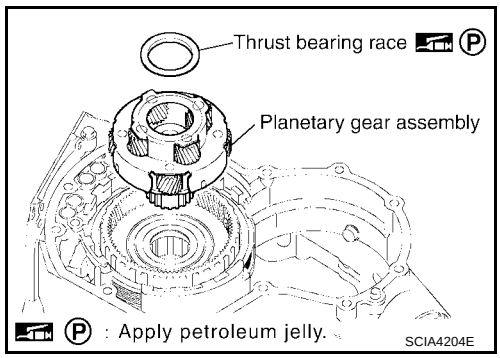




79. Remove RR planetary ring gear assembly.
80. Remove thrust needle roller bearing and thrust bearing race from RR planetary ring gear assembly.



81. Remove planetary gear assembly.
82. Remove thrust bearing race from planetary gear assembly.

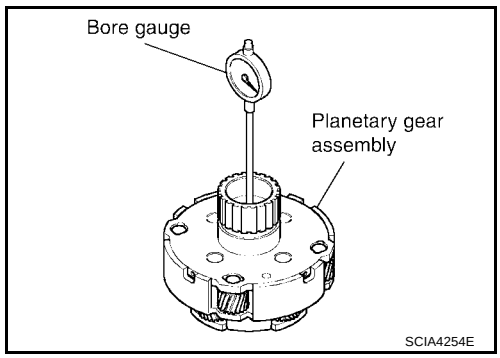


83. Measure the inner diameter of planetary gear assembly bushing using bore gauge.

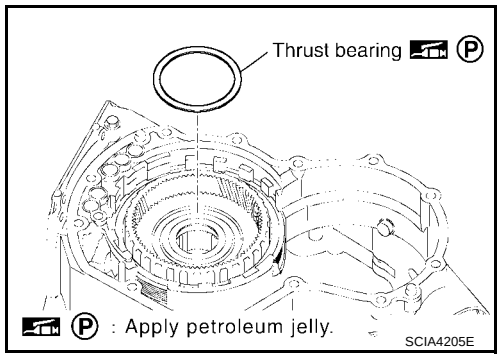
CAUTION:

Measure at different places and take an average. If it is greater than the maximum, replace it with a new planetary gear assembly.

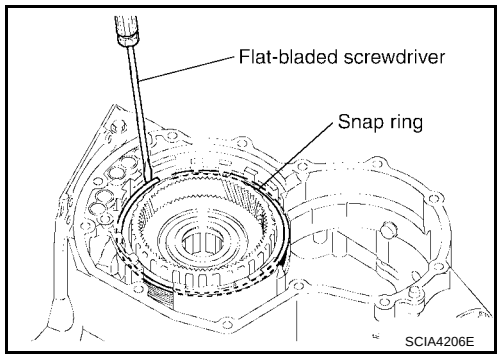
Standard	**:30.056 - 30.082mm (1.1833 - 1.1843in)**
Allowable limit	**:30.132 (1.1863in)**



84. Remove thrust bearing.



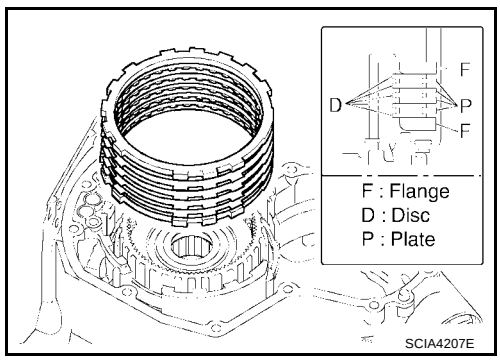
85. Remove snap ring using suitable tool.



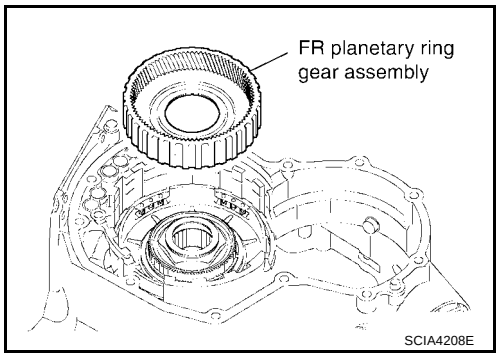
86. Remove 1st and reverse brake flanges, 1st and reverse brake discs and 1st and reverse brake plates.
- INSPECTION
  - Check that the sliding surface of discs are not worn and burnt. If necessary, replace them.

CAUTION:

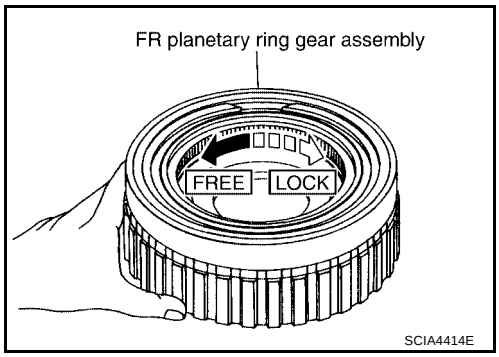
Soak new discs for at least 2 hours in A/T fluid.



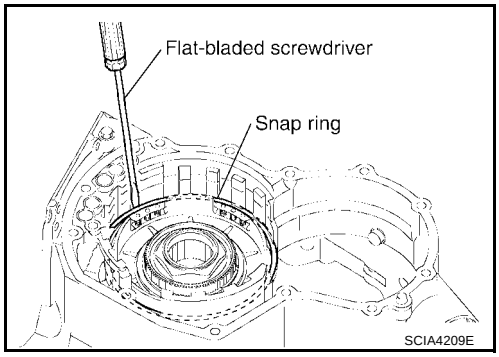
87. Remove FR planetary ring gear assembly with one-way clutch No.2.



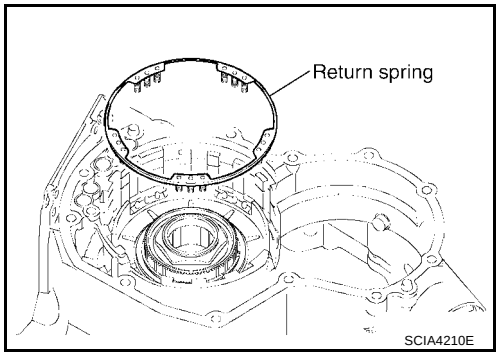
88. Make sure that the FR planetary ring gear assembly turns freely counterclockwise and locks clockwise.



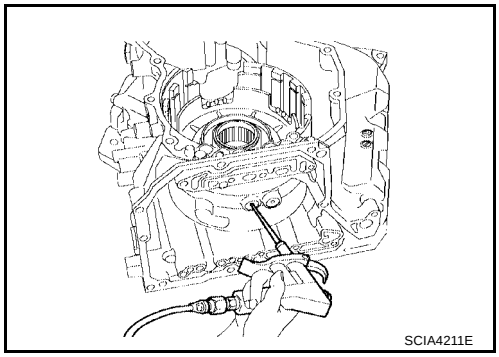
89. Remove snap ring using suitable tool.



90. Remove return spring.



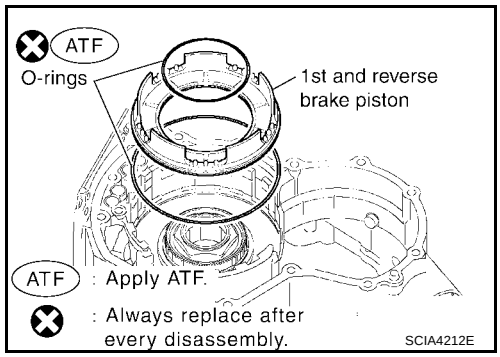
91. While pushing the piston by hand, apply compressed air (4Kg/cm^2) into the oil passage of transaxle case as shown in the figure and remove 1st and reverse brake piston.



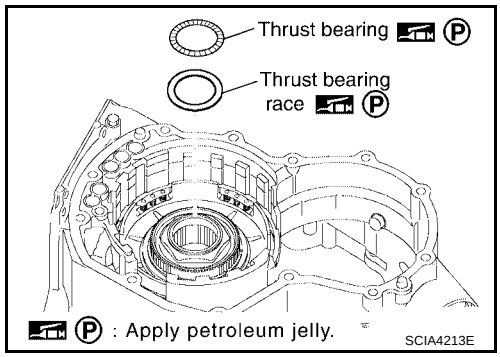
92. Remove O-rings from 1st and reverse brake piston.

CAUTION:

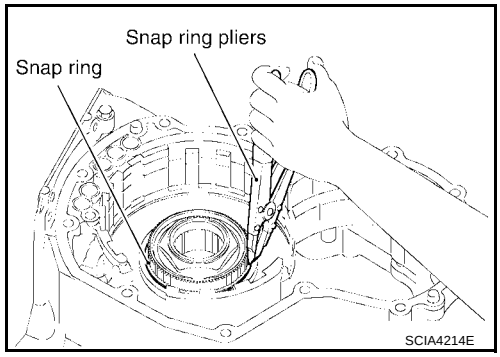
Do not reuse O-rings.



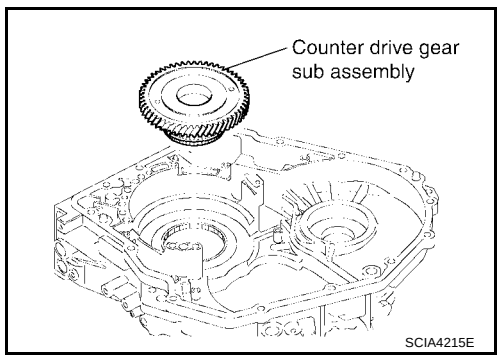
93. Remove thrust bearing and thrust bearing race from counter drive gear sub assembly.



94. Remove snap ring using suitable tool.



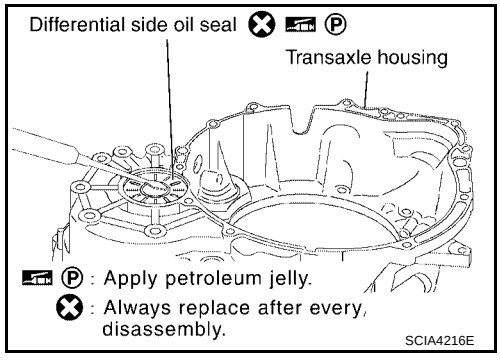
95. Remove counter drive gear sub assembly.

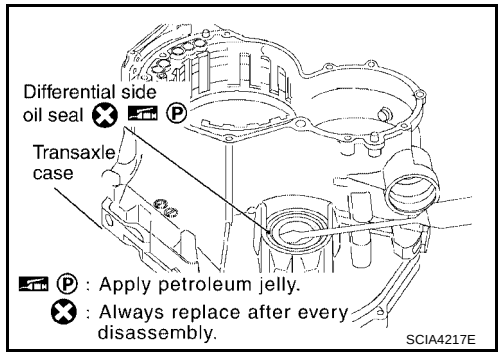


96. Remove differential side oil seal from transaxle case and transaxle housing using suitable tool.

CAUTION:

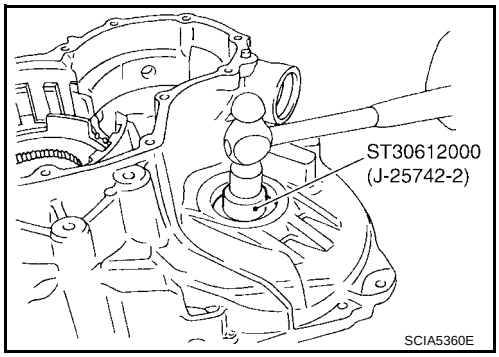
- **Do not reuse oil seals.**
- **Do not scratch transaxle case and transaxle housing.**





97. Remove outer race and adjust shim from transaxle case using Tool

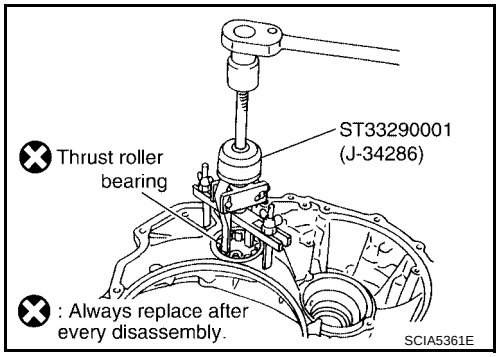
Tool number : ST30612000 (J-25745-2)



98. Remove thrust roller bearing from transaxle housing using Tool.

Tool number : ST33290001 (J-34286)

CAUTION:
Do not reuse thrust roller bearing.



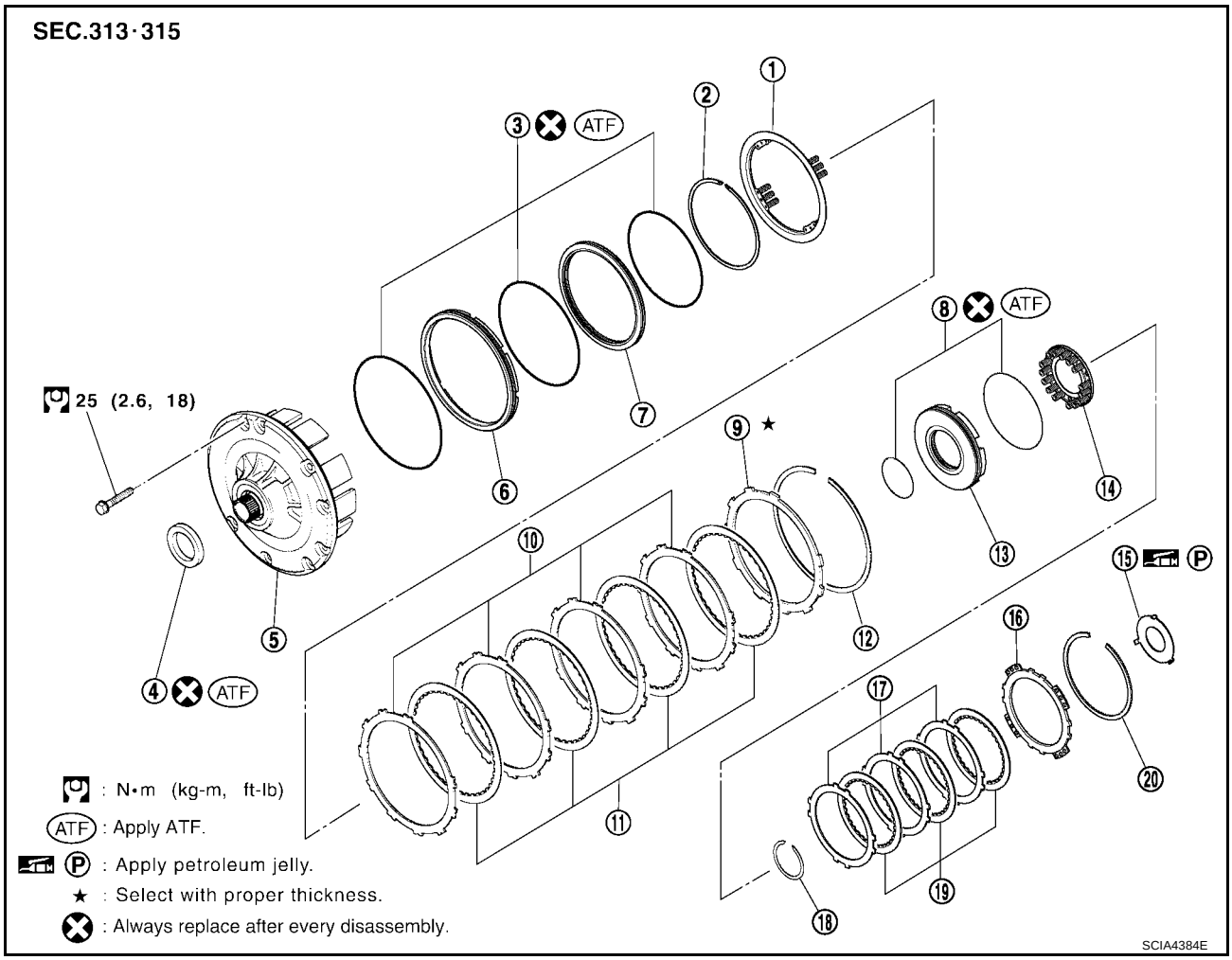
REPAIR FOR COMPONENT PARTS

PFP:00000

Oil Pump, 2nd Coast Brake & 2nd Brake

ECS00BUU

COMPONENTS



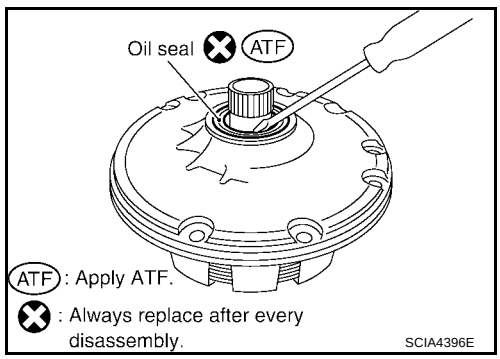
1. Return spring
2. Snap ring
3. O-ring
4. Oil seal
5. Oil pump assembly
6. 2nd brake piston
7. 2nd brake sleeve
8. O-ring
9. 2nd brake flange
10. 2nd brake plate
11. 2nd brake disc
12. Snap ring
13. 2nd coast brake piston
14. Return spring
15. Thrust washer
16. 2nd coast brake flange
17. 2nd coast brake plate
18. Snap ring
19. 2nd coast brake disc
20. Snap ring

DISASSEMBLY

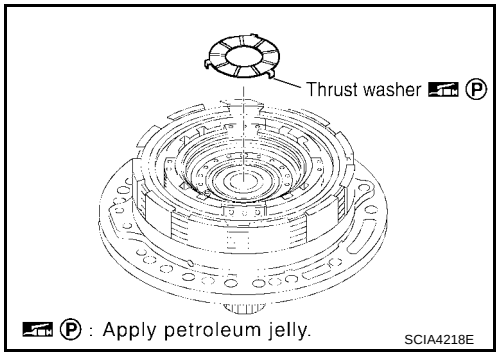
1. Remove oil seal from oil pump assembly using suitable tool.

CAUTION:

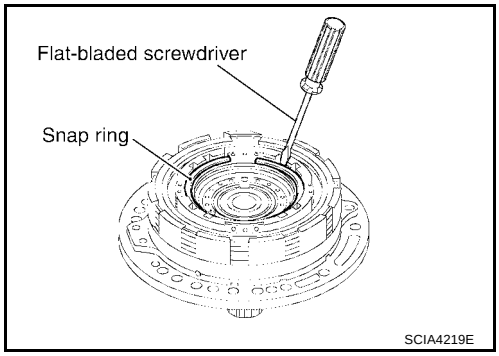
- **Do not reuse oil seal.**
- **Do not scratch oil pump assembly.**



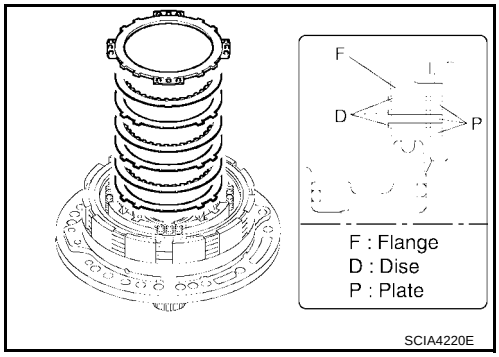
2. Remove thrust washer from oil pump assembly.



3. Remove snap ring using suitable tool.



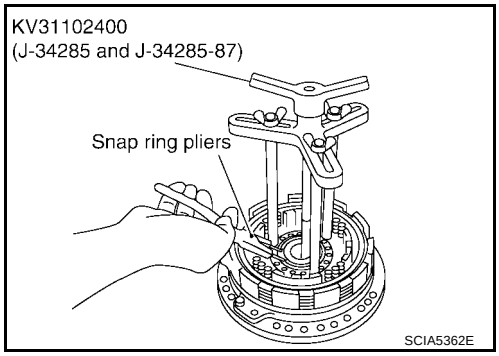
4. Remove 2nd coast brake flange, 2nd coast brake disc and 2nd coast brake plate.



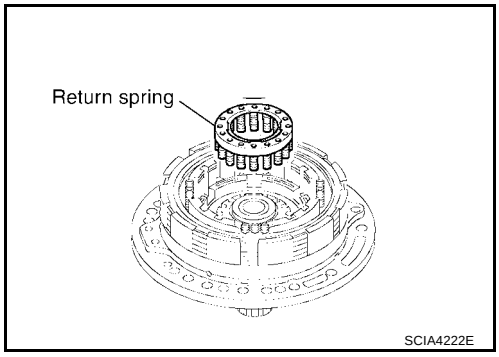
5. Compress return spring with a press using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

6. Remove snap ring using suitable tool.



7. Remove return spring.

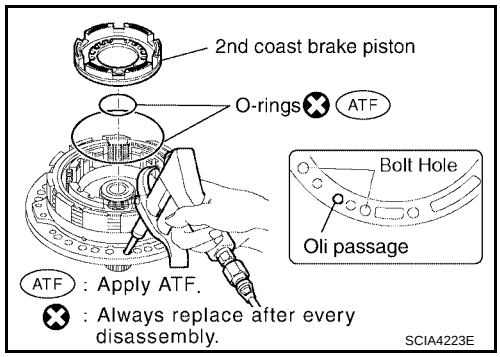


8. While pushing the 2nd coast brake piston by hand, apply compressed air (4kg/cm^2) into the oil passage as shown and remove 2nd coast brake piston.

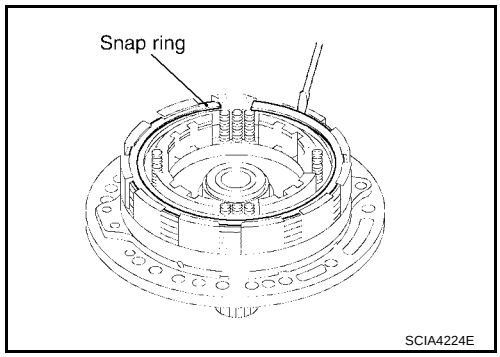
CAUTION:
Do not damage the O-ring and 2nd coast brake piston.

9. Remove O-rings from 2nd coast brake piston.

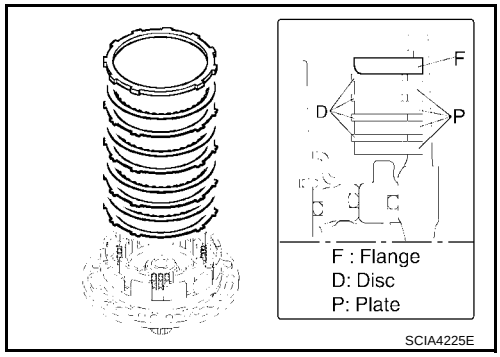
CAUTION:
Do not reuse O-rings.



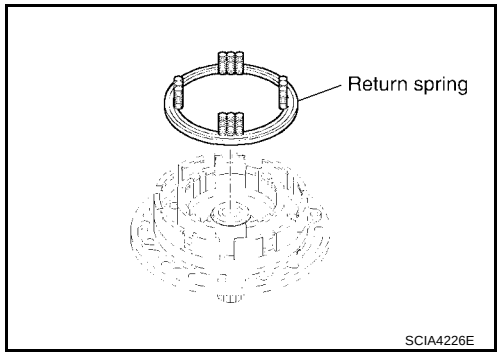
10. Remove snap ring using suitable tool.



11. Remove 2nd brake flange, 2nd brake discs and 2nd brake plates.

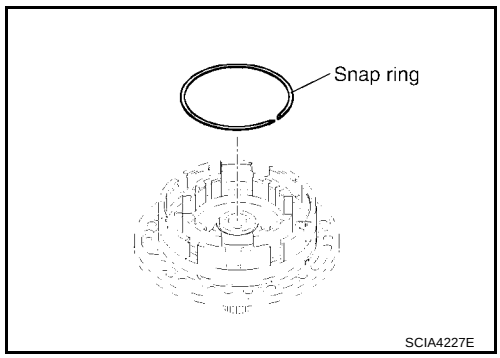


12. Remove return spring.



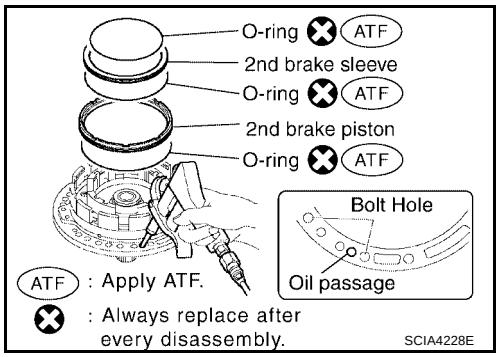
13. Remove snap ring using suitable tool.

CAUTION:
Do not damage oil pump assembly and 2nd brake piston.



14. While pushing the 2nd brake piston by hand, apply compressed air (4kg/cm^2) into the oil passage as shown and remove 2nd brake piston (With 2nd brake sleeve).

CAUTION:
Do not damage 2nd brake piston and 2nd brake sleeve.



15. Remove O-rings from 2nd brake piston and 2nd brake sleeve.

CAUTION:
Do not reuse O-rings.

INSPECTION

- Check that the sliding surface of disc and plate is not worn or burnt. If the disc or plate is worn or burnt, replace it

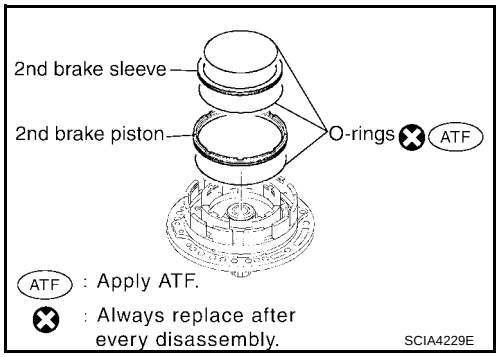
CAUTION:
Soak new clutch discs for at least 2 hours in ATF.

ASSEMBLY

1. Install new O-rings in 2nd brake sleeve and 2nd brake piston.

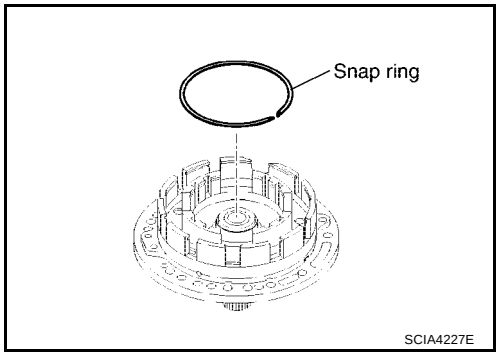
CAUTION:
- **Do not reuse O-ring.**
- **Apply ATF to new O-ring.**

2. Coat the inner surfaces of oil pump assembly with ATF.
3. Press 2nd brake piston and 2nd brake sleeve into oil pump assembly.

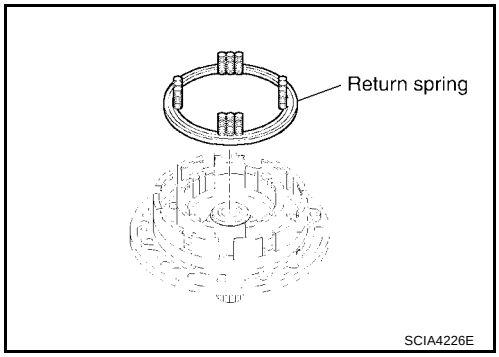


4. Install snap ring using suitable tool.

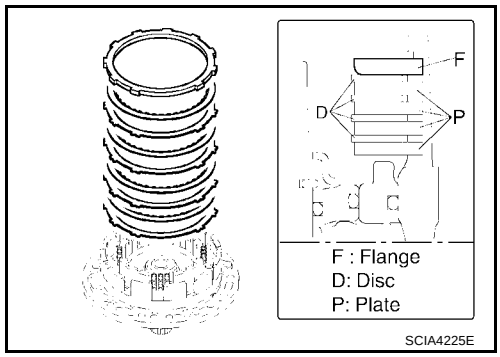
CAUTION:
Do not damage oil pump assembly.



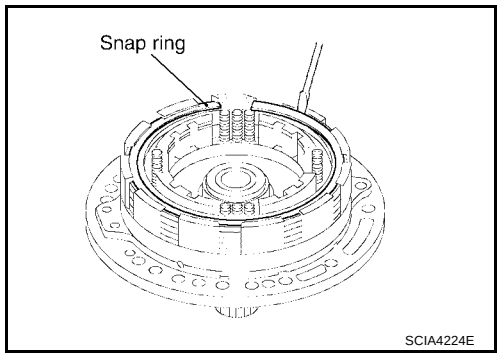
5. Place return spring on 2nd brake piston with the spring side up.



6. Install 2nd brake flange, 2nd brake discs and 2nd brake plates.



7. Install snap ring using suitable tool.

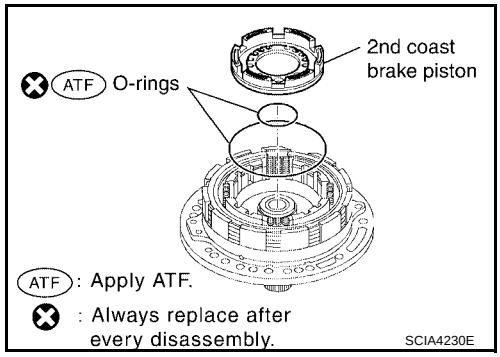


8. Install new O-rings in 2nd coast brake piston.

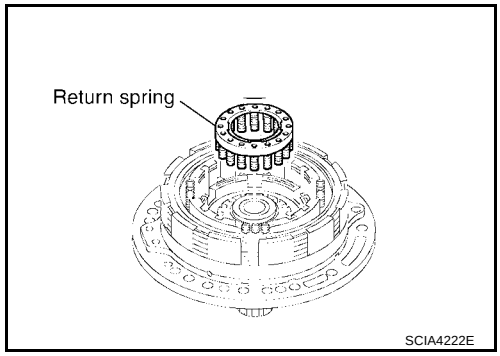
CAUTION:

- **Do not reuse O-rings.**
- **Apply ATF to new O-rings.**

9. Coat the inner surfaces of oil pump assembly with ATF.
10. Press 2nd coast brake piston into oil pump assembly.



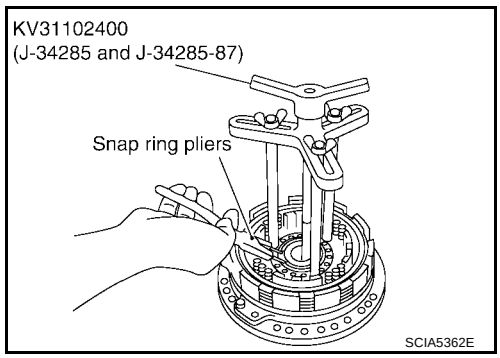
11. Install return spring.



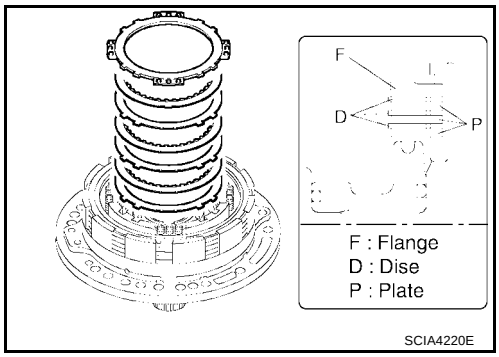
12. Compress return spring using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

13. Install snap ring using suitable tool.



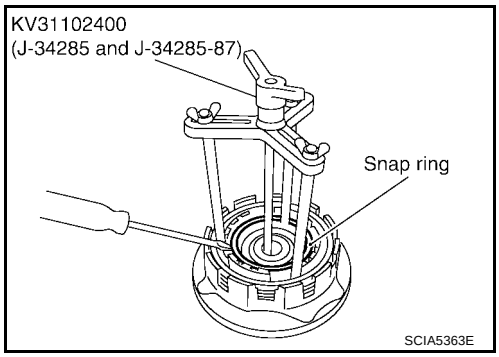
14. Install 2nd coast brake flange, 2nd coast brake disc and 2nd coast brake plate.



15. Compress return spring with a press using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

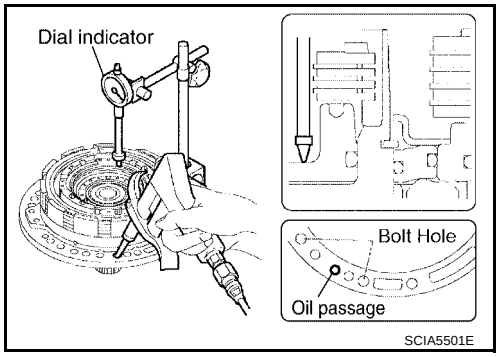
16. Install snap ring using suitable tool.



17. Set a dial indicator as shown.
18. When applying compressed air (4Kg/cm^2) into the oil passage as shown, measure 2nd brake piston stroke and check 2nd brake piston moves smoothly.

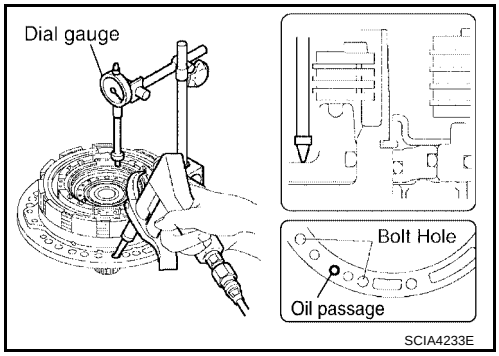
Piston stroke :1.10 - 1.50mm (0.0433 - 0.0591in)

If 2nd brake piston stroke is out standards, select another flange. Refer to AT-317, "2ND BRAKE" .



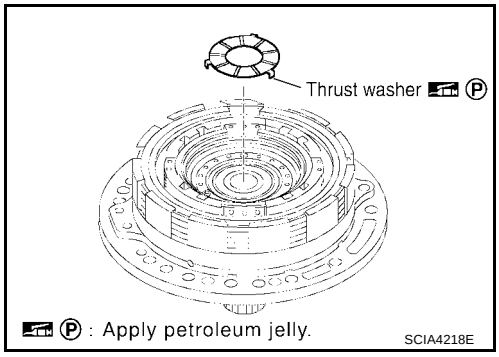
19. Set a dial indicator as shown.
20. When applying compressed air (4Kg/cm^2) into the oil passage as shown, measure 2nd coast brake piston stroke and check 2nd coast brake piston moves smoothly.

Piston stroke :0.76 - 1.44mm (0.0299 - 0.0567in)



21. Install thrust washer facing the flat surface up.

CAUTION:
Apply petroleum jelly to thrust washer.

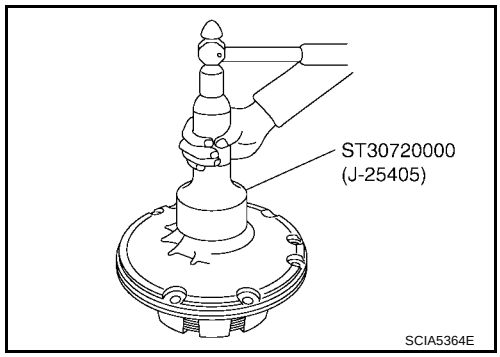


22. Install new oil seal into oil pump assembly until it is flush with the oil pump face using Tool.

Tool number : ST30720000 (J-25405)

CAUTION:

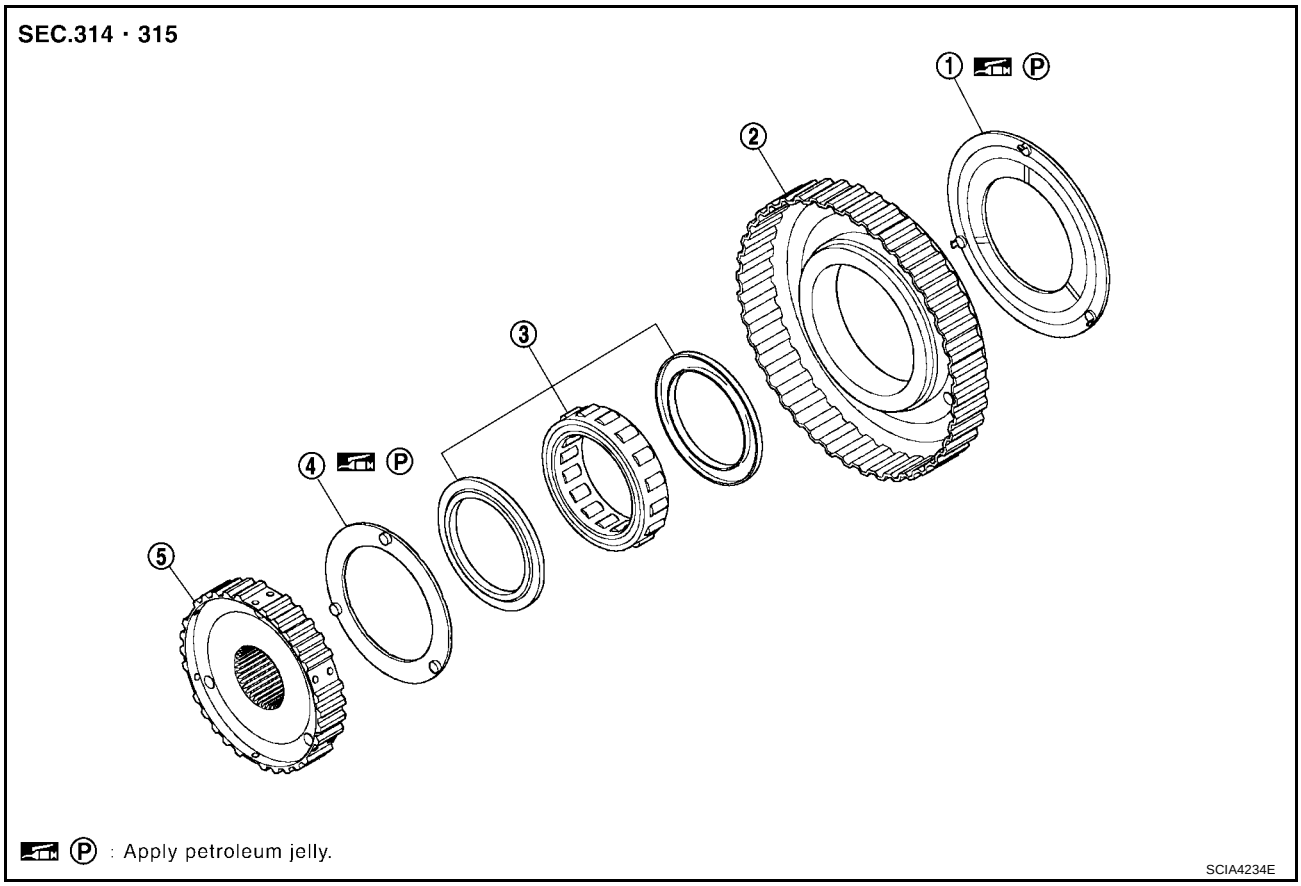
- **Do not reuse oil seal.**
- **Apply ATF to new oil seal.**



One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1

ECS00BUV

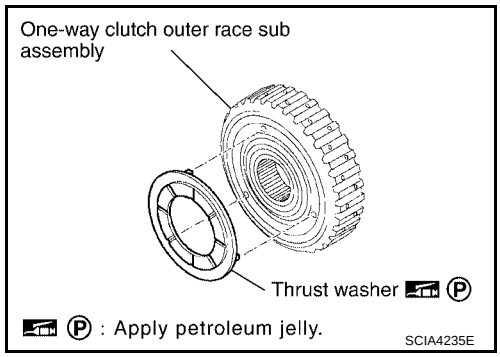
COMPONENTS



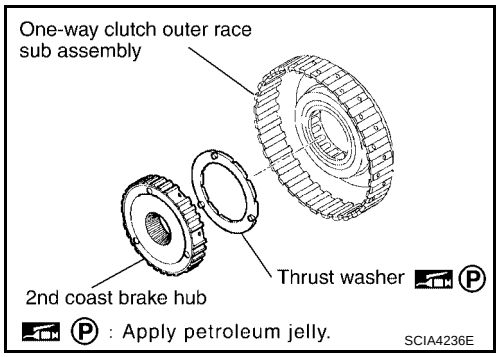
1. Thrust washer
2. One-way clutch outer race sub assembly
3. One-way clutch No.1
4. Thrust washer
5. 2nd coast brake hub

DISASSEMBLY

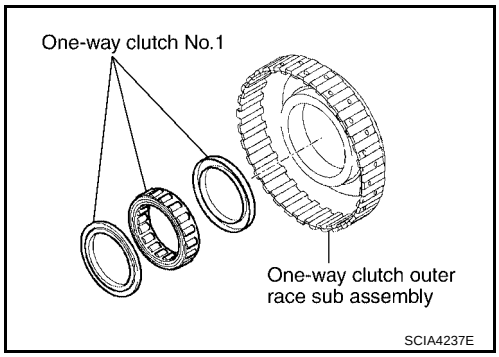
1. Remove thrust washer from one-way clutch outer race sub assembly.



2. Remove 2nd coast brake hub from one-way clutch outer race sub assembly.
3. Remove thrust washer from 2nd coast brake hub.



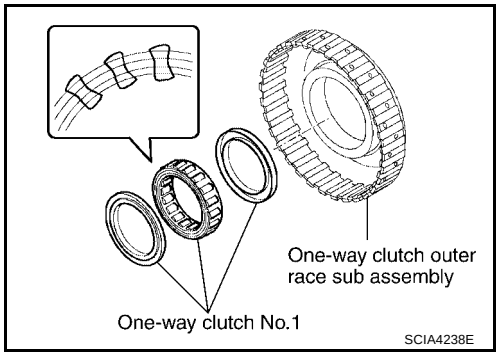
4. Remove one-way clutch No.1 from one-way clutch outer race sub assembly.



ASSEMBLY

1. Install one-way clutch No.1 into the one-way clutch outer race sub assembly.

   CAUTION:
   Take care with the direction of one-way clutch No.1.

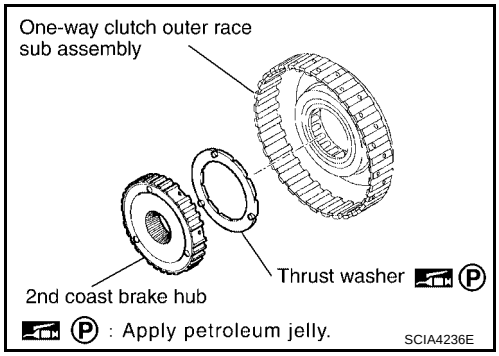


2. Install thrust washer into 2nd coast brake hub.

   CAUTION:
   - **Coat the thrust washer with grease.**
   - **Align the tab of the washer with the hollow of the 2nd coast brake hub.**

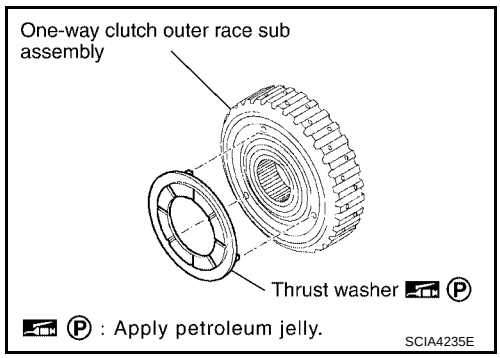
3. Install 2nd coast brake hub into one-way clutch outer race sub assembly.

   NOTE:
   While turning the 2nd coast brake hub, slide it into one-way clutch outer race sub assembly.



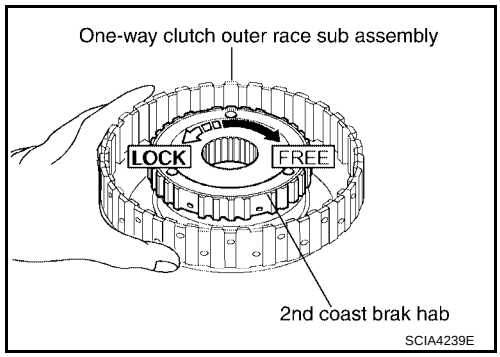
4. Coat the thrust washer with petroleum jelly. Align the tab of the washer with the hollow of the one-way clutch outer race sub assembly.

CAUTION:
Apply petroleum jelly to thrust washer.



INSPECTION

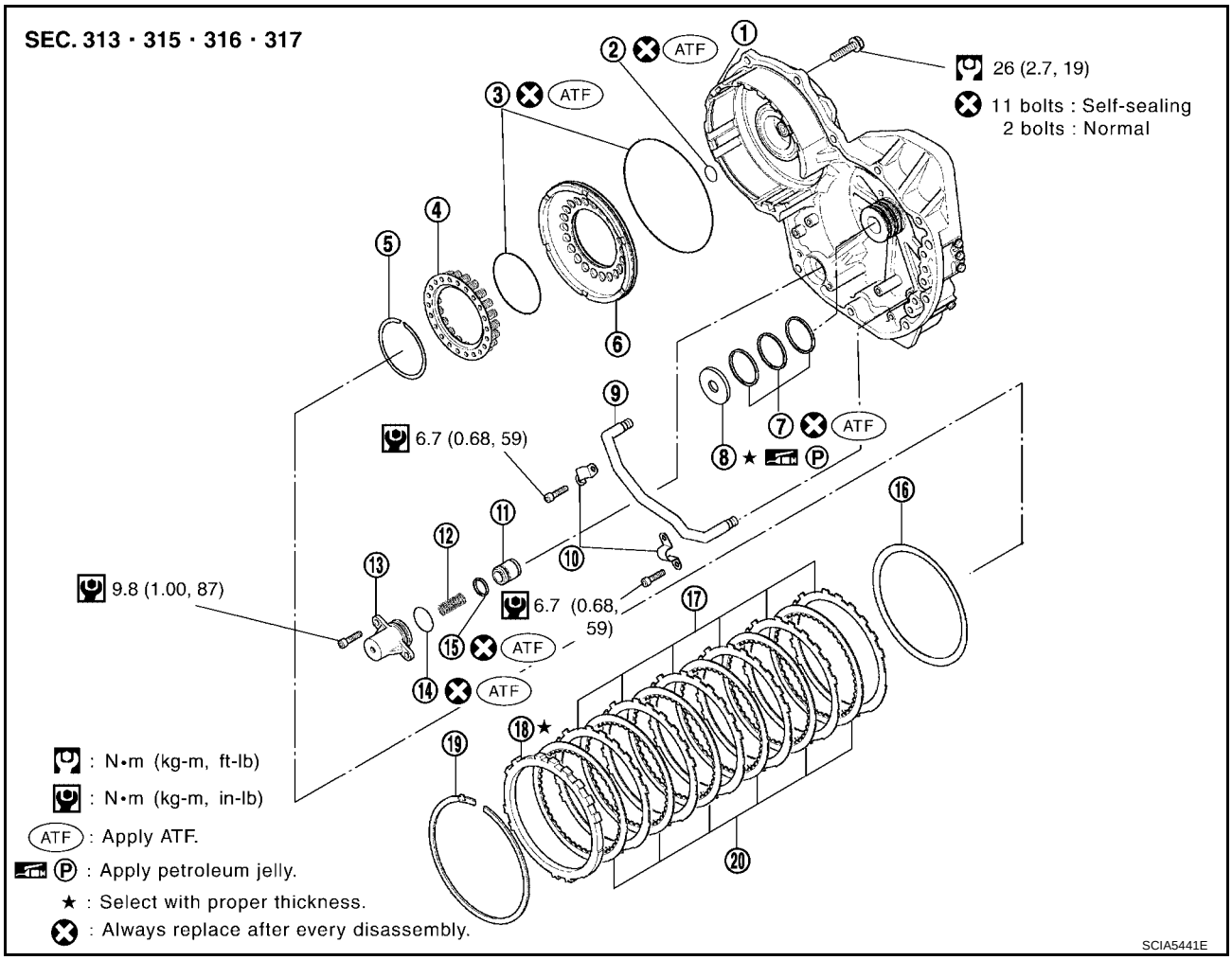
- Hold one-way clutch outer race sub assembly, and check that 2nd coast brake hub turns freely clockwise and locks counter-clockwise.



Transaxle Case Cover & B5 Brake

ECS00BUW

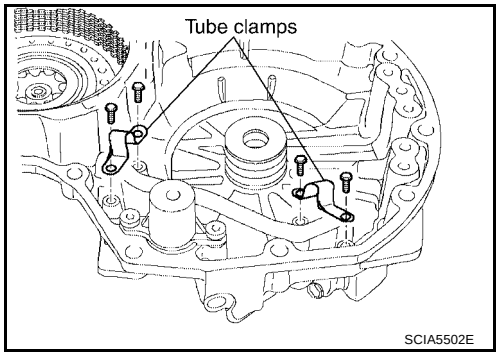
COMPONENTS



1. Transaxle case cover
2. Seal ring
3. O-ring
4. Return spring
5. Snap ring
6. B5 brake piston
7. Seal ring
8. Bearing race
9. U/D clutch apply tube sub assembly
10. Tube clamp
11. Forward clutch accumulator piston
12. Compression spring
13. Accumulator cover
14. O-ring
15. Seal ring
16. B5 brake cushion plate
17. B5 brake plate
18. B5 brake flange
19. Snap ring
20. B5 brake disc

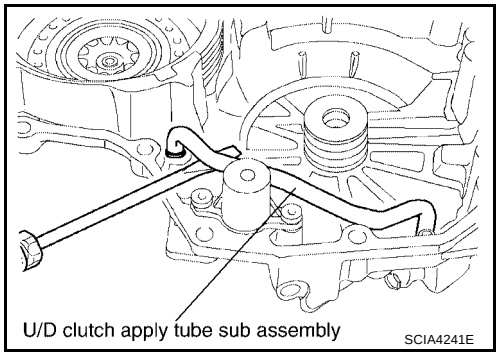
DISASSEMBLY

1. Remove tube clamps.



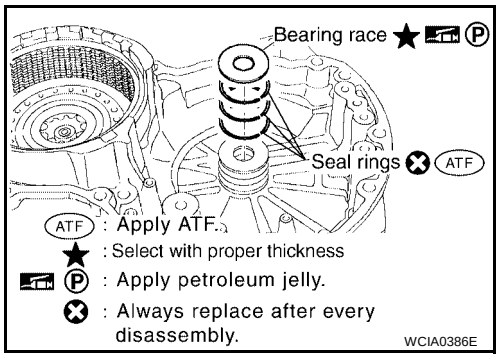
2. Remove U/D clutch apply tube sub assembly using suitable tool.

CAUTION:
Do not damage the U/D clutch apply tube sub assembly and transaxle case cover.



3. Remove bearing race and seal rings from transaxle case cover.

CAUTION:
Do not reuse seal rings.

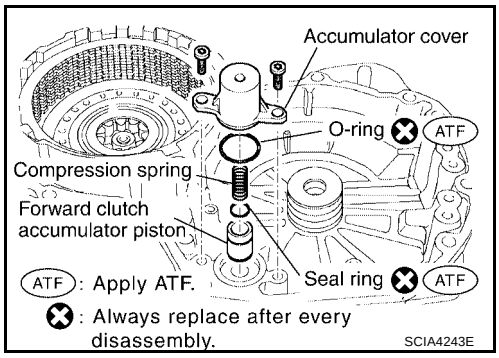


4. Remove accumulator cover, compression spring and forward clutch accumulator piston.
5. Remove O-ring from the accumulator cover.

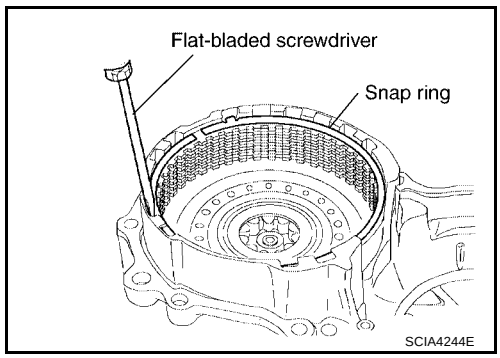
CAUTION:
Do not reuse O-ring.

6. Remove seal ring from the forward clutch accumulator piston.

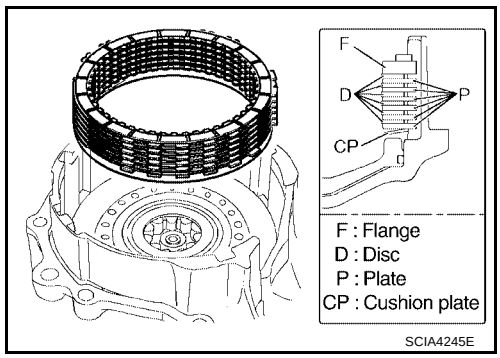
CAUTION:
Do not reuse seal ring.



7. Remove snap ring using suitable tool.



8. Remove B5 brake flange, B5 brake discs, B5 brake plates and B5 brake cushion plate.



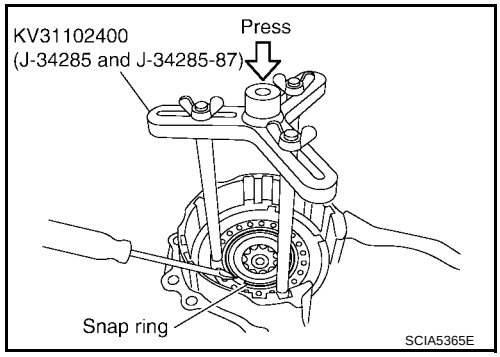
9. Compress return spring with a press using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

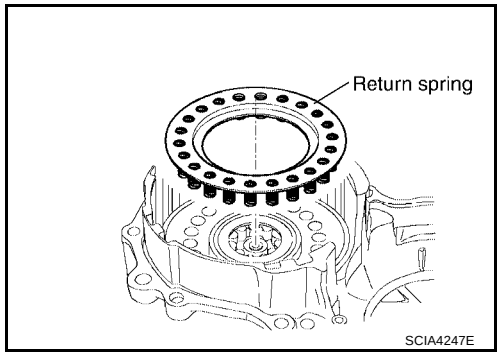
CAUTION:

Do not press return spring too much to avoid deformation.

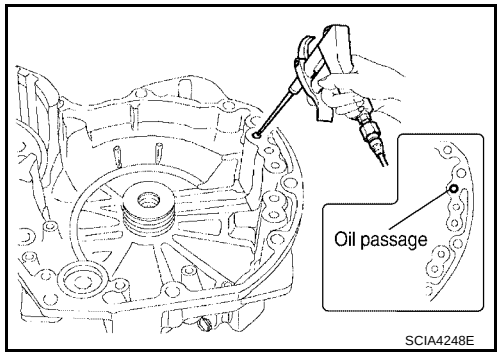
10. Remove snap ring using suitable tool.



11. Remove return spring.



12. While pushing B5 brake piston by hand, apply compressed air (4Kg/cm^2) into the oil passage as shown and remove B5 brake piston.

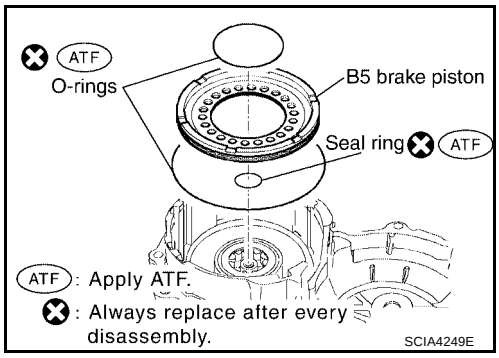


13. Remove O-rings from B5 brake piston.

CAUTION:
Do not reuse O-rings.

14. Remove seal ring from transaxle case cover.

CAUTION:
Do not reuse seal ring.



INSPECTION

- Check that the sliding surface of disc and plate is not worn or burnt. If the disc or plate is worn or burnt, replace it

CAUTION:
Soak new clutch discs for at least 2 hours in ATF.

ASSEMBLY

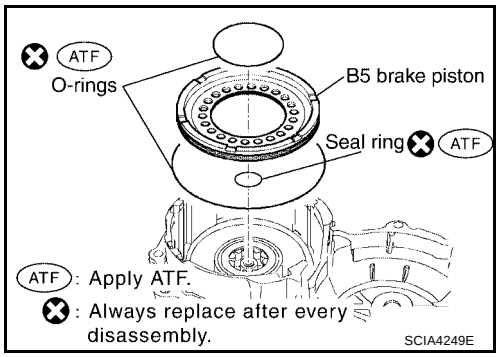
1. Install new seal ring in transaxle case cover.

CAUTION:
- **Do not reuse seal ring.**
- **Apply ATF to new seal ring.**

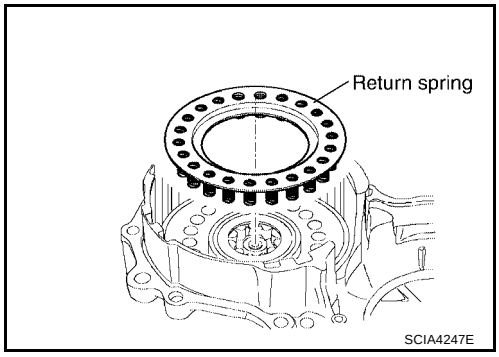
2. Install new O-rings in B5 brake piston.

CAUTION:
- **Do not reuse O-rings.**
- **Apply ATF to new O-rings.**

3. Coat the inner surface of transaxle case cover with ATF.
4. Press B5 brake piston into the transaxle case cover.



5. Place return spring on B5 brake piston.

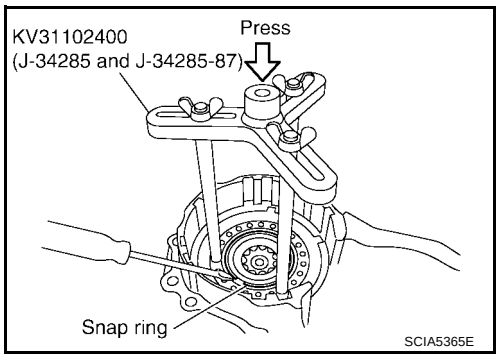


6. Compress return spring with a press using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

CAUTION:
Do not press return spring too much to avoid deformation.

7. Install snap ring using suitable tool.

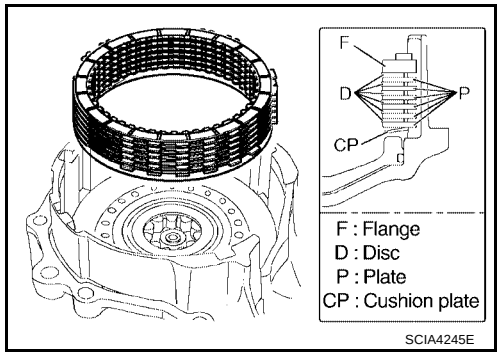


8. Install B5 brake cushion plate.

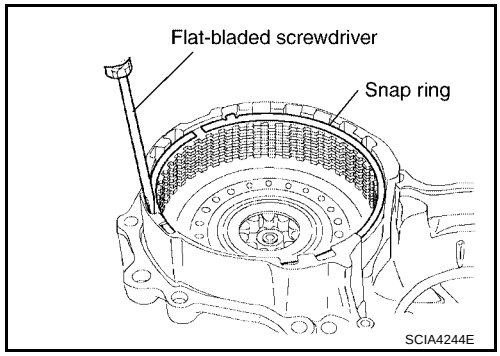
CAUTION:

Take care with direction of B5 brake cushion plate.

9. Install B5 brake flange, B5 brake plates and B5 brake discs as shown.



10. Install snap ring using suitable tool.



11. Install new O-ring in accumulator cover.

CAUTION:

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

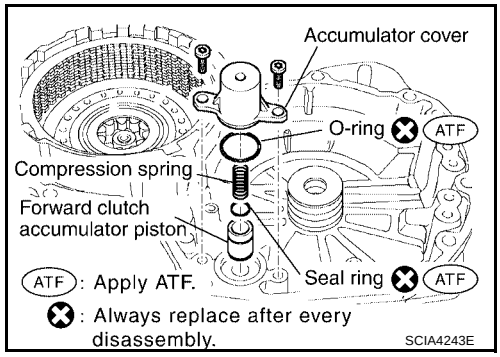
12. Install new seal ring in forward clutch accumulator piston.

CAUTION:

- **Do not reuse seal ring.**
- **Apply ATF to new seal ring.**

13. Install forward clutch accumulator piston, compression spring and accumulator cover in transaxle case cover.

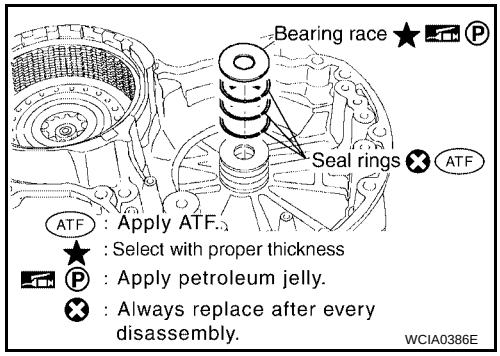
14. Tighten accumulator cover torx bolts to specified torque. Refer to AT-283, "COMPONENTS" .



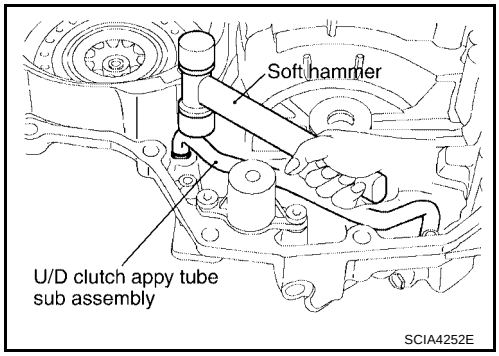
15. Install new seal rings and bearing race in transaxle case cover. Refer to AT-291, "ASSEMBLY" to select proper bearing race.

CAUTION:

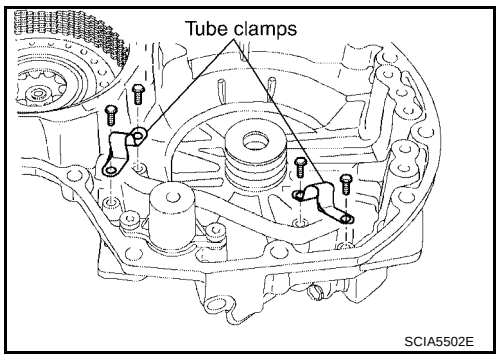
- **Do not reuse seal rings.**
- **Apply ATF to new O-rings.**



16. Install the U/D clutch apply tube sub assembly using suitable tool.



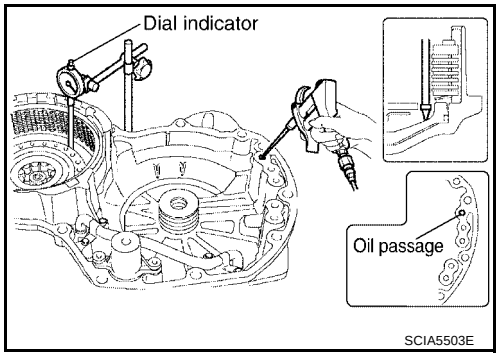
17. Tighten tube clamp bolts to specified torque. Refer to AT-283, "COMPONENTS" .



18. Set a dial indicator as shown.
19. When applying compressed air (4Kg/cm^2) into the oil passage as shown, measure the B5 brake piston stroke and check the B5 brake piston moves smoothly.

    Piston stroke :2.34 - 2.70mm (0.0921 - 0.1063in)

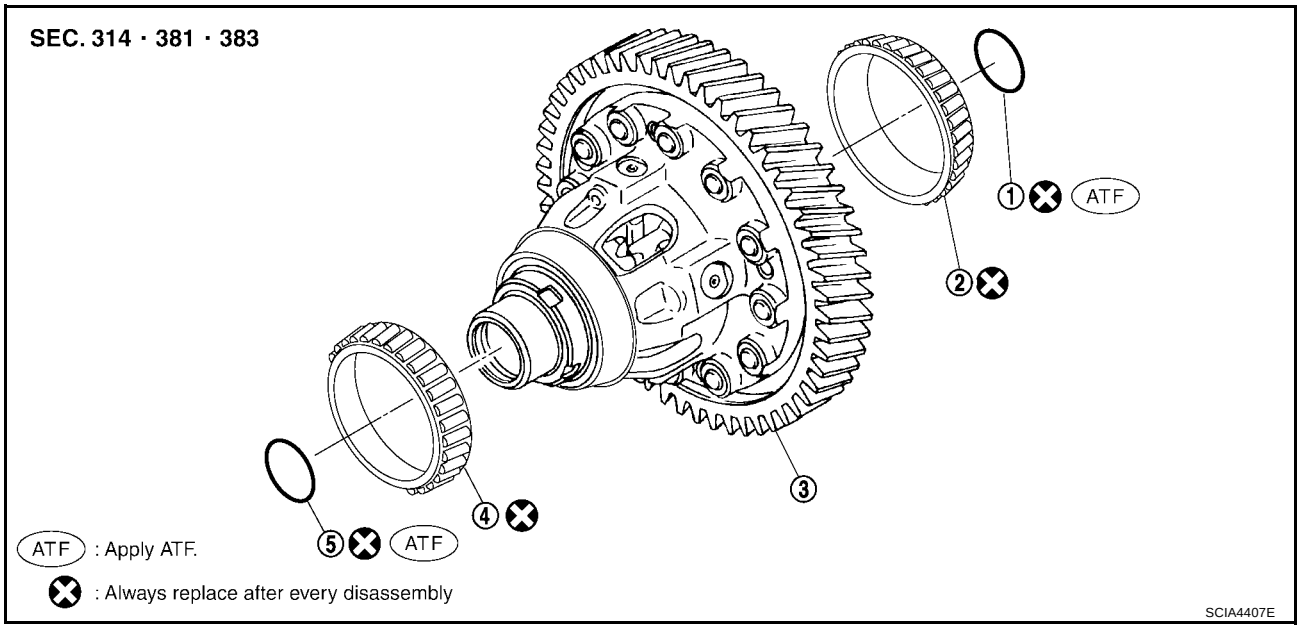
    If the B5 brake piston stroke is out standards, select another flange. Refer to AT-318, "B5 BRAKE" .



Differential Gear Assembly

ECS00BUX

COMPONENTS

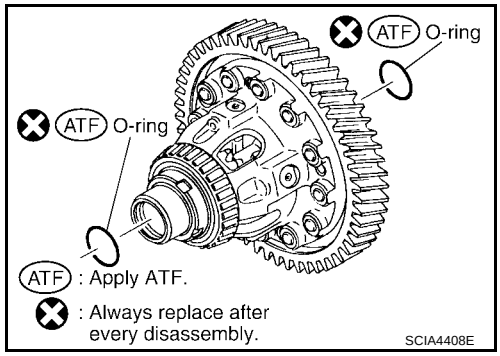


1. O-ring
2. Tapered roller bearing
3. Differential gear assembly
4. Tapered roller bearing
5. O-ring

DISASSEMBLY

1. Remove O-rings from differential gear assembly.

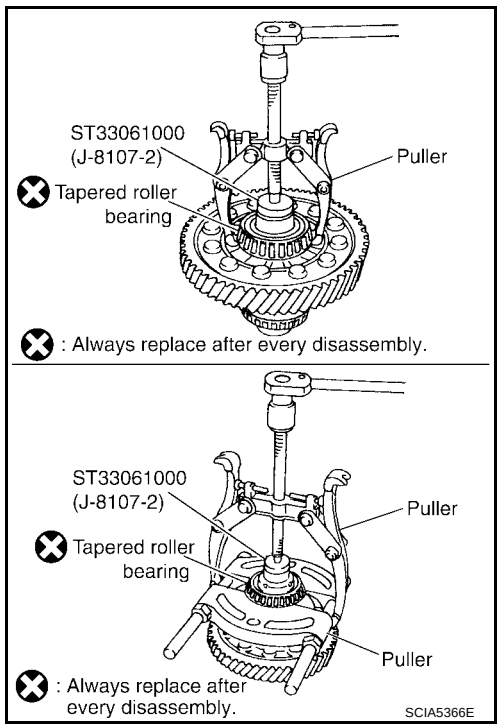
CAUTION:
Do not reuse O-rings.



2. Remove tapered roller bearings using Tool.

Tool number : ST33081000 (J-8107-2)

CAUTION:
Do not reuse tapered roller bearings.

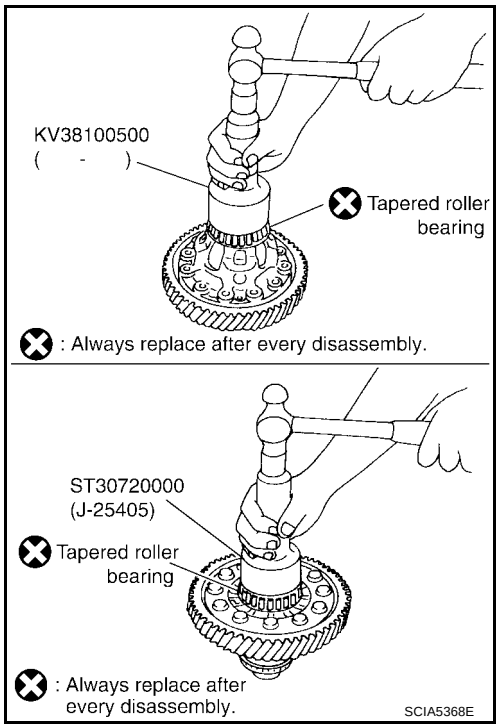


ASSEMBLY

1. Install new tapered roller bearings in differential gear assembly using Tools.

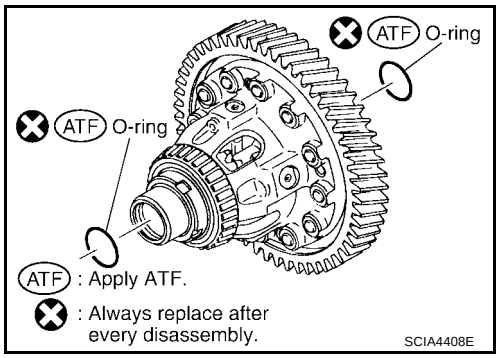
Tool number : KV38100500 (—)
: ST33720000 (J-25405)

CAUTION:
Do not reuse tapered roller bearings.



2. Install new O-rings in differential gear assembly.

CAUTION:
- **Do not reuse O-rings.**
- **Apply ATF to new O-rings.**



ASSEMBLY

PFP:00000

Assembly (1)

ECS00BUY

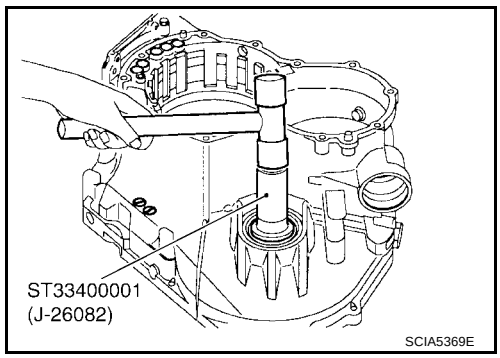
1. Install new differential side oil seal into transaxle case as specified using Tool.

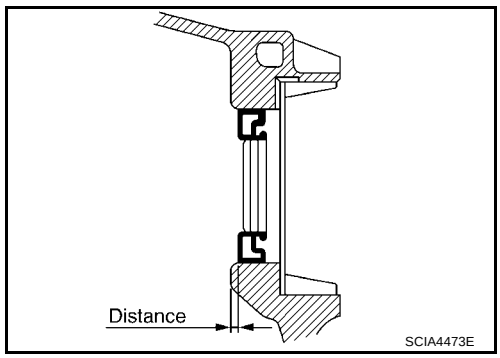
Tool number : ST33400001 (J-26082)

Distance : 3.0 - 4.0 mm (0.118 - 0.157 in)

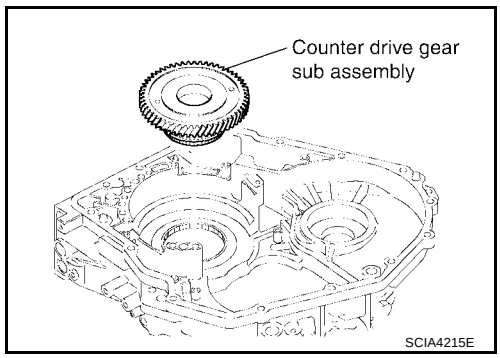
CAUTION:

- **Do not reuse differential side oil seal.**
- **Apply ATF to new differential side oil seal.**

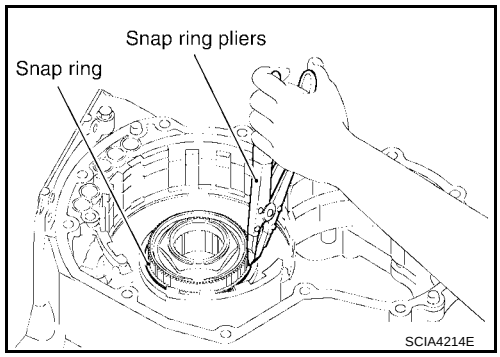




2. Install counter drive gear sub assembly.



3. Install snap ring using suitable tool.

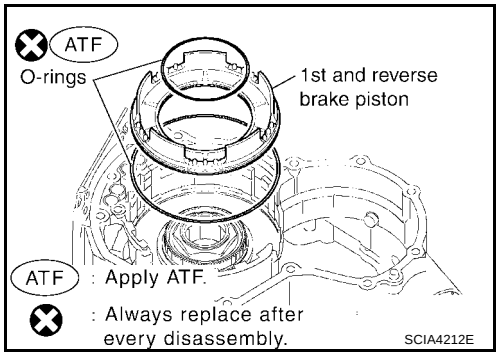


4. Install new O-rings in 1st and reverse brake piston.

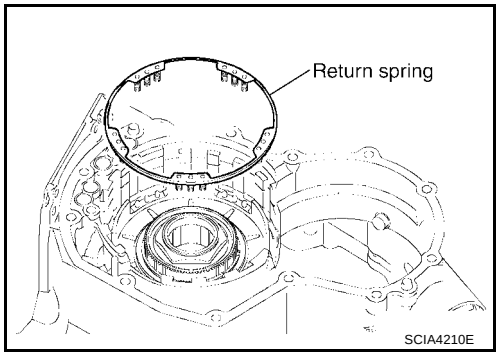
CAUTION:

- **Do not reuse O-rings.**
- **Apply ATF to new O-rings.**

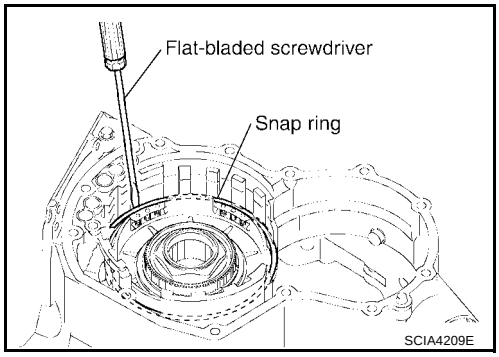
5. Coat the inner surface of transaxle case with ATF.
6. Install 1st and reverse brake piston in transaxle case.



7. Put return spring on 1st and reverse brake piston.



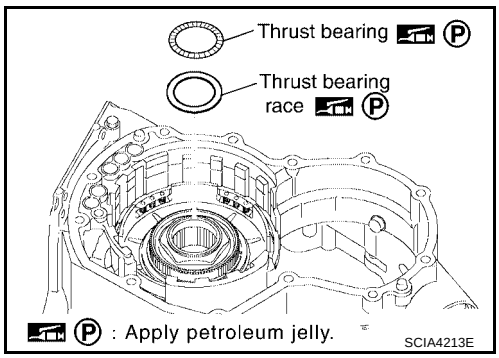
8. Install the snap ring into groove using suitable tool while compressing the return spring by hand.



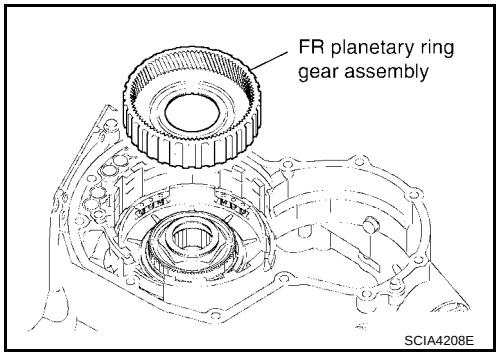
9. Put thrust bearing race and thrust bearing on counter drive gear sub assembly.

CAUTION:

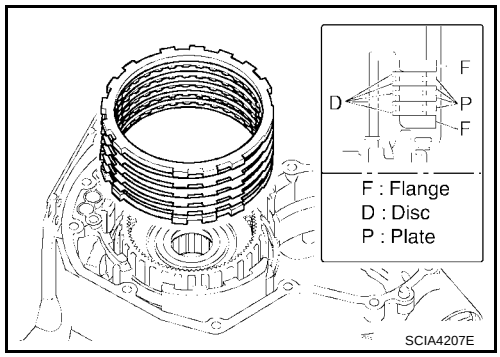
Apply petroleum jelly to thrust bearing and thrust bearing race.



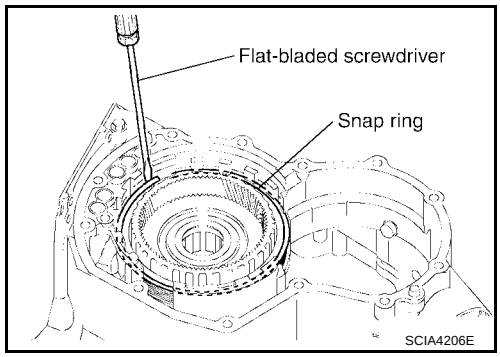
10. Install FR planetary ring gear assembly with one-way clutch No.2.



11. Install 1st and reverse brake flanges, 1st and reverse brake discs and 1st and reverse brake plates.



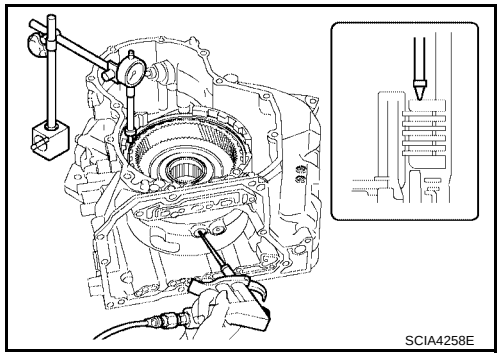
12. Install snap ring using suitable tool.



13. Set a dial indicator as shown.
14. Applying compressed air (4Kg/cm^2) and measure the 1st and reverse brake piston stroke.

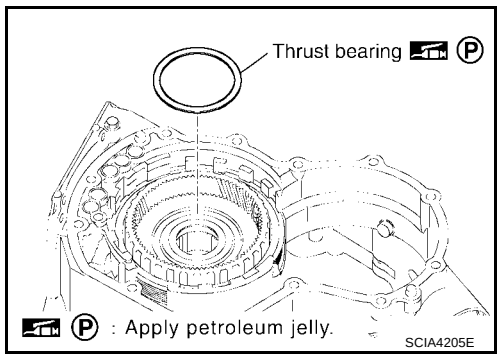
    Piston stroke : 1.39 - 2.21 mm (0.0547 - 0.0870 in)

    In a case that is out of reference, check the following items:
    - Oil pressure leak
    - Damage of O-ring
    - Wear damage of disc



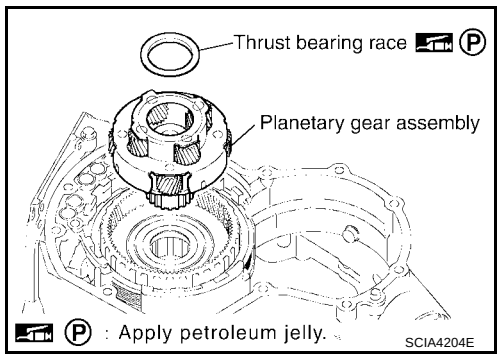
15. Install thrust bearing.

    CAUTION:
    Apply petroleum jelly to thrust bearing.



16. Install planetary gear assembly.
17. Install thrust bearing race in planetary gear assembly.

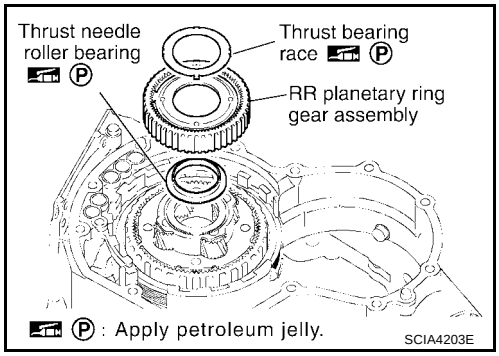
    CAUTION:
    Apply petroleum jelly to thrust bearing race.



18. Install thrust needle roller bearing and thrust bearing race in RR planetary ring gear assembly.

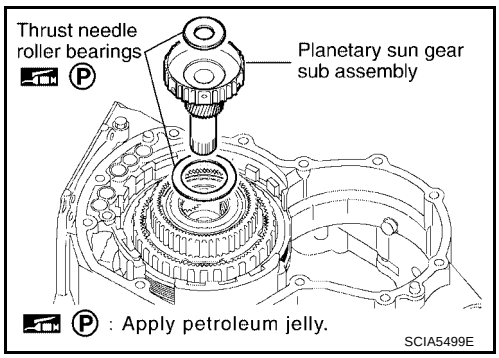
CAUTION:
Apply petroleum jelly to thrust needle roller bearing.

19. Install RR planetary ring gear assembly.



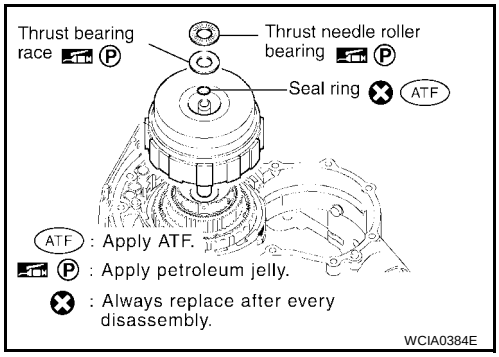
20. Install planetary sun gear sub assembly and thrust needle roller bearing.

CAUTION:
Apply petroleum jelly to thrust needle roller bearing.



21. Install forward and direct clutch assembly.
22. Install thrust bearing race, thrust needle roller bearing and new seal ring in forward and direct clutch assembly.

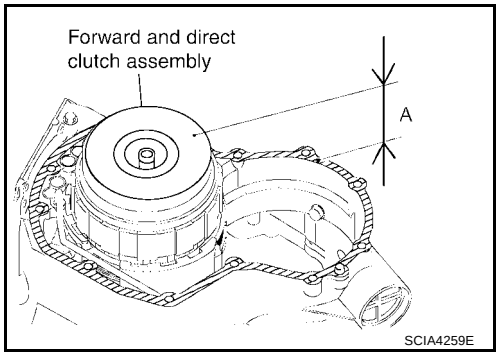
CAUTION:
- **Do not reuse seal ring.**
- **Apply ATF to new seal ring.**
- **Apply petroleum jelly to thrust needle roller bearing and thrust bearing race.**



23. Check the distance of “A”.

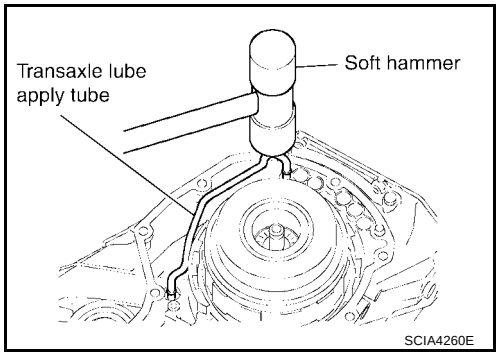
Dimension “A” : 50.850 - 51.825 mm (2.0020 - 2.0404 in)

CAUTION:
If the distance is out of standards, adjust within standards again.

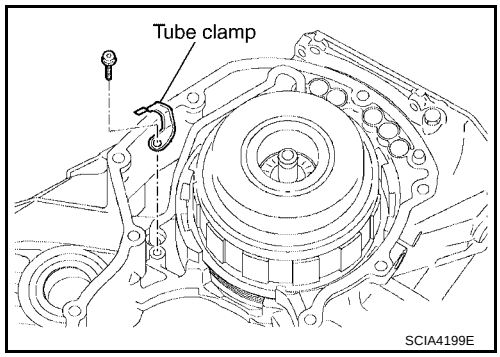


24. Install transaxle lube apply tube using suitable tool.

CAUTION:
Do not bend and damage transaxle lube apply tube.



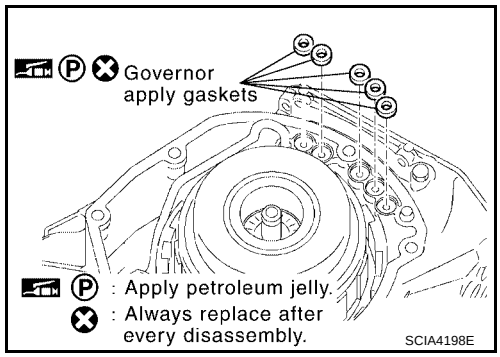
25. Tighten tube clamp bolt to specified torque. Refer to AT-249, "Components" .



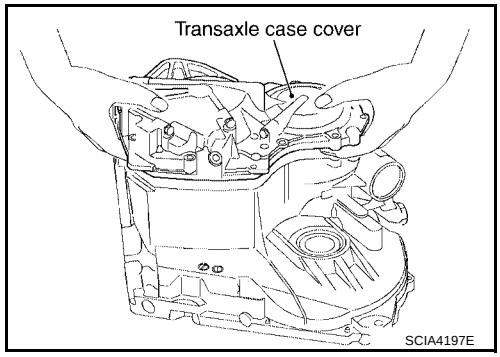
26. Install new governor apply gaskets in transaxle case.

CAUTION:

- **Do not reuse gaskets.**
- **Apply petroleum jelly to new gaskets.**



27. Install transaxle case cover in transaxle case.



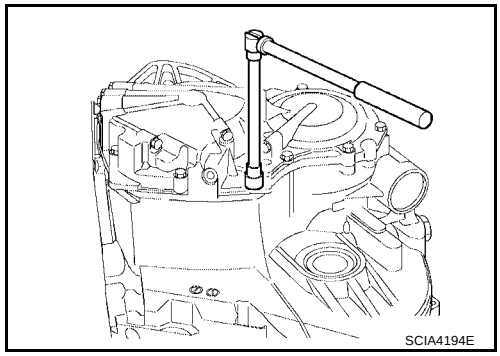
28. Tighten transaxle case cover bolts to specified torque. Refer to AT-249, "Components" .

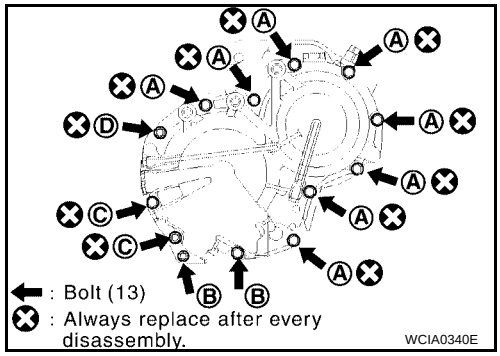
CAUTION:

Do not reuse seal bolts.

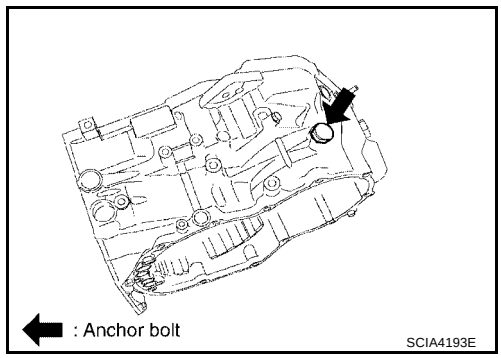
Bolt symbol	Length mm (in)	Number of bolts
A	30 (1.18)	8
B	45 (1.77)	2
C	48 (1.89)	2
D*	—	1

*:Stud bolt





29. Tighten anchor bolt to specified torque. Refer to AT-249, "Components" .

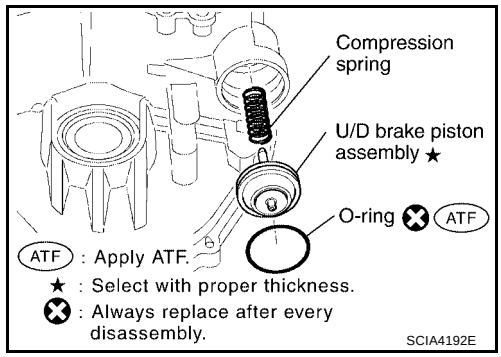


30. Install new O-ring in U/D brake piston assembly.

CAUTION:

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

31. Coat the inner surface of transaxle case with ATF.
32. Install compression spring and U/D brake piston assembly.

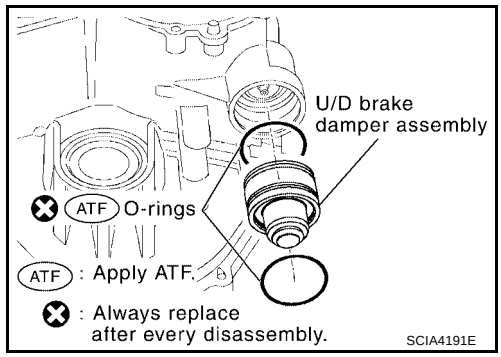


33. Install new O-rings in U/D brake damper assembly.

CAUTION:

- **Do not reuse O-rings.**
- **Apply ATF to new O-rings.**

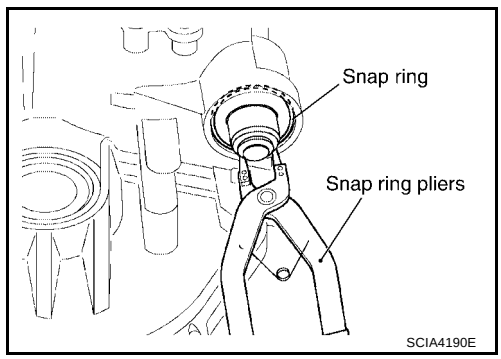
34. Install U/D brake damper assembly.



35. Install snap ring using suitable tool.

CAUTION:

If the snap ring is deformed, replace it.

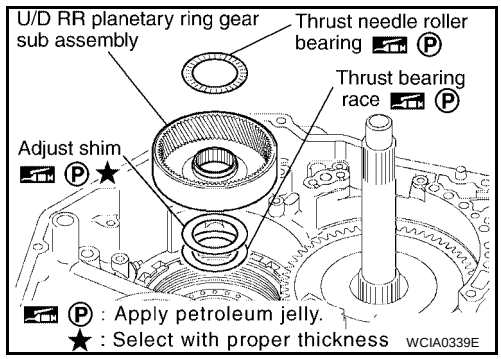


36. Install thrust needle roller bearing adjust shim and thrust bearing race in U/D RR planetary ring gear sub assembly.

CAUTION:

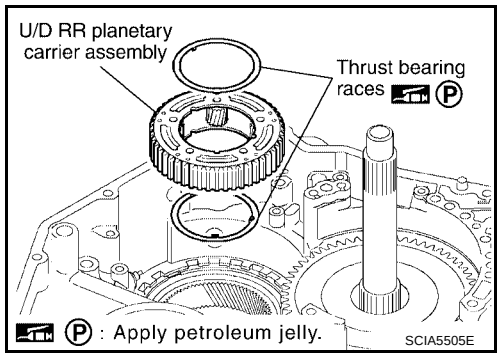
Apply petroleum jelly to adjust shim, thrust needle roller bearing and thrust bearing race.

37. Install U/D RR planetary ring gear sub assembly.

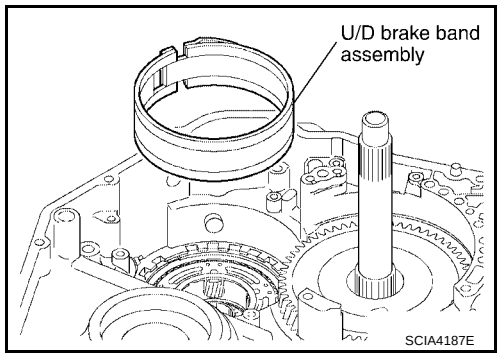


38. Install U/D RR planetary carrier assembly and thrust bearing races.

CAUTION:
Apply petroleum jelly to bearing races.



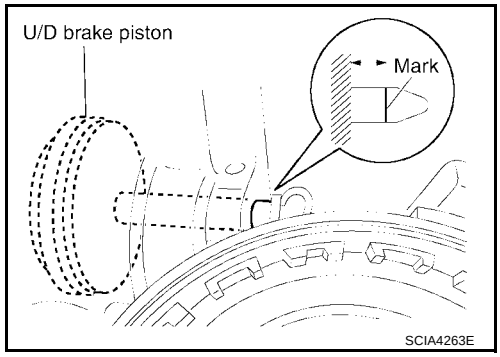
39. Install U/D brake band assembly.

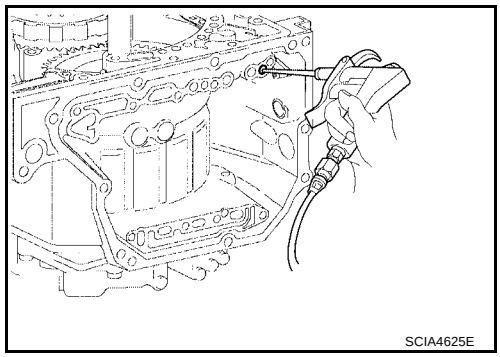


40. Measure the U/D brake piston stroke applying and releasing the compressed air (4Kg/cm^2) as shown.

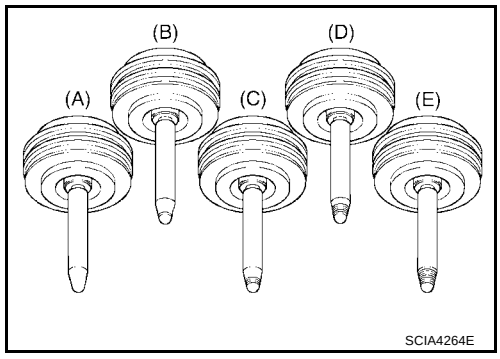
CAUTION:
Measure U/D brake piston stroke after assembling U/D clutch assembly.

Piston Stroke : 5.76 - 6.76 mm (0.2268 - 0.2661 in)





41. If the piston stroke is out of standards, select another U/D brake piston. Refer to AT-318, "U/D BRAKE" .



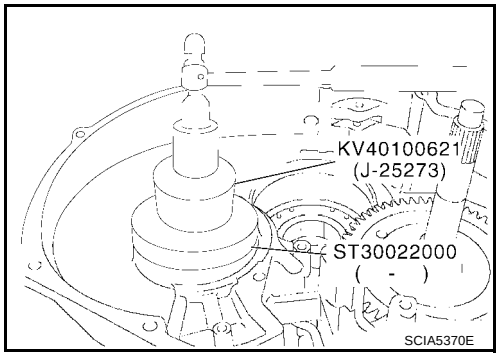
Adjustment

ECS00BUZ

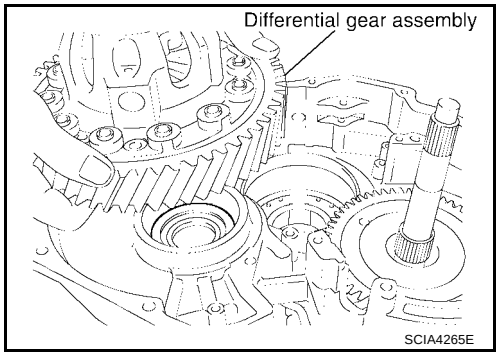
ADJUST PRELOAD OF TAPERED ROLLER BEARING

1. Install adjust shim and outer race in transaxle case using Tools.

Tool number : KV40100621 (J-25273)
: ST30022000 (—)

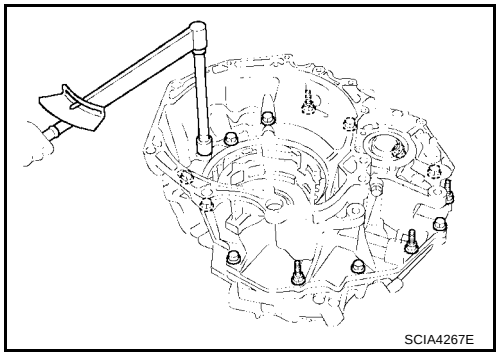


2. Install differential gear assembly in transaxle case.
3. Install transaxle housing into transaxle case.



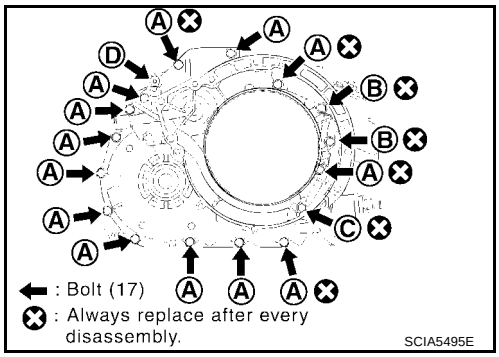
4. Tighten transaxle housing and transaxle case bolts to specified torque. Refer to AT-249, "Components" .

CAUTION:
Use old self-sealing bolts during preload checking and adjustment procedures.

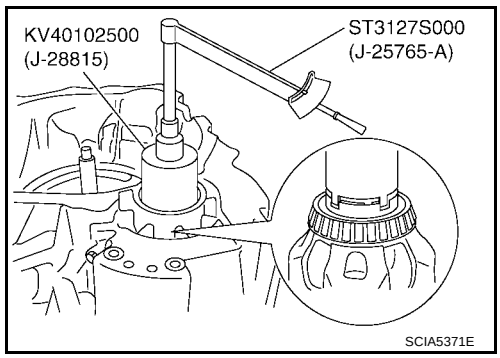


Bolt symbol	Length mm (in)	Number of bolts
A	30 (1.18)	13
B	35 (1.38)	2
C	45 (1.77)	1
D*	—	1

*:Torx bolt



5. Measure turning torque of differential gear assembly using Tools.



Tool number : KV40102500 (J-28815)
: ST3127S000 (J-25765-A)

6. Turn differential gear assembly in both directions several times to seat bearing rollers correctly.

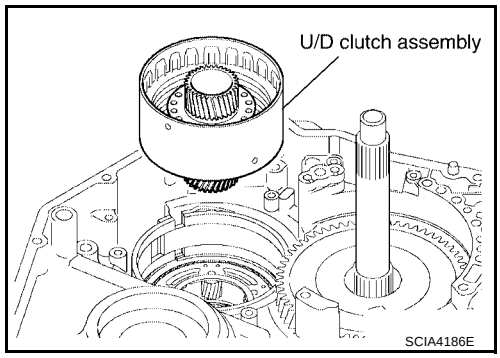
Turning torque : 0.7 - 1.2 N·m
(New bearing) (0.08 - 0.12kg-m, 7 - 10 in-lb)

If the preload is not within specification, remove differential gear assembly from transaxle case. Re-select adjust shim. Refer to AT-318, "DIFFERENTIAL SIDE BEARING ADJUSTING SHIMS" .

Assembly (2)

ECS00BV0

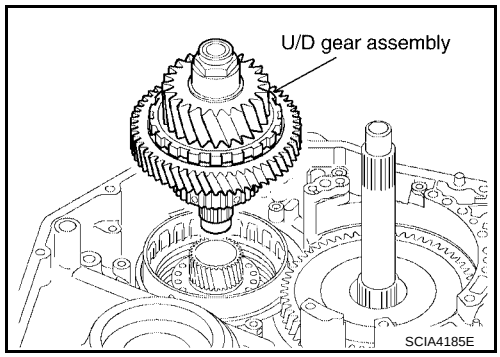
1. Remove transaxle housing and differential gear assembly from transaxle case.
2. Install U/D clutch assembly.



3. Install new seal rings in U/D gear assembly.

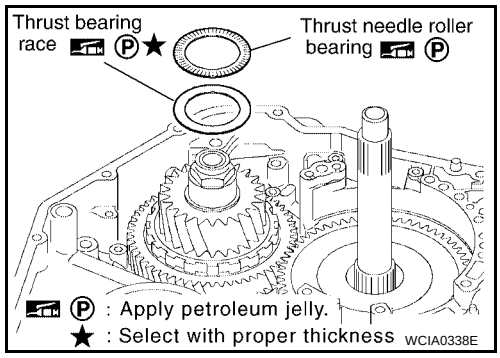
CAUTION:
- **Do not reuse seal rings.**
- **Apply ATF to new seal rings.**

4. Install U/D gear assembly.



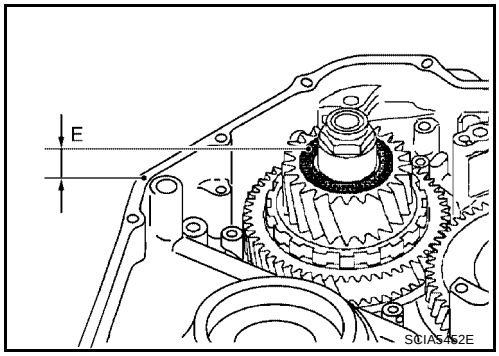
5. Install thrust needle roller bearing and thrust bearing race in U/D gear assembly.

CAUTION:
Apply petroleum jelly to thrust needle roller bearing and thrust bearing race.

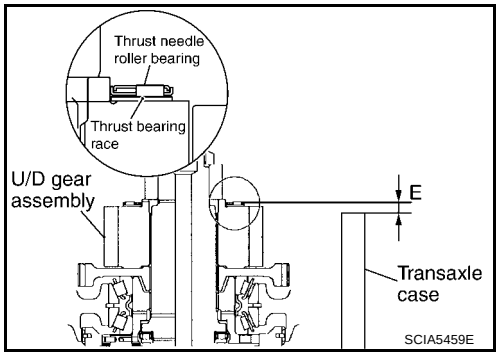


a. Make sure that measurement ″E″ is within the specifications.

Specification ″E″ : 1.269 - 1.645 mm (0.0500 - 0.0648 in)



NOTE:
″E″ is the height between the edge of the transaxle case and the roller part of thrust needle roller bearing.

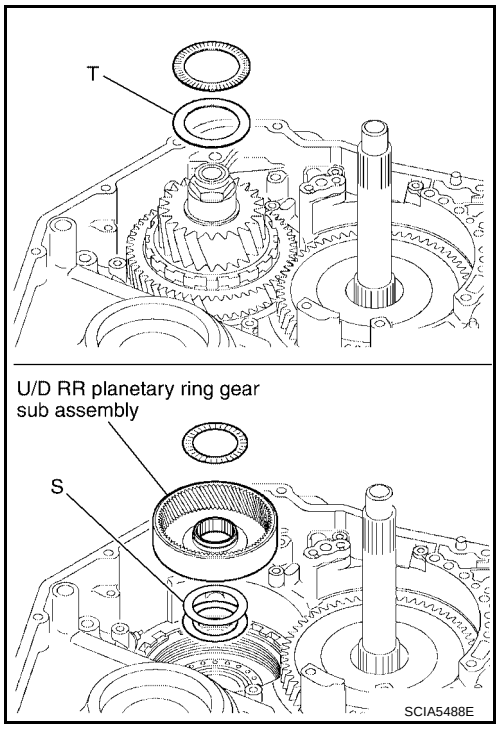


b. If measurement ″E″ is outside the specification, replace ″T″ with one that has applicable thickness. Refer to AT-318, "U/D BRAKE" .

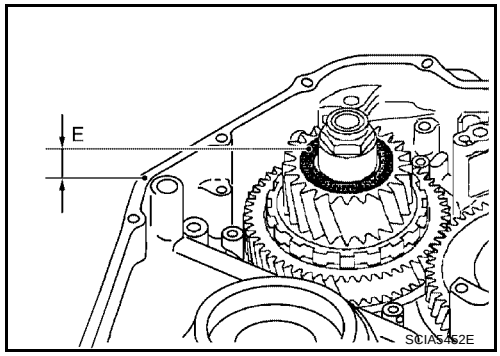
CAUTION:
When adjusting ″T″, use ″S″ of thickness 0.81 mm (0.32 in).

c. If all of ″T″ do not fit ″E″ within the specifications, replace ″S″ with one that has applicable thickness. Refer to AT-318, "U/D BRAKE" .

CAUTION:
When adjusting ″S″, use ″T″ of thickness 0.80 mm (0.31 in).



d. Make sure that measurement "E" is within specifications.

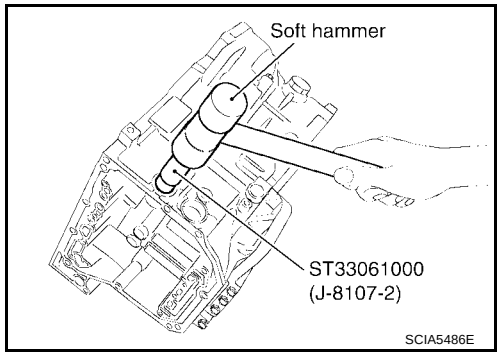


6. Install new manual valve oil seal into transaxle case until it is flush with the transaxle case face, using Tool.

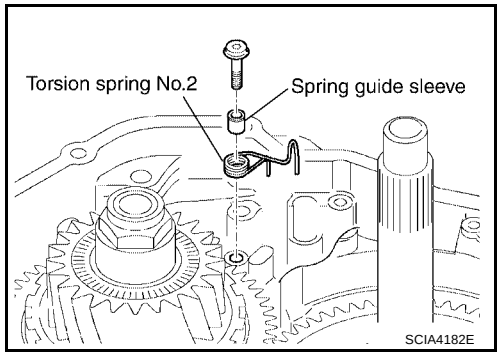
Tool number : ST33061000 (J-8107-2)

CAUTION:

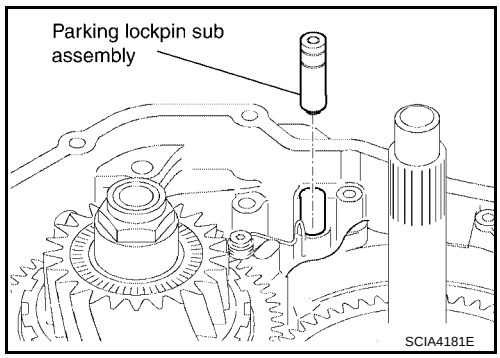
- **Do not reuse manual valve oil seal.**
- **Apply ATF to new manual valve oil seal.**



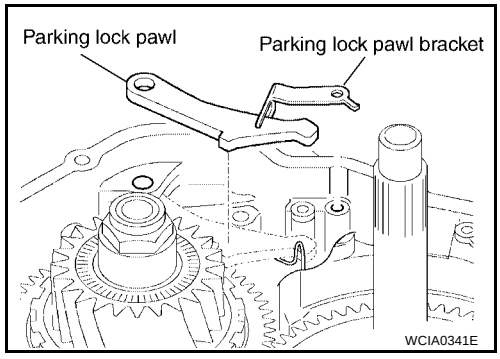
7. Install spring guide sleeve and torsion spring No.2 in transaxle case.
8. Tighten spring guide sleeve and torsion spring No.2 torx bolt to specified torque. Refer to AT-249, "Components" .



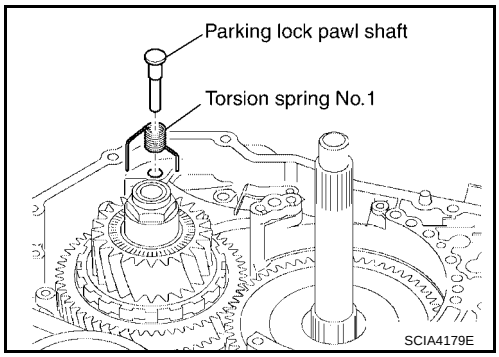
9. Install parking lockpin sub assembly.



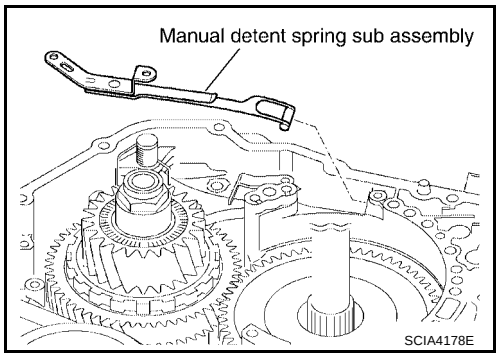
10. Install parking lock pawl bracket and parking lock pawl.



11. Install parking lock pawl shaft and torsion spring No.1.

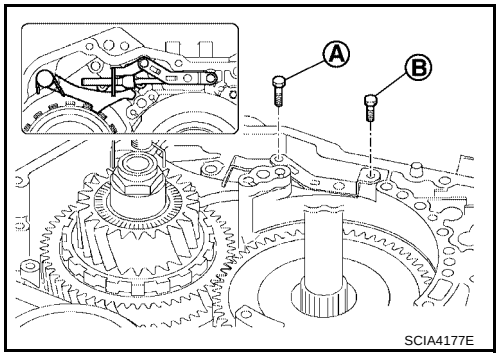


12. Install manual detent spring sub assembly.

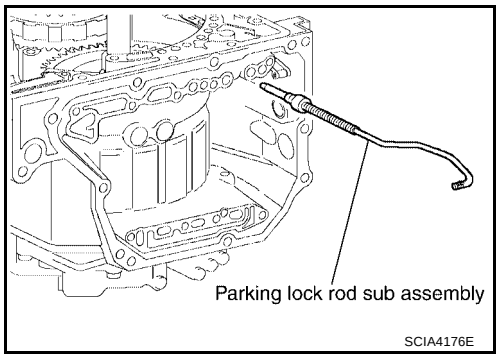


13. Temporary tightening the bolts.

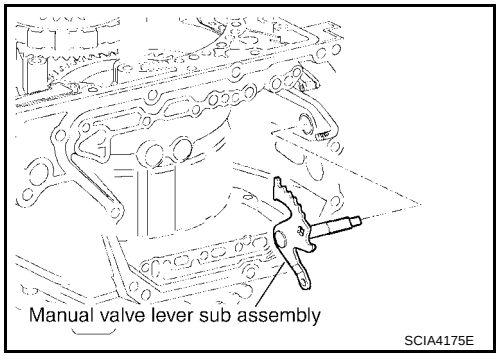
Bolt symbol	Length mm (in)	Number of bolts
A	16.7 (0.657)	1
B	14.0 (0.551)	1



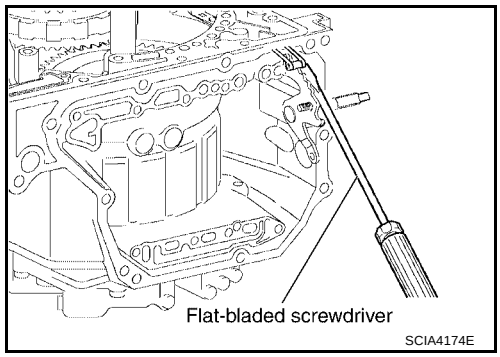
14. Install parking lock rod sub assembly.



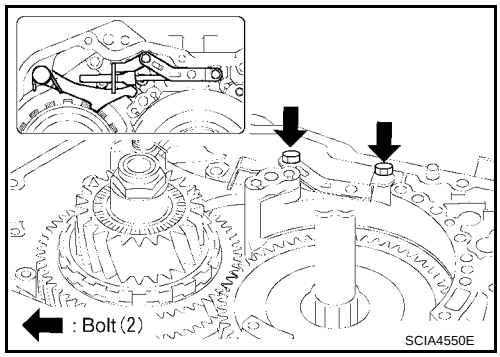
15. Install manual valve lever sub assembly connect parking lock rod sub assembly to it.



16. Connect manual detent spring sub assembly to manual valve lever sub assembly using suitable tool.



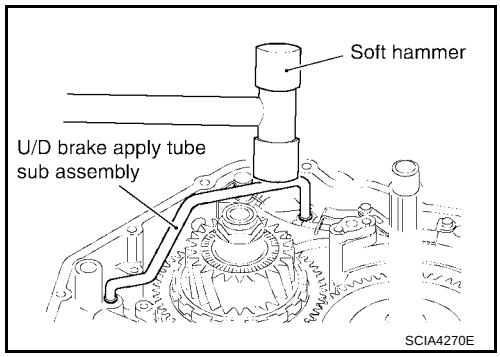
17. Tighten manual detent spring sub assembly bolts to specified torque. Refer to AT-249, "Components" .



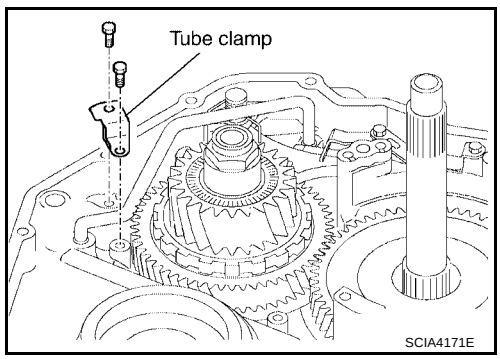
18. Install U/D brake apply tube sub assembly using suitable tool.

CAUTION:

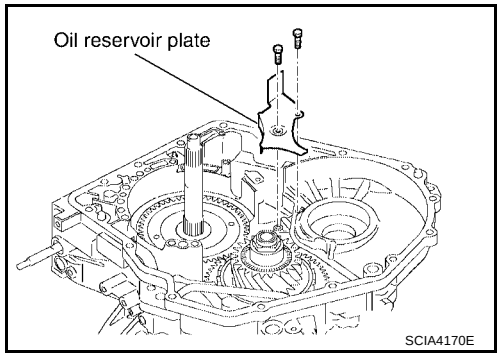
Do not damage U/D brake apply tube sub assembly.



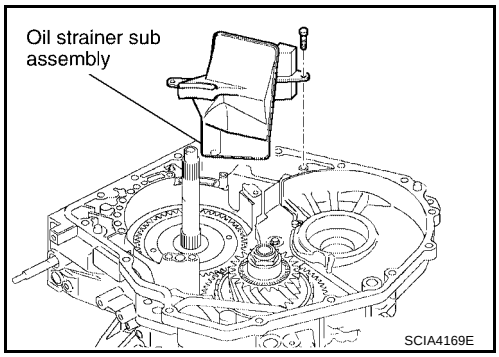
19. Tighten tube clamp bolts to specified torque. Refer to AT-249, "Components" .



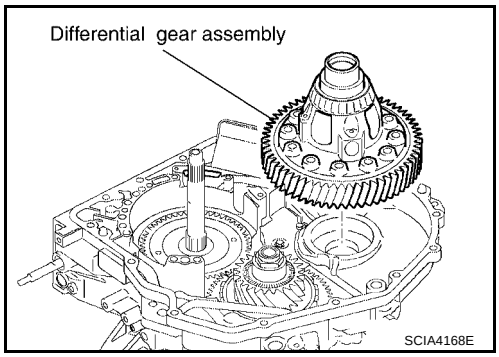
20. Install oil reservoir plate in transaxle case.
21. Tighten oil reservoir plate bolts to specified torque. Refer to AT-249, "Components" .



22. Install oil strainer sub assembly in transaxle case.
23. Tighten oil strainer sub assembly bolt to specified torque. Refer to AT-249, "Components" .



24. Install differential gear assembly.

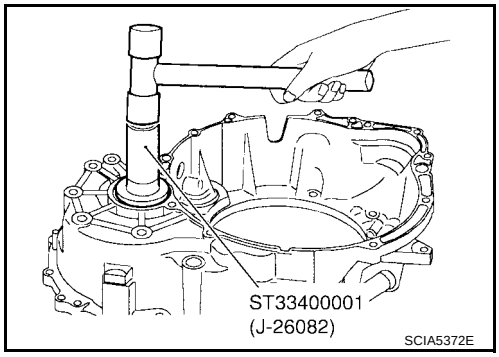


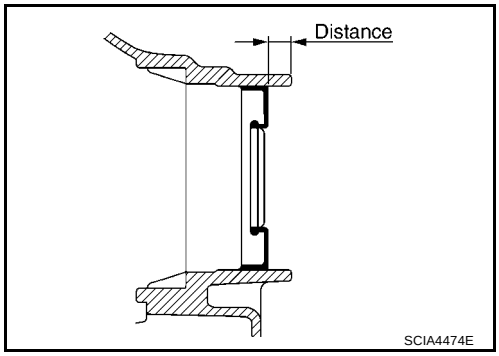
25. Install new differential side oil seal into transaxle housing as specified using Tool.

Tool number : ST33400001 (J-26082)

Distance : 14.8 - 15.8 mm (0.583 - 0.622 in)

CAUTION:
- **Do not reuse differential side oil seal.**
- **Apply ATF to new differential side oil seal.**

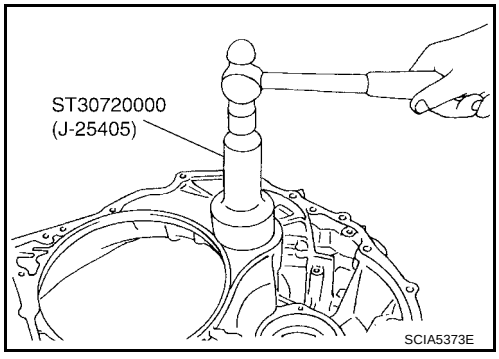




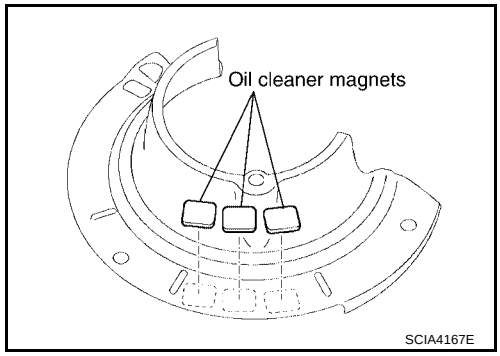
26. Install new thrust roller bearing in transaxle housing using Tool.

Tool number :ST30720000 (J-25405)

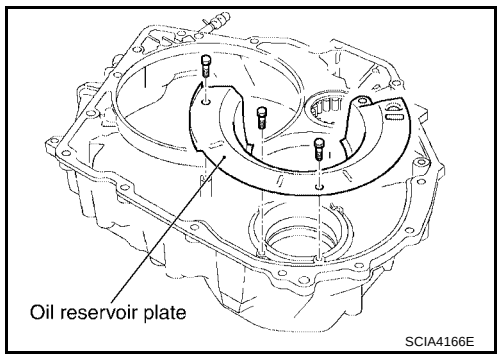
CAUTION:
Do not reuse thrust roller bearing.



27. Install oil cleaner magnets on oil reservoir plate.



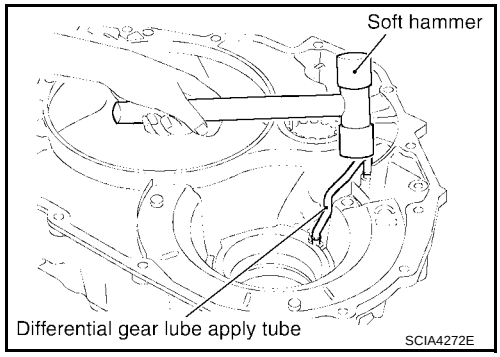
28. Install oil reservoir plate in transaxle housing.
29. Tighten oil reservoir plate bolts to specified torque. Refer to AT-249, "Components" .



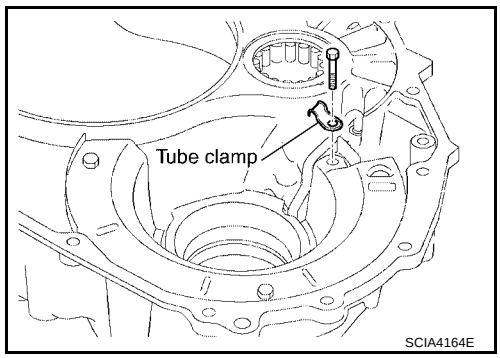
30. Install differential gear lube apply tube using suitable tool.

CAUTION:

Do not bend or damage differential gear lube apply tube.



31. Tighten tube clamp bolt to specified torque. Refer to AT-249, "Components" .



32. Install new governor apply gasket.

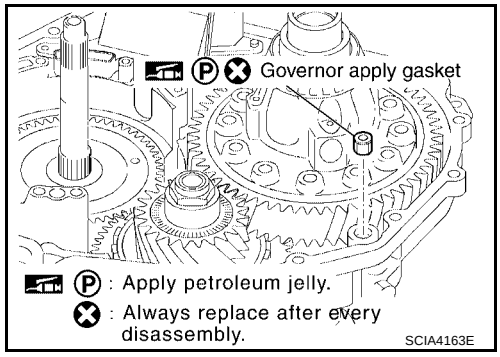
CAUTION:

- **Do not reuse governor apply gasket.**
- **Apply petroleum jelly to new governor apply gasket.**

33. Install new seal ring.

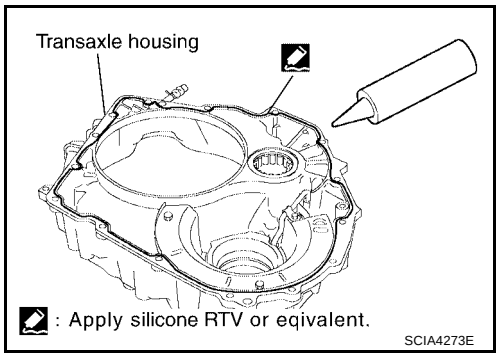
CAUTION:

- **Do not reuse seal ring.**
- **Apply ATF to new seal ring.**

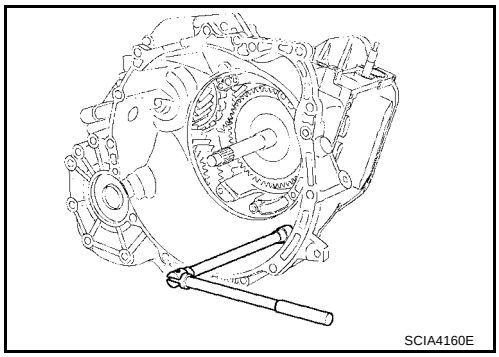


34. Apply Liquid Gasket (Three Bond 1281B) or equivalent to transaxle housing as shown. Refer to GI-45, "Recommended Chemical Products and Sealants" .

CAUTION:
Complete remove all moisture, oil and sealant from transaxle housing and transaxle case.



35. Install transaxle housing in transaxle case.

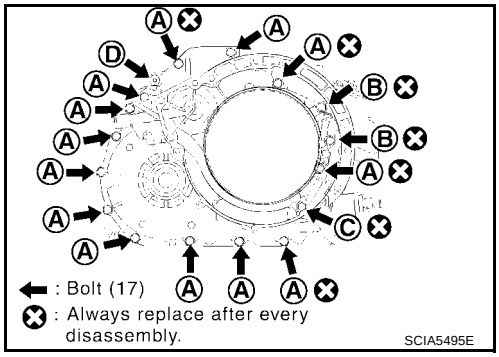


36. Tighten transaxle housing bolts to specified torque. Refer to AT-249, "Components" .

CAUTION:
Do not reuse seal bolt.

Bolt symbol	Length mm (in)	Number of bolts
A	30 (1.18)	13
B	35 (1.38)	2
C	45 (1.77)	1
D*	—	1

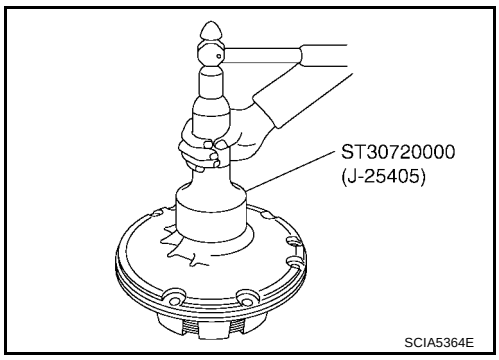
*:Torx bolt



37. Install new oil seal into oil pump assembly until it is flush with oil pump face using Tool.

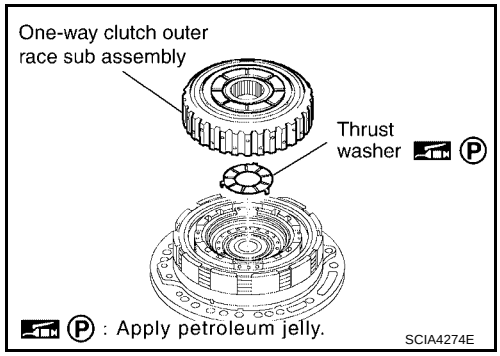
Tool number : ST30720000 (J-25405)

CAUTION:
- **Do not reuse oil seal.**
- **Apply ATF to new oil seal.**



38. Install thrust washer and one- way clutch outer race sub assembly in oil pump assembly.

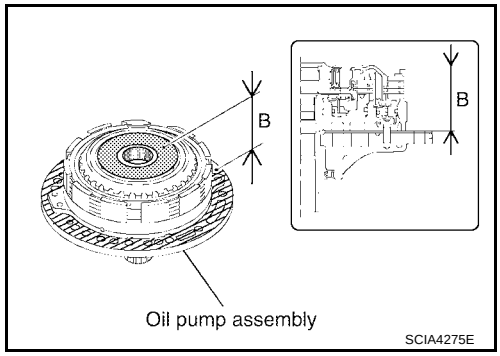
CAUTION:
Apply petroleum jelly to thrust washer.



39. Check the distance of “B”.

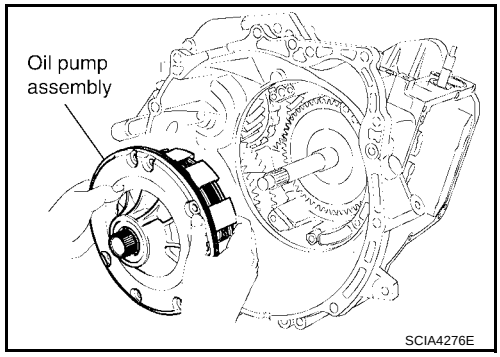
“B” : 51.09 - 51.71 mm (2.0114 - 2.0358 in)

CAUTION:
If the distance is out of standards, adjust within standards again.

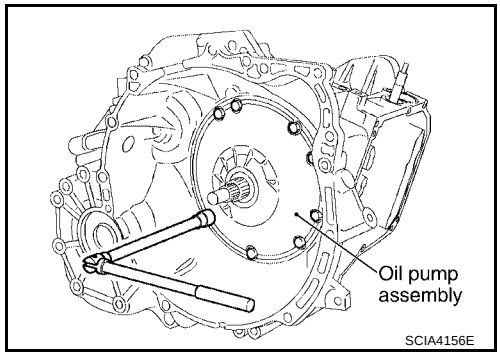


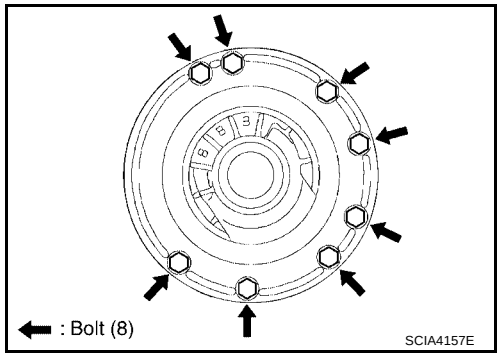
40. Place oil pump assembly through the input shaft in horizontal position, and align the bolt holes of the oil pump assembly with transaxle case. Lightly press oil pump assembly.

CAUTION:
Do not drop one-way clutch outer race sub assembly.



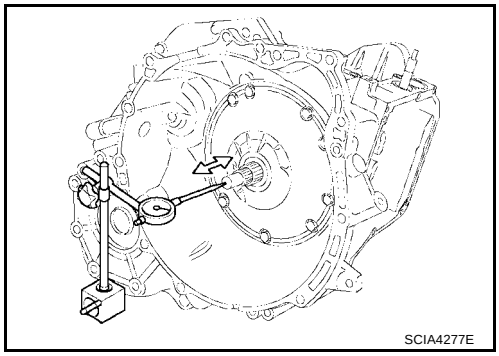
41. Tighten oil pump assembly bolts to specified torque. Refer to AT-249, "Components" .



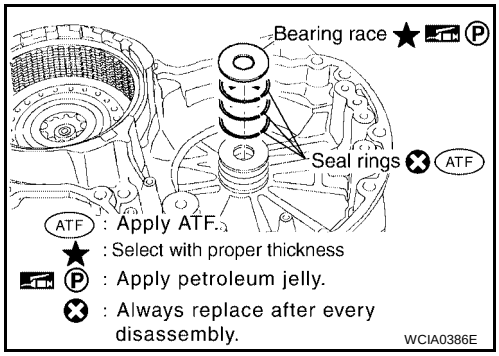


42. Set a dial indicator as shown, move the input shaft and measure the end play.

End play : 0.188 - 0.570 mm (0.0074 - 0.00224 in)

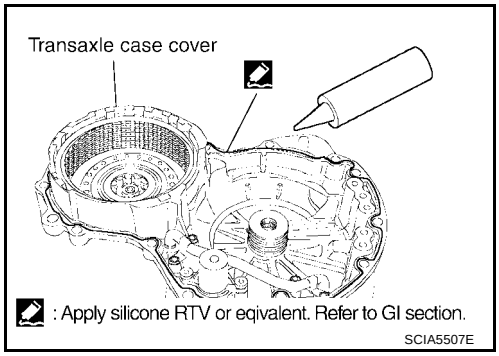


If end play is out of standards, select another thrust bearing race. Refer to AT-318, "FORWARD AND DIRECT CLUTCH ASSEMBLY" .

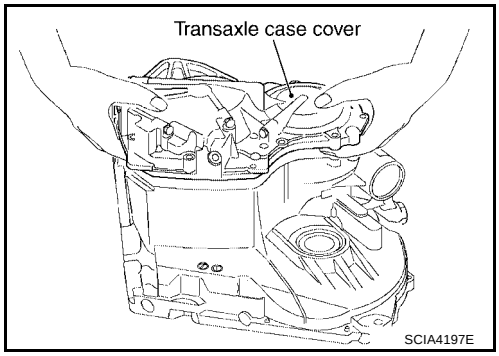


43. Remove transaxle case cover.
44. Apply Liquid Gasket (Three Bond 1281B) or equivalent to transaxle case cover as shown. Refer to GI-45, "Recommended Chemical Products and Sealants" .

CAUTION:
Completely remove all moisture, oil and sealant from transaxle case cover and transaxle.



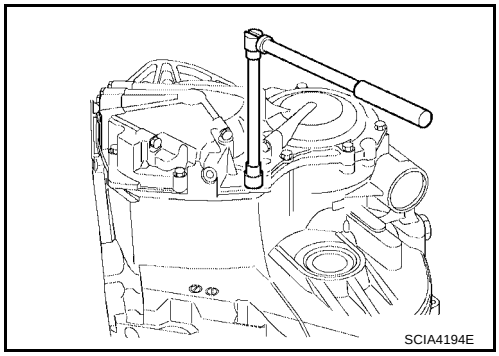
45. Install transaxle case cover in transaxle case.



46. Tighten transaxle case cover bolts to specified torque. Refer to AT-249, "Components" .

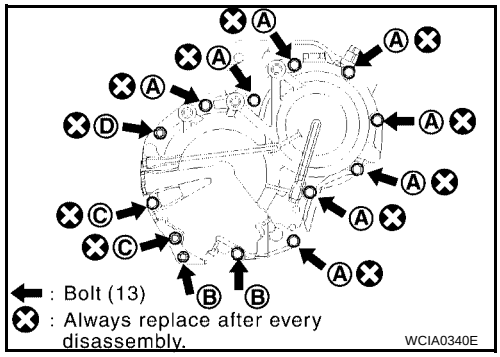
CAUTION:
Do not reuse seal bolts.

Bolt symbol	Length mm (in)	Number of bolts
A	30 (1.18)	8
B	45 (1.77)	2



Bolt symbol	Length mm (in)	Number of bolts
C	48 (1.89)	2
D*	—	1

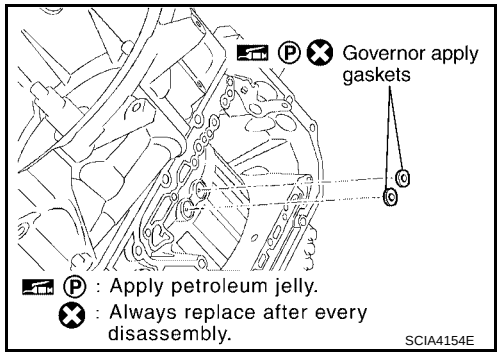
*:Stud bolt



47. Install new governor apply gasket.

CAUTION:

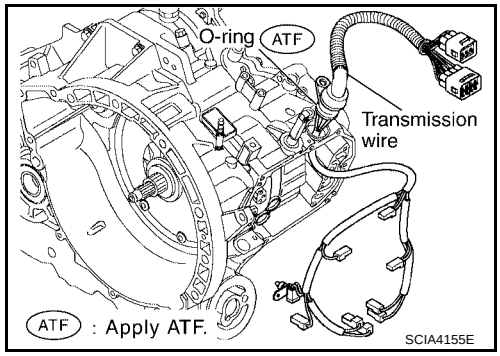
- **Do not reuse governor apply gaskets.**
- **Apply petroleum jelly to new governor apply gaskets.**



48. Install terminal cord assembly.

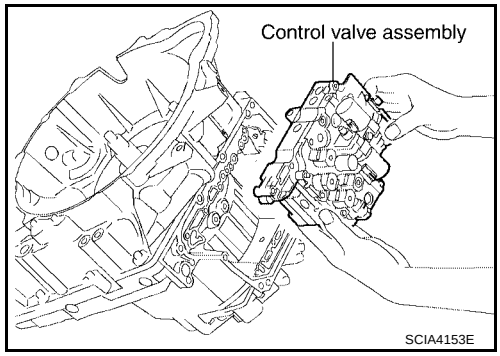
CAUTION:

- **Do not break the solenoid connector and A/T fluid temperature sensor.**
- **Apply ATF to O-ring.**



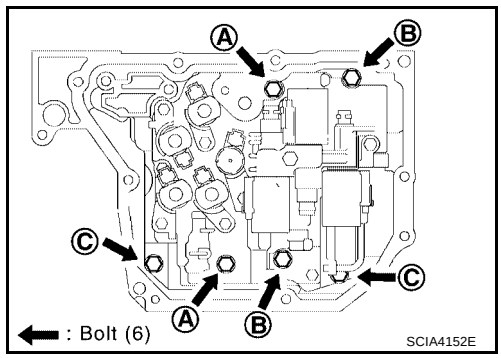
49. While holding control valve assembly, connect the parking lock rod sub assembly to manual valve lever sub assembly.

NOTE:
Shift position is “N”.



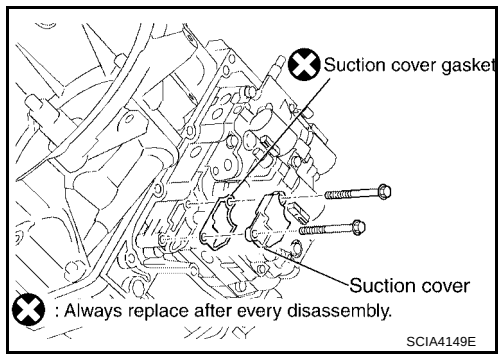
50. Tighten control valve assembly bolts to specified torque. Refer to AT-249, "Components" .

Bolt symbol	Length mm (in)	Number of bolts
A	55 (2.17)	2
B	50 (1.97)	2
C	16 (0.63)	2

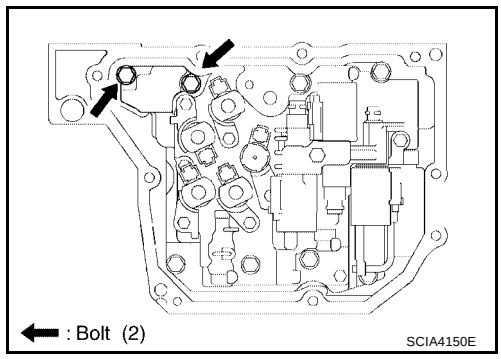


51. Install suction cover and new suction cover gasket in control valve assembly.

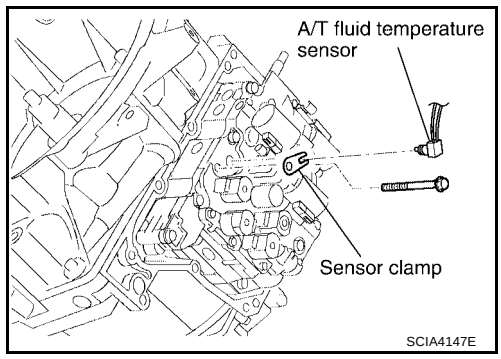
CAUTION:
Do not reuse suction cover gasket.



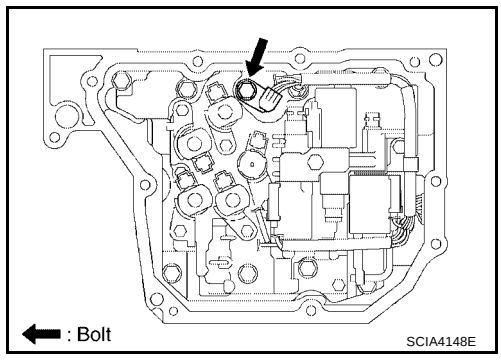
52. Tighten new suction cover bolts to specified torque. Refer to AT-249, "Components" .



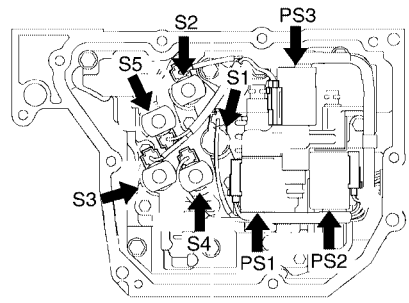
53. Install sensor clamp and A/T fluid temperature sensor in control valve assembly.



54. Tighten sensor clamp bolts to specified torque. Refer to AT-249, "Components" .



55. Connect the solenoid connectors.

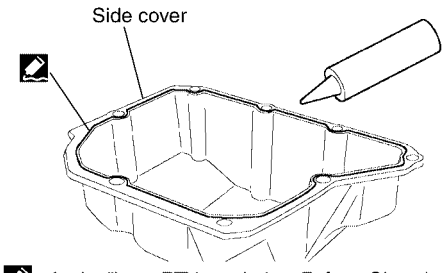


S1 : Shift solenoid valve A
S2 : Shift solenoid valve B
S3 : Shift solenoid valve C
S4 : Shift solenoid valve D
S5 : Shift solenoid valve E
PS1 : Pressure control solenoid valve A
PS2 : Pressure control solenoid valve B
PS3 : Pressure control solenoid valve C

SCIA4146E

56. Apply Liquid Gasket (Three Bond 1281B) or equivalent to side cover as shown. Refer to GI-45, "Recommended Chemical Products and Sealants" .

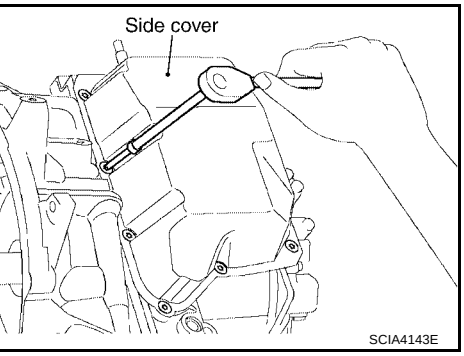
CAUTION:
Completely remove all moisture, oil and sealant from side cover and transaxle case.



: Apply silicone RTV or eqivalent. Refer to GI section.

SCIA5508E

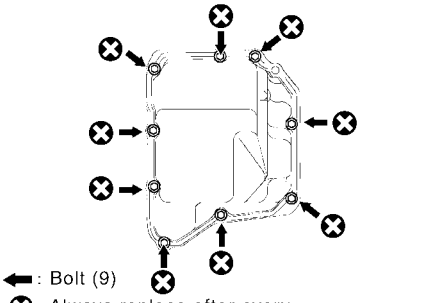
57. Install side cover in transaxle case.



SCIA4143E

58. Tighten side cover torx bolts to specified torque. Refer to AT-249, "Components" .

CAUTION:
Do not reuse seal bolt.



SCIA4144E

59. Install new O-rings in ATF cooler assembly.

CAUTION:

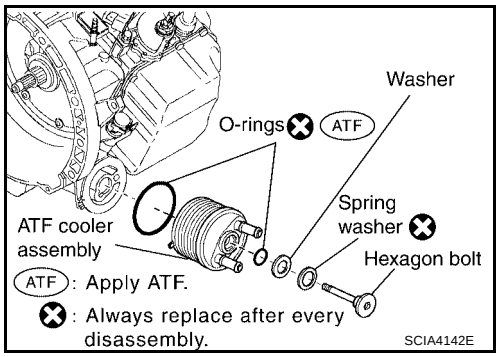
- **Do not reuse O-rings.**
- **Apply ATF to new O-rings.**

60. Install ATF cooler assembly, washer and new spring washer.

CAUTION:

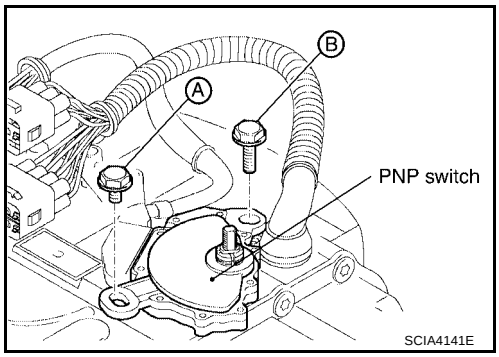
Do not reuse spring washer.

61. Tighten hexagon bolt specified torque. Refer to AT-249, "Components" .



62. Install PNP switch to manual valve lever sub assembly.
63. Temporarily tighten the bolts.

Bolt symbol	Length mm (in)	Number of bolts
A	20 (0.79)	1
B	33 (1.30)	1

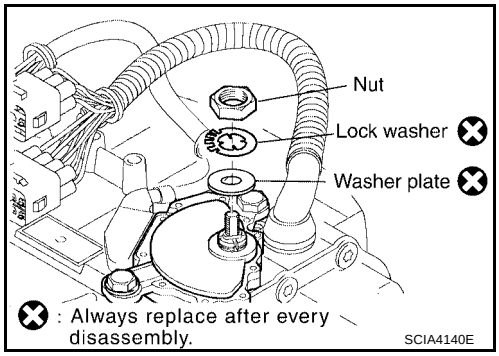


64. Install washer plate and lock washer.

CAUTION:

Do not reuse washer plate and lock washer.

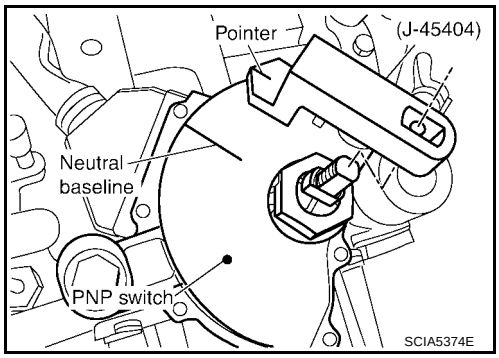
65. Tighten nut specified torque. Refer to AT-249, "Components" .



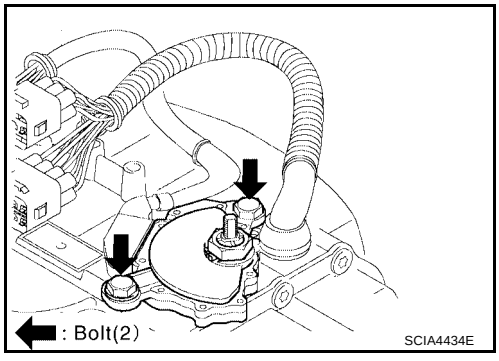
66. Install Tool.

Tool number : KV991J0060 (J-45404)

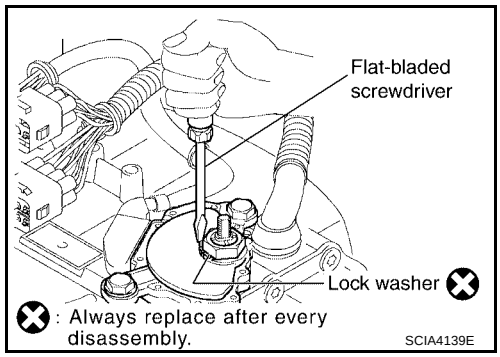
67. Adjust PNP switch so that Tool pointer aligns with neutral base line on PNP switch body.



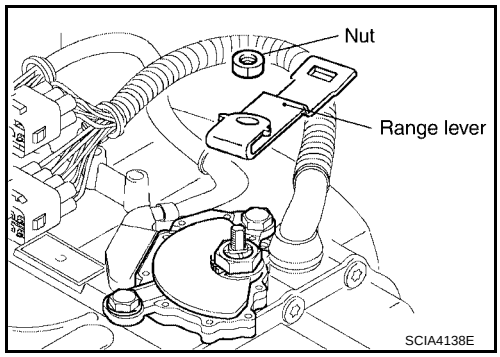
68. Tighten PNP switch bolts to specified torque. Refer to AT-249, "Components" .



69. Bend the lock washer using suitable tool.

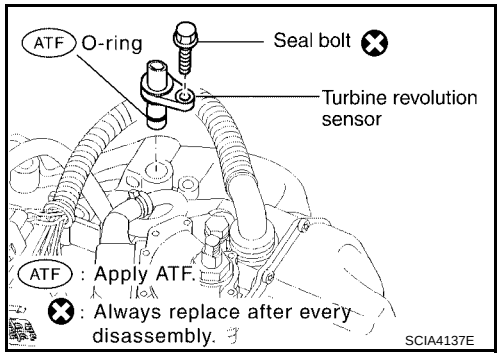


70. Install range lever in manual valve lever sub assembly.
71. Tighten range lever nut to specified torque. Refer to AT-249, "Components" .



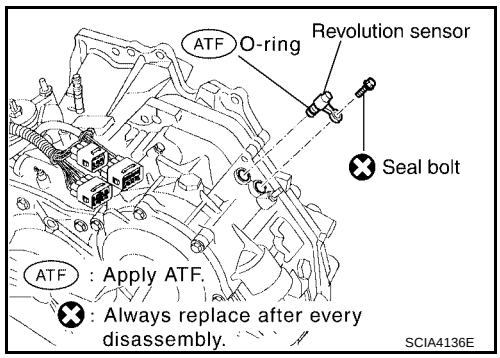
72. Install turbine revolution sensor in transaxle case.
73. Tighten new turbine revolution sensor bolt to specified torque. Refer to AT-249, "Components" .

CAUTION:
- **Do not reuse seal bolt.**
- **Apply ATF to O-ring.**



74. Install revolution sensor in transaxle case.
75. Tighten new revolution sensor bolt to specified torque. Refer to AT-249, "Components" .

CAUTION:
- **Do not reuse seal bolt.**
- **Apply ATF to O-ring.**



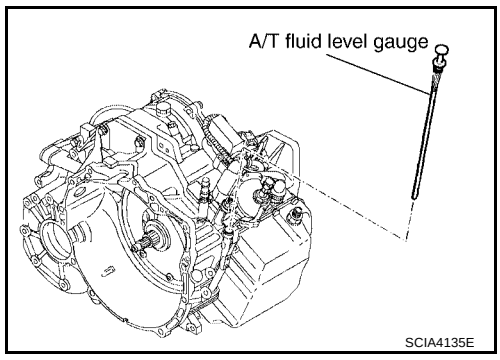
76. Install new O-ring in A/T fluid charging pipe.

CAUTION:
- **Do not reuse O-ring.**
- **Apply petroleum jelly to new O-ring.**

77. Install A/T fluid charging pipe in transaxle housing.
78. Install A/T fluid cooler tube.

CAUTION:
Do not reuse copper washer.

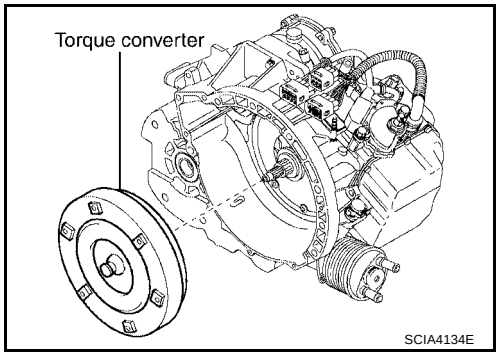
79. Tighten A/T fluid cooler tube union to specified torque. Refer to AT-249, "Components" .



80. Install air breather hose.
81. Install A/T fluid level gauge.
82. Install drain plug with new gasket to transaxle housing.

CAUTION:
Do not reuse drain plug gasket.

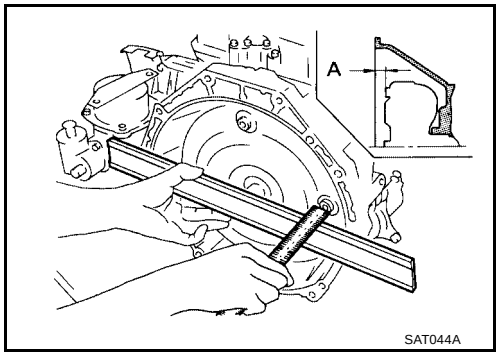
83. Tighten drain plug to specified torque. Refer to AT-249, "Components" .
84. Install torque converter.



85. Check the dimension of “A”.

Dimension “A” : 14.0 mm (0.55 in)

CAUTION:
If the distance is out of standards, adjust within standards again.



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ECS00BUG

Engine		VQ35DE
Automatic transaxle model		RE5F22A
Automatic transaxle model code number		8Y100
Stall torque ratio		1.8: 1
Transaxle gear ratio	1st	4.657
	2nd	3.032
	3rd	1.982
	4th	1.341
	5th	1.018
	Reverse	5.114
	Final drive	2.440
Recommended fluid		Genuine Nissan Matic Fluid K*
Fluid capacity ℓ (US qt, Imp qt)		7.3 (7-3/4, 6-3/8)

CAUTION:

- **Use only Genuine Nissan Matic Fluid K. Do not mix with other fluid.**
- **Using automatic transaxle fluid other than Genuine Nissan Matic Fluid K will deteriorate in driveability and automatic transaxle durability, and may damage the automatic transaxle, which is not covered by the warranty.**

*: Refer to MA-9, "RECOMMENDED FLUIDS AND LUBRICANTS" .

Shift Schedule

ECS00BUH

VEHICLE SPEED WHEN SHIFTING GEARS

Accelerator angle	Vehicle speed km/h (MPH) (Approx.)							
	D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
100 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
90 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
80 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
70 %	59 (37)	95 (59)	147 (91)	217 (135)	197 (122)	141 (88)	81 (50)	41 (25)
60 %	59 (37)	95 (59)	147 (91)	217 (135)	190 (118)	135 (84)	76 (47)	41 (25)
50 %	59 (37)	90 (56)	137 (85)	202 (126)	176 (109)	123 (76)	69 (43)	41 (25)
40 %	50 (31)	82 (51)	117 (73)	172 (107)	148 (92)	92 (57)	54 (34)	32 (20)
30 %	37 (23)	62 (39)	87 (54)	127 (79)	105 (65)	59 (37)	35 (22)	19 (12)
20 %	27 (17)	44 (27)	59 (37)	87 (54)	60 (37)	40 (25)	22 (14)	8 (5)
10 %	19 (12)	27 (17)	35 (22)	55 (34)	44 (27)	32 (20)	22 (14)	8 (5)

VEHICLE SPEED WHEN PERFORMING AND RELEASING COMPLETE LOCK-UP

Accelerator angle	Vehicle speed km/h (MPH) (Approx.)	
	Lock-up “ON”	Lock-up “OFF”
50 %	217 (135)	195 (121)
15%	108 (67)	70 (43)
0 - 8 %	66 (41)	63 (39)

- Lock-up vehicle speed indicates the speed in D position.
- Perform lock-up inspection after warming up engine.
- Lock-up vehicle speed may vary depending on the driving conditions and circumstances.

VEHICLE SPEED WHEN PERFORMING AND RELEASING SLIP LOCK-UP

Accelerator angle	Gear position	Vehicle speed km/h (MPH) (Approx.)	
		Slip lock-up “ON”	Slip lock-up “OFF”
0 - 10 %	4th	41 (25)	38 (24)
	5th	53 (33)	50 (31)

- Slip lock-up vehicle speed indicates the speed in D position.
- Perform slip lock-up inspection after warming up engine.
- Slip lock-up vehicle speed may vary depending on the driving conditions and circumstances.

Stall Speed

ECS00BUI

Stall speed	2,430 - 2,730 rpm

Line Pressure

ECS00BUJ

Engine speed	Line pressure kPa (kg/cm^2 , psi)	
	D, M positions	R position
At idle speed	333 - 392 (3.4 - 4.0, 48 - 57)	500 - 608 (5.1 - 6.2, 73 - 88)
At stall speed	1,285 - 1,393 (13.1 - 14.2, 186 - 202)	1,706 - 1,981 (17.4 - 20.2, 247 - 287)

Time Lag

ECS00BUK

Selector lever	Time
N to D position	Less than 0.7 sec.
N to R position	Less than 1.2 sec.

Shift Solenoid Valves

ECS00BUL

Shift position		Shift solenoid valve					Remarks
		A	B	C	D	E	
P		OFF (Open)	OFF (Closed)	OFF (Closed)	OFF (Open)	OFF (Closed)	PARK POSITION
R		OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	ON (Open)	REVERSE POSITION
N		OFF (Open)	OFF (Closed)	OFF (Closed)	OFF (Open)	OFF (Closed)	NEUTRAL POSITION
D	1st	ON (Closed)	ON (Open)	ON (Open)	OFF (Open)	OFF (Closed)	Automatic shift 1 ⇔ 2 ⇔ 3 ⇔ 4 ⇔ 5
	1 ⇔ 2	OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	OFF (Closed)	
	2nd	OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	OFF (Closed)	
	2 ⇔ 3	OFF (Open)	OFF (Closed)	ON (Open)	ON (Closed)	ON (Open)	
	3rd	OFF (Open)	OFF (Closed)	ON (Open)	ON (Closed)	OFF (Closed)	
	3 ⇔ 4	OFF (Open)	OFF (Closed)	OFF (Closed)	ON (Closed)	ON (Open)	
	4th	OFF (Open)	OFF (Closed)	OFF (Closed)	ON (Closed)	OFF (Closed)	
	4 ⇔ 5	OFF (Open)	ON (Open)	OFF (Closed)	ON (Closed)	OFF (Closed)	
	5th	OFF (Open)	ON (Open)	OFF (Closed)	ON (Closed)	OFF (Closed)	

Shift position		Shift solenoid valve					Remarks
		A	B	C	D	E	
M5	5th	OFF (Open)	ON (Open)	OFF (Closed)	ON (Closed)	OFF (Closed)	Locks in 5th gear*
M4	4th	OFF (Open)	OFF (Closed)	OFF (Closed)	ON (Closed)	OFF (Closed)	Locks in 4th gear*
M3	3rd	OFF (Open)	OFF (Closed)	ON (Open)	ON (Closed)	OFF (Closed)	Locks in 3rd gear*
M2	2nd	OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	OFF (Closed)	Locks in 2nd gear*
M1	1st	ON (Closed)	ON (Open)	ON (Open)	OFF (Open)	ON (Open)	Locks in 1st gear*

*: Except when automated up/down shift control and up/down shift permission control are actuated. Refer to AT-40, "MANUAL MODE" .

Solenoid Valves

ECS00BUM

Solenoid valves	Resistance (Approx.)	Connector (Color)	Terminal
Shift solenoid valve A	11 - 16 Ω	(B)	1 - Ground
Shift solenoid valve B		(GR)	1 - Ground
Shift solenoid valve C		(GR)	1 - Ground
Shift solenoid valve D		(L)	1 - Ground
Shift solenoid valve E		(G)	1 - Ground
Pressure control solenoid valve A	5.0 - 5.6 Ω	(G)	1 - 2
Pressure control solenoid valve B		(B)	1 - 2
Pressure control solenoid valve C		(L)	1 - 2

Specified resistance at 20°C (68°F).

Clutch and Brakes

ECS00BUN

2ND BRAKE

Number of 2nd brake plates	4	
Number of 2nd brake discs	4	
Number of 2nd brake flange	1	
Piston stroke mm (in)	1.10 - 1.50 (0.0433 - 0.0591)	
Thickness of 2nd brake flanges	Thickness mm (in)	Part number*
	3.6 (0.142)	31537-8Y011
	3.8 (0.150)	31537-8Y012
	4.0 (0.157)	31537-8Y013

*: Always check with the Parts Department for the latest parts information.

2ND COAST BRAKE

Number of 2nd coast brake plates	3
Number of 2nd coast brake discs	3
Number of 2nd coast brake flange	1
Piston stroke mm (in)	0.76 - 1.44 (0.0299 - 0.0567)

B5 BRAKE

Number of B5 brake plates	6	
Number of B5 brake discs	6	
Number of B5 brake flange	1	
Number of B5 brake cushion plate	1	
Piston stroke mm (in)	2.34 - 2.70 (0.0921 - 0.1063)	
Thickness of B5 brake flanges	Thickness mm (in)	Part number*
	5.0 (0.197)	31667-8Y010
	5.1 (0.202)	31667-8Y015
	5.2 (0.205)	31667-8Y011
	5.3 (0.209)	31667-8Y013
	5.5 (0.217)	31667-8Y014

*: Always check with the Parts Department for the latest parts information.

1ST AND REVERSE BRAKE

Number of 1st and reverse brake plates	4
Number of 1st and reverse brake discs	5
Number of 1st and reverse brake flanges	2
Piston stroke mm (in)	1.39 - 2.21 (0.0547 - 0.0870)

FORWARD AND DIRECT CLUTCH ASSEMBLY

Thickness of thrust washer races	Thickness mm (in)	Part number*
	0.81 (0.0319)	31435 8Y011
	1.15 (0.0453)	31435 8Y012
End play mm (in)	0.305 - 0.820 mm (0.0120 - 0.0323)	

*: Always check with the Parts Department for the latest parts information.

U/D BRAKE

Piston type	Mark	Piston length mm (in)	Part number*
A	—	63.7 (2.508)	31615 8Y005
B	1	64.2 (2.528)	31615 8Y004
C	2	64.7 (2.547)	31615 8Y003
D	3	65.2 (2.567)	31615 8Y002
E	4	65.7 (2.587)	31615 8Y001
Piston stroke mm (in)		5.76 - 6.76 mm (0.2268 - 0.2661)	

*: Always check with the Parts Department for the latest parts information.

Final Drive

ECS00BUO

DIFFERENTIAL SIDE BEARING ADJUSTING SHIMS

Thickness mm (in)	Part number*	Thickness mm (in)	Part number*
1.00 (0.0394)	31438-8Y001	1.48 (0.0583)	31438-8Y013
1.05 (0.0413)	31438-8Y002	1.51 (0.0594)	31438-8Y014
1.10 (0.0433)	31438-8Y003	1.54 (0.0606)	31438-8Y015
1.15 (0.0453)	31438-8Y004	1.57 (0.0618)	31438-8Y016
1.20 (0.0472)	31438-8Y005	1.60 (0.0630)	31438-8Y017
1.25 (0.0492)	31438-8Y006	1.65 (0.0650)	31438-8Y018
1.30 (0.0512)	31438-8Y007	1.70 (0.0669)	31438-8Y019
1.33 (0.0524)	31438-8Y008	1.75 (0.0689)	31438-8Y020
1.36 (0.0535)	31438-8Y009	1.80 (0.0709)	31438-8Y021
1.39 (0.0547)	31438-8Y010	1.85 (0.0728)	31438-8Y022
1.42 (0.0559)	31438-8Y011	1.90 (0.0748)	31438-8Y023
1.45 (0.0571)	31438-8Y012		

*: Always check with the Parts Department for the latest parts information.

TURNING TORQUE

Turning torque of final drive assembly	0.7 - 1.2 N·m (0.08 - 0.12kg-m, 7 - 10 in-lb)

A/T Fluid Temperature Sensor

ECS00BUP

Condition		Voltage (Approx.)	Resistance (Approx.)
ATF temperature	0°C (32°F)	4.0V	9.8 kΩ
	20°C (68°F)	3.0V	4.2 kΩ
	80°C (176°F)	0.8V	0.54 kΩ
	100°C (212°F)	0.5V	0.31 kΩ

Turbine Revolution Sensor

ECS00BUQ

Condition	Signal	Voltage* (Approx.)
Connect 12V power supply and 100 Ω resistance, and then shake magnetic body.	HIGH	1.2 - 1.6V
	LOW	0.4 - 0.8V

*: Voltage with both end of 100 Ω resistance.

Revolution Sensor

ECS00BUR

Condition	Signal	Voltage* (Approx.)
Connect 12V power supply and 100 Ω resistance, and then shake magnetic body.	HIGH	1.2 - 1.6V
	LOW	0.4 - 0.8V

*: Voltage with both end of 100 Ω resistance.