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SECTION **AT**

AUTOMATIC TRANSAXLE

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TROUBLE DIAGNOSIS - INDEX**Alphabetical & P No. Index for DTC****NOTE:**

If DTC U1000 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000. Refer to [AT-188, "DTC U1000 CAN COMMUNICATION LINE"](#)

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| TCC SOLENOID/CIRC | P0740 | AT-148 |
| TP SEN/CIRC A/T*2 | P1705 | AT-177 |
| VEH SPD SEN/CIR AT*3 | P0720 | AT-117 |
| CAN COMM CIRCUIT | U1000 | AT-188 |

*1: These numbers are prescribed by SAE J2012.

*2: When the fail-safe operation occurs, the MIL illuminates.

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

TROUBLE DIAGNOSIS - INDEX

[RE4F04B]

P NO. INDEX FOR DTC

| DTC | Items (CONSULT-II screen terms) | Reference page |
|---------------------|------------------------------------|------------------------|
| CONSULT-II GST*1 | | |
| P0705 | PNP SW/CIRC | AT-105 |
| P0710 | ATF TEMP SEN/CIRC | AT-111 |
| P0720 | VEH SPD SEN/CIR AT*3 | AT-117 |
| P0725 | ENGINE SPEED SIG | AT-122 |
| P0731 | A/T 1ST GR FNCTN | AT-126 |
| P0732 | A/T 2ND GR FNCTN | AT-131 |
| P0733 | A/T 3RD GR FNCTN | AT-136 |
| P0734 | A/T 4TH GR FNCTN | AT-141 |
| P0740 | TCC SOLENOID/CIRC | AT-148 |
| P0744 | A/T TCC S/V FNCTN | AT-153 |
| P0745 | L/PRESS SOL/CIRC | AT-161 |
| P0750 | SFT SOL A/CIRC*2 | AT-167 |
| P0755 | SFT SOL B/CIRC*2 | AT-172 |
| P1705 | TP SEN/CIRC A/T*2 | AT-177 |
| P1760 | O/R CLTCH SOL/CIRC | AT-183 |
| U1000 | CAN COMM CIRCUIT | AT-188 |

*1: These numbers are prescribed by SAE J2012.

*2: When the fail-safe operation occurs, the MIL illuminates.

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

PRECAUTIONS

PFP:00001

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

ECS0095K

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

ECS0095L

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

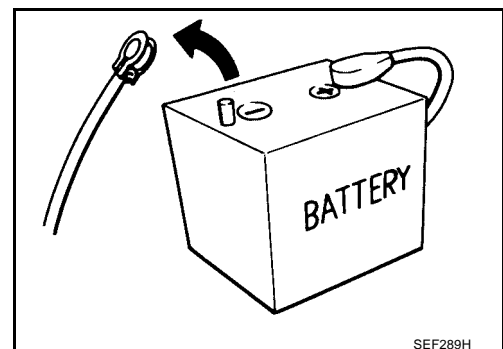
CAUTION:

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

Precautions

ECS0095M

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

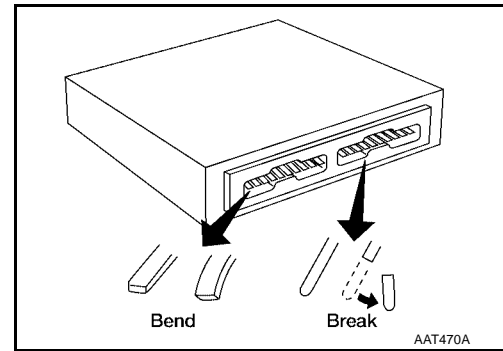


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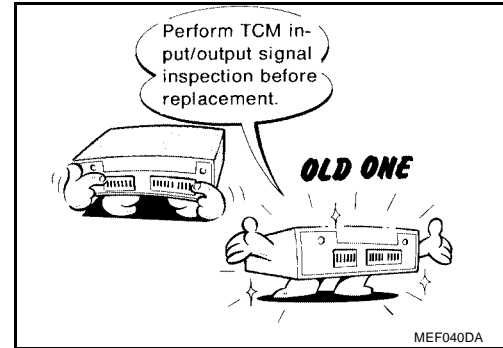
PRECAUTIONS

[RE4F04B]

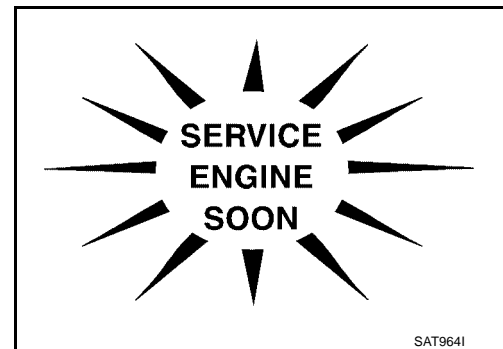
- When connecting or disconnecting pin connectors into or from TCM, take care not to damage pin terminals (bend or break).
Make sure that there are not any bends or breaks on TCM pin terminal, when connecting pin connectors.



- Before replacing TCM, perform TCM input/output signal inspection and make sure whether TCM functions properly or not. Refer to [AT-32, "INPUT/OUTPUT SIGNAL OF TCM"](#) .



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



- Before proceeding with disassembly, thoroughly clean the outside of the transaxle. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Disassembly should be done in a clean work area.
- Use lint-free cloth or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transaxle.
- Place disassembled parts in order for easier and proper assembly.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the transaxle is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Do not use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- Replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer. Refer to [AT-12, "ATF COOLER SERVICE"](#) .
- After overhaul, refill the transaxle with new ATF.
- When the A/T drain plug is removed, only some of the fluid is drained. Old A/T fluid will remain in torque converter and ATF cooling system.
Always follow the procedures when changing A/T fluid. Refer to [MA-31, "Changing A/T Fluid"](#) .

Service Notice or Precautions**FAIL-SAFE**

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

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

When the ignition key is turned ON following Fail-Safe operation, A/T check (position) indicator lamp blinks for about 8 seconds. [For "TCM Self-diagnostic Procedure (No Tools)", refer to [AT-55, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) .]

The blinking of the A/T check (position) indicator lamp for about 8 seconds will appear only once and be cleared. The customer may resume normal driving conditions.

Always follow the "Work Flow" (Refer to [AT-63, "Work Flow"](#)).

The SELF-DIAGNOSIS results will be as follows:

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

TORQUE CONVERTER SERVICE

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

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

The torque converter should not be replaced if:

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

ATF COOLER SERVICE

If A/T fluid contains frictional material (clutches, bands, etc.), replace radiator and flush cooler line using cleaning solvent and compressed air after repair of A/T. Refer to [CO-11, "RADIATOR"](#) .

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 (position) indicator or the malfunction indicator lamp (MIL). Refer to the table on [AT-44](#) for the indicator used to display each self-diagnostic result.

- The self-diagnostic results indicated by the MIL are automatically stored in both the ECM and TCM memories.

Always perform the procedure "HOW TO ERASE DTC" on [AT-41](#) to complete the repair and avoid unnecessary blinking of the MIL.

- The following self-diagnostic items can be detected using ECM self-diagnostic results mode* only when the A/T check (position) indicator lamp does not indicate any malfunctions.

- park/neutral position (PNP) switch
- A/T 1st, 2nd, 3rd, or 4th gear function
- A/T TCC S/V function (lock-up).

*: For details of OBD-II, refer to [EC-53, "ON BOARD DIAGNOSTIC \(OBD\) SYSTEM"](#) .

- **Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector.**
For description and how to disconnect, refer to [GI-23, "How to Check Terminal"](#) .

Wiring Diagrams and Trouble Diagnosis

ECS00950

When you read wiring diagrams, refer to the following:

- [GI-14, "How to Read Wiring Diagrams"](#)
- [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#)

When you perform trouble diagnosis, refer to the following:

- [GI-10, "HOW TO FOLLOW TEST GROUPS IN TROUBLE DIAGNOSES"](#)
- [GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident"](#)

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PREPARATION

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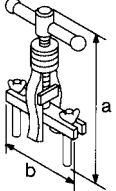
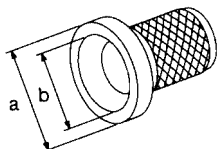
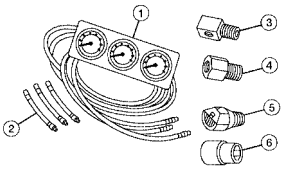
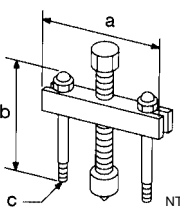
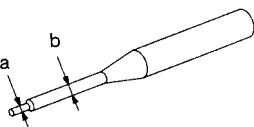
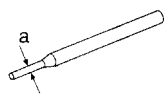
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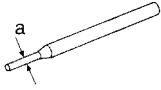
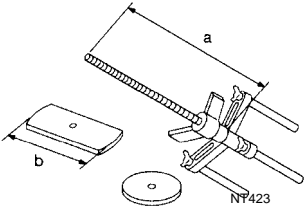
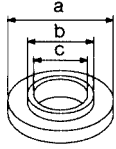
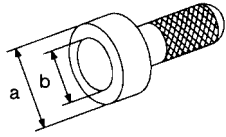
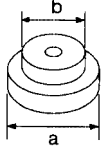
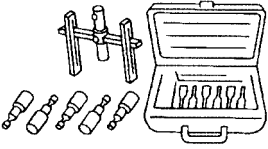
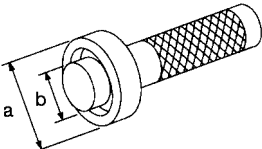
Special Service Tools

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 |
|---|--|
| KV381054S0 (J-34286) Puller  | <ul style="list-style-type: none"> ● Removing differential side oil seals ● Removing differential side bearing outer race ● Removing idler gear bearing outer race a: 250 mm (9.84 in) b: 160 mm (6.30 in) |
| ST33400001 (J-26082) Drift  | <ul style="list-style-type: none"> ● Installing differential side oil seal (RH side) ● Installing oil seal on oil pump housing a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia. |
| (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  | Measuring line pressure |
| ST27180001 (J-25726-A) Puller  | Removing idler gear a: 100 mm (3.94 in) b: 110 mm (4.33 in) c: M8 x 1.25P |
| ST23540000 (J-25689-A) Pin punch  | Removing and installing parking rod plate and manual plate pins a: 2.3 mm (0.091 in) dia. b: 4 mm (0.16 in) dia. |
| ST25710000 (J-25689-A) Pin punch  | Aligning groove of manual shaft and hole of transaxle case a: 2 mm (0.08 in) dia. |

PREPARATION

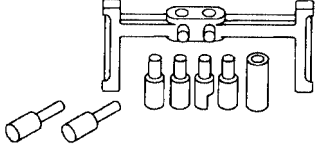
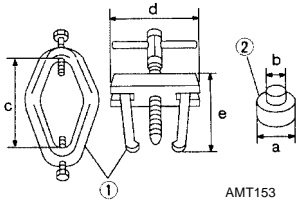
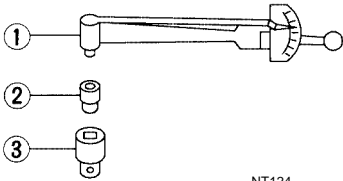
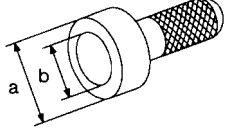
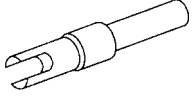
[RE4F04B]

| Tool number (Kent-Moore No.) Tool name | Description |
|--|--|
| KV32101000 (J-25689-A) Pin punch  NT410 | <ul style="list-style-type: none"> ● Removing and installing manual shaft retaining pin ● Removing and installing pinion mate shaft lock pin <p>a: 4 mm (0.16 in) dia.</p> |
| KV31102400 (J-34285 and J-34285-87) Clutch spring compressor  NT423 | <ul style="list-style-type: none"> ● Removing and installing clutch return springs ● Installing low and reverse brake piston <p>a: 320 mm (12.60 in) b: 174 mm (6.85 in)</p> |
| KV40100630 (J-26092) Drift  NT107 | <ul style="list-style-type: none"> ● Installing reduction gear bearing inner race ● Installing idler gear bearing inner race <p>a: 67.5 mm (2.657 in) dia. b: 44 mm (1.73 in) dia. c: 38.5 mm (1.516 in) dia.</p> |
| ST30720000 (J-25405 and J-34331) Bearing installer  NT115 | Installing idler gear bearing outer race <p>a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.</p> |
| ST35321000 (—) Drift  NT073 | Installing output shaft bearing <p>a: 49 mm (1.93 in) dia. b: 41 mm (1.61 in) dia.</p> |
| — (J-34291-A) Shim setting gauge set  NT101 | <ul style="list-style-type: none"> ● Selecting oil pump cover bearing race and oil pump thrust washer ● Selecting side gear thrust washer |
| ST33230000 (J-25805-01) Drift  NT084 | Installing differential side bearing inner race (RH side) <p>a: 51 mm (2.01 in) dia. b: 28.5 mm (1.122 in) dia.</p> |

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[RE4F04B]

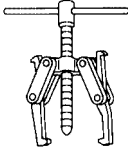
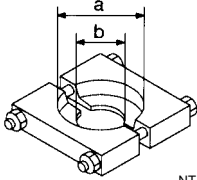
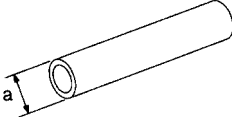
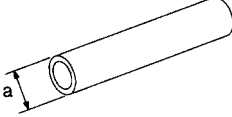
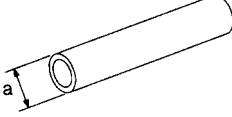
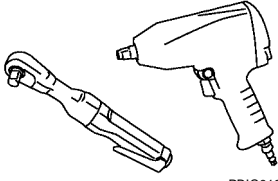
| Tool number (Kent-Moore No.) Tool name | Description |
|--|---|
| — (J-34290) Shim selecting tool set | Selecting differential side bearing adjusting shim  <p style="text-align: center;">NT080</p> |
| ST3306S001 (J-22888-D) Differential side bearing puller set 1 ST33051001 (J-22888-D) Puller 2 ST33061000 (J-8107-2) Adapter | Removing differential side bearing inner race a: 38 mm (1.50 in) dia. b: 28.5 mm (1.122 in) dia. c: 130 mm (5.12 in) d: 135 mm (5.31 in) e: 100 mm (3.94 in)  <p style="text-align: center;">AMT153</p> |
| 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  <p style="text-align: center;">NT124</p> |
| ST35271000 (J-26091) Drift | Installing idler gear a: 72 mm (2.83 in) dia. b: 63 mm (2.48 in) dia.  <p style="text-align: center;">NT115</p> |
| — (J-39713) Preload adapter | <ul style="list-style-type: none"> ● Selecting differential side bearing adjusting shim ● Checking differential side bearing preload  <p style="text-align: center;">NT087</p> |

PREPARATION

[RE4F04B]

Commercial Service Tools

ECS0095Q

| Tool name | Description |
|--|--|
| Puller  NT077 | <ul style="list-style-type: none"> ● Removing idler gear bearing inner race ● Removing and installing band servo piston snap ring |
| Puller  NT411 | Removing reduction gear bearing inner race a: 60 mm (2.36 in) dia. b: 35 mm (1.38 in) dia. |
| Drift  NT083 | Installing needle bearing on bearing retainer a: 36 mm (1.42 in) dia. |
| Drift  NT083 | Removing needle bearing from bearing retainer a: 33.5 mm (1.319 in) dia. |
| Drift  NT083 | Installing differential side bearing outer race (RH side) a: 75 mm (2.95 in) dia. |
| Power tool  PBIC0190E | <ul style="list-style-type: none"> ● Removing transaxle assembly ● Removing transaxle oil pan ● Removing transaxle case and cover |

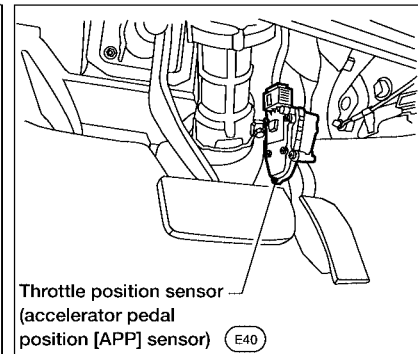
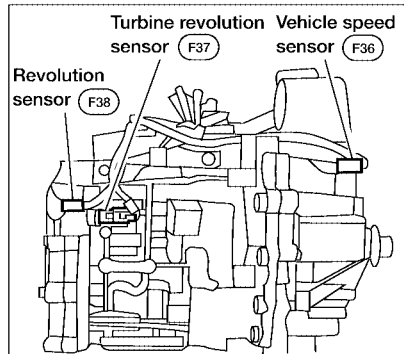
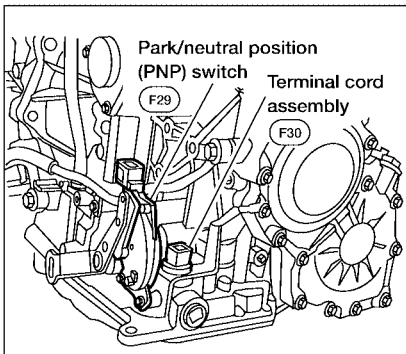
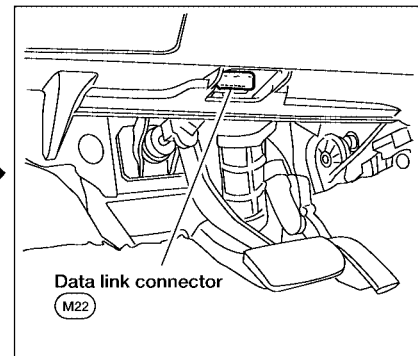
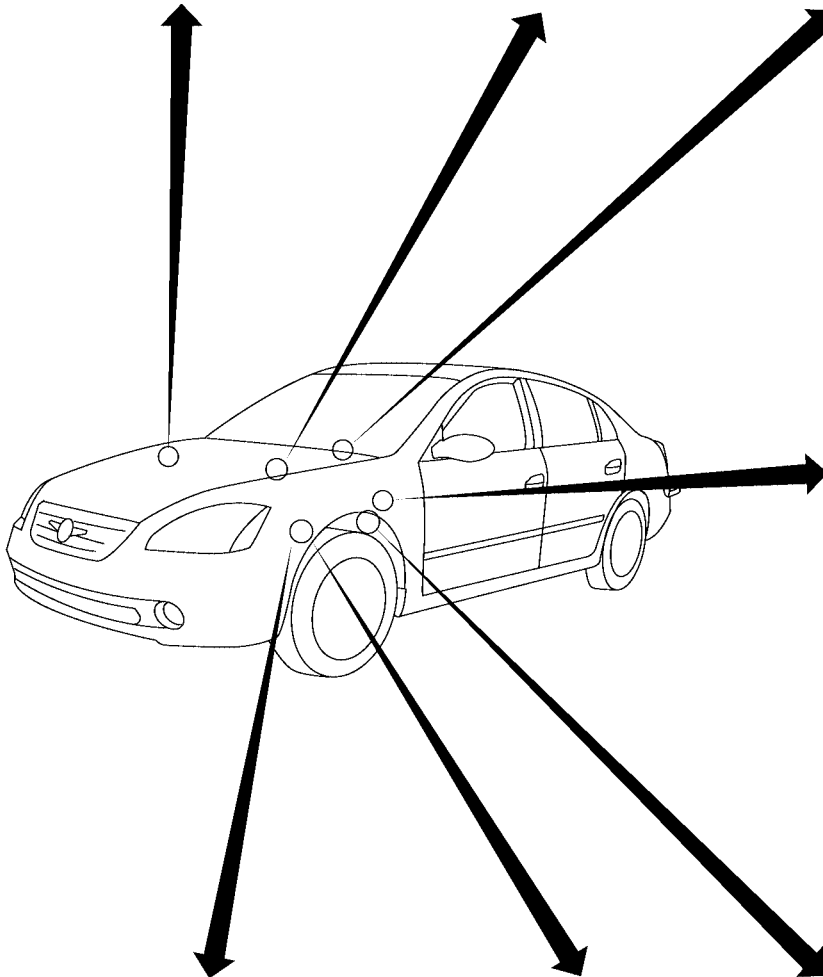
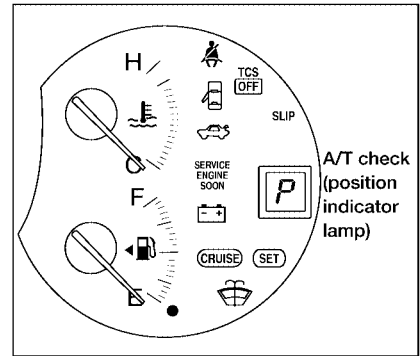
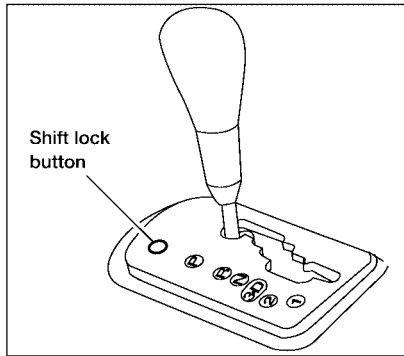
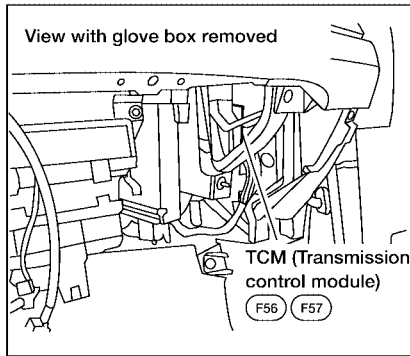
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OVERALL SYSTEM

PFP:00000

A/T Electrical Parts Location

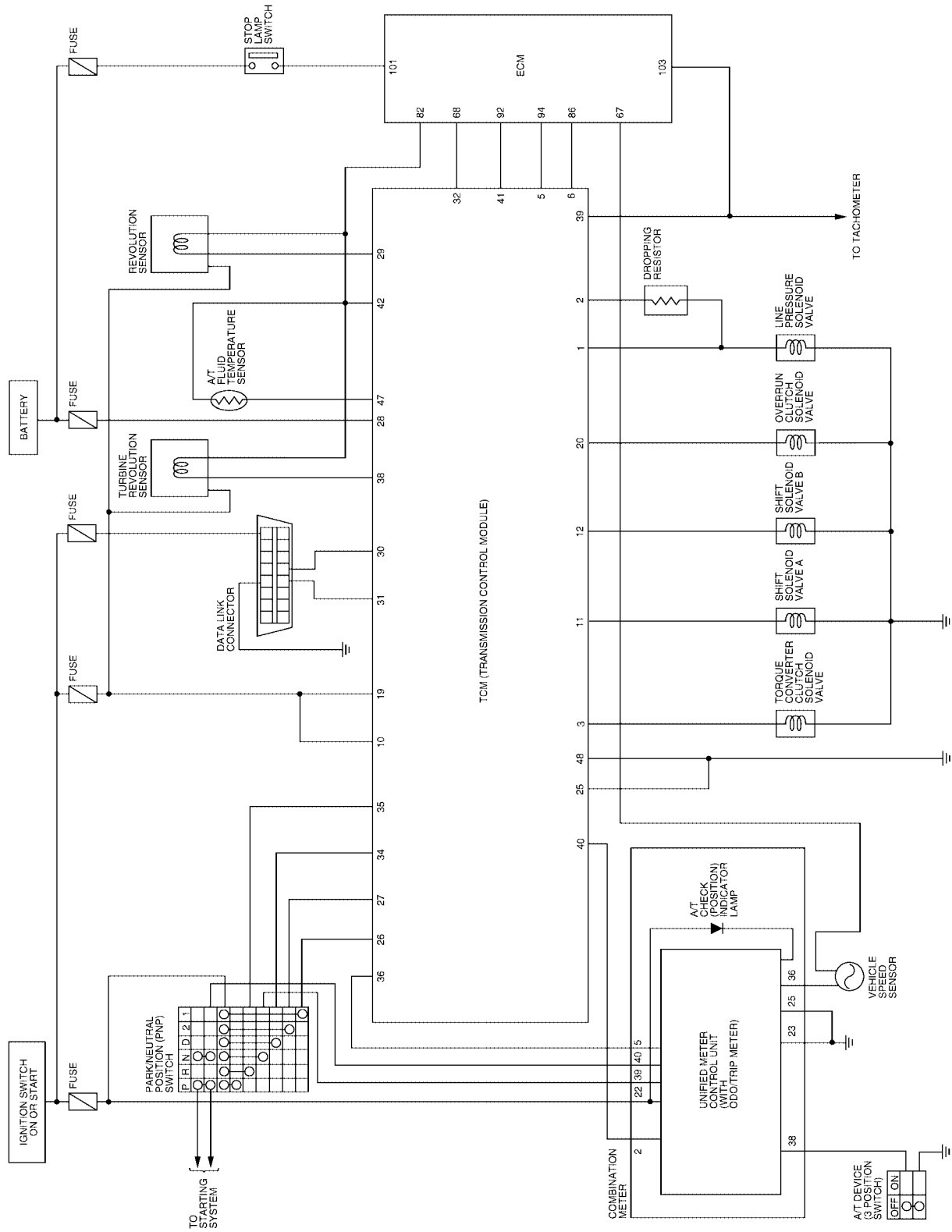
ECS0095R



WCIA0535E

Circuit Diagram

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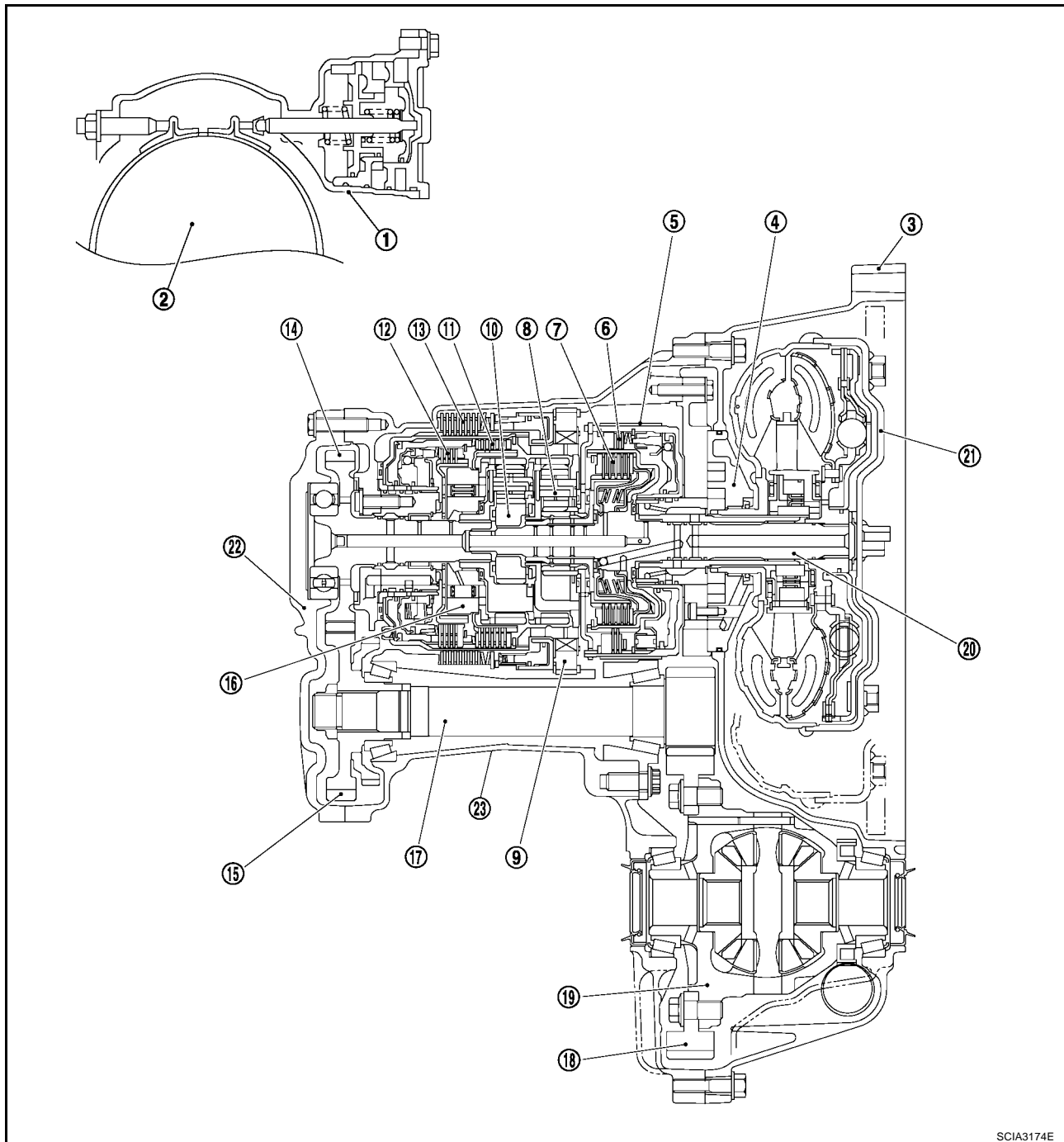


OVERALL SYSTEM

[RE4F04B]

Cross-sectional View

ECS0095T



SCIA3174E

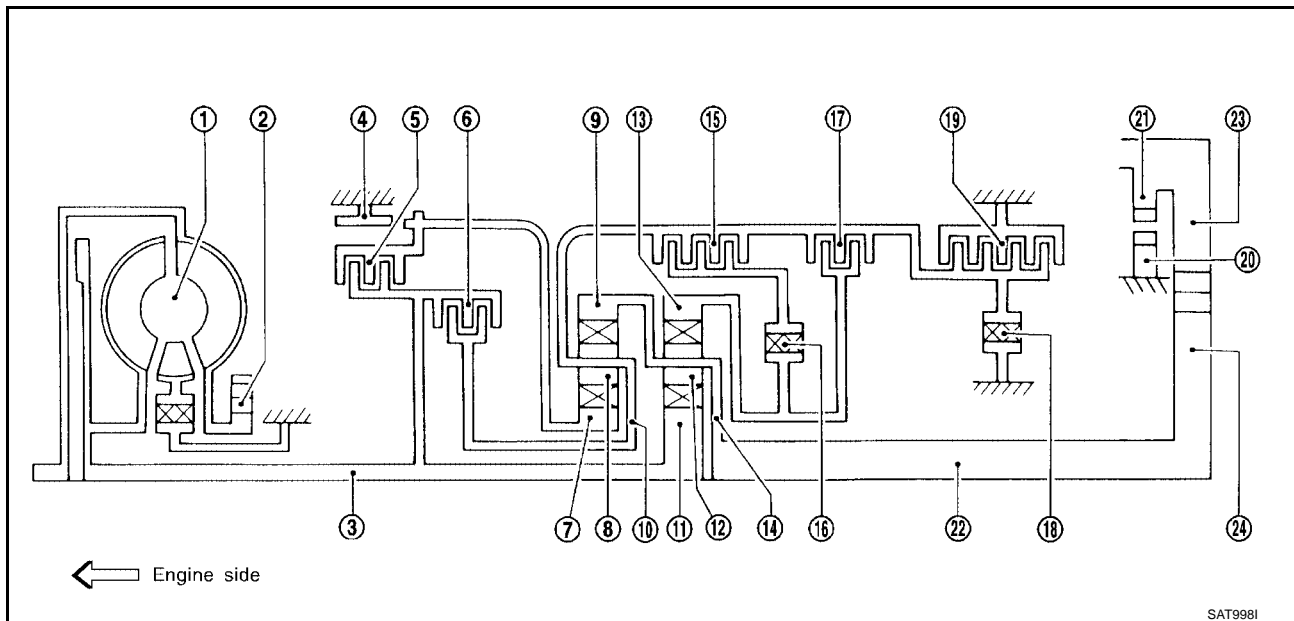
- | | | |
|----------------------------|---------------------------|-----------------------|
| 1. Band servo piston | 2. Reverse clutch drum | 3. Converter housing |
| 4. Oil pump | 5. Brake band | 6. Reverse clutch |
| 7. High clutch | 8. Front planetary gear | 9. Low one-way clutch |
| 10. Rear planetary gear | 11. Forward clutch | 12. Overrun clutch |
| 13. Low & reverse brake | 14. Output gear | 15. Idler gear |
| 16. Forward one-way clutch | 17. Pinion reduction gear | 18. Final gear |
| 19. Differential case | 20. Input shaft | 21. Torque converter |
| 22. Side cover | 23. Transaxle case | |

OVERALL SYSTEM

[RE4F04B]

ECS0095V

Shift Mechanism CONSTRUCTION



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

SAT998I

FUNCTION OF CLUTCH AND BRAKE

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

CLUTCH AND BAND CHART

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

OVERALL SYSTEM

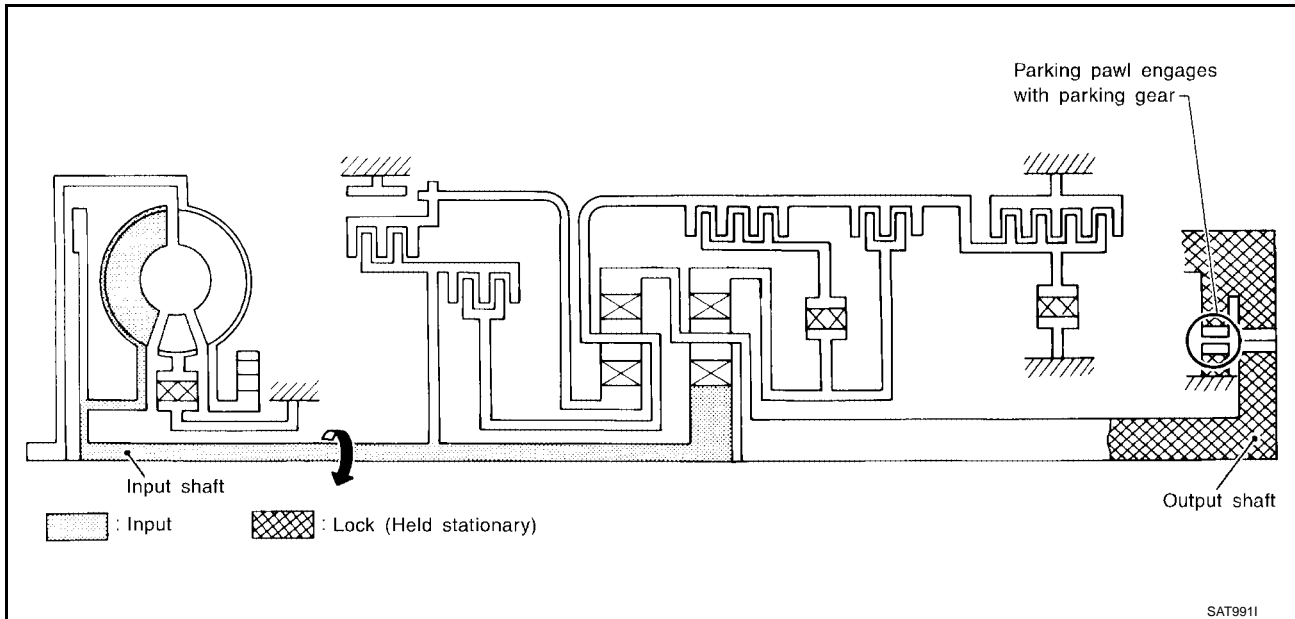
[RE4F04B]

| Shift position | Re-verse clutch 5 | High clutch 6 | For-ward clutch 15 | Over-run clutch 17 | Band servo | | | For-ward one-way clutch 16 | Low one-way clutch 18 | Low & re-verse brake 19 | Lock-up | Remarks |
|----------------|----------------------|------------------|-----------------------|-----------------------|------------|--------------|-----------|-------------------------------|--------------------------|----------------------------|---------|--|
| | | | | | 2nd apply | 3rd re-lease | 4th apply | | | | | |
| N | | | | | | | | | | | | NEUTRAL POSITION |
| D*4 | 1st | | O | *1D | | | | B | B | | | Automatic shift 1 ↔ 2 ↔ 3 ↔ 4 |
| | 2nd | | O | *1 A | O | | | B | | | | |
| | 3rd | | O | O | *1 A | *2C | C | | | | *5O | |
| | 4th | | O | C | | *3C | C | O | | | O | |
| 2 | 1st | | O | D | | | | B | B | | | Automatic shift 1 ↔ 2 ↔ 3 |
| | 2nd | | O | A | O | | | B | | | | |
| 1 | 1st | | O | O | | | | B | | O | | Locks (held stationary) in 1st speed 1 ↔ 2 ↔ 3 |
| | 2nd | | O | O | O | | | B | | | | |

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

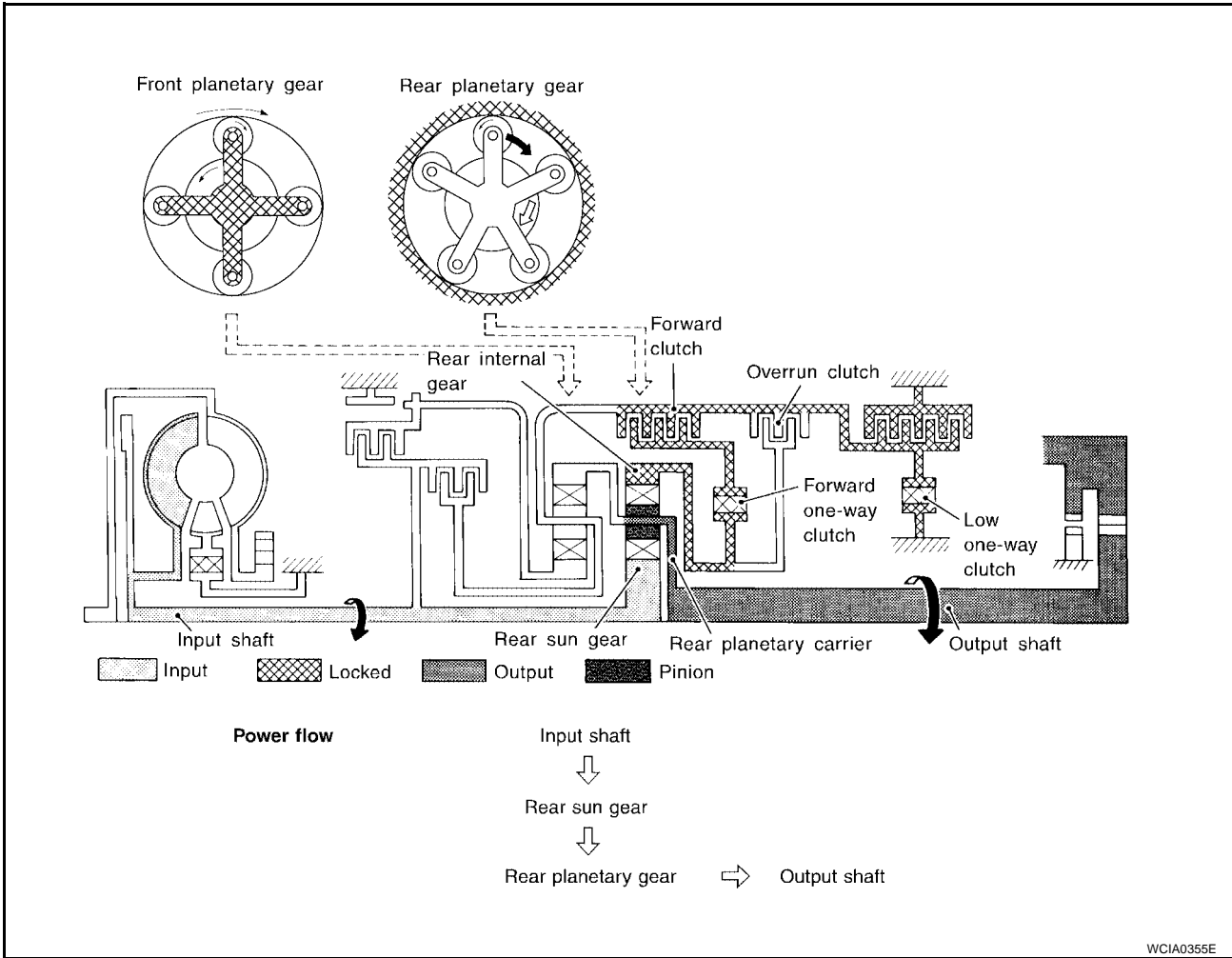
POWER TRANSMISSION

P and N Positions



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

11 Position

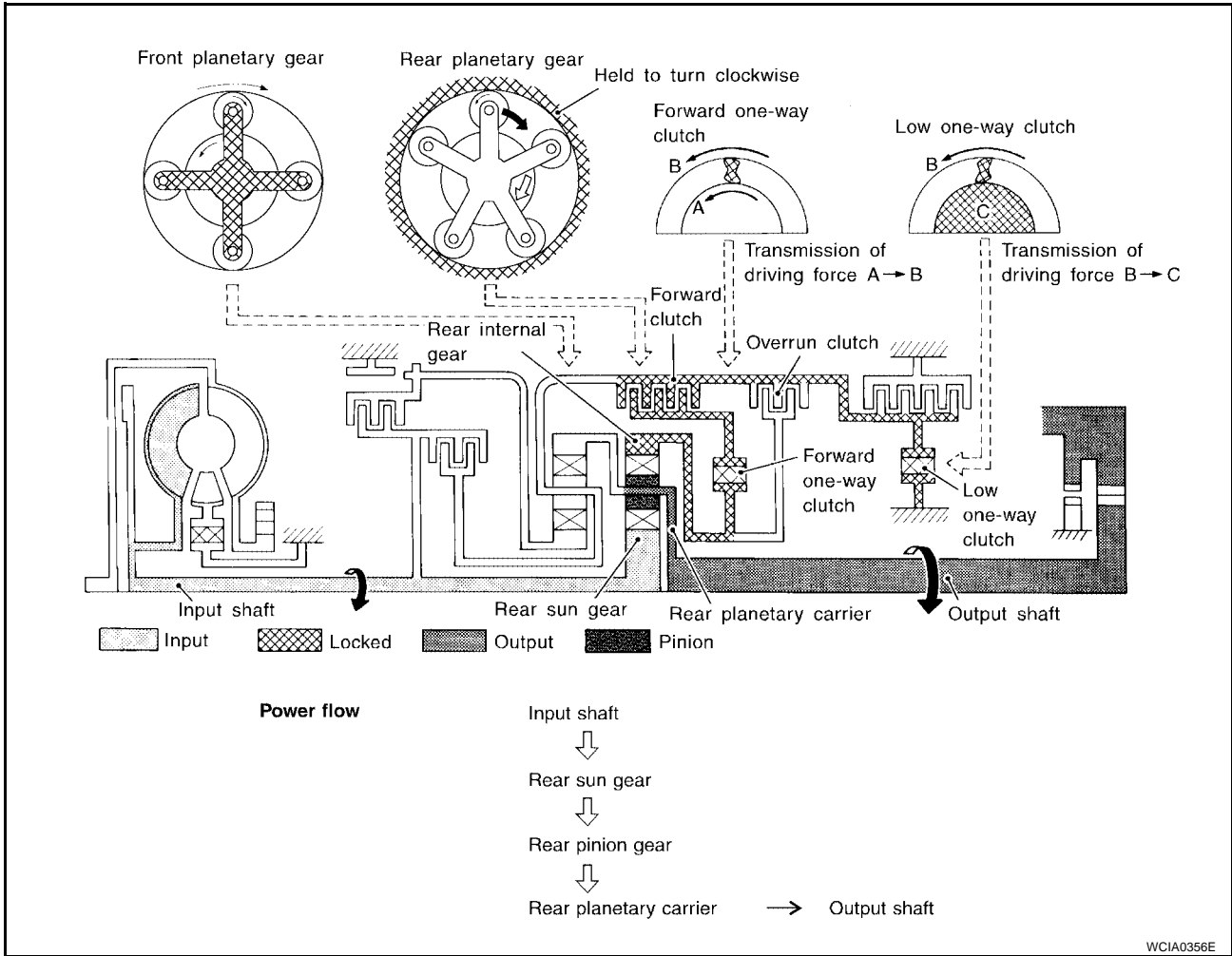


WCIA0355E

| | |
|---|---|
| <ul style="list-style-type: none"> ● Forward clutch ● Low one-way clutch ● Forward one-way clutch ● Overrun clutch ● Low and reverse brake | <p>As overrun clutch engages, rear internal gear is locked by the operation of low and reverse brake. This is different from that of D1 , 21 , and 31 .</p> |
| <p>Engine brake</p> | <p>Overrun clutch always engages, therefore engine brake can be obtained when decelerating.</p> |

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D1 and 21 Positions

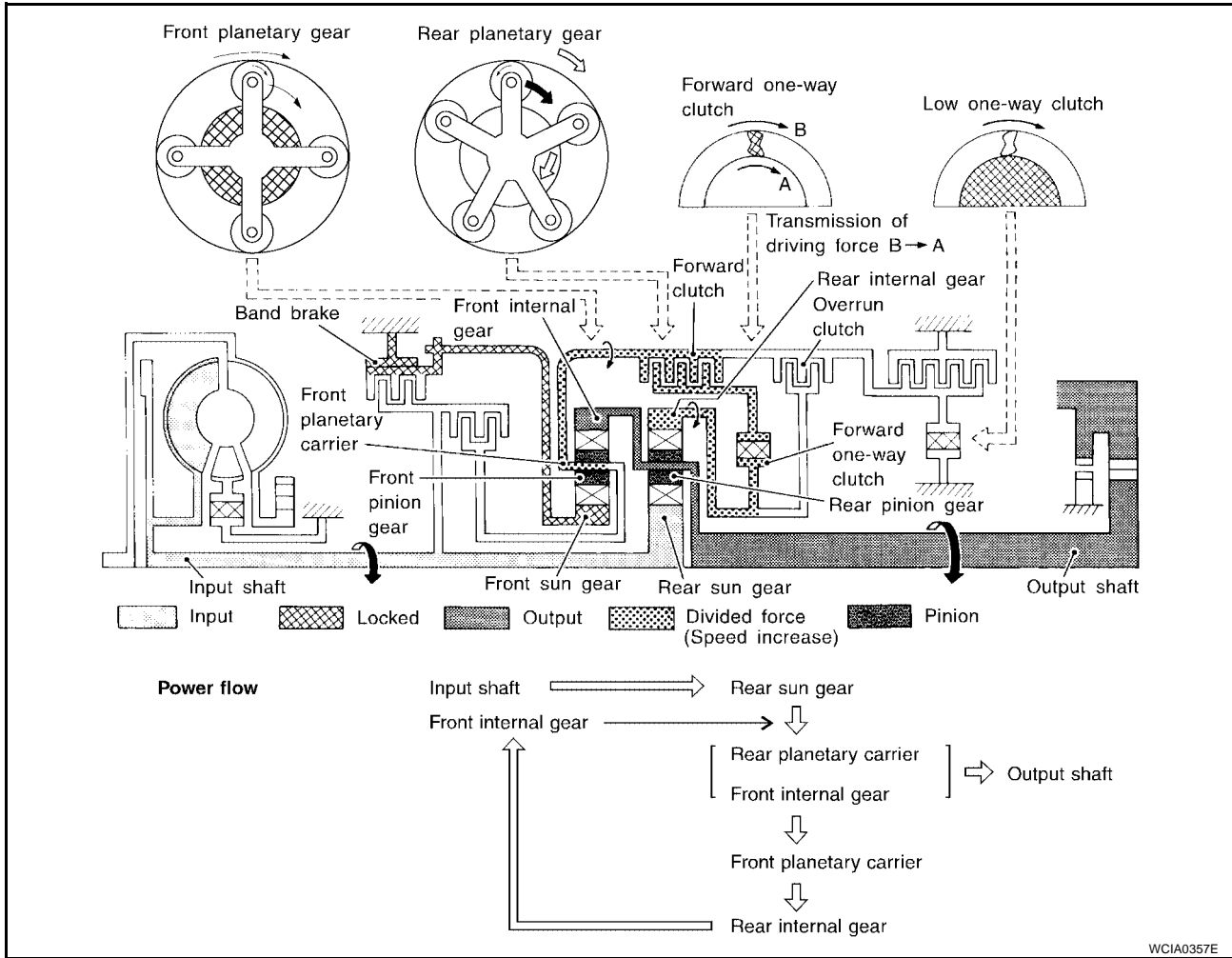


| | |
|--|--|
| <ul style="list-style-type: none"> ● Forward one-way clutch ● Forward clutch ● Low one-way clutch | <p>Rear internal gear is locked to rotate counterclockwise because of the functioning of these three clutches.</p> |
| <p>Overrun clutch engagement conditions (Engine brake)</p> | <p>D1 : Overdrive control switch OFF and throttle opening is less than 3/16 21 : Always engaged At D1 and 21 positions, engine brake is not activated due to free turning of low one-way clutch.</p> |

OVERALL SYSTEM

[RE4F04B]

D2 , 32 , 22 and 12 Positions



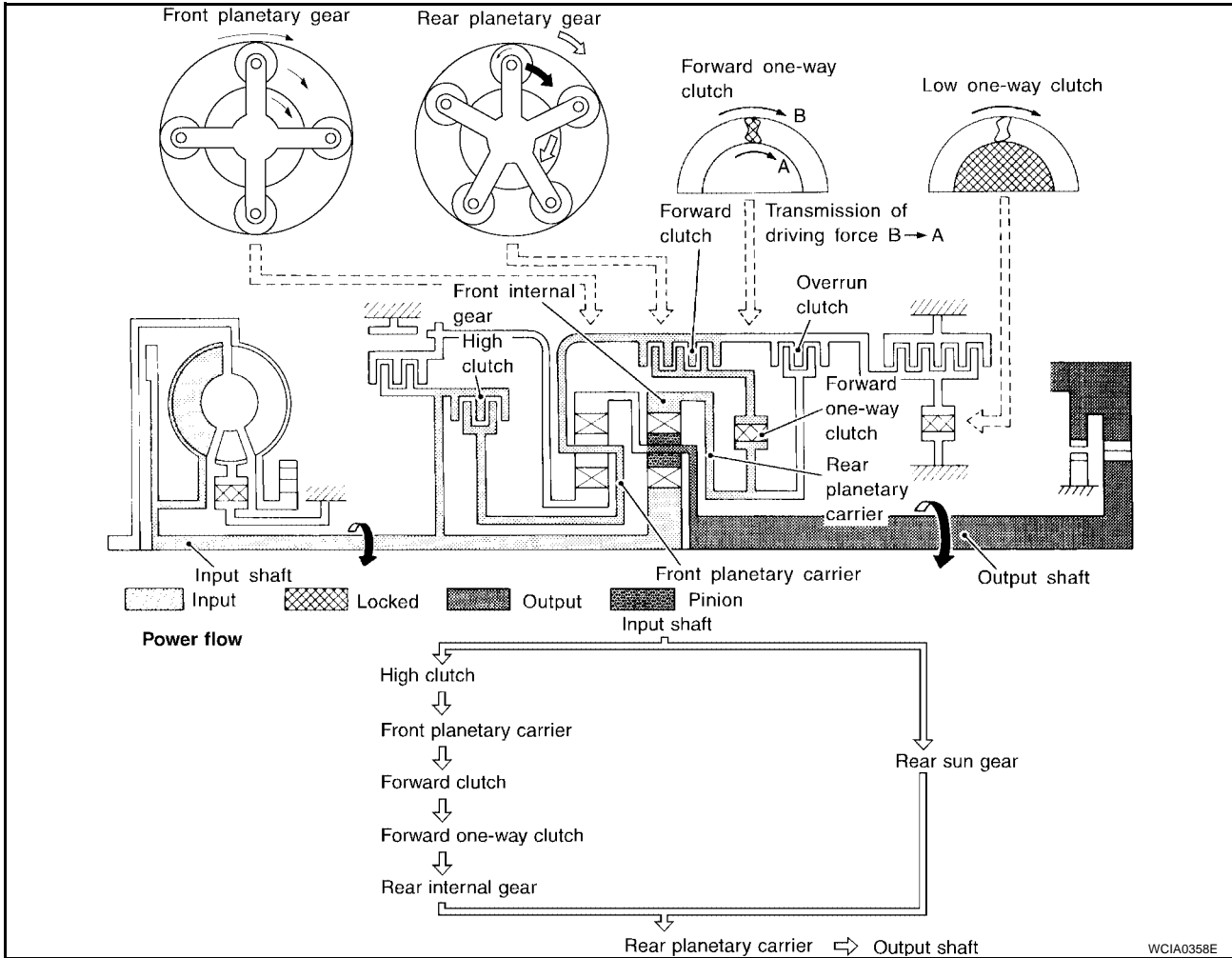
WCIA0357E

| | |
|---|---|
| <ul style="list-style-type: none"> ● Forward clutch ● Forward one-way clutch ● Brake band | <p>Rear sun gear drives rear planetary carrier and combined front internal gear. Front internal gear now rotates around front sun gear accompanying front planetary carrier. As front planetary carrier transfers the power to rear internal gear through forward clutch and forward one-way clutch, this rotation of rear internal gear increases the speed of rear planetary carrier compared with that of the 1st speed.</p> |
| <p>Overrun clutch engagement conditions</p> | <p>32 : Gear selector lever is set in 3 position and throttle opening is less than 3/16 32 , 22 and 12 : Always engaged</p> |

OVERALL SYSTEM

[RE4F04B]

D3 and 33 Positions

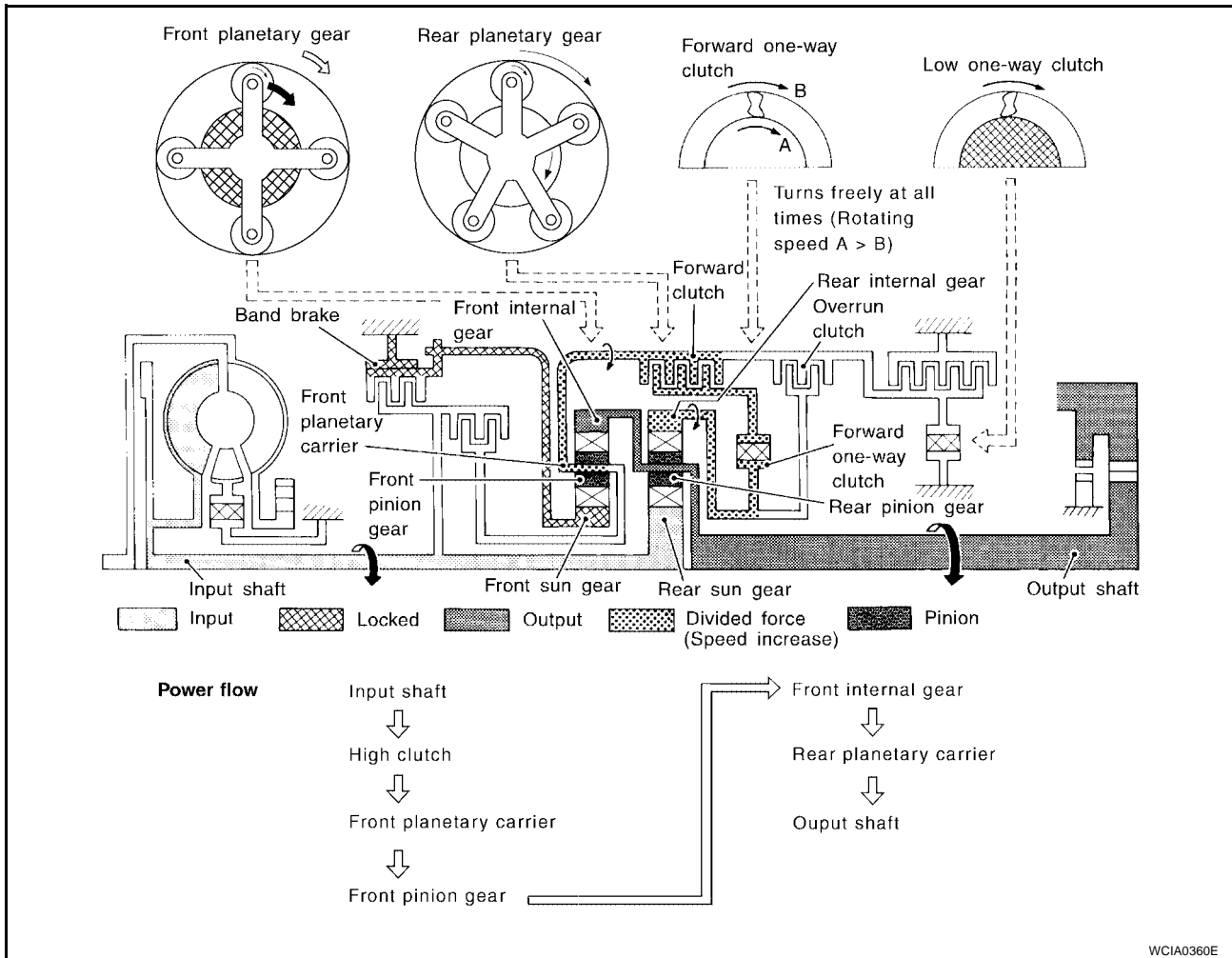


| | |
|--|---|
| <ul style="list-style-type: none"> ● High clutch ● Forward clutch ● Forward one-way clutch | <p>Input power is transmitted to front planetary carrier through high clutch. And front planetary carrier is connected to rear internal gear by operation of forward clutch and forward one-way clutch.</p> <p>This rear internal gear rotation and another input (the rear sun gear) accompany rear planetary carrier to turn at the same speed.</p> |
| <p>Overrun clutch engagement conditions</p> | <p>D3 and 33 : Selector lever is set in 3 position and throttle opening is less than 3/16</p> |

OVERALL SYSTEM

[RE4F04B]

D4 Position



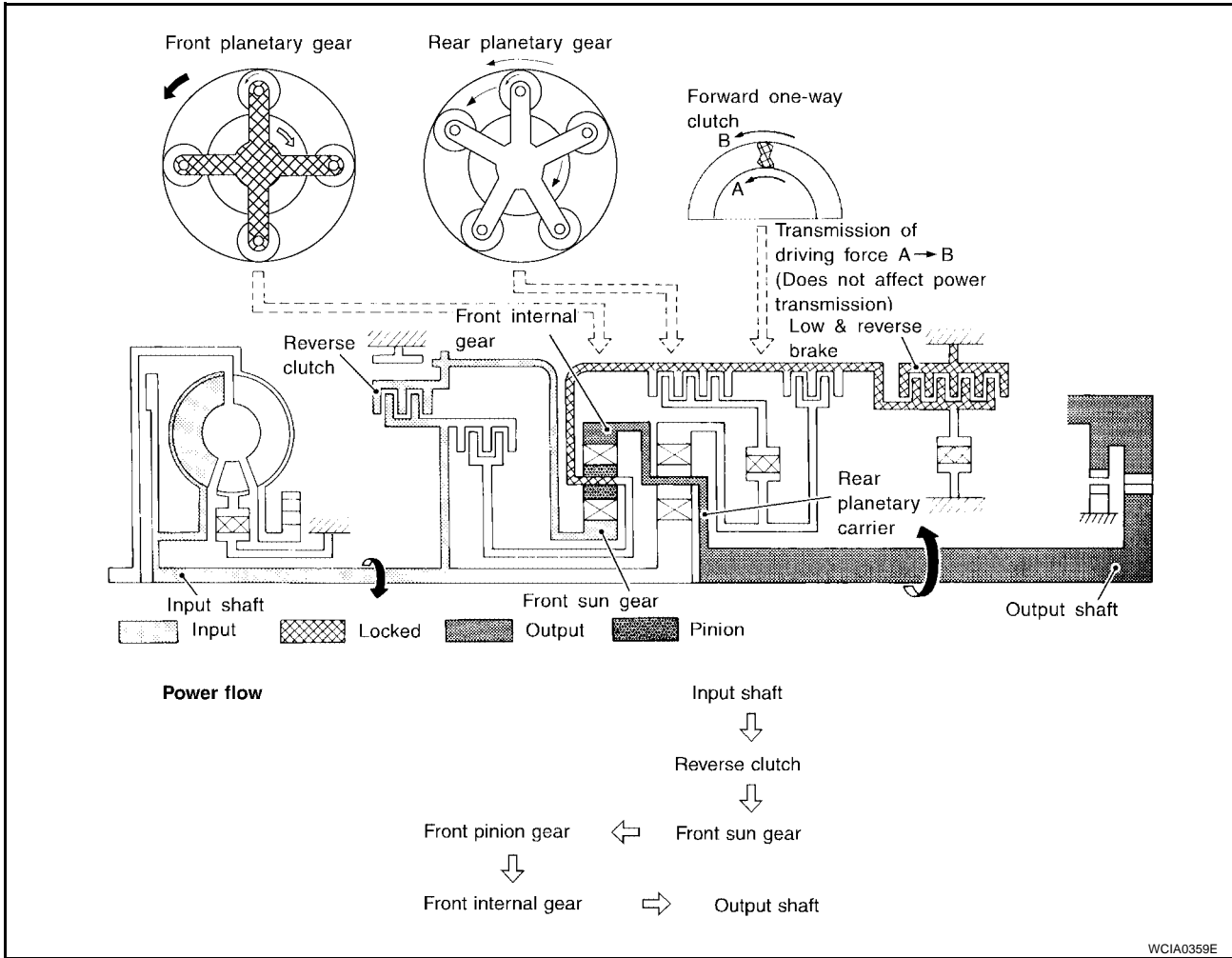
WCIA0360E

| | |
|---|---|
| <ul style="list-style-type: none"> ● High clutch ● Brake band ● Forward clutch (Does not affect power transmission) | <p>Input power is transmitted to front carrier through high clutch. This front carrier turns around the sun gear which is fixed by brake band and makes front internal gear (output) turn faster.</p> |
| <p>Engine brake</p> | <p>At D4 position, there is no one-way clutch in the power transmission line and engine brake can be obtained when decelerating.</p> |

OVERALL SYSTEM

[RE4F04B]

R Position



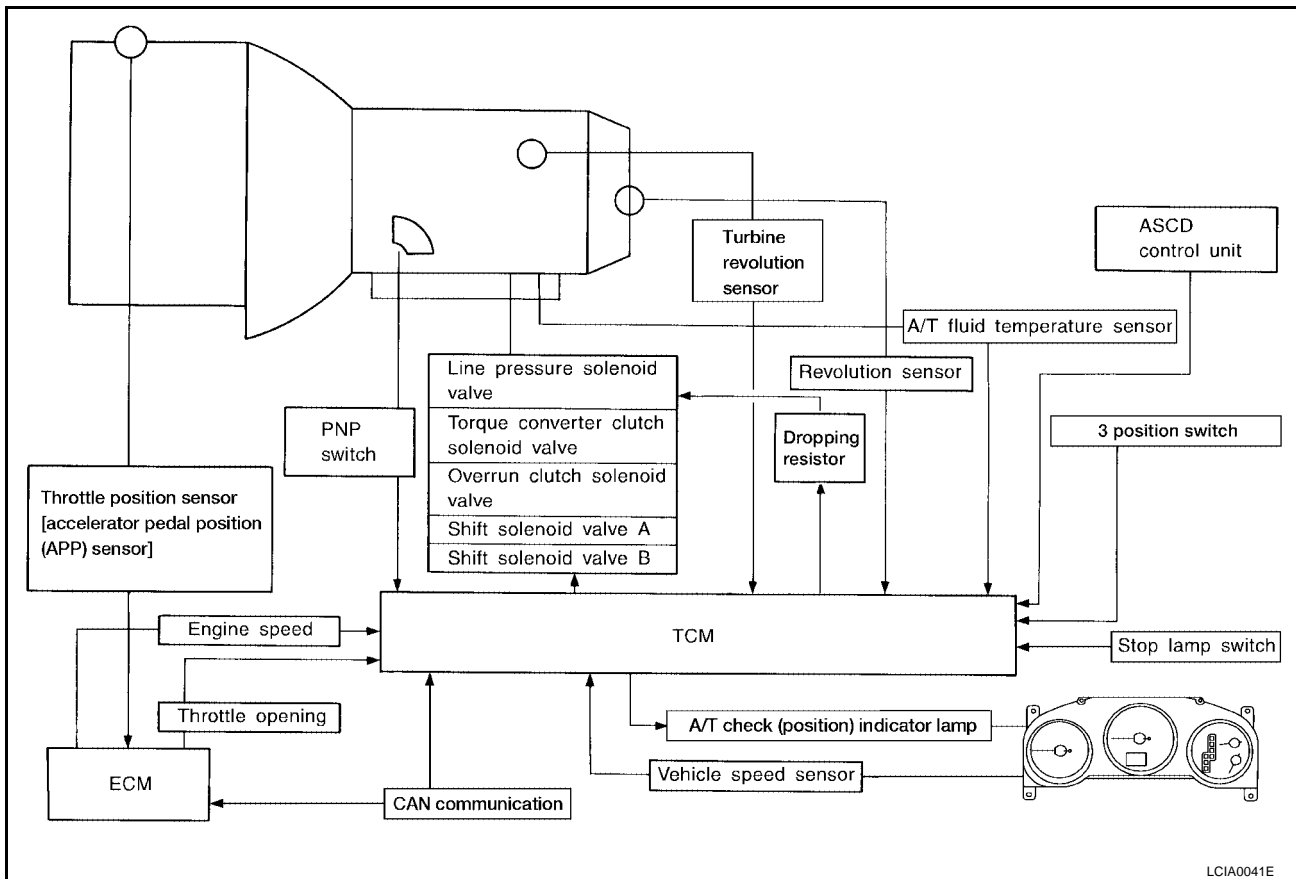
| | |
|---|--|
| <ul style="list-style-type: none"> ● Reverse clutch ● Low and reverse brake | <p>Front planetary carrier is stationary because of the operation of low and reverse brake. Input power is transmitted to front sun gear through reverse clutch, which drives front internal gear in the opposite direction.</p> |
| <p>Engine brake</p> | <p>As there is no one-way clutch in the power transmission line, engine brake can be obtained when decelerating.</p> |

**Control System
OUTLINE**

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

| SENSORS | TCM | ACTUATORS |
|---|--|--|
| Park/neutral position (PNP) switch Throttle position sensor [accelerator pedal position (APP) sensor] Engine speed signal A/T fluid temperature sensor Revolution sensor (VHCL/S SE-1) Vehicle speed sensor (VHCL/S SE-2) 3 position switch ASCD control unit Stop lamp switch Turbine revolution sensor | Shift control Line pressure control Lock-up control Overrun clutch control Timing control Fail-safe control Self-diagnosis CAN communication line control | Shift solenoid valve A Shift solenoid valve B Overrun clutch solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve A/T check (position) indicator lamp |

CONTROL SYSTEM



LCIA0041E

TCM FUNCTION

The function of the TCM is to:

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

INPUT/OUTPUT SIGNAL OF TCM

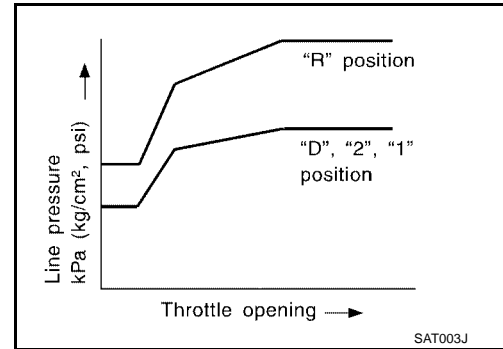
| | Sensors and solenoid valves | Function |
|--------|--|---|
| Input | Park/neutral position (PNP) switch | Detects select lever position and sends a signal to TCM. |
| | Throttle position sensor [accelerator pedal position (APP) sensor] | Detects throttle valve position and sends a signal to TCM. |
| | Engine speed signal | Receives signal from ECM and controls lock-up control solenoid valve. |
| | A/T fluid temperature sensor | Detects transaxle fluid temperature and sends a signal to TCM. |
| | Revolution sensor (VHCL/S SE-1) | Detects output shaft rpm and sends a signal to TCM. |
| | Vehicle speed sensor (VHCL/S SE-2) | Used as an auxiliary vehicle speed sensor. Sends a signal when revolution sensor (installed on transaxle) malfunctions. |
| | 3 position switch | Sends a signal, which prohibits a shift to D4 (overdrive) position, to the TCM. |
| | ASCD control unit | Sends the cruise signal and D4 (overdrive) cancellation signal from ASCD control unit to TCM. |
| | Stop lamp switch | Send the lock-up release signal to the TCM at time of D4 (lock-up). |
| | CAN communication | In CAN communication, control units are connected to 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transaxle with less wiring. |
| Output | Shift solenoid valve A/B | Selects shifting point suited to driving conditions in relation to a signal sent from TCM. |
| | Line pressure solenoid valve | Regulates (or decreases) line pressure suited to driving conditions in relation to a signal sent from TCM. |
| | Torque converter clutch solenoid valve | Regulates (or decreases) lock-up pressure suited to driving conditions in relation to a signal sent from TCM. |
| | Overrun clutch solenoid valve | Controls an "engine brake" effect suited to driving conditions in relation to a signal sent from TCM. |
| | A/T check (position) indicator lamp | Shows TCM faults, when A/T control components malfunction. |
| | CAN communication | In CAN communication, control units are connected to 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transaxle with less wiring. |

Control Mechanism
LINE PRESSURE CONTROL

TCM has various line pressure control characteristics to meet the driving conditions.
An ON-OFF duty signal is sent to the line pressure solenoid valve based on TCM characteristics.
Hydraulic pressure on the clutch and brake is electronically controlled through the line pressure solenoid valve to accommodate engine torque. This results in smooth shift operation.

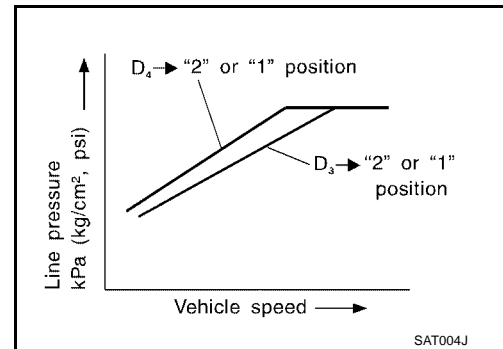
Normal Control

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



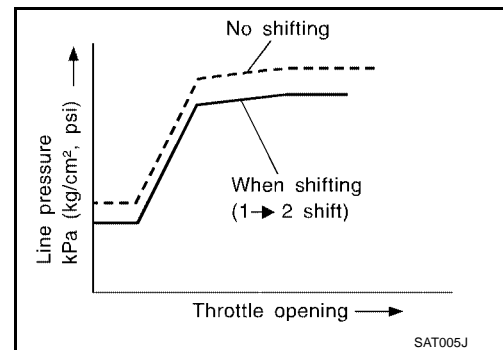
Back-up Control (Engine brake)

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



During Shift Change

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

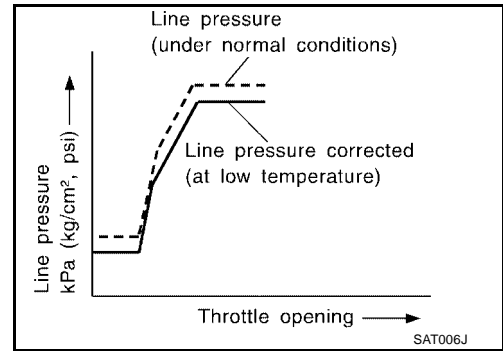


At Low Fluid Temperature

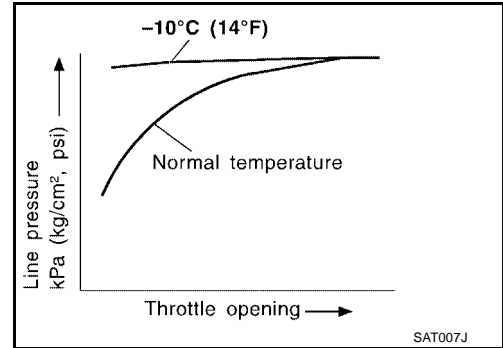
- Fluid viscosity and frictional characteristics of the clutch facing change with fluid temperature. Clutch engaging or band-contacting pressure is compensated for, according to fluid temperature, to stabilize shifting quality.

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- The line pressure is reduced below 60°C (140°F) to prevent shifting shock due to low viscosity of automatic transaxle fluid when temperature is low.



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



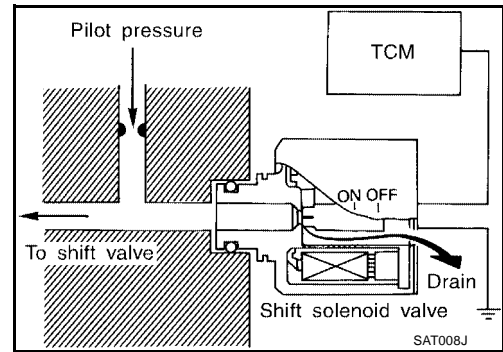
SHIFT CONTROL

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

Control of Shift Solenoid Valves A and B

The shift solenoid valve performs simple ON-OFF operation. When set to ON, the drain circuit closes and pilot pressure is applied to the shift valve.

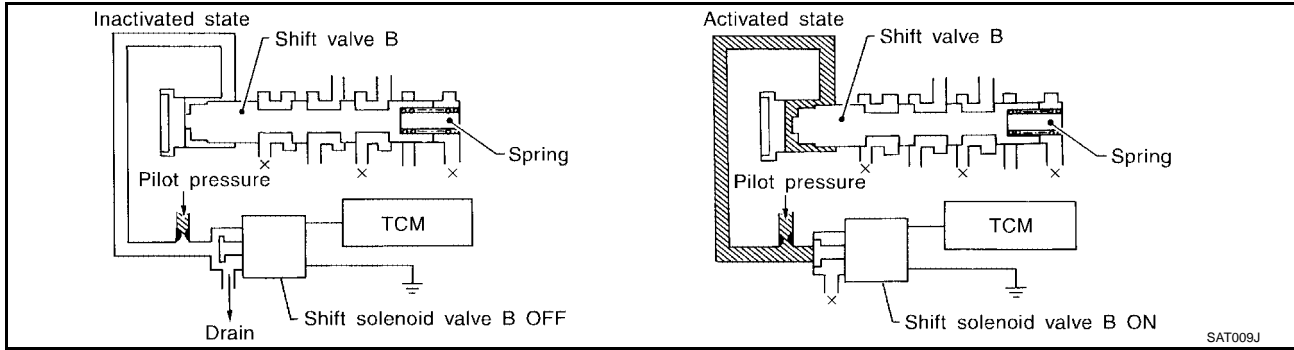
The TCM activates shift solenoid valves A and B according to signals from the ECM (throttle opening) and revolution sensor to select the optimum gear position on the basis of the shift schedule memorized in the TCM.



Relation between shift solenoid valves A and B and gear positions

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

Control of Shift Valves A and B



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

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

LOCK-UP CONTROL

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

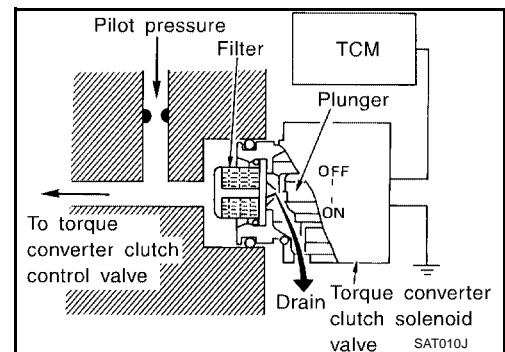
Conditions for Lock-up Operation

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

| | | |
|------------------------------|------------------------|------------|
| Selector lever | D position | 3 position |
| Gear position | D4 | 3 |
| Vehicle speed sensor | More than set value | |
| ECM (throttle opening) | Less than set opening | |
| A/T fluid temperature sensor | More than 40°C (104°F) | |

Torque Converter Clutch Solenoid Valve Control

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



OVERALL SYSTEM

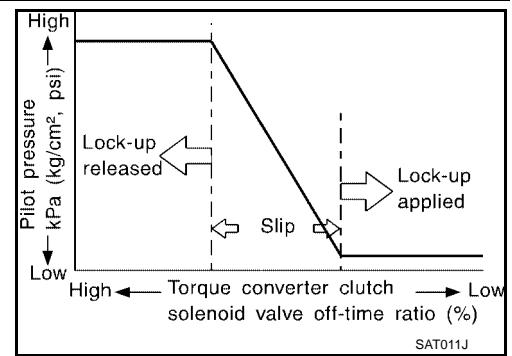
[RE4F04B]

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

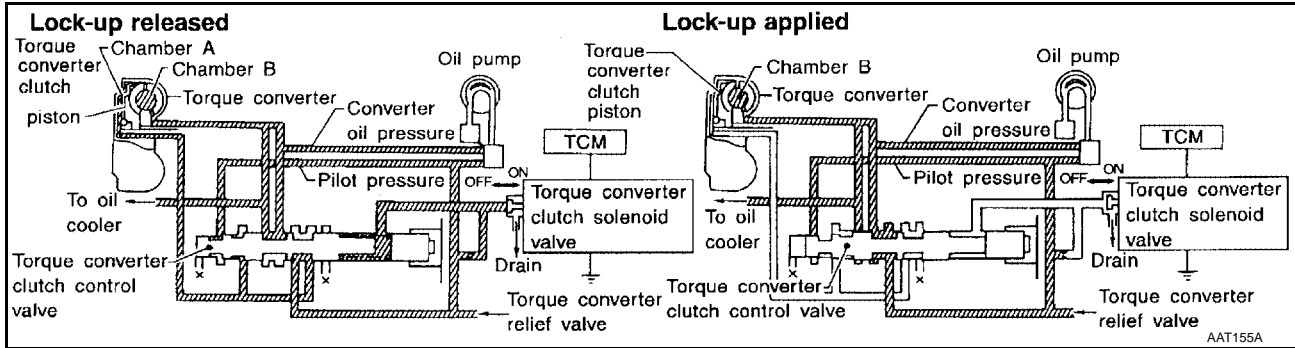
↓
Amount of drain DECREASING

↓
Pilot pressure HIGH

↓
Lock-up RELEASING



Torque Converter Clutch Control Valve Operation



LOCK-UP RELEASED

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

LOCK-UP APPLIED

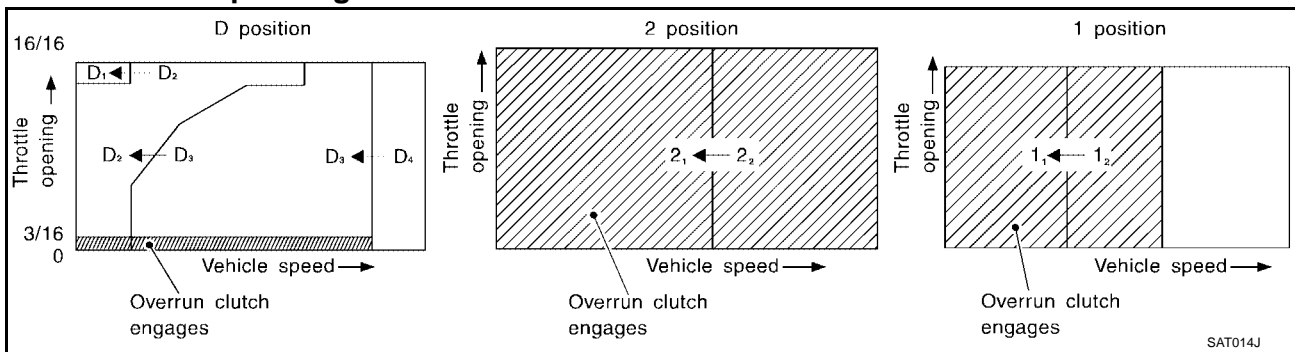
When the OFF-duration of the torque converter clutch solenoid valve is short, pilot pressure drains and becomes low. Accordingly, the control valve moves to the right by the pilot pressure of the other circuit and converter pressure. As a result, converter pressure is applied to chamber B, keeping the torque converter clutch piston applied.

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

OVERRUN CLUTCH CONTROL (ENGINE BRAKE CONTROL)

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

Overrun Clutch Operating Conditions



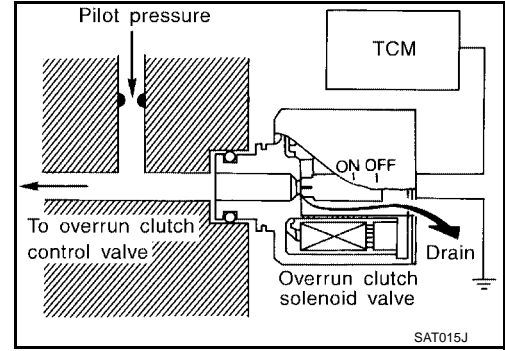
| Selector lever position | Gear position | Throttle opening |
|-------------------------|---------------|------------------|
| D | D1, D2, D3 | Less than 3/16 |
| 2 | 21, 22 | |
| 1 | 11, 12 | At any position |

Overrun Clutch Solenoid Valve Control

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

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

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

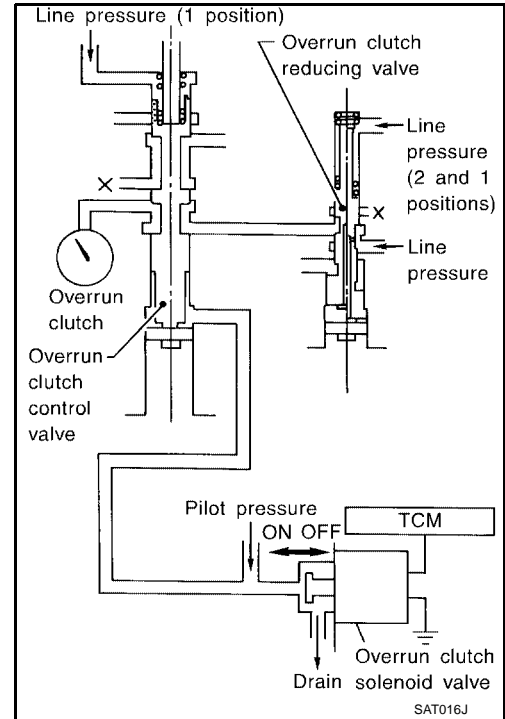


Overrun Clutch Control Valve Operation

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

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

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



Control Valve

FUNCTION OF CONTROL VALVES

| Valve name | Function |
|--|---|
| Pressure regulator valve, plug and sleeve plug | Regulates oil discharged from the oil pump to provide optimum line pressure for all driving conditions. |
| Pressure modifier valve and sleeve | Used as a signal supplementary valve to the pressure regulator valve. Regulates pressure-modifier pressure (signal pressure) which controls optimum line pressure for all driving conditions. |
| Pilot valve | Regulates line pressure to maintain a constant pilot pressure level which controls lock-up mechanism, overrun clutch, shift timing. |
| Accumulator control valve | Regulates accumulator back-pressure to pressure suited to driving conditions. |
| Manual valve | Directs line pressure to oil circuits corresponding to select positions. Hydraulic pressure drains when the shift lever is in Neutral. |
| Shift valve A | Simultaneously switches three oil circuits using output pressure of shift solenoid valve A to meet driving conditions (vehicle speed, throttle opening, etc.). Provides automatic downshifting and up-shifting (1st → 2nd → 3rd → 4th gears/4th → 3rd → 2nd → 1st gears) in combination with shift valve B. |

OVERALL SYSTEM

[RE4F04B]

| Valve name | Function |
|--|--|
| Shift valve B | Simultaneously switches two oil circuits using output pressure of shift solenoid valve B in relation to driving conditions (vehicle speed, throttle opening, etc.). Provides automatic downshifting and up-shifting (1st → 2nd → 3rd → 4th gears/4th → 3rd → 2nd → 1st gears) in combination with shift valve A. |
| Overrun clutch control valve | Switches hydraulic circuits to prevent engagement of the overrun clutch simultaneously with application of the brake band in D4 . (Interlocking occurs if the overrun clutch engages during D4 .) |
| "1" reducing valve | Reduces low & reverse brake pressure to dampen engine-brake shock when down-shifting from the 1 position 12 to 11 . |
| Overrun clutch reducing valve | Reduces oil pressure directed to the overrun clutch and prevents engine-brake shock. In 1 and 2 positions, line pressure acts on the overrun clutch reducing valve to increase the pressure-regulating point, with resultant engine brake capability. |
| Torque converter relief valve | Prevents an excessive rise in torque converter pressure. |
| Torque converter clutch control valve, plug and sleeve | Activates or inactivates the lock-up function. Also provides smooth lock-up through transient application and release of the lock-up system. |
| 1-2 accumulator valve and piston | Dampens the shock encountered when 2nd gear band servo contracts, and provides smooth shifting. |
| 3-2 timing valve | Switches the pace that oil pressure is released depending on vehicle speed; maximizes the high clutch release timing, and allows for soft down shifting. |
| Shuttle valve | Determines if the overrun clutch solenoid valve should control the 3-2 timing valve or the overrun clutch control valve and switches between the two. |
| Cooler check valve | At low speeds and with a small load when little heat is generated, saves the volume of cooler flow, and stores the oil pressure for lock up. |

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

PFP:00000

Introduction

ECS0095Z

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 (transaxle control module) in combination with the ECM. The malfunction is indicated by the MIL (malfunction indicator lamp) and is stored as a DTC in the ECM memory but not the TCM memory.

The second is the TCM original self-diagnosis indicated by the A/T check (position) indicator lamp. The malfunction is stored in the TCM memory. The detected items are overlapped with OBD-II self-diagnostic items. For details, refer to [AT-39, "OBD-II Function for A/T System"](#).

OBD-II Function for A/T System

ECS00960

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

ECS00961

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. — First Trip

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

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

| Items | MIL | |
|--|--------------------|--------------------|
| | One trip detection | Two trip detection |
| Shift solenoid valve A — DTC: P0750 | X | |
| Shift solenoid valve B — DTC: P0755 | X | |
| Accelerator pedal position (APP) sensor — DTC: P1705 | X | |
| Except above | | X |



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

OBD-II Diagnostic Trouble Code (DTC)

ECS00962

HOW TO READ DTC AND 1ST TRIP DTC

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

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

These DTCs are prescribed by SAE J2012.

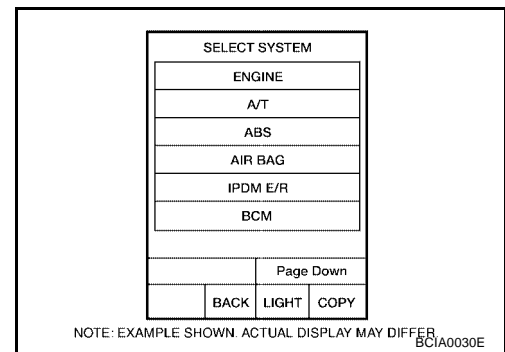
(CONSULT-II also displays the malfunctioning component or system.)

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

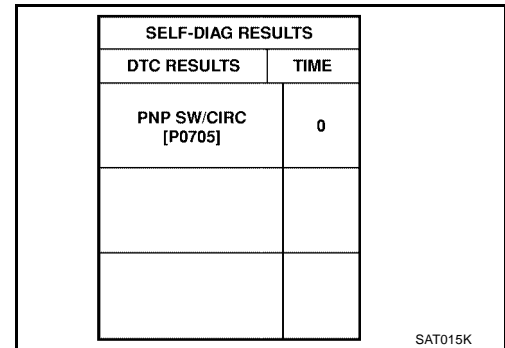
ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[RE4F04B]

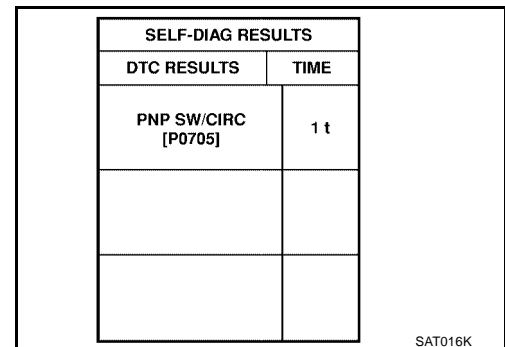
A sample of CONSULT-II display for DTC and 1st trip DTC is shown in the following page. DTC or 1st trip DTC of a malfunction is displayed in "SELF DIAGNOSIS" mode for "ENGINE" with CONSULT-II. Time data indicates how many times the vehicle was driven after the last detection of a DTC.



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



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



Freeze Frame Data and 1st Trip Freeze Frame Data

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

Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data, and the data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-II or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-II screen, not on the GST. For details, refer to ! Hyper-link Error ! .

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

| Priority | Items | |
|----------|----------------------------|--|
| 1 | Freeze frame data | Misfire — DTC: P0300 - P0306 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175 |
| 2 | | Except the above items (Includes A/T related items) |
| 3 | 1st trip freeze frame data | |

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

HOW TO ERASE DTC

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

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

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to ! Hyper-link Error ! .

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

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

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

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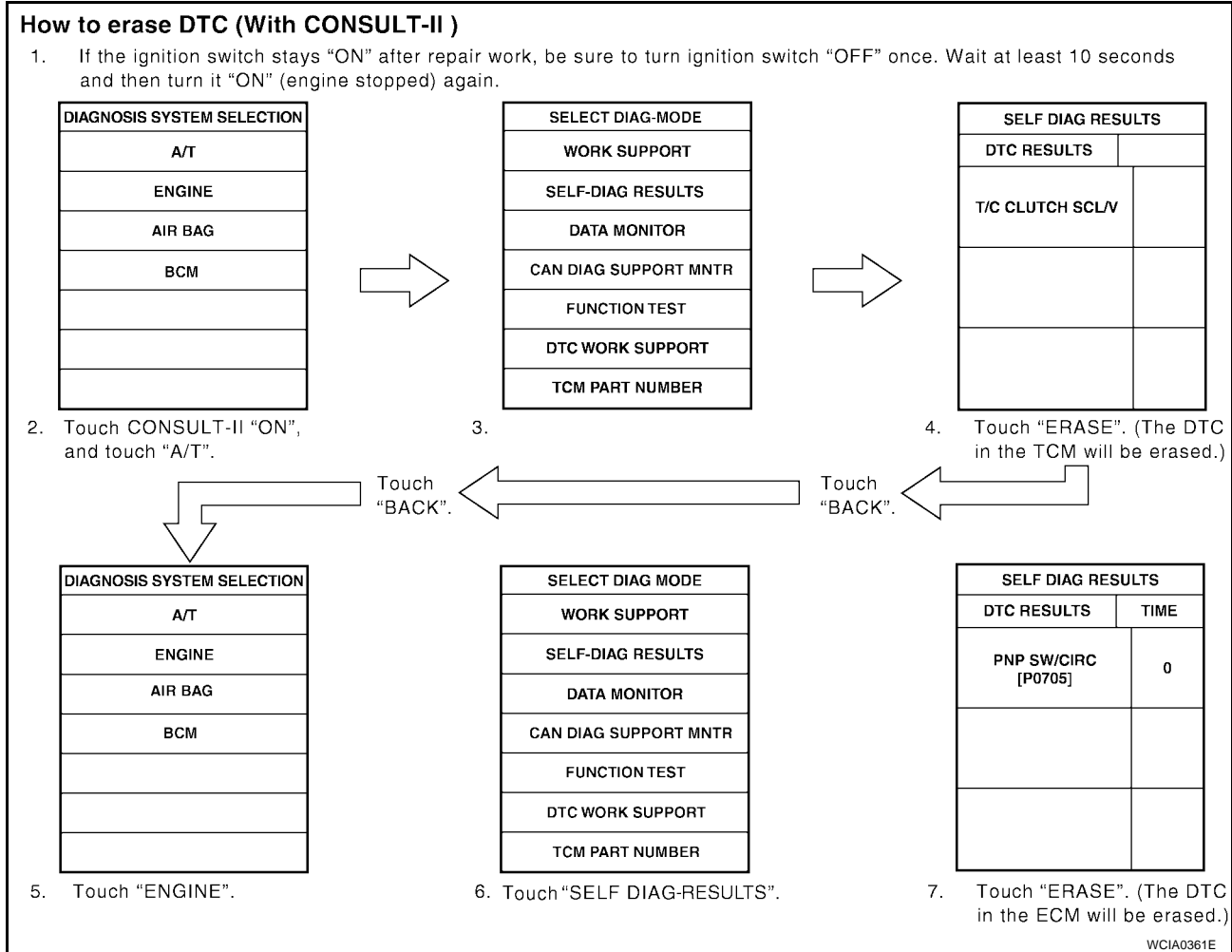
J

K

L

M

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



HOW TO ERASE DTC (WITH GST)

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform "OBD-II SELF-DIAGNOSTIC PROCEDURE (No Tools)". Refer to [AT-55, "OBD-II SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) . (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-65, "How to Erase DTC"](#) .

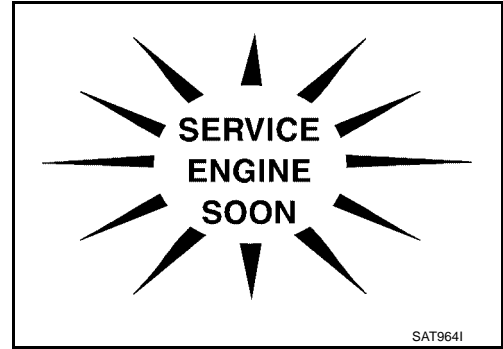
HOW TO ERASE DTC (NO TOOLS)

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)". Refer to [AT-55, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)

Malfunction Indicator Lamp (MIL)

ECS00963

1. The malfunction indicator lamp will light up when the ignition switch is turned ON without the engine running. This is for checking the lamp.
 - If the malfunction indicator lamp does not light up, refer to [DI-30, "WARNING LAMPS"](#) .
(Or see [EC-67, "Malfunction Indicator Lamp \(MIL\)"](#) .)
2. When the engine is started, the malfunction indicator lamp should go off.
If the lamp remains on, the on board diagnostic system has detected an emission-related (OBD-II) malfunction. For details, refer to ! Hyper-link Error ! .



CONSULT-II Function (TCM)

ECS00964

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. |

CAUTION:

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

After performing "SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)" ([AT-44, "SELF-DIAGNOSTIC PROCEDURE \(WITH CONSULT-II\)"](#)), place check marks for results on the "Diagnostic Worksheet", [AT-60, "DIAGNOSTIC WORKSHEET"](#) . Reference pages are provide following the items.

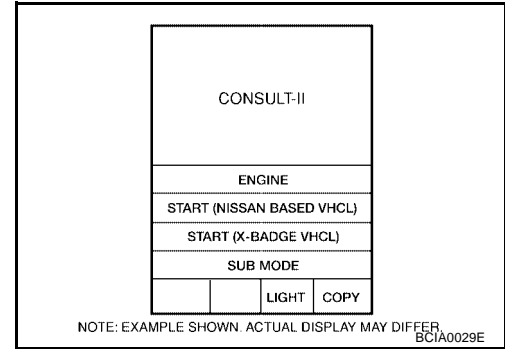
NOTICE:

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

⑧ SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)

1. Touch on CONSULT-II, touch "START (NISSAN BASED VHCL)", and touch "ENGINE" for OBD-II detected items or touch "A/T" for TCM self-diagnosis.

If A/T is not displayed, check TCM power supply and ground circuit. Refer to [AT-102, "TROUBLE DIAGNOSIS FOR POWER SUPPLY"](#) . If result is NG, refer to [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#) .

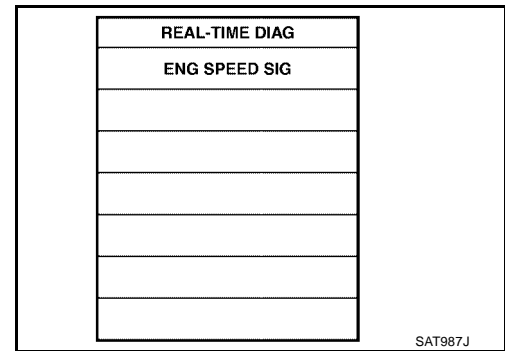


2. Touch "SELF DIAG RESULTS".

Display shows malfunction experienced since the last erasing operation.

CONSULT-II performs "Real Time Diagnosis".

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



SELF-DIAGNOSTIC RESULT TEST MODE

| Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode) | | Malfunction is detected when... | TCM self-diagnosis | OBD-II (DTC) |
|---|---------------------|---|---|---|
| "A/T" | "ENGINE" | | Available by A/T check (position) indicator lamp or "A/T" on CONSULT-II | Available by malfunction indicator lamp*2, <small>SERVICE ENGINE SOON</small> "ENGINE" on CONSULT-II or GST |
| — | PNP SW/CIRC | ● TCM does not receive the correct voltage signal (based on the gear position) from the switch. | — | P0705 |
| — | VEH SPD SEN/ CIR AT | ● TCM does not receive the proper voltage signal from the sensor. | X | P0720 |
| — | — | ● TCM does not receive the proper voltage signal from the sensor. | X | — |
| — | A/T 1ST GR FNCTN | ● A/T cannot be shifted to the 1st gear position even if electrical circuit is good. | — | P0731*1 |
| — | A/T 2ND GR FNCTN | ● A/T cannot be shifted to the 2nd gear position even if electrical circuit is good. | — | P0732*1 |
| — | A/T 3RD GR FNCTN | ● A/T cannot be shifted to the 3rd gear position even if electrical circuit is good. | — | P0733*1 |
| — | A/T 4TH GR FNCTN | ● A/T cannot be shifted to the 4th gear position even if electrical circuit is good. | — | P0734*1 |

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[RE4F04B]

| Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode) | | Malfunction is detected when... | TCM self-diagnosis | OBD-II (DTC) | A |
|---|--------------------|---|---|---|----|
| "A/T" | "ENGINE" | | Available by A/T check (position) indicator lamp or "A/T" on CONSULT-II | Available by malfunction indicator lamp*2, <small>SERVICE ENGINE SOON</small> "ENGINE" on CONSULT-II or GST | B |
| A/T TCC S/V function (lock-up) | | ● A/T cannot perform lock-up even if electrical circuit is good. | — | P0744*1 | AT |
| — | A/T TCC S/V FNCTN | | | | |
| Shift solenoid valve A | | ● TCM detects an improper voltage drop when it tries to operate the solenoid valve. | X | P0750 | D |
| SHIFT SOLENOID/V A | SFT SOL A/CIRC | | | | |
| Shift solenoid valve B | | ● TCM detects an improper voltage drop when it tries to operate the solenoid valve. | X | P0755 | E |
| SHIFT SOLENOID/V B | SFT SOL B/CIRC | | | | |
| Overrun clutch solenoid valve | | ● TCM detects an improper voltage drop when it tries to operate the solenoid valve. | X | P1760 | F |
| OVERRUN CLUTCH S/V | O/R CLUCH SOL/CIRC | | | | |
| T/C clutch solenoid valve | | ● TCM detects an improper voltage drop when it tries to operate the solenoid valve. | X | P0740 | G |
| T/C CLUTCH SOL/V | TCC SOLENOID/CIRC | | | | |
| Line pressure solenoid valve | | ● TCM detects an improper voltage drop when it tries to operate the solenoid valve. | X | P0745 | H |
| LINE PRESSURE S/V | L/PRESS SOL/CIRC | | | | |
| Throttle position sensor [accelerator pedal position (APP) sensor] | | ● TCM receives an excessively low or high voltage from this sensor | X | P1705 | I |
| THROTTLE POSI SEN TP/SEN/CIRC A/T | | | | | |
| Engine speed signal | | ● TCM does not receive the proper voltage signal from the ECM. | X | P0725 | J |
| ENGINE SPEED SIG | | | | | |
| A/T fluid temperature sensor | | ● TCM receives an excessively low or high voltage from the sensor. | X | P0710 | K |
| BATT/FLUID TEMP SEN | ATF TEMP SEN/CIRC | | | | |
| Engine control | | ● The ECM-A/T communication line is open or shorted. | X | U1000 | L |
| A/T COMM LINE | — | | | | |
| Turbine revolution sensor | | ● TCM does not receive proper voltage signal from sensor | X | — | M |
| TURBINE REV | | | | | |
| TCM (RAM) | | ● TCM memory (RAM) is malfunctioning | — | — | |
| CONTROL UNIT (RAM) | — | | | | |
| TCM (ROM) | | ● TCM memory (ROM) is malfunctioning | — | — | |
| CONTROL UNIT (ROM) | — | | | | |
| TCM (EEP ROM) | | ● TCM memory (EEP ROM) is malfunctioning. | — | — | |
| CONT UNIT(EEP ROM) | — | | | | |

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[RE4F04B]

| Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode) | | Malfunction is detected when... | TCM self-diagnosis | OBD-II (DTC) |
|--|----------|--|---|---|
| | | | Available by A/T check (position) indicator lamp or "A/T" on CONSULT-II | Available by malfunction indicator lamp*2, <small>SERVICE ENGINE SOON</small> "ENGINE" on CONSULT-II or GST |
| "A/T" | "ENGINE" | | | |
| Initial start | | <ul style="list-style-type: none"> This is not a malfunction message (Whenever shutting off a power supply to the TCM, this message appears on the screen.) | X | — |
| INITIAL START | — | | | |
| No failure (NO SELF DIAGNOSTIC FAILURE INDICATED FURTHER TESTING MAY BE REQUIRED**) | | <ul style="list-style-type: none"> No failure has been detected. | X | X |

X: Applicable

—: Not applicable

*1: These malfunctions cannot be displayed by MIL SERVICE ENGINE SOON if another malfunction is assigned to MIL.

*2: Refer to [EC-67, "Malfunction Indicator Lamp \(MIL\)"](#).

DATA MONITOR MODE (A/T)

| Item | Display | Monitor item | | | Description | Remarks |
|--|-------------------------------|-------------------|--------------|---------------------|--|---|
| | | TCM Input signals | Main signals | Selection from menu | | |
| Vehicle speed sensor 1 (A/T) (Revolution sensor) | VHCL/S SE-A/T [km/h] or [mph] | X | — | ▼ | <ul style="list-style-type: none"> Vehicle speed computed from signal of revolution sensor is displayed. | <ul style="list-style-type: none"> When racing engine in N or P with vehicle stationary, CONSULT-II data may not indicate 0 km/h (0 mph). |
| Vehicle speed sensor 2 (Meter) | VHCL/S SE-MTR [km/h] or [mph] | X | — | ▼ | <ul style="list-style-type: none"> Vehicle speed computed from signal of vehicle speed sensor is displayed. | <ul style="list-style-type: none"> Vehicle speed display may not be accurate under approx. 10 km/h (6 mph). It may not indicate 0 km/h (0 mph) when vehicle is stationary. |
| Throttle position sensor [accelerator pedal position (APP) sensor] | THRTL POS SEN [V] | X | — | ▼ | <ul style="list-style-type: none"> Throttle position sensor signal voltage is displayed | |
| A/T fluid temperature sensor | FLUID TEMP SE [V] | X | — | ▼ | <ul style="list-style-type: none"> A/T fluid temperature sensor signal voltage is displayed. Signal voltage lowers as fluid temperature rises. | |
| Battery voltage | BATTERY VOLT [V] | X | — | ▼ | <ul style="list-style-type: none"> Source voltage of TCM is displayed. | |
| Engine speed | ENGINE SPEED [rpm] | X | X | ▼ | <ul style="list-style-type: none"> Engine speed, computed from engine speed signal, is displayed. | <ul style="list-style-type: none"> Engine speed display may not be accurate under approx. 800 rpm. It may not indicate 0 rpm even when engine is not running. |
| Turbine revolution sensor | TURBINE REV | X | — | ▼ | <ul style="list-style-type: none"> Checks changing speed then performs oil pressure control and torque down control | |
| Overdrive control switch | OVERDRIVE SW [ON/OFF] | X | — | ▼ | <ul style="list-style-type: none"> ON/OFF state computed from signal of 3 position switch is displayed. | |

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[RE4F04B]

| Item | Display | Monitor item | | | Description | Remarks |
|---|-------------------------------|-------------------|--------------|---------------------|---|--|
| | | TCM Input signals | Main signals | Selection from menu | | |
| PN position (PNP) switch | PN POSI SW [ON/OFF] | X | — | ▼ | <ul style="list-style-type: none"> ON/OFF state computed from signal of PN position SW is displayed. | |
| R position switch | R POSITION SW [ON/OFF] | X | — | ▼ | <ul style="list-style-type: none"> ON/OFF state computed from signal of R position SW is displayed. | |
| D position switch | D POSITION SW [ON/OFF] | X | — | ▼ | <ul style="list-style-type: none"> ON/OFF state computed from signal of D position SW is displayed. | |
| 2 position switch | 2 POSITION SW [ON/OFF] | X | — | ▼ | <ul style="list-style-type: none"> ON/OFF status, computed from signal of 2 position SW, is displayed. | |
| 1 position switch | 1 POSITION SW [ON/OFF] | X | — | ▼ | <ul style="list-style-type: none"> ON/OFF status, computed from signal of 1 position SW, is displayed. | |
| ASCD cruise signal | ASCD-CRUISE [ON/OFF] | X | — | ▼ | <ul style="list-style-type: none"> Status of ASCD cruise signal is displayed. ON ... Cruising state OFF ... Normal running state | |
| ASCD OD cut signal | ASCD-OD CUT [ON/OFF] | X | — | ▼ | <ul style="list-style-type: none"> Status of ASCD OD release signal is displayed. ON ... OD released OFF ... OD not released | |
| Kickdown switch | KICKDOWN SW [ON/OFF] | X | — | ▼ | <ul style="list-style-type: none"> ON/OFF status, computed from signal of kickdown SW, is displayed. | <ul style="list-style-type: none"> This is displayed even when no kickdown switch is equipped. |
| Stop lamp switch | BRAKE SW [ON/OFF] | X | — | — | <ul style="list-style-type: none"> ON/OFF status is displayed. ON ... Brake pedal is depressed. OFF ... Brake pedal is released. | |
| Selector lever position | SLCT LVR POSI | — | X | ▼ | <ul style="list-style-type: none"> Selector lever position data, used for computation by TCM, is displayed. | <ul style="list-style-type: none"> A specific value used for control is displayed if fail-safe is activated due to error. |
| Vehicle speed | VEHICLE SPEED [km/h] or [mph] | — | X | ▼ | <ul style="list-style-type: none"> Vehicle speed data, used for computation by TCM, is displayed. | |
| Throttle position [Accelerator pedal position (APP) sensor] | THROTTLE POSI [1/8] | — | X | — | <ul style="list-style-type: none"> Throttle position data, used for computation by TCM, is displayed. | <ul style="list-style-type: none"> A specific value used for control is displayed if fail-safe is activated due to error. |

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ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[RE4F04B]

| Item | Display | Monitor item | | | Description | Remarks |
|---|------------------------|-------------------|--------------|---------------------|--|--|
| | | TCM Input signals | Main signals | Selection from menu | | |
| Gear position | GEAR | — | X | ▼ | <ul style="list-style-type: none"> ● Gear position data used for computation by TCM, is displayed. | |
| Line pressure duty | LINE PRES DTY [%] | — | X | — | <ul style="list-style-type: none"> ● Control value of line pressure solenoid valve, computed by TCM from each input signal, is displayed. | |
| Torque converter clutch solenoid valve duty | TCC S/V DUTY [%] | — | X | — | <ul style="list-style-type: none"> ● Control value of torque converter clutch solenoid valve, computed by TCM from each input signal, is displayed. | |
| Shift solenoid valve A | SHIFT S/V A [ON/OFF] | — | X | — | <ul style="list-style-type: none"> ● Control value of shift solenoid valve A, computed by TCM from each input signal, is displayed. | <ul style="list-style-type: none"> ● Control value of solenoid is displayed even if solenoid circuit is disconnected. The OFF signal is displayed if solenoid circuit is shorted. |
| Shift solenoid valve B | SHIFT S/V B [ON/OFF] | — | X | — | <ul style="list-style-type: none"> ● Control value of shift solenoid valve B, computed by TCM from each input signal, is displayed. | |
| Overrun clutch solenoid valve | OVERRUN/C S/V [ON/OFF] | — | X | ▼ | <ul style="list-style-type: none"> ● Control value of overrun clutch solenoid valve computed by TCM from each input signal is displayed. | |
| Self-diagnosis display lamp [A/T check (position) indicator lamp] | SELF-D DP LMP [ON/OFF] | — | X | ▼ | <ul style="list-style-type: none"> ● Control status of A/T check (position) indicator lamp is displayed. | |
| Torque converter slip ratio | TC SLIP RATIO [0.000] | — | — | ▼ | <ul style="list-style-type: none"> ● Ratio of engine revolution to input shaft revolution of torque converter. | |
| Torque converter slip speed | TC SLIP SPEED [rpm] | — | — | ▼ | <ul style="list-style-type: none"> ● Difference in revolution between input shaft revolution and torque converter input shaft revolution. | <ul style="list-style-type: none"> ● Display does not indicate engine is stopped even if 0 rpm — this is not a malfunction. |
| Voltage [V] | | — | — | ▼ | <ul style="list-style-type: none"> ● Value measured by voltage probe is displayed. | |

| Item | Display | Monitor item | | | Description | Remarks |
|----------------|---------|-------------------|--------------|---------------------|---|---------|
| | | TCM Input signals | Main signals | Selection from menu | | |
| Frequency [Hz] | | — | — | ▼ | <ul style="list-style-type: none"> Value measured by pulse probe is displayed. If measurement is impossible, "#" sign is displayed. "#" sign is also displayed at the final data value until the measurement result is obtained. | |
| DUTY-HI | | — | — | ▼ | <ul style="list-style-type: none"> Duty cycle value for measurement probe is displayed. | |
| DUTY-LOW | | — | — | ▼ | | |
| PLS WIDTH-HI | | — | — | ▼ | <ul style="list-style-type: none"> Measured pulse width of measurement probe is displayed. | |
| PLS WIDTH-LOW | | — | — | ▼ | | |

X: Applicable

—: Not applicable

▼: Option

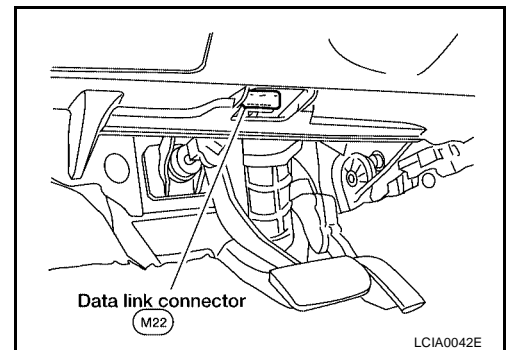
DTC WORK SUPPORT MODE WITH CONSULT-II

CONSULT-II Setting Procedure

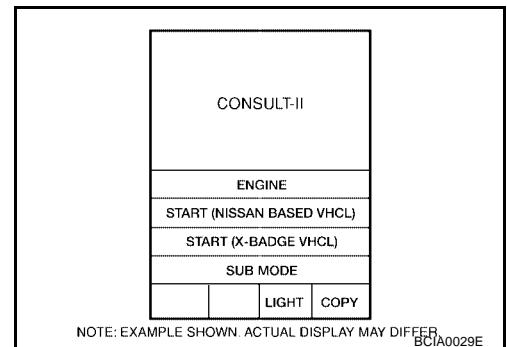
CAUTION:

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.

1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to Data link connector, which is located in left side dash panel.



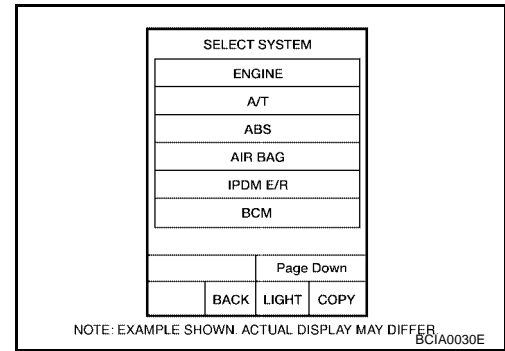
3. Turn ignition switch ON. (Do not start engine)
4. Touch "START (NISSAN BASED VHCL)".



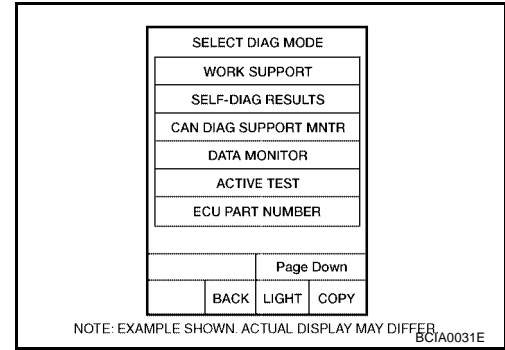
ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[RE4F04B]

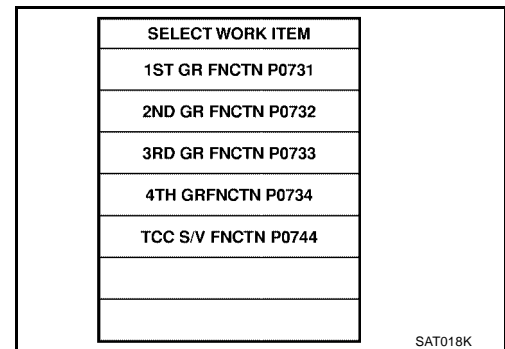
5. Touch "A/T".



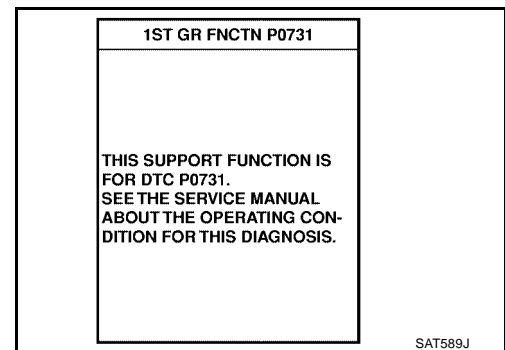
6. Touch "DTC WORK SUPPORT".



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



8. Touch "START".



ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[RE4F04B]

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

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

SAT019K

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

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

SAT591J

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

| | |
|--------------------|--|
| 1ST GR FNCTN P0731 | |
| STOP VEHICLE | |

SAT592J

| | |
|--------------------|--|
| 1ST GR FNCTN P0731 | |
| NG | |

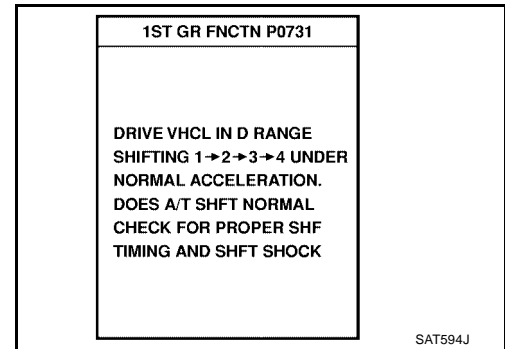
SAT593J

A
B
AT
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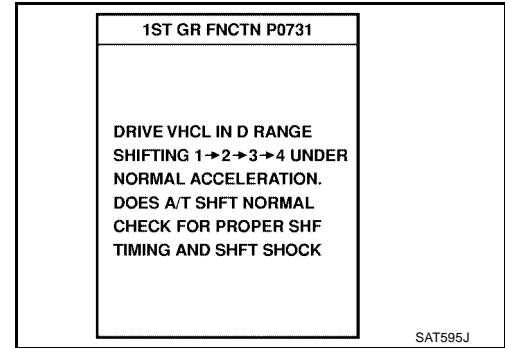
ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[RE4F04B]

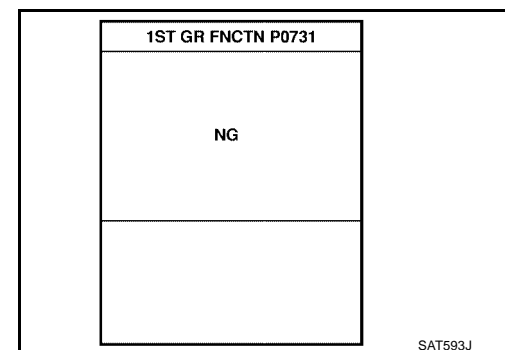
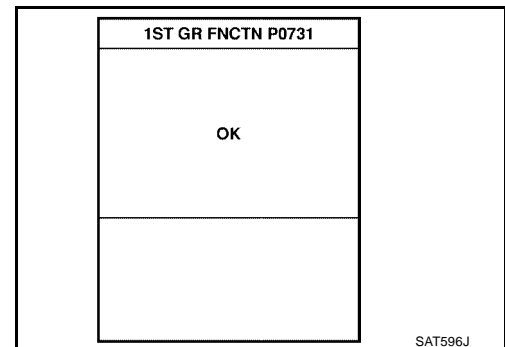
11. Perform test drive to check gear shift feeling in accordance with instructions displayed.



12. Touch "YES" or "NO".



13. CONSULT-II procedure ended.



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

DTC WORK SUPPORT MODE

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[RE4F04B]

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

J
K
L
M

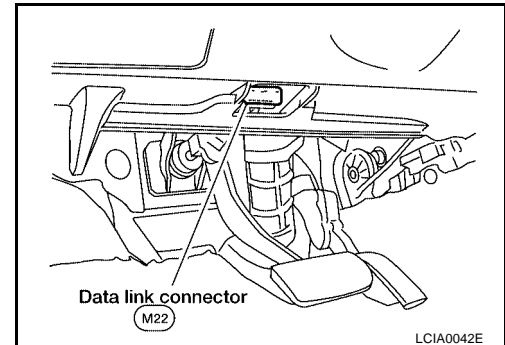
CAN DIAGNOSTIC SUPPORT MONITOR

CONSULT-II Setting Procedure

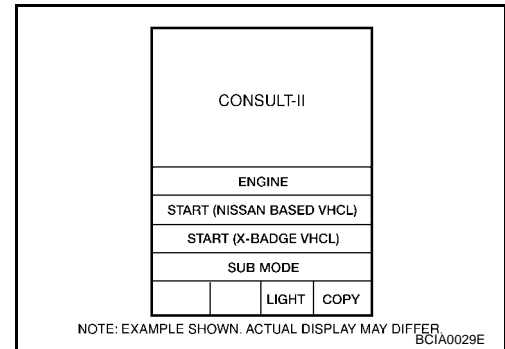
CAUTION:

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

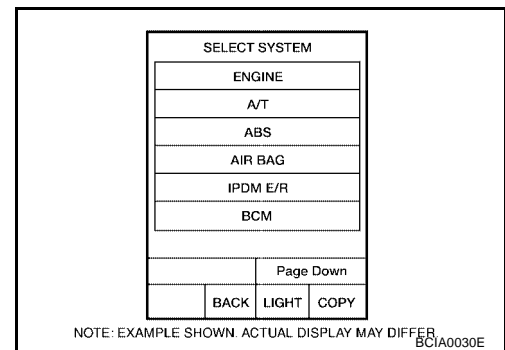
1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector, which is located in left side dash panel.



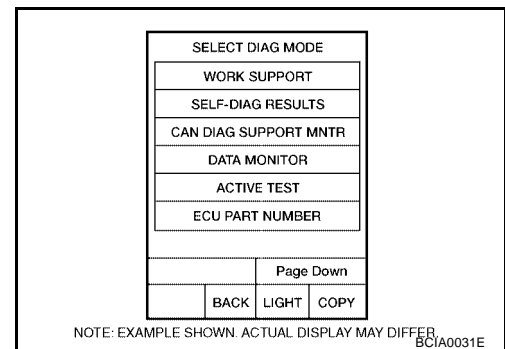
3. Turn ignition switch ON. (Do not start engine.)
4. Touch "START (NISSAN BASED VHCL)".



5. Touch "A/T".



6. Touch "CAN DIAGNOSTIC SUPPORT MONITOR".
Refer to [LAN-16, "CAN Diagnostic Support Monitor"](#).



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



Refer to [EC-140, "Generic Scan Tool \(GST\) Function"](#).

ECS00965

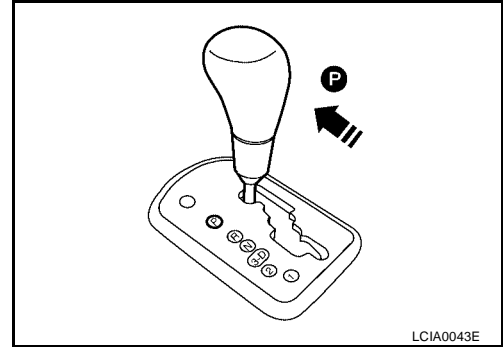
NO TOOLS **OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)**

Refer to [EC-67, "Malfunction Indicator Lamp \(MIL\)"](#) .

NO TOOLS **TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)**

1. CHECK A/T CHECK (POSITION) INDICATOR LAMP

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

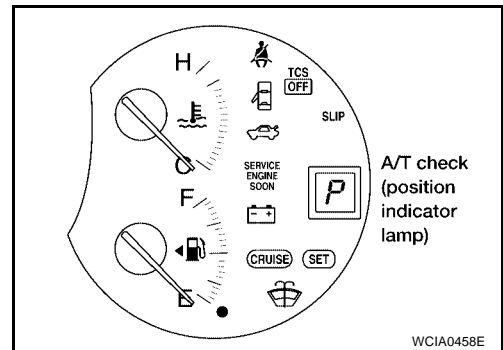


5. Does A/T check (position) indicator lamp come on for about 2 seconds?

Yes or No

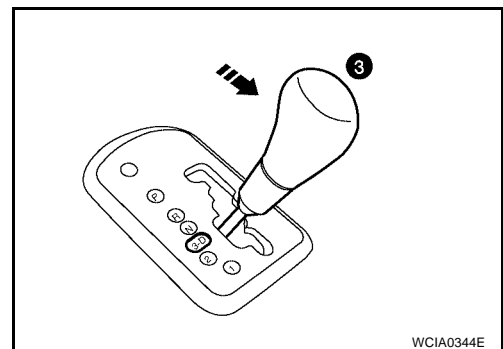
Yes >> GO TO 2.

No >> Stop procedure. Perform [AT-215, "1. A/T Check \(Position\) Indicator Lamp Does Not Come On"](#) before proceeding.



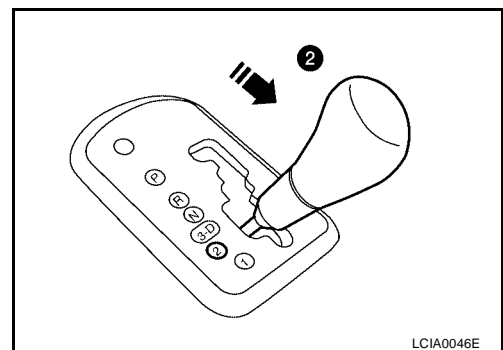
2. JUDGEMENT PROCEDURE STEP 1

1. Turn ignition switch to OFF position.
2. Push and hold shift lock button.
3. Depress the brake pedal, then move gear selector lever from P to 3 position.
4. Wait 3 seconds.



5. Move selector lever to 2 position.
6. Release brake pedal.

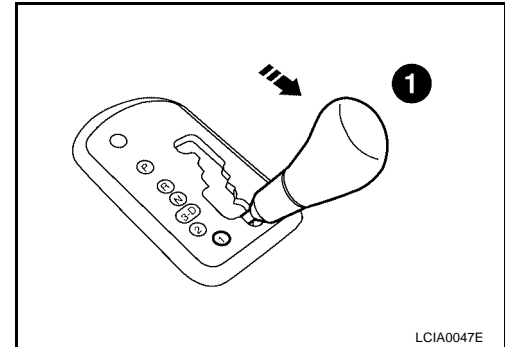
>> GO TO 3.



3. JUDGEMENT PROCEDURE STEP 2

1. Move selector lever to 1 position.
2. Depress brake pedal.
3. Depress accelerator pedal fully and release it.
4. The A/T check (position) indicator lamp will begin to flash.

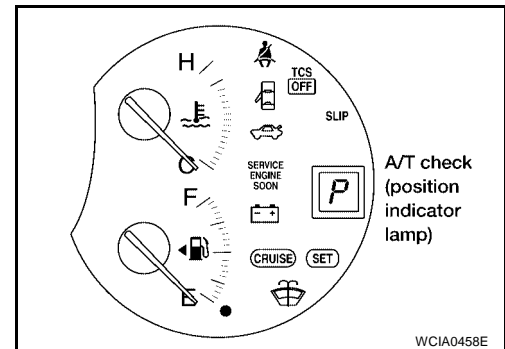
>> GO TO 4.



4. CHECK SELF-DIAGNOSTIC CODE

Check A/T check (position) indicator lamp.
Refer to [AT-56. "JUDGEMENT OF SELF-DIAGNOSIS CODE"](#).

>> DIAGNOSIS END



JUDGEMENT OF SELF-DIAGNOSIS CODE

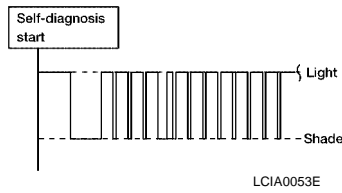
A/T check (position) indicator lamp:

| | |
|---|---|
| <p>All judgement flickers are the same.</p> <div style="text-align: center;"> <p style="font-size: x-small;">LCIA0049E</p> </div> <p>All circuits that can be confirmed by self-diagnosis are OK.</p> | <p>1st judgement flicker is longer than others.</p> <div style="text-align: center;"> <p style="font-size: x-small;">LCIA0050E</p> </div> <p>Revolution sensor circuit is short-circuited or disconnected. ⇒ Go to AT-117. "DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR)".</p> |
| <p>2nd judgement flicker is longer than others.</p> <div style="text-align: center;"> <p style="font-size: x-small;">LCIA0051E</p> </div> <p>Vehicle speed sensor circuit is short-circuited or disconnected. ⇒ Go to AT-199. "DTC VEHICLE SPEED SENSOR MTR".</p> | <p>3rd judgement flicker is longer than others.</p> <div style="text-align: center;"> <p style="font-size: x-small;">LCIA0052E</p> </div> <p>Throttle position sensor circuit is short-circuited or disconnected. ⇒ Go to AT-177. "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]".</p> |

A/T check (position) indicator lamp:

A
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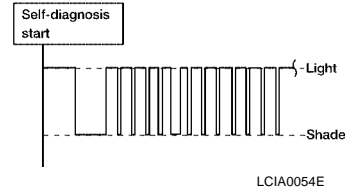
4th judgement flicker is longer than others.



LCIA0053E

Shift solenoid valve A circuit is short-circuited or disconnected.
⇒ Go to [AT-167, "DTC P0750 SHIFT SOLENOID VALVE A"](#) .

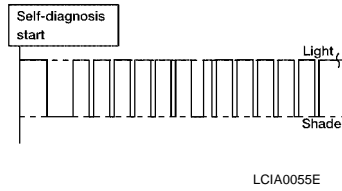
5th judgement flicker is longer than others.



LCIA0054E

Shift solenoid valve B circuit is short-circuited or disconnected.
⇒ Go to [AT-172, "DTC P0755 SHIFT SOLENOID VALVE B"](#) .

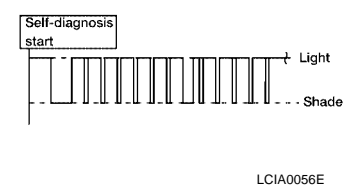
6th judgement flicker is longer than others.



LCIA0055E

Overrun clutch solenoid valve circuit is short-circuited or disconnected.
⇒ Go to [AT-183, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"](#) .

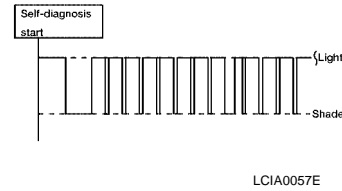
7th judgement flicker is longer than others.



LCIA0056E

Torque converter clutch solenoid valve circuit is short-circuited or disconnected.
⇒ Go to [AT-148, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"](#) .

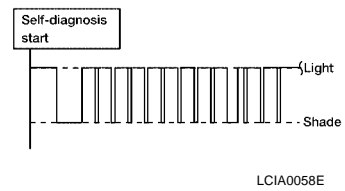
8th judgement flicker is longer than others.



LCIA0057E

A/T fluid temperature sensor is disconnected or TCM power source circuit is damaged.
⇒ Go to [AT-111, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT"](#) .

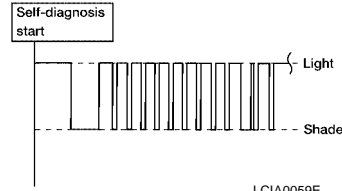
9th judgement flicker is longer than others.



LCIA0058E

Engine speed signal circuit is short-circuited or disconnected.
⇒ Go to [AT-122, "DTC P0725 ENGINE SPEED SIGNAL"](#) .

10th judgement flicker is longer than others.



LCIA0059E

Turbine revolution sensor circuit is short-circuited or disconnected.
⇒ Go to [AT-203, "DTC TURBINE REVOLUTION SENSOR"](#) .

11th judgement flicker is longer than others.

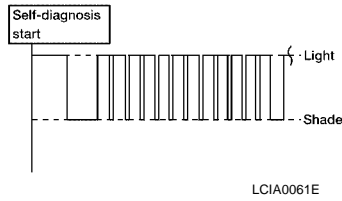


LCIA0060E

Line pressure solenoid valve circuit is short-circuited or disconnected.
⇒ Go to [AT-161, "DTC P0745 LINE PRESSURE SOLENOID VALVE"](#) .

A/T check (position) indicator lamp:

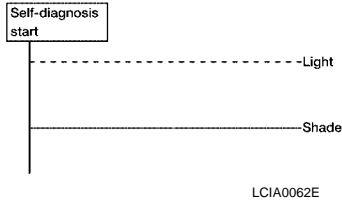
12th judgement flicker is longer than others.



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

⇒ Go to [AT-188, "DTC U1000 CAN COMMUNICATION LINE"](#).

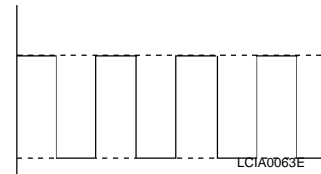
Lamp turns off.



Park/neutral position (PNP) switch, and 3 position switch circuit is disconnected or TCM is damaged.

⇒ Go to [AT-252, "21. TCM Self-diagnosis Does Not Activate \(PNP & 3 Position Switches Circuit Checks\), and Throttle Position Sensor \[Accelerator Pedal Position \(APP\) Sensor\] Circuit Check"](#).

Flickers as shown below.



Battery power is low.

Battery has been disconnected for a long time.

Battery is connected conversely.

(When reconnecting TCM connectors. — This is not a problem.)

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

TROUBLE DIAGNOSIS - INTRODUCTION

PFP:00000

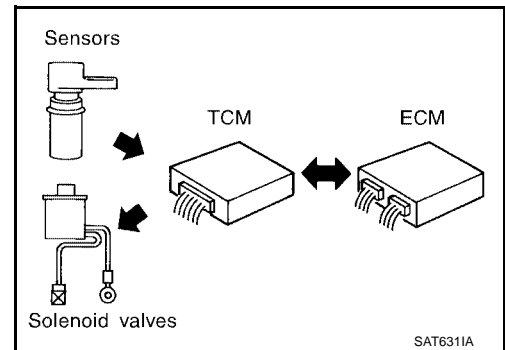
ECS00966

Introduction

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

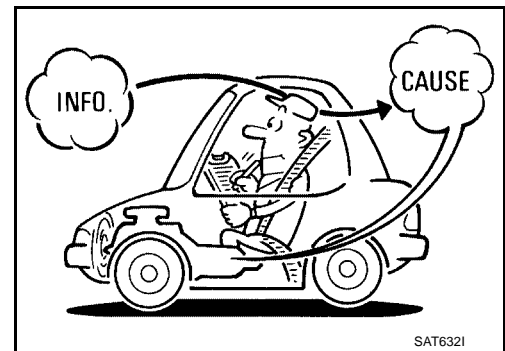
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.

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



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

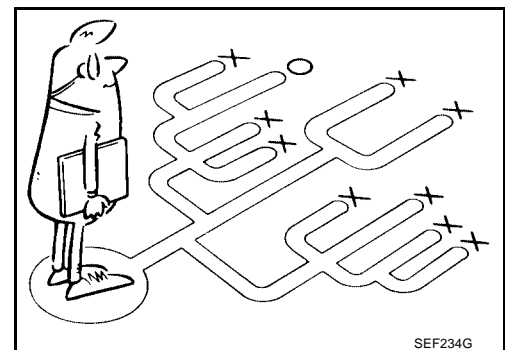
A visual check only, may not find the cause of the problems. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the "Work Flow". Refer to [AT-63, "Work Flow"](#).



Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such problems, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A "DIAGNOSTIC WORKSHEET" like the example on page [AT-61](#) should be used.

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

Also check related Service bulletins for information.



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TROUBLE DIAGNOSIS - INTRODUCTION

[RE4F04B]

Diagnostic Worksheet

| | | | | | |
|--|---|--|--|--|---|
| 1. | <input type="checkbox"/> Read the Fail-safe and listen to customer complaints. | AT-12 | A | | |
| 2. | <input type="checkbox"/> CHECK A/T FLUID | AT-65 | | | |
| | <input type="checkbox"/> Leakage (Follow specified procedure) <input type="checkbox"/> Fluid condition <input type="checkbox"/> Fluid level | | B | | |
| 3. | <input type="checkbox"/> Perform STALL TEST and PRESSURE TEST. | AT-68 , AT-71 | AT | | |
| | <input type="checkbox"/> Stall test — Mark possible damaged components/others. | | | | |
| | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Torque converter one-way clutch <input type="checkbox"/> Reverse clutch <input type="checkbox"/> Forward clutch <input type="checkbox"/> Overrun clutch <input type="checkbox"/> Forward one-way clutch </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Low & reverse brake <input type="checkbox"/> Low one-way clutch <input type="checkbox"/> Engine <input type="checkbox"/> Line pressure is low <input type="checkbox"/> Clutches and brakes except high clutch and brake band are OK </td> </tr> </table> | <input type="checkbox"/> Torque converter one-way clutch <input type="checkbox"/> Reverse clutch <input type="checkbox"/> Forward clutch <input type="checkbox"/> Overrun clutch <input type="checkbox"/> Forward one-way clutch | <input type="checkbox"/> Low & reverse brake <input type="checkbox"/> Low one-way clutch <input type="checkbox"/> Engine <input type="checkbox"/> Line pressure is low <input type="checkbox"/> Clutches and brakes except high clutch and brake band are OK | | D |
| <input type="checkbox"/> Torque converter one-way clutch <input type="checkbox"/> Reverse clutch <input type="checkbox"/> Forward clutch <input type="checkbox"/> Overrun clutch <input type="checkbox"/> Forward one-way clutch | <input type="checkbox"/> Low & reverse brake <input type="checkbox"/> Low one-way clutch <input type="checkbox"/> Engine <input type="checkbox"/> Line pressure is low <input type="checkbox"/> Clutches and brakes except high clutch and brake band are OK | | | | |
| | <input type="checkbox"/> Pressure test — Suspected parts: | | E | | |
| 4. | <input type="checkbox"/> Perform all ROAD TEST and mark required procedures. | AT-72 | | | |
| 4-1. | Check before engine is started. | AT-74 | F | | |
| 1. | <input type="checkbox"/> SELF-DIAGNOSTIC PROCEDURE - Mark detected items. | | | | |
| | <input type="checkbox"/> Park/neutral position (PNP) switch, AT-105 <input type="checkbox"/> A/T fluid temperature sensor, AT-111 . <input type="checkbox"/> Vehicle speed sensor-A/T (Revolution sensor), AT-117 . <input type="checkbox"/> Engine speed signal, AT-122 . <input type="checkbox"/> Turbine revolution sensor, AT-203 . <input type="checkbox"/> Torque converter clutch solenoid valve, AT-148 . <input type="checkbox"/> Line pressure solenoid valve, AT-161 . <input type="checkbox"/> Shift solenoid valve A, AT-167 . <input type="checkbox"/> Shift solenoid valve B, AT-172 . <input type="checkbox"/> Throttle position sensor [accelerator pedal position (APP) sensor], AT-177 . <input type="checkbox"/> Overrun clutch solenoid valve, AT-183 . <input type="checkbox"/> Park/neutral position (PNP) & 3 position switches circuit checks, and throttle position sensor [accelerator pedal position (APP) sensor circuit check AT-252 . <input type="checkbox"/> A/T fluid temperature sensor, AT-111 . <input type="checkbox"/> Vehicle speed sensor-MTR, AT-199 . <input type="checkbox"/> CAN communication line, AT-188 . <input type="checkbox"/> Control unit (RAM), Control unit (ROM), AT-207 . <input type="checkbox"/> Control unit (EEP ROM), AT-209 . <input type="checkbox"/> Battery <input type="checkbox"/> Others | | G | | |
| | | | H | | |
| | | | I | | |
| | | | J | | |
| | | | K | | |
| | | | L | | |

TROUBLE DIAGNOSIS - INTRODUCTION

[RE4F04B]

| | | | |
|----------|---------------|---|---|
| 4- 2. | Check at idle | | AT-74 |
| | | <input type="checkbox"/> 1. A/T Check (Position) Indicator Lamp Does Not Come On, AT-215 . <input type="checkbox"/> 2. Engine Cannot Be Started In P and N Position, AT-217 . <input type="checkbox"/> 3. In P Position, Vehicle Moves Forward or Backward When Pushed, AT-218 . <input type="checkbox"/> 4. In N Position, Vehicle Moves, AT-219 . <input type="checkbox"/> 5. Large Shock. N → R Position, AT-221 . <input type="checkbox"/> 6. Vehicle Does Not Creep Backward In R Position, AT-223 . <input type="checkbox"/> 7. Vehicle Does Not Creep Forward In D, 2 or 1 Position, AT-226 . | |
| 4- 3. | Cruise test | | AT-76 |
| | Part-1 | | AT-81 |
| | | <input type="checkbox"/> 8. Vehicle Cannot Be Started From D1 , AT-229 . <input type="checkbox"/> 9. A/T Does Not Shift: D1 → D2 or Does Not Kickdown: D4 → D2 , AT-232 . <input type="checkbox"/> 10. A/T Does Not Shift: D2 → D3 , AT-235 . <input type="checkbox"/> 11. A/T Does Not Shift: D3 → D4 , AT-238 . <input type="checkbox"/> 12. A/T Does Not Perform Lock-up, AT-241 . <input type="checkbox"/> 13. A/T Does Not Hold Lock-up Condition, AT-243 . <input type="checkbox"/> 14. Lock-up Is Not Released, AT-245 . <input type="checkbox"/> 15. Engine Speed Does Not Return To Idle (Light Braking D4 → D3) , AT-246 . | |
| | Part-2 | | AT-84 |
| | | <input type="checkbox"/> 16. Vehicle Does Not Start From D1 , AT-248 . <input type="checkbox"/> 9. A/T Does Not Shift: D1 → D2 or Does Not Kickdown: D4 → D2 , AT-232 . <input type="checkbox"/> 10. A/T Does Not Shift: D2 → D3 , AT-235 . <input type="checkbox"/> 11. A/T Does Not Shift: D3 → D4 , AT-238 . | |
| 4. | Part-3 | | AT-86 |
| | | <input type="checkbox"/> 17. A/T Does Not Shift: D4 → D3 When Gear Selector Lever D → 3, AT-249 . <input type="checkbox"/> 15. Engine Speed Does Not Return To Idle (Engine Brake In D3) , AT-246 . <input type="checkbox"/> 18. A/T Does Not Shift: D3 → 22 , When Selector Lever D → 2 Position, AT-250 . <input type="checkbox"/> 15. Engine Speed Does Not Return To Idle (Engine Brake In 22) , AT-246 . <input type="checkbox"/> 19. A/T Does Not Shift: 22 → 11 , When Selector Lever 2 → 1 Position, AT-251 . <input type="checkbox"/> 20. Vehicle Does Not Decelerate By Engine Brake, AT-252 . <input type="checkbox"/> SELF-DIAGNOSTIC PROCEDURE — Mark detected items. | |
| | | <input type="checkbox"/> Park/neutral position (PNP) switch, AT-105 <input type="checkbox"/> A/T fluid temperature sensor, AT-111 . <input type="checkbox"/> Vehicle speed sensor-A/T (Revolution sensor), AT-117 . <input type="checkbox"/> Engine speed signal, AT-122 . <input type="checkbox"/> Turbine revolution sensor, AT-203 . <input type="checkbox"/> Torque converter clutch solenoid valve, AT-148 . <input type="checkbox"/> Line pressure solenoid valve, AT-161 . <input type="checkbox"/> Shift solenoid valve A, AT-167 . <input type="checkbox"/> Shift solenoid valve B, AT-172 . <input type="checkbox"/> Throttle position sensor [accelerator pedal position (APP) sensor], AT-177 . <input type="checkbox"/> Overrun clutch solenoid valve, AT-183 . <input type="checkbox"/> Park/neutral position (PNP) & 3 position switches circuit checks, and throttle position sensor [accelerator pedal position (APP) sensor] circuit check, AT-252 . <input type="checkbox"/> A/T fluid temperature sensor, AT-111 . <input type="checkbox"/> Vehicle speed sensor-MTR, AT-199 . <input type="checkbox"/> CAN communication line, AT-188 . <input type="checkbox"/> Control unit (RAM), Control unit (ROM), AT-207 . <input type="checkbox"/> Control unit (EEP ROM), AT-209 . <input type="checkbox"/> Battery <input type="checkbox"/> Others | |
| 5. | | <input type="checkbox"/> For self-diagnosis NG items, inspect each component. Repair or replace the damaged parts. | AT-265 |
| 6. | | <input type="checkbox"/> Perform all ROAD TEST and re-mark required procedures. | AT-72 |
| 7. | | <input type="checkbox"/> Perform DTC CONFIRMATION PROCEDURE for following MIL indicating items and check out NG items. Refer to ! Hyper-link Error ! . | ! Hyper-link Error !, ! Hyper-link Error ! |
| | | <input type="checkbox"/> DTC (P0731) A/T 1st gear function, AT-126 . <input type="checkbox"/> DTC (P0732) A/T 2nd gear function, AT-131 . <input type="checkbox"/> DTC (P0733) A/T 3rd gear function, AT-136 . <input type="checkbox"/> DTC (P0734) A/T 4th gear function, AT-141 . <input type="checkbox"/> DTC (P0744) A/T TCC S/V function (lock-up), AT-153 . | |

TROUBLE DIAGNOSIS - INTRODUCTION

[RE4F04B]

| | | |
|----|---|--|
| 8. | <input type="checkbox"/> Perform the Diagnostic Procedures for all remaining items marked NG. Repair or replace the damaged parts. Refer to the Symptom Chart when you perform the procedures. (The chart also shows some other possible symptoms and the component inspection orders.) | AT-44 AT-54 |
| 9. | <input type="checkbox"/> Erase DTC from TCM and ECM memories. | AT-41 |

Work Flow

ECS00967

HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

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

Make good use of the two sheets provided, [AT-60, "Information from Customer"](#) and [AT-61, "Diagnostic Work-sheet"](#), to perform the best troubleshooting possible.

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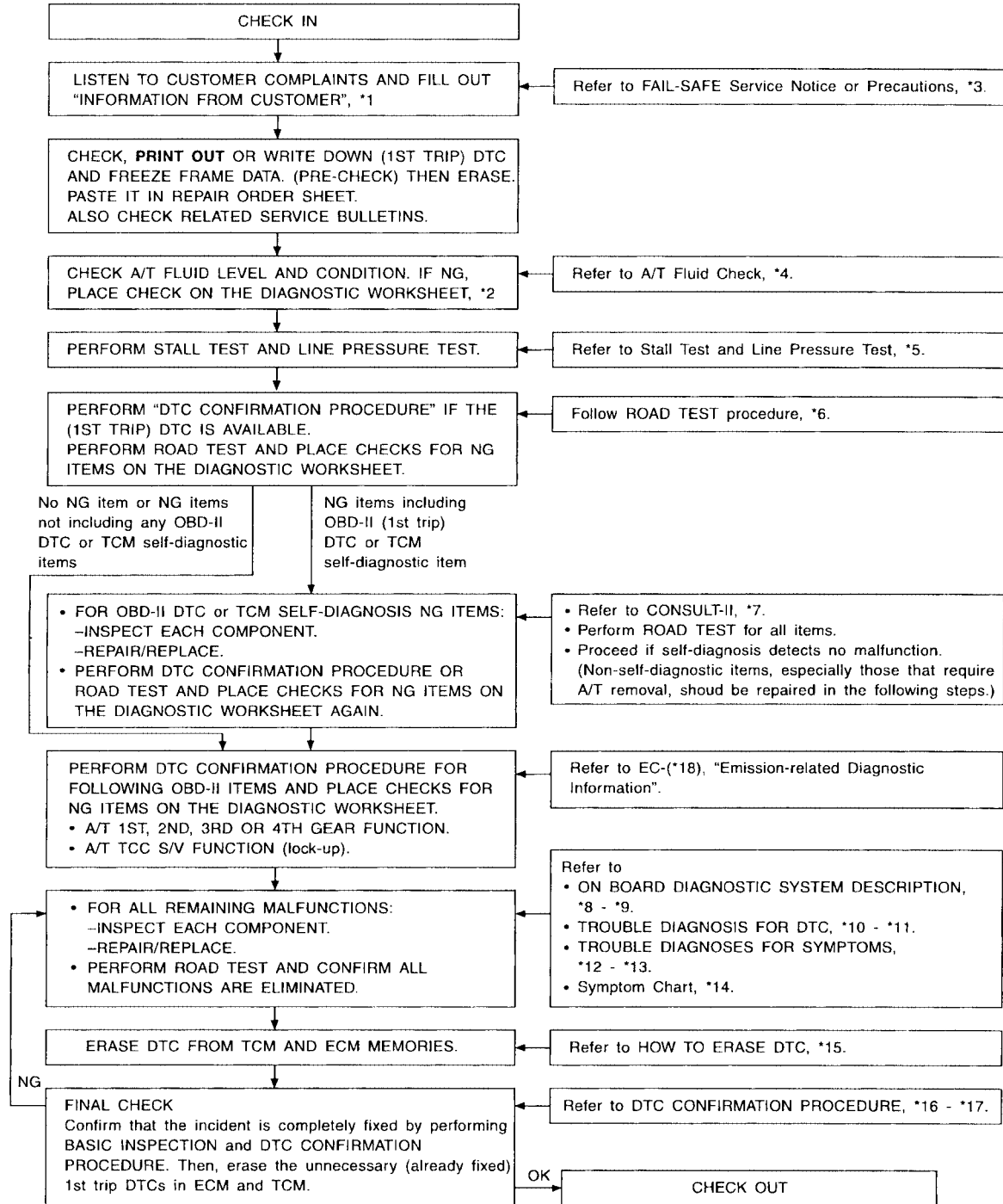
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WORK FLOW CHART



*1: [AT-60](#)

*4: [AT-65](#)

*7: [AT-43](#)

*10: [AT-105](#)

*13: [AT-252](#)

*16: [AT-105](#)

*2: [AT-61](#)

*5: [AT-68, AT-71](#)

*8: [AT-39](#)

*11: [AT-209](#)

*14: [AT-88](#)

*17: [AT-192](#)

*3: [AT-12](#)

*6: [AT-72](#)

*9: [AT-39](#)

*12: [AT-211](#)

*15: [AT-41](#)

*18: [EC-54](#)

SAT086J1

TROUBLE DIAGNOSIS - BASIC INSPECTION

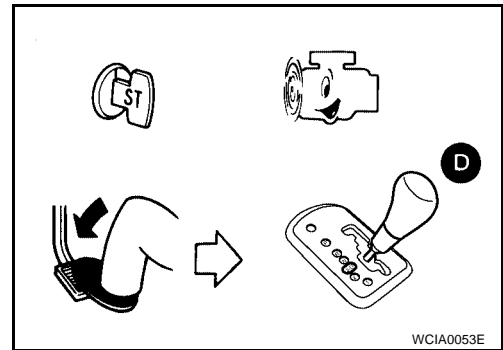
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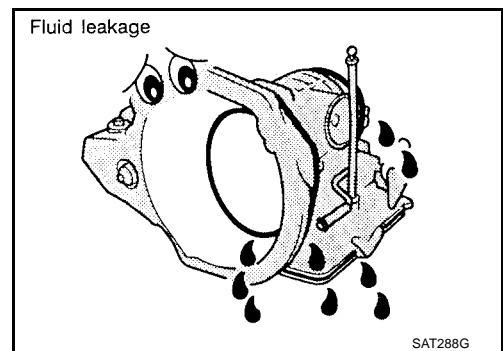
A/T Fluid Check

FLUID LEAKAGE CHECK

1. Clean area suspected of leaking. — for example, mating surface of converter housing and transaxle case.
2. Start engine, apply foot brake, place selector lever in D position and wait a few minutes.
3. Stop engine.

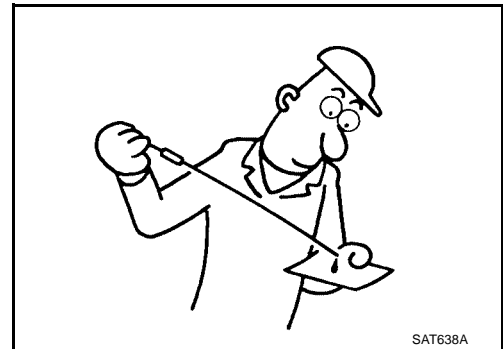


4. Check for fresh leakage.



FLUID CONDITION CHECK

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



FLUID LEVEL CHECK

Refer to [MA-30, "Checking A/T Fluid"](#) .

A/T Fluid Cooler Cleaning

ECS00969

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.

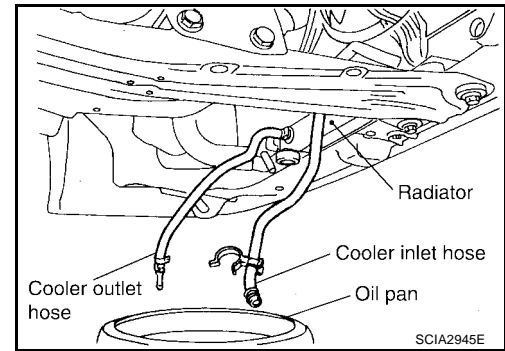
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3. Disconnect the fluid cooler inlet and outlet rubber hoses from the steel cooler tubes or bypass valve.

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.

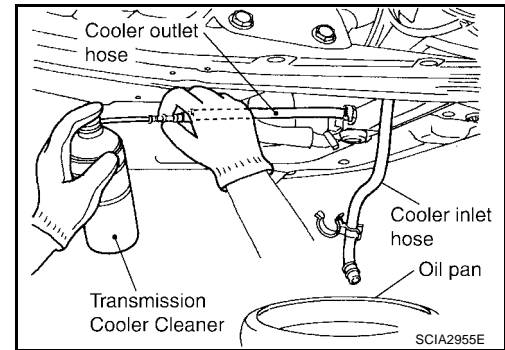


5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

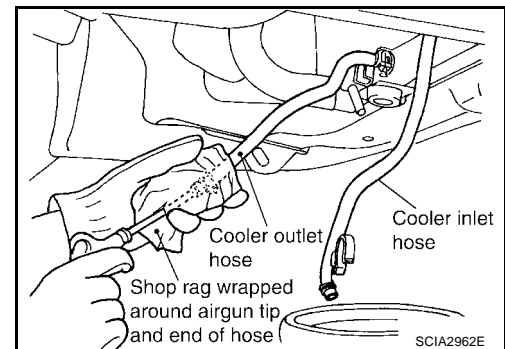
CAUTION:

- 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/cm² (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/cm² (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 [AT-66, "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.

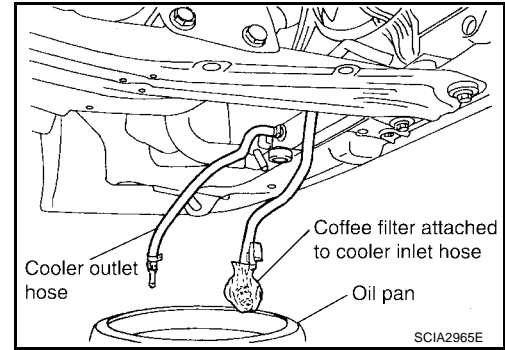
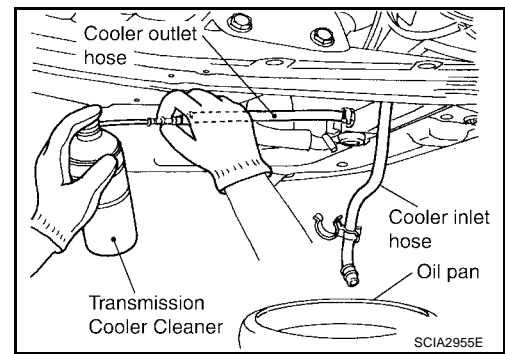
3. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

CAUTION:

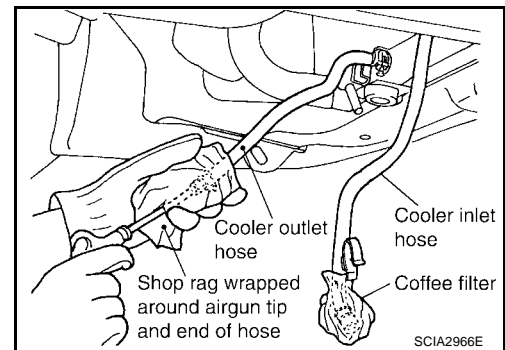
- Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.
- Spray cooler cleaner only with adequate ventilation.
- Avoid contact with eyes and skin.
- Do not breath vapors or spray mist.

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.

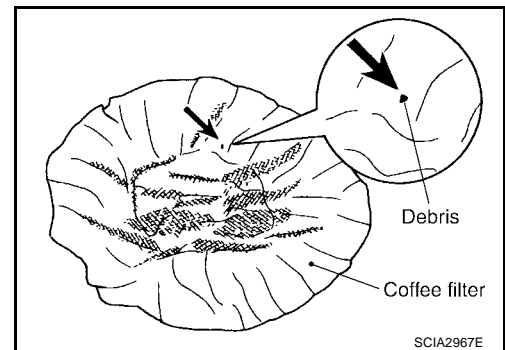


6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 - 9 kg/cm² (70 - 130 psi) through the cooler outlet hose to force any remaining A/T fluid into the coffee filter.
9. Remove the coffee filter from the end of the cooler inlet hose.
10. Perform [AT-67, "A/T FLUID COOLER INSPECTION PROCEDURE"](#).



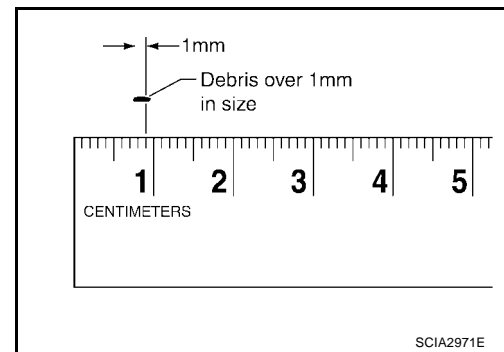
A/T FLUID COOLER INSPECTION PROCEDURE

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.



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- b. If one or more pieces of debris are found that are over 1mm in size and/or peeled clutch facing material is found in the coffee filter, the fluid cooler is not serviceable. The radiator/fluid cooler must be replaced and the inspection procedure is ended.



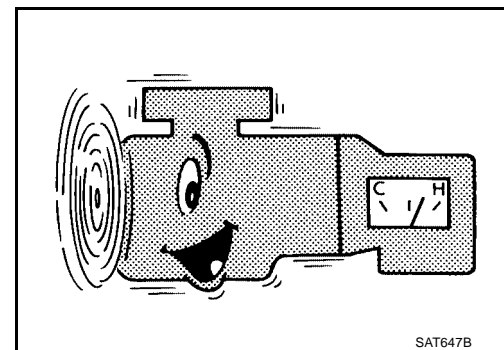
A/T FLUID COOLER FINAL INSPECTION

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

Stall Test STALL TEST PROCEDURE

ECS0096A

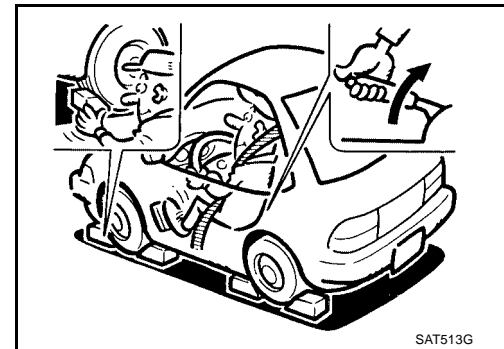
1. Check A/T fluid and engine oil levels. If necessary, add fluid and oil.



2. Drive vehicle for approximately 10 minutes or until fluid and oil reach operating temperature.

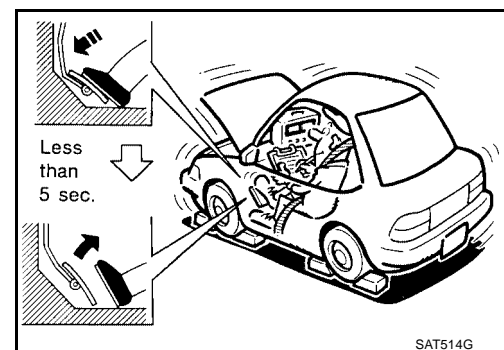
ATF operating temperature :50 - 80°C (122 - 176°F)

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

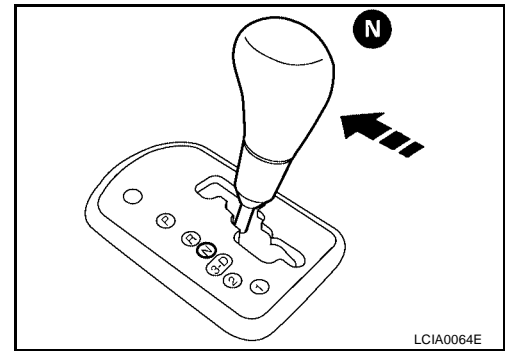


5. Start engine, apply foot brake, and place selector lever in D position.
6. Accelerate to wide open throttle gradually while applying foot brake.
7. Quickly note the engine stall revolution and immediately release throttle.
 - During test, never hold throttle wide open for less than 5 seconds.

Stall revolution : 2,300 - 2,750 rpm



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



JUDGEMENT OF STALL TEST

The test result and possible damaged components relating to each result are shown in the illustrations on next page.

In order to pinpoint the possible damaged components, refer to [AT-64, "WORK FLOW CHART"](#) .

NOTE:

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

- Slippage occurs in 1st gear but not in 2nd and 3rd gears. Low one-way clutch slippage
- Slippage occurs in the following gears:
1st through 3rd gears in 3 position and engine brake functions.
1st and 2nd gears in 2 position and engine brake functions with accelerator pedal released (fully closed throttle). Forward clutch or forward one-way clutch slippage

Stall revolution is too high in R position:

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

Stall revolution within specifications:

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

CAUTION:

Be careful since automatic fluid temperature increases abnormally.

- Slippage occurs in 3rd and 4th gears in D position. High clutch slippage
- Slippage occurs in 2nd and 4th gear in D position. Brake band slippage
- Engine brake does not function in 2nd and 3rd gears in D position, 2nd gear in 2 position, and 1st gear in 1 position.

Stall revolution less than specifications:

TROUBLE DIAGNOSIS - BASIC INSPECTION

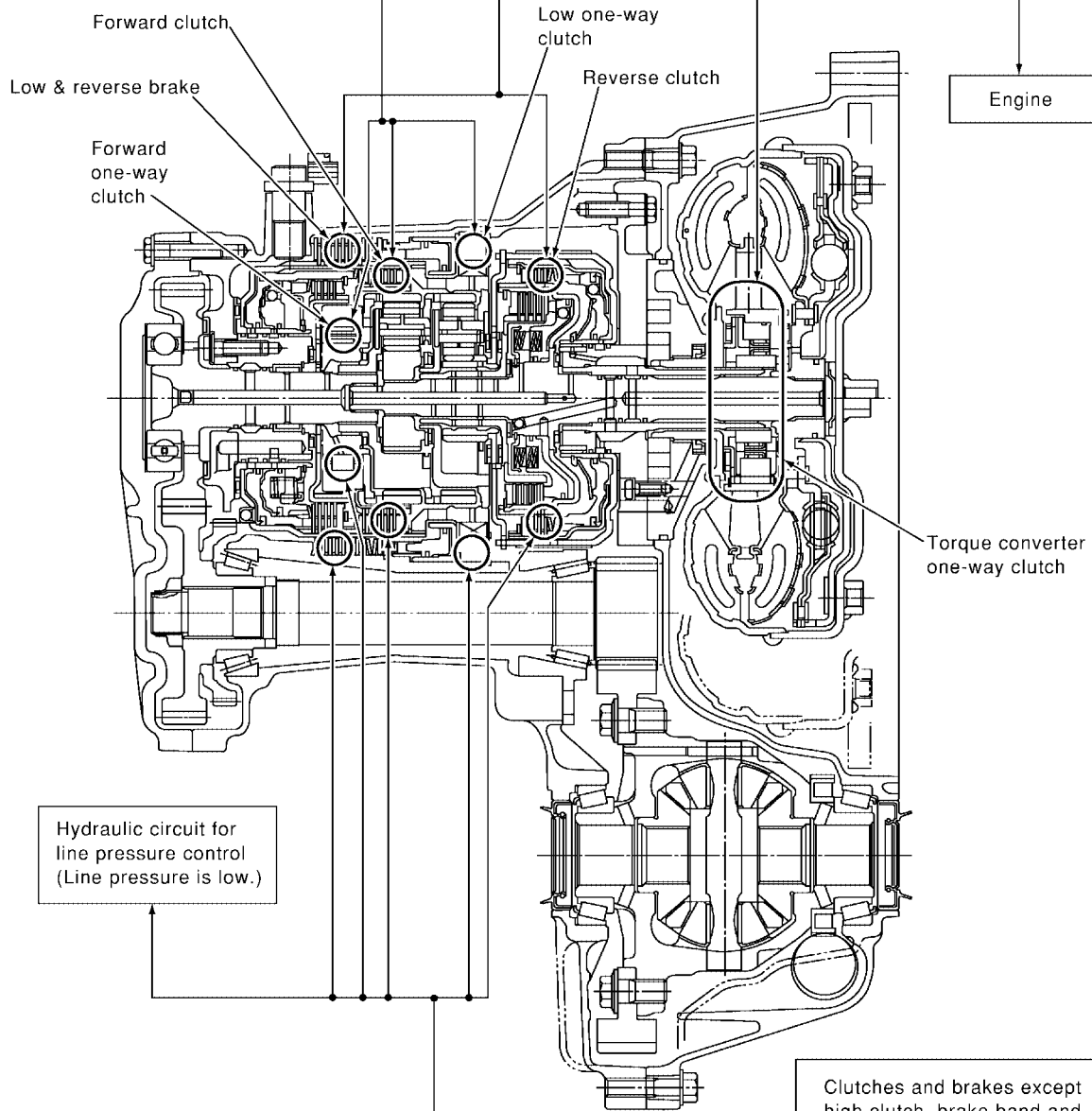
[RE4F04B]

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

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

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

Damaged components



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

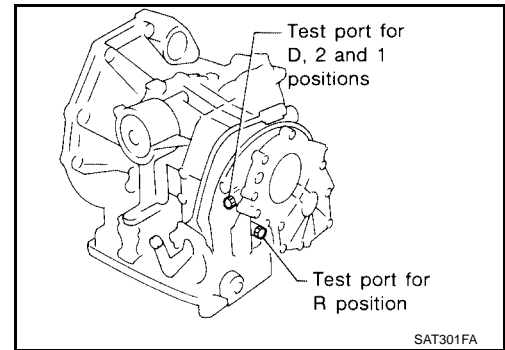
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Line Pressure Test LINE PRESSURE TEST PORTS

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

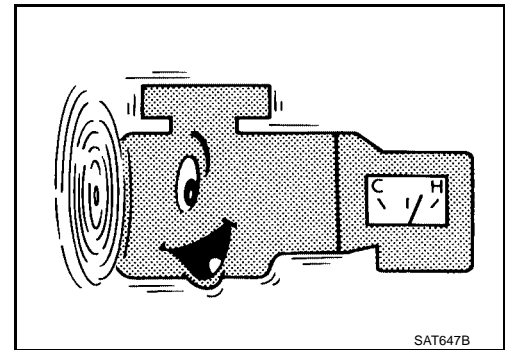
- Always replace pressure plugs as they are self-sealing bolts.



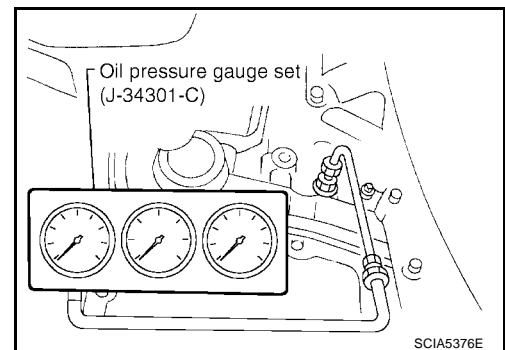
LINE PRESSURE TEST PROCEDURE

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

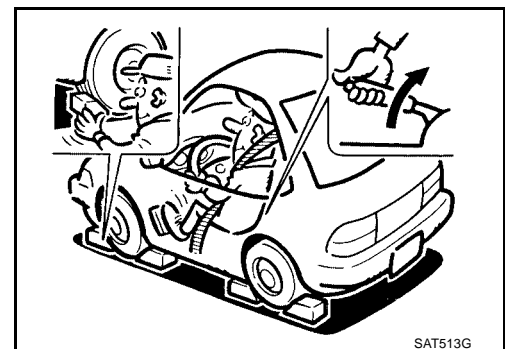
ATF operating temperature :50 - 80°C (122 - 176°F)



3. Install pressure gauge to corresponding line pressure port.



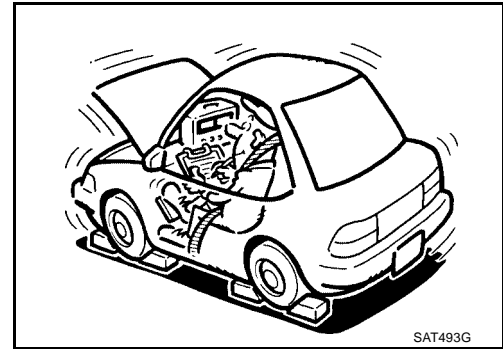
4. Set parking brake and block wheels.
 - Continue to depress brake pedal fully while line pressure test is being performed at stall speed.



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

AT-71, "Line Pressure Test" : Refer to SDS, AT-377, "Line Pressure"



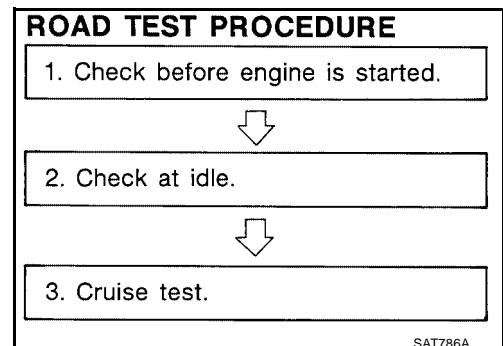
JUDGEMENT OF LINE PRESSURE TEST

| Judgement | | Suspected parts |
|----------------|--|--|
| At idle | Line pressure is low in all positions. | <ul style="list-style-type: none"> ● Oil pump wear ● Control piston damage ● Pressure regulator valve or plug sticking ● Spring for pressure regulator valve damaged ● Fluid pressure leakage between oil strainer and pressure regulator valve ● Clogged strainer |
| | Line pressure is low in particular position. | <ul style="list-style-type: none"> ● Fluid pressure leakage between manual valve and particular clutch ● For example, line pressure is: <ul style="list-style-type: none"> – Low in R and 1 positions, but – Normal in D and 2 positions. Therefore, fluid leakage exists at or around low and reverse brake circuit. Refer to <u>AT-22, "CLUTCH AND BAND CHART"</u> . |
| | Line pressure is high. | <ul style="list-style-type: none"> ● A/T fluid temperature sensor damaged ● Line pressure solenoid valve sticking ● Short circuit of line pressure solenoid valve circuit ● Pressure modifier valve sticking ● Pressure regulator valve or plug sticking ● Open in dropping resistor circuit |
| At stall speed | Line pressure is low. | <ul style="list-style-type: none"> ● Line pressure solenoid valve sticking ● Short circuit of line pressure solenoid valve circuit ● Pressure regulator valve or plug sticking ● Pressure modifier valve sticking ● Pilot valve sticking |

Road Test DESCRIPTION

ECS0096C

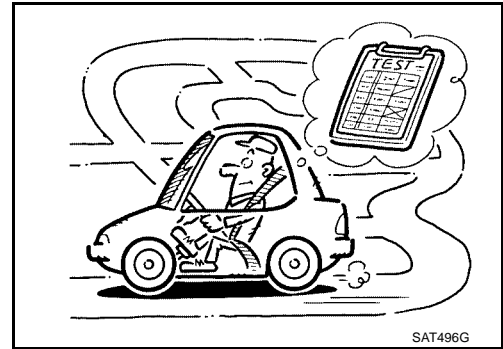
- The purpose of the test is to determine overall performance of A/T and analyze causes of problems.
- The road test consists of the following three parts:
 1. Check before engine is started
 2. Check at idle
 3. Cruise test



TROUBLE DIAGNOSIS - BASIC INSPECTION

[RE4F04B]

- Before road test, familiarize yourself with all test procedures and items to check.
- Conduct tests on all items until specified symptom is found. Troubleshoot items which check out No Good after road test. Refer to [AT-39, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"](#) and [AT-211, "TROUBLE DIAGNOSIS FOR SYMPTOMS"](#).



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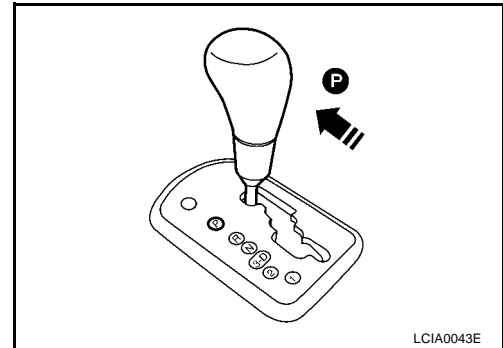
1. CHECK BEFORE ENGINE IS STARTED

1. CHECK A/T CHECK (POSITION) INDICATOR LAMP

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

Yes or No

- Yes >> GO TO 2.
 No >> Stop ROAD TEST. Go to [AT-215, "1. A/T Check \(Position\) Indicator Lamp Does Not Come On"](#) .

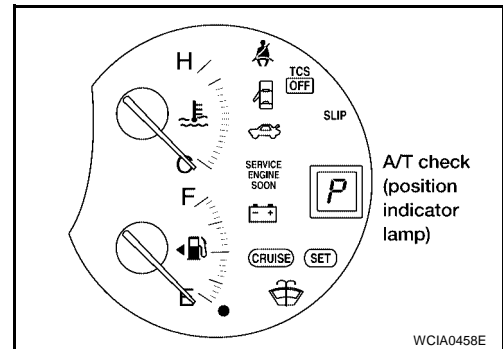


2. CHECK A/T CHECK (POSITION) INDICATOR LAMP

Does A/T check (position) OFF indicator lamp flicker for about 8 seconds?

Yes or No

- Yes >> Perform self-diagnosis and check NG items on the DIAGNOSTIC WORKSHEET, [AT-61](#) . Refer to [AT-55, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) .
- No >> 1. Turn ignition switch to OFF position.
 2. Perform self-diagnosis and note NG items. Refer to [AT-55, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#) .
 3. Go to [AT-74, "2. CHECK AT IDLE"](#) .



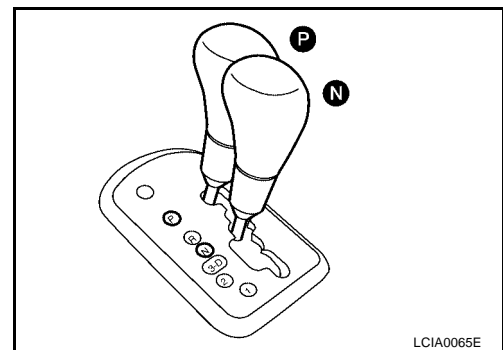
2. CHECK AT IDLE

1. CHECK ENGINE START

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

Yes or No

- Yes >> GO TO 2.
 No >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to [AT-217, "2. Engine Cannot Be Started In P and N Position"](#) . Continue ROAD TEST.

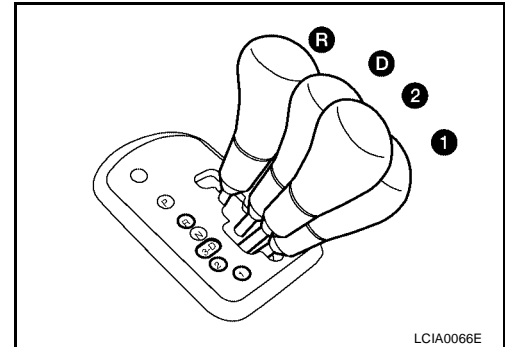


2. CHECK ENGINE START

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

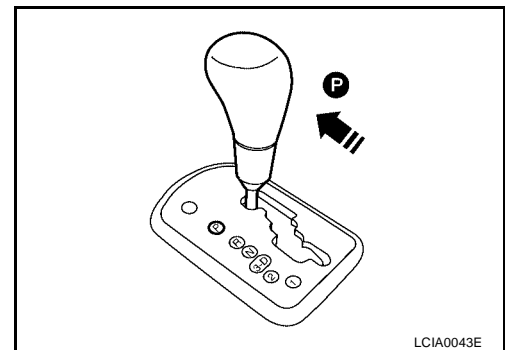
Yes or No

- Yes >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to [AT-217, "2. Engine Cannot Be Started In P and N Position"](#). Continue ROAD TEST.
- No >> GO TO 3.



3. CHECK VEHICLE MOVE

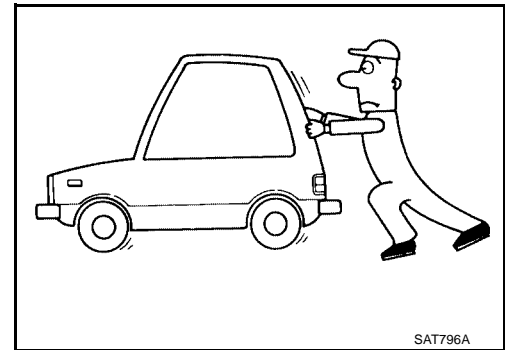
1. Move selector lever to P position.
2. Turn ignition switch to OFF position.
3. Release parking brake.



4. Push vehicle forward or backward.
5. Does vehicle move when it is pushed forward or backward?
6. Apply parking brake.

Yes or No

- Yes >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to [AT-218, "3. In P Position, Vehicle Moves Forward or Backward When Pushed"](#). Continue ROAD TEST.
- No >> GO TO 4.

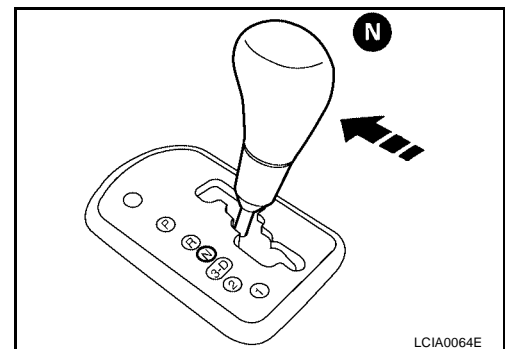


4. CHECK VEHICLE MOVE

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

Yes or No

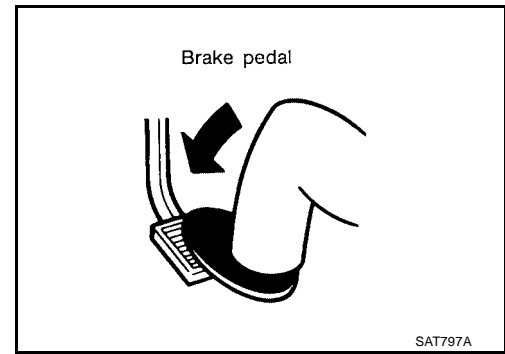
- Yes >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to [AT-219, "4. In N Position, Vehicle Moves"](#). Continue ROAD TEST.
- No >> GO TO 5.



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5. CHECK SHIFT LOCK

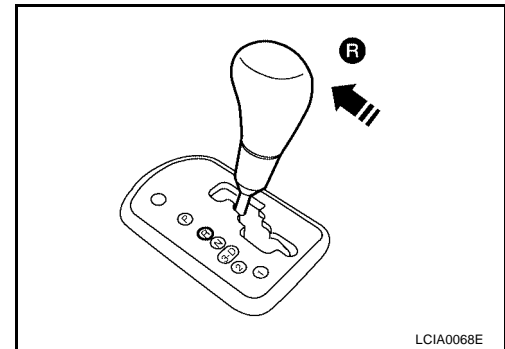
1. Apply foot brake.



2. Move selector lever to R position.
3. Is there large shock when changing from N to R position?

Yes or No

- Yes >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to [AT-221, "5. Large Shock. N → R Position"](#) . Continue ROAD TEST.
- No >> GO TO 6.

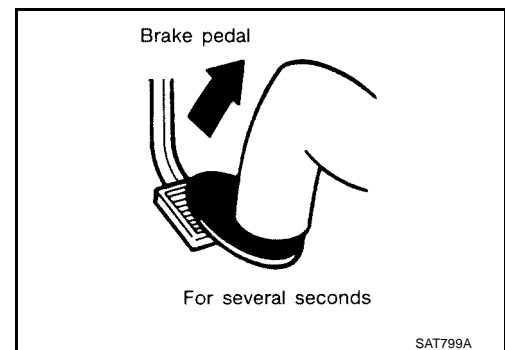


6. CHECK VEHICLE MOVE

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

Yes or No

- Yes >> GO TO 7.
- No >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to [AT-223, "6. Vehicle Does Not Creep Backward In R Position"](#) . Continue ROAD TEST.

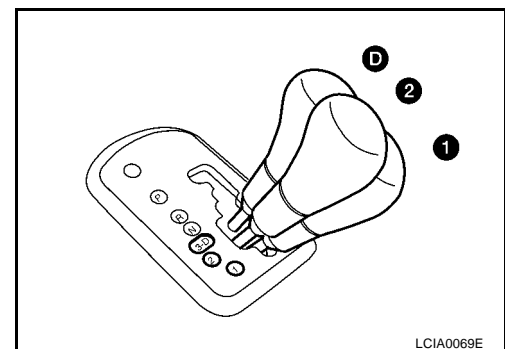


7. CHECK VEHICLE MOVE

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

Yes or No

- Yes >> Go to [AT-76, "3. CRUISE TEST"](#) .
- No >> Mark the box on the DIAGNOSTIC WORKSHEET. Go to [AT-226, "7. Vehicle Does Not Creep Forward in D, 3, 2 or 1 Position"](#) . Continue ROAD TEST.

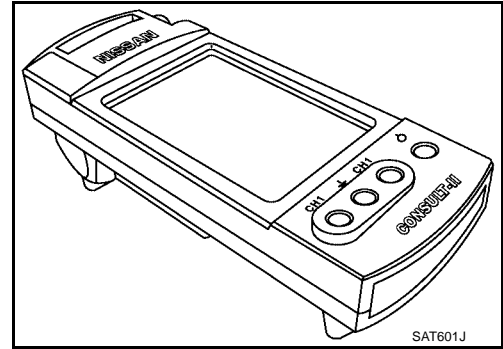


3. CRUISE TEST

- Check all items listed in Parts 1 through 3.

Ⓟ With CONSULT-II

- Using CONSULT-II, conduct a cruise test and record the result.
- Print the result and ensure that shifts and lock-ups take place as per Shift Schedule. Refer to [AT-376, "Shift Schedule"](#)

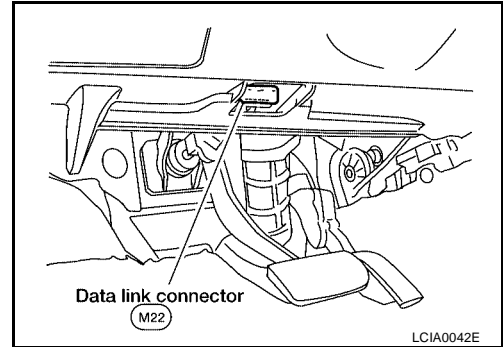


CONSULT-II Setting Procedure

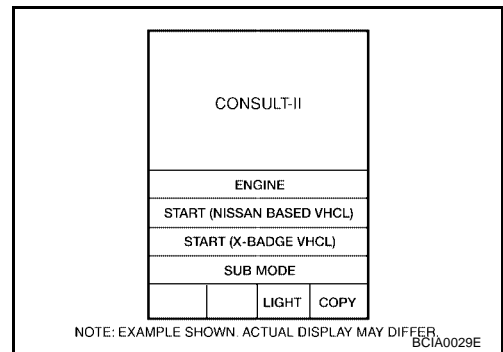
CAUTION:

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

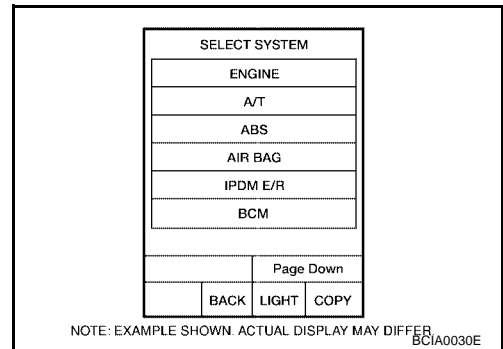
1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector, which is located in left side dash panel.



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



5. Touch "A/T".

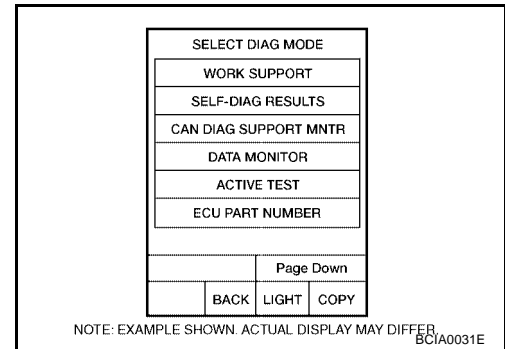


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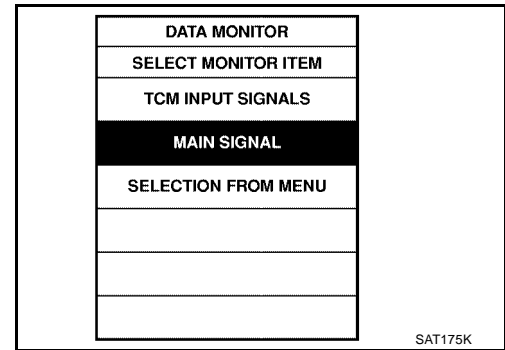
TROUBLE DIAGNOSIS - BASIC INSPECTION

[RE4F04B]

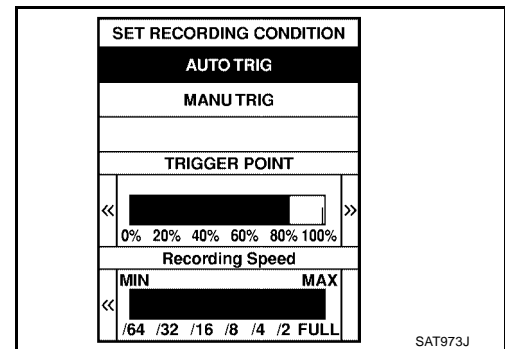
6. Touch "DATA MONITOR".



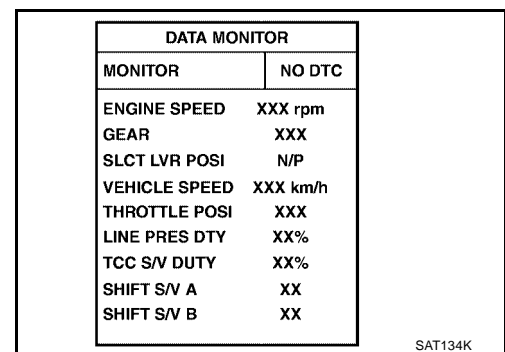
7. Touch "MAIN SIGNALS" or "TCM INPUT SIGNALS".
 8. See "Numerical Display", "Barchart Display" or "Line Graph Display".



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

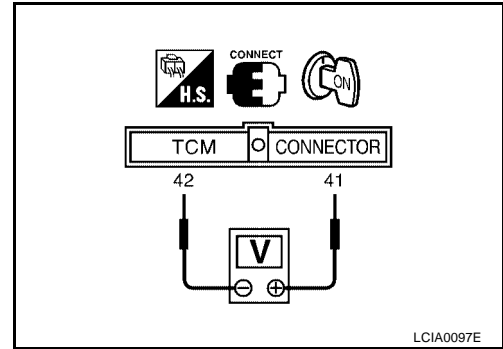


11. When performing cruise test, touch "RECORD".



⊗ **Without CONSULT-II**

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



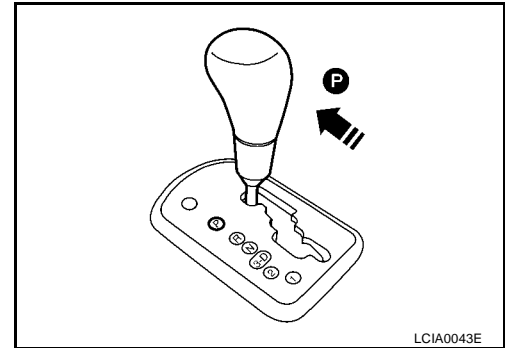
Cruise Test — Part 1

1. CHECK STARTING GEAR (D1) POSITION

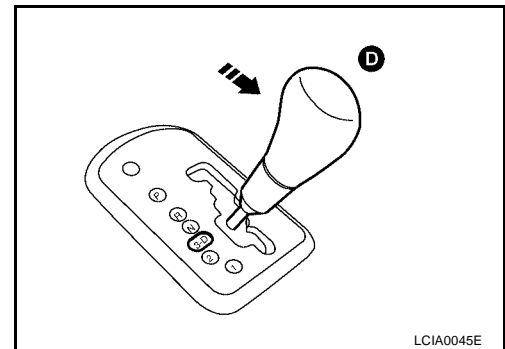
1. Drive vehicle for approximately 10 minutes to warm engine oil and ATF up to operating temperature.

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

2. Park vehicle on flat surface.
3. Set gear selector lever to P position.
4. Move selector lever to P position.
5. Start engine.



6. Move selector lever to D position.

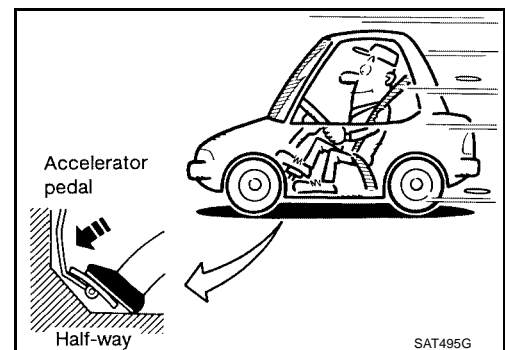


7. Accelerate vehicle by constantly depressing accelerator pedal half-way.
8. Does vehicle start from D1 ?

Read gear position.

Yes or No

- Yes >> GO TO 2.
 No >> Go to [AT-229, "8. Vehicle Cannot Be Started From D1"](#).
 Continue ROAD TEST.



2. CHECK SHIFT UP (D1 TO D2)

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

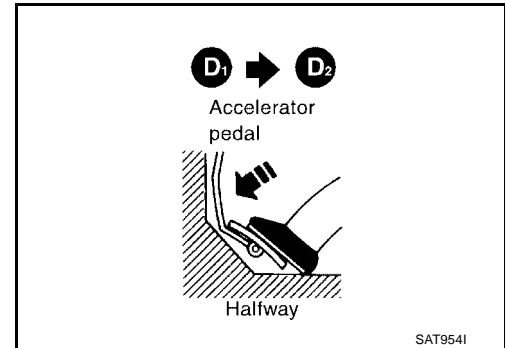
④ Read gear position, throttle opening and vehicle speed.

Specified speed when shifting from D1 to D2 :Refer to [AT-376, "Shift Schedule"](#) .

Yes or No

Yes >> GO TO 3.

No >> Go to [AT-232, "9. A/T Does Not Shift: D1 → D2 or Does Not Kickdown: D4 → D2"](#) . Continue ROAD TEST.



SAT954I

3. CHECK SHIFT UP (D2 TO D3)

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

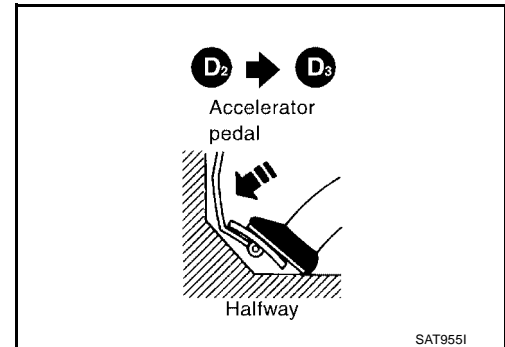
④ Read gear position, throttle opening and vehicle speed.

Specified speed when shifting from D2 to D3 :Refer to [AT-376, "Shift Schedule"](#) .

Yes or No

Yes >> GO TO 4.

No >> Go to [AT-235, "10. A/T Does Not Shift: D2 → D3"](#) . Continue ROAD TEST.



SAT955I

4. CHECK SHIFT UP (D3 TO D4)

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

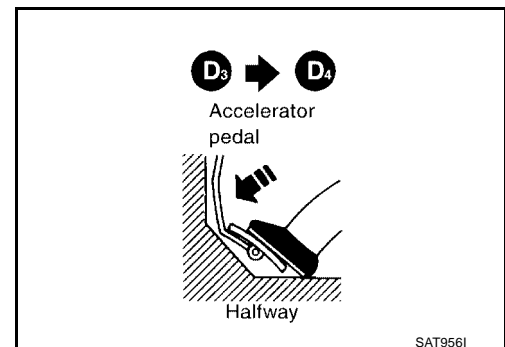
④ Read gear position, throttle opening and vehicle speed.

Specified speed when shifting from D3 to D4 :Refer to [AT-376, "Shift Schedule"](#) .

Yes or No

Yes >> GO TO 5.

No >> Go to [AT-238, "11. A/T Does Not Shift: D3 → D4"](#) . Continue ROAD TEST.



SAT956I

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

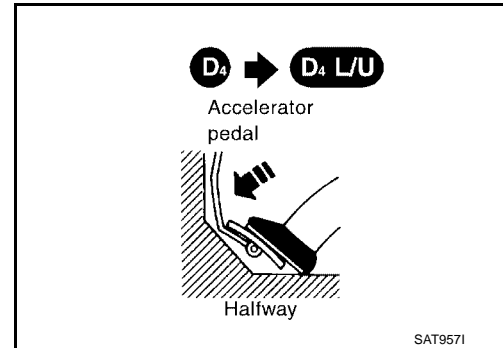
Does A/T perform lock-up at the specified speed?

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

Specified speed when lock-up occurs :Refer to [AT-376, "Shift Schedule"](#) .

Yes or No

- Yes >> GO TO 6.
- No >> Go to [AT-241, "12. A/T Does Not Perform Lock-up"](#) . Continue ROAD TEST.



6. CHECK HOLD LOCK-UP

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

Yes or No

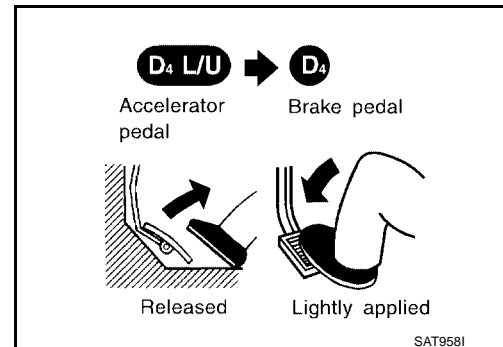
- Yes >> GO TO 7.
- No >> Go to [AT-243, "13. A/T Does Not Hold Lock-up Condition"](#) .

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

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

Yes or No

- Yes >> GO TO 8.
- No >> Go to [AT-245, "14. Lock-up Is Not Released"](#) . Continue ROAD TEST.



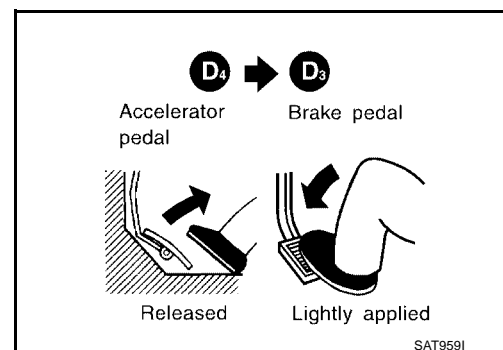
8. CHECK SHIFT DOWN (D4 TO D3)

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

Read gear position and engine speed.

Yes or No

- Yes >> 1. Stop vehicle.
2. Go to [AT-84, "Cruise Test — Part 2"](#) .
- No >> Go to [AT-246, "15. Engine Speed Does Not Return To Idle \(Light Braking D4 → D3\)"](#) . Continue ROAD TEST.



Cruise Test — Part 2

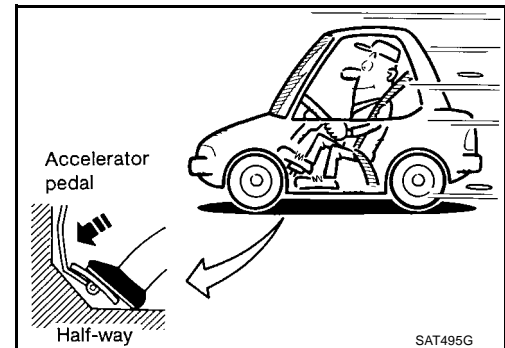
1. CHECK STARTING GEAR (D1) POSITION

1. Confirm gear selector lever is in D position.
2. Accelerate vehicle by half throttle again.
3. Does vehicle start from D1 ?

 **Read gear position.**

Yes or No

- Yes >> GO TO 2.
 No >> Go to [AT-248, "16. Vehicle Does Not Start From D1"](#) . Continue ROAD TEST.



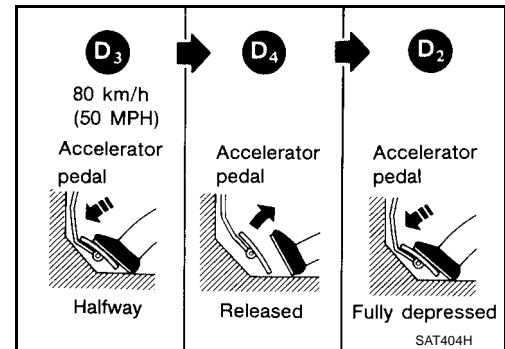
2. CHECK SHIFT UP AND SHIFT DOWN (D3 TO D4 TO D2)

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

 **Read gear position and throttle opening.**

Yes or No

- Yes >> GO TO 3.
 No >> Go to [AT-232, "9. A/T Does Not Shift: D1 → D2 or Does Not Kickdown: D4 → D2"](#) . Continue ROAD TEST.



3. CHECK SHIFT UP (D2 TO D3)

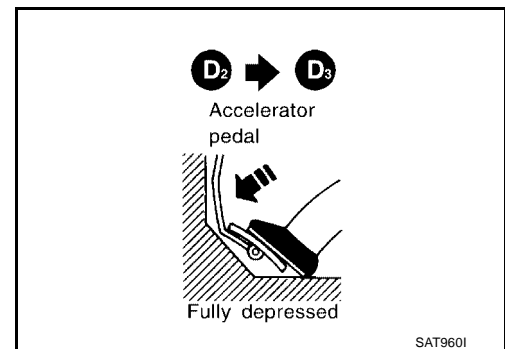
Does A/T shift from D2 to D3 at the specified speed?

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

Specified speed when shifting from D2 to D3 :Refer to [AT-376, "Shift Schedule"](#) .

Yes or No

- Yes >> GO TO 4.
 No >> Go to [AT-235, "10. A/T Does Not Shift: D2 → D3"](#) . Continue ROAD TEST.



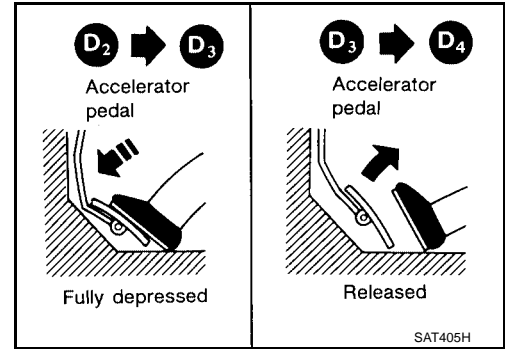
4. CHECK SHIFT UP (D3 TO D4) AND ENGINE BRAKE

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

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

Yes or No

- Yes >> 1. Stop vehicle.
2. Go to [AT-86, "Cruise Test — Part 3"](#) .
- No >> Go to [AT-238, "11. A/T Does Not Shift: D3 → D4"](#) . Continue ROAD TEST.

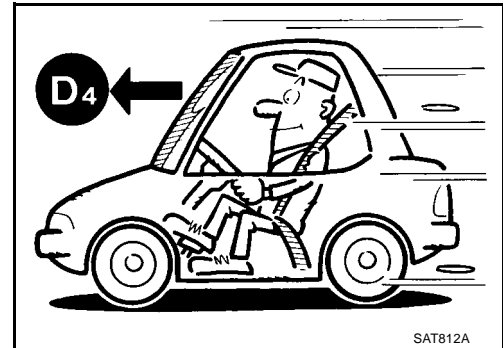


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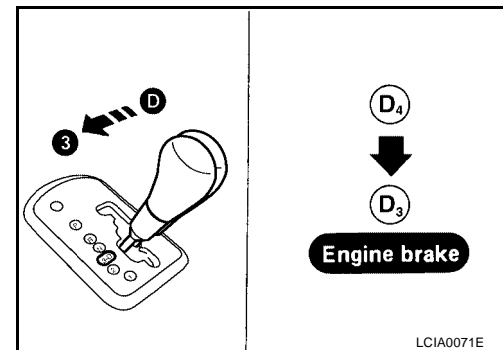
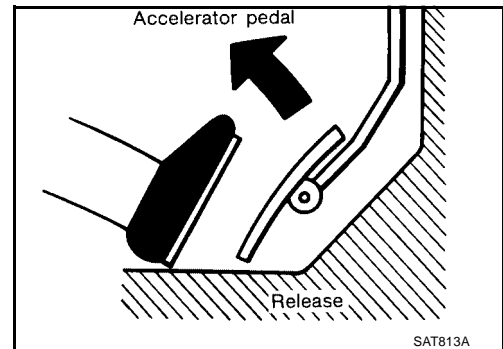
Cruise Test — Part 3

1. VEHICLE SPEED (D4) POSITION

1. Confirm gear selector lever is in D position.
2. Using half-throttle, accelerate vehicle until it shifts into D4 .



3. Release accelerator pedal.
4. Move gear selector lever from D position to 3 position while driving in D4 .
5. Does A/T shift from D4 to 3?
 - Ⓜ Read gear position and vehicle speed.



Yes or No

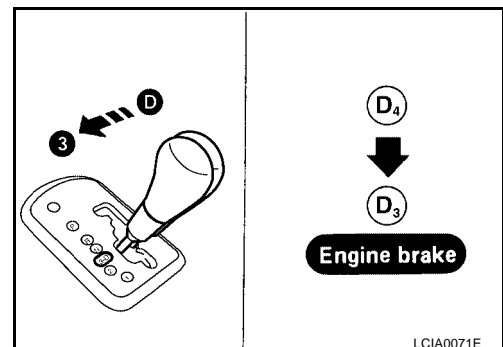
- Yes >> GO TO 2.
- No >> Go to [AT-249, "17. A/T Does Not Shift: D4 → 3₃ , When A/T Selector Lever D → 3"](#) . Continue ROAD TEST.

2. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

- Yes >> GO TO 3.
- No >> Go to [AT-246, "15. Engine Speed Does Not Return To Idle \(Light Braking D4 → D3\)"](#) . Continue ROAD TEST.



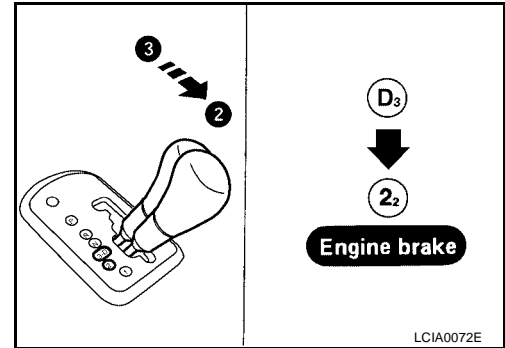
3. CHECK SHIFT DOWN (3₃ TO 2₂)

1. Move selector lever from 3 to 2 position while driving in 3₃.
2. Does A/T shift from 3₃ to 2₂?

Read gear position.

Yes or No

- Yes >> GO TO 4.
 No >> Go to [AT-250, "18. A/T Does Not Shift: 3₃ → 2₂, When Selector Lever 3 → 2 Position"](#). Continue ROAD TEST.

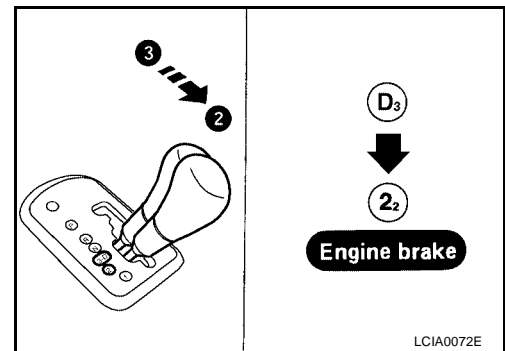


4. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

- Yes >> GO TO 5.
 No >> Go to [AT-246, "15. Engine Speed Does Not Return To Idle \(Light Braking D4 → D3\)"](#). Continue ROAD TEST.



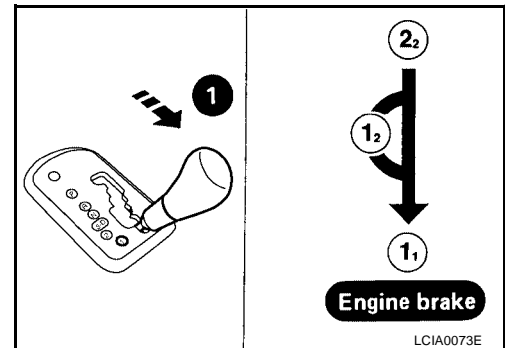
5. CHECK SHIFT DOWN (2₂ TO 1₁)

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

Read gear position.

Yes or No

- Yes >> GO TO 6.
 No >> Go to [AT-251, "19. A/T Does Not Shift: 2₂ → 1₁, When Selector Lever 2 → 1 Position"](#). Continue ROAD TEST.

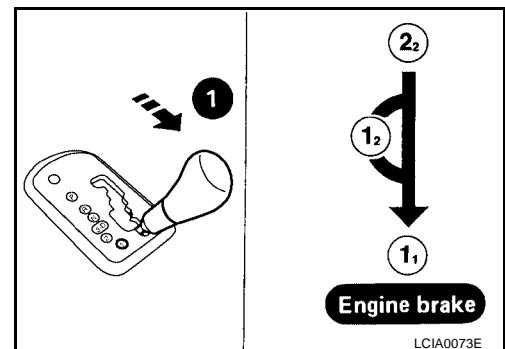


6. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

- Yes >> 1. Stop vehicle.
 2. Perform self-diagnosis. Refer to [AT-55, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#).
 No >> Go to [AT-252, "20. Vehicle Does Not Decelerate By Engine Brake"](#). Continue ROAD TEST.



TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

PFP:00000

Symptom Chart

ECS0096D

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

| Items | Symptom | Condition | Diagnostic Item | Reference Page |
|--|---|-------------|--|---|
| No Lock-up Engagement/ TCC Inoperative | Torque converter is not locked up. | ON vehicle | 1. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117 , AT-199 |
| | | | 3. Park/neutral position (PNP) switch adjustment | AT-267 |
| | | | 4. Engine speed signal | AT-122 |
| | | | 5. A/T fluid temperature sensor | AT-111 |
| | | | 6. Line pressure test | AT-71 |
| | | | 7. Torque converter clutch solenoid valve | AT-148 |
| | | | 8. Control valve assembly | AT-265 |
| | | OFF vehicle | 9. Torque converter | AT-280 |
| | Torque converter clutch piston slip. | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 3. Line pressure test | AT-71 |
| | | | 4. Torque converter clutch solenoid valve | AT-148 |
| | | | 5. Line pressure solenoid valve | AT-161 |
| | | | 6. Control valve assembly | AT-265 |
| | | | OFF vehicle | 7. Torque converter |
| | Lock-up point is extremely high or low. | ON vehicle | 1. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117 , AT-199 |
| | | | 3. Torque converter clutch solenoid valve | AT-148 |
| | | | 4. Control valve assembly | AT-265 |
| | Shift Shock | ON vehicle | 1. Engine idling rpm | EC-80 |
| 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | | | EC-93 | |
| 3. Line pressure test | | | AT-71 | |
| 4. A/T fluid temperature sensor | | | AT-111 | |
| 5. Engine speed signal | | | AT-122 | |
| 6. Line pressure solenoid valve | | | AT-161 | |
| 7. Control valve assembly | | | AT-265 | |
| 8. Accumulator N-D | | | AT-280 | |
| | | OFF vehicle | 9. Forward clutch | AT-326 |

TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

| Items | Symptom | Condition | Diagnostic Item | Reference Page |
|--|---|--|--|--------------------------------|
| Shift Shock | Too sharp a shock in change from D1 to D2 . | ON vehicle | 1. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 2. Line pressure test | AT-71 |
| | | | 3. Accumulator servo release | AT-280 |
| | | | 4. Control valve assembly | AT-265 |
| | | | 5. A/T fluid temperature sensor | AT-111 |
| | | OFF vehicle | 6. Brake band | AT-280 |
| | Too sharp a shock in change from D2 to D3 . | ON vehicle | 1. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 2. Line pressure test | AT-71 |
| | | | 3. Control valve assembly | AT-265 |
| | | OFF vehicle | 4. High clutch | AT-321 |
| | | | 5. Brake band | AT-280 |
| | Too sharp a shock in change from D3 to D4 . | ON vehicle | 1. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 2. Line pressure test | AT-71 |
| | | | 3. Control valve assembly | AT-265 |
| | | OFF vehicle | 4. Brake band | AT-280 |
| 5. Overrun clutch | | | AT-326 | |
| Gear change shock felt during deceleration by releasing accelerator pedal. | ON vehicle | 1. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 | |
| | | 2. Line pressure test | AT-71 | |
| | | 3. Overrun clutch solenoid valve | AT-183 | |
| | | 4. Control valve assembly | AT-265 | |
| Large shock changing from 12 to 11 in 1 position. | ON vehicle | 1. Control valve assembly | AT-265 | |
| | ON vehicle | 2. Low & reverse brake | AT-333 | |
| Improper Shift Timing | Too high a gear change point from D1 to D2 , from D2 to D3 , from D3 to D4 . | ON vehicle | 1. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117, AT-199 |
| | | | 3. Shift solenoid valve A | AT-167 |
| | | | 4. Shift solenoid valve B | AT-172 |
| | Gear change directly from D1 to D3 occurs. | ON vehicle | 1. Fluid level | AT-65 |
| | | OFF vehicle | 2. Accumulator servo release | AT-275 |
| | | OFF vehicle | 3. Brake band | AT-280 |
| | Too high a change point from D4 to D3 , from D3 to D2 , from D2 to D1 . | ON vehicle | 1. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117, AT-199 |
| | Kickdown does not operate when depressing pedal in D4 within kick-down vehicle speed. | ON vehicle | 1. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117, AT-199 |
| | | | 3. Shift solenoid valve A | AT-167 |
| | | | 4. Shift solenoid valve B | AT-172 |

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TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

| Items | Symptom | Condition | Diagnostic Item | Reference Page |
|---------------------------|---|---|--|---|
| Improper Shift Timing | Kickdown operates or engine overruns when depressing pedal in D4 beyond kickdown vehicle speed limit. | ON vehicle | 1. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117 , AT-199 |
| | | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 3. Shift solenoid valve A | AT-167 |
| | | | 4. Shift solenoid valve B | AT-172 |
| | Gear change from 22 to 23 in 2 position. | ON vehicle | 1. Park/neutral position (PNP) switch adjustment | AT-267 |
| | Gear change from 11 to 12 in 1 position. | ON vehicle | 1. Park/neutral position (PNP) switch adjustment | AT-267 |
| No Down Shift | Failure to change gear from D4 to D3 . | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 3. Overrun clutch solenoid valve | AT-183 |
| | | | 4. Shift solenoid valve A | AT-167 |
| | | | 5. Line pressure solenoid valve | AT-161 |
| | | | 6. Control valve assembly | AT-265 |
| | | OFF vehicle | 7. Low & reverse brake | AT-333 |
| | | 8. Overrun clutch | AT-326 | |
| | Failure to change gear from D3 to D2 or from D4 to D2 . | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 3. Shift solenoid valve A | AT-167 |
| | | | 4. Shift solenoid valve B | AT-172 |
| | | | 5. Control valve assembly | AT-265 |
| | | OFF vehicle | 6. High clutch | AT-321 |
| | | 7. Brake band | AT-280 | |
| | | Failure to change gear from D2 to D1 or from D3 to D1 . | ON vehicle | 1. Fluid level |
| | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | | | EC-93 |
| | 3. Shift solenoid valve A | | | AT-167 |
| 4. Shift solenoid valve B | AT-172 | | | |
| 5. Control valve assembly | AT-265 | | | |
| OFF vehicle | 6. Low one-way clutch | | AT-280 | |
| 7. High clutch | AT-321 | | | |
| 8. Brake band | AT-280 | | | |

TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

| Items | Symptom | Condition | Diagnostic Item | Reference Page |
|---------------|--|------------------------|--|--------------------------------|
| No Down Shift | Failure to change from D3 to 22 when changing lever into 2 position. AT-250 | ON vehicle | 1. Park/neutral position (PNP) switch adjustment | AT-267 |
| | | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 3. Overrun clutch solenoid valve | AT-183 |
| | | | 4. Shift solenoid valve B | AT-172 |
| | | | 5. Shift solenoid valve A | AT-167 |
| | | | 6. Control valve assembly | AT-265 |
| | | | 7. Control cable adjustment | AT-268 |
| | OFF vehicle | 8. Brake band | AT-280 | |
| | | 9. Overrun clutch | AT-326 | |
| | Does not change from 12 to 11 in 1 position. | ON vehicle | 1. Park/neutral position (PNP) switch adjustment | AT-267 |
| | | | 2. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117, AT-199 |
| | | | 3. Shift solenoid valve A | AT-167 |
| | | | 4. Control valve assembly | AT-265 |
| | | | 5. Overrun clutch solenoid valve | AT-183 |
| OFF vehicle | | 6. Overrun clutch | AT-326 | |
| | | 7. Low & reverse brake | AT-333 | |
| No Up Shift | Failure to change gear from D1 to D2 . | ON vehicle | 1. Park/neutral position (PNP) switch adjustment | AT-267 |
| | | | 2. Control cable adjustment | AT-268 |
| | | | 3. Shift solenoid valve A | AT-167 |
| | | | 4. Control valve assembly | AT-265 |
| | | | 5. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117, AT-199 |
| | | OFF vehicle | 6. Brake band | AT-280 |
| | Failure to change gear from D2 to D3 . | ON vehicle | 1. Park/neutral position (PNP) switch adjustment | AT-267 |
| | | | 2. Control cable adjustment | AT-268 |
| | | | 3. Shift solenoid valve B | AT-172 |
| | | | 4. Control valve assembly | AT-265 |
| | | | 5. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117, AT-199 |
| | | OFF vehicle | 6. High clutch | AT-321 |
| | | | 7. Brake band | AT-280 |

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TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

| Items | Symptom | Condition | Diagnostic Item | Reference Page | |
|----------------------------------|--|------------------------|--|--|---|
| No Up Shift | Failure to change gear from D3 to D4 . | ON vehicle | 1. Park/neutral position (PNP) switch adjustment | AT-267 | |
| | | | 2. Control cable adjustment | AT-268 | |
| | | | 3. Shift solenoid valve A | AT-167 | |
| | | | 4. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117 , AT-199 | |
| | | | 5. A/T fluid temperature sensor | AT-111 | |
| | | OFF vehicle | 6. Brake band | AT-280 | |
| | A/T does not shift to D4 when driving with overdrive control switch ON. | | ON vehicle | 1. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | | 2. Park/neutral position (PNP) switch adjustment | AT-267 |
| | | | | 3. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117 , AT-199 |
| | | | | 4. Shift solenoid valve A | AT-167 |
| 5. Overrun clutch solenoid valve | | | | AT-183 | |
| 6. Control valve assembly | | | | AT-265 | |
| 7. A/T fluid temperature sensor | | | | AT-111 | |
| 8. Line pressure solenoid valve | | | | AT-161 | |
| | | | OFF vehicle | 9. Brake band | AT-280 |
| 10. Overrun clutch | | | AT-326 | | |
| Slips/Will Not Engage | Vehicle will not run in R position (but runs in D, 2 and 1 positions). Clutch slips. Very poor acceleration. | ON vehicle | 1. Control cable adjustment | AT-268 | |
| | | | 2. Line pressure test | AT-71 | |
| | | | 3. Line pressure solenoid valve | AT-161 | |
| | | | 4. Control valve assembly | AT-265 | |
| | | | OFF vehicle | 5. Reverse clutch | AT-318 |
| | | 6. High clutch | | AT-321 | |
| | | 7. Forward clutch | | AT-326 | |
| | | 8. Overrun clutch | | AT-326 | |
| | | 9. Low & reverse brake | | AT-333 | |
| | Vehicle will not run in D and 2 positions (but runs in 1 and R positions). | ON vehicle | 1. Control cable adjustment | AT-268 | |
| | | OFF vehicle | 2. Low one-way clutch | AT-280 | |

TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

| Items | Symptom | Condition | Diagnostic Item | Reference Page |
|--|---|--|--|------------------------|
| Slips/Will Not Engage | Vehicle will not run in D, 1, 2 positions (but runs in R position). Clutch slips. Very poor acceleration. | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Line pressure test | AT-71 |
| | | | 3. Line pressure solenoid valve | AT-161 |
| | | | 4. Control valve assembly | AT-265 |
| | | | 5. Accumulator N-D | AT-280 |
| | | OFF vehicle | 6. Reverse clutch | AT-318 |
| | | | 7. High clutch | AT-321 |
| | | | 8. Forward clutch | AT-326 |
| | | | 9. Forward one-way clutch | AT-280 |
| | | | 10. Low one-way clutch | AT-280 |
| | Clutches or brakes slip somewhat in starting. | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Control cable adjustment | AT-268 |
| | | | 3. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 4. Line pressure test | AT-71 |
| | | | 5. Line pressure solenoid valve | AT-161 |
| | | | 6. Control valve assembly | AT-265 |
| | | | 7. Accumulator N-D | AT-280 |
| | | OFF vehicle | 8. Forward clutch | AT-326 |
| | | | 9. Reverse clutch | AT-318 |
| | | | 10. Low & reverse brake | AT-333 |
| | | | 11. Oil pump | AT-299 |
| | | | 12. Torque converter | AT-280 |
| | No creep at all. AT-223 , AT-226 | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Line pressure test | AT-71 |
| | | | 3. Control valve assembly | AT-265 |
| | | OFF vehicle | 4. Forward clutch | AT-326 |
| | | | 5. Oil pump | AT-299 |
| | | | 6. Torque converter | AT-280 |
| Almost no shock or clutches slipping in change from D1 to D2 . | ON vehicle | 1. Fluid level | AT-65 | |
| | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 | |
| | | 3. Line pressure test | AT-71 | |
| | | 4. Accumulator servo release | AT-275 | |
| | | 5. Control valve assembly | AT-265 | |
| | OFF vehicle | 6. Brake band | AT-280 | |

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TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

| Items | Symptom | Condition | Diagnostic Item | Reference Page |
|--|--|--|--|------------------------|
| Slips/Will Not Engage | Almost no shock or slipping in change from D2 to D3 . | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 3. Line pressure test | AT-71 |
| | | | 4. Control valve assembly | AT-265 |
| | | OFF vehicle | 5. High clutch | AT-321 |
| | | | 6. Forward clutch | AT-326 |
| | Almost no shock or slipping in change from D3 to D4 . | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 3. Line pressure test | AT-71 |
| | | | 4. Control valve assembly | AT-265 |
| | | OFF vehicle | 5. High clutch | AT-321 |
| | | | 6. Brake band | AT-280 |
| | Races extremely fast or slips in changing from D4 to D3 when depressing pedal. | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 3. Line pressure test | AT-71 |
| | | | 4. Line pressure solenoid valve | AT-161 |
| | | | 5. Control valve assembly | AT-265 |
| | | OFF vehicle | 6. High clutch | AT-321 |
| | | | 7. Forward clutch | AT-326 |
| | Races extremely fast or slips in changing from D4 to D2 when depressing pedal. | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 3. Line pressure test | AT-71 |
| | | | 4. Line pressure solenoid valve | AT-161 |
| | | | 5. Shift solenoid valve A | AT-167 |
| 6. Control valve assembly | | | AT-265 | |
| OFF vehicle | | 7. Brake band | AT-280 | |
| | | 8. Forward clutch | AT-326 | |
| Races extremely fast or slips in changing from D3 to D2 when depressing pedal. | ON vehicle | 1. Fluid level | AT-65 | |
| | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 | |
| | | 3. Line pressure test | AT-71 | |
| | | 4. Line pressure solenoid valve | AT-161 | |
| | | 5. Control valve assembly | AT-265 | |
| | | 6. A/T fluid temperature sensor | AT-111 | |
| | OFF vehicle | 7. Brake band | AT-280 | |
| | | 8. Forward clutch | AT-326 | |
| | | 9. High clutch | AT-321 | |

TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

| Items | Symptom | Condition | Diagnostic Item | Reference Page |
|--|--|--|--|--------------------------------|
| Slips/Will Not Engage | Races extremely fast or slips in changing from D4 or D3 to D1 when depressing pedal. | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 3. Line pressure test | AT-71 |
| | | | 4. Line pressure solenoid valve | AT-161 |
| | | | 5. Control valve assembly | AT-265 |
| | OFF vehicle | 6. Forward clutch | AT-326 | |
| | | 7. Forward one-way clutch | AT-280 | |
| | | 8. Low one-way clutch | AT-280 | |
| | Vehicle will not run in any position. | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Control cable adjustment | AT-268 |
| 3. Line pressure test | | | AT-71 | |
| 4. Line pressure solenoid valve | | | AT-161 | |
| OFF vehicle | | 5. Oil pump | AT-299 | |
| | | 6. High clutch | AT-321 | |
| | | 7. Brake band | AT-280 | |
| | | 8. Low & reverse brake | AT-333 | |
| | | 9. Torque converter | AT-280 | |
| | | 10. Parking components | AT-275 | |
| Engine cannot be started in P and N positions. AT-217 | ON vehicle | 1. Ignition switch and starter | SC-13 | |
| | | 2. Control cable adjustment | AT-268 | |
| | | 3. Park/neutral position (PNP) switch adjustment | AT-267 | |
| | Engine starts in positions other than P and N. | ON vehicle | 1. Control cable adjustment | AT-268 |
| | | | 2. Park/neutral position (PNP) switch adjustment | AT-267 |
| | Transaxle noise in P and N positions. | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Line pressure test | AT-71 |
| | | | 3. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 4. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117, AT-199 |
| 5. Engine speed signal | | | AT-122 | |
| OFF vehicle | | 6. Oil pump | AT-299 | |
| | | 7. Torque converter | AT-280 | |
| Vehicle moves when changing into P position or parking gear does not disengage when shifted out of P position. | ON vehicle | 1. Control cable adjustment | AT-268 | |
| | OFF vehicle | 2. Parking components | AT-275 | |

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TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

| Items | Symptom | Condition | Diagnostic Item | Reference Page |
|---|---|---------------------------|---|------------------------|
| NOT USED | Vehicle runs in N position. AT-219 | ON vehicle | 1. Control cable adjustment | AT-268 |
| | | OFF vehicle | 2. Forward clutch | AT-326 |
| | | | 3. Reverse clutch | AT-318 |
| | | | 4. Overrun clutch | AT-326 |
| | Vehicle braked when shifting into R position. | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Control cable adjustment | AT-268 |
| | | | 3. Line pressure test | AT-71 |
| | | | 4. Line pressure solenoid valve | AT-161 |
| | | | 5. Control valve assembly | AT-265 |
| | | OFF vehicle | 6. High clutch | AT-321 |
| | | | 7. Brake band | AT-280 |
| | | | 8. Forward clutch | AT-326 |
| | | | 9. Overrun clutch | AT-326 |
| | Excessive creep. | ON vehicle | 1. Engine idling rpm | EC-80 |
| | Engine stops when shifting lever into R, D, 2 and 1. | ON vehicle | 1. Engine idling rpm | EC-80 |
| | | | 2. Torque converter clutch solenoid valve | AT-148 |
| | | | 3. Control valve assembly | AT-265 |
| | | OFF vehicle | 4. Torque converter | AT-280 |
| | Vehicle braked by gear change from D1 to D2 . | ON vehicle | 1. Fluid level | AT-65 |
| | | OFF vehicle | 2. Reverse clutch | AT-318 |
| 3. Low & reverse brake | | | AT-333 | |
| 4. High clutch | | | AT-321 | |
| 5. Low one-way clutch | | | AT-280 | |
| Vehicle braked by gear change from D2 to D3 . | ON vehicle | 1. Fluid level | AT-65 | |
| | OFF vehicle | 2. Brake band | AT-280 | |
| Vehicle braked by gear change from D3 to D4 . | ON vehicle | 1. Fluid level | AT-65 | |
| | OFF vehicle | 2. Overrun clutch | AT-326 | |
| | | 3. Forward one-way clutch | AT-280 | |
| | | 4. Reverse clutch | AT-318 | |

TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

| Items | Symptom | Condition | Diagnostic Item | Reference Page |
|--|--|-------------------------|--|--------------------------------|
| NOT USED | Maximum speed not attained. Acceleration poor. | ON vehicle | 1. Fluid level | AT-65 |
| | | | 2. Park/neutral position (PNP) switch adjustment | AT-267 |
| | | | 3. Shift solenoid valve A | AT-167 |
| | | | 4. Shift solenoid valve B | AT-172 |
| | | | 5. Control valve assembly | AT-265 |
| | | OFF vehicle | 6. Reverse clutch | AT-318 |
| | | | 7. High clutch | AT-321 |
| | | | 8. Brake band | AT-280 |
| | | | 9. Low & reverse brake | AT-333 |
| | | | 10. Oil pump | AT-299 |
| | | | 11. Torque converter | AT-280 |
| | Transaxle noise in D, 2, 1 and R positions. | ON vehicle | 1. Fluid level | AT-65 |
| | | OFF vehicle | 2. Torque converter | AT-280 |
| | Engine brake does not operate in "1" position. | ON vehicle | 1. Park/neutral position (PNP) switch adjustment | AT-267 |
| | | | 2. Control cable adjustment | AT-268 |
| | | | 3. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | EC-93 |
| | | | 4. Vehicle speed sensor-A/T (Revolution sensor) and vehicle speed sensor-MTR | AT-117, AT-199 |
| | | | 5. Shift solenoid valve A | AT-167 |
| | | | 6. Control valve assembly | AT-265 |
| | | | 7. Overrun clutch solenoid valve | AT-183 |
| | | OFF vehicle | 8. Overrun clutch | AT-326 |
| | | | 9. Low & reverse brake | AT-333 |
| | Transaxle overheats. | ON vehicle | 1. Fluid level | AT-65 |
| 2. Engine idling rpm | | | EC-80 | |
| 3. Throttle position sensor [accelerator pedal position (APP) sensor] adjustment | | | EC-93 | |
| 4. Line pressure test | | | AT-71 | |
| 5. Line pressure solenoid valve | | | AT-161 | |
| 6. Control valve assembly | | | AT-265 | |
| OFF vehicle | | 7. Oil pump | AT-299 | |
| | | 8. Reverse clutch | AT-318 | |
| | | 9. High clutch | AT-321 | |
| | | 10. Brake band | AT-280 | |
| | | 11. Forward clutch | AT-326 | |
| | | 12. Overrun clutch | AT-326 | |
| | | 13. Low & reverse brake | AT-333 | |
| | | 14. Torque converter | AT-280 | |

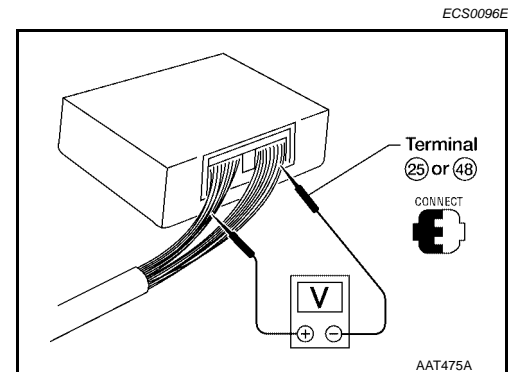
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TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

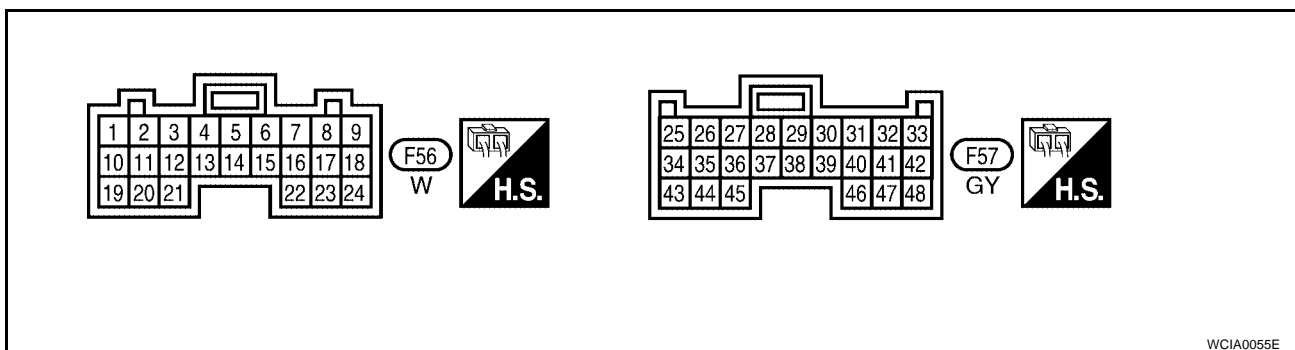
| Items | Symptom | Condition | Diagnostic Item | Reference Page |
|---|--|---|------------------------|------------------------|
| NOT USED | ATF shoots out during operation. White smoke emitted from exhaust pipe during operation. | ON vehicle | 1. Fluid level | AT-65 |
| | | OFF vehicle | 2. Reverse clutch | AT-318 |
| | | | 3. High clutch | AT-321 |
| | | | 4. Brake band | AT-280 |
| | | | 5. Forward clutch | AT-326 |
| | | | 6. Overrun clutch | AT-326 |
| | | | 7. Low & reverse brake | AT-333 |
| | Offensive smell at fluid charging pipe. | ON vehicle | 1. Fluid level | AT-65 |
| | | OFF vehicle | 2. Torque converter | AT-280 |
| | | | 3. Oil pump | AT-299 |
| | | | 4. Reverse clutch | AT-318 |
| | | | 5. High clutch | AT-321 |
| | | | 6. Brake band | AT-280 |
| | | | 7. Forward clutch | AT-326 |
| | | | 8. Overrun clutch | AT-326 |
| 9. Low & reverse brake | | | AT-333 | |
| Engine is stopped at R, D, 2 and 1 positions. | ON vehicle | 1. Fluid level | AT-65 | |
| | | 2. Torque converter clutch solenoid valve | AT-148 | |
| | | 3. Shift solenoid valve B | AT-172 | |
| | | 4. Shift solenoid valve A | AT-167 | |
| | | 5. Control valve assembly | AT-265 | |

TCM Terminals and Reference Value PREPARATION



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

TCM HARNESS CONNECTOR TERMINAL LAYOUT















TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]







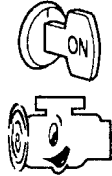


TCM INSPECTION TABLE

(Data are reference values.)

| Terminal No. | Wire color | Item | Condition | | Judgement standard (Approx.) |
|--------------|------------|---|--|--|------------------------------|
| 1 | G/R | Line pressure solenoid valve |  | When releasing accelerator pedal after warming up engine. | 1.5 - 3.0V |
| | | | | When depressing accelerator pedal fully after warming up engine. | 0V |
| 2 | W/B | Line pressure solenoid valve (with dropping resistor) |  | When releasing accelerator pedal after warming up engine. | 4 - 14V |
| | | | | When depressing accelerator pedal fully after warming up engine. | 0V |
| 3 | G/B | Torque converter clutch solenoid valve |  | When A/T performs lock-up. | 8 - 15V |
| | | | | When A/T does not perform lock-up. | 0V |
| 5* | L | CAN-H | — | — | — |
| 6* | P | CAN-L | — | — | — |
| 10 | R/Y | Power source |  or  | With ignition switch ON. | Battery voltage |
| | | | | With ignition switch OFF. | 0V |
| 11 | R/Y | Shift solenoid valve A |  | When shift solenoid valve A operates. (When driving in D1 or D4 .) | Battery voltage |
| | | | | When shift solenoid valve A does not operate. (When driving in D2 or D3 .) | 0V |
| 12 | LG/B | Shift solenoid valve B |  | When shift solenoid valve B operates. (When driving in D1 or D2 .) | Battery voltage |
| | | | | When shift solenoid valve B does not operate. (When driving in D3 or D4 .) | 0V |
| 19 | R/Y | Power source | Same as No. 10 | | |
| 20 | BR/Y | Overrun clutch solenoid valve |  | When overrun clutch solenoid valve operates. | Battery voltage |
| | | | | When overrun clutch solenoid valve does not operate. | 0V |
| 25 | B | Ground | — | — | — |
| | | | | — | — |
| 26 | PU/W | PNP switch 1 position |  | When setting selector lever to 1 position. | Battery voltage |
| | | | | When setting selector lever to other positions. | 0V |
| 27 | P/B | PNP switch 2 position |  | When setting selector lever to 2 position. | Battery voltage |
| | | | | When setting selector lever to other positions. | 0V |
| 28 | Y/R | Power source (Memory back-up) |  or  | With ignition switch OFF. | Battery voltage |
| | | | | With ignition switch ON. | Battery voltage |


TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

| Terminal No. | Wire color | Item | Condition | | Judgement standard (Approx.) |
|--------------|------------|--|---|--|--|
| 29 | W | Revolution sensor |  | When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item. | 450 Hz |
| | | | | When vehicle is parked. | Under 1.3V or over 4.5V |
| 30** | BR/Y | Data link connector (RX) |  | — | — |
| 31** | LG | Data link connector (TX) | | — | — |
| 32 | R | Sensor power | | Ignition switch ON. | 4.5 - 5.5V |
| | | | Ignition switch OFF. | 0V | |
| 34 | G | PNP switch D position |  | When setting selector lever to D position. | Battery voltage |
| | | | | When setting selector lever to other positions. | 0V |
| 35 | G/W | PNP switch R position |  | When setting selector lever to R position. | Battery voltage |
| | | | | When setting selector lever to other positions. | 0V |
| 36 | R/B | PNP switch P or N position |  | When setting selector lever to P or N position. | Battery voltage |
| | | | | When setting selector lever to other positions. | 0V |
| 38 | G | Turbine revolution sensor |  | When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item. | 240 Hz |
| | | | | When vehicle is parked. | Under 1.3V or over 4.5V |
| 39 | W/G | Engine speed signal |  | Refer to EC-120, "ECM INSPECTION TABLE" . | |
| 40 | PU/R | Vehicle speed sensor |  | When moving vehicle at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more. | Voltage varies between less than 1V and more than 4.5V |
| 41 | W | Throttle position sensor [accelerator pedal position (APP) sensor] |  | When depressing accelerator pedal slowly after warming up engine. (Voltage rises gradually in response to throttle position.) | Fully-closed throttle: 0.5V Fully-open throttle: 4V |
| 42 | B | Sensor ground | — | — | — |

TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

[RE4F04B]

| Terminal No. | Wire color | Item | Condition | Judgement standard (Approx.) | |
|--------------|------------|------------------------------|---|---------------------------------------|------|
| 47 | G | A/T fluid temperature sensor |  | When ATF temperature is 20°C (68°F). | 1.5V |
| | | | | When ATF temperature is 80°C (176°F). | 0.5V |
| 48 | B | Ground | — | — | |

*: These terminals are connected to the ECM.

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

CAN Communication

ECS0096F

For details, refer to [LAN-21, "CAN COMMUNICATION"](#) .

TROUBLE DIAGNOSIS FOR POWER SUPPLY

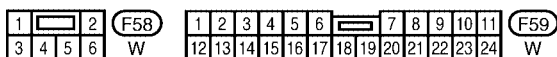
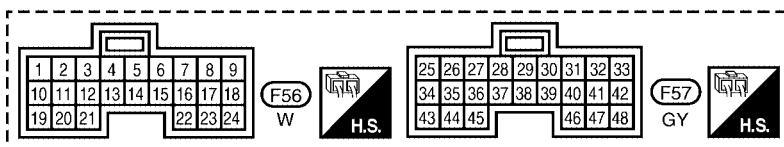
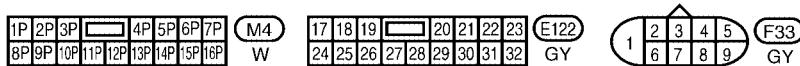
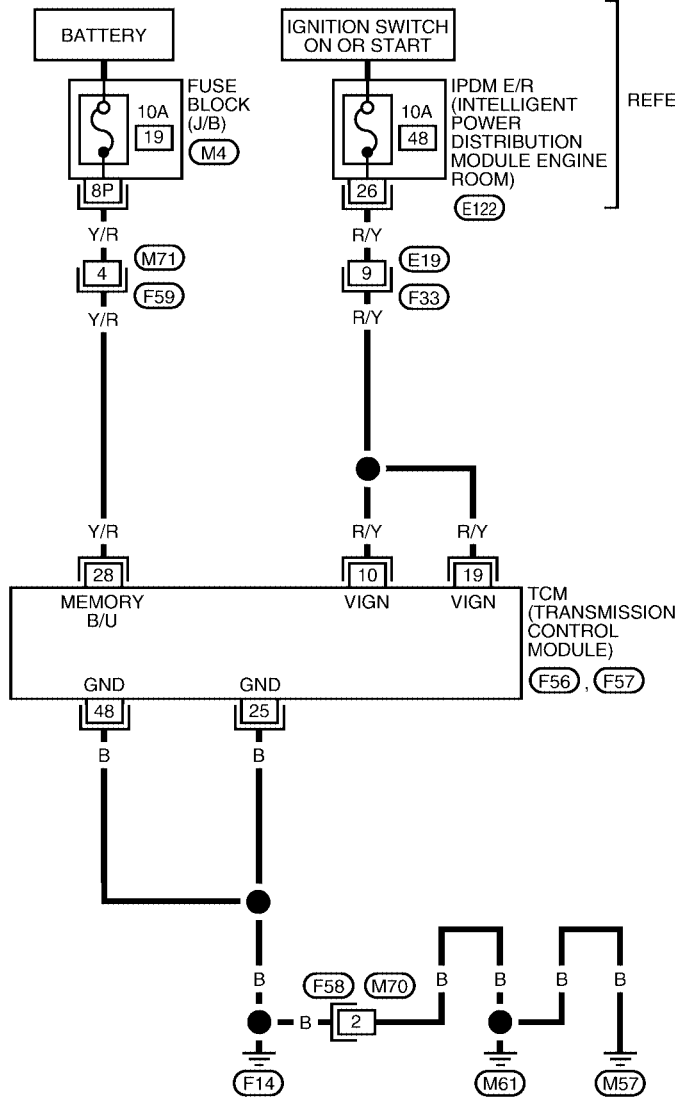
PF0:0000

Wiring Diagram — AT — MAIN

ECS0096G

AT-MAIN-01

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



BCWA0137E

TROUBLE DIAGNOSIS FOR POWER SUPPLY

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|---------------------------------|--------------|-----------------|
| 10 | R/Y | POWER SOURCE | IGNITION ON | BATTERY VOLTAGE |
| | | | IGNITION OFF | 0V |
| 19 | R/Y | POWER SOURCE | IGNITION ON | BATTERY VOLTAGE |
| | | | IGNITION OFF | 0V |
| 25 | B | GROUND | — | — |
| 28 | Y/R | POWER SOURCE (MEMORY BACKUP) | IGNITION ON | BATTERY VOLTAGE |
| | | | IGNITION OFF | BATTERY VOLTAGE |
| 48 | B | GROUND | — | — |

Diagnostic Procedure

ECS0096H

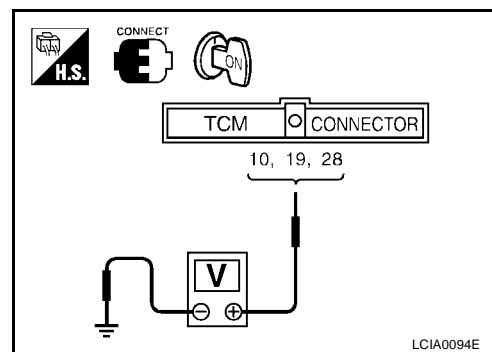
1. CHECK TCM POWER SOURCE STEP 1

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

Voltage : **Battery voltage**

OK or NG

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



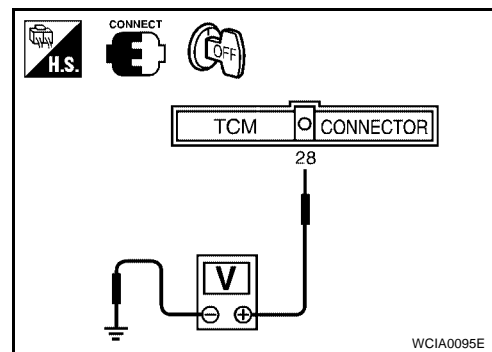
2. CHECK TCM POWER SOURCE STEP 2

- Turn ignition switch to OFF position.
- Check voltage between TCM terminal 28 (Y/R) and ground.

Voltage : **Battery voltage**

OK or NG

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



3. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between ignition switch and TCM terminals 10, 19 and 28
- Fuse
- Ignition switch
Refer to [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#).

OK or NG

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

4. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect TCM harness connector.
3. Check continuity between TCM terminals 25, 48 and ground. Refer to [AT-102, "Wiring Diagram — AT — MAIN"](#).

Continuity should exist.

OK or NG

OK >> **INSPECTION END**

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

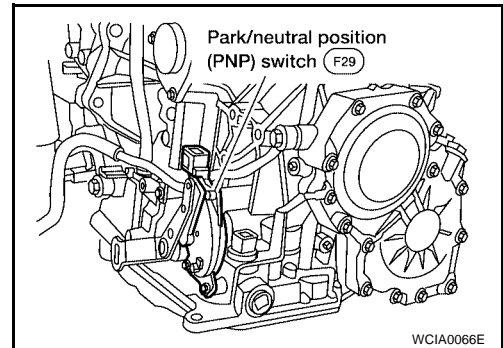
DTC P0705 PARK/NEUTRAL POSITION SWITCH

PFP:32006

ECS0096I

Description

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



ECS0096J

On Board Diagnosis Logic

Diagnostic trouble code PNP SW/CIRC with CONSULT-II or P0705 without CONSULT-II is detected when TCM does not receive the correct voltage signal from the switch based on the gear position.

ECS0096K

Possible Cause

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0096L

CAUTION:

Always drive vehicle at a safe speed.

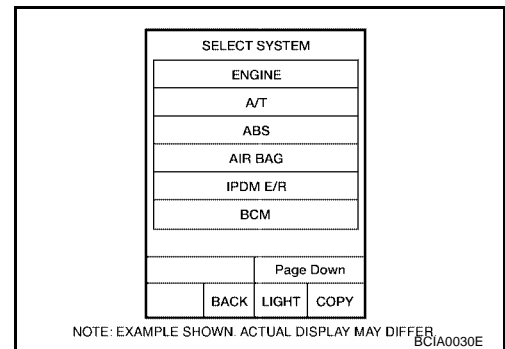
NOTE:

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

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

WITH CONSULT-II

1. Turn ignition switch ON.

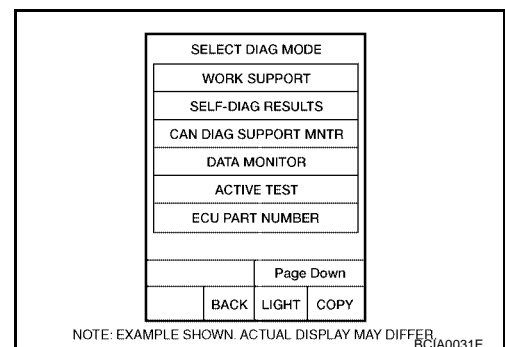


2. Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.

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

THRTL POS SEN: More than 1.3V

Selector lever: 3 or D position



DTC P0705 PARK/NEUTRAL POSITION SWITCH

[RE4F04B]

WITH GST

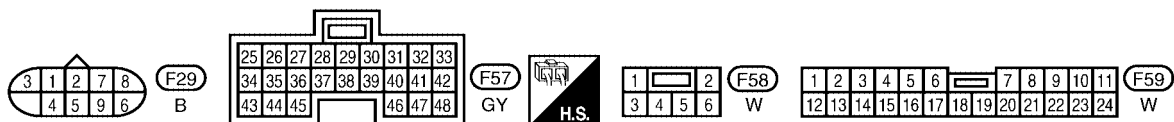
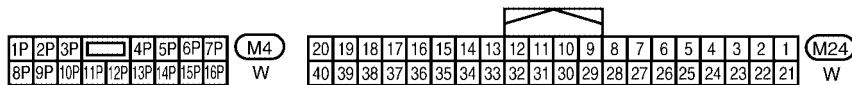
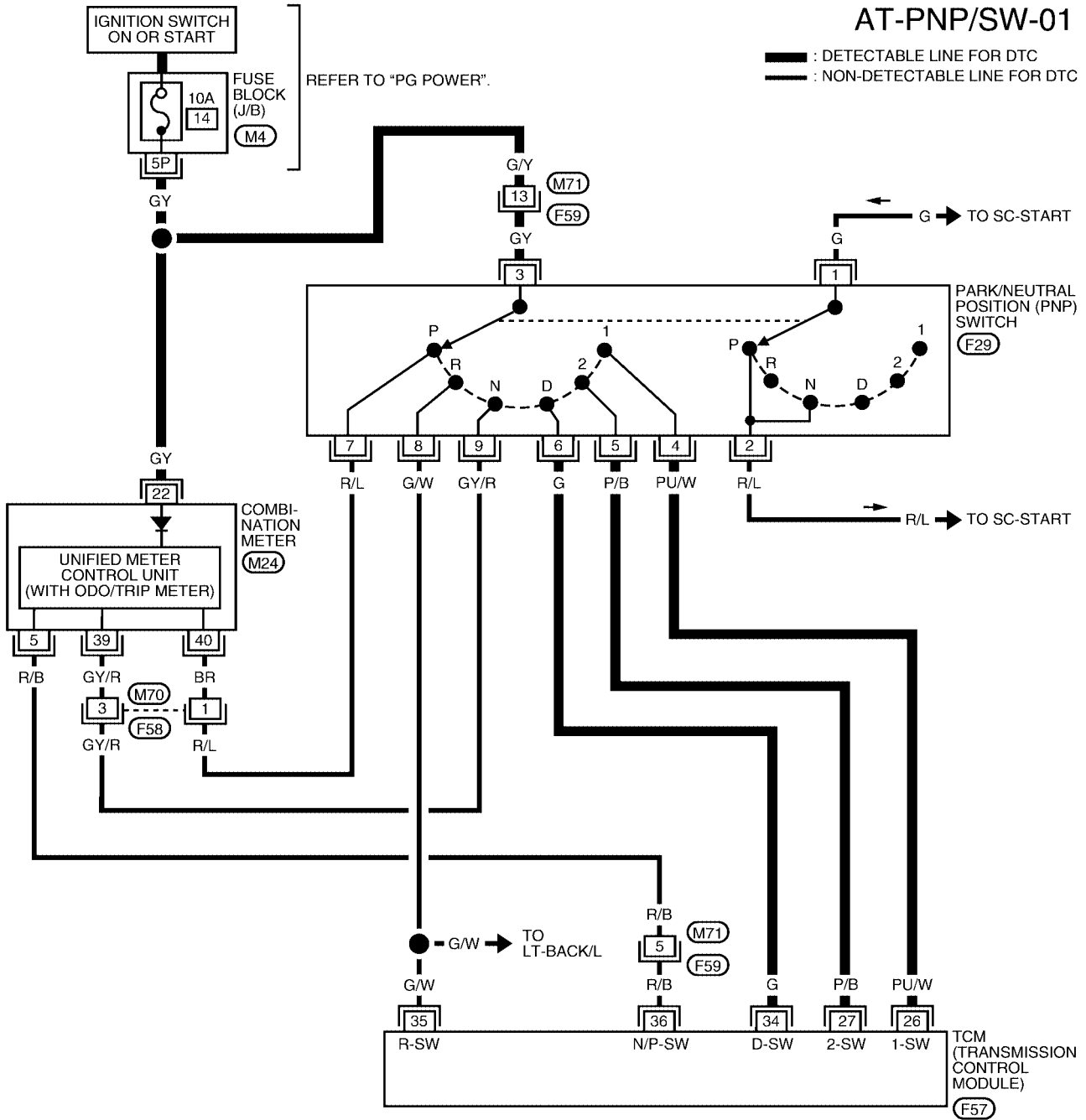
Follow the procedure "With CONSULT-II".

DTC P0705 PARK/NEUTRAL POSITION SWITCH

[RE4F04B]

ECS0096M

Wiring Diagram — AT — PNP/SW



DTC P0705 PARK/NEUTRAL POSITION SWITCH

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|-------------------------------|---|-----------------|
| 26 | PU/W | PNP SWITCH 1 POSITION | WHEN SETTING SELECTOR LEVER IN 1 POSITION | BATTERY VOLTAGE |
| | | | WHEN SETTING SELECTOR LEVER IN OTHER POSITIONS | 0V |
| 27 | P/B | PNP SWITCH 2 POSITION | WHEN SETTING SELECTOR LEVER IN 2 POSITION | BATTERY VOLTAGE |
| | | | WHEN SETTING SELECTOR LEVER IN OTHER POSITIONS | 0V |
| 34 | G | PNP SWITCH D POSITION | WHEN SETTING SELECTOR LEVER IN D POSITION | BATTERY VOLTAGE |
| | | | WHEN SETTING SELECTOR LEVER IN OTHER POSITIONS | 0V |
| 35 | G/W | PNP SWITCH R POSITION | WHEN SETTING SELECTOR LEVER IN R POSITION | BATTERY VOLTAGE |
| | | | WHEN SETTING SELECTOR LEVER IN OTHER POSITIONS | 0V |
| 36 | R/B | PNP SWITCH P OR N POSITION | WHEN SETTING SELECTOR LEVER IN P OR N POSITION | BATTERY VOLTAGE |
| | | | WHEN SETTING SELECTOR LEVER IN OTHER POSITIONS | 0V |

Diagnostic Procedure

ECS0096N

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

- Yes >> GO TO 2.
- No >> GO TO 6.

2. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITH CONSULT-II)

With CONSULT-II

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

OK or NG

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

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

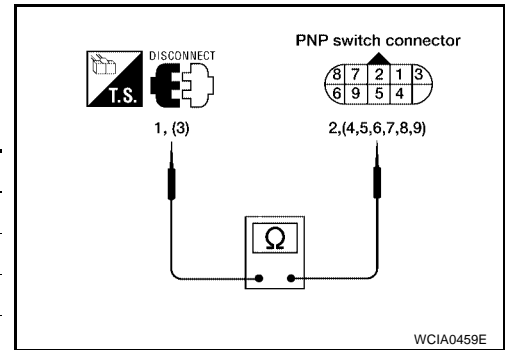
SAT701J

3. DETECT MALFUNCTIONING ITEM

Check the following item:

- Park/neutral position (PNP) switch
Check continuity between park/neutral position (PNP) switch F29 terminals 1 (G) and 2 (R/L) and between terminals 3 (GY) and 4 (PU/W), 5 (P/B), 6 (G), 7 (R/L), 8 (G/W) and 9 (GY/R) while moving manual shaft through each position.

| Lever position | Terminal No. | |
|----------------|--------------|-------|
| P | 3 - 7 | 1 - 2 |
| R | 3 - 8 | |
| N | 3 - 9 | 1 - 2 |
| D | 3 - 6 | |
| 2 | 3 - 5 | |
| 1 | 3 - 4 | |



OK or NG

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

4. CHECK MANUAL CONTROL CABLE ADJUSTMENT

Check PNP switch again with manual control cable disconnected from manual shaft of A/T assembly. Refer to test group 1.

OK or NG

- OK >> Adjust manual control cable. Refer to [AT-268, "Control Cable Adjustment"](#).
- NG >> Repair or replace PNP switch.

5. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between ignition switch and park/neutral position (PNP) switch (Main harness)
- Harness for short or open between park/neutral position (PNP) switch and TCM (Main harness)
- Fuse
- Ignition switch
Refer to [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#).

OK or NG

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

6. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITHOUT CONSULT-II)

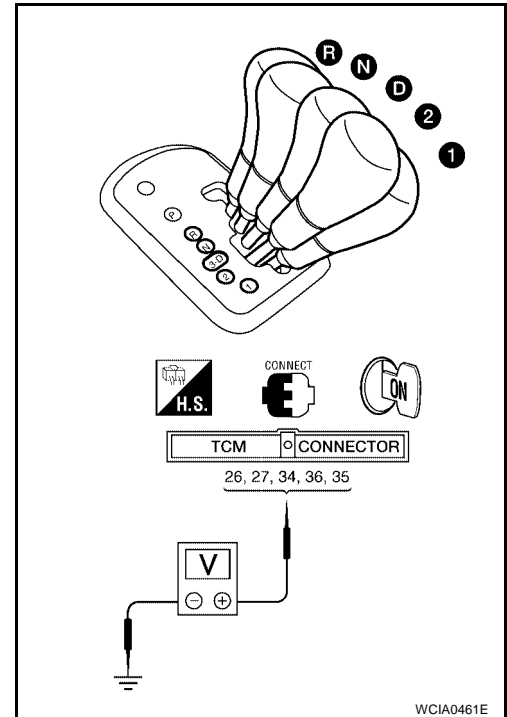
⊗ Without CONSULT-II

1. Turn ignition switch to ON position. (Do not start engine.)
2. Check voltage between TCM terminals 26 (PU/W), 27 (P/B), 34 (G), 35 (G/W), 36 (R/B) and ground while moving selector lever through each position.

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

B = Battery voltage

0 = 0V



OK or NG

- OK >> GO TO 7.
- NG >> GO TO 5.

7. CHECK DTC

Perform [AT-105. "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

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

8. CHECK TCM INSPECTION

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

OK or NG

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

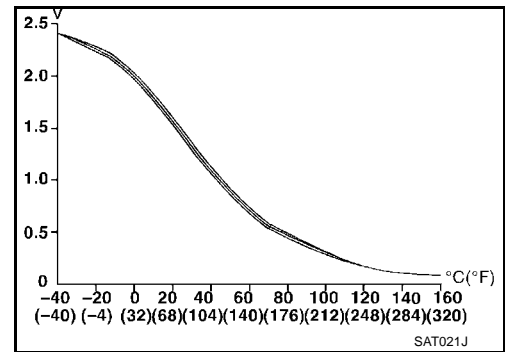
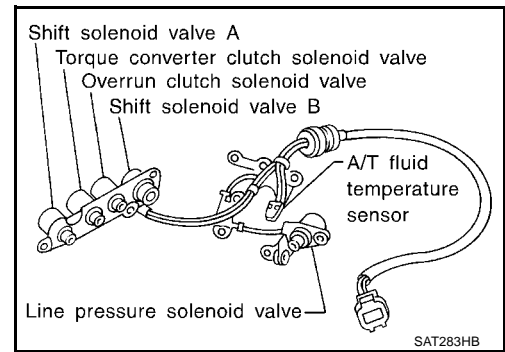
DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

PF3:31940

Description

ECS00960

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



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

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

On Board Diagnosis Logic

ECS0096P

Diagnostic trouble code ATF TEMP SEN/CIRC with CONSULT-II or P0710 without CONSULT-II is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause

ECS0096Q

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0096R

CAUTION:

Always drive vehicle at a safe speed.

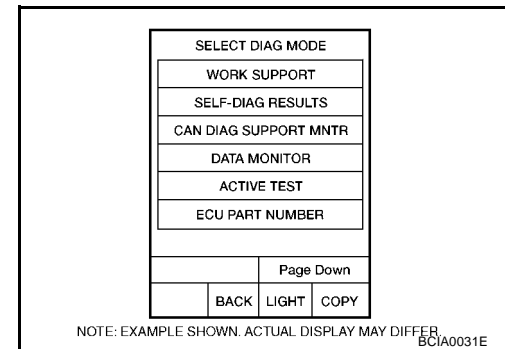
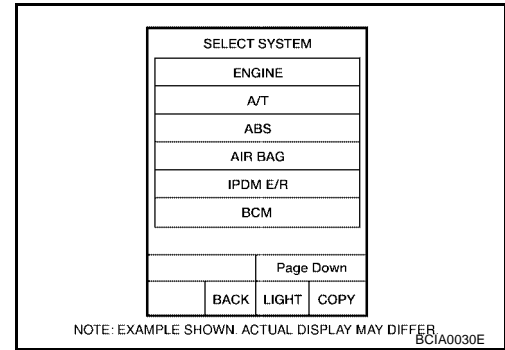
NOTE:

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

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

WITH CONSULT-II

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



2. Select "ECM INPUT SIGNALS" touch "START".
3. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)
 - ENG SPEED: 450 rpm or more**
 - VEHICLE SPEED: 10 km/h (6 MPH) or more**
 - THRTL POSI: More than 1.2V**
 - Selector lever: D position**

WITH GST

Follow the procedure "With CONSULT-II".

DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

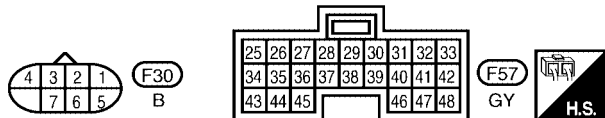
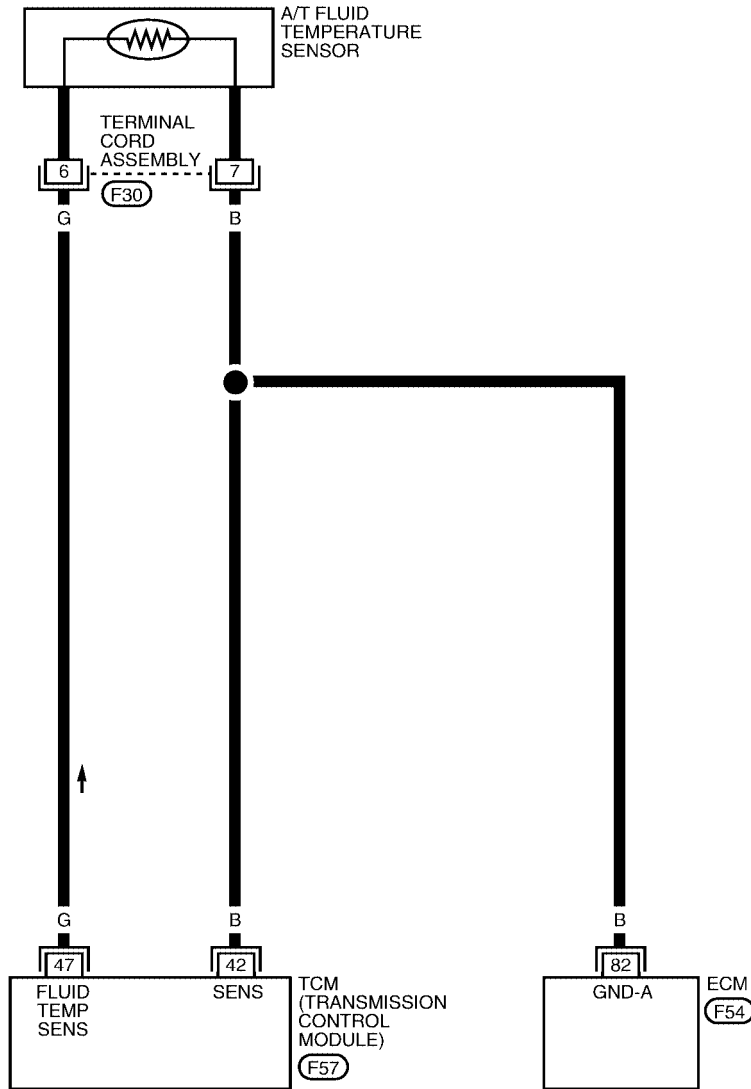
[RE4F04B]

Wiring Diagram — AT — FTS

ECS0096S

AT-FTS-01

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



REFER TO THE FOLLOWING.
 (F54) - ELECTRICAL UNITS

BCWA0139E

DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|------------------------------|---|----------------|
| 42 | B | SENSOR GROUND | — | — |
| 47 | G | A/T FLUID TEMPERATURE SENSOR | IGNITION ON AND ATF TEMPERATURE IS 20°C (68°F) | 1.5V |
| | | | IGNITION ON AND ATF TEMPERATURE IS 80°C (176°F) | 0.5V |

Diagnostic Procedure

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

- Yes >> GO TO 2.
No >> GO TO 6.

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

 With CONSULT-II

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

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

OK or NG

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

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

LCIA0090E

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

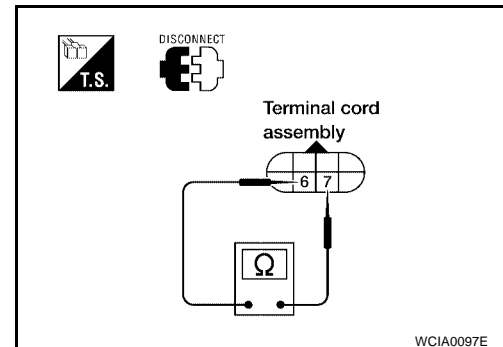
- Turn ignition switch to OFF position.
- Disconnect terminal cord assembly connector in engine compartment.
- Check resistance between terminal cord F30 terminals 6 and 7 (component side) when A/T is cold.

| Temperature | Resistance (Approx.) |
|--------------------|----------------------|
| Cold [20°C (68°F)] | 2.5kΩ |

- Reinstall any part removed.

OK or NG

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



4. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short to ground or short to power or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM
Refer to [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#).

OK or NG

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

5. DETECT MALFUNCTIONING ITEM

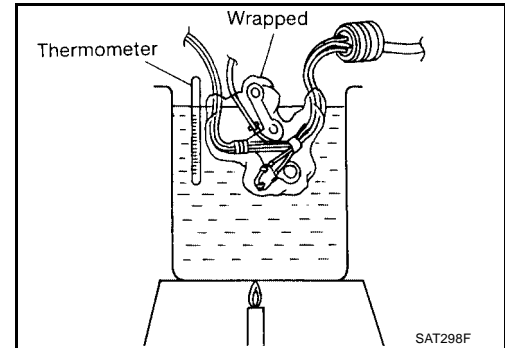
1. Remove oil pan.
2. Check the following items:
 - A/T fluid temperature sensor
Check resistance between two terminals while changing temperature as shown in figure.

| Temperature | Resistance (Approx.) |
|-------------|----------------------|
| 20 (68) | 25kΩ |
| 80 (176) | 0.3kΩ |

- Harness of terminal cord assembly for short or open

OK or NG

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



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

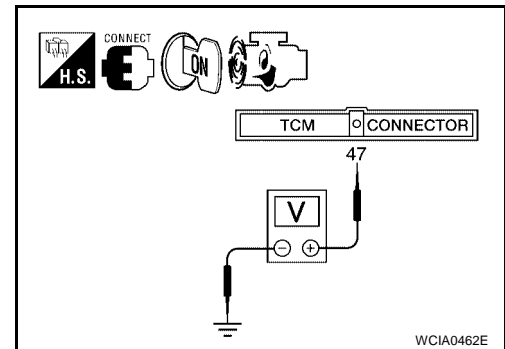
⊗ **Without CONSULT-II**

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

| Temperature | Voltage (Approx.) |
|---|-------------------|
| Cold [20°C (68°F)] → Hot [80°C (176°F)] | 1.5V → 0.5V |

OK or NG

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



7. CHECK DTC

Perform [AT-111, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

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

8. CHECK TCM INSPECTION

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

OK or NG

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

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

[RE4F04B]

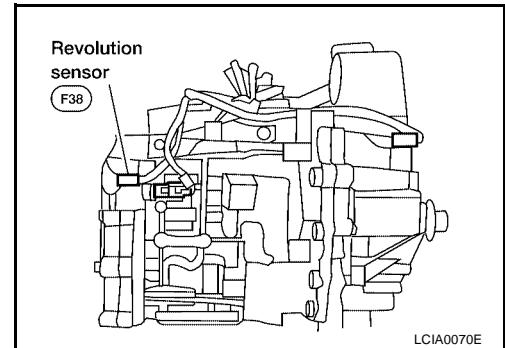
DTC P0720 VEHICLE SPEED SENSOR-A/T (REVOLUTION SENSOR)

PFP:32702

Description

ECS0096U

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



On Board Diagnosis Logic

ECS0096V

Diagnostic trouble code VEH SPD SEN/CIR AT with CONSULT-II or P0720 without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor.

Possible Cause

ECS0096W

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0096X

CAUTION:

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

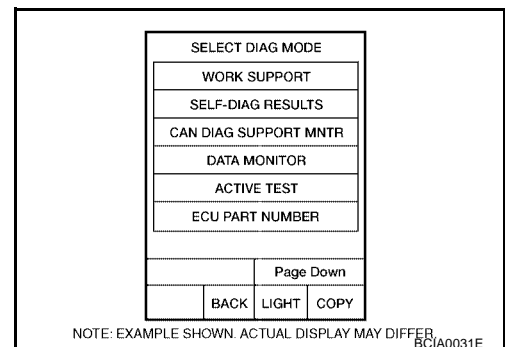
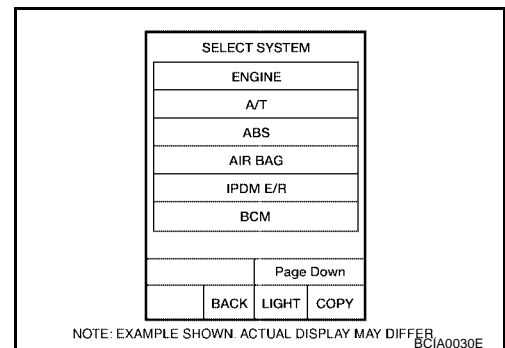
NOTE:

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

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

WITH CONSULT-II

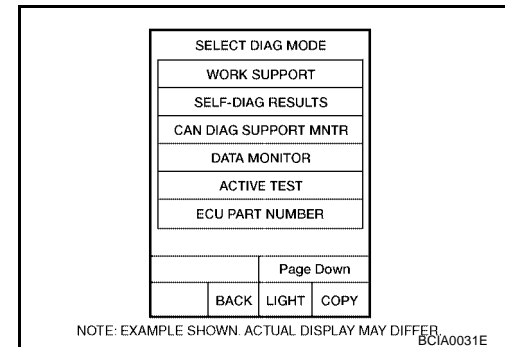
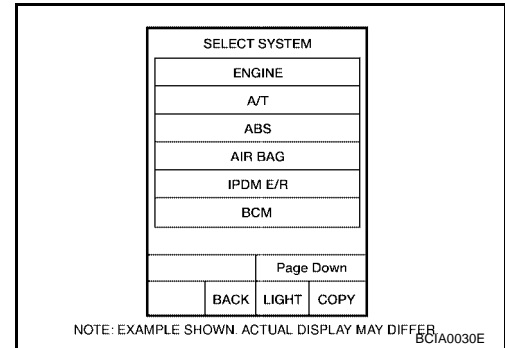
1. Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.



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

[RE4F04B]

2. Drive vehicle and check for an increase of "VHCL/S SE-MTR" value.
If the check result is NG, go to [AT-120, "Diagnostic Procedure"](#) .
If the check result is OK, go to following step.
3. Select "DATA MONITOR" mode for A/T" with CONSULT-II.



4. Start engine and maintain the following conditions for at least 5 consecutive seconds.
VHCL SPEED SE: 30 km/h (19 MPH) or more
THRTL POS SEN: More than 1.2V
Selector lever: D position
Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
If the check result is NG, go to [AT-120, "Diagnostic Procedure"](#) .
If the check result is OK, go to following step.
5. Maintain the following conditions for at least 5 consecutive seconds.
CMPS-RPM (REF): 3,500 rpm or more
THRTL POS SEN: More than 1.2V
Selector lever: D position
Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

WITH GST

Follow the procedure "With CONSULT-II".

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

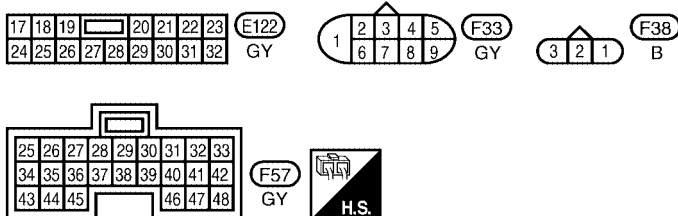
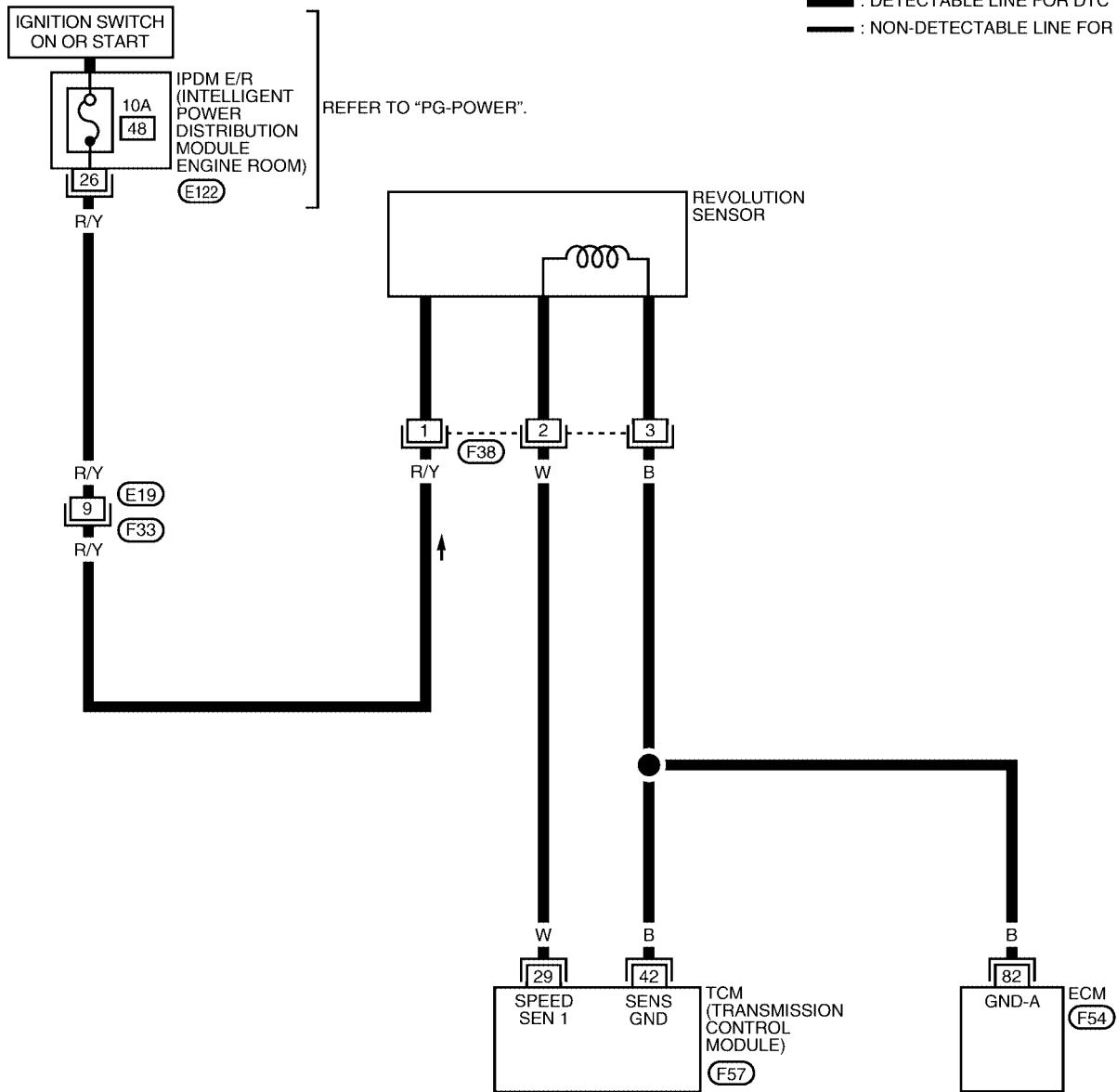
[RE4F04B]

Wiring Diagram — AT — VSSA/T

ECS0096Y

AT-VSSA/T-01

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



REFER TO THE FOLLOWING.
 (F54) - ELECTRICAL UNITS

BCWA0140E

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

[RE4F04B]

TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (DC) |
|----------|------------|-------------------|--|-------------------------------------|
| 29 | W | REVOLUTION SENSOR | VEHICLE MOVING AT 20 KM/H (12 MPH). USE THE CONSULT-II PULSE FREQUENCY MEASURING FUNCTION. A CIRCUIT TESTER CANNOT BE USED TO TEST THIS ITEM. CAUTION: CONNECT THE DIAGNOSIS DATA LINK CABLE TO THE VEHICLE DIAGNOSIS CONNECTOR. | 450 HZ |
| | | | VEHICLE NOT MOVING. | LESS THAN 1.3V OR GREATER THAN 4.5V |
| 42 | B | SENSOR GROUND | — | — |

Diagnostic Procedure

ECS0096Z

1. CHECK INPUT SIGNAL (WITH CONSULT-II)

With CONSULT-II

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

OK or NG

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

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

LCIA0090E

2. CHECK REVOLUTION SENSOR (WITH CONSULT-II)

With CONSULT-II

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

OK or NG

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

| Condition | Judgement standard (Approx.) |
|--|------------------------------|
| When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function. *1 CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item. | 450 Hz |
| When vehicle parks. | 0V |

LCIA0091E

3. CHECK DTC

Perform [AT-117, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

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

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

[RE4F04B]

4. CHECK TCM INSPECTION

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

OK or NG

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

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DTC P0725 ENGINE SPEED SIGNAL

PF0:24825

Description

ECS00970

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

On Board Diagnosis Logic

ECS00971

Diagnostic trouble code ENGINE SPEED SIG with CONSULT-II or P0725 without CONSULT-II is detected when TCM does not receive the proper voltage signal from ECM.

Possible Cause

ECS00972

Check harness or connectors. (The sensor circuit is open or shorted.)

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS00973

CAUTION:

Always drive vehicle at a safe speed.

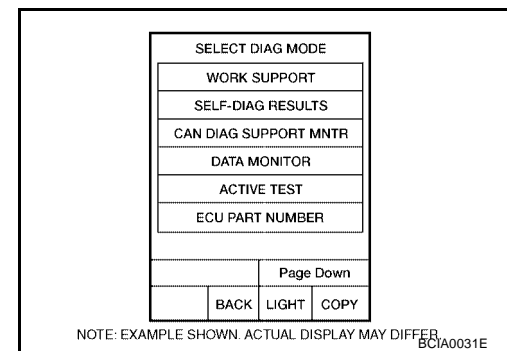
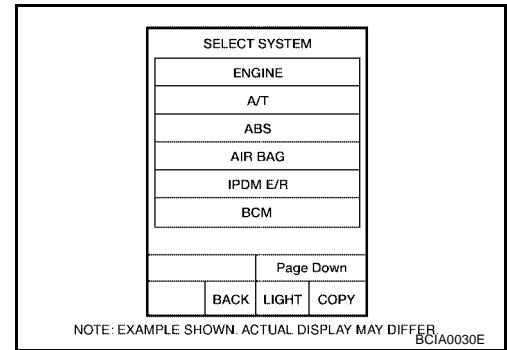
NOTE:

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

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

WITH CONSULT-II

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



2. Start engine and maintain the following conditions for at least 10 consecutive seconds.

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

THRTL POS SEN: More than 1.2V

Selector lever: D position

WITH GST

Follow the procedure "With CONSULT-II".

DTC P0725 ENGINE SPEED SIGNAL

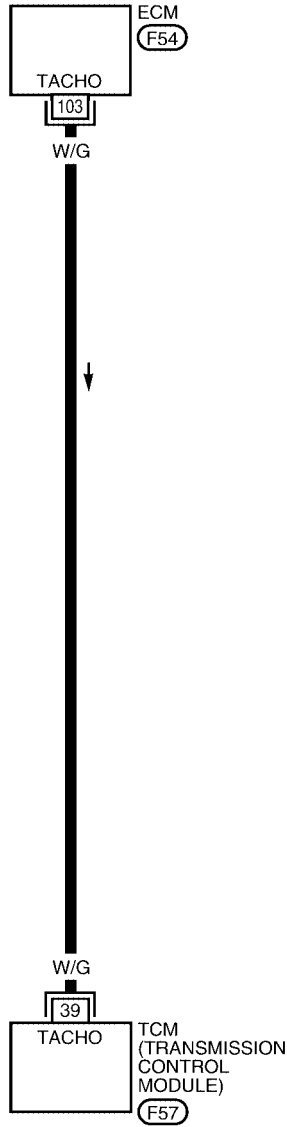
[RE4F04B]

Wiring Diagram — AT — ENGSS

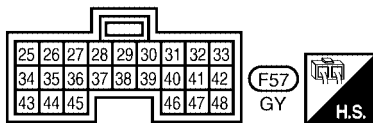
ECS00974

AT-ENGSS-01

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



REFER TO THE FOLLOWING.
F54 - ELECTRICAL UNITS

BCWA0141E

DTC P0725 ENGINE SPEED SIGNAL

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA |
|----------|------------|---------------------|--|------|
| 39 | W/G | ENGINE SPEED SIGNAL | EC-120. "ECM INSPECTION TABLE" | |

Diagnostic Procedure

EC500975

1. CHECK DTC WITH ECM

- Check P code.
Turn ignition switch ON and select "SELF-DIAGNOSTIC RESULTS" mode for "ENGINE" with CONSULT-II.
Refer to [EC-67. "Malfunction Indicator Lamp \(MIL\)"](#) .

OK or NG

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

OK (without CONSULT-II)>> GO TO 4.

NG >> Check ignition signal circuit for engine control. Refer to [EC-572. "IGNITION SIGNAL"](#) .

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

With CONSULT-II

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

OK or NG

OK >> GO TO 6.

NG >> GO TO 3.

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

SAT645J

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM and ECM
- Resistor and ignition coil
Refer to [EC-572. "IGNITION SIGNAL"](#) .

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

4. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

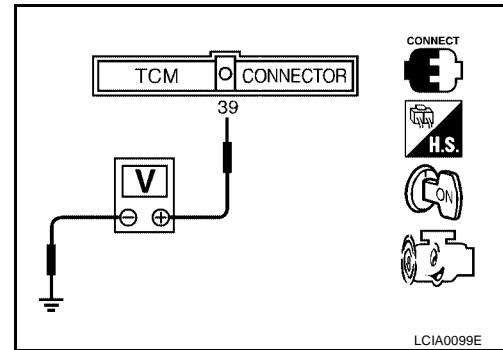
⊗ Without CONSULT-II

1. Start engine.
2. Check voltage between TCM terminal 39 (W/G) and ground.

Voltage :0.6 (Idle speed) - 2.2V (3,000 rpm)

OK or NG

- OK >> GO TO 6.
NG >> GO TO 5.



5. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM and ECM
- Resistor and ignition coil
Refer to [EC-572, "IGNITION SIGNAL"](#).

OK or NG

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

6. CHECK DTC

Perform [AT-122, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#).

OK or NG

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

7. CHECK TCM INSPECTION

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

OK or NG

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

DTC P0731 A/T 1ST GEAR FUNCTION

PFP:31940

Description

ECS00976

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

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

On Board Diagnosis Logic

ECS00977

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

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

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

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

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

Gear positions supposed by TCM are as follows.

In case of gear position with no malfunctions: **1** , 2, 3 and 4 positions

In case of gear position with shift solenoid valve A stuck open: **2*** , 2, 3 and 3 positions

In case of gear position with shift solenoid valve B stuck open: **4*** , 3, 3 and 4 positions to each gear position above

*: P0731 is detected.

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

Possible Cause

ECS00978

Check the following items.

- Shift solenoid valve A
- Shift solenoid valve B
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS00979

CAUTION:

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

NOTE:

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

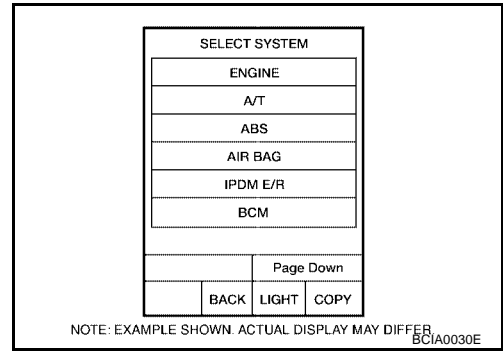
TESTING CONDITION:

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

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

WITH CONSULT-II

1. Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.
FLUID TEMP SEN: 0.4 - 1.5V
 If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).
3. Select "1ST GR FNCTN P0731" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".



4. Accelerate vehicle to 20 to 25 km/h (12 to 16 MPH) under the following condition and release the accelerator pedal completely.

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

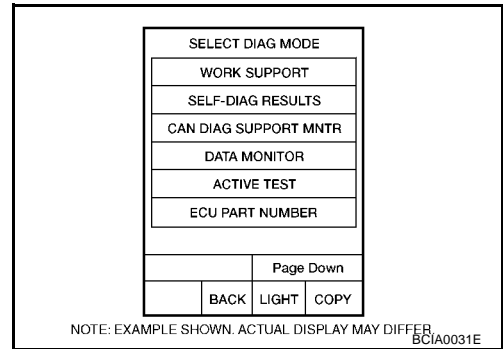
- Check that "GEAR" shows "2" after releasing pedal.
5. Depress accelerator pedal to WOT (more than 7.0/8 of "THROTTLE POSI") quickly from a speed of 20 to 25 km/h (12 to 16 MPH) until "TESTING" changes to "STOP VEHICLE" or "COMPLETED". (It will take approximately 3 seconds.)

If the check result NG appears on CONSULT-II screen, go to [AT-129, "Diagnostic Procedure"](#).

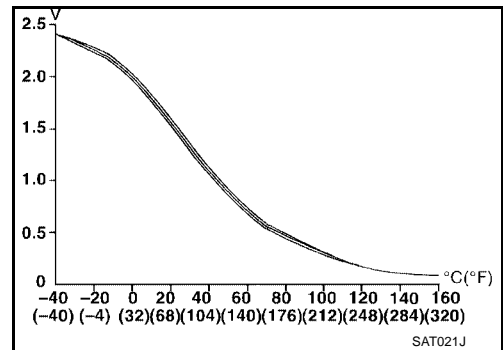
If "STOP VEHICLE" appears on CONSULT-II screen, go to the following step.

- Check that "GEAR" shows "1" when depressing accelerator pedal to WOT.
- If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAG RESULTS" for "ENGINE". In case a 1st trip DTC other than P0731 is shown, refer to applicable "TROUBLE DIAGNOSIS FOR DTC".

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



| Vehicle condition | Gear on actual transaxle shift pattern when screen is changed to 1 → 2 → 3 → 4 |
|-------------------------------|--|
| No malfunction exists. | 1 → 2 → 3 → 4 |
| Malfunction for P0731 exists. | 2 → 2 → 3 → 3 |
| | 4 → 3 → 3 → 4 |



8. Make sure that "OK" is displayed. (If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE".)
 Refer to [AT-129, "Diagnostic Procedure"](#).
 Refer to [AT-376, "Shift Schedule"](#).

WITH GST

Follow the procedure "With CONSULT-II".

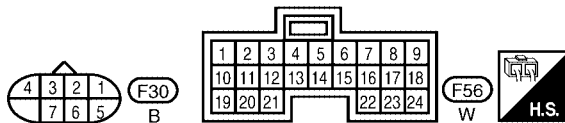
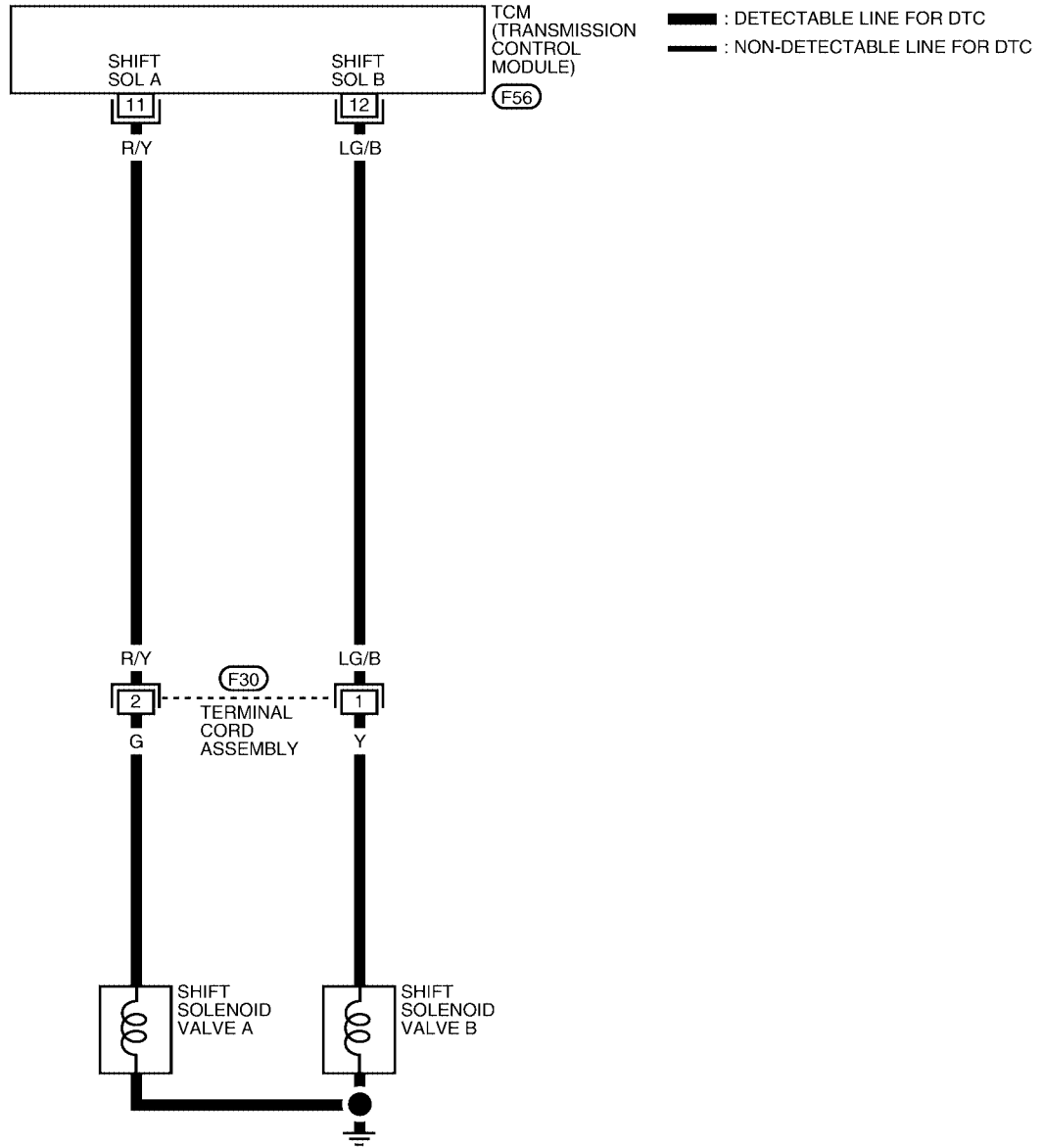
DTC P0731 A/T 1ST GEAR FUNCTION

[RE4F04B]

Wiring Diagram — AT — 1ST SIG

ECS0097A

AT-1STSIG-01



LCWA0010E

DTC P0731 A/T 1ST GEAR FUNCTION

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|------------------------|---|-----------------|
| 11 | R/Y | SHIFT SOLENOID VALVE A | WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D1 OR D4) | BATTERY VOLTAGE |
| | | | WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D2 OR D3) | 0V |
| 12 | LG/B | SHIFT SOLENOID VALVE B | WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D1 OR D2) | BATTERY VOLTAGE |
| | | | WHEN SHIFT SOLENOID VALVE B IS NOT OPERATING (DRIVING IN D3 OR D4) | 0V |

Diagnostic Procedure

ECS0097B

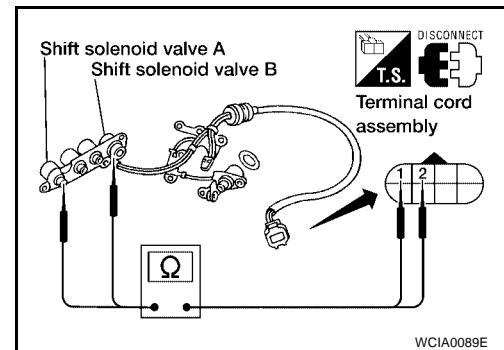
1. CHECK VALVE RESISTANCE

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Shift solenoid valve A
 - Shift solenoid valve B
- Check resistance between two terminals.

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

OK or NG

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

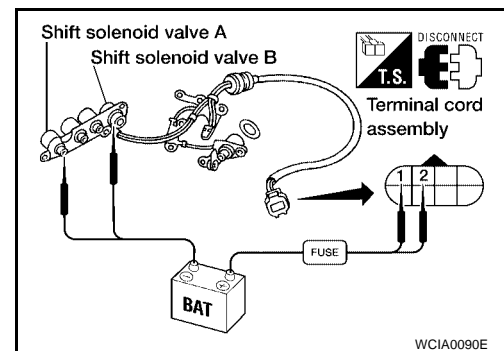


2. CHECK VALVE OPERATION

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Shift solenoid valve A
 - Shift solenoid valve B
- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

OK or NG

- OK >> GO TO 3.
 NG >> Repair or replace shift solenoid valve assembly.

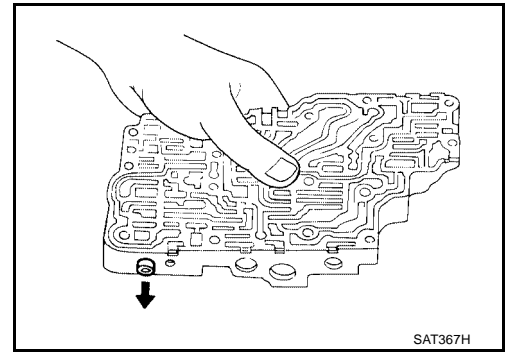


3. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to [AT-303, "Control Valve Assembly"](#) .
2. Check to ensure that:
 - Valve, sleeve and plug slide along valve bore under their own weight.
 - Valve, sleeve and plug are free from burrs, dents and scratches.
 - Control valve springs are free from damage, deformation and fatigue.
 - Hydraulic line is free from obstacles.

OK or NG

- OK >> GO TO 4.
NG >> Repair control valve assembly.



4. CHECK DTC

Perform [AT-126, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

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

DTC P0732 A/T 2ND GEAR FUNCTION

PFP:31940

Description

ECS0097C

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

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

On Board Diagnosis Logic

ECS0097D

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

Torque converter slip ratio = A x C/B

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

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

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

Gear positions supposed by TCM are as follows.

In case of gear position with no malfunctions: 1, 2, 3 and 4 positions

In case of gear position with shift solenoid valve B stuck open: 4, 3*, 3 and 4 positions to each gear position above

*: P0732 is detected.

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

Possible Cause

ECS0097E

Check the following items.

- Shift solenoid valve B
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0097F

CAUTION:

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

NOTE:

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

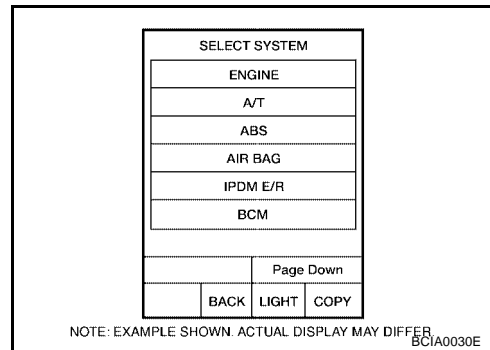
TESTING CONDITION:

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

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

WITH CONSULT-II

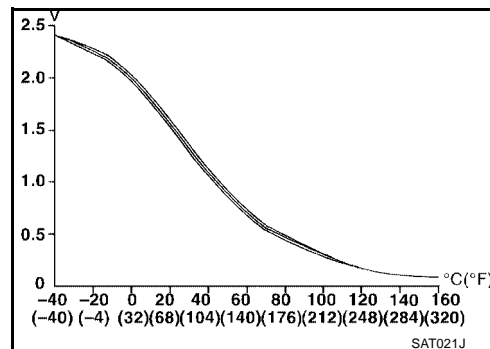
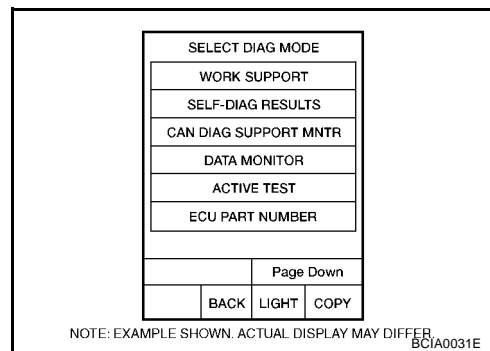
1. Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.
FLUID TEMP SEN: 0.4 - 1.5V
 If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).
3. Select "2ND GR FNCTN P0732" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".



4. Accelerate vehicle to 45 to 50 km/h (28 to 31 MPH) under the following condition and release the accelerator pedal completely.

THROTTLE POSI: Less than 1.0/8
Selector lever: D position

- Check that "GEAR" shows "3" or "4" after releasing pedal.
5. Depress accelerator pedal to WOT (more than 7.0/8 of "THROTTLE POSI") quickly from a speed of 45 to 50 km/h (28 to 31 MPH) until "TESTING" changes to "STOP VEHICLE" or "COMPLETE". (It will take approximately 3 seconds.)
 If the check result NG appears on CONSULT-II screen, go to [AT-134, "Diagnostic Procedure"](#).
 If "STOP VEHICLE" appears on CONSULT-II screen, go to following step.
 - Check that "GEAR" shows "2" when depressing accelerator pedal to WOT.
 - If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAG RESULTS" for "ENGINE". In case a 1st trip DTC other than P0732 is shown, refer to applicable "TROUBLE DIAGNOSIS FOR DTC".
 6. Stop vehicle.
 7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)



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

8. Make sure that "OK" is displayed. (If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE".)
 Refer to [AT-134, "Diagnostic Procedure"](#).
 Refer to [AT-376, "Shift Schedule"](#).

WITH GST

Follow the procedure "With CONSULT-II".

DTC P0732 A/T 2ND GEAR FUNCTION

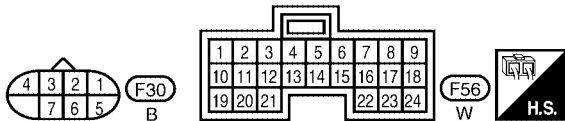
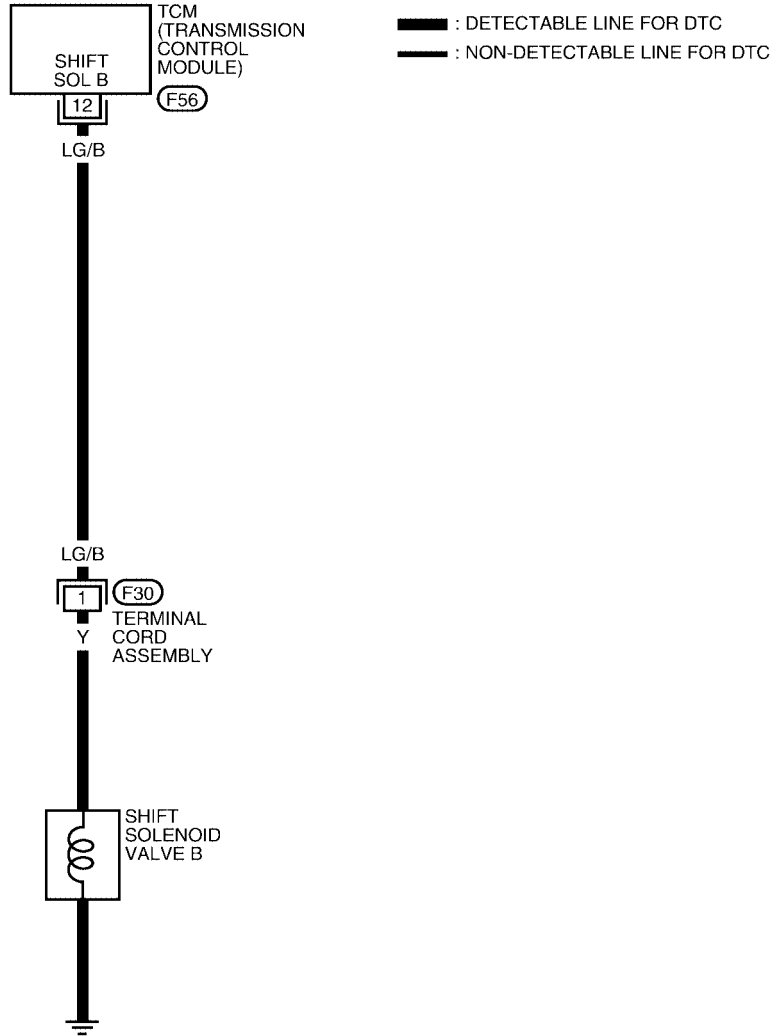
[RE4F04B]

Wiring Diagram — AT — 2NDSIG

ECS0097G

AT-2NDSIG-01

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LCWA0011E

DTC P0732 A/T 2ND GEAR FUNCTION

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|------------------------|---|-----------------|
| 12 | LG/B | SHIFT SOLENOID VALVE B | WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D1 OR D2) | BATTERY VOLTAGE |
| | | | WHEN SHIFT SOLENOID VALVE B IS NOT OPERATING (DRIVING IN D3 OR D4) | 0V |

Diagnostic Procedure

ECS0097H

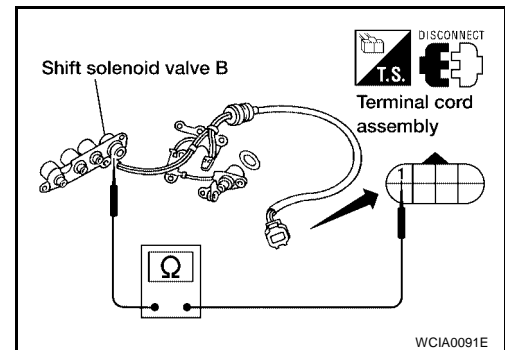
1. CHECK VALVE RESISTANCE

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Shift solenoid valve B
- Check resistance to the terminal and ground.

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

OK or NG

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

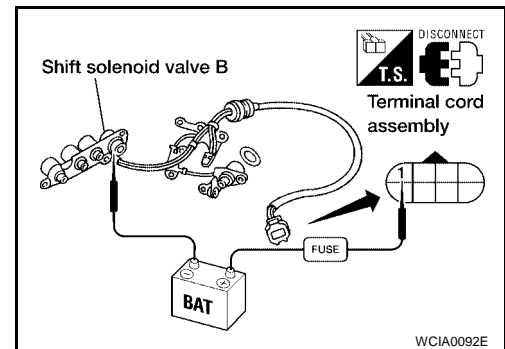


2. CHECK VALVE OPERATION

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Shift solenoid valve B
- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

OK or NG

- OK >> GO TO 3.
 NG >> Repair or replace shift solenoid valve assembly.

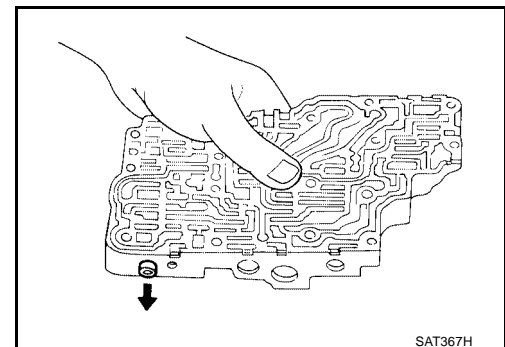


3. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to [AT-303, "Control Valve Assembly"](#) .
- Check to ensure that:
 - Valve, sleeve and plug slide along valve bore under their own weight.
 - Valve, sleeve and plug are free from burrs, dents and scratches.
 - Control valve springs are free from damage, deformation and fatigue.
 - Hydraulic line is free from obstacles.

OK or NG

- OK >> GO TO 4.
 NG >> Repair control valve assembly.



4. CHECK DTC

Perform [AT-131, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

OK >> **INSPECTION END**

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

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DTC P0733 A/T 3RD GEAR FUNCTION

PFP:31940

Description

ECS0097I

- This is an OBD-II self-diagnostic item and not available in TCM self-diagnosis.
- This malfunction will not be detected while the A/T check (position) indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into third gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning servo piston or brake band, etc.

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

On Board Diagnosis Logic

ECS0097J

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

Torque converter slip ratio = A x C/B

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

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

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

Gear positions supposed by TCM are as follows.

In case of gear position with no malfunctions: 1, 2, **3** and 4 positions

In case of gear position with shift solenoid valve A stuck closed: 1, 1, **4*** and 4 positions to each gear position above

*: P0733 is detected.

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

Possible Cause

ECS0097K

Check the following items.

- Shift solenoid valve A
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0097L

CAUTION:

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

NOTE:

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

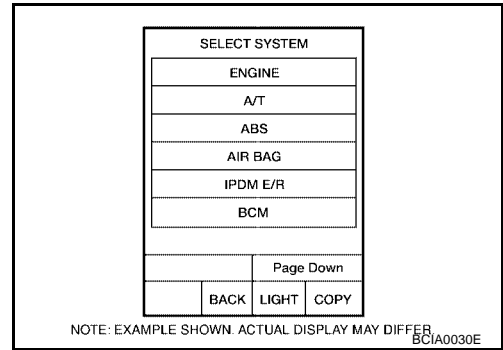
TESTING CONDITION:

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

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

WITH CONSULT-II

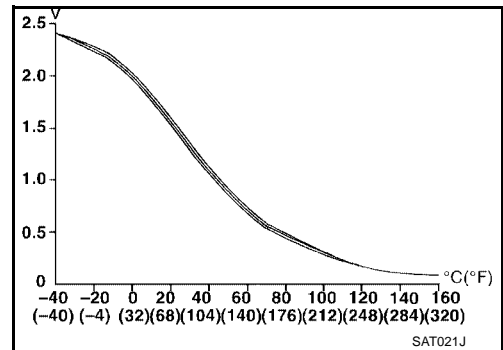
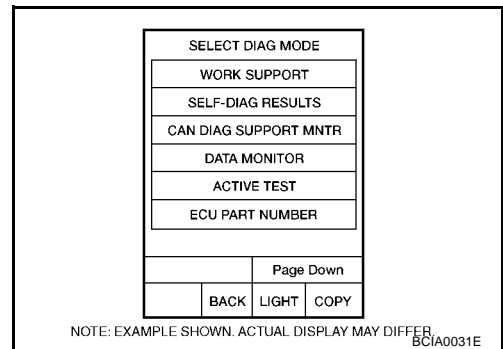
1. Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.
FLUID TEMP SEN: 0.4 - 1.5V
 If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).
3. Select "3RD GR FNCTN P0733" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".



4. Accelerate vehicle to 60 to 75 km/h (37 to 47 MPH) under the following condition and release the accelerator pedal completely.

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

- Check that "GEAR" shows "4" after releasing pedal.
5. Depress accelerator pedal steadily with 3.5/8 - 4.5/8 of "THROTTLE POSI" from a speed of 60 to 75 km/h (37 to 47 MPH) until "TESTING" changes to "STOP VEHICLE" or "COMPLETED". (It will take approximately 3 seconds.)
 If the check result NG appears on CONSULT-II screen, go to [AT-139, "Diagnostic Procedure"](#).
 If "STOP VEHICLE" appears on CONSULT-II screen, go to following step.
 - Check that "GEAR" shows "3" when depressing accelerator pedal with 3.5/8 - 4.5/8 of "THROTTLE POSI".
 - If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAG RESULTS" for "ENGINE". In case a 1st trip DTC other than P0733 is shown, refer to applicable "TROUBLE DIAGNOSIS FOR DTC".
 6. Stop vehicle.
 7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)



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

8. Make sure that "OK" is displayed. (If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE".)
 Refer to [AT-139, "Diagnostic Procedure"](#).
 Refer to [AT-376, "Shift Schedule"](#).

WITH GST

Follow the procedure "With CONSULT-II".

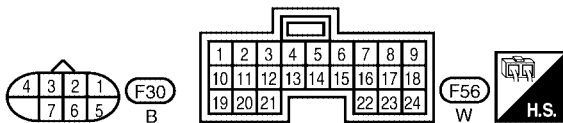
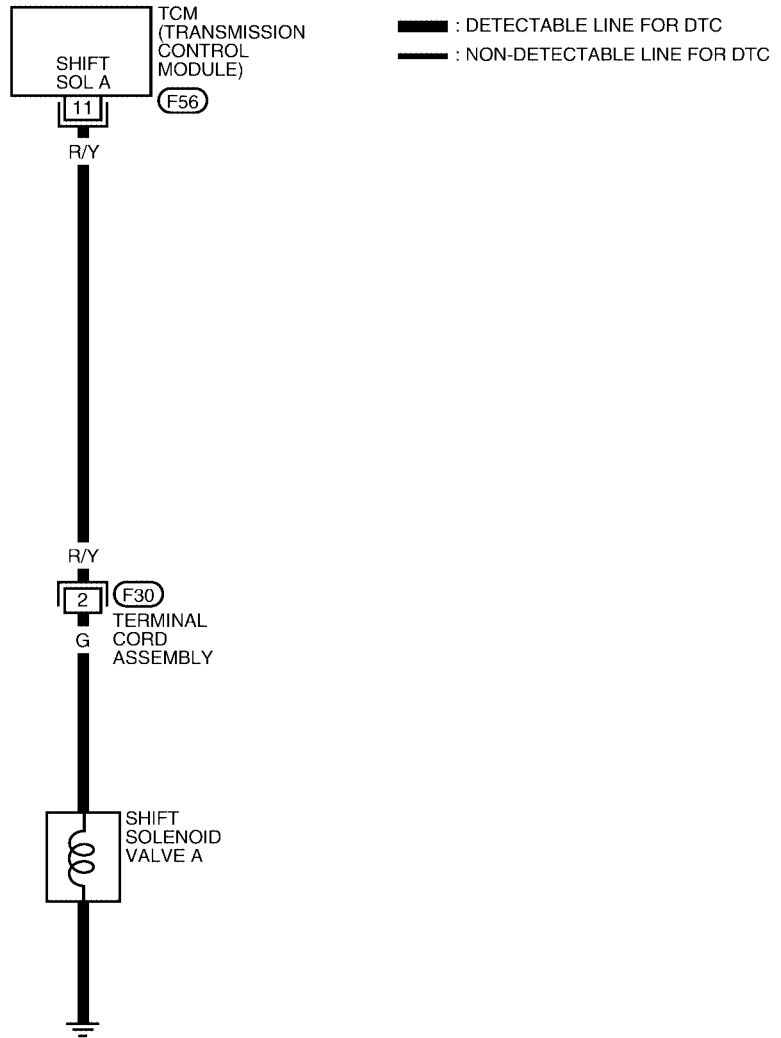
DTC P0733 A/T 3RD GEAR FUNCTION

[RE4F04B]

Wiring Diagram — AT — 3RDSIG

ECS0097M

AT-3RDSIG-01



LCWA0012E

DTC P0733 A/T 3RD GEAR FUNCTION

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|------------------------|---|-----------------|
| 11 | R/Y | SHIFT SOLENOID VALVE A | WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D1 OR D4) | BATTERY VOLTAGE |
| | | | WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D2 OR D3) | 0V |

Diagnostic Procedure

ECS0097N

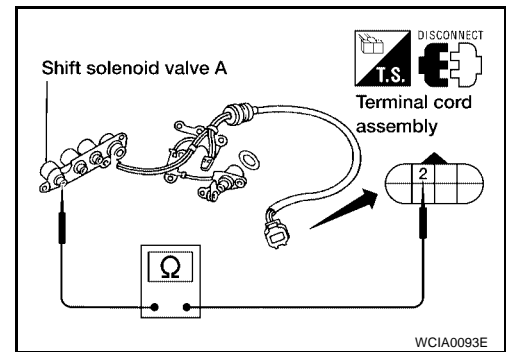
1. CHECK VALVE RESISTANCE

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Shift solenoid valve A
- Check resistance to the terminal and ground.

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

OK or NG

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

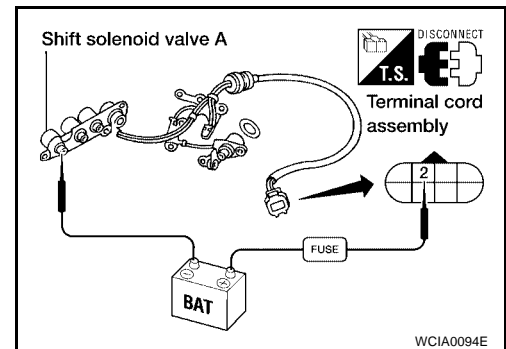


2. CHECK VALVE OPERATION

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Shift solenoid valve A
- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

OK or NG

- OK >> GO TO 3.
 NG >> Repair or replace shift solenoid valve assembly.

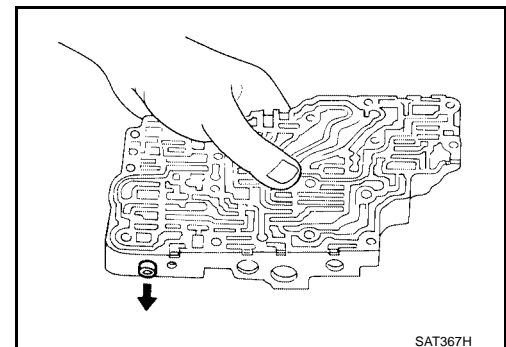


3. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to [AT-303, "Control Valve Assembly"](#) .
- Check to ensure that:
 - Valve, sleeve and plug slide along valve bore under their own weight.
 - Valve, sleeve and plug are free from burrs, dents and scratches.
 - Control valve springs are free from damage, deformation and fatigue.
 - Hydraulic line is free from obstacles.

OK or NG

- OK >> GO TO 4.
 NG >> Repair control valve assembly.



4. CHECK DTC

Perform [AT-136, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

OK >> **INSPECTION END**

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

DTC P0734 A/T 4TH GEAR FUNCTION

PF3:31940

Description

ECS00970

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

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

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

| Monitor item | Condition | Specification |
|---|--|-------------------|
| Torque converter clutch solenoid valve duty | Lock-up OFF | Approximately 4% |
| | ↓ Lock-up ON | Approximately 94% |
| Line pressure solenoid valve duty | Small throttle opening (Low line pressure) | Approximately 24% |
| | ↓ Large throttle opening (High line pressure) | Approximately 95% |

On Board Diagnosis Logic

ECS0097P

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

Torque converter slip ratio = A x C/B

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

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

Gear positions supposed by TCM are as follows.

In case of gear position with no malfunctions: 1, 2, 3 and 4 positions

In case of gear position with shift solenoid valve B stuck closed: 1, 2, 2 and 1* positions to each gear position above

*: P0734 is detected.

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

Possible Cause

ECS0097Q

Check the following items.

- Shift solenoid valve A
- Shift solenoid valve B
- Line pressure solenoid valve
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0097R

CAUTION:

- Always drive vehicle at a safe speed.
- If conducting this "DTC CONFIRMATION PROCEDURE" again, always turn ignition switch OFF and wait at least 10 seconds before continuing.
- Be careful not to rev engine into the red zone on the tachometer.

NOTE:

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

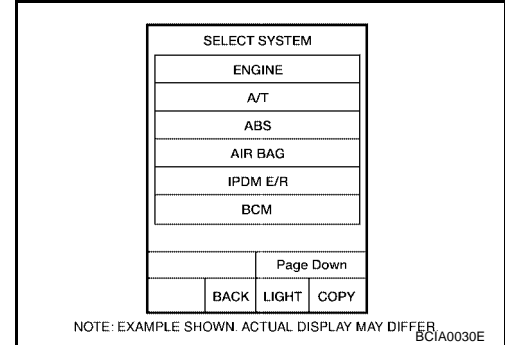
TESTING CONDITION:

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

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

WITH CONSULT-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.
FLUID TEMP SEN: 0.4 - 1.5V
 If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).
3. Select “4TH GR FNCTN P0734” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.



4. Accelerate vehicle to 55 to 65 km/h (34 to 40 MPH) under the following condition and release the accelerator pedal completely.

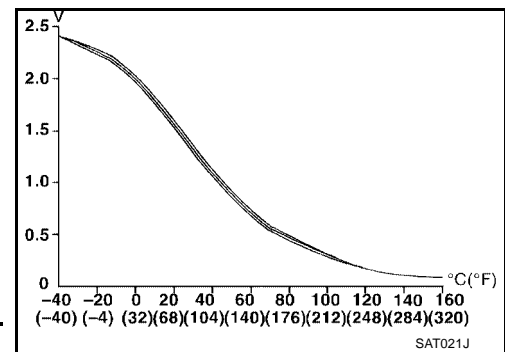
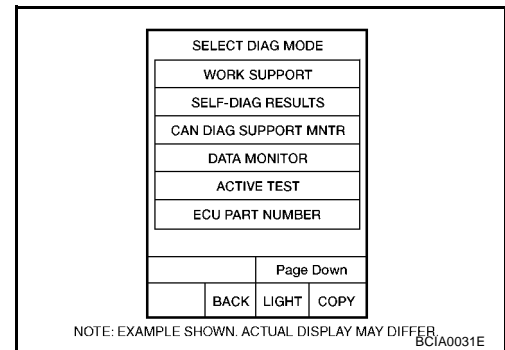
THROTTLE POSI: Less than 5.5/8 (at all times during step 4)
Selector lever: D position

- Check that “GEAR” shows “3” after releasing pedal.
5. Depress accelerator pedal steadily with 1.0/8 - 2.0/8 of “THROTTLE POSI” from a speed of 55 to 65 km/h (34 to 40 MPH) until “TESTING” has turned to “STOP VEHICLE” or “COMPLETED”. (It will take approximately 3 seconds.)

If the check result NG appears on CONSULT-II screen, go to [AT-144, "Diagnostic Procedure"](#).

If “STOP VEHICLE” appears on CONSULT-II screen, go to following step.

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



| Vehicle condition | Gear on actual transaxle shift pattern when screen is changed to 1 → 2 → 3 → 4 |
|-------------------------------|--|
| No malfunction exists | 1 → 2 → 3 → 4 |
| Malfunction for P0734 exists. | 1 → 2 → 2 → 1 |

8. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDURE”.)
 Refer to [AT-144, "Diagnostic Procedure"](#).
 Refer to [AT-376, "Shift Schedule"](#).

WITH GST

Follow the procedure “With CONSULT-II”.

DTC P0734 A/T 4TH GEAR FUNCTION

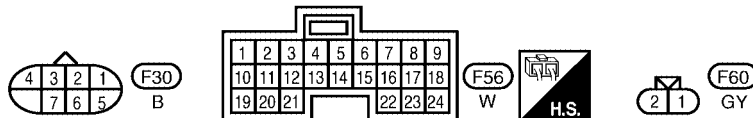
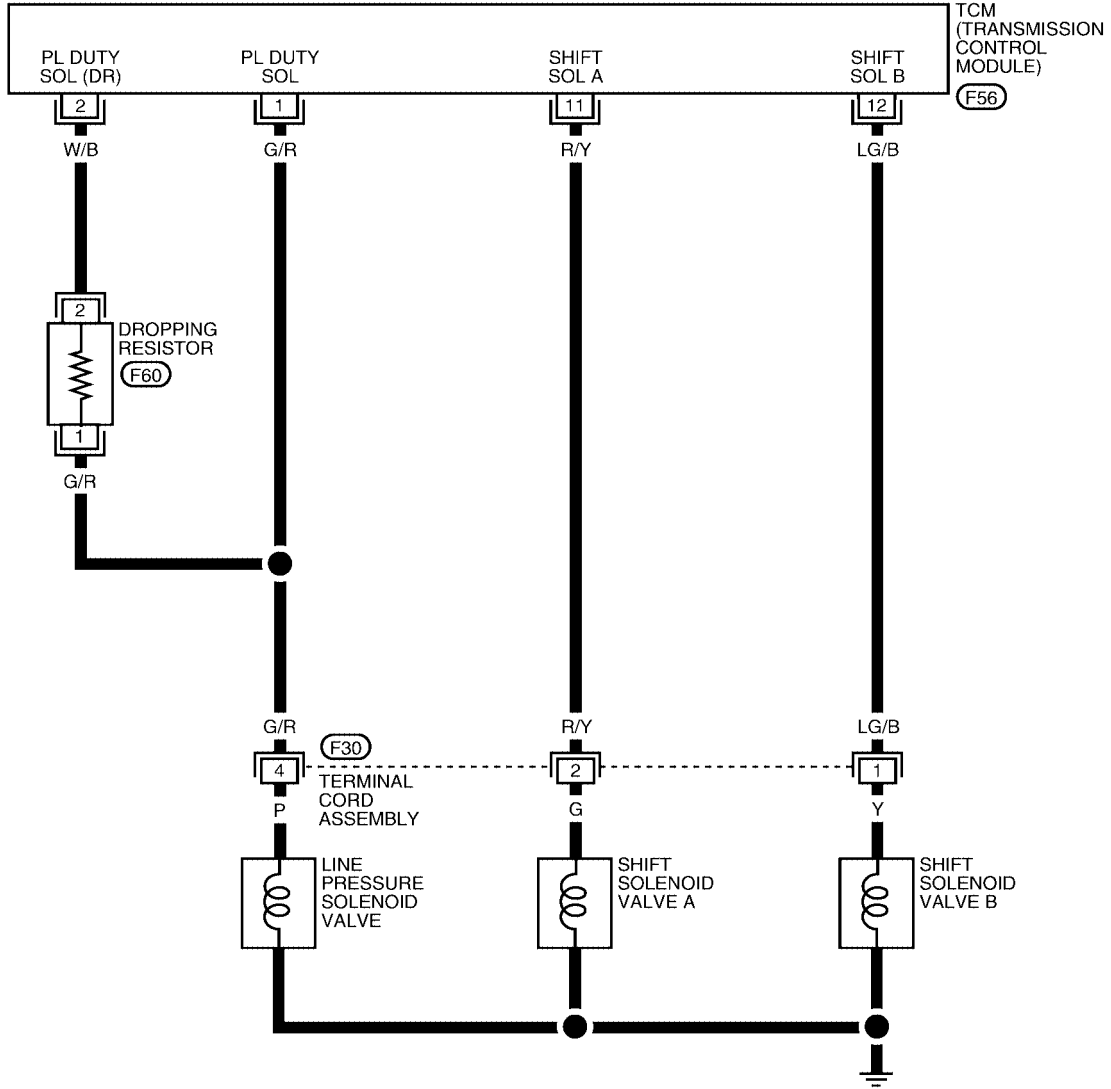
[RE4F04B]

Wiring Diagram — AT — 4THSIG

ECS0097S

AT-4THSIG-01

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



BCWA0142E

DTC P0734 A/T 4TH GEAR FUNCTION

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|--|--|-----------------|
| 1 | G/R | LINE PRESSURE SOLENOID VALVE | WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING | 1.5 - 3.0V |
| | | | WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING | 0V |
| 2 | W/B | LINE PRESSURE SOLENOID VALVE (DROPPING RESISTOR) | WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING | 4 - 14V |
| | | | WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING | 0V |
| 11 | R/Y | SHIFT SOLENOID VALVE A | WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D1 OR D4) | BATTERY VOLTAGE |
| | | | WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D2 OR D3) | 0V |
| 12 | LG/B | SHIFT SOLENOID VALVE B | WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D1 OR D2) | BATTERY VOLTAGE |
| | | | WHEN SHIFT SOLENOID VALVE BE IS NOT OPERATING (DRIVING IN D3 OR D4) | 0V |

Diagnostic Procedure

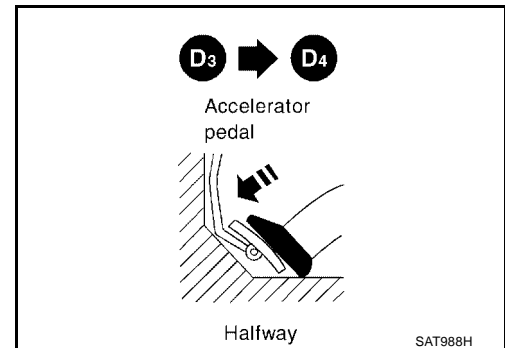
ECS0097T

1. CHECK SHIFT UP (D3 TO D4)

During [AT-81, "Cruise Test — Part 1"](#) , does A/T shift from D3 to D4 at the specified speed?

Yes or No

- Yes >> GO TO 11.
- No >> GO TO 2.



2. CHECK LINE PRESSURE

Perform line pressure test.

| Engine Speed RPM | Line Pressure kPa (kg/cm ² , psi) | |
|---------------------|--|-------------------|
| | D, 2 and 1 Position | R Position |
| Idle | 500 (5.1, 73) | 778 (7.9, 113) |
| Stall | 1,233 (12.6, 179) | 1,918 (19.6, 278) |

Refer to [AT-71, "Line Pressure Test"](#) .

OK or NG

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

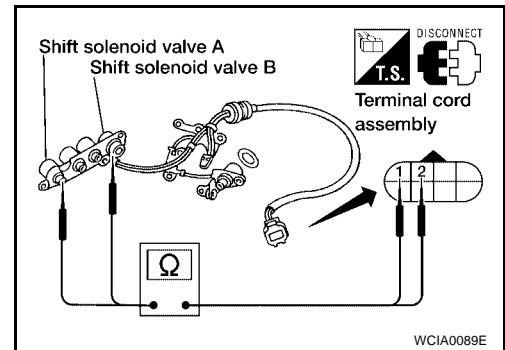
3. CHECK VALVE RESISTANCE

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Shift solenoid valve A
 - Shift solenoid valve B
- Check resistance between two terminals.

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

OK or NG

- OK >> GO TO 5.
- NG >> Replace solenoid valve assembly.

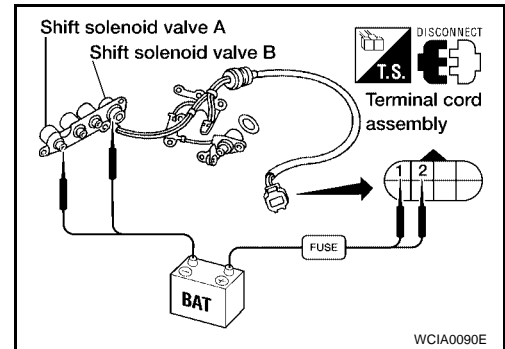


4. CHECK VALVE OPERATION

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Shift solenoid valve A
 - Shift solenoid valve B
- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

OK or NG

- OK >> GO TO 5.
- NG >> Replace solenoid valve assembly.

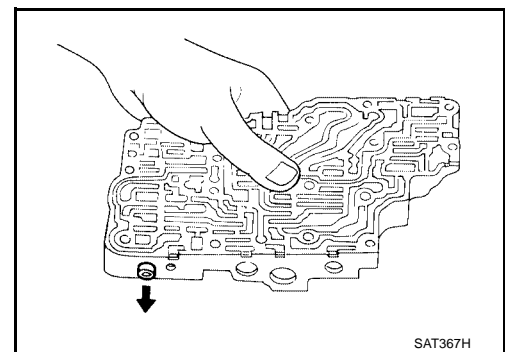


5. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to [AT-303, "Control Valve Assembly"](#) .
- Check to ensure that:
 - Valve, sleeve and plug slide along valve bore under their own weight.
 - Valve, sleeve and plug are free from burrs, dents and scratches.
 - Control valve springs are free from damage, deformation and fatigue.
 - Hydraulic line is free from obstacles.

OK or NG

- OK >> GO TO 6.
- NG >> Repair control valve.



6. CHECK SHIFT UP (D3 TO D4)

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

OK or NG

- OK >> GO TO 11.
- NG >> Check control valve again. Repair or replace control valve assembly.

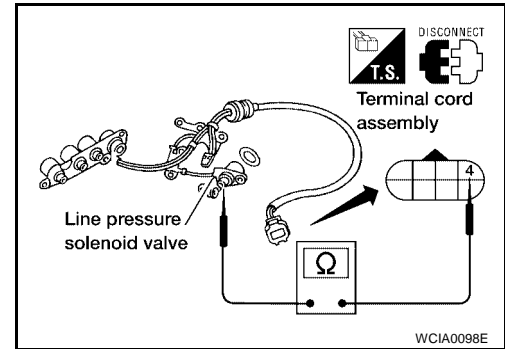
7. CHECK VALVE RESISTANCE

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Line pressure solenoid valves
- Check resistance to the terminal and ground.

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

OK or NG

- OK >> GO TO 9.
- NG >> Replace solenoid valve assembly.

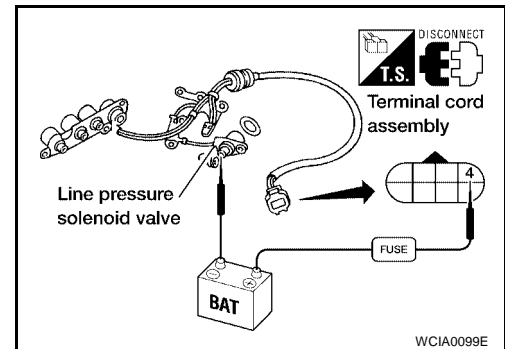


8. CHECK VALVE OPERATION

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Line pressure solenoid valves
- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

OK or NG

- OK >> GO TO 9.
- NG >> Replace solenoid valve assembly.

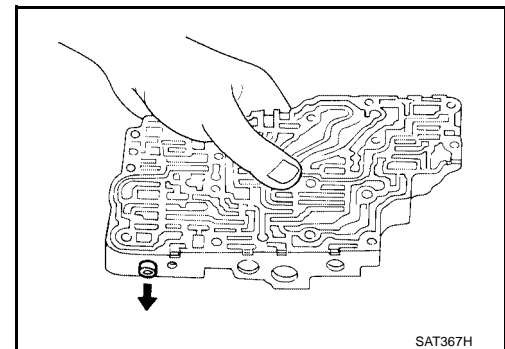


9. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to [AT-303, "Control Valve Assembly"](#) .
- Check line pressure circuit valves for sticking.
 - Pressure regulator valve
 - Pilot valve
 - Pressure modifier valve

OK or NG

- OK >> GO TO 10.
- NG >> Repair control valve.



10. CHECK SHIFT UP (D3 TO D4)

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

OK or NG

- OK >> GO TO 11.
- NG >> Check control valve again. Repair or replace control valve assembly.

11. CHECK DTC

Perform [AT-141, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> Perform "Cruise test — Part 1" again and return to the start point of this test group.

A

B

AT

D

E

F

G

H

I

J

K

L

M

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[RE4F04B]

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

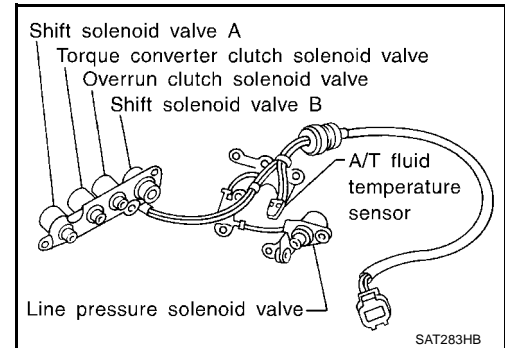
Description

ECS0097U

The torque converter clutch solenoid valve is activated, with the gear in D4, by the TCM in response to signals sent from the vehicle speed and the ECM (throttle opening). Lock-up piston operation will then be controlled.

Lock-up operation, however, is prohibited when A/T fluid temperature is too low.

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



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

| Monitor item | Condition | Specification |
|---|-----------------|------------------------|
| Torque converter clutch solenoid valve duty | Lock-up OFF | Approximately 4% |
| | ↓ Lock-up ON | ↓ Approximately 94% |

On Board Diagnosis Logic

ECS0097V

Diagnostic trouble code TCC SOLENOID/CIRC with CONSULT-II or P0740 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

ECS0097W

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0097X

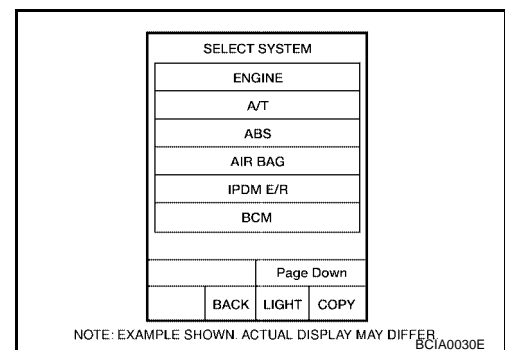
NOTE:

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

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

WITH CONSULT-II

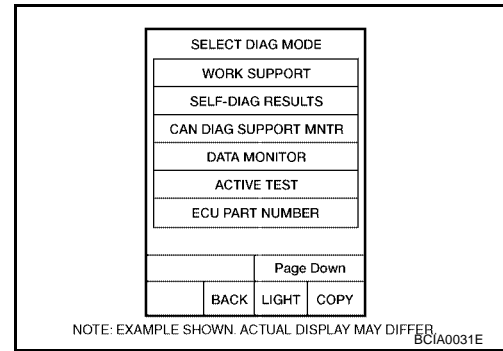
1. Turn ignition switch ON.



DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[RE4F04B]

2. Select "DATA MONITOR" mode for "A/T" with CONSULT-II and wait at least 1 second.



A

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WITH GST

Follow the procedure "With CONSULT-II".

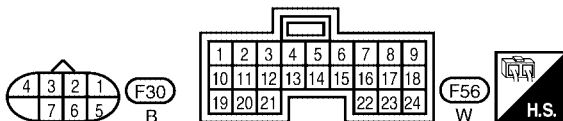
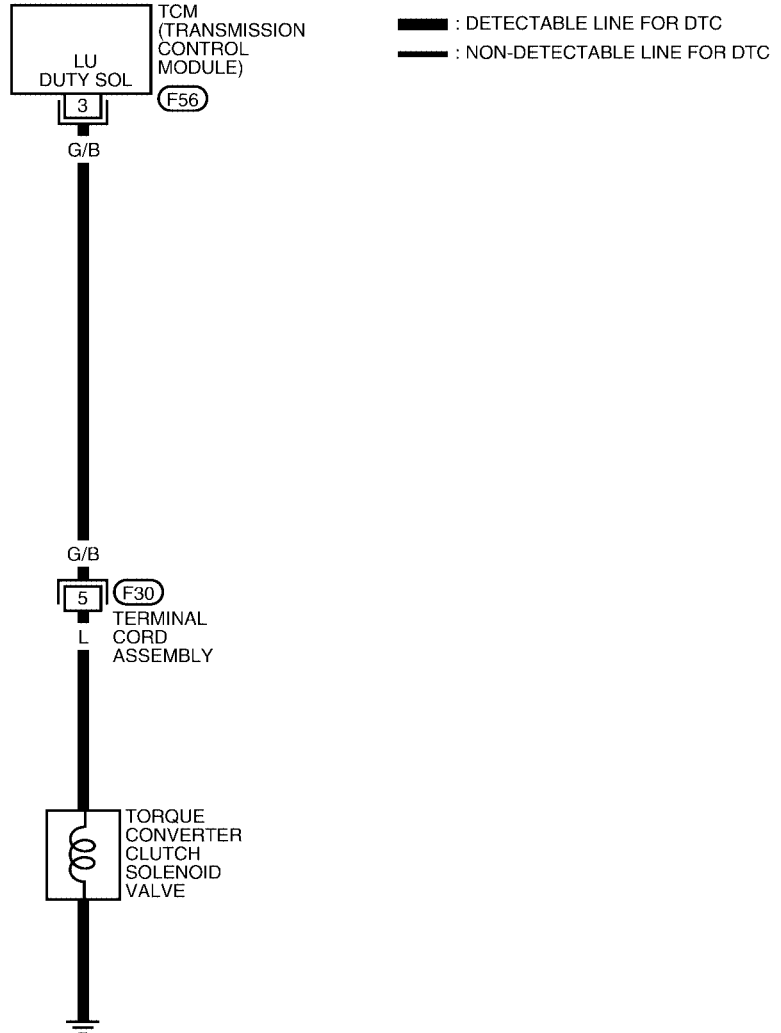
DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[RE4F04B]

Wiring Diagram — AT — TCV

ECS0097Y

AT-TCV-01



LCWA0014E

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|--|----------------------------------|----------------|
| 3 | G/B | TORQUE CONVERTER CLUTCH SOLENOID VALVE | WITH TORQUE CONVERTER LOCK-UP | 8 - 15V |
| | | | WITHOUT TORQUE CONVERTER LOCK-UP | 0V |

Diagnostic Procedure

ECS0097Z

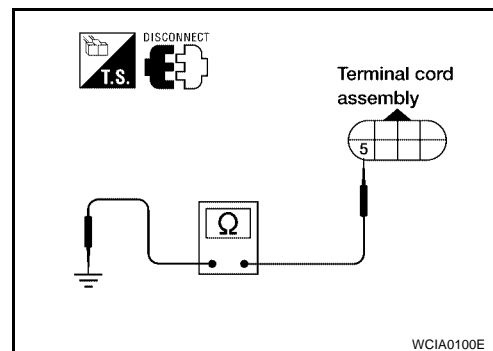
1. CHECK VALVE RESISTANCE

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

Resistance : 5 - 20Ω

OK or NG

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

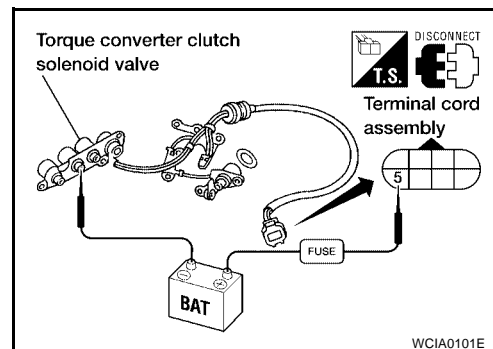


2. CHECK VALVE OPERATION

1. Remove oil pan.
2. Check the following items:
 - Torque converter clutch solenoid valve
 - Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.
 - Harness of terminal cord assembly for short or open

OK or NG

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



3. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect TCM harness connector.
3. Check continuity between terminal cord assembly harness connector terminal 5 and TCM harness connector terminal 3. Refer to [AT-150, "Wiring Diagram — AT — TCV"](#).

Continuity should exist.

4. Reinstall any part removed.

OK or NG

- OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK DTC

Perform [AT-148, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

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

5. CHECK TCM INSPECTION

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

OK or NG

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

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

PF3:31940

Description

ECS00980

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

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

| Monitor item | Condition | Specification |
|---|-------------|-------------------|
| Torque converter clutch solenoid valve duty | Lock-up OFF | Approximately 4% |
| | ↓ | ↓ |
| | Lock-up ON | Approximately 94% |

On Board Diagnosis Logic

ECS00981

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

Torque converter slip ratio = A x C/B

A: Output shaft revolution signal from revolution sensor

B: Engine speed signal from ECM

C: Gear ratio determined as gear position which TCM supposes

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

Gear positions supposed by TCM are as follows.

In case of gear position with no malfunctions: 1, 2, 3 and 4 positions

In case of gear position with shift solenoid valve B stuck closed: 1, 2, 2 and 1* positions to each gear position above

*: P0744 is detected.

Diagnostic trouble code A/T TCC S/V FNCTN with CONSULT-II or P0744 without CONSULT-II is detected when A/T cannot perform lock-up even if electrical circuit is good.

Possible Cause

ECS00982

Check the following items.

- Line pressure solenoid valve
- Torque converter clutch solenoid valve
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS00983

CAUTION:

Always drive vehicle at a safe speed.

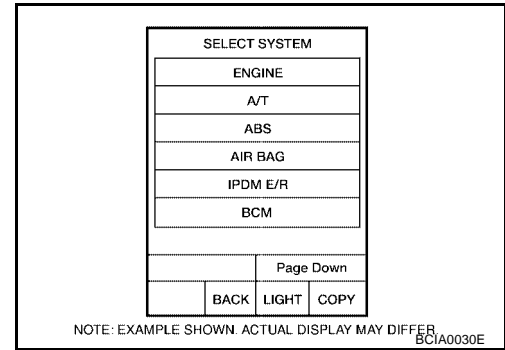
NOTE:

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

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

WITH CONSULT-II

1. Start engine and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.
FLUID TEMP SEN: 0.4 - 1.5V
 If out of range, drive vehicle to decrease voltage (warm up the fluid) or stop engine to increase voltage (cool down the fluid).
3. Select "TCC S/V FNCTN P0744" of "DTC WORK SUPPORT" mode for "A/T" with CONSULT-II and touch "START".



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

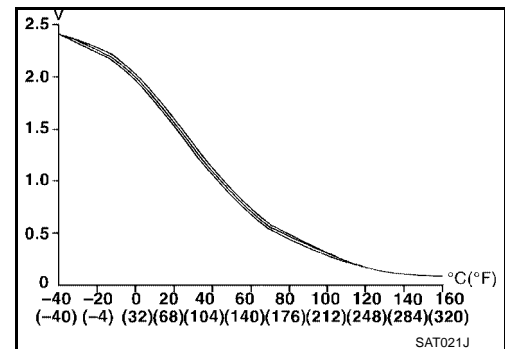
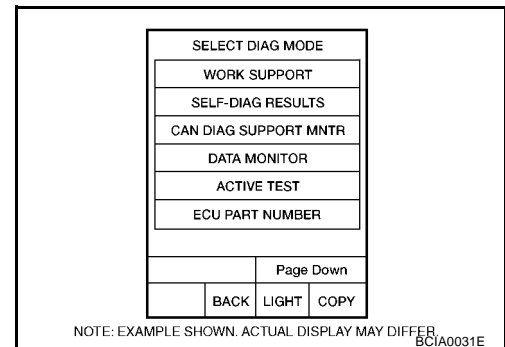
THROTTLE POSI: 1.0/8 - 2.0/8 (at all times during step 4)

Selector lever: D position

TCC S/V DUTY: More than 94%

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

- Check that "GEAR" shows "4".
 - For shift schedule, refer to [AT-376, "Shift Schedule"](#).
 - If "TESTING" does not appear on CONSULT-II for a long time, select "SELF-DIAG RESULTS". In case a 1st trip DTC other than P0744 is shown, refer to applicable "TROUBLE DIAGNOSIS FOR DTC".
5. Make sure that "OK" is displayed. (If "NG" is displayed, refer to "DIAGNOSTIC PROCEDURE".)
 Refer to [AT-156, "Diagnostic Procedure"](#).
 Refer to [AT-376, "Shift Schedule"](#).



WITH GST

Follow the procedure "With CONSULT-II".

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

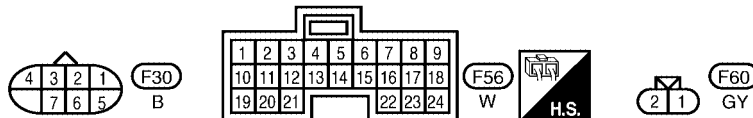
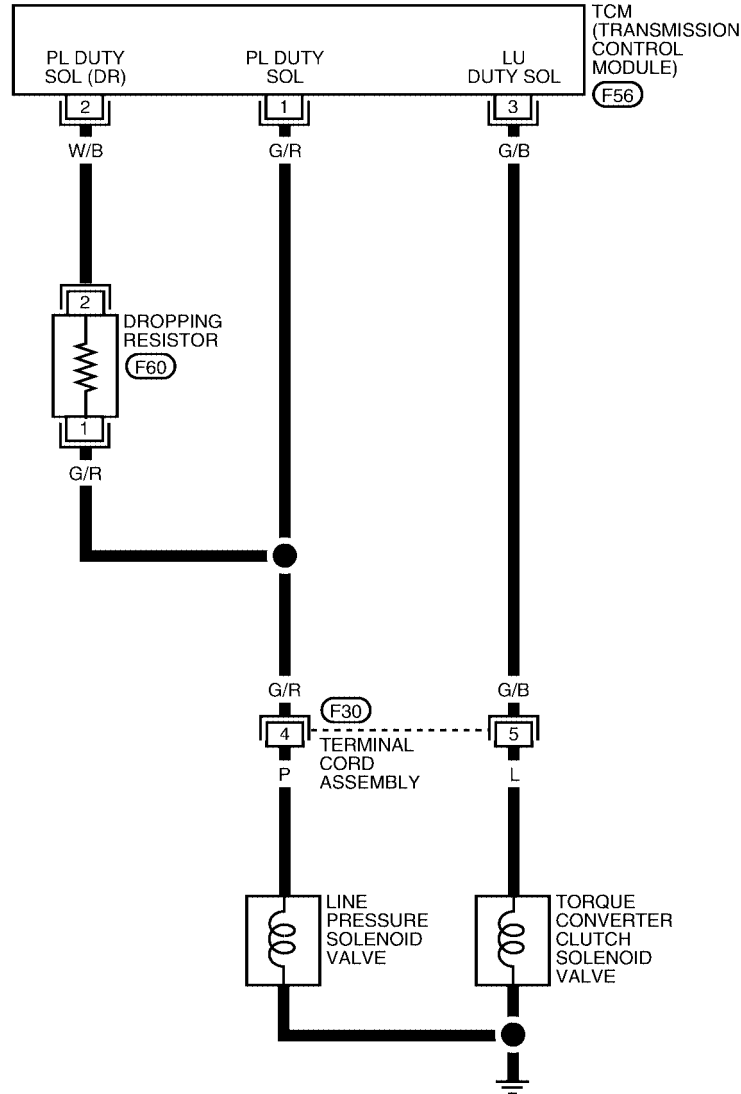
[RE4F04B]

Wiring Diagram — AT — TCCSIG

ECS009B4

AT-TCCSIG-01

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



BCWA0143E

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

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|--|---|----------------|
| 1 | G/R | LINE PRESSURE SOLENOID VALVE | WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING | 1.5 - 3.0V |
| | | | WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING | 0V |
| 2 | W/B | LINE PRESSURE SOLENOID VALVE (DROPPING RESISTOR) | WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING | 4 - 14V |
| | | | WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING | 0V |
| 3 | G/B | TORQUE CONVERTER CLUTCH SOLENOID VALVE | WITH TORQUE CONVERTER LOCK-UP | 8 - 15V |
| | | | WITHOUT TORQUE CONVERTER LOCK-UP | 0V |

Diagnostic Procedure

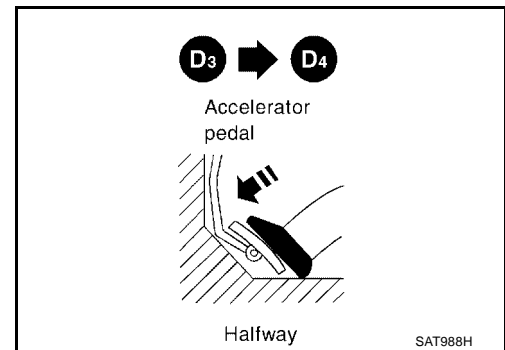
ECS00985

1. CHECK SHIFT UP (D3 TO D4)

During [AT-81, "Cruise Test — Part 1"](#), does A/T shift from D3 to D4 at the specified speed?

Yes or No

- Yes >> GO TO 11.
- No >> GO TO 2.



2. CHECK LINE PRESSURE

Perform line pressure test.

| Engine Speed RPM | Line Pressure kPa (kg/cm ² , psi) | |
|---------------------|--|-------------------|
| | D, 2 and 1 Position | R Position |
| Idle | 500 (5.1, 73) | 778 (7.9, 113) |
| Stall | 1,233 (12.6, 179) | 1,918 (19.6, 278) |

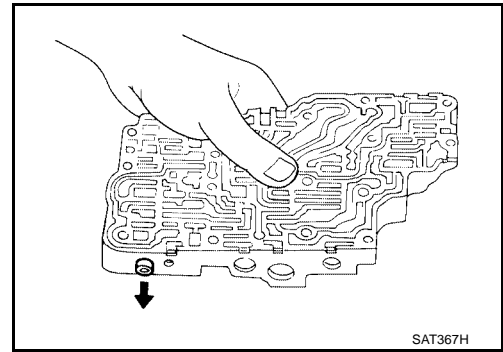
Refer to [AT-71, "Line Pressure Test"](#).

OK or NG

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

3. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to [AT-303, "Control Valve Assembly"](#) .
2. Check to ensure that:
 - Valve, sleeve and plug slide along valve bore under their own weight.
 - Valve, sleeve and plug are free from burrs, dents and scratches.
 - Control valve springs are free from damage, deformation and fatigue.
 - Hydraulic line is free from obstacles.



OK or NG

- OK >> GO TO 4.
- NG >> Repair control valve.

4. CHECK SHIFT UP (D3 TO D4)

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

OK or NG

- OK >> GO TO 5.
- NG >> Check control valve again. Repair or replace control valve assembly.

5. CHECK DTC

Perform [AT-153, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 11. Check for proper lock-up.

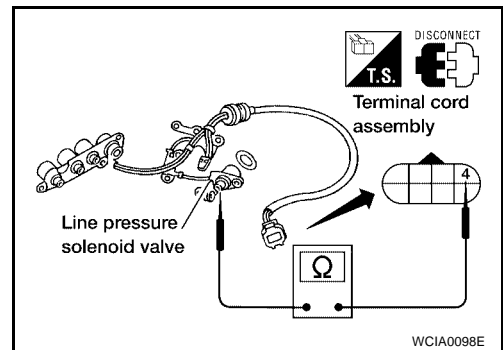
6. CHECK VALVE RESISTANCE

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Line pressure solenoid valve
2. Check resistance to the terminal and ground.

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

OK or NG

- OK >> GO TO 8.
- NG >> Replace solenoid valve assembly.

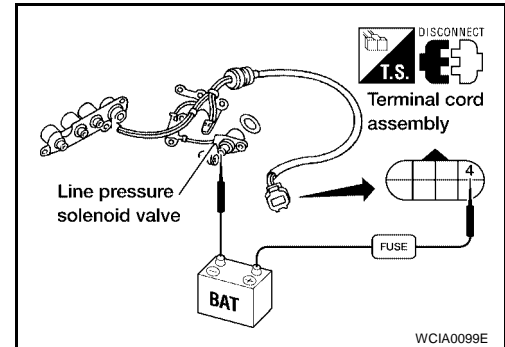


7. CHECK VALVE OPERATION

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Line pressure solenoid valve
- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

OK or NG

- OK >> GO TO 8.
 NG >> Replace solenoid valve assembly.

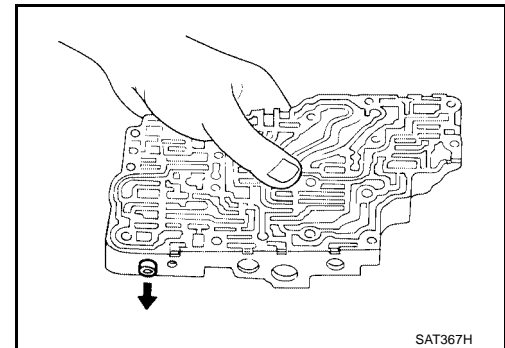


8. CHECK CONTROL VALVE

- Disassemble control valve assembly. Refer to [AT-303, "Control Valve Assembly"](#) .
- Check line pressure circuit valves for sticking.
 - Pressure regulator valve
 - Pilot valve
 - Pressure modifier valve

OK or NG

- OK >> GO TO 9.
 NG >> Repair control valve.



9. CHECK SHIFT UP (D3 TO D4)

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

OK or NG

- OK >> GO TO 10.
 NG >> Check control valve again. Repair or replace control valve assembly.

10. CHECK DTC

Perform [AT-153, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

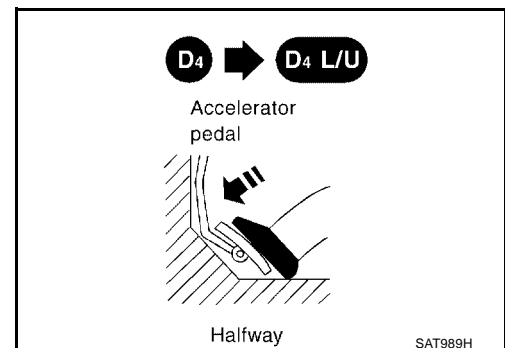
- OK >> **INSPECTION END**
 NG >> GO TO 11. Check for proper lock-up.

11. CHECK LOCK-UP

During [AT-81, "Cruise Test — Part 1"](#) , does A/T perform lock-up at the specified speed?

Yes or No

- Yes >> Perform "Cruise test — Part 1" again and return to the start point of this test group.
 No >> GO TO 12.



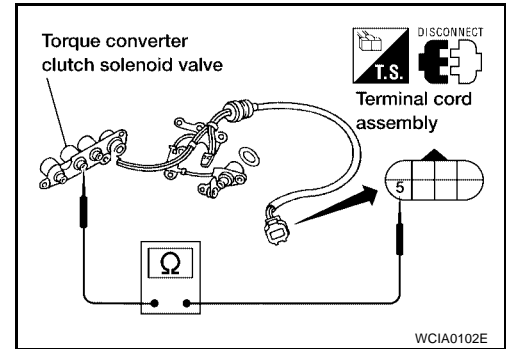
12. CHECK VALVE RESISTANCE

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Torque converter clutch solenoid valve
2. Check resistance to the terminal and ground.

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

OK or NG

- OK >> GO TO 14.
- NG >> Replace solenoid valve assembly.

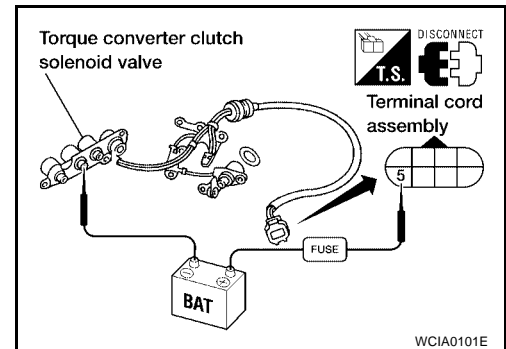


13. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
 - Torque converter clutch solenoid valve
2. Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

OK or NG

- OK >> GO TO 14.
- NG >> Replace solenoid valve assembly.

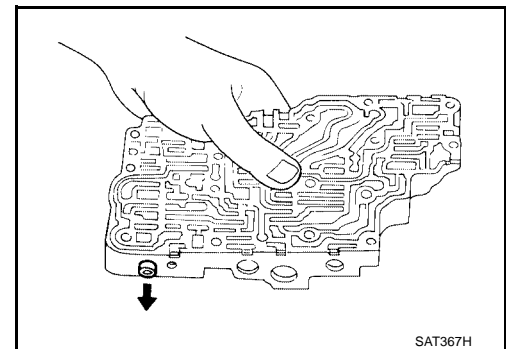


14. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to [AT-303, "Control Valve Assembly"](#) .
2. Check control valves for sticking.
 - Torque converter clutch control valve
 - Torque converter clutch relief valve

OK or NG

- OK >> GO TO 15.
- NG >> Repair control valve.



15. CHECK LOCK-UP

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

Yes or No

- Yes >> GO TO 16.
- No >> Check control valve again. Repair or replace control valve assembly.

16. CHECK DTC

Perform [AT-153, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> Perform "Cruise test — Part 1" again and return to the start point of this test group.

DTC P0745 LINE PRESSURE SOLENOID VALVE

[RE4F04B]

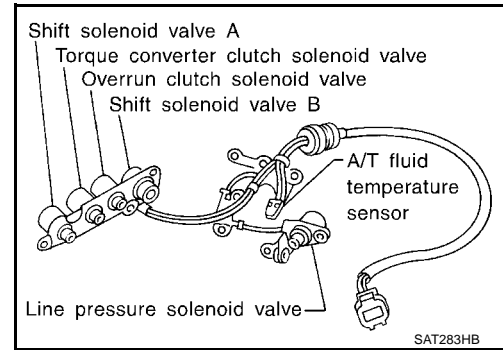
DTC P0745 LINE PRESSURE SOLENOID VALVE

PF3:31940

ECS00986

Description

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



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

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

On Board Diagnosis Logic

ECS00987

Diagnostic trouble code L/PRESS SOL/CIRC with CONSULT-II or P0745 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

ECS00988

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS00989

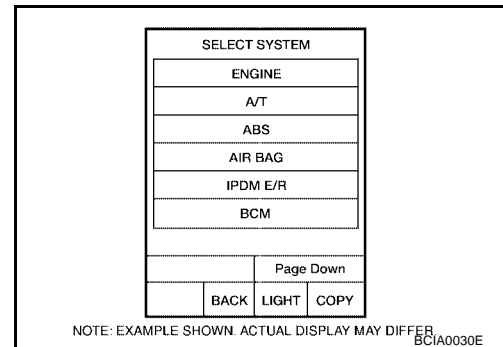
NOTE:

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

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

WITH CONSULT-II

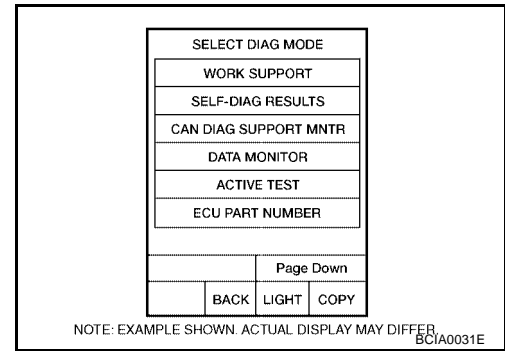
1. Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.



DTC P0745 LINE PRESSURE SOLENOID VALVE

[RE4F04B]

2. Depress accelerator pedal completely and wait at least 1 second.



WITH GST

Follow the procedure "With CONSULT-II".

DTC P0745 LINE PRESSURE SOLENOID VALVE

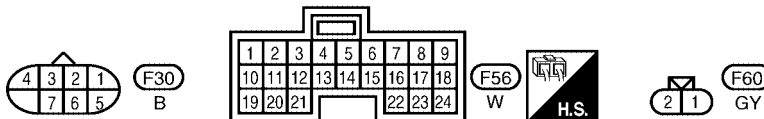
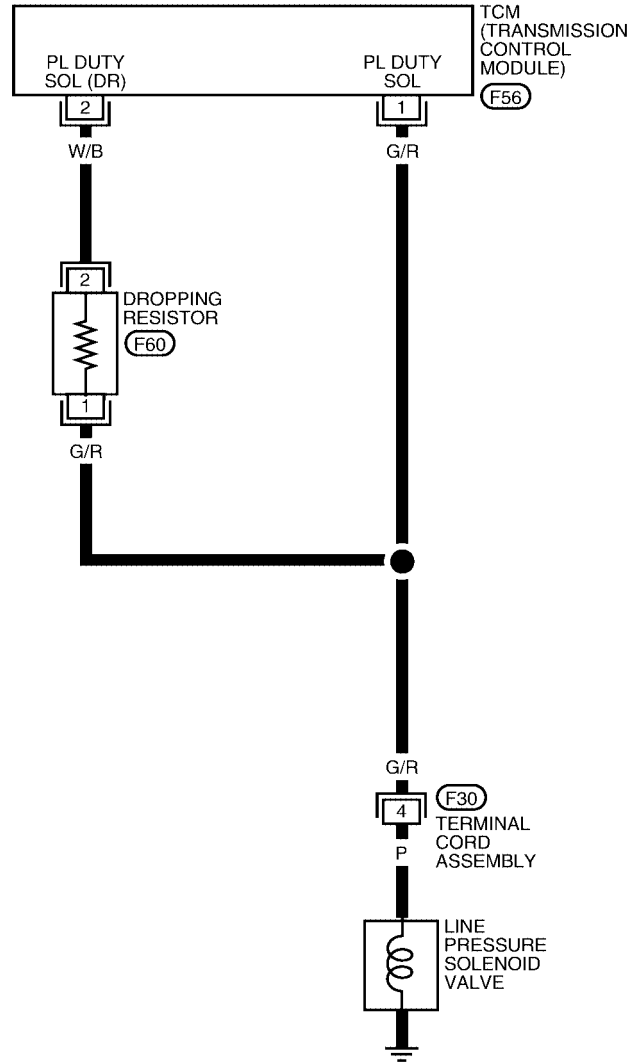
[RE4F04B]

Wiring Diagram — AT — LPSV

ECS0098A

AT-LPSV-01

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



BCWA0144E

DTC P0745 LINE PRESSURE SOLENOID VALVE

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|--|---|----------------|
| 1 | G/R | LINE PRESSURE SOLENOID VALVE | WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING | 1.5 - 3.0V |
| | | | WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING | 0V |
| 2 | W/B | LINE PRESSURE SOLENOID VALVE (DROPPING RESISTOR) | WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING | 4 - 14V |
| | | | WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING | 0V |

Diagnostic Procedure

ECS0098B

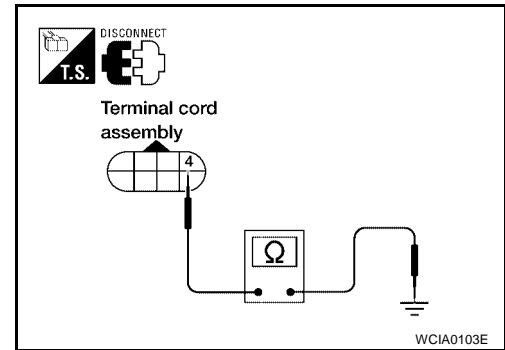
1. CHECK VALVE RESISTANCE

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

Resistance : 2.5 - 5Ω

OK or NG

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



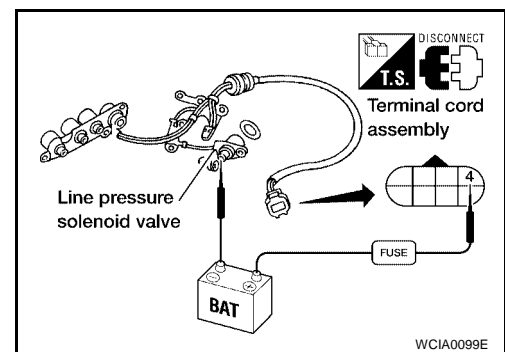
WCIA0103E

2. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#).
2. Check the following items:
 - Line pressure solenoid valve
 - Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.
 - Harness of terminal cord assembly for short or open

OK or NG

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



WCIA0099E

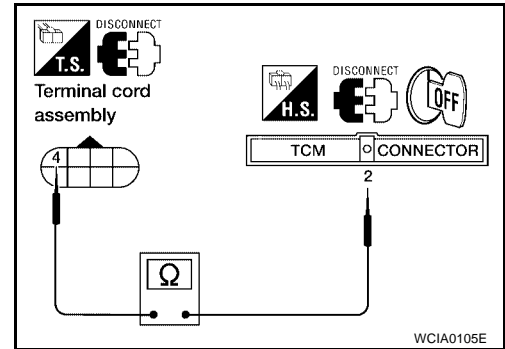
3. CHECK POWER SOURCE AND DROPPING RESISTOR CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect TCM harness connector.
3. Check resistance between terminal 4 (G/R) and TCM harness connector terminal 2 (W/B).

Resistance : 10 - 15Ω

OK or NG

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



4. DETECT MALFUNCTIONING ITEM

Check the following items:

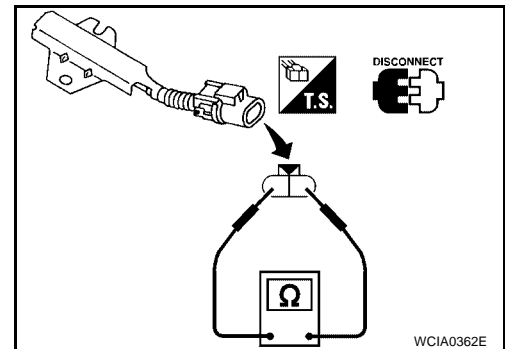
- Dropping resistor
- Check resistance between two terminals.

Resistance : 10 - 15Ω

- Harness for short or open between TCM terminal 2 and terminal cord assembly (Main harness)

OK or NG

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



5. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to OFF position.
2. Check continuity between terminal cord assembly harness connector terminal 4 and TCM harness connector terminal 1. Refer to [AT-163, "Wiring Diagram — AT — LPSV"](#).

Continuity should exist.

3. Reinstall any part removed.

OK or NG

- OK >> GO TO 6.
- NG >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK DTC

Perform [AT-161, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#).

OK or NG

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

7. CHECK TCM INSPECTION

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

OK or NG

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

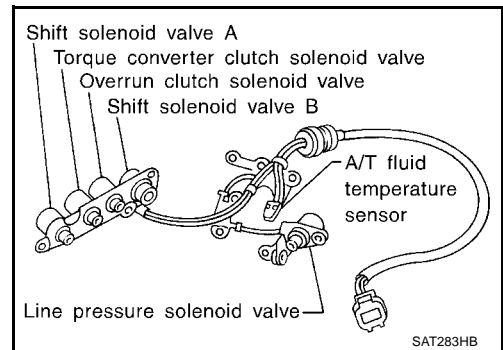
DTC P0750 SHIFT SOLENOID VALVE A

PF3:31940

Description

ECS0098C

Shift solenoid valves A and B are turned ON or OFF by the TCM in response to signals sent from the park/neutral position (PNP) switch, vehicle speed and ECM (throttle opening). Gears will then be shifted to the optimum position.



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

On Board Diagnosis Logic

ECS0098D

Diagnostic trouble code SFT SOL A/CIRC with CONSULT-II or P0750 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

ECS0098E

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0098F

CAUTION:

Always drive vehicle at a safe speed.

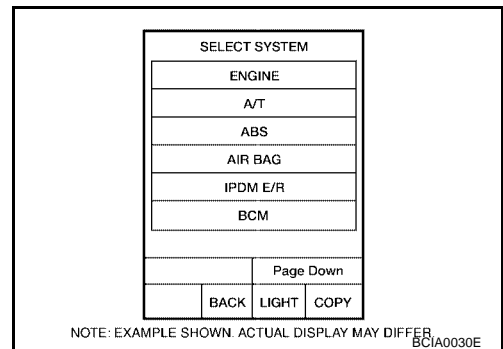
NOTE:

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

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

WITH CONSULT-II

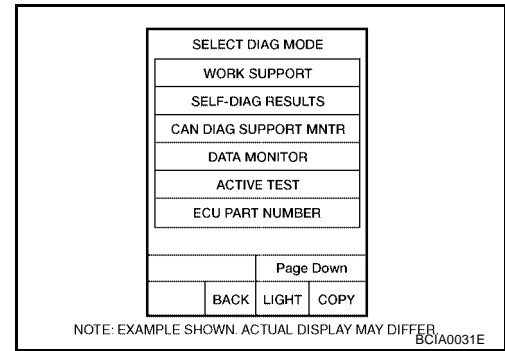
1. Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.



DTC P0750 SHIFT SOLENOID VALVE A

[RE4F04B]

2. Start engine.
3. Drive vehicle in D position and allow the transaxle to shift 1 → 2 ("GEAR").



WITH GST

Follow the procedure "With CONSULT-II".

DTC P0750 SHIFT SOLENOID VALVE A

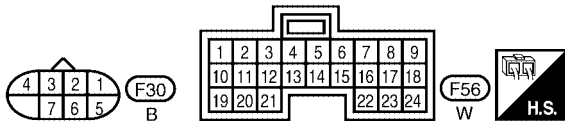
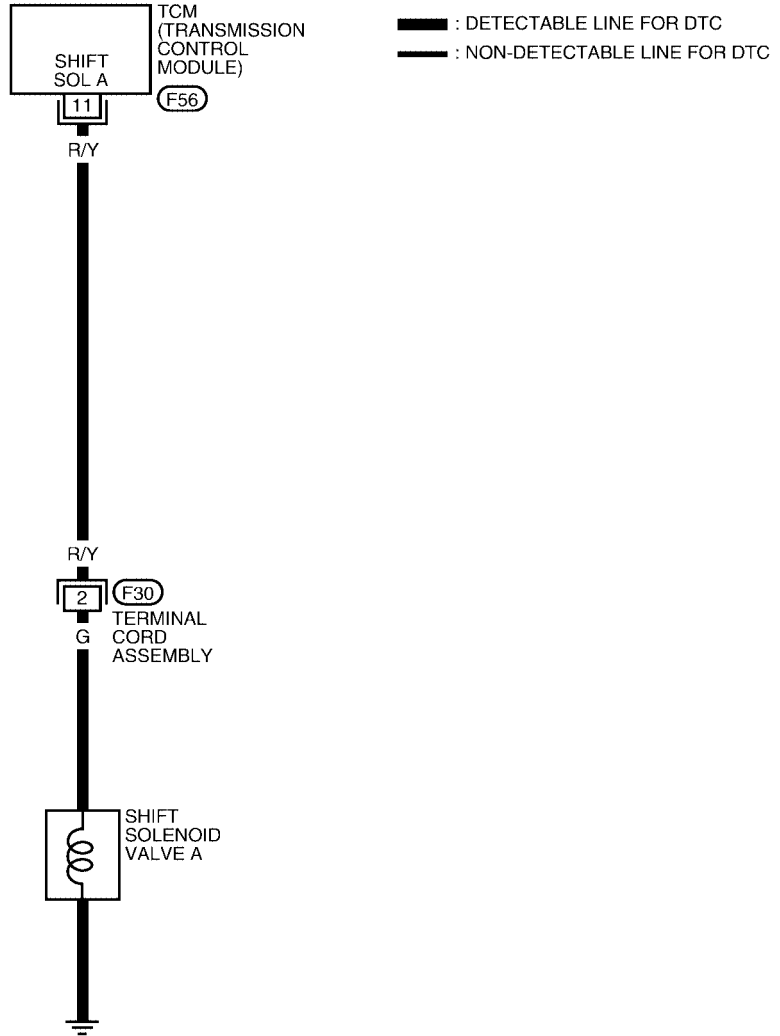
[RE4F04B]

Wiring Diagram — AT — SSV/A

ECS0098G

AT-SSV/A-01

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



LCWA0017E

DTC P0750 SHIFT SOLENOID VALVE A

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|------------------------|---|-----------------|
| 11 | R/Y | SHIFT SOLENOID VALVE A | WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D1 OR D4) | BATTERY VOLTAGE |
| | | | WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D2 OR D3) | 0V |

Diagnostic Procedure

ECS0098H

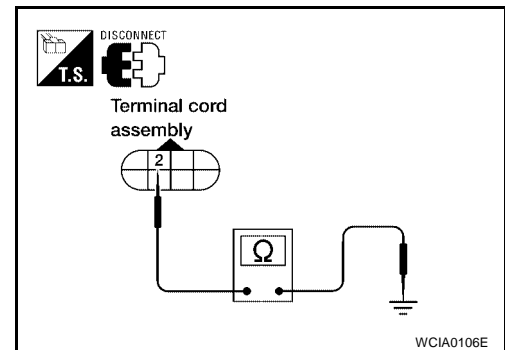
1. CHECK VALVE RESISTANCE

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

Resistance : 20 - 30Ω

OK or NG

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

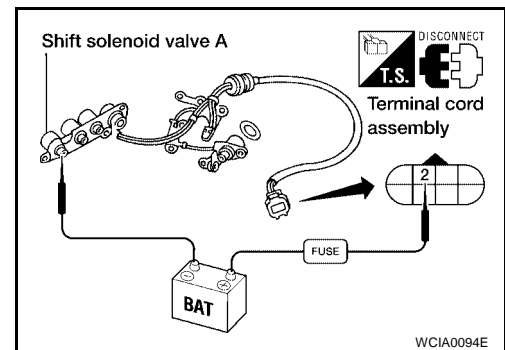


2. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#).
2. Check the following items:
 - Shift solenoid valve A
 - Operation check
 - Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.
 - Harness of terminal cord assembly for short or open

OK or NG

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



3. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect TCM harness connector.
3. Check continuity between terminal cord assembly harness connector terminal 2 and TCM harness connector terminal 11. Refer to [AT-169, "Wiring Diagram — AT — SSV/A"](#).

Continuity should exist.

4. Reinstall any part removed.

OK or NG

- OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK DTC

Perform [AT-167, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 5.

5. CHECK TCM INSPECTION

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

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

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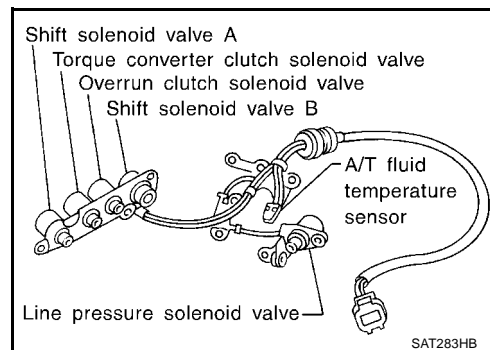
DTC P0755 SHIFT SOLENOID VALVE B

PFP:31940

Description

ECS0098I

Shift solenoid valves A and B are turned ON or OFF by the TCM in response to signals sent from the park/neutral position (PNP) switch, vehicle speed and ECM (throttle opening). Gears will then be shifted to the optimum position.



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

On Board Diagnosis Logic

ECS0098J

Diagnostic trouble code SFT SOL B/CIRC with CONSULT-II or P0755 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

ECS0098K

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0098L

CAUTION:

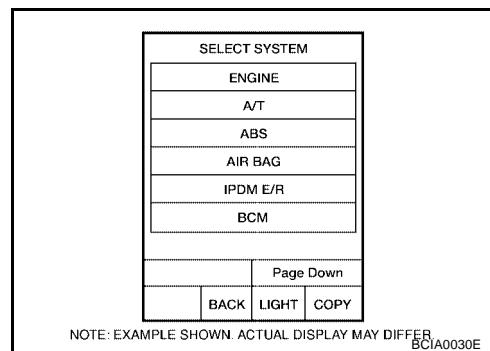
Always drive vehicle at a safe speed.

NOTE:

If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

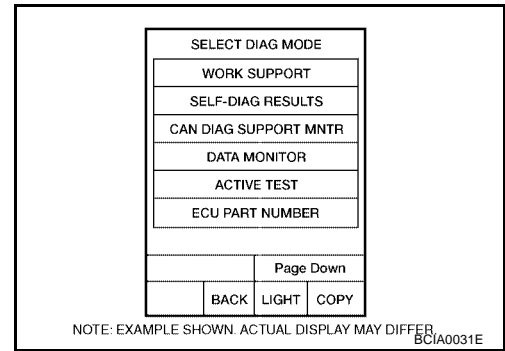
1. Turn ignition switch ON and select “DATA MONITOR” mode for “A/T” with CONSULT-II.



DTC P0755 SHIFT SOLENOID VALVE B

[RE4F04B]

2. Start engine.
3. Drive vehicle in D position and allow the transaxle to shift 1 → 2 → 3 ("GEAR").



WITH GST

Follow the procedure "With CONSULT-II".

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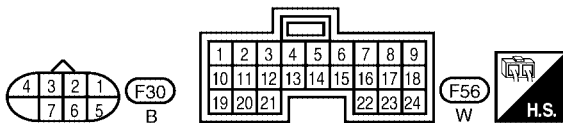
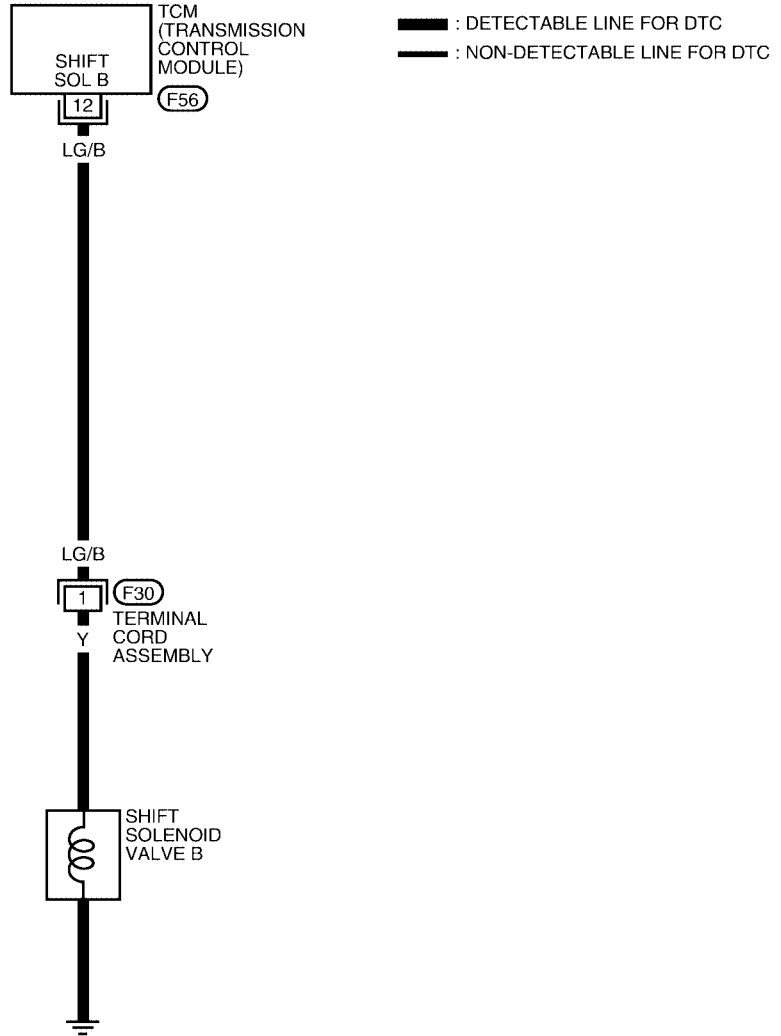
DTC P0755 SHIFT SOLENOID VALVE B

[RE4F04B]

Wiring Diagram — AT — SSV/B

ECS0098M

AT-SSV/B-01



LCWA0018E

DTC P0755 SHIFT SOLENOID VALVE B

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|------------------------|--|-----------------|
| 12 | LG/B | SHIFT SOLENOID VALVE B | WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D1 OR D2) | BATTERY VOLTAGE |
| | | | WHEN SHIFT SOLENOID VALVE BE IS NOT OPERATING (DRIVING IN D3 OR D4) | 0V |

Diagnostic Procedure

ECS0098N

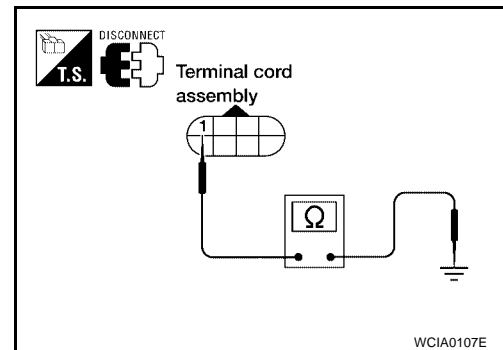
1. CHECK VALVE RESISTANCE

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

Resistance : 5 - 20Ω

OK or NG

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

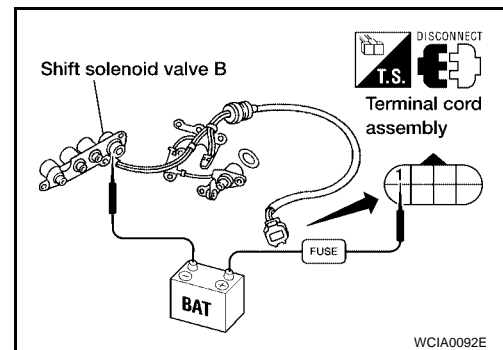


2. CHECK VALVE OPERATION

- Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#).
- Check the following items:
 - Shift solenoid valve B
 - Operation check
 - Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.
 - Harness of terminal cord assembly for short or open

OK or NG

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



3. CHECK POWER SOURCE CIRCUIT

- Turn ignition switch to OFF position.
- Disconnect TCM harness connector.
- Check continuity between terminal cord harness connector terminal 1 and TCM harness connector terminal 12. Refer to [AT-174, "Wiring Diagram — AT — SSV/B"](#).

Continuity should exist.

- Reinstall any part removed.

OK or NG

- OK >> GO TO 4.
- NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK DTC

Perform [AT-172, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

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

5. CHECK TCM INSPECTION

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

OK or NG

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

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

[RE4F04B]

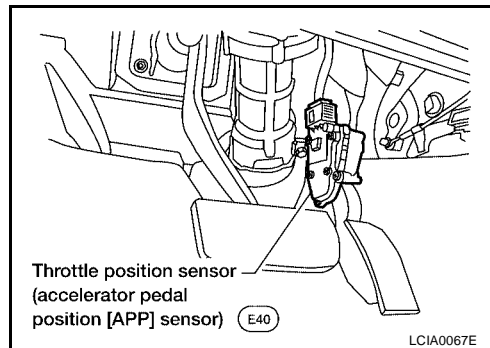
DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

PF2:22560

Description

ECS00980

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



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

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

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

[RE4F04B]

On Board Diagnosis Logic

ECS0098P

Diagnostic trouble code TP SEN/CIRC A/T or P1705 with CONSULT-II, or 3rd judgement flicker without CONSULT-II is detected when TCM receives an excessively low or high voltage from the ECM.

Possible Cause

ECS0098Q

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0098R

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

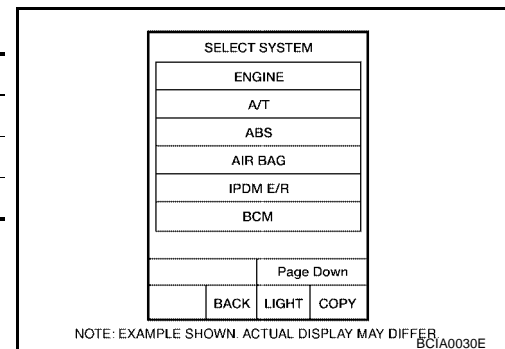
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
2. Touch "SELECTION FROM MENU".
3. Touch "THRTL POS SEN".
Touch "START"

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

If the check result is NG, go to [AT-181, "Diagnostic Procedure"](#).
If the check result is OK, go to following step.



4. Turn ignition switch ON and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
5. Touch "SELECTION FROM MENU"
6. Touch "VHCL SPEED SE" and "THRTL SEN 1".
Touch "START".
7. Start engine and maintain the following conditions for at least 3 consecutive seconds. Then release accelerator pedal completely.

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

THRTL POS 1: Approximately 3V or less

Selector lever: D position

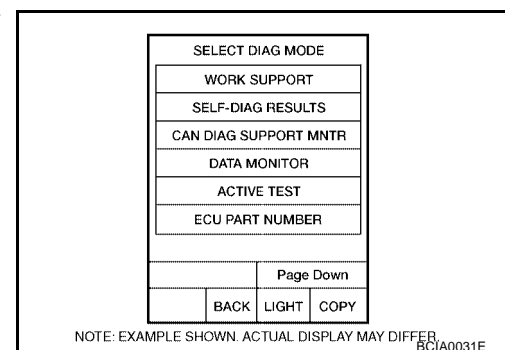
If the check result is NG, go to [AT-181, "Diagnostic Procedure"](#).

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

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

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

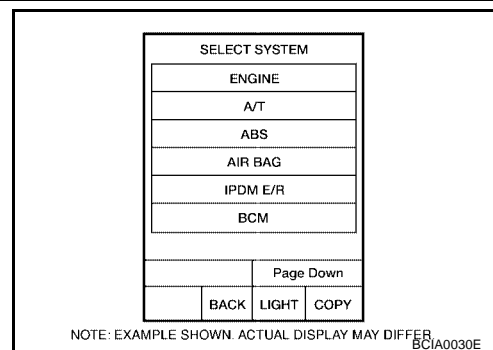
Accelerator pedal: Wide open throttle



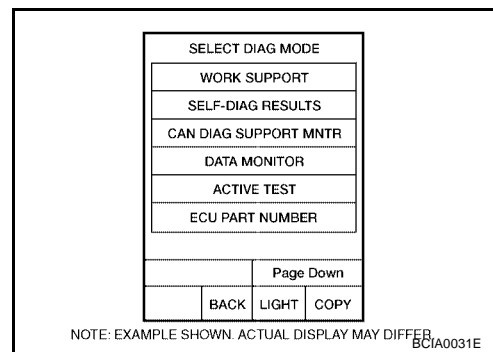
DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

[RE4F04B]

Selector lever: D position



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WITH GST

Follow the procedure "With CONSULT-II".

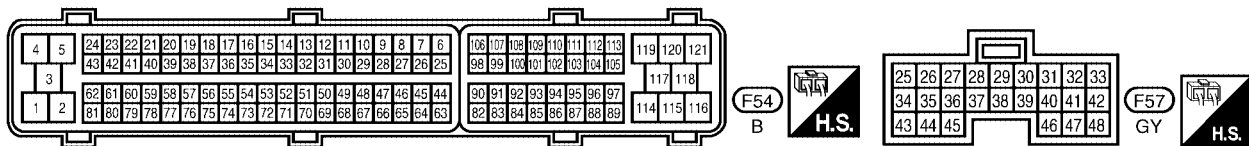
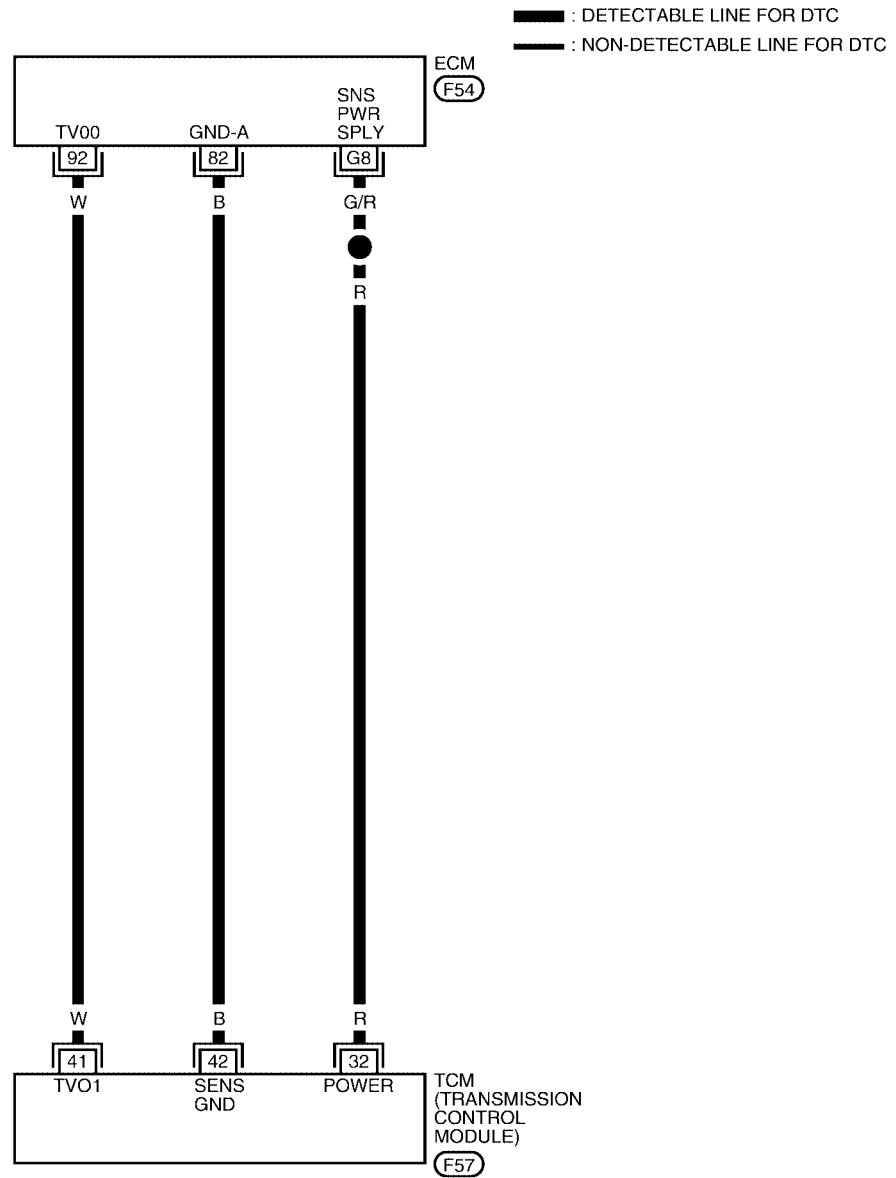
DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

[RE4F04B]

Wiring Diagram — AT — TPS

ECS0098S

AT-TPS-01



BCWA0145E

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

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|--|---|--|
| 32 | R | SENSOR POWER | IGNITION SWITCH ON | 4.5 -5.5V |
| | | | IGNITION SWITCH OFF | 0V |
| 41 | W | THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR] | IGNITION ON AND ACCELERATOR PEDAL IS DEPRESSED SLOWLY AFTER WARMING UP ENGINE | FULLY CLOSED THROTTLE: 0.5V FULLY OPEN THROTTLE: 4V |
| 42 | B | SENSOR GROUND | — | — |

Diagnostic Procedure

ECS0098T

1. CHECK DTC WITH ECM

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

Refer to [EC-128, "CONSULT-II Function \(ENGINE\)"](#)

OK or NG

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

NG >> Check accelerator pedal position (APP) sensor circuit for engine control. Refer to [EC-204, "DTC P0122, P0123 TP SENSOR"](#) and [EC-542, "DTC P2122, P2123 APP SENSOR"](#). If CAN communication line is detected, GO TO [AT-188, "DTC U1000 CAN COMMUNICATION LINE"](#).

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

 With CONSULT-II

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

Voltage:

Fully-closed throttle :Approximately 0.5V

Fully-open throttle :Approximately 4V

OK or NG

OK >> GO TO 4.

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

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

LCIA0090E

3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

⊗ Without CONSULT-II

1. Turn ignition switch to ON position. (Do not start engine.)
2. Check voltage between TCM terminals 41 (W) and 42 (B) while accelerator pedal is depressed slowly.

Voltage:

Fully-closed throttle valve :Approximately 0.5V

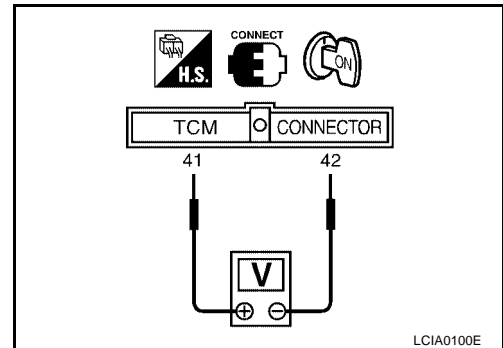
Fully-open throttle valve :Approximately 4V

(Voltage rises gradually in response to throttle position.)

OK or NG

OK >> GO TO 4.

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



4. CHECK TCM INSPECTION

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

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

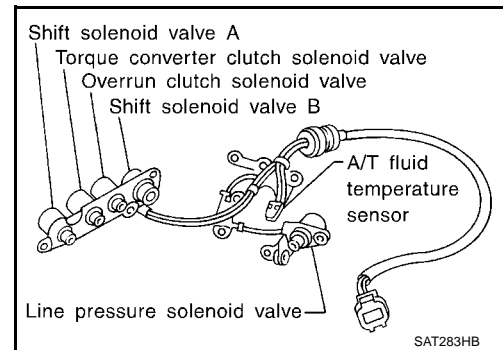
DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

PF3:31940

Description

ECS0098U

The overrun clutch solenoid valve is activated by the TCM in response to signals sent from the park/neutral position (PNP) switch, overdrive control switch, vehicle speed and ECM (throttle opening). The overrun clutch operation will then be controlled.



On Board Diagnosis Logic

ECS0098V

Diagnostic trouble code O/R CLTCH SOL/CIRC with CONSULT-II or P1760 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

ECS0098W

Check the following items.

- Harness or connectors
(The solenoid circuit is open or shorted.)
- Overrun clutch solenoid valve

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0098X

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

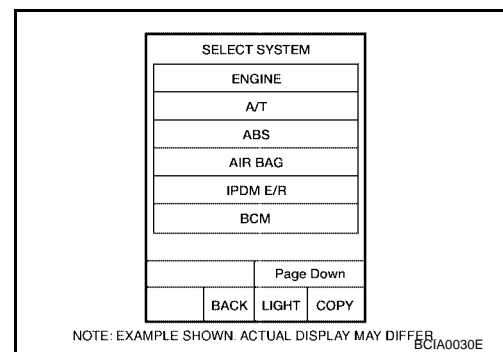
TESTING CONDITION:

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

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

WITH CONSULT-II

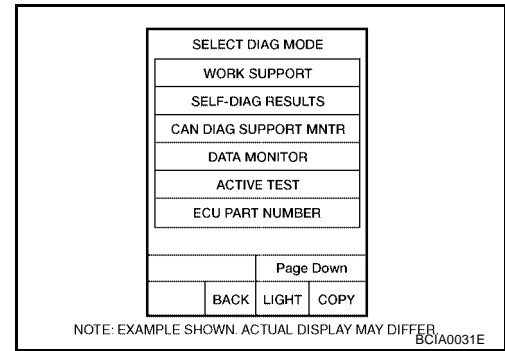
1. Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.
2. Touch "MAIN SIGNALS".
Touch "START".
3. Start engine.
4. Accelerate vehicle to a speed of more than 10 km/h (6 MPH) with selector lever in D position.



DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

[RE4F04B]

5. Release accelerator pedal completely with selector lever in 3 position. Verify operation of "OVERRUN/C S/V".



WITH GST

Follow the procedure "With CONSULT-II".

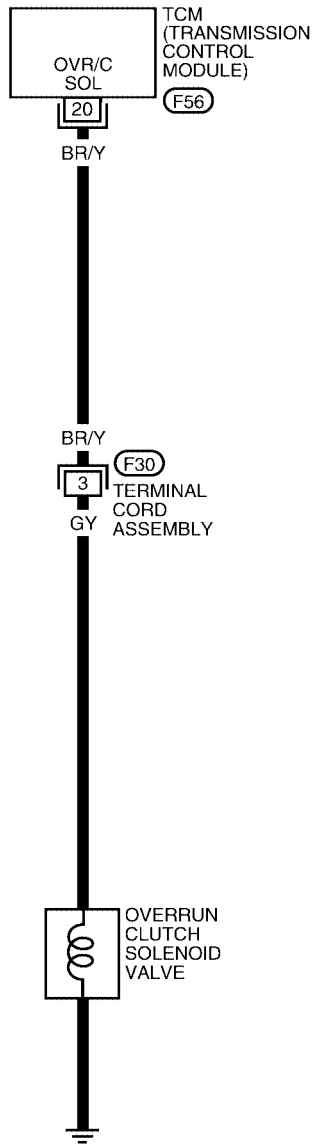
DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

[RE4F04B]

Wiring Diagram — AT — OVRCSV

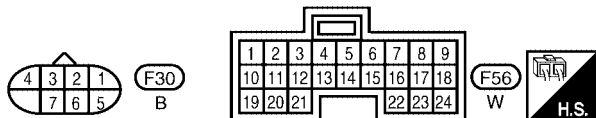
ECS0098Y

AT-OVRCSV-01



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

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WCWA0053E

DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|-------------------------------|---|-----------------|
| 20 | BR/Y | OVERRUN CLUTCH SOLENOID VALVE | WHEN OVERRUN CLUTCH SOLENOID VALVE OPERATES | BATTERY VOLTAGE |
| | | | WHEN OVERRUN CLUTCH SOLENOID VALVE DOES NOT OPERATE | 0V |

Diagnostic Procedure

ECS0098Z

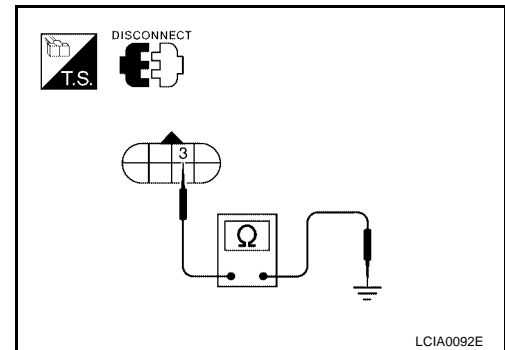
1. CHECK VALVE RESISTANCE

1. Turn ignition switch to OFF position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal cord assembly F30 terminal 3 (component side) and ground.

Resistance : 20 - 30Ω

OK or NG

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

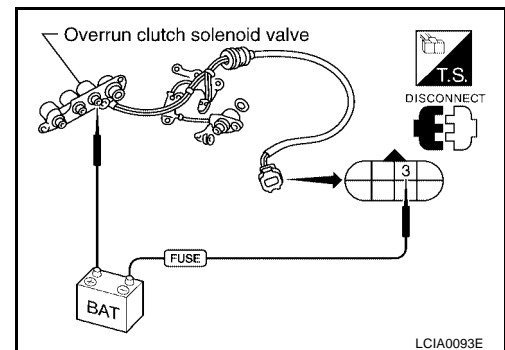


2. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#).
2. Check the following items:
 - Overrun clutch solenoid valve
 - Operation check
- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.
- Harness of terminal cord assembly for short or open

OK or NG

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



3. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect TCM harness connector.
3. Check continuity between terminal cord assembly harness connector terminal 3 and TCM harness connector terminal 20. Refer to [AT-185, "Wiring Diagram — AT — OVRCSV"](#).

Continuity should exist.

4. Reinstall any part removed.

OK or NG

- OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. CHECK DTC

Perform [AT-183, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 5.

5. CHECK TCM INSPECTION

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

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

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DTC U1000 CAN COMMUNICATION LINE

PFP:23710

Description

ECS00990

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

On Board Diagnosis Logic

ECS00991

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code A/T COMM LINE or U1000 with CONSULT-II and 12th judgement flicker without CONSULT-II is detected when TCM cannot communicate to other control unit.

Possible Cause

ECS00992

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

DTC Confirmation Procedure

ECS00993

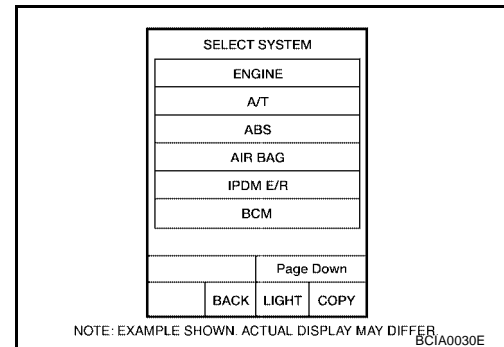
NOTE:

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

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

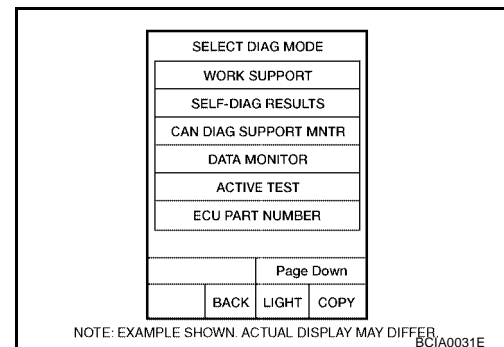
④ WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and wait for at least 6 seconds.
4. If DTC is detected, go to [AT-191, "Diagnostic Procedure"](#).



④ WITH GST

Follow the procedure “WITH CONSULT-II”.



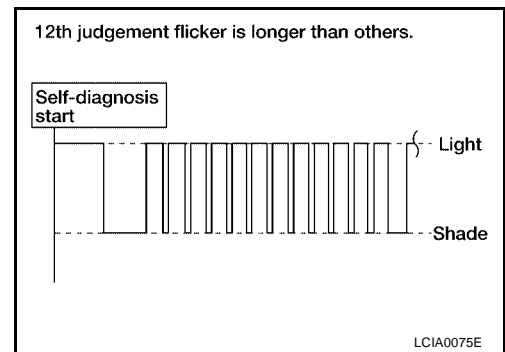
⊗ WITHOUT CONSULT-II

1. Turn ignition switch "ON".

DTC U1000 CAN COMMUNICATION LINE

[RE4F04B]

2. Wait at least 6 seconds or start engine and wait at least 6 seconds.
3. Perform self-diagnosis. Refer to [AT-55, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#).



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DTC U1000 CAN COMMUNICATION LINE

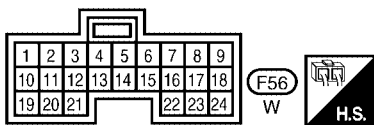
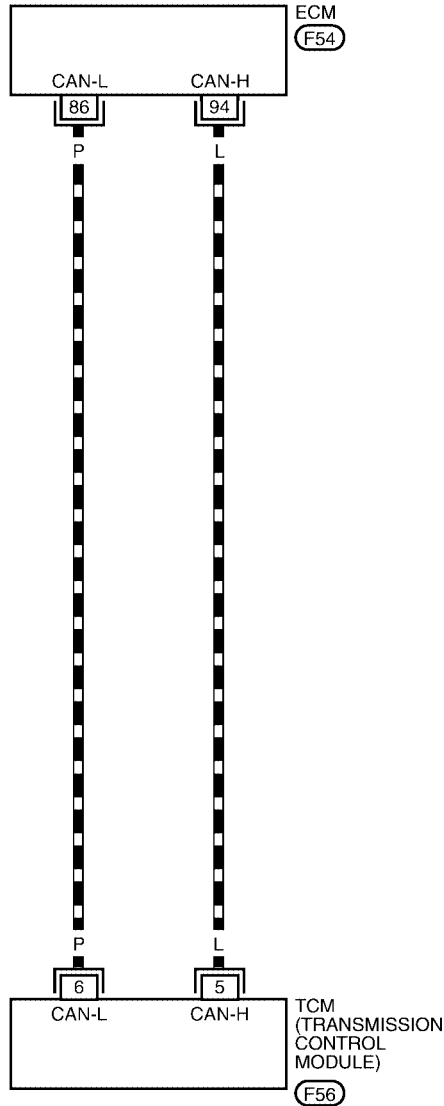
[RE4F04B]

Wiring Diagram — AT — CAN

ECS00994

AT-CAN-01

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



REFER TO THE FOLLOWING.

(F54) - ELECTRICAL UNITS

BCWA0146E

Diagnostic Procedure

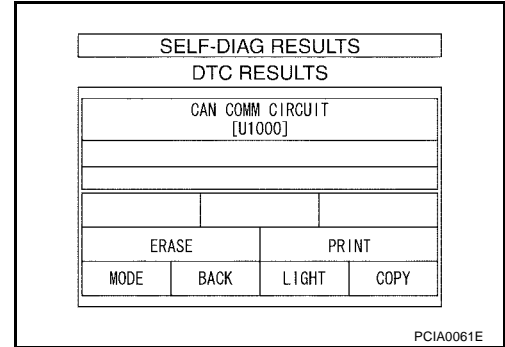
1. CHECK CAN COMMUNICATION CIRCUIT

 **With CONSULT-II**

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

Yes or No

- Yes >> Print out CONSULT-II screen, GO TO [LAN-4, "Precautions When Using CONSULT-II"](#) .
- No >> **INSPECTION END**



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

[RE4F04B]

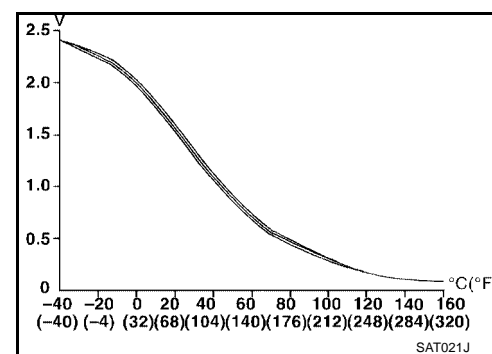
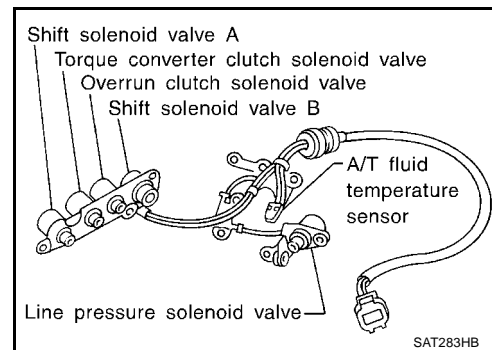
DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)

PFP:31940

Description

ECS00996

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



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

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

On Board Diagnosis Logic

ECS00997

Diagnostic trouble code BATT/FLUID TEMP SEN with CONSULT-II or 8th judgement flicker without CONSULT-II is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause

ECS00998

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS00999

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

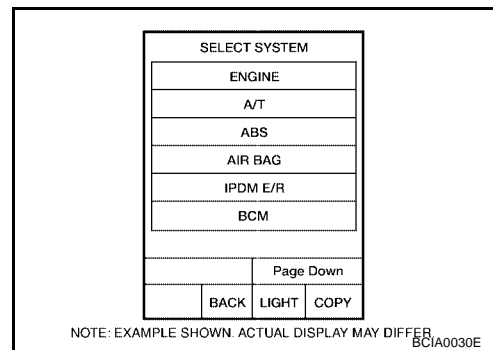
WITH CONSULT-II

1. Start engine.

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

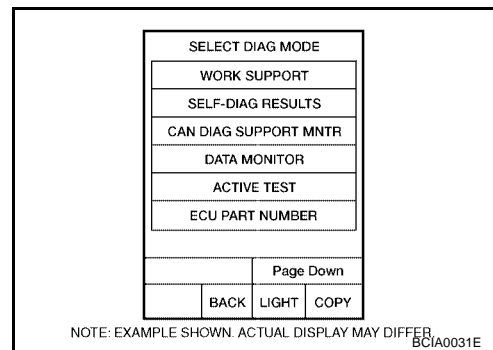
[RE4F04B]

- Select "DATA MONITOR" mode for "A/T" with CONSULT-II.



A
B
AT

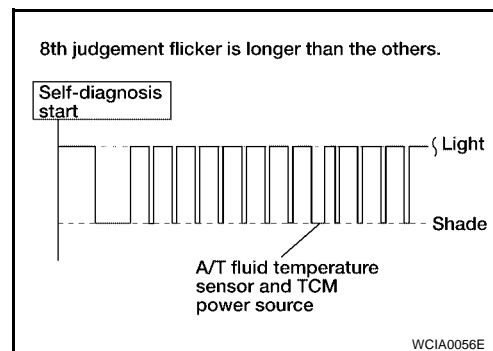
- Drive vehicle under the following conditions:
Selector lever in D, vehicle speed higher than 20 km/h (12 MPH).



D
E
F
G

WITHOUT CONSULT-II

- Start engine.
- Drive vehicle under the following conditions:
Selector lever in D, vehicle speed higher than 20 km/h (12 MPH).
- Perform self-diagnosis.
Refer to [AT-55, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#).



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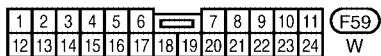
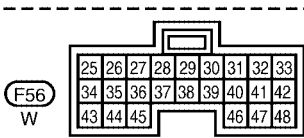
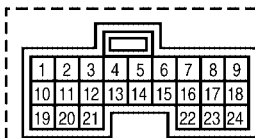
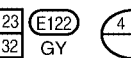
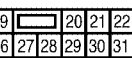
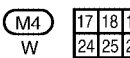
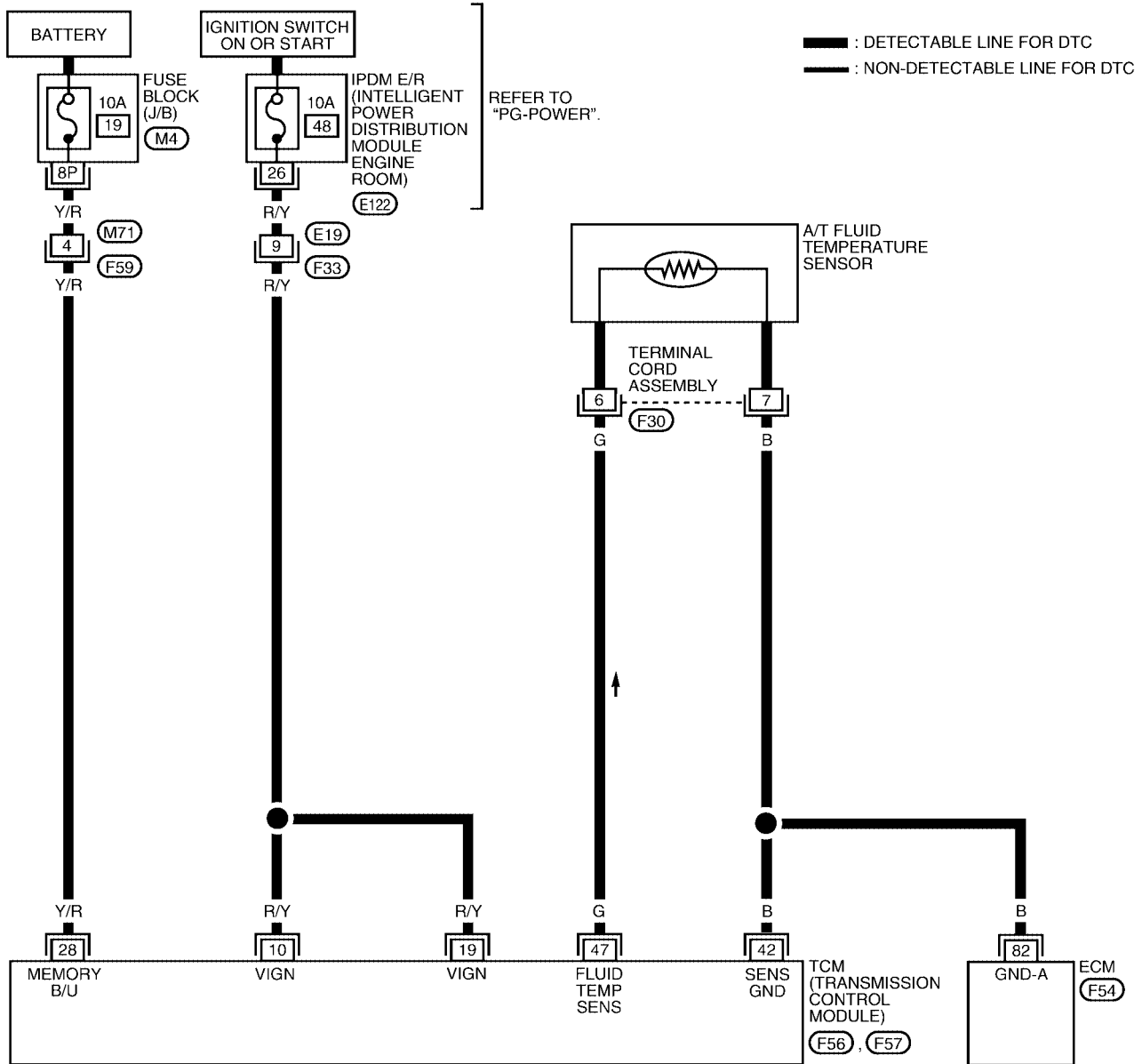
DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)

[RE4F04B]

ECS0099A

Wiring Diagram — AT — BA/FTS

AT-BA/FTS-01



REFER TO THE FOLLOWING.
 (F54) - ELECTRICAL UNITS

BCWA0147E

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

[RE4F04B]

TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|------------------------------|--|-----------------|
| 10 | R/Y | POWER SOURCE | IGNITION ON | BATTERY VOLTAGE |
| | | | IGNITION OFF | 0V |
| 19 | R/Y | POWER SOURCE | IGNITION ON | BATTERY VOLTAGE |
| | | | IGNITION OFF | 0V |
| 28 | Y/R | POWER SOURCE (MEMORY BACKUP) | IGNITION ON | BATTERY VOLTAGE |
| | | | IGNITION OFF | BATTERY VOLTAGE |
| 42 | B | SENSOR GROUND | — | — |
| 47 | G | A/T FLUID TEMPERATURE SENSOR | IGNITION ON WITH ATF TEMPERATURE AT 20°C (68°F) | 1.5V |
| | | | IGNITION ON WITH ATF TEMPERATURE AT 80°C (176°F) | 0.5V |

Diagnostic Procedure

ECS0099B

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

With CONSULT-II

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

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

:Approximately 1.5V → 0.5V

OK or NG

- OK >> GO TO 9.
 NG >> GO TO 2.

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

LCIA0090E

2. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM
 Refer to [EC-159, "POWER SUPPLY AND GROUND CIRCUIT"](#).

OK or NG

- OK >> GO TO 9.
 NG >> Repair or replace damaged parts.

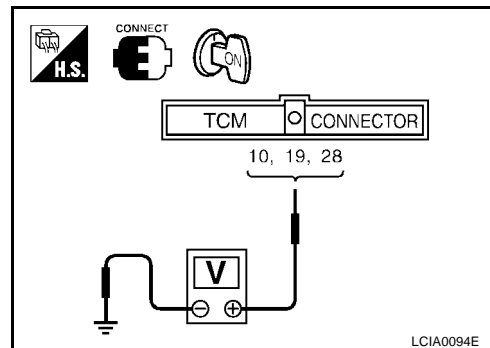
3. CHECK TCM POWER SOURCE STEP 1

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

Voltage : Battery voltage

OK or NG

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



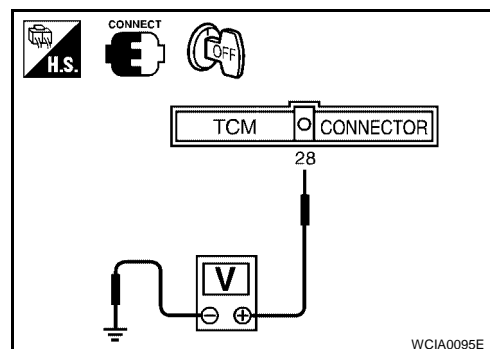
4. CHECK TCM POWER SOURCE STEP 2

1. Turn ignition switch to OFF position.
2. Check voltage between TCM harness connector terminal 28 (Y/R) and ground.

Voltage : Battery voltage

OK or NG

- OK >> GO TO 6.
NG >> GO TO 5.



5. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between ignition switch and TCM (Main harness)
- Ignition switch and fuse
Refer to [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#).

OK or NG

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

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

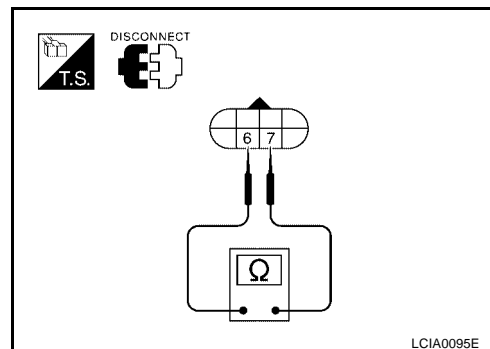
1. Turn ignition switch to OFF position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal cord assembly F30 terminals 6 and 7 (component side) when A/T is cold.

| Temperature | Resistance (Approx.) |
|------------------|----------------------|
| Cold 20°C (68°F) | 2.5kΩ |

4. Reinstall any part removed.

OK or NG

- OK (without CONSULT-II) >> GO TO 8.
NG >> GO TO 7.



7. DETECT MALFUNCTIONING ITEM

1. Remove oil pan.
2. Check the following items:
 - A/T fluid temperature sensor
 - Check resistance between two terminals while changing temperature as shown.

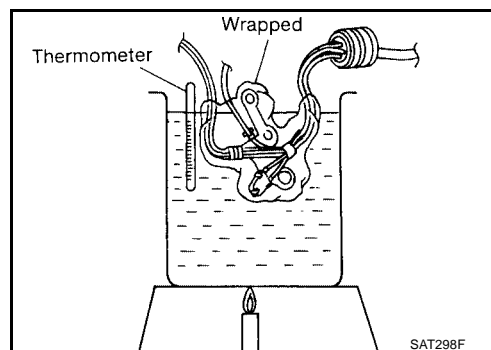
| Temperature °C (°F) | Resistance (Approx.) |
|---------------------|----------------------|
| 20 (68) | 2.5kΩ |
| 80 (176) | 0.3kΩ |

- Harness of terminal cord assembly for short or open

OK or NG

OK (without CONSULT-II) >> GO TO 8.

NG >> Repair or replace damaged parts.



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

⊗ Without CONSULT-II

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

| Temperature | Voltage (Approx.) |
|---|-------------------|
| Cold [20°C (68°F)] → Hot [80°C (176°F)] | 1.5V → 0.5V |

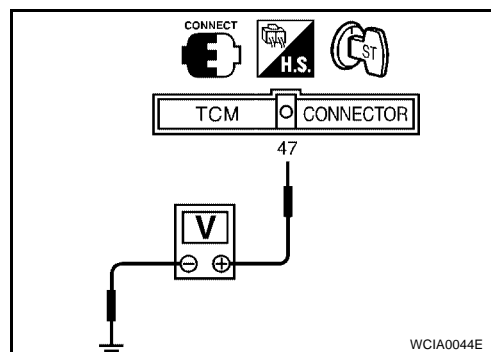
3. Turn ignition switch to OFF position.
4. Disconnect TCM harness connector.
5. Check resistance between terminal 42 and ground. Refer to [AT-194, "Wiring Diagram — AT — BA/FTS"](#).

Continuity should exist.

OK or NG

OK >> GO TO 10.

NG >> GO TO 9.



9. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM
Refer to [EC-159, "POWER SUPPLY AND GROUND CIRCUIT"](#).

OK or NG

OK >> GO TO 10.

NG >> Repair or replace damaged parts.

10. CHECK DTC

Perform [AT-192, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 11.

11. CHECK TCM INSPECTION

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

OK or NG

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

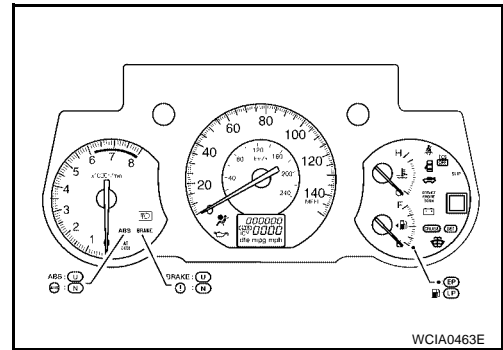
DTC VEHICLE SPEED SENSOR MTR

PF2:24814

Description

ECS0099C

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



WCIA0463E

On Board Diagnosis Logic

ECS0099D

Diagnostic trouble code VHCL SPEED SEN-MTR with CONSULT-II or 2nd judgement flicker without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor.

Possible Cause

ECS0099E

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS0099F

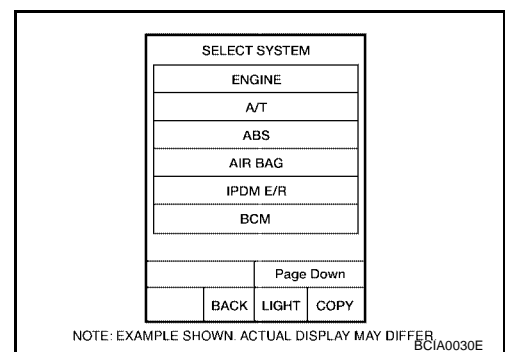
CAUTION:

- Always drive vehicle at a safe speed.
- If conducting this “DTC Confirmation Procedure” again, always turn ignition switch OFF and wait at least 10 seconds before continuing.

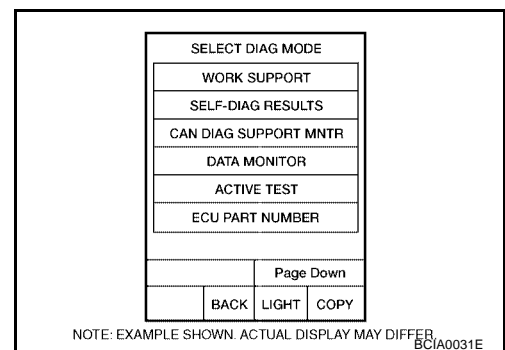
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

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



2. Start engine and accelerate vehicle from 0 to 25 km/h (0 to 16 MPH).



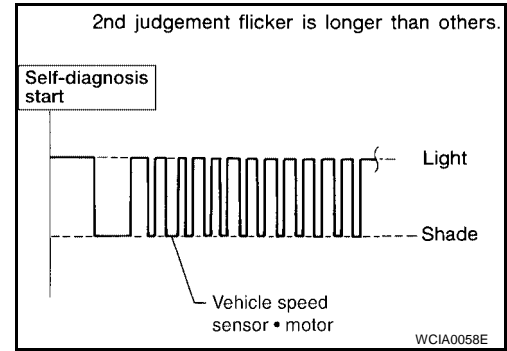
WITHOUT CONSULT-II

1. Start engine.

DTC VEHICLE SPEED SENSOR MTR

[RE4F04B]

2. Drive vehicle under the following conditions:
Selector lever in D and vehicle speed higher than 25 km/h (16 MPH).
3. Perform self-diagnosis.
Refer to [AT-55, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#).



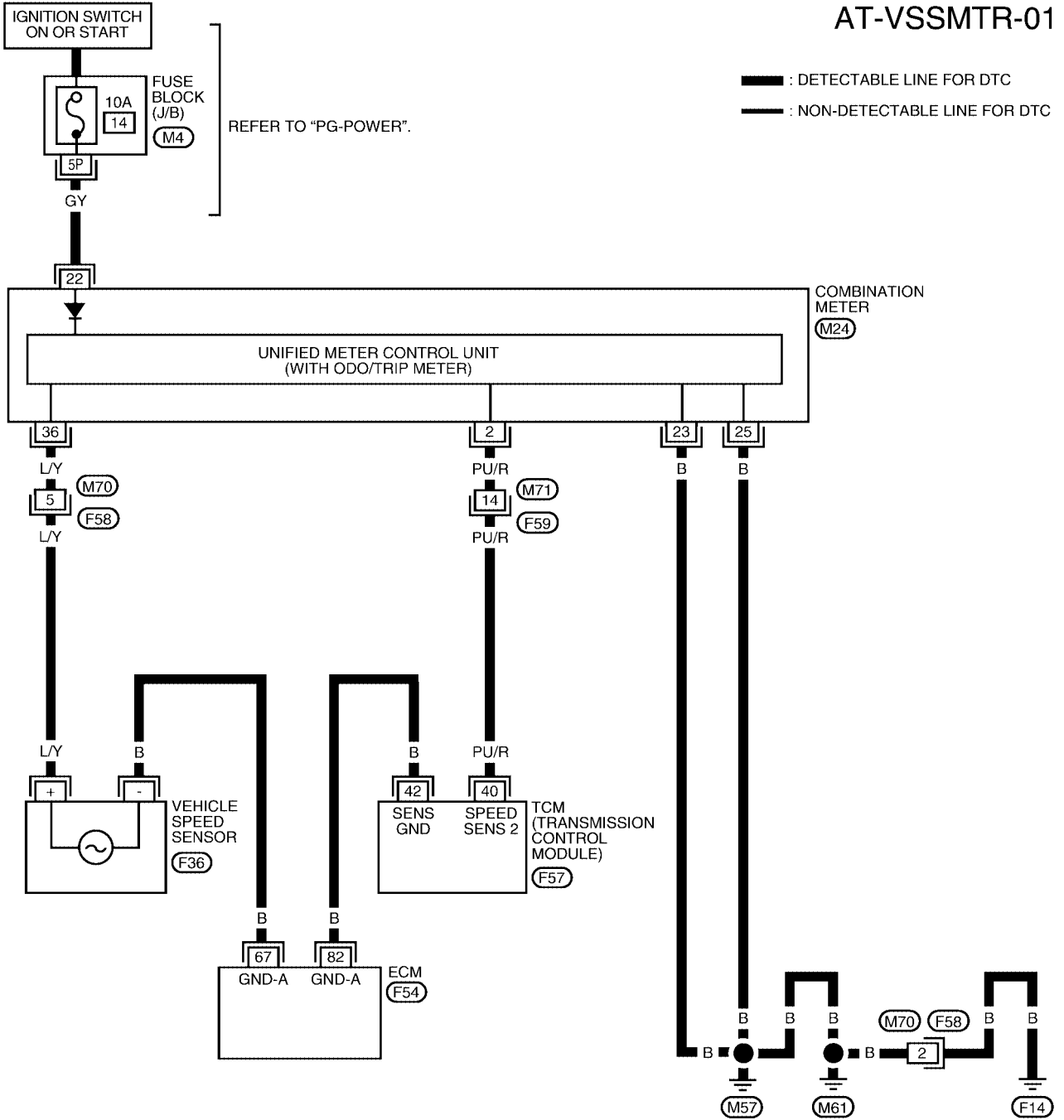
DTC VEHICLE SPEED SENSOR MTR

[RE4F04B]

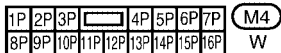
Wiring Diagram — AT — VSSMTR

ECS0099G

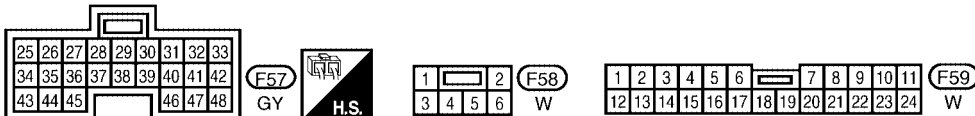
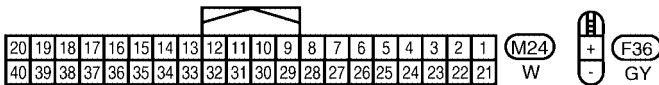
AT-VSSMTR-01



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REFER TO THE FOLLOWING.
 (F54) - ELECTRICAL UNITS



BCWA0148E

Diagnostic Procedure

1. CHECK INPUT SIGNAL

With CONSULT-II

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

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

LCIA0090E

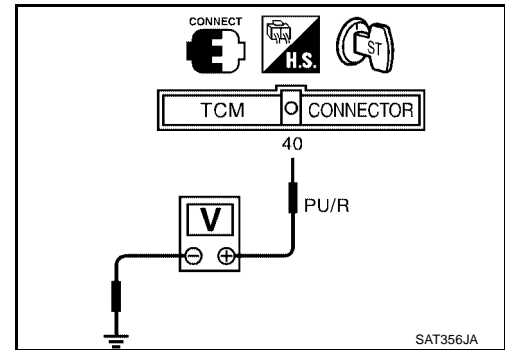
Without CONSULT-II

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

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

OK or NG

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



2. DETECT MALFUNCTIONING ITEM

Check the following items:

- Vehicle speed sensor and ground circuit for vehicle speed sensor
Refer to [DI-17, "Vehicle Speed System"](#) .
- Harness for short or open between TCM and vehicle speed sensor (Main harness)

OK or NG

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

3. CHECK DTC

Perform [AT-199, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .

OK or NG

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

4. CHECK TCM INSPECTION

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

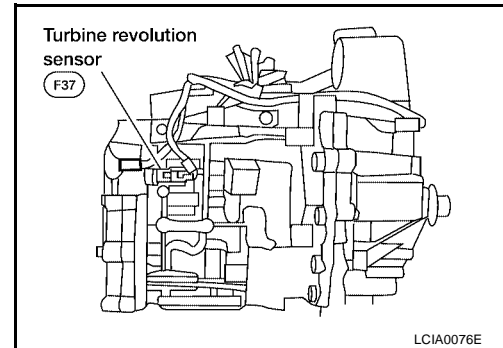
OK or NG

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

DTC TURBINE REVOLUTION SENSOR

Description

The turbine revolution sensor detects forward clutch drum rpm (revolutions per minute). It is located on the input side of the automatic transaxle. The vehicle speed sensor A/T (Revolution sensor) is located on the output side of the automatic transaxle. With the two sensors, input and output rpms are accurately detected. The result is optimal shift timing during deceleration and improved shifting.



ON BOARD DIAGNOSIS LOGIC

| Diagnostic trouble code | Malfunction is detected when ... | Check items (Possible cause) |
|---|---|---|
| (P) : TURBINE REV (X) : 10th judgement flicker | TCM does not receive the proper voltage signal from the sensor. | <ul style="list-style-type: none"> ● Harness or connectors (The sensor circuit is open or shorted.) ● Turbine revolution sensor |

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

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

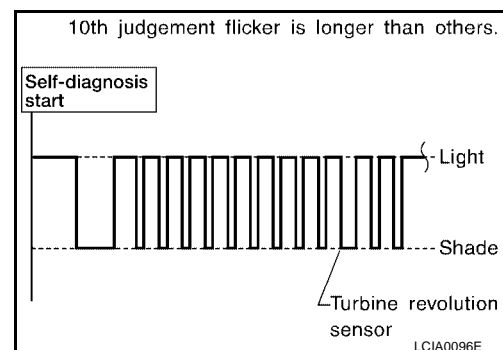
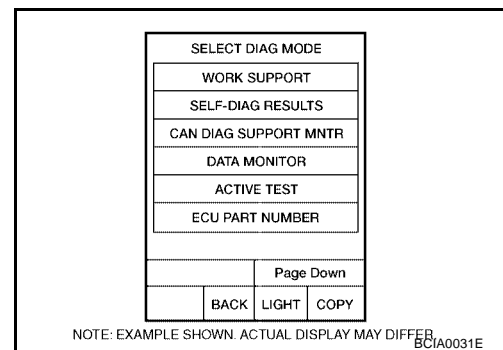
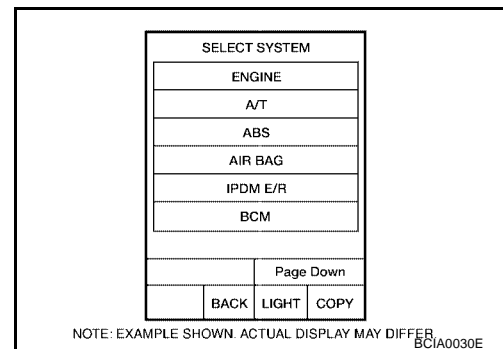
After the repair, perform the following procedure to confirm the malfunction is eliminated.

(P) WITH CONSULT-II

1. Start engine.
2. Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
3. Drive vehicle under the following conditions:
Selector lever in D, vehicle speed higher than 40 km/h (25 MPH), engine speed higher than 1,500 rpm, throttle opening greater than 1.0/8 of the full throttle position and driving for more than 5 seconds.

(X) WITHOUT CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:
Selector lever in "D" and vehicle speed higher than 40 km/h (25 MPH), engine speed higher than 1,500 rpm, throttle opening greater than 1/8 of the full throttle position and driving for more than 5 seconds.
3. Perform self-diagnosis.
Refer to [AT-55, "TCM SELF-DIAGNOSTIC PROCEDURE \(NO TOOLS\)"](#).



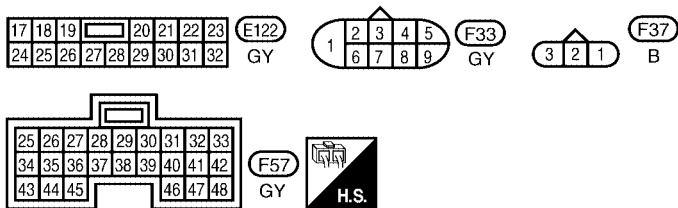
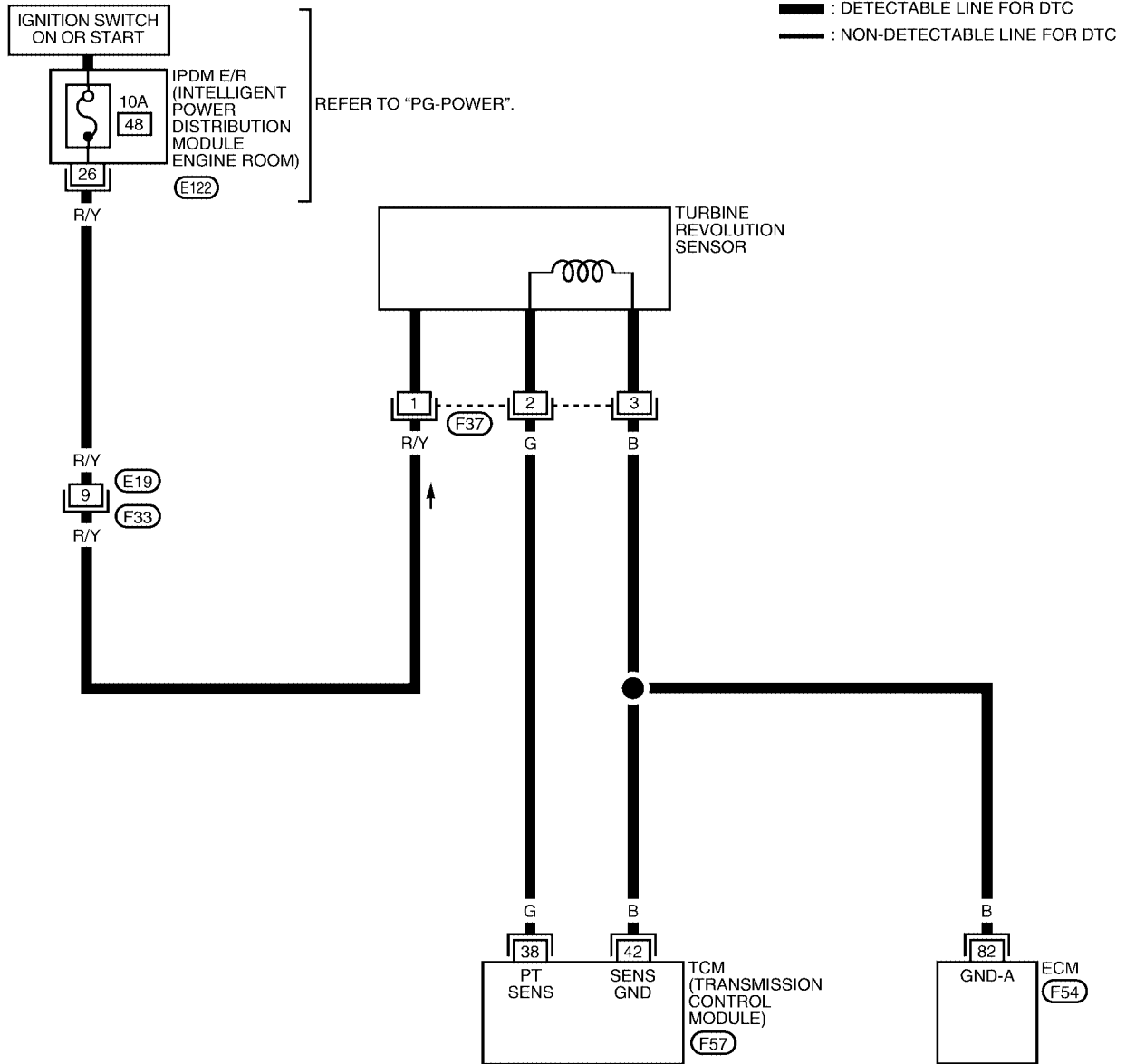
DTC TURBINE REVOLUTION SENSOR

[RE4F04B]

Wiring Diagram — AT — TRSA/T

ECS0099J

AT-TRSA/T-01



REFER TO THE FOLLOWING.

F54 - ELECTRICAL UNITS

BCWA0149E

DTC TURBINE REVOLUTION SENSOR

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (DC) |
|----------|------------|------------------------------------|--|-------------------------|
| 38 | G | TURBINE REVOLUTION SENSOR (SIGNAL) | WHEN MOVING AT 20 KM/H (12 MPH), USE THE CONSULT-II PULSE FREQUENCY MEASURING FUNCTION.*1 CAUTION: CONNECT THE DIAGNOSIS DATA LINK CABLE TO THE VEHICLE DIAGNOSIS CONNECTOR. *1: A CIRCUIT TESTER CANNOT BE USED TO TEST THIS ITEM. | 240 Hz |
| | | | WHEN VEHICLE IS PARKED. | UNDER 1.3V OR OVER 4.5V |
| 42 | B | SENSOR GROUND | — | — |

Diagnostic Procedure

ECS0099K

1. CHECK INPUT SIGNAL

With CONSULT-II

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

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

SAT740J

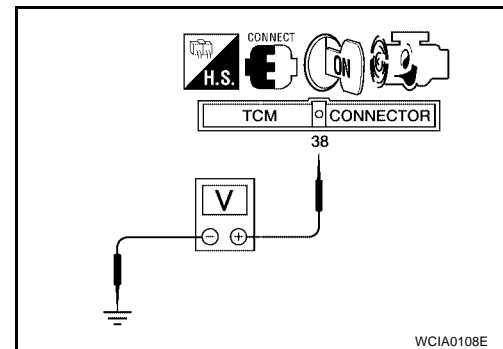
Without CONSULT-II

1. Start engine.
2. Check frequency between TCM terminal 38 and ground.

Frequency : Approximately 240 Hz when driving 20 km/h (12 MPH)

OK or NG

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



2. DETECT MALFUNCTIONING ITEM

Check harness for short or open between TCM and turbine revolution sensor.

OK or NG

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

3. CHECK DTC

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

OK or NG

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

4. CHECK TCM INSPECTION

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

OK or NG

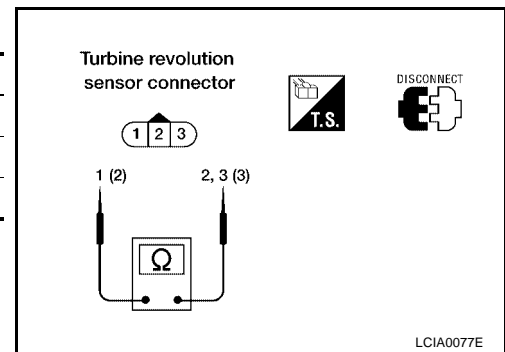
- OK >> **INSPECTION END.**
- NG >> Repair or replace damaged parts.

Component Inspection TURBINE REVOLUTION SENSOR

ECS0099L

- Check resistance between terminals 1, 2 and 3.

| Terminal No. | | Resistance (Approx.) |
|--------------|---|----------------------|
| 1 | 2 | No continuity |
| 1 | 3 | No continuity |
| 2 | 3 | 2.4 - 2.8 kΩ |



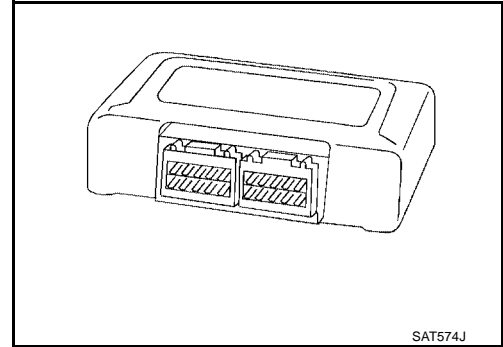
DTC CONTROL UNIT (RAM), CONTROL UNIT (ROM)

PF3:31036

Description

ECS0099M

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



SAT574J

ECS0099N

On Board Diagnosis Logic

Diagnostic trouble code CONTROL UNIT (RAM), CONTROL UNIT (ROM) with CONSULT-II is detected when TCM memory (RAM) or (ROM).

Possible Cause

ECS0099O

Check TCM.

Diagnostic Trouble Code (DTC) Confirmation Procedure

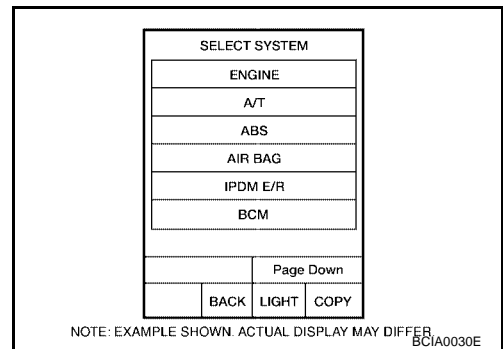
ECS0099P

NOTE:

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

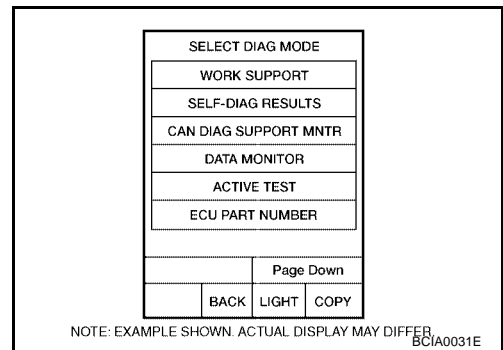
WITH CONSULT-II

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



BCIA0030E

3. Run engine for at least 2 seconds at idle speed.



BCIA0031E

Diagnostic Procedure

ECS00990

1. INSPECTION START

With CONSULT-II

1. Turn ignition switch ON and select "SELF DIAGNOSIS" mode for A/T with CONSULT-II.
2. Touch "ERASE".
3. Perform [AT-207, "Diagnostic Trouble Code \(DTC\) Confirmation Procedure"](#) .
4. Is the "CONTROL UNIT (RAM)" or "CONTROL UNIT (ROM)" displayed again?

Yes or No

- Yes >> Replace TCM.
No >> **INSPECTION END**

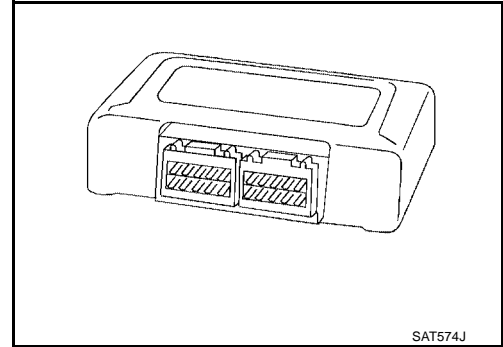
DTC CONTROL UNIT (EEP ROM)

PFP:31036

Description

ECS0099R

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



ON BOARD DIAGNOSIS LOGIC

| Diagnostic trouble code | Malfunction is detected when ... | Check item (Possible cause) |
|-------------------------|---|-----------------------------|
| Ⓜ : CONT UNIT (EEP ROM) | TCM memory (EEP ROM) is malfunctioning. | ● TCM |

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

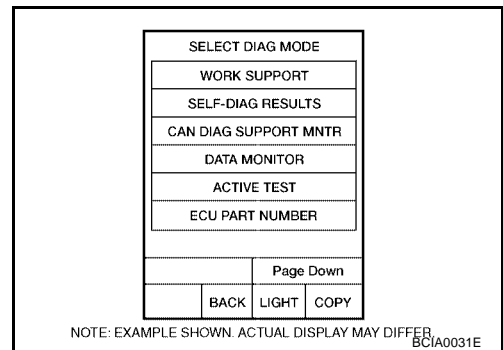
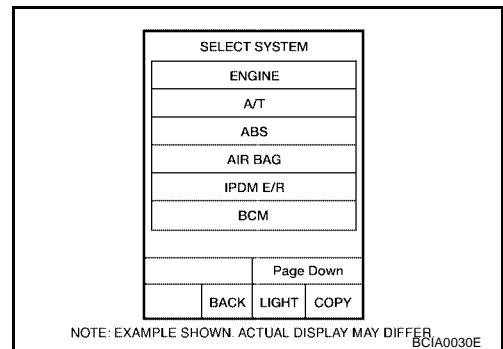
NOTE:

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

Ⓜ With CONSULT-II

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

3. Run engine for at least 2 seconds at idle speed.



Diagnostic Procedure

1. CHECK DTC

④ With CONSULT-II

1. Turn ignition switch "ON" and select "SELF DIAGNOSIS" mode for A/T with CONSULT-II.
2. Move selector lever to "R" position.
3. Depress accelerator pedal (Full throttle position).
4. Touch "ERASE".
5. Turn ignition switch "OFF" position for 10 seconds.

Perform [AT-209. "DIAGNOSTIC TROUBLE CODE \(DTC\) CONFIRMATION PROCEDURE"](#) .

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

Yes >> Replace TCM.

No >> **INSPECTION END**

TROUBLE DIAGNOSIS FOR SYMPTOMS

[RE4F04B]

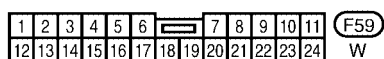
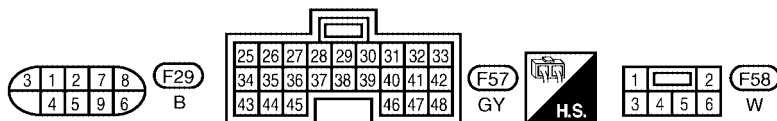
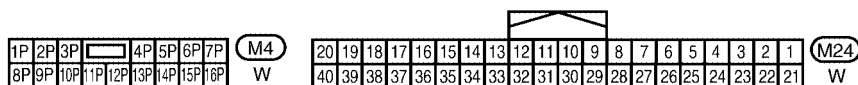
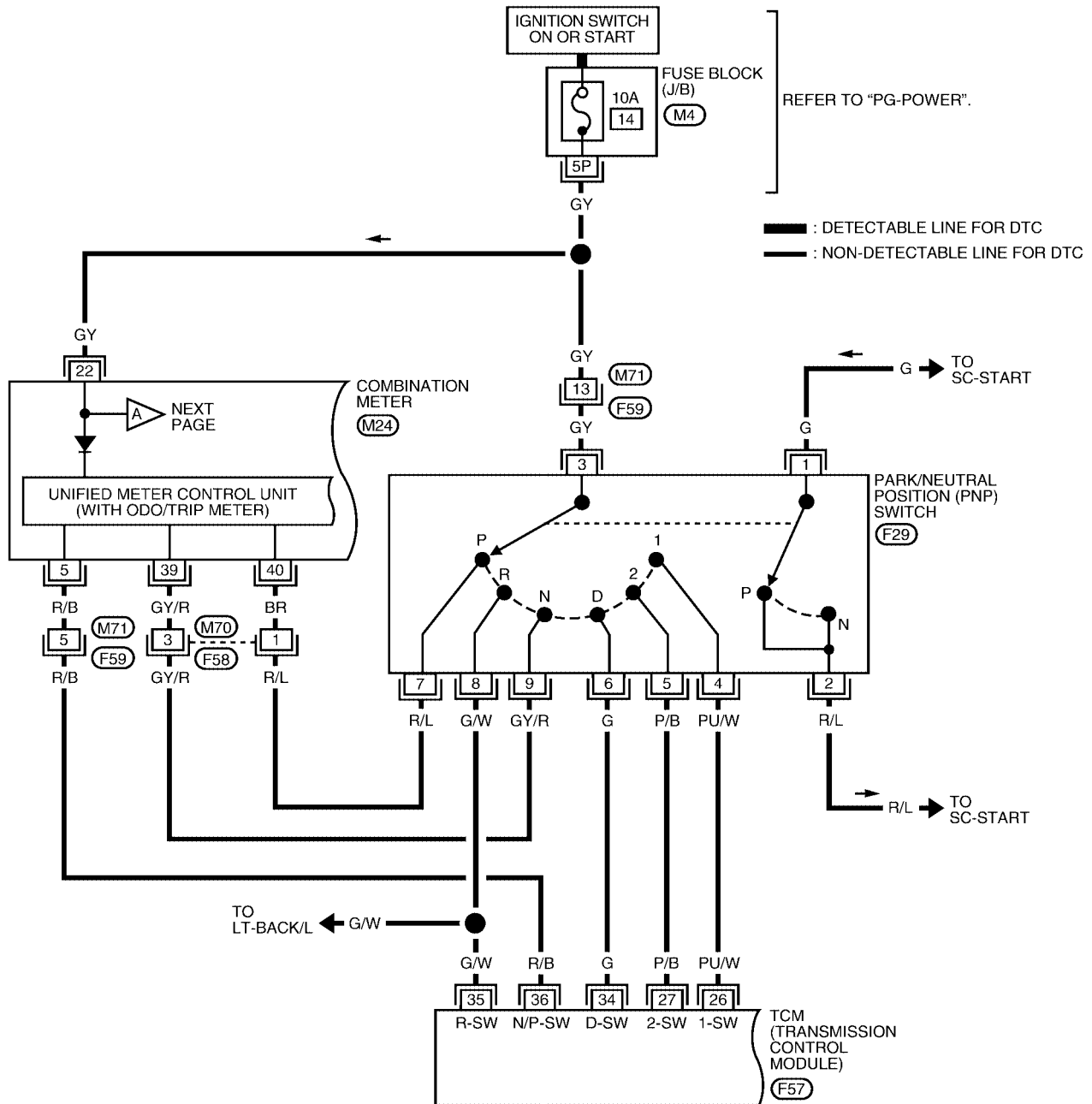
TROUBLE DIAGNOSIS FOR SYMPTOMS

PF0:00007

Wiring Diagram — AT — NONDTC

ECS0099T

AT-NONDTC-01



BCWA0150E

TROUBLE DIAGNOSIS FOR SYMPTOMS

[RE4F04B]

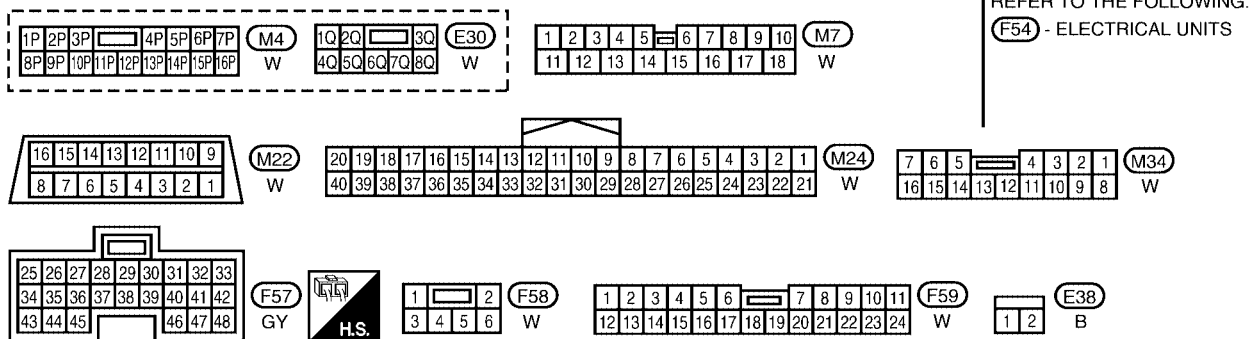
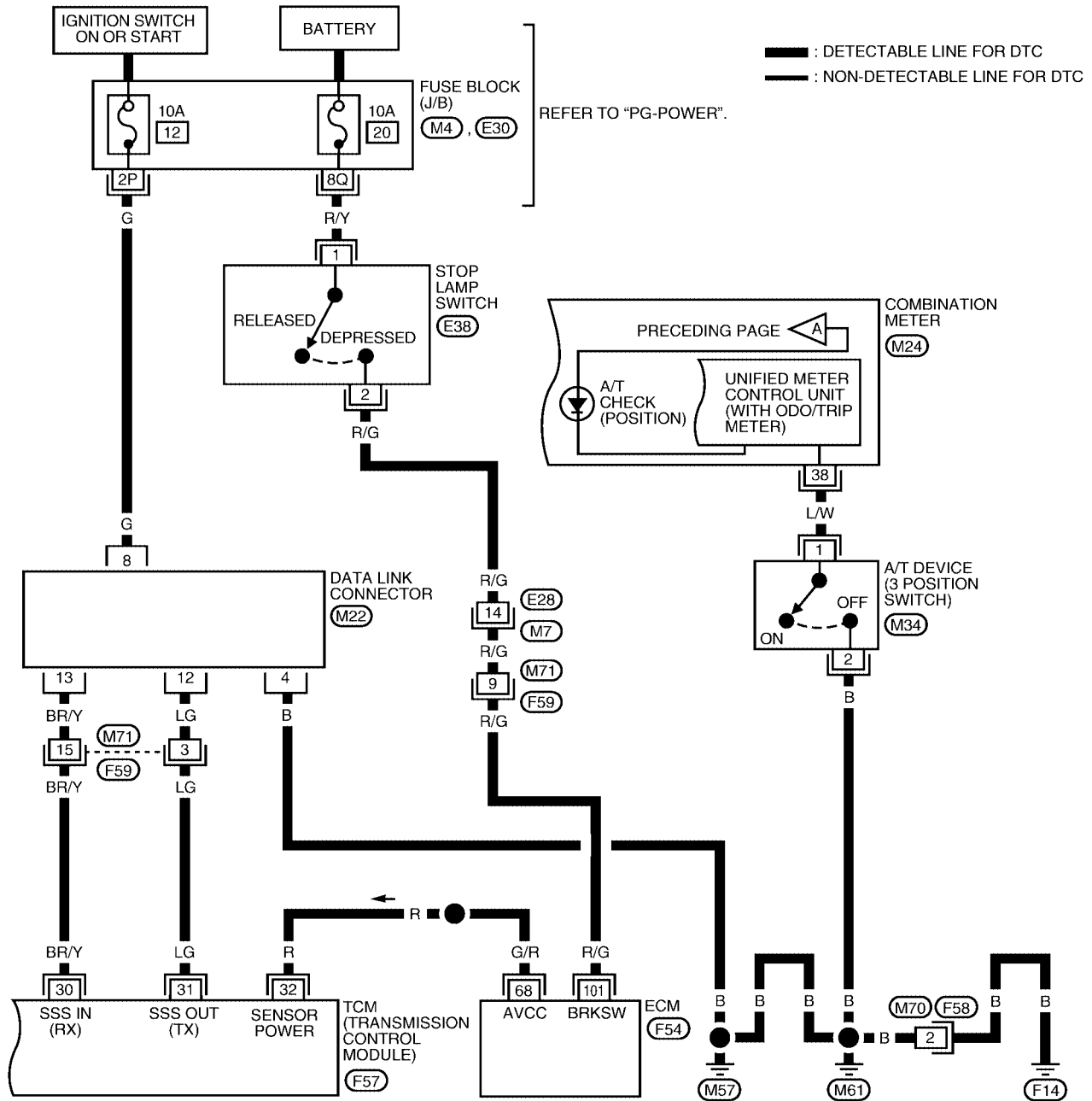
TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|-------------------------------|--|-----------------|
| 26 | PU/W | PNP SWITCH 1 POSITION | IGNITION ON AND SELECTOR LEVER IN 1 POSITION | BATTERY VOLTAGE |
| | | | IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS | 0V |
| 27 | P/B | PNP SWITCH 2 POSITION | IGNITION ON AND SELECTOR LEVER IN 2 POSITION | BATTERY VOLTAGE |
| | | | IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS | 0V |
| 34 | G | PNP SWITCH D POSITION | IGNITION ON AND SELECTOR LEVER IN D POSITION | BATTERY VOLTAGE |
| | | | IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS | 0V |
| 35 | G/W | PNP SWITCH R POSITION | IGNITION ON AND SELECTOR LEVER IN R POSITION | BATTERY VOLTAGE |
| | | | IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS | 0V |
| 36 | R/B | PNP SWITCH P OR N POSITION | IGNITION ON AND SELECTOR LEVER IN P OR N POSITION | BATTERY VOLTAGE |
| | | | IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS | 0V |

TROUBLE DIAGNOSIS FOR SYMPTOMS

[RE4F04B]

AT-NONDTC-02



BCWA0151E

TROUBLE DIAGNOSIS FOR SYMPTOMS

[RE4F04B]

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

| TERMINAL | WIRE COLOR | ITEM | CONDITION | DATA (APPROX.) |
|----------|------------|---------------------|---------------------|----------------|
| 30 | BR/Y | DATA LINK CONNECTOR | — | — |
| 31 | LG | DATA LINK CONNECTOR | — | — |
| 32 | R | SENSOR POWER | IGNITION SWITCH ON | 4.5 - 5.5V |
| | | | IGNITION SWITCH OFF | 0V |

1. A/T Check (Position) Indicator Lamp Does Not Come On

SYMPTOM:

A/T check (position) indicator lamp does not come on for about 2 seconds when turning ignition switch to ON.

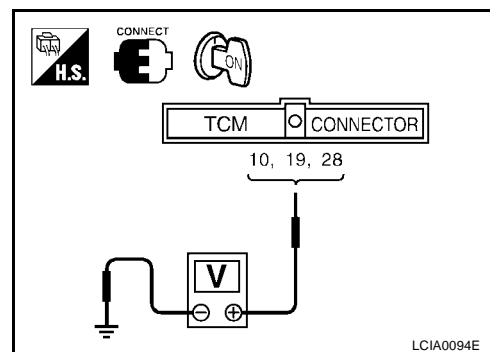
1. CHECK TCM POWER SOURCE

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

Voltage : **Battery voltage**

OK or NG

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



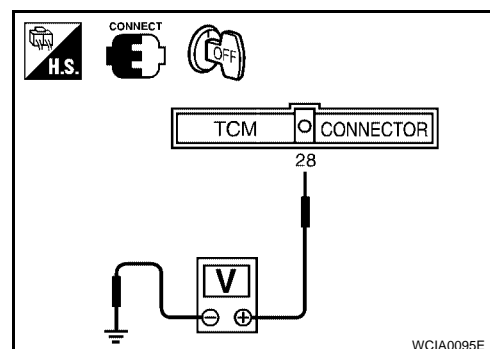
2. CHECK POWER SOURCE STEP 2

- Turn ignition switch to OFF position.
- Check voltage between TCM terminal 28 (Y/R) and ground.

Voltage : **Battery voltage**

OK or NG

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



3. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between ignition switch and TCM (Main harness)
Refer to [AT-102, "Wiring Diagram — AT — MAIN"](#) .
- Ignition switch and fuse
Refer to [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#) .

OK or NG

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

4. CHECK TCM GROUND CIRCUIT

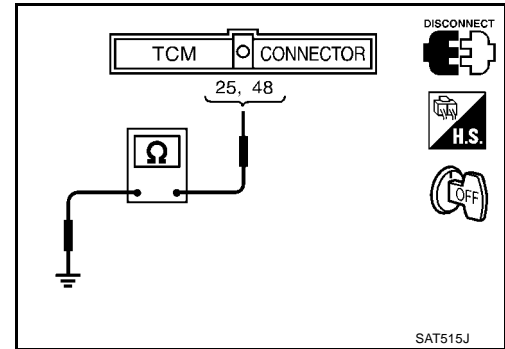
1. Turn ignition switch to OFF position.
2. Disconnect TCM harness connector.
3. Check continuity between TCM harness connector terminals 25, 48 and ground.

Continuity should exist.

OK or NG

OK >> GO TO 5.

NG >> Repair open circuit or short to ground or short to power in harness or connectors. Refer to [AT-102, "Wiring Diagram — AT — MAIN"](#) .



5. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness and fuse for short or open between ignition switch and A/T check (position) indicator lamp (Main harness)
Refer to [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#) .
- Harness for short or open between A/T check (position) indicator lamp and TCM

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

6. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 8.

7. CHECK TCM INSPECTION

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

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

2. Engine Cannot Be Started In P and N Position

SYMPTOM:

- Engine cannot be started with selector lever in P or N position.
- Engine can be started with selector lever in D, 2, 1 or R position.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT

With CONSULT-II

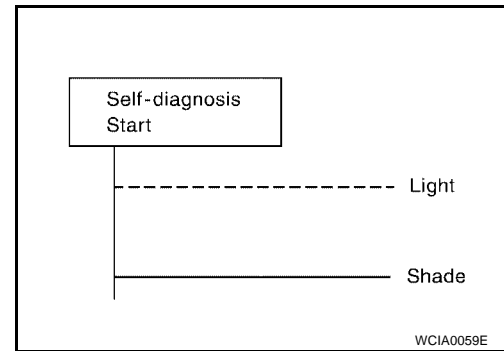
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

- Yes >> Check park/neutral position (PNP) switch circuit. Refer to [AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#).
- No >> GO TO 2.



2. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH

Check for short or open of park/neutral position (PNP) switch harness connector terminals 1 and 2. Refer to [SC-16, "DIAGNOSTIC PROCEDURE 2"](#).

OK or NG

- OK >> GO TO 3.
- NG >> Repair or replace park/neutral position (PNP) switch.

3. CHECK STARTING SYSTEM

Check starting system. Refer to [SC-14, "WORK FLOW"](#).

OK or NG

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

3. In P Position, Vehicle Moves Forward or Backward When Pushed

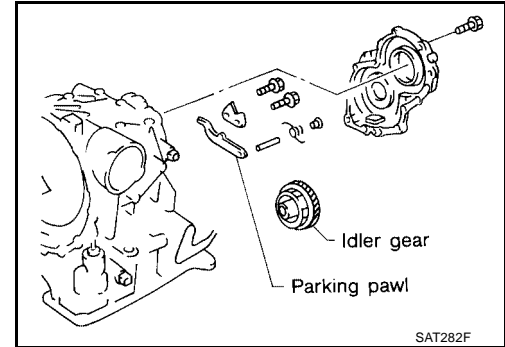
ECS0099W

SYMPTOM:

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

1. CHECK PARKING COMPONENTSCheck parking components. Refer to [AT-275, "OVERHAUL"](#) and [AT-280, "DISASSEMBLY"](#).**OK or NG**

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



4. In N Position, Vehicle Moves**SYMPTOM:**

Vehicle moves forward or backward when selecting N position.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT**④ With CONSULT-II**

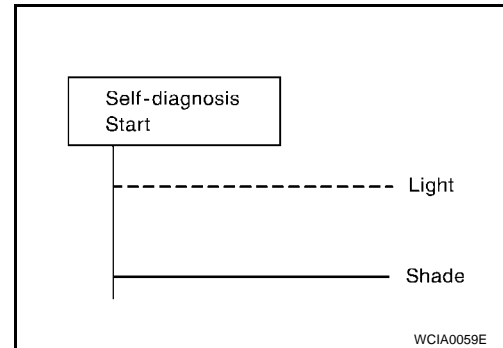
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

⊗ Without CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

- Yes >> Check park/neutral position (PNP) switch circuit. Refer to [AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#).
- No >> GO TO 2.

**2. CHECK CONTROL LINKAGE**

Check control cable. Refer to [AT-264, "Control Cable"](#).

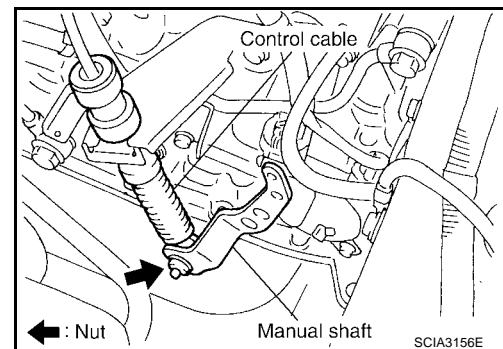
OK or NG

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

3. ADJUST CONTROL CABLE

Adjust control cable.

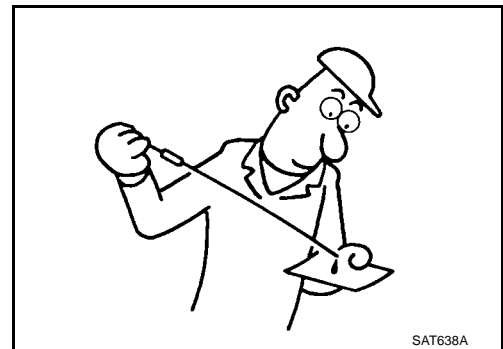
- >> Refer to [AT-268, "Control Cable Adjustment"](#).

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

Check A/T fluid level again.

OK or NG

- OK >> GO TO 5.
- NG >> Refill ATF.

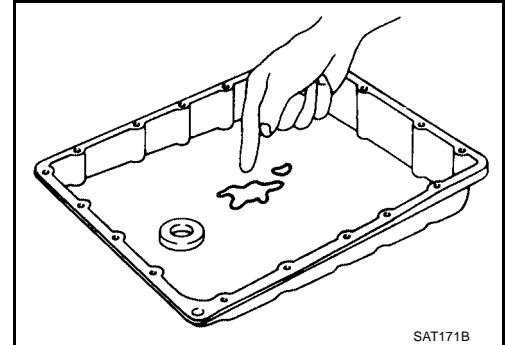


5. CHECK A/T FLUID CONDITION

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

OK or NG

- OK >> GO TO 7.
 NG >> GO TO 6.

**6. DETECT MALFUNCTIONING ITEM**

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

OK or NG

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

7. CHECK SYMPTOM

Check again.

OK or NG

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

8. CHECK TCM INSPECTION

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

OK or NG

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

5. Large Shock. N → R Position

SYMPTOM:

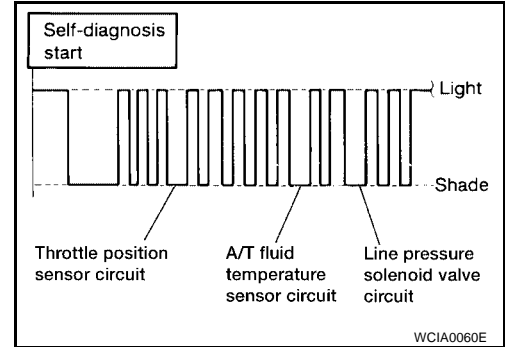
There is large shock when changing from N to R position.

1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to A/T fluid temperature sensor, line pressure solenoid valve or throttle position sensor [accelerator pedal position (APP) sensor] circuit?

Yes or No

- Yes >> GO TO 2.
No >> GO TO 3.



2. CHECK DAMAGED CIRCUIT

Check damaged circuit.

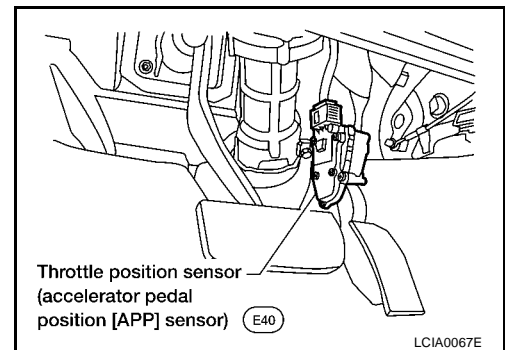
- >> Refer to [AT-111, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT"](#) , [AT-161, "DTC P0745 LINE PRESSURE SOLENOID VALVE"](#) or [AT-177, "DTC P1705 THROTTLE POSITION SENSOR \[ACCELERATOR PEDAL POSITION \(APP\) SENSOR\]"](#) .

3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to [EC-204, "DTC P0122, P0123 TP SENSOR"](#) and [EC-542, "DTC P2122, P2123 APP SENSOR"](#) .

OK or NG

- OK >> GO TO 4.
NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

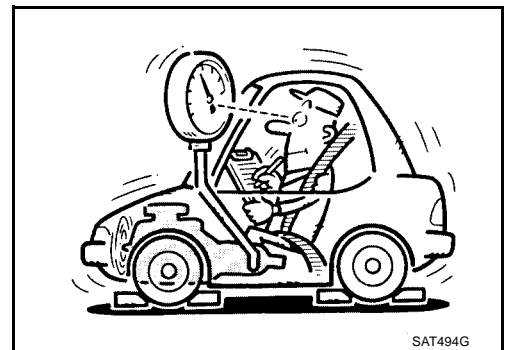


4. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in D position. Refer to [AT-71, "Line Pressure Test"](#) .

OK or NG

- OK >> GO TO 6.
NG >> GO TO 5.



5. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
 - Line pressure solenoid valve

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

7. CHECK TCM INSPECTION

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

OK or NG

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

6. Vehicle Does Not Creep Backward In R Position**SYMPTOM:**

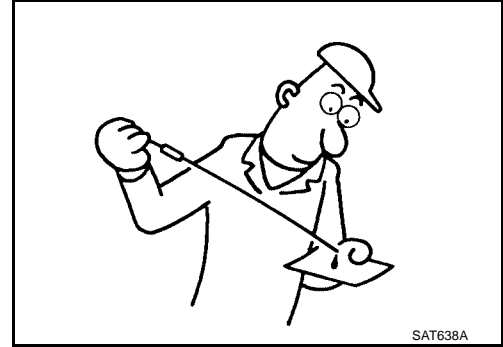
Vehicle does not creep backward when selecting R position.

1. CHECK A/T FLUID LEVEL

Check A/T fluid level again.

OK or NG

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



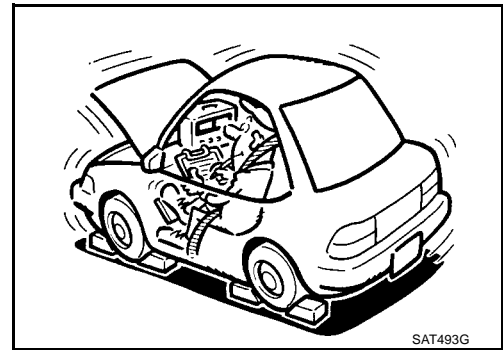
SAT638A

2. CHECK STALL REVOLUTION

Check stall revolution with selector lever in 1 and R positions.

OK or NG

- OK >> GO TO 5.
 OK in 1 position, NG in R position >> GO TO 3.
 NG in both 1 and R positions >> GO TO 4.



SAT493G

3. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#).
2. Check the following items:
 - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
 - Line pressure solenoid valve
3. Disassemble A/T.
4. Check the following items:
 - Oil pump assembly
 - Torque converter
 - Reverse clutch assembly
 - High clutch assembly

OK or NG

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

4. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
 - Line pressure solenoid valve
3. Disassemble A/T.
4. Check the following items:
 - Oil pump assembly
 - Torque converter
 - Reverse clutch assembly
 - High clutch assembly
 - Low & reverse brake assembly
 - Low one-way clutch

OK or NG

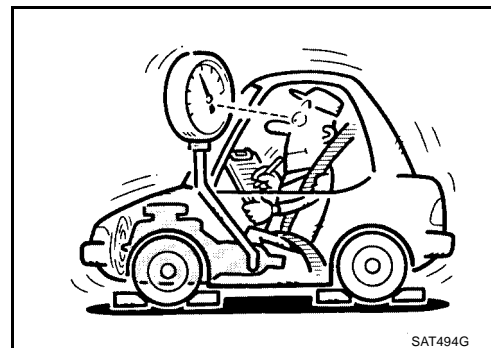
- OK >> GO TO 5.
 NG >> Repair or replace damaged parts.

5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in R position. Refer to [AT-71, "Line Pressure Test"](#) .

OK or NG

- OK >> GO TO 7.
 NG >> GO TO 6.



SAT494G

6. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
 - Line pressure solenoid valve
3. Disassemble A/T.
4. Check the following item:
 - Oil pump assembly

OK or NG

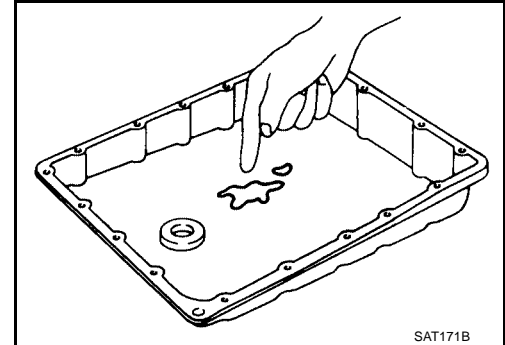
- OK >> GO TO 7.
 NG >> Repair or replace damaged parts.

7. CHECK A/T FLUID CONDITION

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

OK or NG

- OK >> GO TO 9.
 NG >> GO TO 8.

**8. DETECT MALFUNCTIONING ITEM**

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#).
2. Check the following items:
 - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
 - Line pressure solenoid valve
3. Disassemble A/T.
4. Check the following items:
 - Oil pump assembly
 - Torque converter
 - Reverse clutch assembly
 - High clutch assembly
 - Low & reverse brake assembly
 - Low one-way clutch

OK or NG

- OK >> GO TO 9.
 NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again.

OK or NG

- OK >> **INSPECTION END**
 NG >> GO TO 10.

10. CHECK TCM INSPECTION

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

OK or NG

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

7. Vehicle Does Not Creep Forward in D, 3, 2 or 1 Position

SYMPTOM:

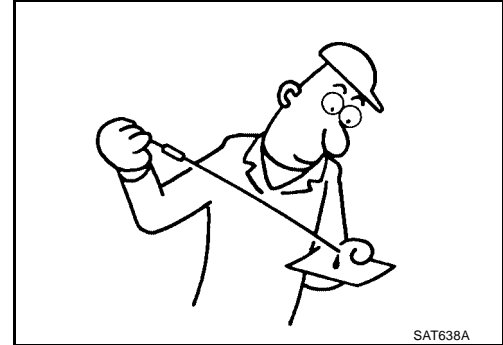
Vehicle does not creep forward when selecting D, 3, 2 or 1 position.

1. CHECK A/T FLUID LEVEL

Check A/T fluid level again.

OK or NG

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



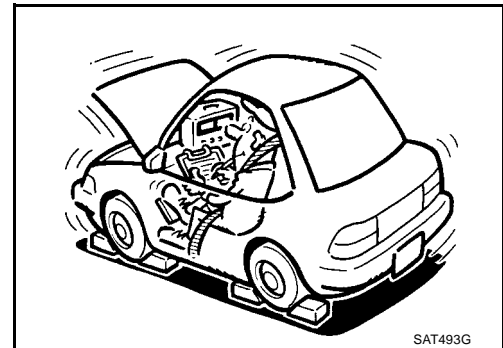
SAT638A

2. CHECK STALL REVOLUTION

Check stall revolution with selector lever in D position. Refer to [AT-68, "Stall Test"](#).

OK or NG

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



SAT493G

3. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#).
2. Check the following items:
 - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
 - Line pressure solenoid valve
3. Disassemble A/T.
4. Check the following items:
 - Oil pump assembly
 - Forward clutch assembly
 - Forward one-way clutch
 - Low one-way clutch
 - Low & reverse brake assembly
 - Torque converter

OK or NG

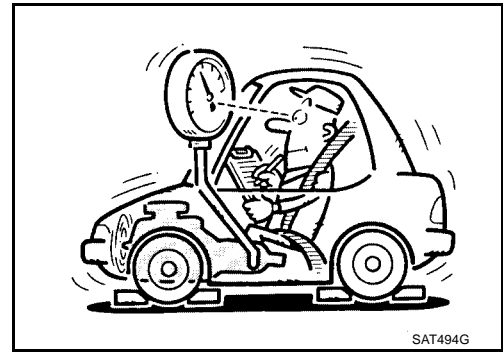
- OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in D position. Refer to [AT-71, "Line Pressure Test"](#) .

OK or NG

- OK >> GO TO 6.
- NG >> GO TO 5.

**5. DETECT MALFUNCTIONING ITEM**

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
 - Line pressure solenoid valve
3. Disassemble A/T.
4. Check the following item:
 - Oil pump assembly

OK or NG

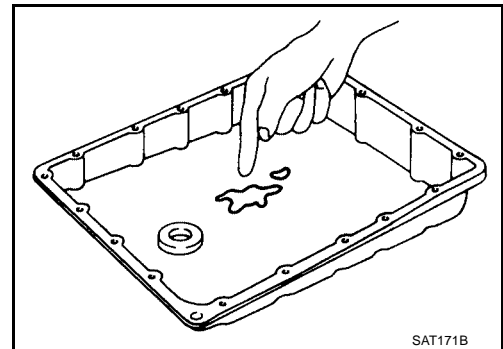
- OK >> GO TO 6.
- NG >> Repair or replace damaged parts.

6. CHECK A/T FLUID CONDITION

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

OK or NG

- OK >> GO TO 8.
- NG >> GO TO 7.



7. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
 - Line pressure solenoid valve
3. Disassemble A/T.
4. Check the following items:
 - Oil pump assembly
 - Forward clutch assembly
 - Forward one-way clutch
 - Low one-way clutch
 - Low & reverse brake assembly
 - Torque converter

OK or NG

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

8. CHECK SYMPTOM

Check again.

OK or NG

- OK >> **INSPECTION END**
NG >> GO TO 9.

9. CHECK TCM INSPECTION

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

OK or NG

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

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

Vehicle cannot be started from D1 on Cruise test — Part 1.

1. CHECK SYMPTOM

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

Yes or No

Yes >> GO TO 2.

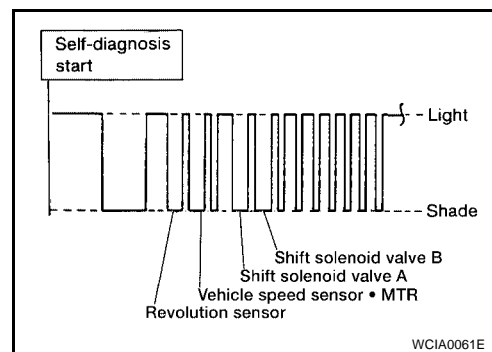
No >> Go to [AT-223, "6. Vehicle Does Not Creep Backward In R Position"](#).**2. CHECK SELF-DIAGNOSTIC RESULTS**

Does self-diagnosis show damage to vehicle speed sensor-A/T (revolution sensor), shift solenoid valve A, B or vehicle speed sensor-MTR after cruise test?

Yes or No

Yes >> Check damaged circuit. Refer to [AT-117, "DTC P0720 VEHICLE SPEED SENSOR-A/T \(REVOLUTION SENSOR\)"](#), [AT-167, "DTC P0750 SHIFT SOLENOID VALVE A"](#), [AT-172, "DTC P0755 SHIFT SOLENOID VALVE B"](#) or [AT-199, "DTC VEHICLE SPEED SENSOR MTR"](#).

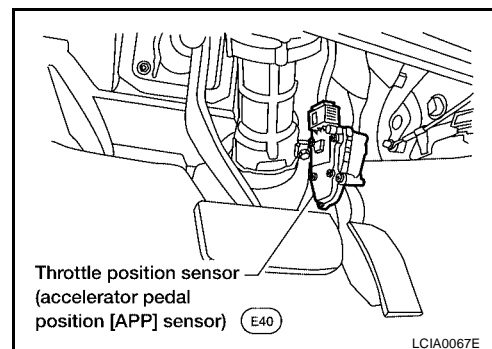
No >> GO TO 3.

**3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]**Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to [EC-204, "DTC P0122, P0123 TP SENSOR"](#) and [EC-542, "DTC P2122, P2123 APP SENSOR"](#).

OK or NG

OK >> GO TO 4.

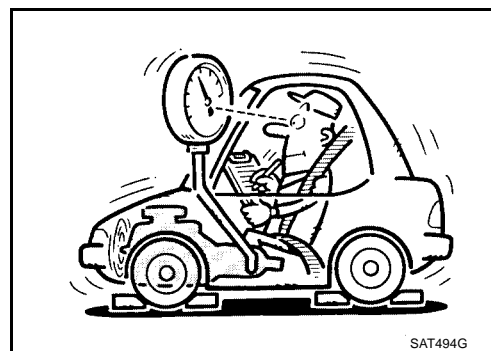
NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

**4. CHECK LINE PRESSURE**Check line pressure at stall point with selector lever in D position. Refer to [AT-71, "Line Pressure Test"](#).

OK or NG

OK >> GO TO 6.

NG >> GO TO 5.



5. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Shift valve A
 - Shift valve B
 - Shift solenoid valve A
 - Shift solenoid valve B
 - Pilot valve
 - Pilot filter
3. Disassemble A/T.
4. Check the following items:
 - Forward clutch assembly
 - Forward one-way clutch
 - Low one-way clutch
 - High clutch assembly
 - Torque converter
 - Oil pump assembly

OK or NG

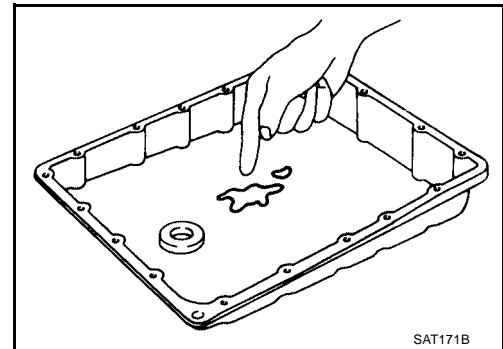
- OK >> GO TO 8.
 NG >> Repair or replace damaged parts.

6. CHECK A/T FLUID CONDITION

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

OK or NG

- OK >> GO TO 7.
 NG >> GO TO 5.

**7. DETECT MALFUNCTIONING ITEM**

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Shift valve A
 - Shift valve B
 - Shift solenoid valve A
 - Shift solenoid valve B
 - Pilot valve
 - Pilot filter

OK or NG

- OK >> GO TO 8.
 NG >> Repair or replace damage parts.

8. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 9.

9. CHECK TCM INSPECTION

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

OK or NG

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

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

A/T does not shift from D1 to D2 at the specified speed.

A/T does not shift from D4 to D2 when depressing accelerator pedal fully at the specified speed.

1. CHECK SYMPTOM

Are "7. Vehicle Does Not Creep Forward In D, 3, 2 Or 1 Position" and "8. Vehicle Cannot Be Started From D1" OK?

Yes or No

Yes >> GO TO 2.

No >> Go to [AT-226, "7. Vehicle Does Not Creep Forward in D, 3, 2 or 1 Position"](#) and [AT-229, "8. Vehicle Cannot Be Started From D1"](#).

2. CHECK SELF-DIAGNOSTIC RESULTS**Ⓜ With CONSULT-II**

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

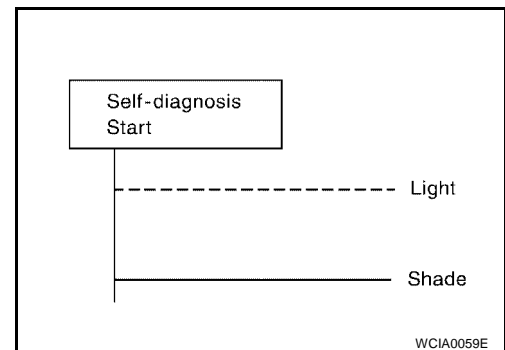
ⓧ Without CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

Yes >> Check park/neutral position (PNP) switch circuit. Refer to [AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#).

No >> GO TO 3.

**3. CHECK VEHICLE SPEED SENSOR-A/T AND VEHICLE SPEED SENSOR-MTR CIRCUIT**

Check vehicle speed sensor-A/T (revolution sensor) and vehicle speed sensor-MTR circuit. Refer to [AT-117, "DTC P0720 VEHICLE SPEED SENSOR-A/T \(REVOLUTION SENSOR\)"](#) and [AT-199, "DTC VEHICLE SPEED SENSOR MTR"](#).

OK or NG

OK >> GO TO 4.

NG >> Repair or replace vehicle speed sensor-A/T (revolution sensor) and vehicle speed sensor-MTR circuits.

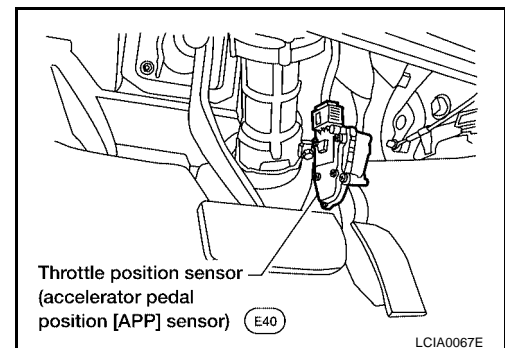
4. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to [EC-204, "DTC P0122, P0123 TP SENSOR"](#) and [EC-542, "DTC P2122, P2123 APP SENSOR"](#).

OK or NG

OK >> GO TO 5.

NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

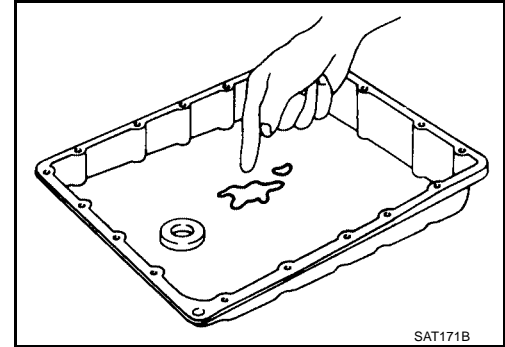


5. CHECK A/T FLUID CONDITION

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

OK or NG

- OK >> GO TO 7.
 NG >> GO TO 6.

**6. DETECT MALFUNCTIONING ITEM**

1. Remove control valve. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Shift valve A
 - Shift solenoid valve A
 - Pilot valve
 - Pilot filter
3. Disassemble A/T.
4. Check the following items:
 - Servo piston assembly
 - Brake band
 - Oil pump assembly

OK or NG

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

7. DETECT MALFUNCTIONING ITEM

1. Remove control valve. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Shift valve A
 - Shift solenoid valve A
 - Pilot valve
 - Pilot filter

OK or NG

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

8. CHECK SYMPTOM

Check again.

OK or NG

- OK >> **INSPECTION END**
 NG >> GO TO 9.

9. CHECK TCM INSPECTION

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

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

10. A/T Does Not Shift: D2 → D3**SYMPTOM:**

A/T does not shift from D2 to D3 at the specified speed.

1. CHECK SYMPTOM

Are 7. Vehicle Does Not Creep Forward In D, 3, 2 or 1 Position and 8. Vehicle Cannot Be Started From D1 OK?

Yes or No

Yes >> GO TO 2.

No >> Go to [AT-226, "7. Vehicle Does Not Creep Forward in D, 3, 2 or 1 Position"](#) and [AT-229, "8. Vehicle Cannot Be Started From D1"](#).

2. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT**With CONSULT-II**

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

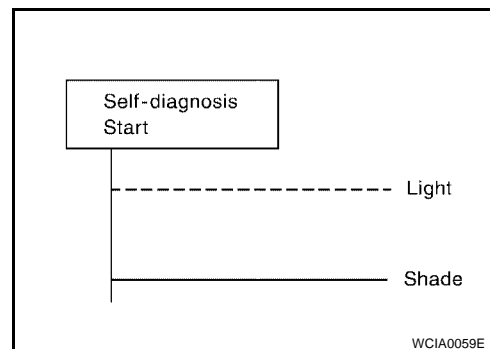
Without CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

Yes >> Check park/neutral position (PNP) switch circuit. Refer to [AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#).

No >> GO TO 3.

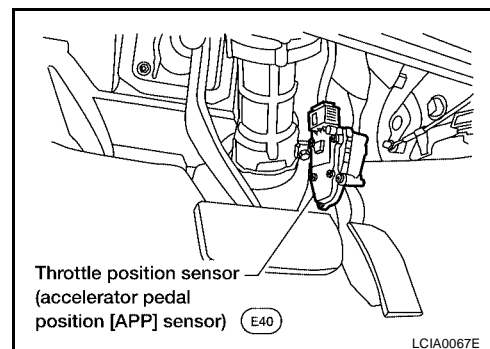
**3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]**

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to [EC-204, "DTC P0122, P0123 TP SENSOR"](#) and [EC-542, "DTC P2122, P2123 APP SENSOR"](#).

OK or NG

OK >> GO TO 4.

NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

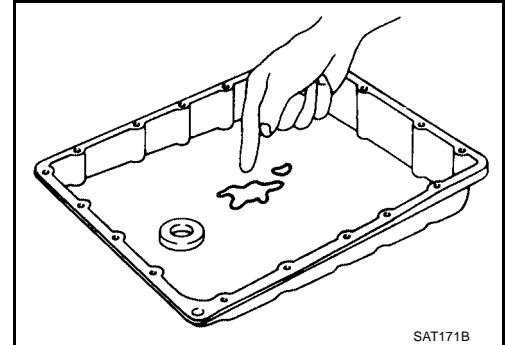


4. CHECK A/T FLUID CONDITION

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

OK or NG

- OK >> GO TO 6.
 NG >> GO TO 5.



5. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#).
2. Check the following items:
 - Shift valve B
 - Shift solenoid valve B
 - Pilot valve
 - Pilot filter
3. Disassemble A/T.
4. Check the following items:
 - Servo piston assembly
 - High clutch assembly
 - Oil pump assembly

OK or NG

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

6. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#).
2. Check the following items:
 - Shift valve B
 - Shift solenoid valve B
 - Pilot valve
 - Pilot filter

OK or NG

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

7. CHECK SYMPTOM

Check again.

OK or NG

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

8. CHECK TCM INSPECTION

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

OK or NG

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

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11. A/T Does Not Shift: D3 → D4

SYMPTOM:

- A/T does not shift from D3 to D4 at the specified speed.
- A/T must be warm before D3 to D4 shift will occur.

1. CHECK SYMPTOM

Are "7. Vehicle Does Not Creep Forward In D, 3, 2 or 1 Position" and "8. Vehicle Cannot Be Started From D1" OK?

Yes or No

Yes >> GO TO 2.

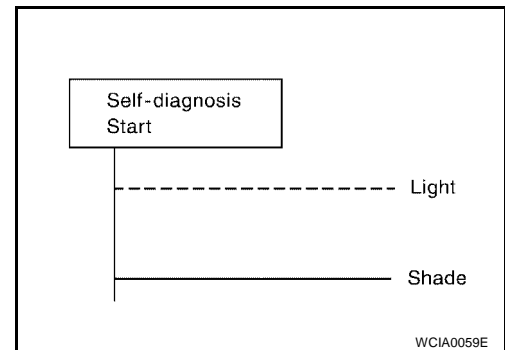
No >> Go to [AT-226, "7. Vehicle Does Not Creep Forward in D, 3, 2 or 1 Position"](#) and [AT-229, "8. Vehicle Cannot Be Started From D1"](#).

2. CHECK SELF-DIAGNOSTIC RESULTS

Ⓜ With CONSULT-II

Does self-diagnosis, after cruise test, show damage to any of the following circuits?

- Park/neutral position (PNP) switch
- Overdrive control switch
- A/T fluid temperature sensor
- Vehicle speed sensor-A/T (revolution sensor)
- Shift solenoid valve A or B

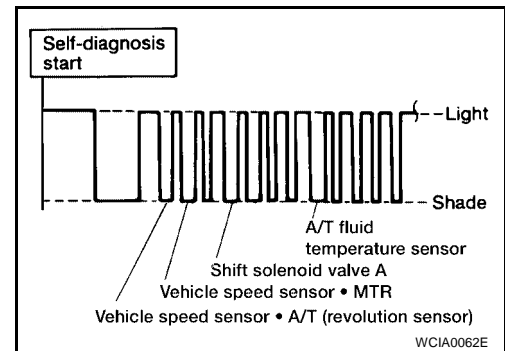


- Vehicle speed sensor-MTR

Yes or No

Yes >> Check damaged circuit. Refer to [AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#), [AT-111, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT"](#), [AT-117, "DTC P0720 VEHICLE SPEED SENSOR-A/T \(REVOLUTION SENSOR\)"](#), [AT-167, "DTC P0750 SHIFT SOLENOID VALVE A"](#), [AT-172, "DTC P0755 SHIFT SOLENOID VALVE B"](#) or [AT-199, "DTC VEHICLE SPEED SENSOR MTR"](#).

No >> GO TO 3.



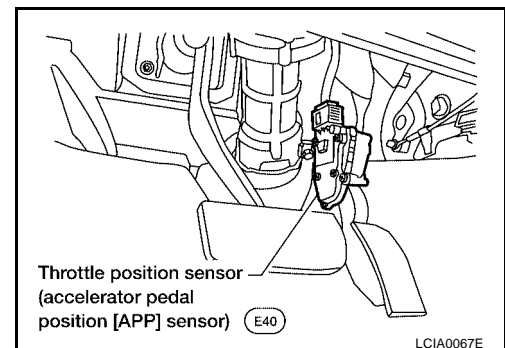
3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to [EC-204, "DTC P0122, P0123 TP SENSOR"](#) and [EC-542, "DTC P2122, P2123 APP SENSOR"](#).

OK or NG

OK >> GO TO 4.

NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

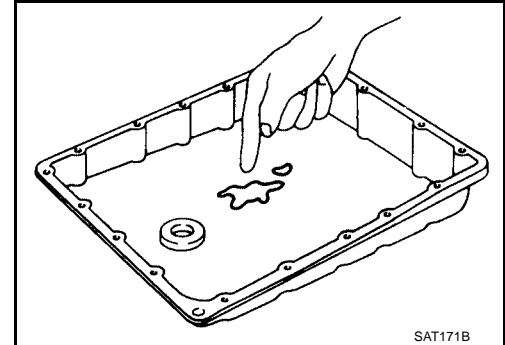


4. CHECK A/T FLUID CONDITION

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

OK or NG

- OK >> GO TO 6.
 NG >> GO TO 5.

**5. DETECT MALFUNCTIONING ITEM**

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#).
2. Check the following items:
 - Shift valve B
 - Overrun clutch control valve
 - Shift solenoid valve B
 - Pilot valve
 - Pilot filter
3. Disassemble A/T.
4. Check the following items:
 - Servo piston assembly
 - Brake band
 - Torque converter
 - Oil pump assembly

OK or NG

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

6. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#).
2. Check the following items:
 - Shift valve B
 - Overrun clutch control valve
 - Shift solenoid valve B
 - Pilot valve
 - Pilot filter

OK or NG

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

7. CHECK SYMPTOM

Check again.

OK or NG

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

8. CHECK TCM INSPECTION

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

OK or NG

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

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

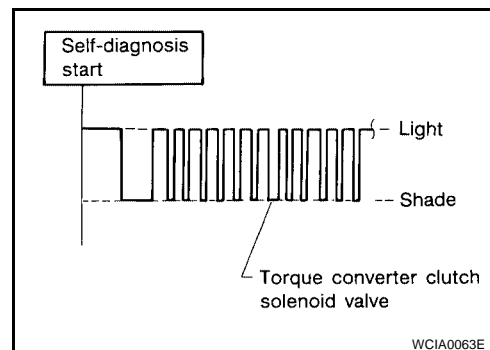
A/T does not perform lock-up at the specified speed.

1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to torque converter clutch solenoid valve circuit after cruise test?

Yes or No

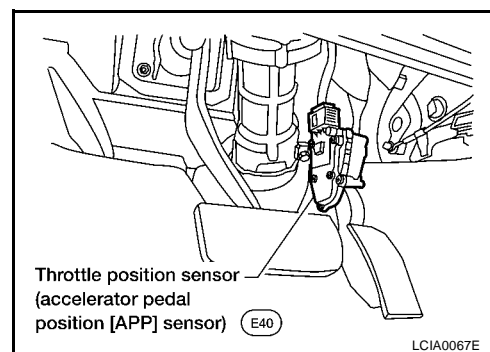
- Yes >> Check torque converter clutch solenoid valve circuit.
Refer to [AT-148, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"](#) .
- No >> GO TO 2.

**2. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]**

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to [EC-204, "DTC P0122, P0123 TP SENSOR"](#) and [EC-542, "DTC P2122, P2123 APP SENSOR"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

**3. DETECT MALFUNCTIONING ITEM**

1. Remove control valve. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check following items:
 - Torque converter clutch control valve
 - Torque converter relief valve
 - Torque converter clutch solenoid valve
 - Pilot valve
 - Pilot filter

OK or NG

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

4. CHECK SYMPTOM

Check again.

OK or NG

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

5. CHECK TCM INSPECTION

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

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

13. A/T Does Not Hold Lock-up Condition**SYMPTOM:**

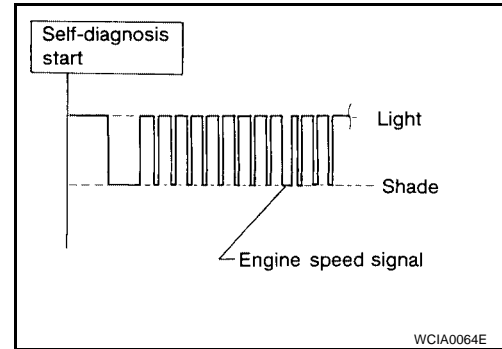
A/T does not hold lock-up condition for more than 30 seconds.

1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to engine speed signal circuit after cruise test?

Yes or No

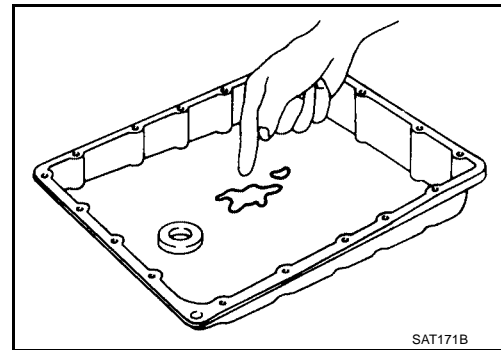
- Yes >> Check engine speed signal circuit. Refer to [AT-122](#), "[DTC P0725 ENGINE SPEED SIGNAL](#)".
- No >> GO TO 2.

**2. CHECK A/T FLUID CONDITION**

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

OK or NG

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

**3. DETECT MALFUNCTIONING ITEM**

1. Remove control valve assembly. Refer to [AT-265](#), "[Control Valve Assembly and Accumulators](#)".
2. Check the following items:
 - Torque converter clutch control valve
 - Pilot valve
 - Pilot filter
3. Disassemble A/T.
4. Check torque converter and oil pump assembly.

OK or NG

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

4. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Torque converter clutch control valve
 - Pilot valve
 - Pilot filter

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 >> GO TO 6.

6. CHECK TCM INSPECTION

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

OK or NG

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

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

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

1. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR] CIRCUIT**With CONSULT-II**

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to throttle position sensor [accelerator pedal position (APP) sensor] circuit?

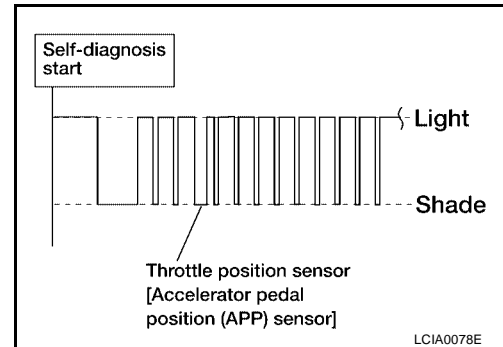
Without CONSULT-II

Does self-diagnosis show damage to throttle position sensor [accelerator pedal position (APP) sensor] circuit?

Yes or No

Yes >> Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to [EC-204, "DTC P0122, P0123 TP SENSOR"](#) and [EC-542, "DTC P2122, P2123 APP SENSOR"](#).

No >> GO TO 2.

**2. CHECK SYMPTOM**

Check again.

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 3.

3. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.

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

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

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

SYMPTOM:

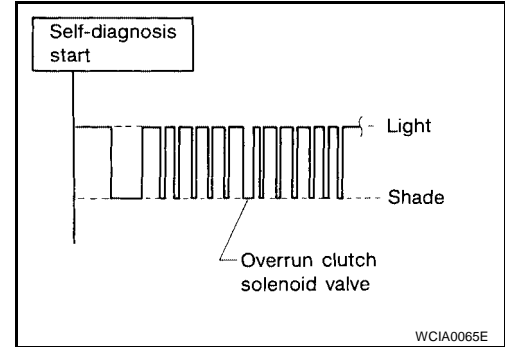
- Engine speed does not smoothly return to idle when A/T shifts from D4 to D3 .
- Vehicle does not decelerate by engine brake when A/T selector lever is in 3 position.
- Vehicle does not decelerate by engine brake when shifting A/T from D to 2 position.

1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to overrun clutch solenoid valve circuit after cruise test?

Yes or No

- Yes >> Check overrun clutch solenoid valve circuit. Refer to [AT-183. "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"](#) .
- No >> GO TO 2.

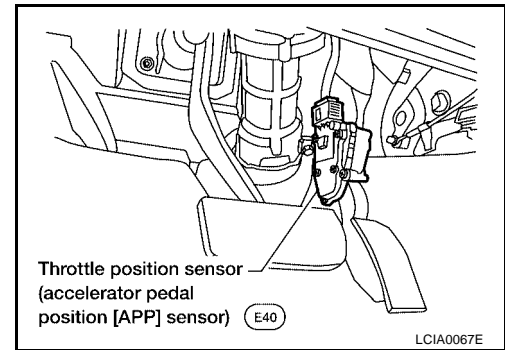


2. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to [EC-204. "DTC P0122, P0123 TP SENSOR"](#) and [EC-542. "DTC P2122, P2123 APP SENSOR"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

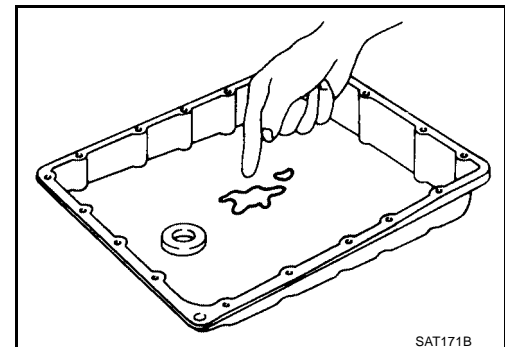


3. CHECK A/T FLUID CONDITION

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

OK or NG

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



4. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Overrun clutch control valve
 - Overrun clutch reducing valve
 - Overrun clutch solenoid valve
3. Disassemble A/T.
4. Check the following items:
 - Overrun clutch assembly
 - Oil pump assembly

OK or NG

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

5. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to [AT-265, "Control Valve Assembly and Accumulators"](#) .
2. Check the following items:
 - Overrun clutch control valve
 - Overrun clutch reducing valve
 - Overrun clutch solenoid valve

OK or NG

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

6. CHECK SYMPTOM

Check again.

OK or NG

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

7. CHECK TCM INSPECTION

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

OK or NG

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

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

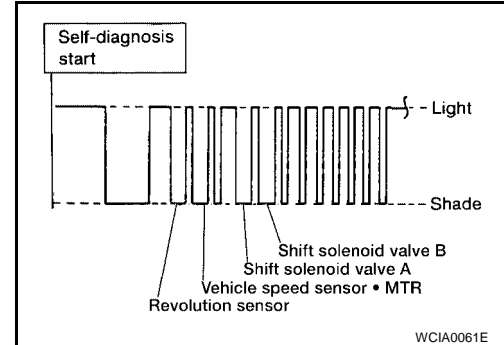
Vehicle does not start from D1 on Cruise test — Part 2.

1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to vehicle speed sensor-A/T (revolution sensor), shift solenoid valve A, B or vehicle speed sensor-MTR after cruise test?

Yes or No

- Yes >> Check damaged circuit. Refer to [AT-117, "DTC P0720 VEHICLE SPEED SENSOR-A/T \(REVOLUTION SENSOR\)"](#), [AT-167, "DTC P0750 SHIFT SOLENOID VALVE A"](#), [AT-172, "DTC P0755 SHIFT SOLENOID VALVE B"](#) or [AT-199, "DTC VEHICLE SPEED SENSOR MTR"](#).
- No >> GO TO 2.

**2. CHECK SYMPTOM**

Check again.

OK or NG

- OK >> Go to [AT-229, "8. Vehicle Cannot Be Started From D1"](#).
- NG >> GO TO 3.

3. CHECK TCM INSPECTION

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

OK or NG

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

17. A/T Does Not Shift: D4 → 3₃ , When A/T Selector Lever D → 3

ECS009AA

SYMPTOM:A/T does not shift from D4 to 3₃ when changing A/T selector lever from D → 3 position.**1. CHECK 3 POSITION SWITCH CIRCUIT****④ With CONSULT-II**

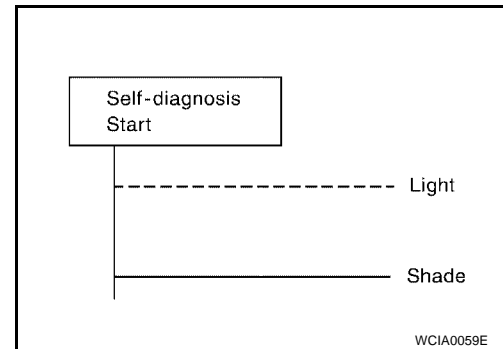
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to 3 position switch circuit?

⊗ Without CONSULT-II

Does self-diagnosis show damage to 3 position switch circuit?

Yes or No

- Yes >> Check 3 position switch circuit. Refer to [AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#) .
- No >> Go to [AT-235, "10. A/T Does Not Shift: D2 → D3"](#) .



18. A/T Does Not Shift: 33 → 22 , When Selector Lever 3 → 2 Position**SYMPTOM:**

A/T does not shift from 33 to 22 when changing selector lever from 3 to 2 position.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT**④ With CONSULT-II**

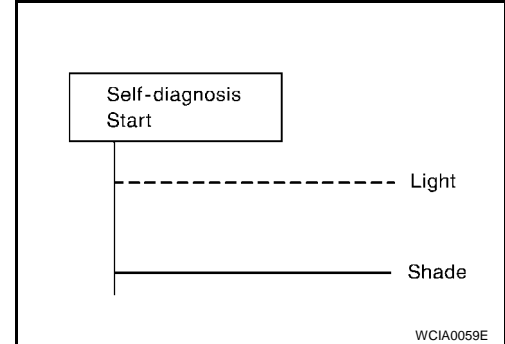
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

⊗ Without CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

- Yes >> Check park/neutral position (PNP) switch circuit. Refer to [AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#) .
- No >> Go to [AT-232, "9. A/T Does Not Shift: D1 → D2 or Does Not Kickdown: D4 → D2"](#) .



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

A/T does not shift from 22 to 11 when changing selector lever from 2 to 1 position.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT**With CONSULT-II**

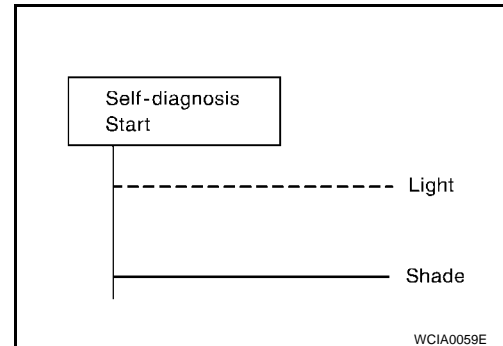
Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to park/neutral position (PNP) switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

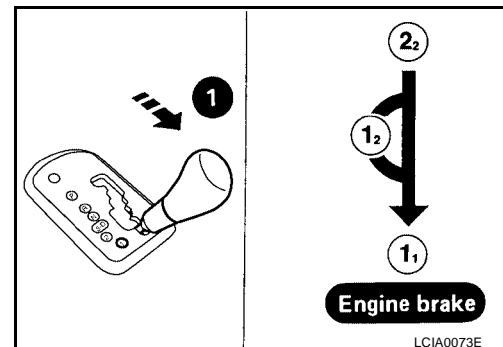
- Yes >> Check park/neutral position (PNP) switch circuit. Refer to [AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#).
- No >> GO TO 2.

**2. CHECK SYMPTOM**

Check again.

OK or NG

- OK >> **INSPECTION END**
- NG >> GO TO 3.

**3. CHECK TCM INSPECTION**

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

OK or NG

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

20. Vehicle Does Not Decelerate By Engine Brake

SYMPTOM:

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

1. CHECK SYMPTOM

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

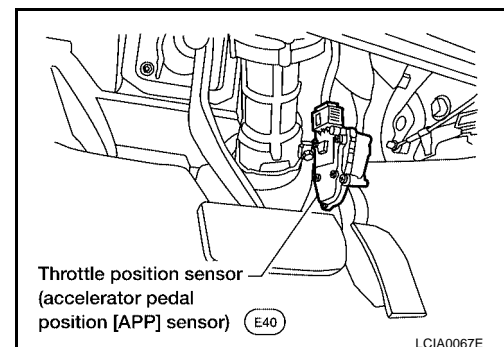
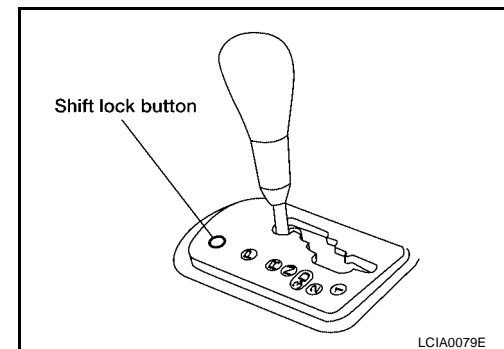
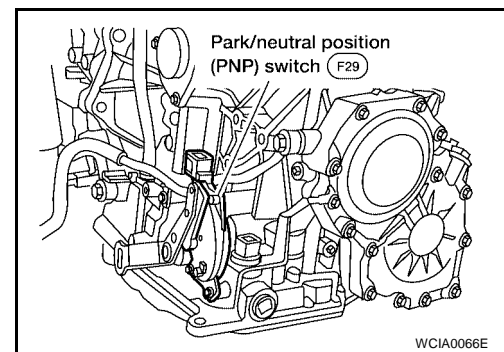
Yes or No

- Yes >> Go to [AT-246, "15. Engine Speed Does Not Return To Idle \(Light Braking D4 → D3\)"](#) .
 No >> Go to [AT-223, "6. Vehicle Does Not Creep Backward In R Position"](#) .

21. TCM Self-diagnosis Does Not Activate (PNP & 3 Position Switches Circuit Checks), and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor] Circuit Check

SYMPTOM:

A/T check (position) 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 transaxle range switch. The transaxle range switch detects the selector lever position and sends a signal to the TCM.
- 3 position switch

TROUBLE DIAGNOSIS FOR SYMPTOMS

[RE4F04B]

Detects the A/T selector lever in 3 position and sends a signal to the TCM.

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

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DIAGNOSTIC PROCEDURE

NOTE:

The diagnostic procedure includes inspection for the 3 position switch circuit.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITH CONSULT-II)

With CONSULT-II

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

OK or NG

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

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

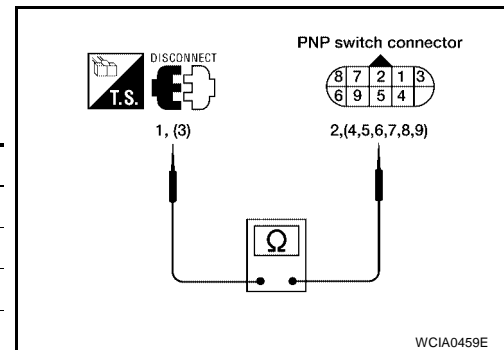
SAT701J

2. DETECT MALFUNCTIONING ITEM

Check the following items:

- Park/neutral position (PNP) switch
 - Check continuity between park/neutral position (PNP) switch F29 terminals 1 (G) and 2 (R/L) and between terminals 3 (GY) and 4 (PU/W), 5 (P/B), 6 (G), 7 (R/L), 8 (G/W) and 9 (GY/R) while moving manual shaft through each position.

| Lever position | Terminal No. | |
|----------------|--------------|-------|
| P | 3 - 7 | 1 - 2 |
| R | 3 - 8 | |
| N | 3 - 9 | 1 - 2 |
| D | 3 - 6 | |
| 2 | 3 - 5 | |
| 1 | 3 - 4 | |



- If NG, check again with manual control cable disconnected from manual shaft of A/T assembly. Refer to step a.
- If OK on step b, adjust manual control cable. Refer to [AT-268, "Control Cable Adjustment"](#) .
- If NG on step b, remove park/neutral position (PNP) switch from A/T and check continuity of park/neutral position (PNP) switch terminals. Refer to step a.
- If OK on step d, adjust park/neutral position (PNP) switch. Refer to [AT-267, "Park/Neutral Position \(PNP\) Switch Adjustment"](#) .
- If NG on step d, replace park/neutral position (PNP) switch.
- Harness for short or open between ignition switch and park/neutral position (PNP) switch (Main harness)
- Harness for short or open between park/neutral position (PNP) switch and TCM (Main harness)

OK or NG

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

3. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITHOUT CONSULT-II)**⊗ Without CONSULT-II**

1. Turn ignition switch to ON position. (Do not start engine.)
2. Check voltage between TCM terminals 26 (PU/W), 27 (P/B), 34 (G), 35 (G/W), 36 (R/B) and ground while moving selector lever through each position.

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

**Volt-
age:**

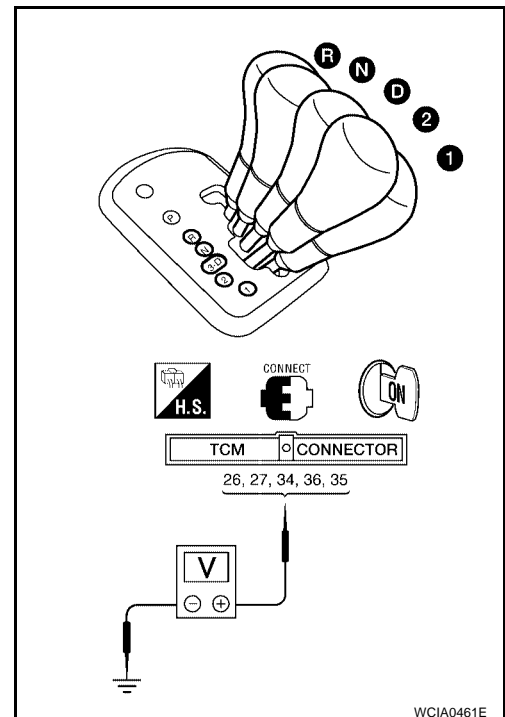
B : Battery voltage

0 : 0V

OK or NG

OK >> GO TO 6.

NG >> GO TO 4.



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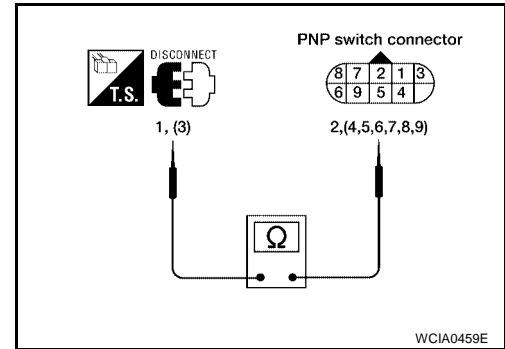
M

4. DETECT MALFUNCTIONING ITEM

Check the following items:

- Park/neutral position (PNP) switch
 - Check continuity between park/neutral position (PNP) switch terminals 1 (G) and 2 (R/L), and between terminals 3 (G/Y) and 4 (PU/W), 5 (P/B), 6 (G), 7 (R/L), 8 (G/W) and 9 (GY/R) while moving manual shaft through each position.

| Lever position | Terminal No. | |
|----------------|--------------|-------|
| P | 3 - 7 | 1 - 2 |
| R | 3 - 8 | |
| N | 3 - 9 | 1 - 2 |
| D | 3 - 6 | |
| 2 | 3 - 5 | |
| 1 | 3 - 4 | |



- If NG, check again with manual control cable disconnected from manual shaft of A/T assembly. Refer to step a.
- If OK on step b, adjust manual control cable. Refer to [AT-268, "Control Cable Adjustment"](#) .
- If NG on step b, remove park/neutral position (PNP) switch from A/T and check continuity of park/neutral position (PNP) switch terminals. Refer to step a.
- If OK on step d, adjust park/neutral position (PNP) switch. Refer to [AT-267, "Park/Neutral Position \(PNP\) Switch Adjustment"](#) .
- If NG on step d, replace park/neutral position (PNP) switch.
- Harness for short or open between ignition switch and park/neutral position (PNP) switch (Main harness)
- Harness for short or open between park/neutral position (PNP) switch and TCM (Main harness)

OK or NG

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

5. CHECK 3 POSITION SWITCH CIRCUIT (WITH CONSULT-II)

Ⓜ With CONSULT-II

1. Turn ignition switch to "ON" position.
(Do not start engine.)
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
3. Read out "OVERDRIVE SW".
Check the signal of the 3 position switch is indicated properly.
(Overdrive switch "ON" displayed on CONSULT-II means overdrive "OFF".)

OK or NG

- OK >> GO TO 7.
- NG >> GO TO 6.

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

6. DETECT MALFUNCTIONING ITEM

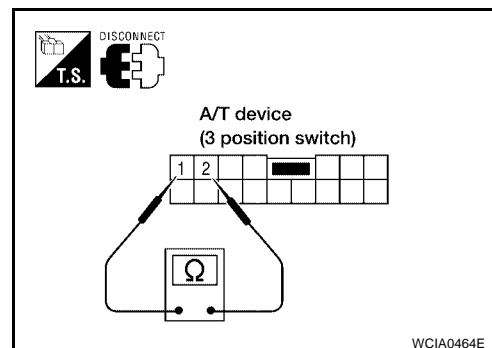
Check the following items:

- 3 position switch M34.
- Check for continuity between terminals 1 (L/W) and 2 (B) with selector lever in 3 position.
- Harness for short or open between meter and 3 position switch (Main harness)
- Harness of ground circuit for 3 position switch (Main harness) for short or open

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

**7. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]**

- Perform throttle position sensor [accelerator pedal position (APP) sensor] inspection. Refer to [AT-177, "DTC P1705 THROTTLE POSITION SENSOR \[ACCELERATOR PEDAL POSITION \(APP\) SENSOR\]"](#).

OK or NG

OK >> GO TO 8.

NG >> Repair or replace damaged parts.

8. CHECK TCM INSPECTION

1. Perform TCM input/output inspection. Refer to [AT-99, "TCM INSPECTION TABLE"](#)

OK or NG

OK >> **INSPECTION END**

NG >> Inspect TCM terminals and related wiring harnesses for damage or loose connections. Repair or replace damaged parts.

A/T SHIFT LOCK SYSTEM

PF3:34950

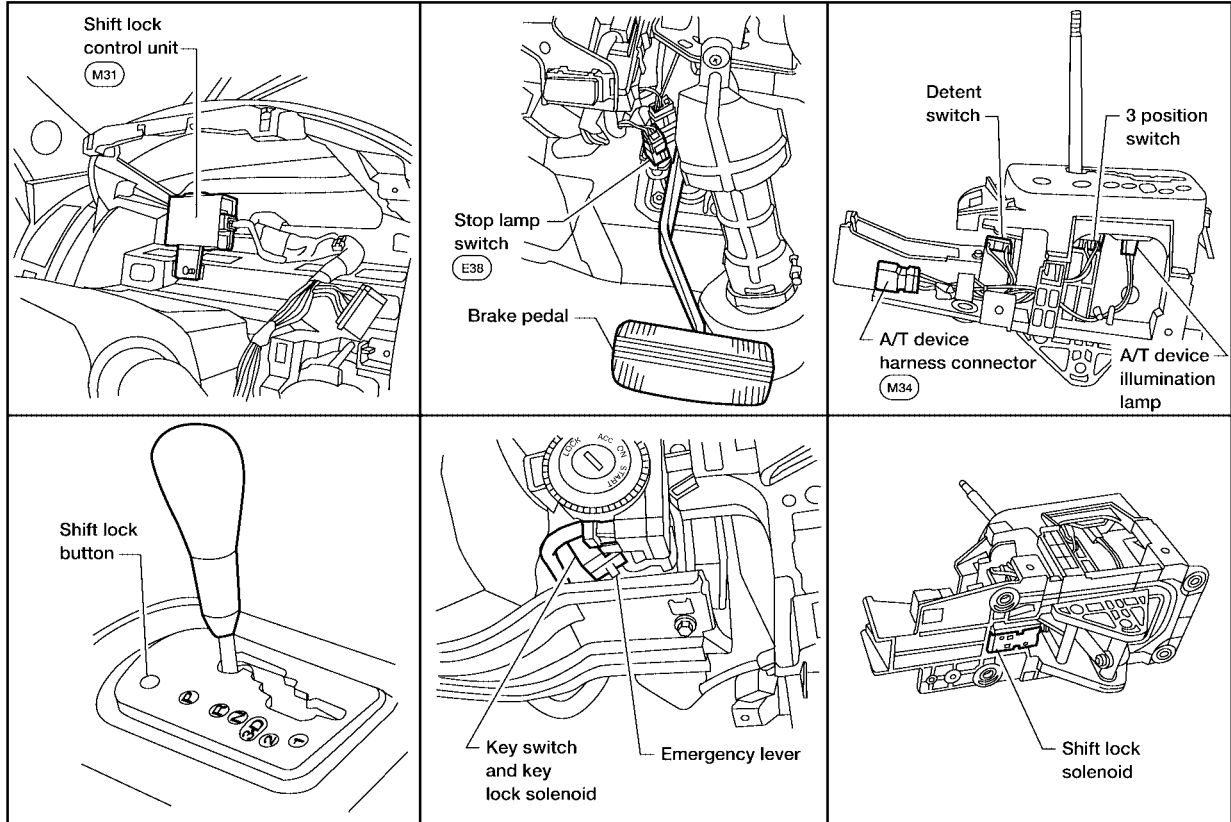
Description

ECS009AF

- 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

ECS009AG



LCIA0082E

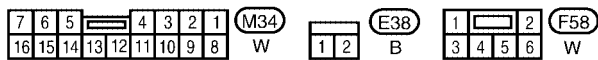
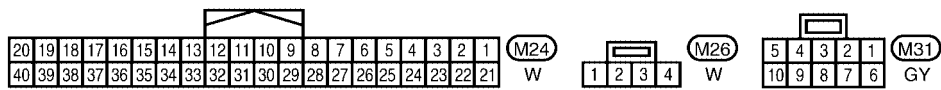
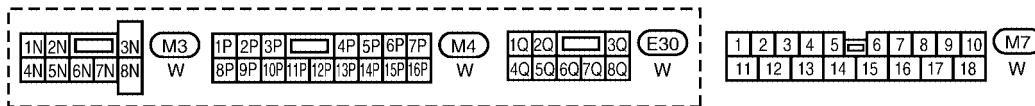
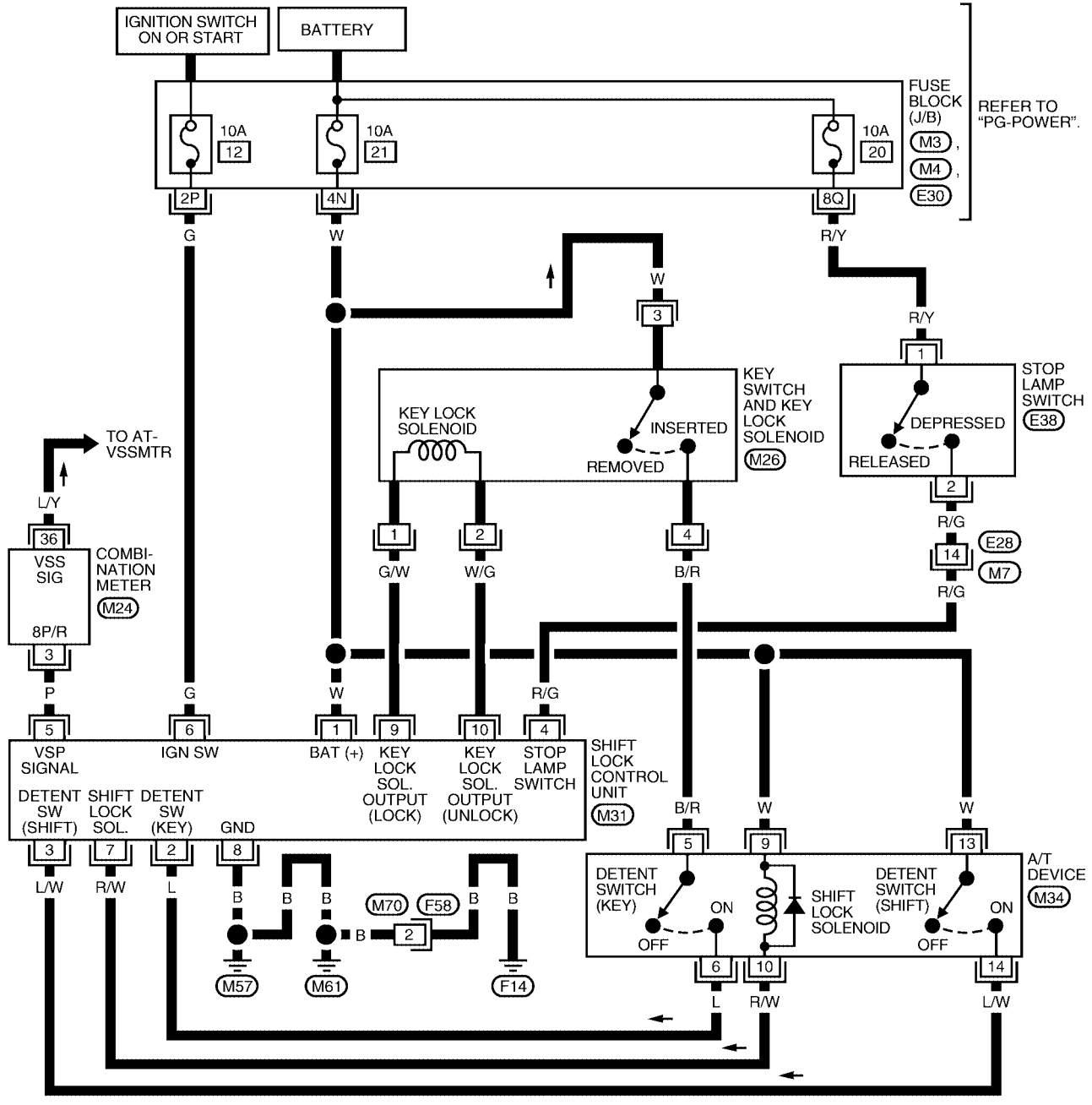
A/T SHIFT LOCK SYSTEM

[RE4F04B]

Wiring Diagram — SHIFT —

ECS009AH

AT-SHIFT-01



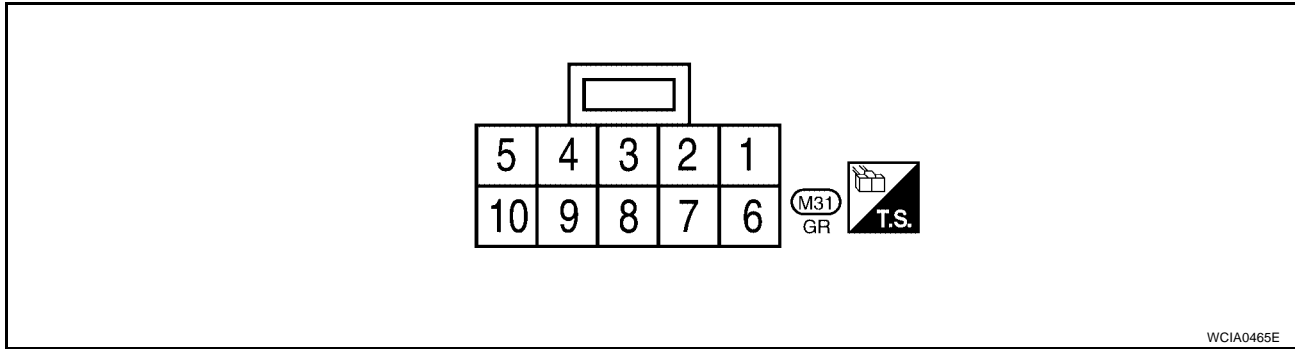
WCWA0222E

A/T SHIFT LOCK SYSTEM

[RE4F04B]

ECS009AI

Shift Lock Control Unit Reference Values 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 (W) | 8 (B) | Power source | Always | Battery voltage |
| 2 (L) | 8 (B) | Detent switch (key) | When selector lever is not in "P" position with key inserted | Battery voltage |
| | | | Except the above | Approx. 0V |
| 3 (L/W) | 8 (B) | Detention switch (for shift) | When selector lever is not in "P" position | Battery voltage |
| | | | When selector lever is in "P" position | Approx. 0V |
| 4 (R/G) | 8 (B) | Stop lamp switch | When brake pedal is depressed | Battery voltage |
| | | | When brake pedal is released | Approx. 0V |
| 5 (P) | 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 (G/W) | 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.

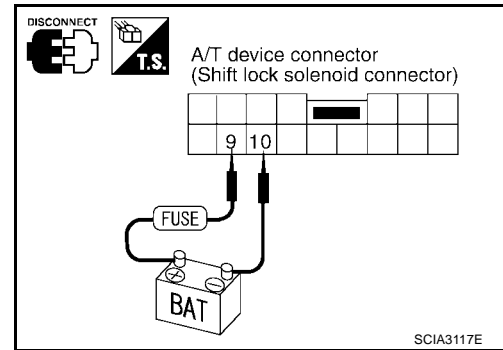
Component Inspection SHIFT LOCK SOLENOID

- 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 No. | Terminal No. |
|---------------|-----------------------------------|
| M34 | 9 (Battery voltage) - 10 (Ground) |

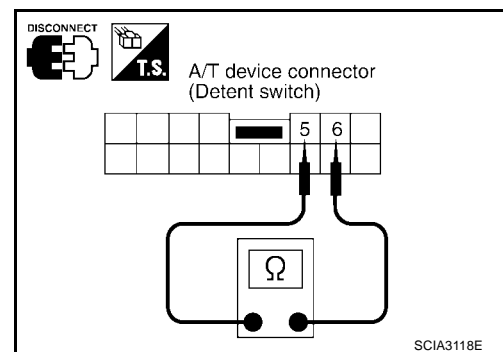


DETENT SWITCH

For Key:

- Check continuity between terminals of the A/T device connector.

| Condition | Connector No. | Terminal No. | Continuity |
|---|---------------|--------------|------------|
| When selector lever is not in "P" position with key inserted. | M34 | 5 - 6 | Yes |
| Except the above | | | No |

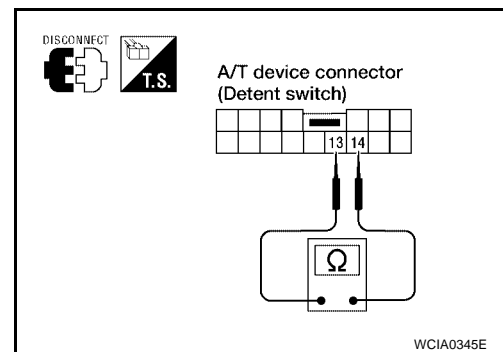


DETENT SWITCH

For Shift:

- Check continuity between terminals of the A/T device connector.

| Condition | Connector No. | Terminal No. | Continuity |
|---|---------------|--------------|------------|
| When selector lever is not in "P" position. | M34 | 13 - 14 | Yes |
| Except the above | | | No |



KEY LOCK SOLENOID

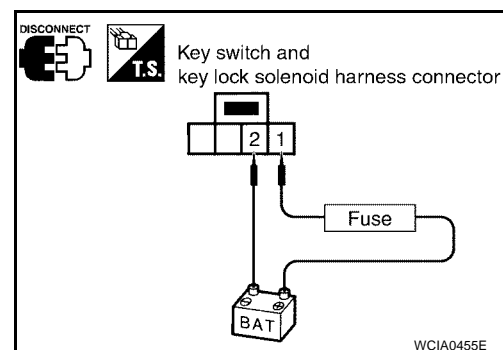
Key Lock

- Check operation by applying battery voltage to key switch and key lock solenoid connector.

CAUTION:

Be careful not to cause burnout of the harness.

| Connector No. | Terminal No. |
|---------------|----------------------------------|
| M26 | 1 (Battery voltage) - 2 (Ground) |



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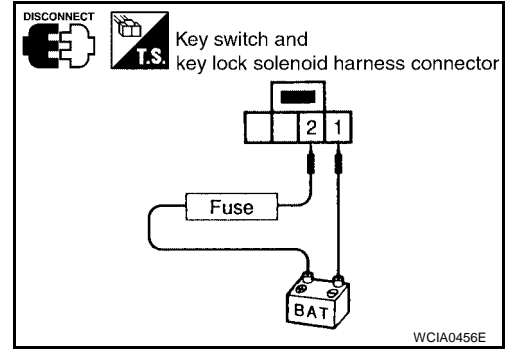
Key Unlock

- Check operation by applying battery voltage to key switch and key lock solenoid connector.

CAUTION:

Be careful not to cause burnout of the harness.

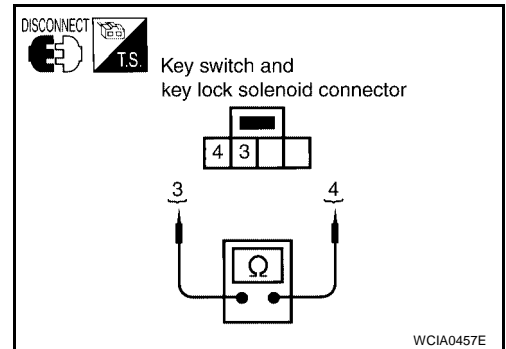
| Connector No. | Terminal No. |
|---------------|----------------------------------|
| M26 | 2 (Battery voltage) - 1 (Ground) |



KEY SWITCH

- Check continuity between terminals of the key switch and key lock solenoid connector.

| Condition | Connector No. | Terminal No. | Continuity |
|--------------|---------------|--------------|------------|
| Key inserted | M26 | 3 - 4 | Yes |
| Key removed | | | No |

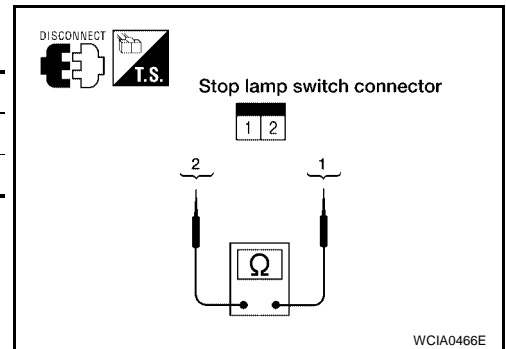


STOP LAMP SWITCH

- Check continuity between terminals of the stop lamp switch connector.

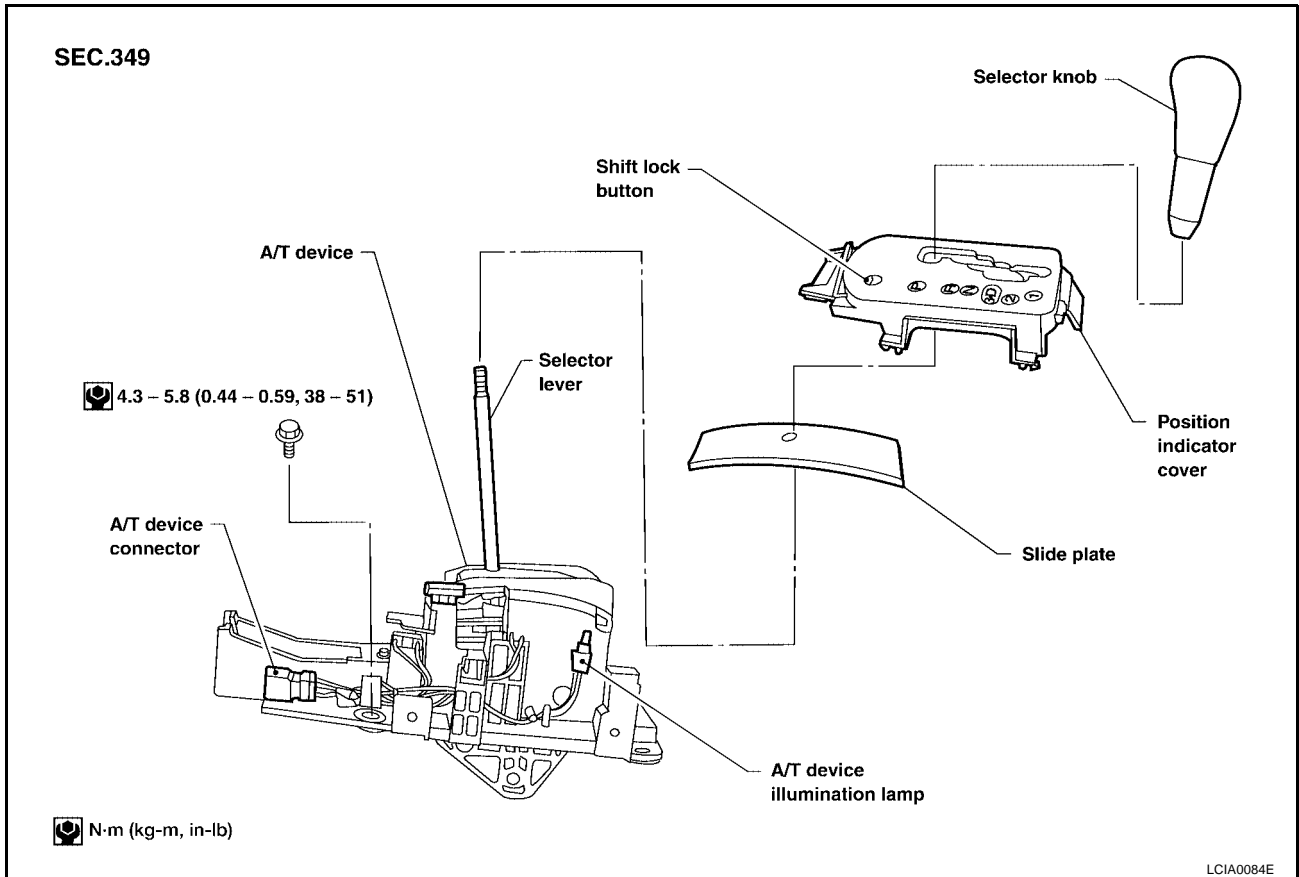
| Condition | Connector No. | Terminal No. | Continuity |
|-------------------------------|---------------|--------------|------------|
| When brake pedal is depressed | E38 | 1 - 2 | Yes |
| When brake pedal is released | | | No |

Check stop lamp switch after adjusting brake pedal. Refer to [BR-6, "Inspection and Adjustment"](#) .



SHIFT CONTROL SYSTEM

Control Device



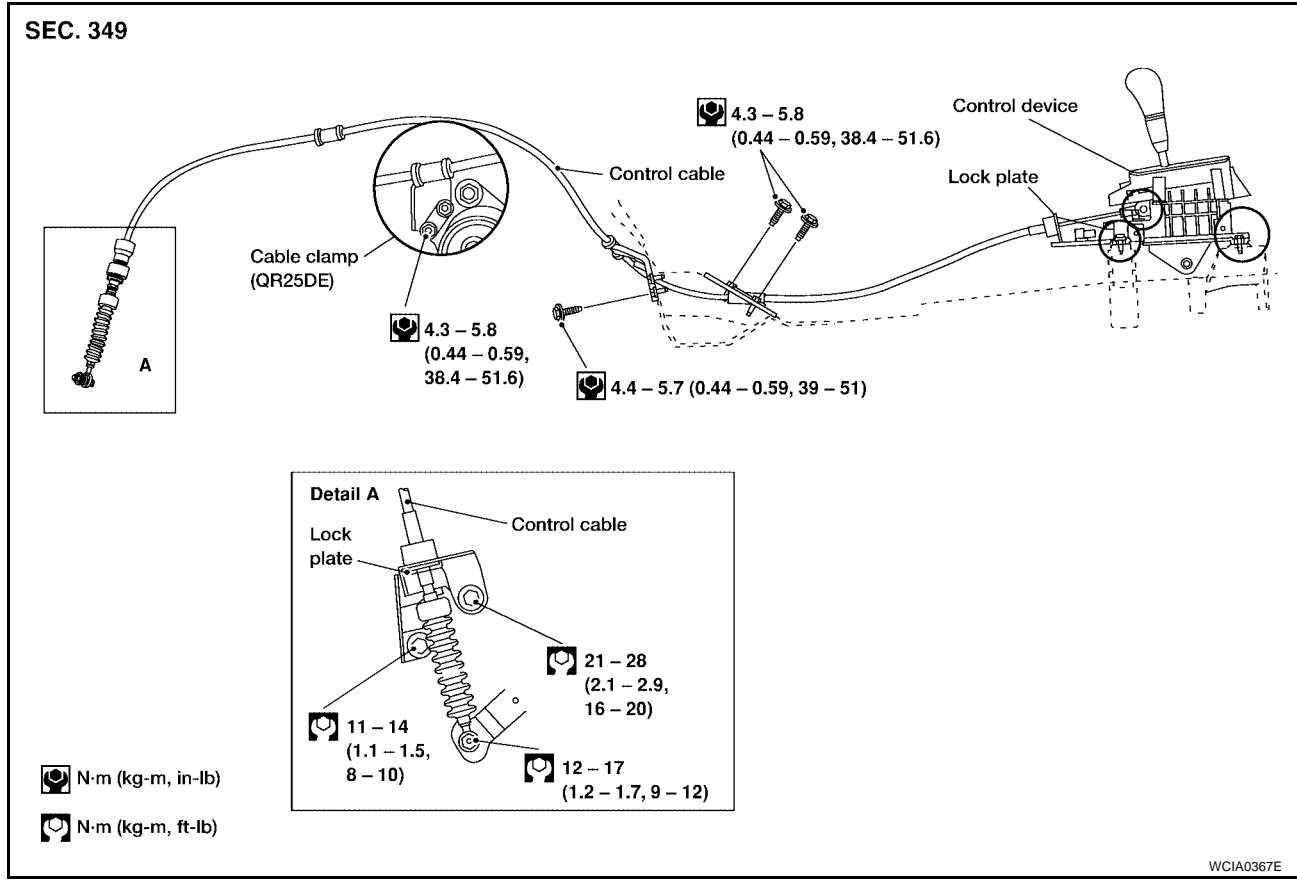
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SHIFT CONTROL SYSTEM

[RE4F04B]

ECS009AL

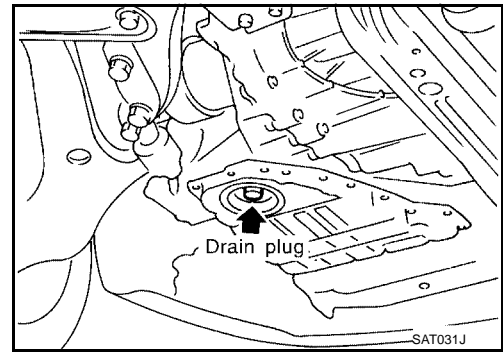
Control Cable



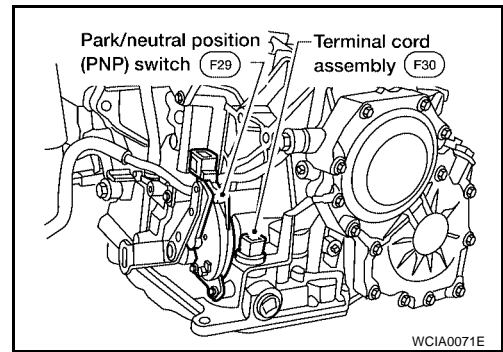
ON-VEHICLE SERVICE

**Control Valve Assembly and Accumulators
REMOVAL**

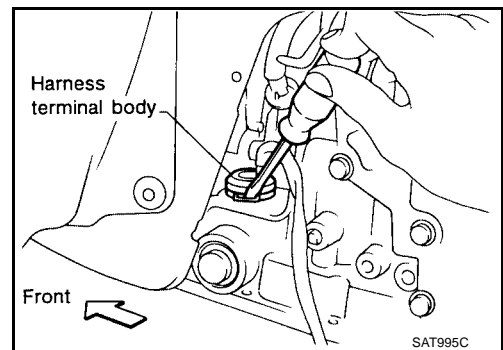
1. Drain ATF from transaxle.
 - Do not reuse oil pan bolts.



3. Disconnect terminal cord assembly harness connector.



4. Remove stopper ring from terminal cord assembly harness terminal body.
5. Remove terminal cord assembly harness from transaxle case by pushing on terminal body.



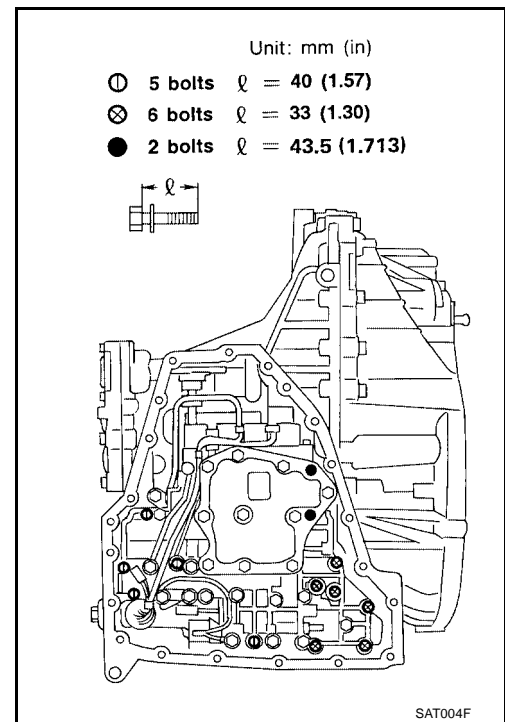
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6. Remove control valve assembly by removing bolts I, X and ●. Bolt length, number and location are shown in the illustration.

NOTE:

Be careful not to drop manual valve and servo release accumulator return spring.

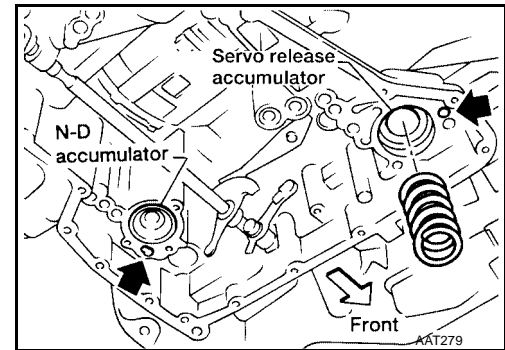
7. Disassemble and inspect control valve assembly if necessary. Refer to [AT-303, "Control Valve Assembly"](#).



8. Remove servo release and N-D accumulators by applying compressed air if necessary.

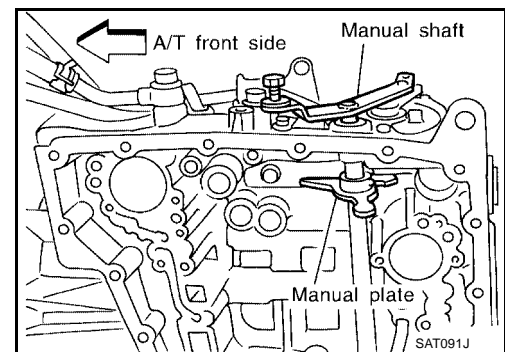
NOTE:

Hold each piston with a rag.



INSTALLATION

- Set manual shaft in Neutral, then align manual plate with groove in manual valve.
- After installing control valve assembly, make sure that selector lever can be moved to all positions.



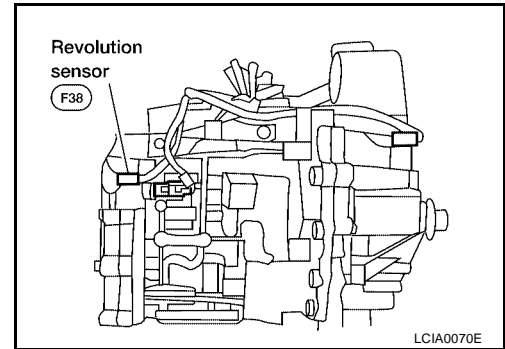
Revolution Sensor Replacement

ECS009AN

1. Disconnect electrical connector.
2. Remove revolution sensor from A/T.
3. Reinstall any part removed.

NOTE:

Always use new sealing parts.



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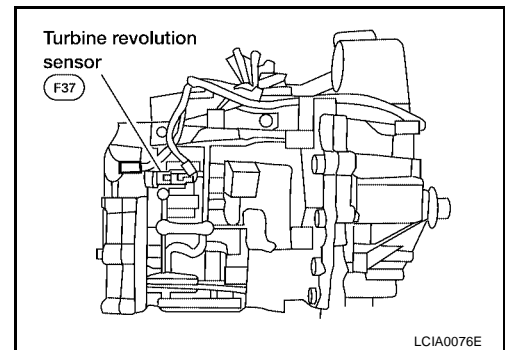
Turbine Revolution Sensor Replacement

ECS009AO

1. Disconnect electrical connector.
2. Remove bolt, and turbine revolution sensor from A/T.
3. Reinstall any part removed.

NOTE:

Always use new sealing parts.

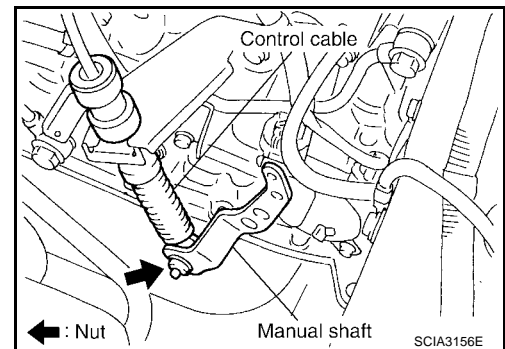


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Park/Neutral Position (PNP) Switch Adjustment

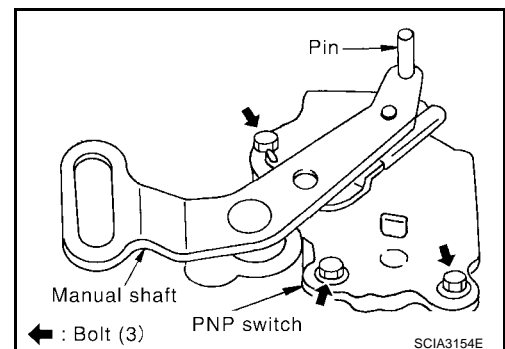
ECS009AP

1. Remove control cable from manual shaft.
2. Set manual shaft in N position.



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3. Loosen park/neutral position (PNP) switch bolts.
4. Insert pin into adjustment holes in both park/neutral position (PNP) switch and manual shaft as near vertical as possible.
5. Reinstall any part removed.
6. Check continuity of park/neutral position (PNP) switch. Refer to [AT-108, "Diagnostic Procedure"](#).



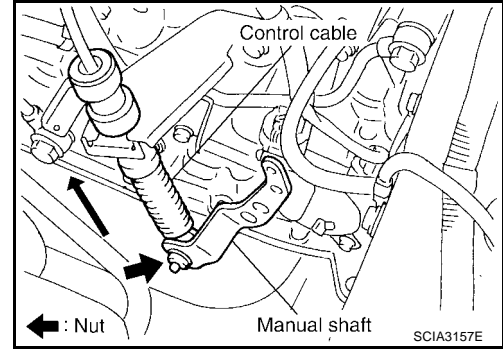
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Control Cable Adjustment

ECS009A0

Move selector lever from the P position to the 1 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.

- Place selector lever in the P position.
CAUTION:
Turn wheels more than 1/4 turn and apply the parking brake.
- Loosen control cable lock nut.
- Secure the manual lever.
- Using the specified force, push control cable in the direction of the arrow shown in the illustration.



Specified force : 9.8 N (1.0 kg, 2.2 lb)

- Tighten control cable lock nut.
- Move selector lever from P to 1 position. Make sure that selector lever moves smoothly.

NOTE:

- Make sure that the starter operates when the selector lever is placed in the N or P position.
- Make sure that the transaxle is locked properly when the selector lever is placed in the P position.

Differential Side Oil Seal Replacement

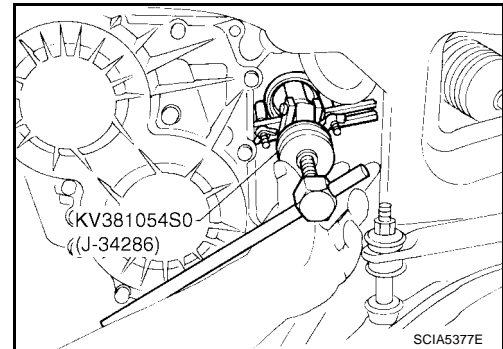
ECS009AR

- Remove drive shaft assembly. Refer to [FAX-11, "FRONT DRIVE SHAFT"](#).
- Remove oil seal, using Tool

Tool number : KV381054S0 (J-34286)

NOTE:

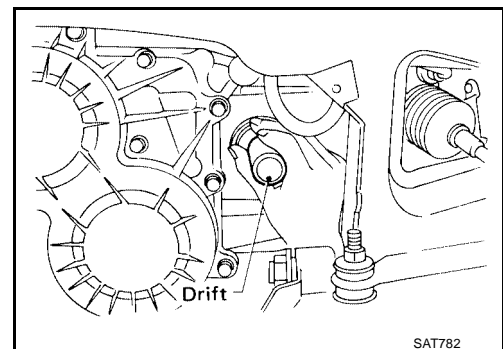
Do not reuse old seal.



- Install new oil seal.

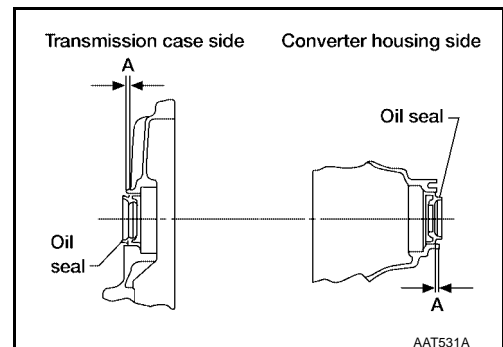
NOTE:

- Apply ATF before installing.



- Install oil seals so dimension A is within specification

Dimension A : -0.5 mm (-0.02 in) to 0.5 mm (0.02 in)



4. Installation of the remaining components is in the reverse order of removal.

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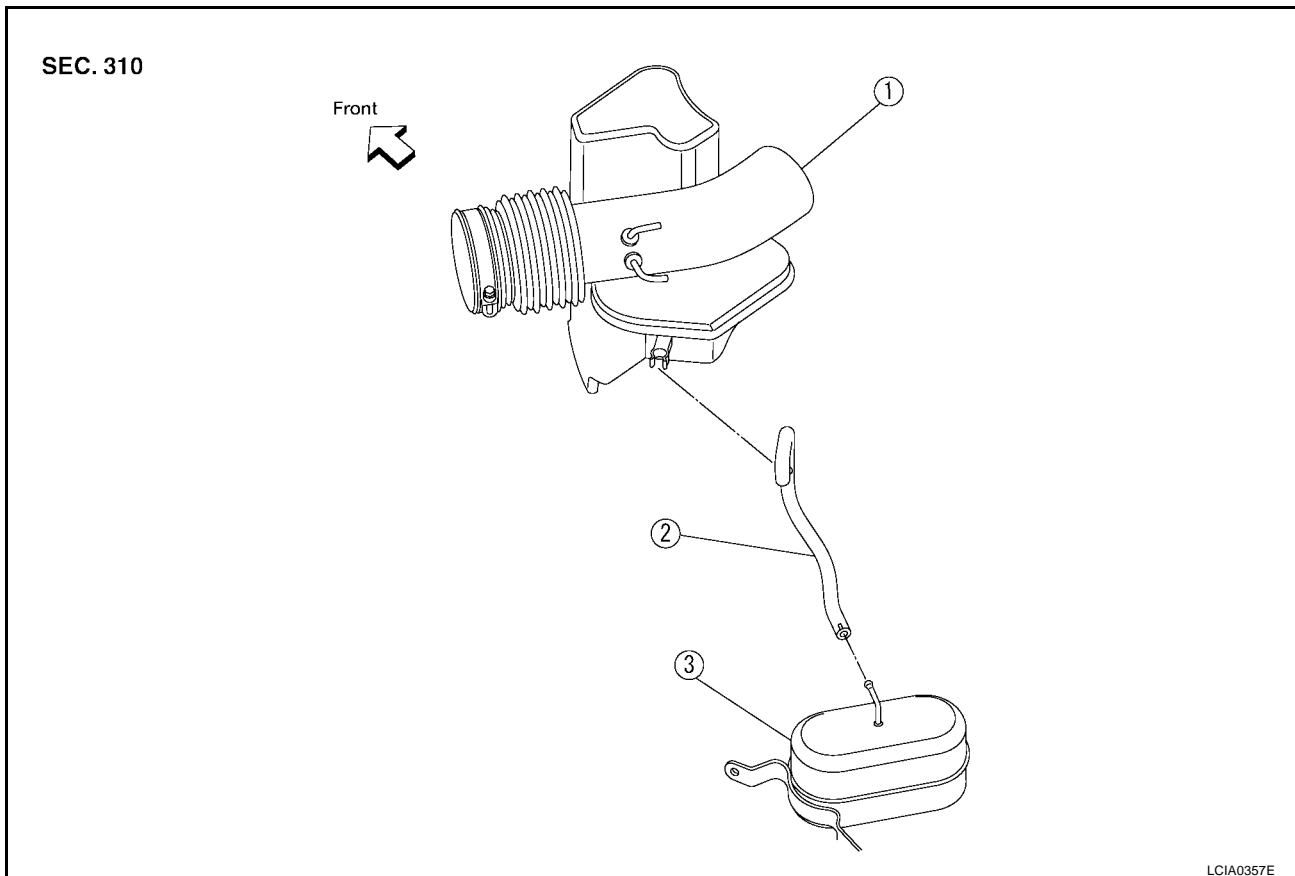
AIR BREATHER HOSE

PFP:31098

Air Breather Hose - Air Duct Side REMOVAL AND INSTALLATION QR25DE MODELS

ECS009AS

AIR BREATHER HOSE TO AIR DUCT SIDE



1. Air cleaner to electronic throttle control actuator tube 2. Air breather hose (air duct side) 3. Oil catch tank

Removal

1. Remove the air cleaner to electronic throttle control actuator tube. Refer to, [EM-17, "REMOVAL"](#).
2. Remove the air breather hose from the oil catch tank.

Installation

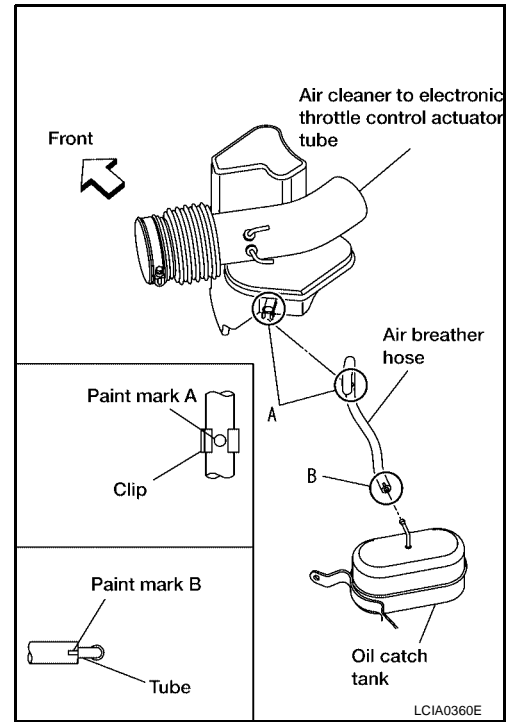
Installation is in the reverse order of removal.

CAUTION:

Do not to crush or kink the air breather hose during installation

NOTE:

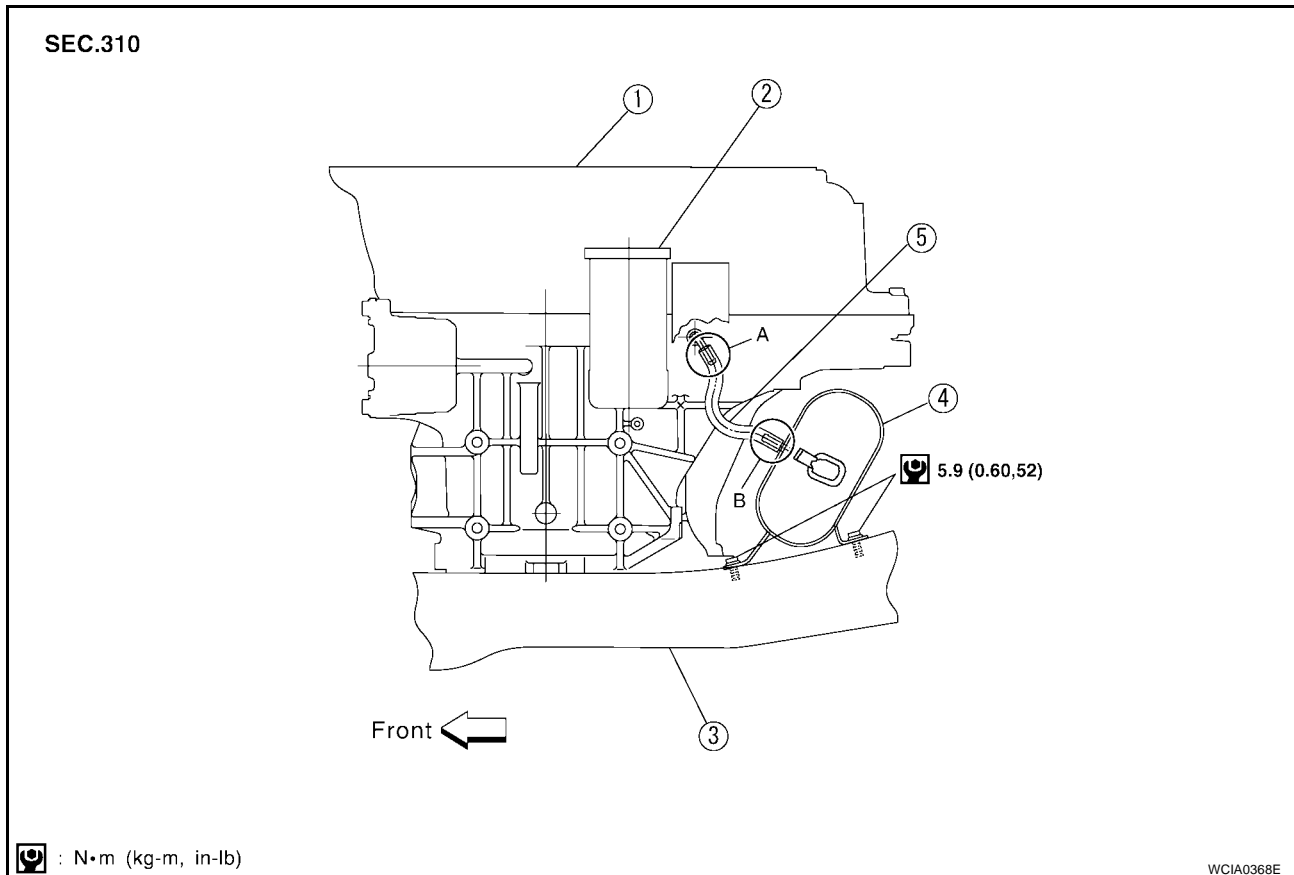
- Be sure paint mark A can be seen in the clip when installing the air breather hose to the air cleaner to electronic throttle control actuator tube.
- Be sure paint mark B is facing upwards and to the end of the radius in the oil catch tank tube.
- Insert air breather hose into oil catch tank until it reaches the point where the winding radius stops.



Air Breather Hose - Transaxle Side

REMOVAL AND INSTALLATION (OIL CATCH TANK TO AIR DUCT)

ECS009AT



: N·m (kg-m, in-lb)

WCIA0368E

- | | | |
|-----------------------|---------------------------------------|---------------------------|
| 1. Transaxle assembly | 2. Starter motor | 3. Left front side member |
| 4. Oil catch tank | 5. Air breather hose (transaxle side) | |

Removal

1. Remove the air cleaner to electronic throttle control actuator tube. Refer to, [EM-17, "REMOVAL"](#) .

AIR BREATHER HOSE

[RE4F04B]

2. Disconnect the air breather hose air cleaner to electronic throttle control actuator tube side and transaxle side of the oil catch tank.
3. Remove the oil catch tank.

Installation

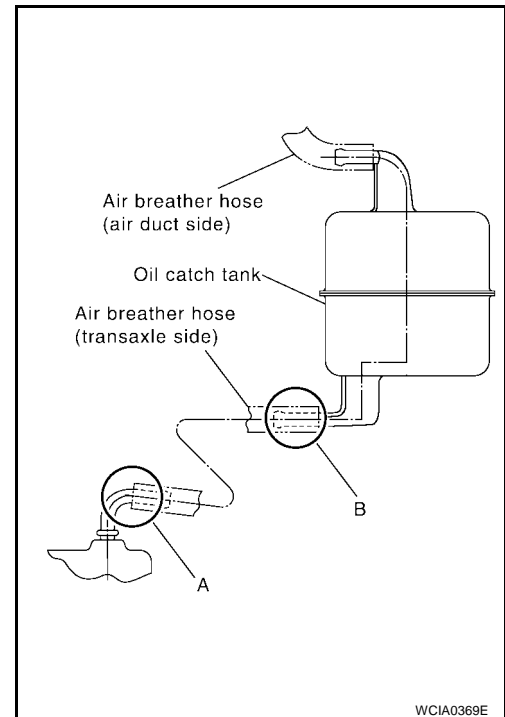
Installation is in the reverse order of removal.

CAUTION:

Do not crush or kink the air breather hose during installation.

NOTE:

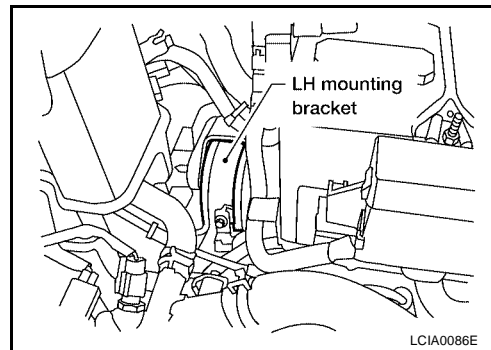
- The paint marks must face upwards on installation.
- Insert air breather hose (transaxle side) B into tube stopper when installing air breather hose to the oil catch tank.
- Insert air breather hose (transaxle side) A into the point where the radius stops on the air breather hose when installing to the transaxle.



REMOVAL AND INSTALLATION

Removal

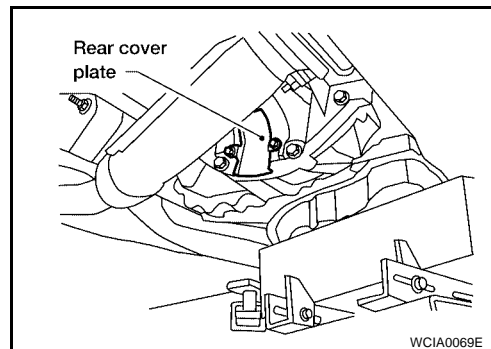
1. Remove battery and bracket.
2. Remove air cleaner assembly. Refer to [EM-17, "Removal and Installation"](#) .
3. Disconnect terminal cord assembly harness connector and park/neutral position (PNP) switch harness connectors.
4. Disconnect harness connectors of revolution sensor, ground, vehicle speed sensor, mass air flow sensor, and turbine revolution sensor.
5. Remove LH mounting bracket from transaxle and body.
6. Disconnect control cable at transaxle side.
7. Remove drive shafts. Refer to [FAX-11, "FRONT DRIVE SHAFT"](#) .
8. Drain ATF through drain plug. Refer to [MA-31, "Changing A/T Fluid"](#) .
9. Remove push clips and engine undercover.
10. Disconnect fluid cooler piping.
11. Remove starter motor from transaxle. Refer to [SC-17, "Removal and Installation"](#) .



12. Support engine.
13. Remove upper transaxle to engine bolts.
14. Remove front suspension member. Refer to [FSU-15, "Removal and Installation"](#) .
15. Remove rear cover plate and torque converter to drive plate bolts.

NOTE:

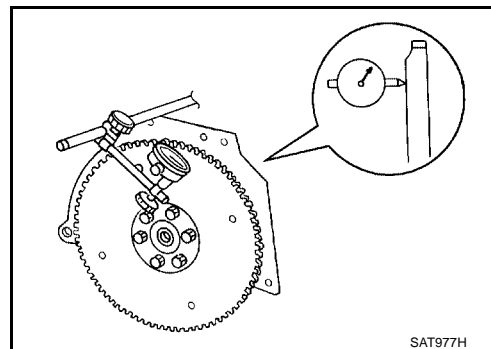
Rotate crankshaft for access to torque convertor bolts.



16. Support transaxle with a jack.
17. Remove lower transaxle to engine bolts.
18. Lower transaxle while supporting it with a jack.

Inspection

Check the drive plate runout as shown.
 If this runout is out of allowance, replace drive plate and ring gear.
 Refer to [AT-376, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .



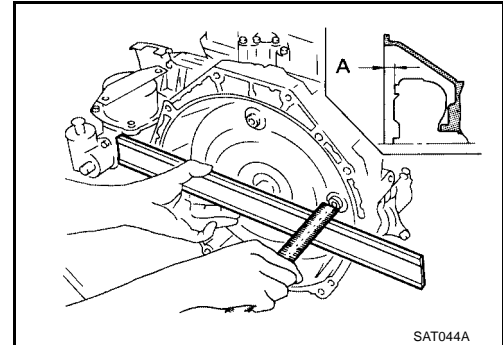
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Installation

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.

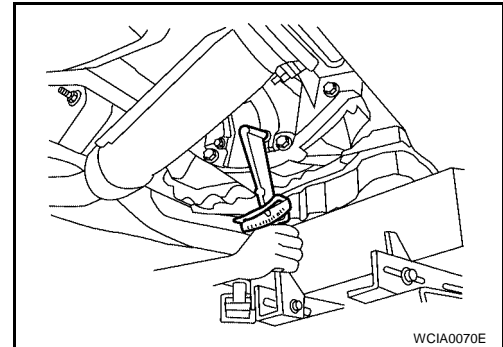
Distance "A" : 14 mm (0.55 in) or more



2. Install torque converter bolts to drive plate.

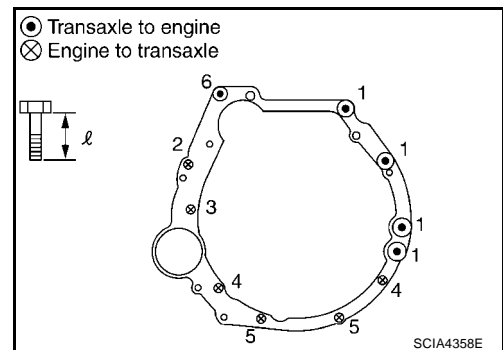
NOTE:

With converter installed, rotate crankshaft several turns to check that transaxle rotates freely without binding.



3. Tighten transaxle to engine bolts.

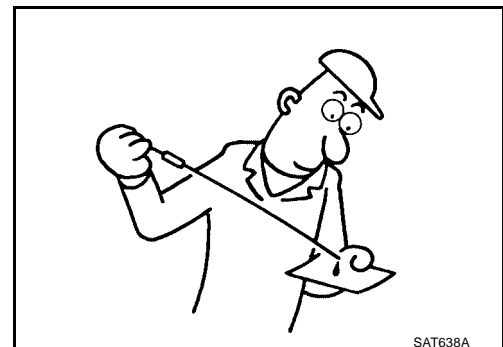
| Bolt No. | 1 | 2 | 3 | 4 | 5 | 6 |
|--|-----------------|-----------------|-----------------|--------------|--------------|-----------------|
| Number of bolts | 4 | 1 | 1 | 2 | 2 | 1 |
| Bolt length "ℓ" mm (in) | 49 (1.93) | 40 (1.57) | 45 (1.77) | 40 (1.57) | 30 (1.18) | 45 (1.77) |
| Tightening torque N·m (kg·m, ft·lb) | 75 (7.7, 55) | 35 (3.3, 26) | 75 (7.7, 55) | 43 (4.4, 32) | | 35 (3.6, 26) |



4. Installation of the remaining components is in the reverse order of removal.

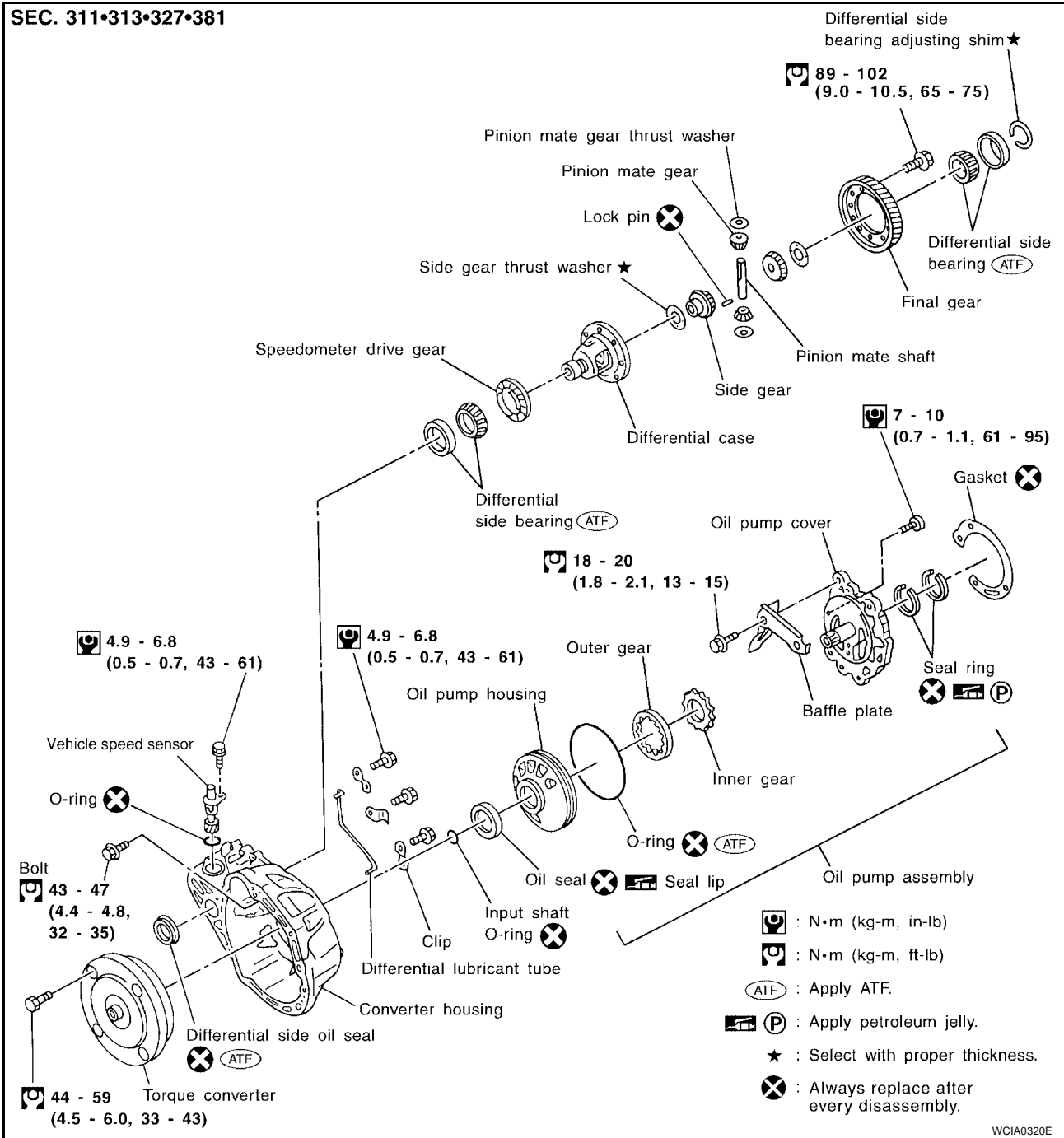
NOTE:

- Check fluid level in transaxle.
- Move selector lever through all positions to be sure that transaxle operates correctly.
With parking brake applied, rotate engine at idling. Move selector lever through N to D, to 2, to 1 and to R position. A slight shock should be felt by hand gripping selector each time transaxle is shifted.
- Perform road test. Refer to [AT-72, "Road Test"](#).

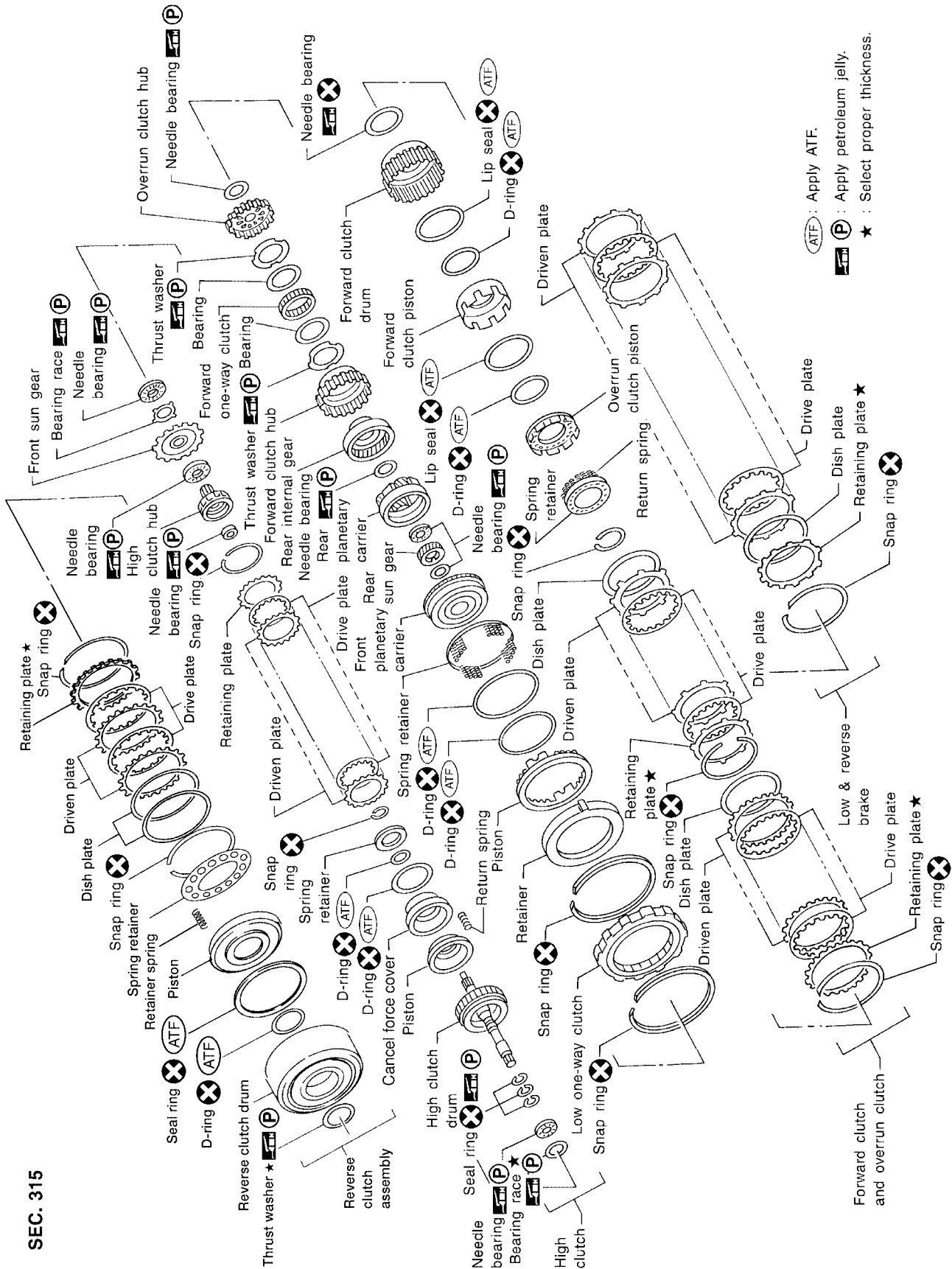


OVERHAUL Components

SEC. 311•313•327•381



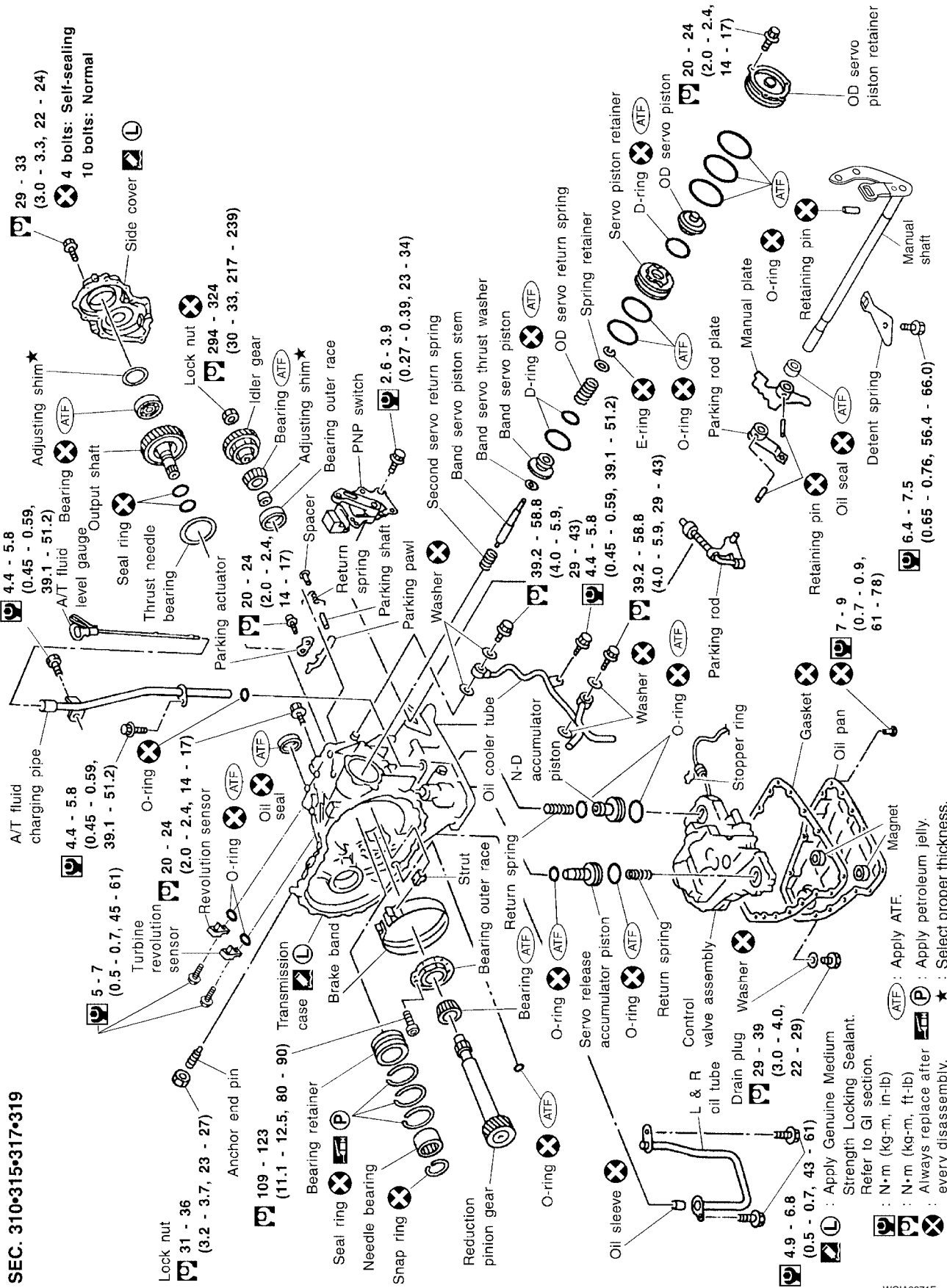
WCIA0320E



SEC. 315

(ATF) : Apply ATF.
 (P) : Apply petroleum jelly.
 ★ : Select proper thickness.

SEC. 310-315-317-319

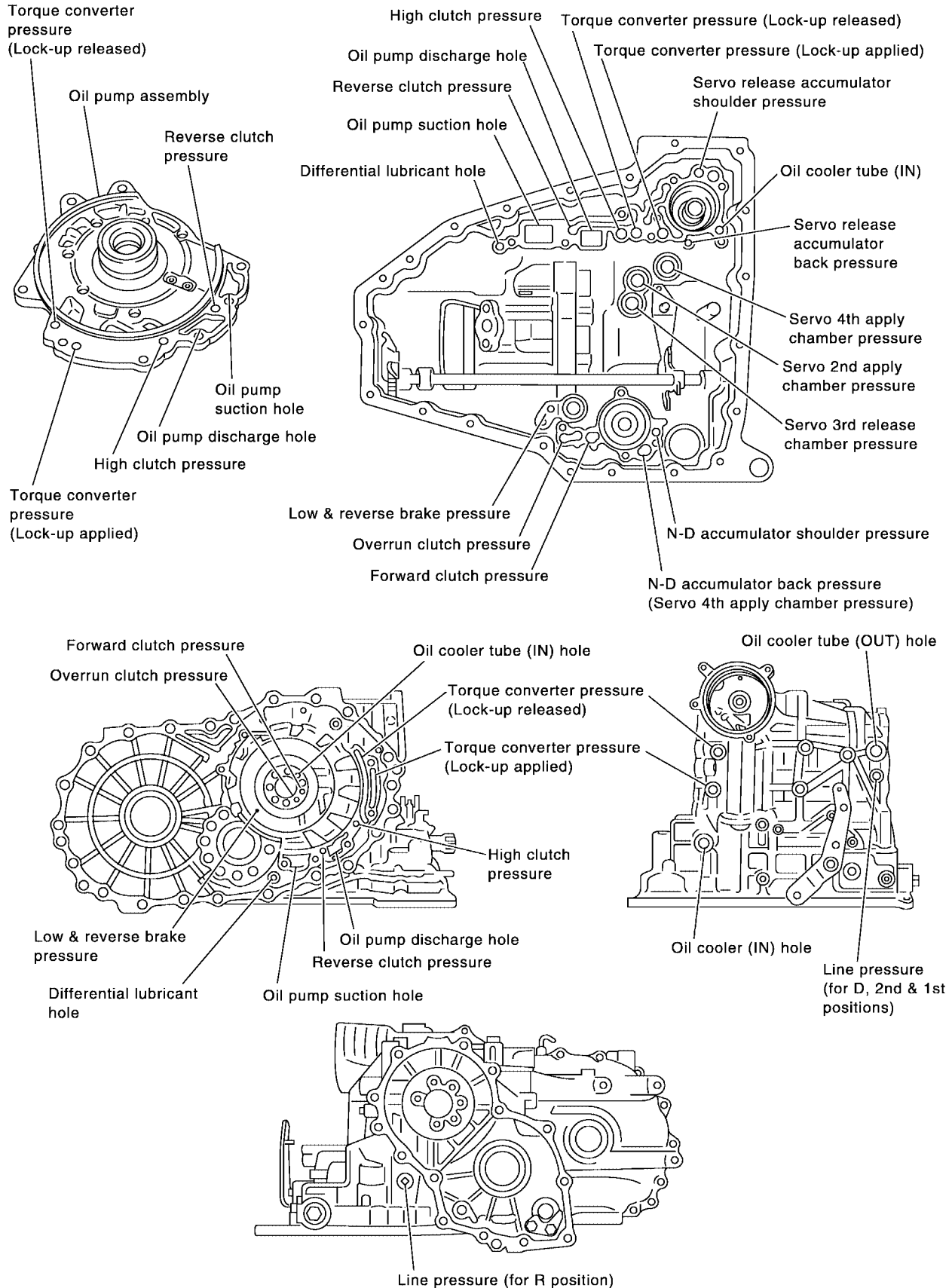


- ⓧ : Apply ATF.
- ⓧ : Apply petroleum jelly.
- ⓧ : Always replace after every disassembly.
- ⓧ : N·m (kg·m, in·lb)
- ⓧ : N·m (kg·m, ft·lb)
- ⓧ : Refer to GI section.
- ⓧ : Strength Locking Sealant.
- ⓧ : Apply Genuine Medium
- ⓧ : Apply ATF.
- ⓧ : Select proper thickness.
- ⓧ : Always replace after every disassembly.
- ⓧ : N·m (kg·m, in·lb)
- ⓧ : N·m (kg·m, ft·lb)
- ⓧ : Refer to GI section.
- ⓧ : Strength Locking Sealant.
- ⓧ : Apply Genuine Medium
- ⓧ : Apply ATF.
- ⓧ : Select proper thickness.

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Oil Channel



OVERHAUL

[RE4F04B]

ECS009AZ

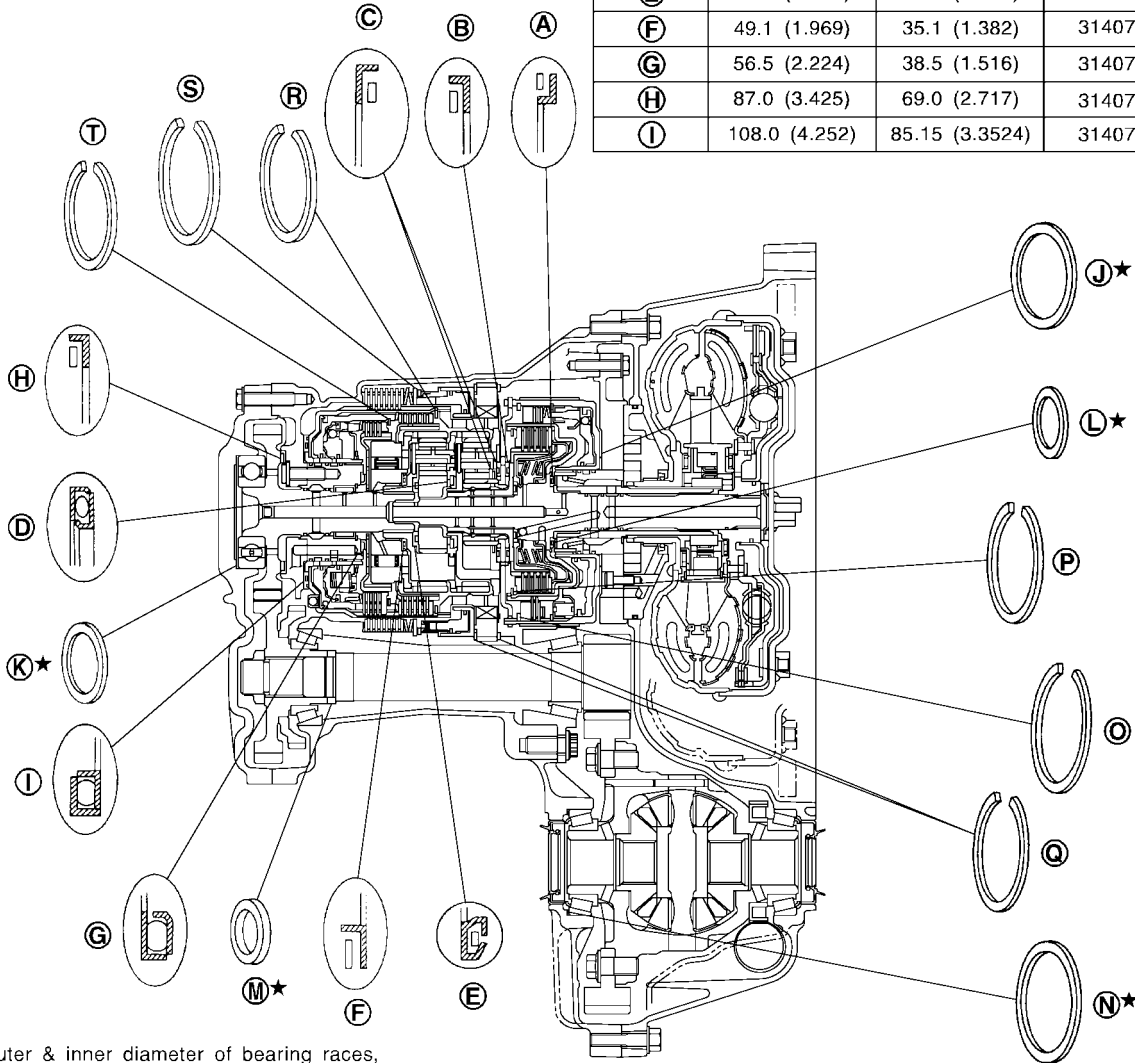
Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

Outer diameter of thrust washers

| Item number | Outer diameter mm (in) | Parts number* |
|-------------|------------------------|---------------------------|
| (J)★ | 76.0 (2.992) | 31508 80X13 - 31508 80X20 |
| (K)★ | 80.0 (3.150) | 31438 80X60 - 31438 80X70 |

Outer and inner diameter of needle bearings

| Item number | Outer diameter mm (in) | Inner diameter mm (in) | Parts number* |
|-------------|------------------------|------------------------|---------------|
| (A) | 49.1 (1.969) | 35.1 (1.382) | 31407 88X00 |
| (B) | 42.0 (1.654) | 23.7 (0.933) | 31407 80X01 |
| (C) | 70.0 (2.756) | 50.0 (1.969) | 31407 80X09 |
| (D) | 51.0 (2.008) | 33.1 (1.303) | 31407 80X02 |
| (E) | 48.0 (1.890) | 30.0 (1.181) | 31407 80X03 |
| (F) | 49.1 (1.969) | 35.1 (1.382) | 31407 88X00 |
| (G) | 56.5 (2.224) | 38.5 (1.516) | 31407 80X08 |
| (H) | 87.0 (3.425) | 69.0 (2.717) | 31407 80X07 |
| (I) | 108.0 (4.252) | 85.15 (3.3524) | 31407 80X24 |



Outer & inner diameter of bearing races, adjusting shims and adjusting spacer

| Item number | Outer diameter mm (in) | Inner diameter mm (in) | Parts number* |
|-------------|------------------------|------------------------|---|
| (L)★ | 51.0 (2.008) | 36.0 (1.417) | 31435 80X00 - 31435 80X06 31435 80X09 - 31435 80X14 |
| (M)★ | 38.0 (1.496) | 28.1 (1.106) | 31439 85X01 - 31439 85X06 31439 83X11 - 31439 83X24 31439 81X00 - 31439 81X24 31439 81X46 - 31439 81X49 31439 81X60 - 31439 81X74 |
| (N)★ | 75.0 (2.953) | 67.0 (2.638) | 31438 80X00 - 31438 80X11 |

Outer diameter of snap rings

| Item number | Outer diameter mm (in) | Parts number* |
|-------------|------------------------|---------------|
| (O) | 150 (5.91) | 31506 89X00 |
| (P) | 119.1 (4.689) | 31506 80X06 |
| (Q) | 182.8 (7.197) | 31506 80X08 |
| (R) | 144.8 (5.701) | 31506 80X03 |
| (S) | 173.8 (6.843) | 31506 80X09 |
| (T) | 133.9 (5.272) | 31506 80X01 |

★ : Select proper thickness.

* : Always check with the Parts Department for the latest parts information.

SCIA4972E

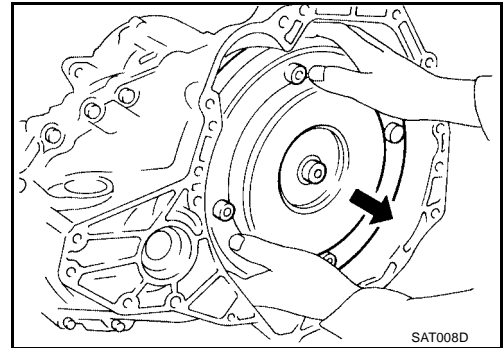
DISASSEMBLY

PFP:31020

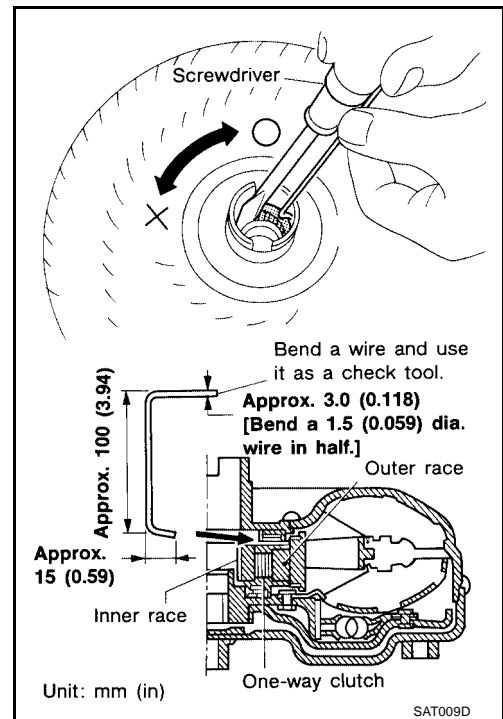
ECS009B0

Disassembly

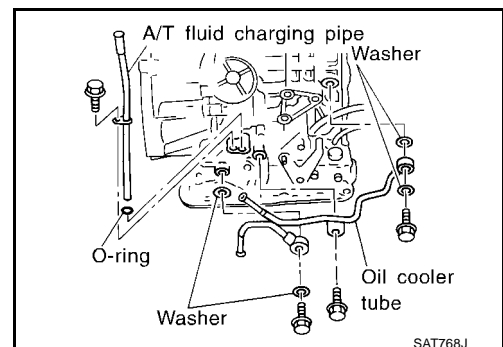
1. Drain ATF through drain plug. Refer to [MA-31, "Changing A/T Fluid"](#).
2. Remove torque converter.



3. Check torque converter one-way clutch using check tool as shown.
 - a. Insert check tool into the groove of bearing support built into one-way clutch outer race.
 - b. When fixing bearing support with check tool, rotate one-way clutch spline using screwdriver.
 - c. Check that inner race rotates clockwise only. If not, replace torque converter assembly.



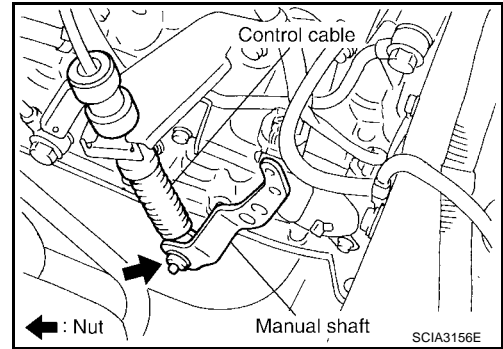
4. Remove A/T fluid charging pipe and fluid cooler tube.



DISASSEMBLY

[RE4F04B]

5. Set manual shaft to position P.
6. Remove park/neutral position (PNP) switch.



7. Remove oil pan using power tools, and oil pan gasket.

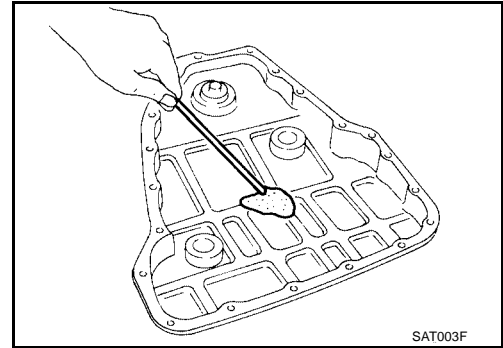
NOTE:

Do not reuse oil pan bolts.

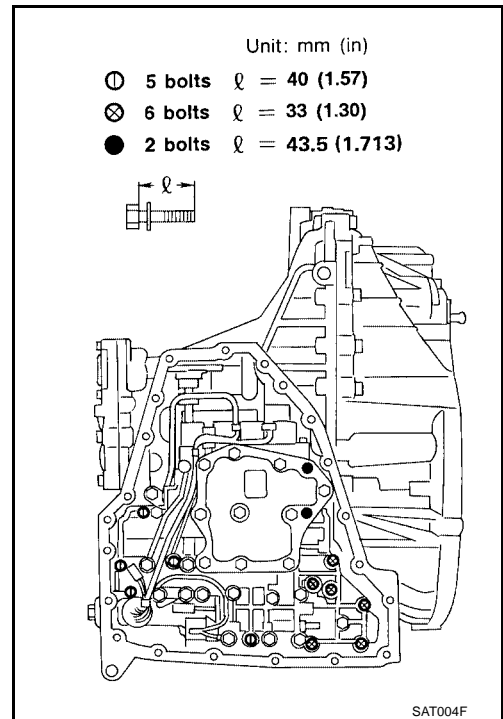
8. Check foreign materials in oil pan to help determine causes of malfunction. If the fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.

NOTE:

If frictional material is detected, replace radiator after repair of A/T. Refer to [CO-11, "RADIATOR"](#).



9. Remove control valve assembly according to the following procedures.
 - a. Remove control valve assembly mounting bolts I, X and ●.

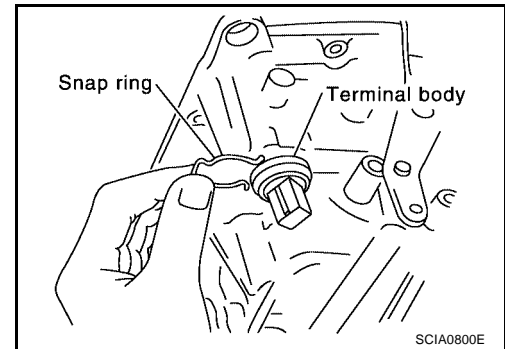


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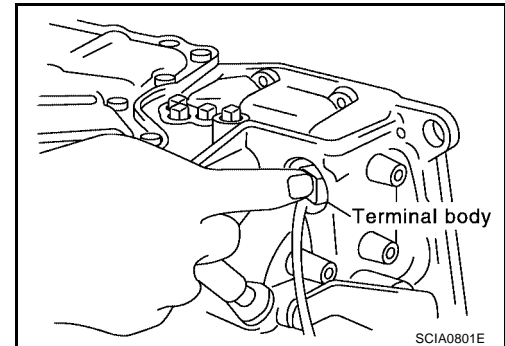
DISASSEMBLY

[RE4F04B]

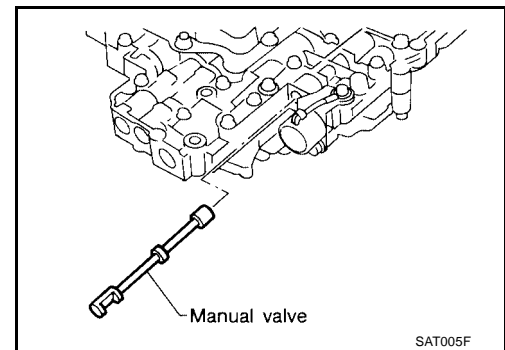
b. Remove snap ring from terminal body.



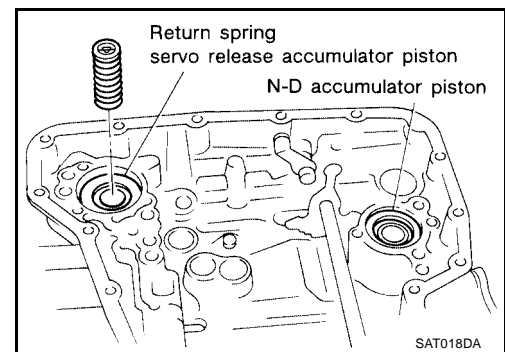
c. Push terminal body into transaxle case and draw out terminal cord assembly.



10. Remove manual valve from control valve assembly.

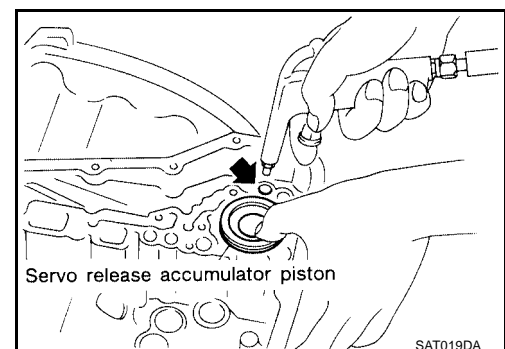


11. Remove return spring from servo release accumulator piston.



12. Remove servo release accumulator piston with compressed air.

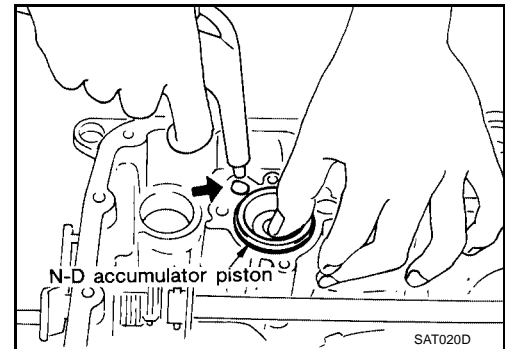
13. Remove O-rings from servo release accumulator piston.



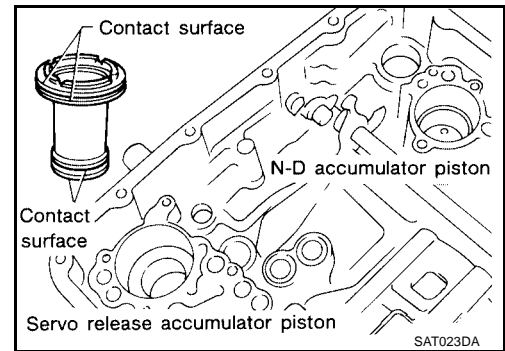
DISASSEMBLY

[RE4F04B]

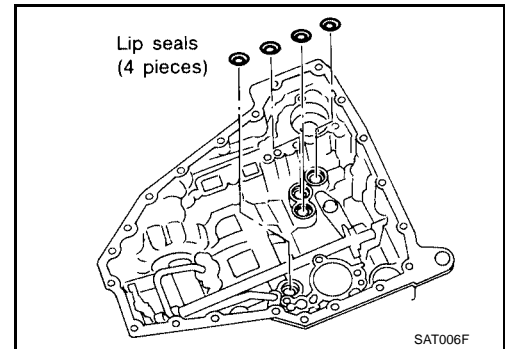
14. Remove N-D accumulator piston and return spring with compressed air.



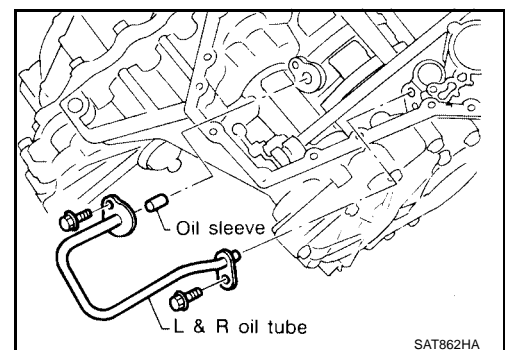
15. Remove O-rings from N-D accumulator piston.
16. Check accumulator pistons and contact surface of transaxle case for damage.



17. Check accumulator return springs for damage and free length.
18. Remove lip seals.



19. Remove L & R oil tube and oil sleeve.

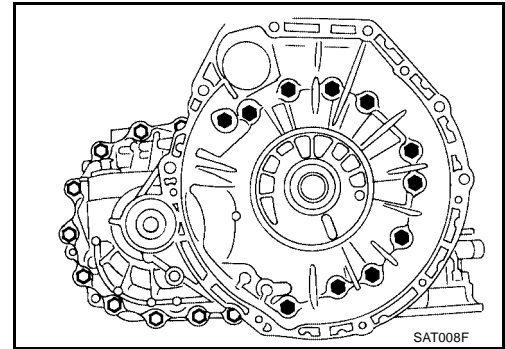


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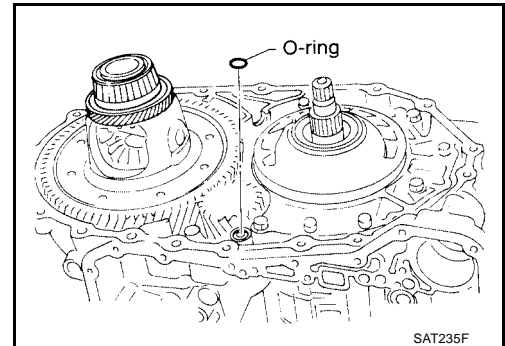
DISASSEMBLY

[RE4F04B]

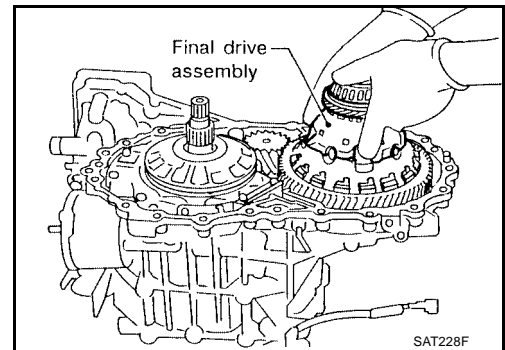
20. Remove converter housing according to the following procedures.
- a. Remove converter housing mounting bolts using power tools.
 - b. Remove converter housing by tapping it lightly.



- c. Remove O-ring from differential oil port.

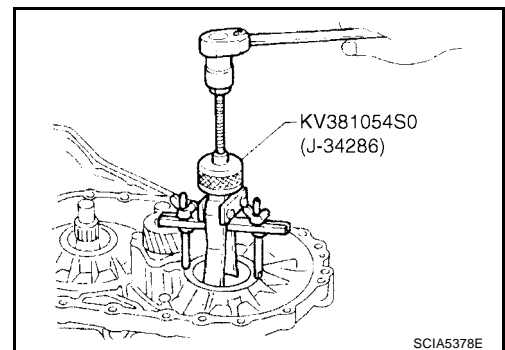


21. Remove final drive assembly from transaxle case.

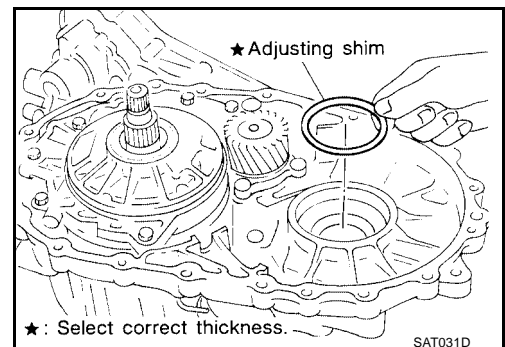


22. Remove differential side bearing outer race and side bearing adjusting shim from transaxle case using Tool.

Tool number : KV381054S0 (J-34286)



23. Remove differential side bearing adjusting shim from transaxle case.

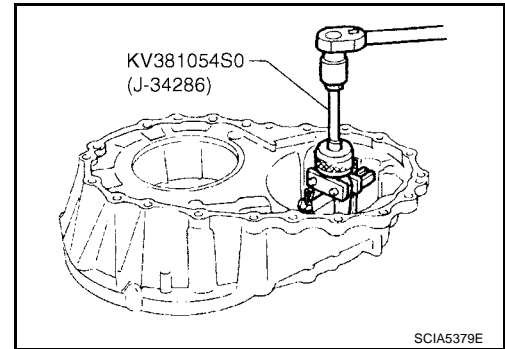


DISASSEMBLY

[RE4F04B]

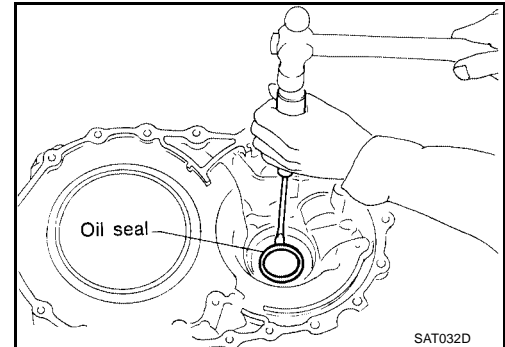
24. Remove differential side bearing outer race from converter housing using Tool.

Tool number : KV381054S0 (J-34286)

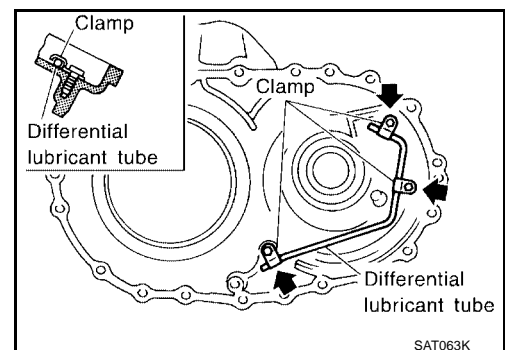


25. Remove oil seal from converter housing using suitable tool.

CAUTION:
Be careful not to damage case.

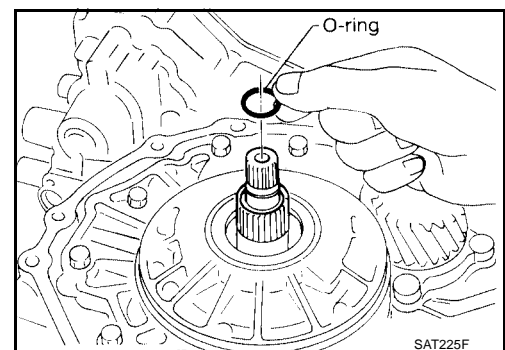


26. Remove differential lubricant tube from converter housing.

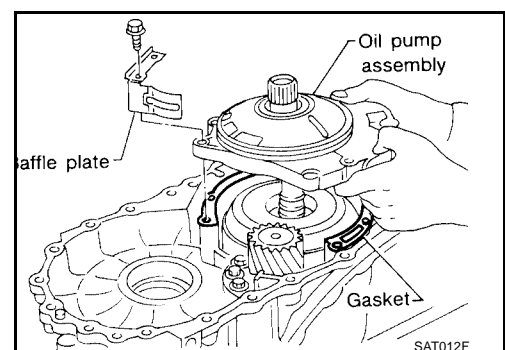


27. Remove oil pump according to the following procedures.

a. Remove O-ring from input shaft.



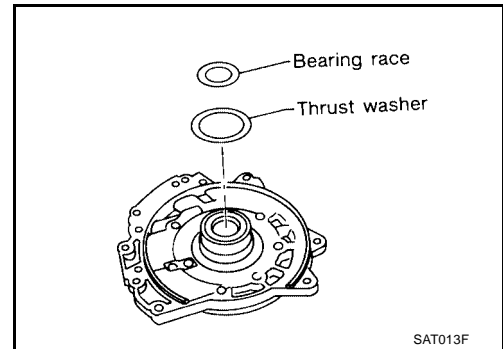
b. Remove oil pump assembly, baffle plate and gasket from transaxle case.



DISASSEMBLY

[RE4F04B]

- c. Remove thrust washer and bearing race from oil pump assembly.

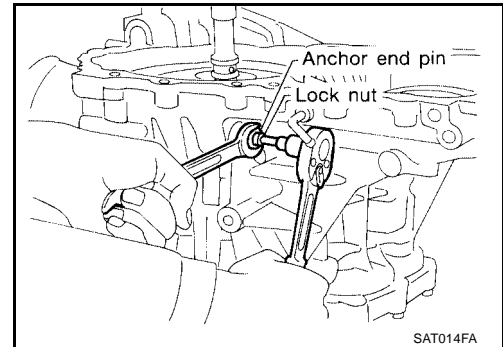


28. Remove brake band according to the following procedures.

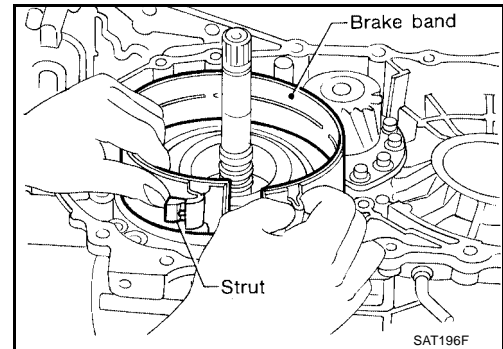
- a. Loosen lock nut, then back off anchor end pin using suitable tool.

NOTE:

Do not reuse anchor end pin.



- b. Remove brake band and strut from transaxle case.

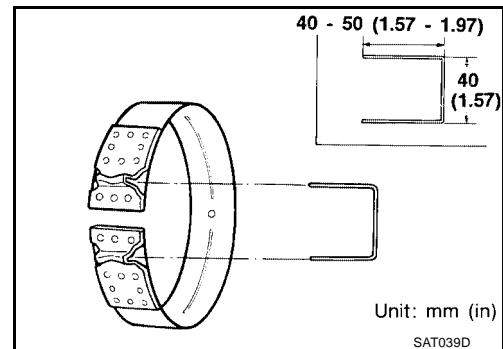


CAUTION:

To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown in the figure at left.

NOTE:

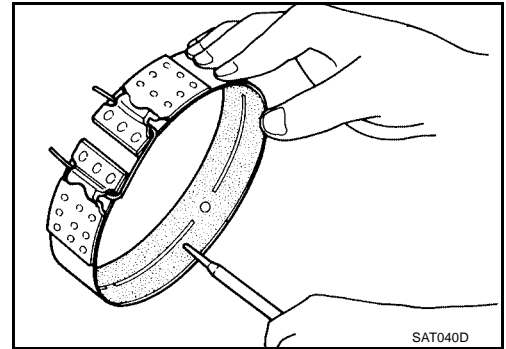
Leave the clip in position after removing the brake band.



DISASSEMBLY

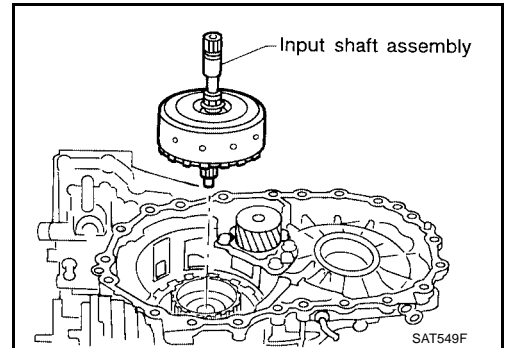
[RE4F04B]

- c. Check brake band facing for damage, cracks, wear or burns.

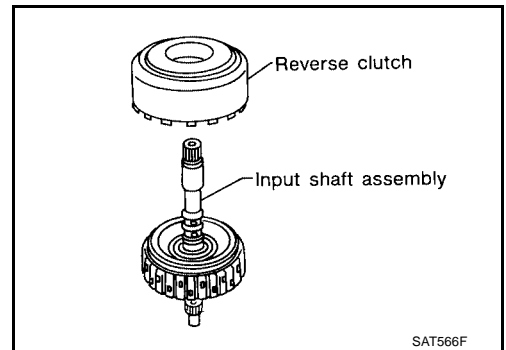


29. Remove input shaft assembly (high clutch) and reverse clutch according to the following procedures.

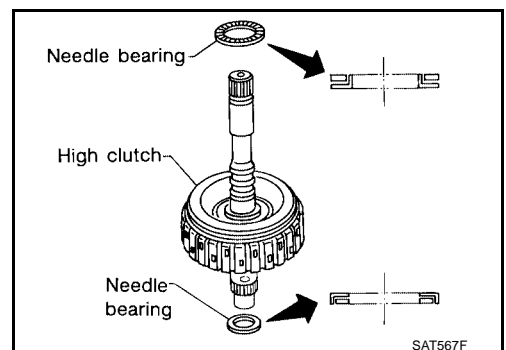
- a. Remove input shaft assembly (high clutch) with reverse clutch.



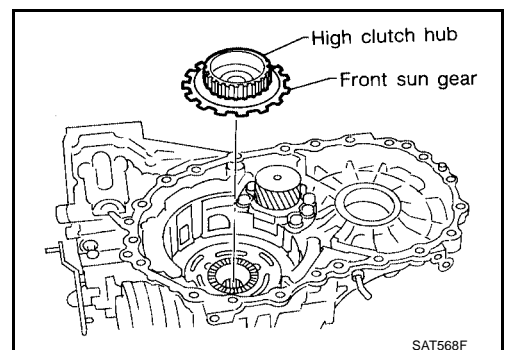
- b. Remove input shaft assembly (high clutch) from reverse clutch.



- c. Remove needle bearings from high clutch drum and check for damage or wear.



- d. Remove high clutch hub and front sun gear from transaxle case.

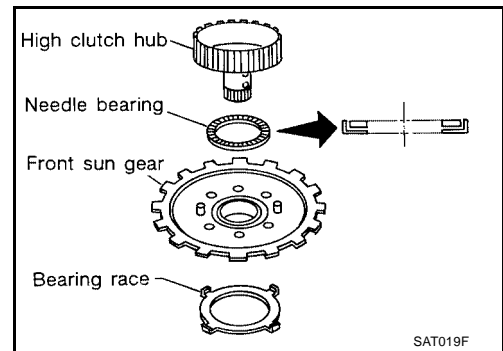


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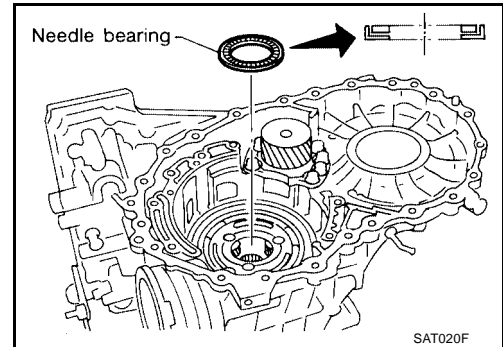
DISASSEMBLY

[RE4F04B]

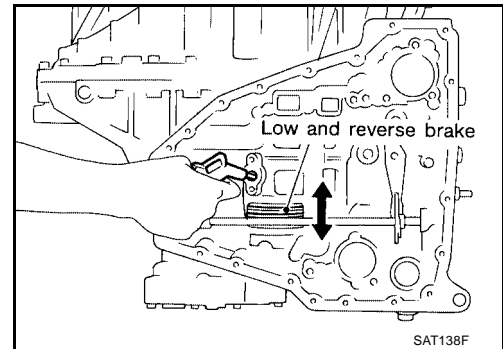
- e. Remove front sun gear and needle bearing from high clutch hub and check for damage or wear.
- f. Remove bearing race from front sun gear and check for damage or wear.



- 30. Remove needle bearing from transaxle case and check for damage or wear.

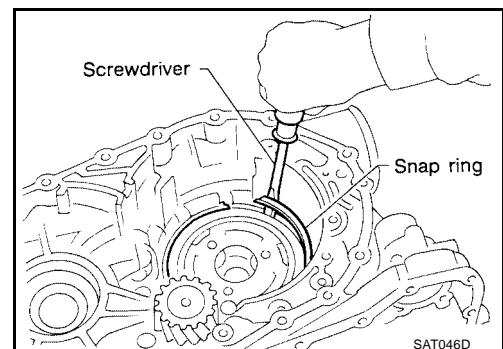


- 31. Apply compressed air and check to see that low and reverse brake operates.



- 32. Remove low one-way clutch and front planetary carrier assembly according to the following procedures.

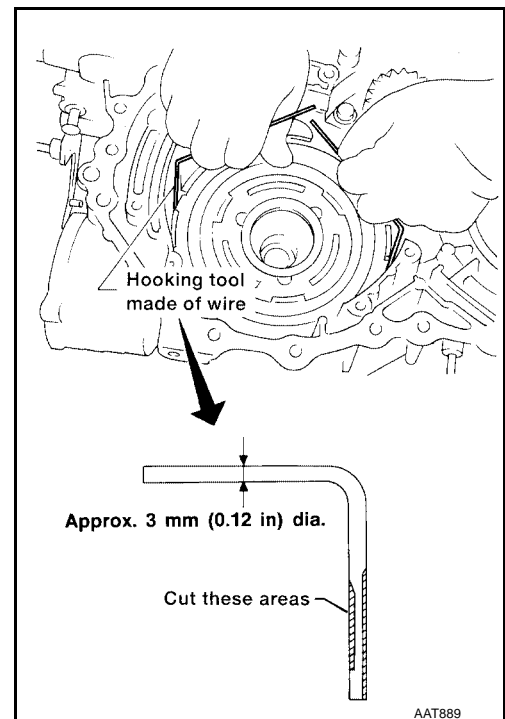
- a. Remove snap ring with flat-bladed screwdriver.



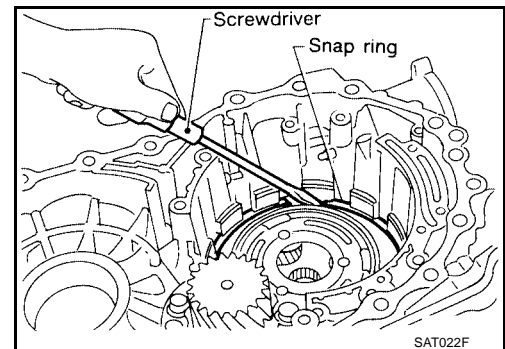
DISASSEMBLY

[RE4F04B]

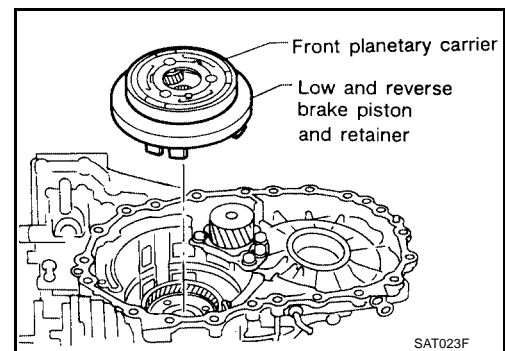
- b. Remove low one-way clutch with a suitable hook made of wire.



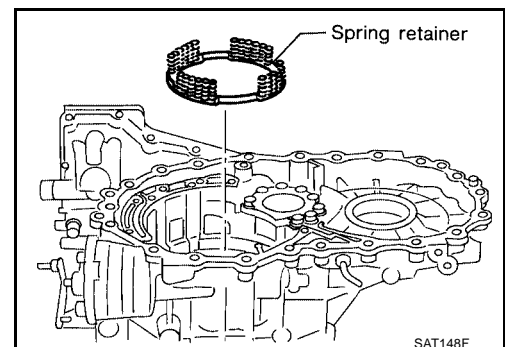
- c. Remove snap ring with flat-bladed screwdriver.



- d. Remove front planetary carrier with low and reverse brake piston and retainer.



- e. Remove low and reverse brake spring retainer.
- NOTE:**
Do not remove return springs from spring retainer.

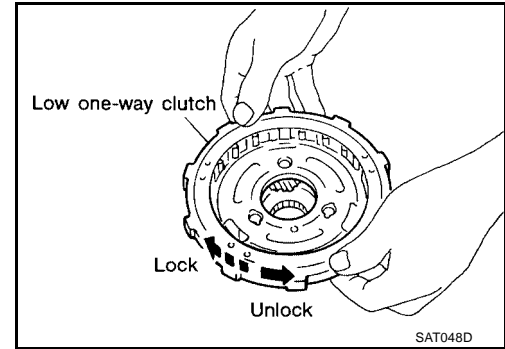


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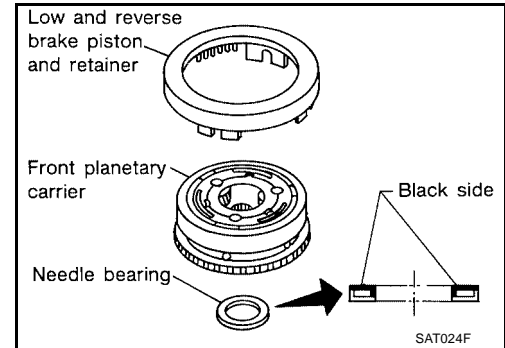
DISASSEMBLY

[RE4F04B]

- f. Check that low one-way clutch rotates in the direction of the clockwise arrow and locks in the opposite direction.



- g. Remove needle bearing, low and reverse brake piston and retainer from front planetary carrier.
- h. Check front planetary carrier, low one-way clutch and needle bearing for damage or wear.

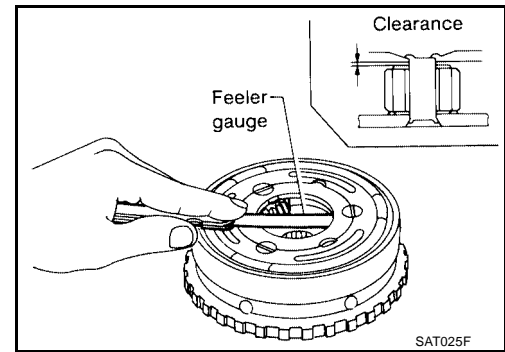


- i. Check clearance between planetary gears and planetary carrier with feeler gauge.

Standard clearance : 0.20 - 0.70 mm (0.0079 - 0.0276 in)

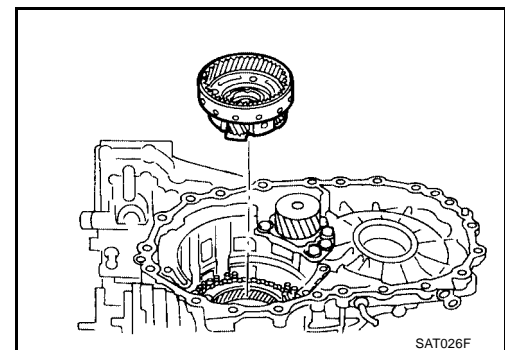
Allowable limit : 0.80 mm (0.0315 in)

Replace front planetary carrier if the clearance exceeds allowable limit.

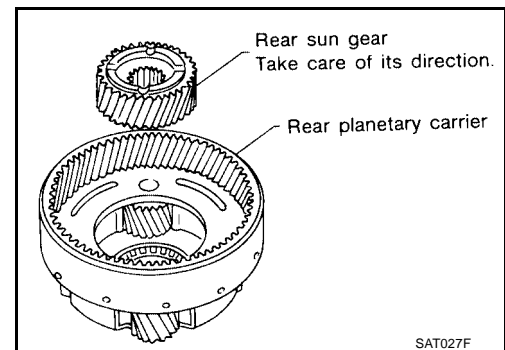


33. Remove rear planetary carrier assembly and rear sun gear according to the following procedures.

- a. Remove rear planetary carrier assembly from transaxle case.



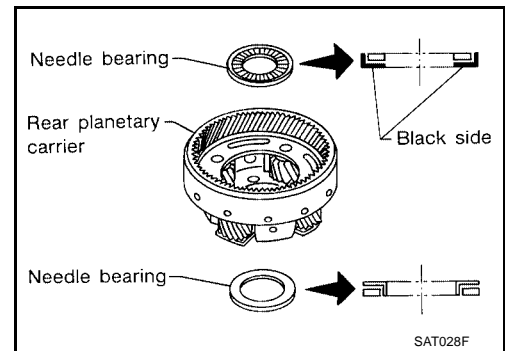
- b. Remove rear sun gear from rear planetary carrier.



DISASSEMBLY

[RE4F04B]

- c. Remove needle bearings from rear planetary carrier assembly.
- d. Check rear planetary carrier, rear sun gear and needle bearings for damage or wear.

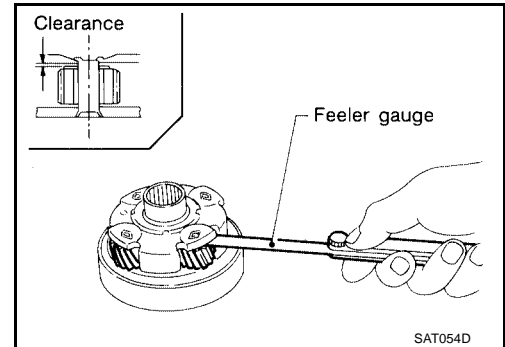


- e. Check clearance between pinion washer and rear planetary carrier with feeler gauge.

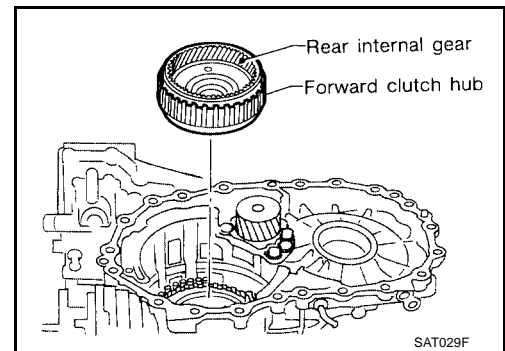
Standard clearance : 0.20 - 0.70 mm
(0.0079 - 0.0276 in)

Allowable limit : 0.80 mm (0.0315 in)

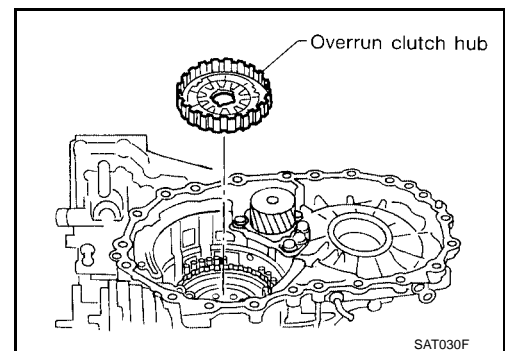
Replace rear planetary carrier if the clearance exceeds allowable limit.



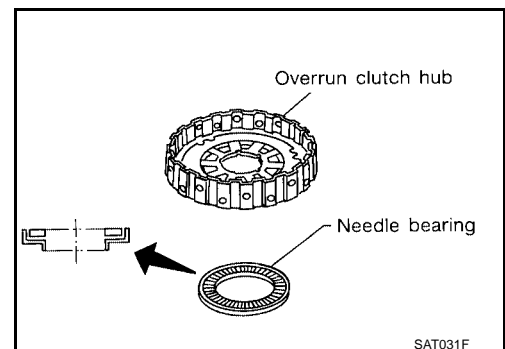
- 34. Remove rear internal gear and forward clutch hub from transaxle case.



- 35. Remove overrun clutch hub from transaxle case.

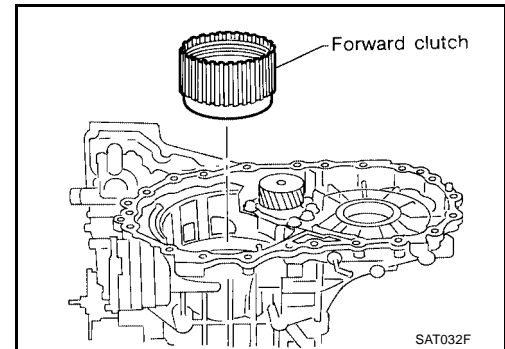


- 36. Remove needle bearing from overrun clutch hub and check for damage or wear.

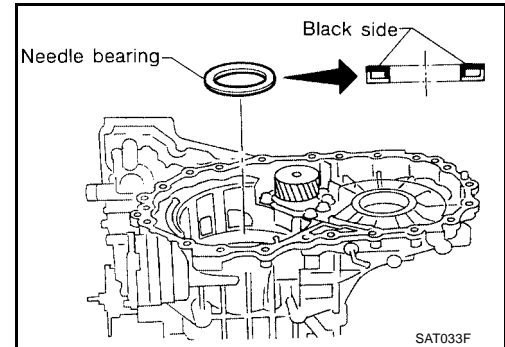


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37. Remove forward clutch assembly from transaxle case.



38. Remove needle bearing from transaxle case.

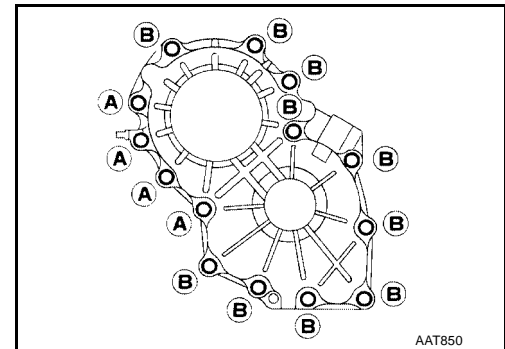


39. Remove output shaft assembly according to the following procedures.

a. Remove side cover bolts.

NOTE:

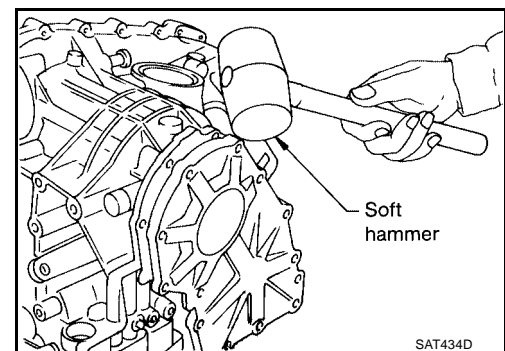
- Do not mix bolts A and B.
- Always replace bolts A as they are self-sealing bolts.



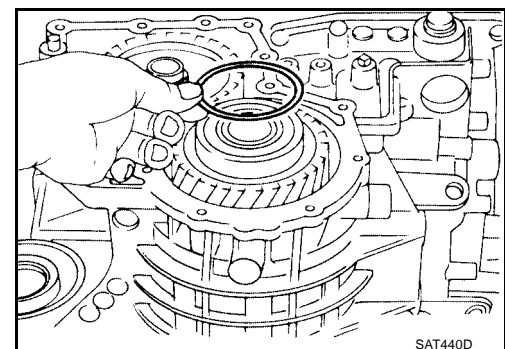
b. Remove side cover by lightly tapping it with a soft hammer.

NOTE:

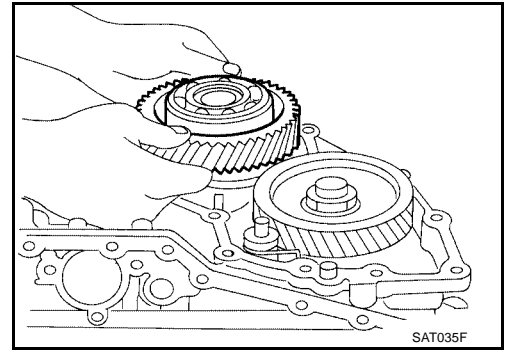
Be careful not to drop output shaft assembly. It might come out when removing side cover.



c. Remove adjusting shim.

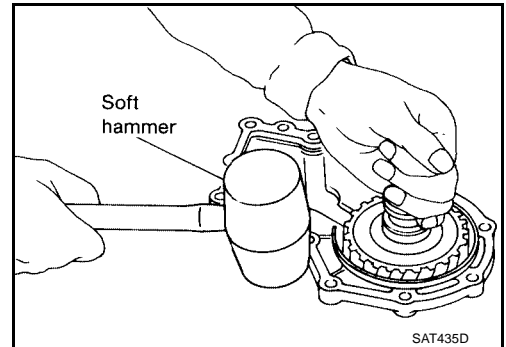


- d. Remove output shaft assembly.

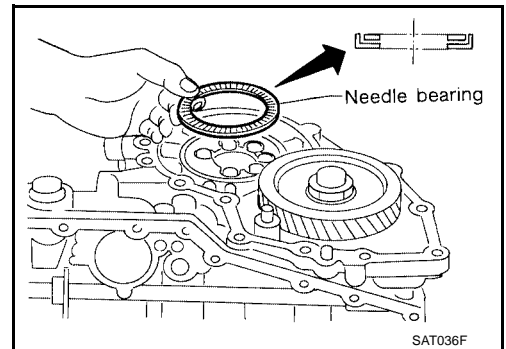


NOTE:

If output shaft assembly came off with side cover, tap cover with a soft hammer to separate.

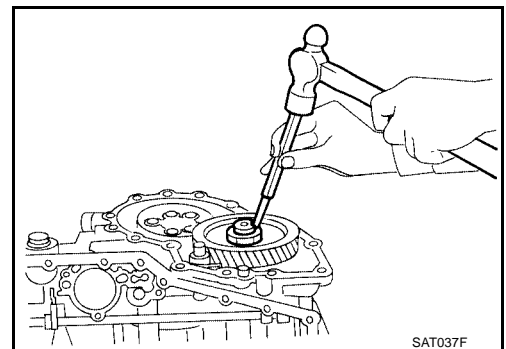


- e. Remove needle bearing.



40. Disassemble reduction pinion gear according to the following procedures.

- a. Set manual shaft to position P to fix idler gear.
- b. Unlock idler gear lock nut using a suitable punch.



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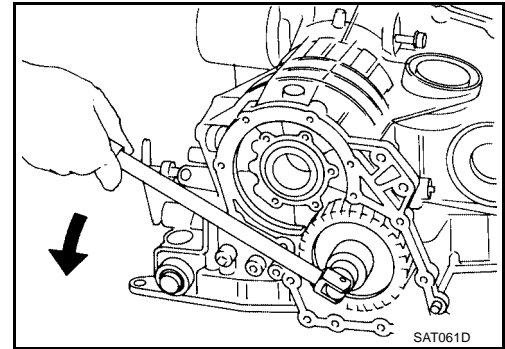
DISASSEMBLY

[RE4F04B]

- c. Remove idler gear lock nut using suitable tool.

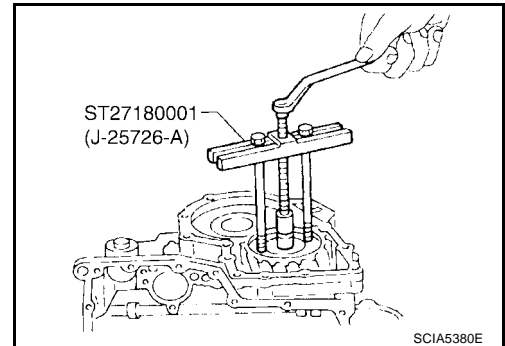
NOTE:

Do not reuse idler gear lock nut.



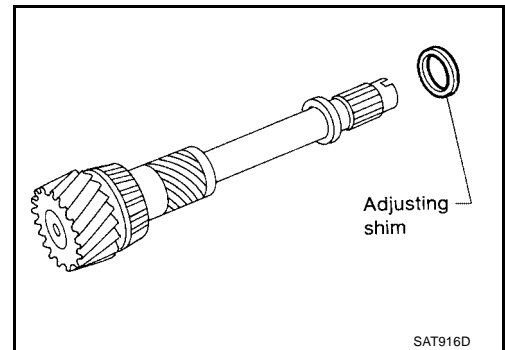
- d. Remove idler gear using Tool.

Tool number : ST27180001 (J-25726-A)

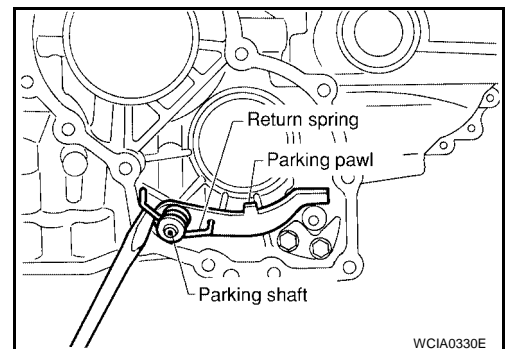


- e. Remove reduction pinion gear.

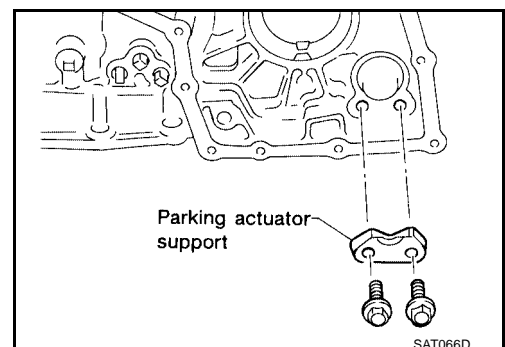
- f. Remove adjusting shim from reduction pinion gear.



41. Remove return spring from parking shaft with screwdriver.
42. Draw out parking shaft and remove parking pawl from transaxle case.
43. Check parking pawl and shaft for damage or wear.



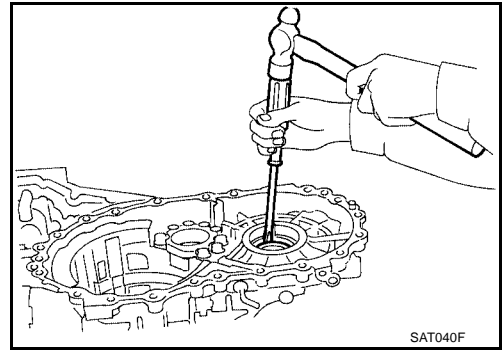
44. Remove parking actuator support from transaxle case.
45. Check parking actuator support for damage or wear.



DISASSEMBLY

[RE4F04B]

46. Remove side oil seal from transaxle case using suitable tool.



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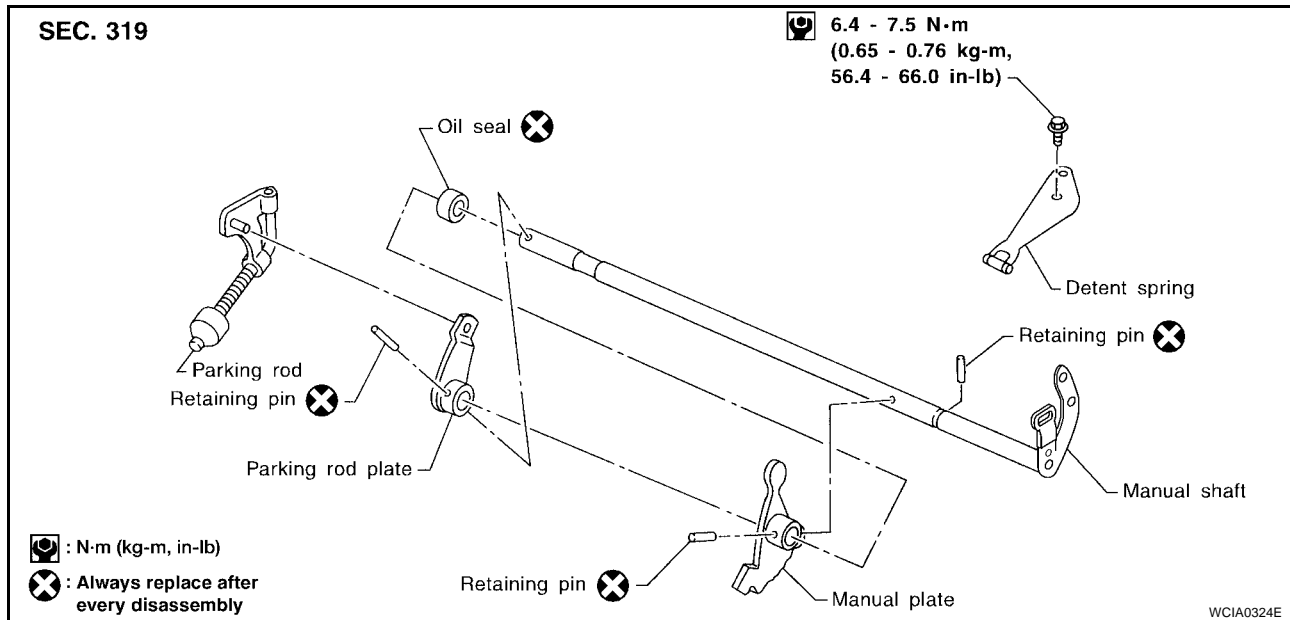
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REPAIR FOR COMPONENT PARTS

PFP:00000

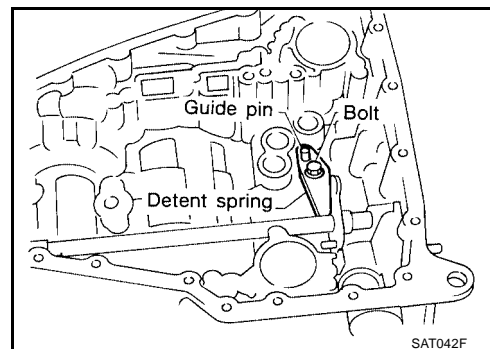
Manual Shaft
COMPONENTS

ECS009B1



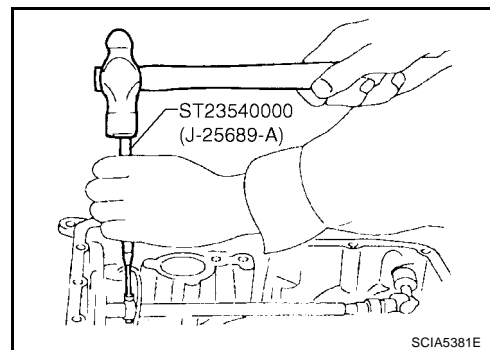
REMOVAL

1. Remove detent spring from transaxle case.



2. Drive out manual plate retaining pin using Tool.

Tool number : ST23540000 (J-25689-A)



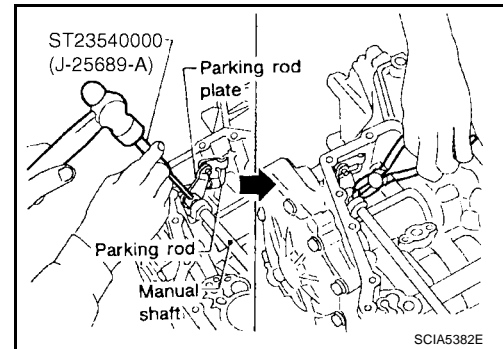
REPAIR FOR COMPONENT PARTS

[RE4F04B]

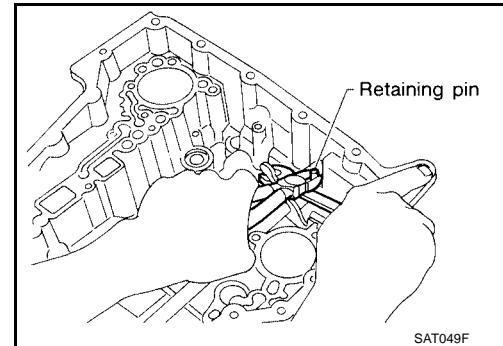
3. Drive and pull out parking rod plate retaining pin using Tool.

Tool number : ST23540000 (J-25689-A)

4. Remove parking rod plate from manual shaft.
5. Draw out parking rod from transaxle case using suitable tool.

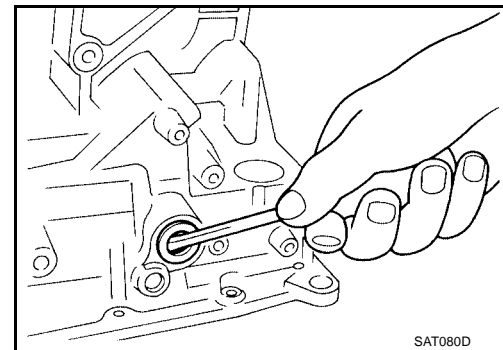


6. Pull out manual shaft retaining pin using suitable tool.
7. Remove manual shaft and manual plate from transaxle case.



8. Remove manual shaft oil seal using suitable tool.

CAUTION:
Do not damage the transaxle case.



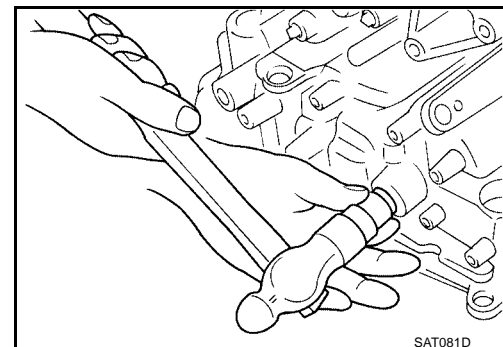
INSPECTION

- Check component parts for wear or damage. Replace if necessary.

INSTALLATION

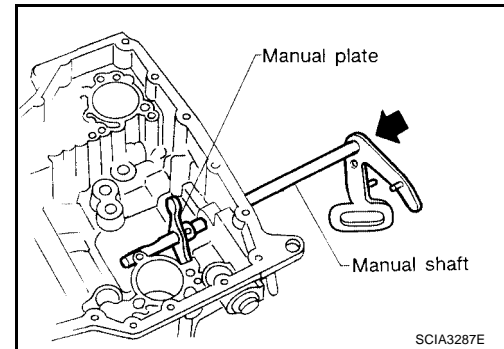
1. Install manual shaft oil seal using suitable tool.

NOTE:
Apply ATF to the outer surface of new oil seal



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2. Install manual shaft and manual plate.

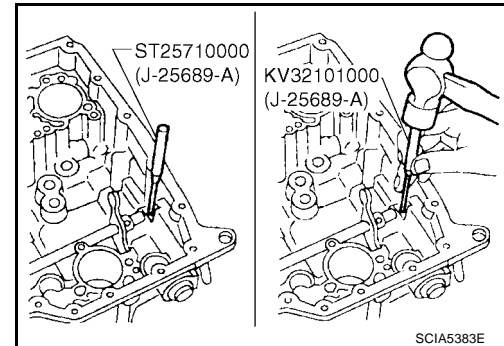


3. Align groove of manual shaft and hole of transaxle case using Tool.

Tool number : ST25710000 (J-25689-A)

4. Install manual shaft retaining pin up to bottom of hole using Tool.

Tool number : KV32101000 (J-25689-A)

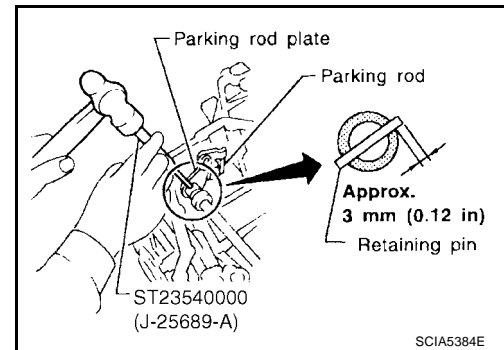


5. Install parking rod to parking rod plate.
6. Set parking rod assembly onto manual shaft and drive retaining pin using Tool.

Tool number : ST23540000 (J-25689-A)

NOTE:

Both ends of the pin should protrude.

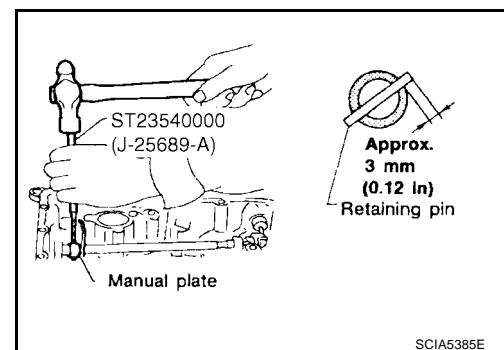


7. Drive manual plate retaining pin using Tool.

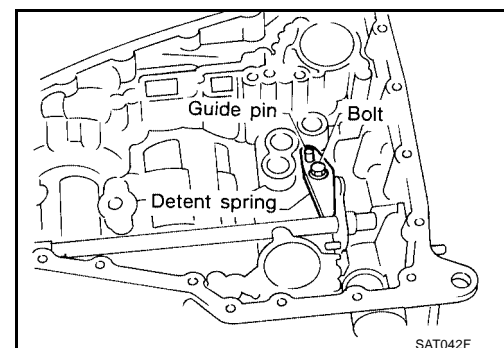
Tool number : ST23540000 (J-25689-A)

NOTE:

Both ends of the pin should protrude.

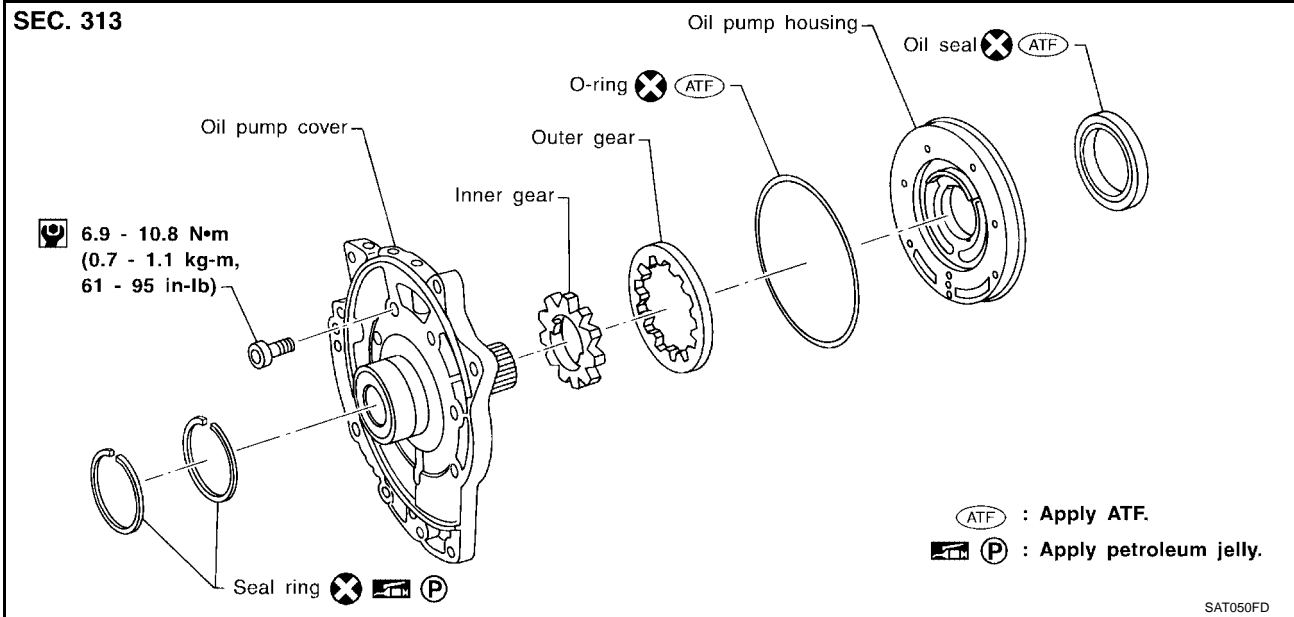


8. Install detent spring. Tighten detent spring bolts to the specified torque. Refer to [AT-275, "Components"](#) .



Oil Pump COMPONENTS

SEC. 313

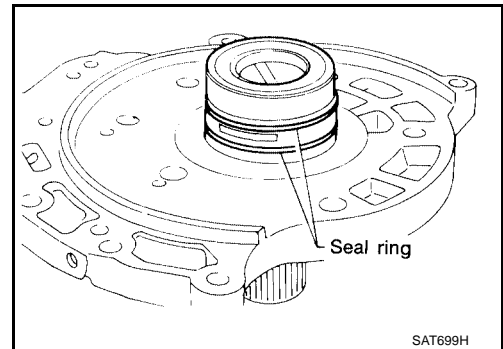


DISASSEMBLY

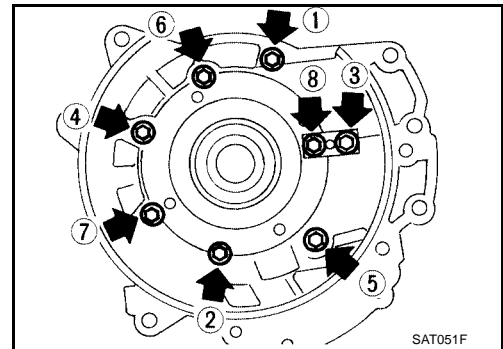
1. Remove seal rings.

NOTE:

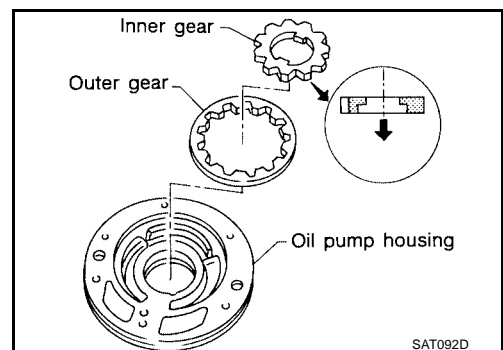
Do not reuse seal rings.



2. Loosen bolts in a crisscross pattern and remove oil pump cover.



3. Remove inner and outer gear from oil pump housing.

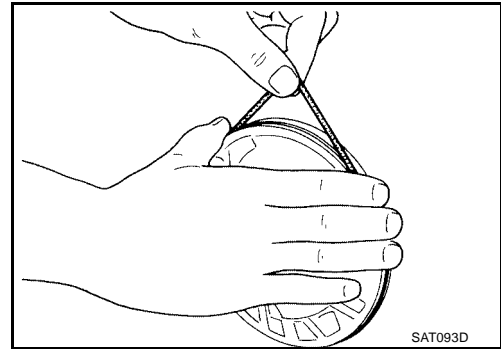


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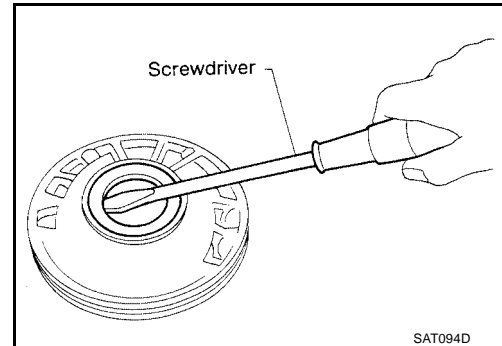
- Remove O-ring from oil pump housing.

NOTE:

Do not reuse O-rings.



- Remove oil pump housing oil seal using suitable tool.



INSPECTION

Oil Pump Housing, Oil Pump Cover, Inner Gear and Outer Gear

Check component parts for wear or damage. Replace if necessary.

Side Clearances

Measure side clearance of inner and outer gears in at least four places around each outside edge. Maximum measured values should be within specified positions.

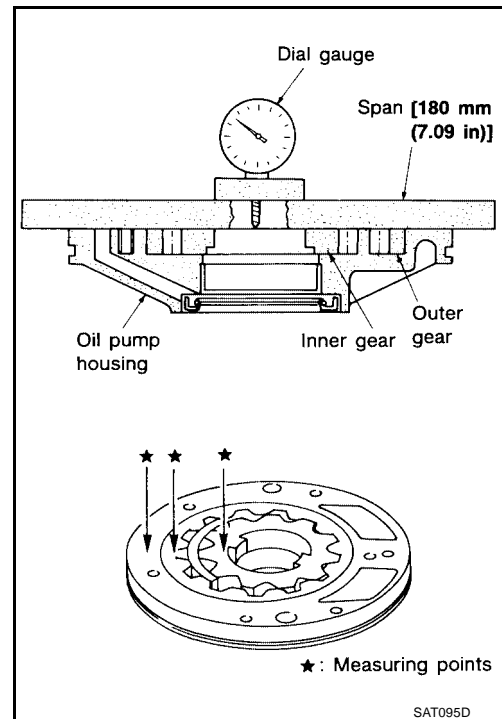
**Standard clearance : 0.030 - 0.050 mm
(0.0012 - 0.0020 in)**

If clearance is less than specification, select inner and outer gear as a set so that clearance is within specifications.

Inner and outer gear:

Refer to [AT-376, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).

If clearance is more than standard, replace whole oil pump assembly except oil pump cover.



REPAIR FOR COMPONENT PARTS

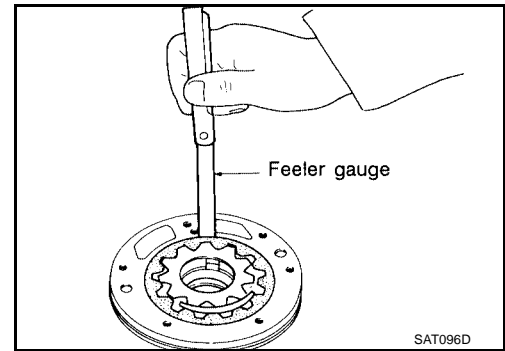
[RE4F04B]

Measure clearance between outer gear and oil pump housing.

Standard clearance : 0.111 - 0.181 mm
(0.0044 - 0.0071 in)

Allowable limit : 0.181 mm (0.0071 in)

If not within allowable limit, replace whole oil pump assembly except oil pump cover.



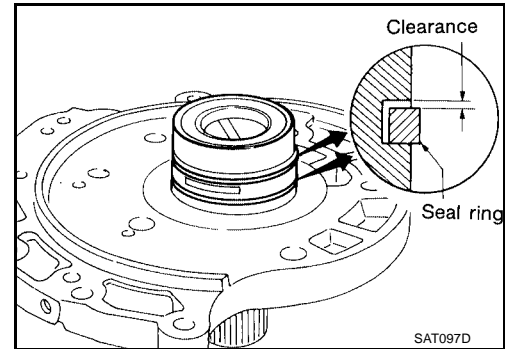
Seal Ring Clearance

Measure clearance between seal ring and ring groove.

Standard clearance : 0.1 - 0.25 mm (0.0039 - 0.0098 in)

Allowable limit : 0.25 mm (0.0098 in)

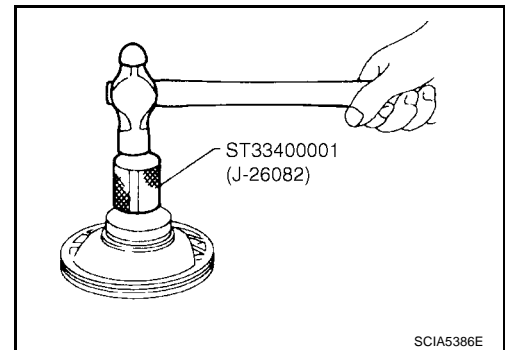
If not within allowable limit, replace oil pump cover assembly.



ASSEMBLY

1. Install new oil seal on oil pump housing.

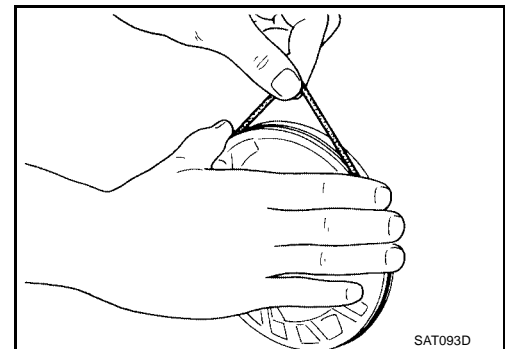
Tool number : ST33400001 (J-26082)



2. Install new O-ring on oil pump housing.

NOTE:

Apply ATF to new O-ring.



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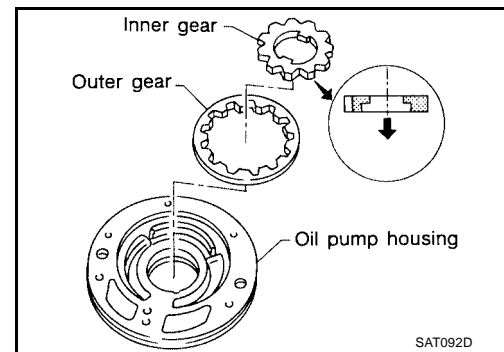
REPAIR FOR COMPONENT PARTS

[RE4F04B]

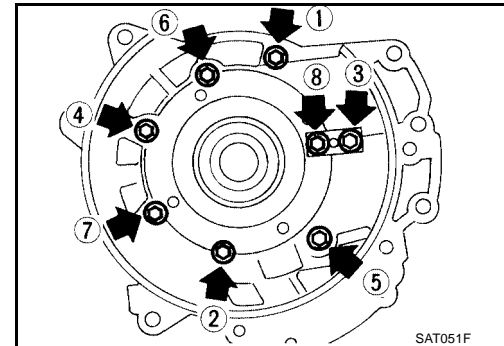
3. Install inner and outer gears on oil pump housing.

CAUTION:

Be careful of the direction of inner gear



4. Install oil pump cover on oil pump housing.
- a. Wrap masking tape around splines of oil pump cover assembly to protect seal. Position oil pump cover assembly on oil pump housing assembly, then remove masking tape.
- b. Tighten bolts in a crisscross pattern. Tighten oil pump cover bolts to the specified torque. Refer to [AT-299, "COMPONENTS"](#)



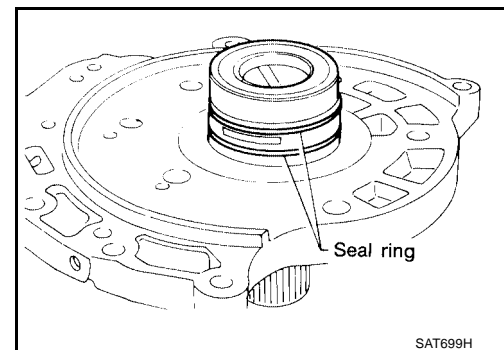
5. Install new seal rings carefully after packing ring groove with petroleum jelly.

CAUTION:

- Do not spread gap of the seal ring excessively while installing, The ring may be deformed.

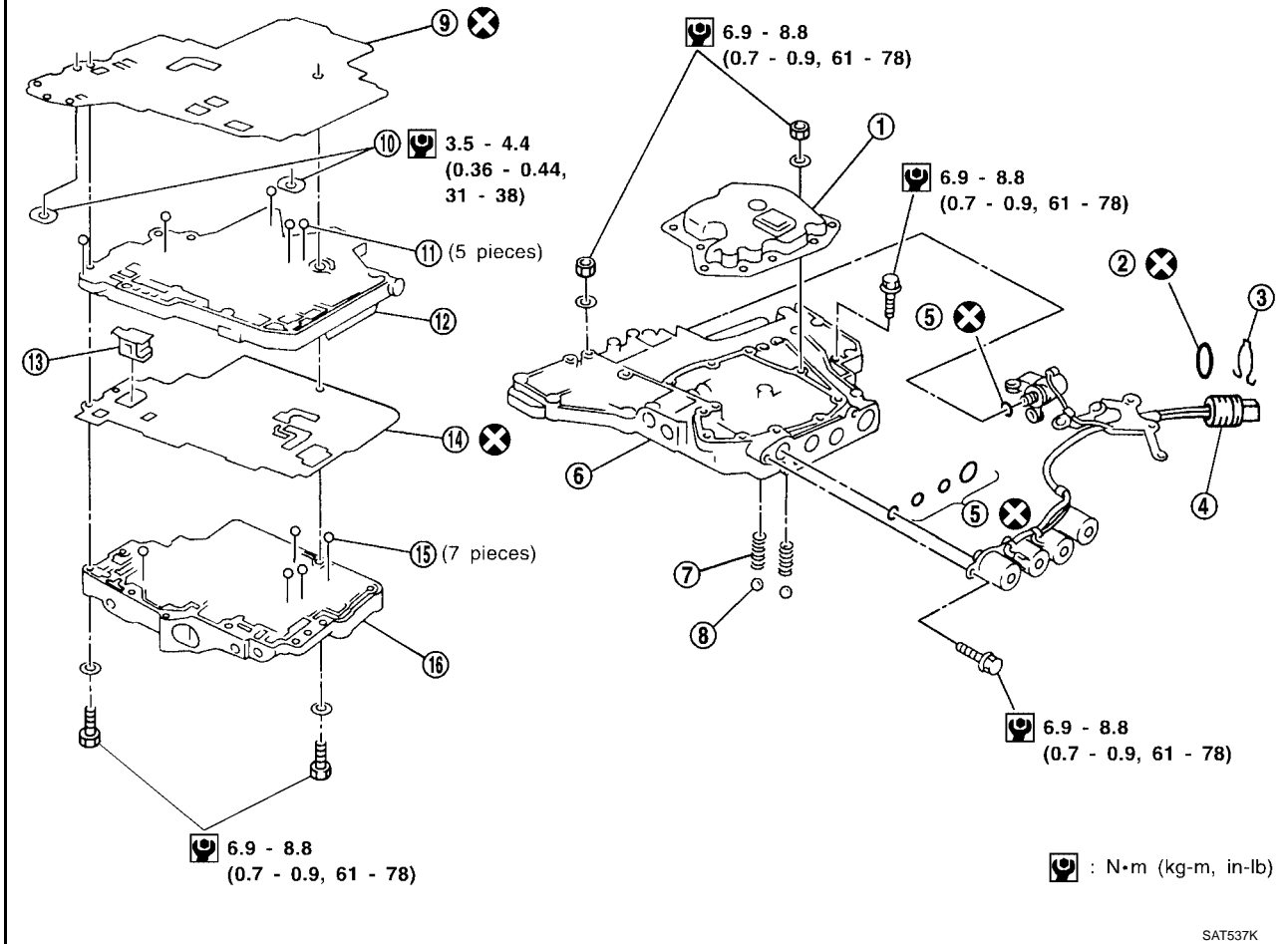
NOTE:

- Do not reuse seal rings.
- Apply petroleum jelly to new seal rings.



**Control Valve Assembly
COMPONENTS**

SEC. 317



- | | | |
|-----------------------------------|----------------------|------------------------------|
| 1. Oil strainer | 2. O-ring | 3. Snap ring |
| 4. Terminal body | 5. O-rings | 6. Control valve lower body |
| 7. Oil cooler relief valve spring | 8. Check ball | 9. Separating plate |
| 10. Support plate | 11. Steel ball | 12. Control valve inter body |
| 13. Pilot filter | 14. Separating plate | 15. Steel ball |
| 16. Control valve upper body | | |

DISASSEMBLY

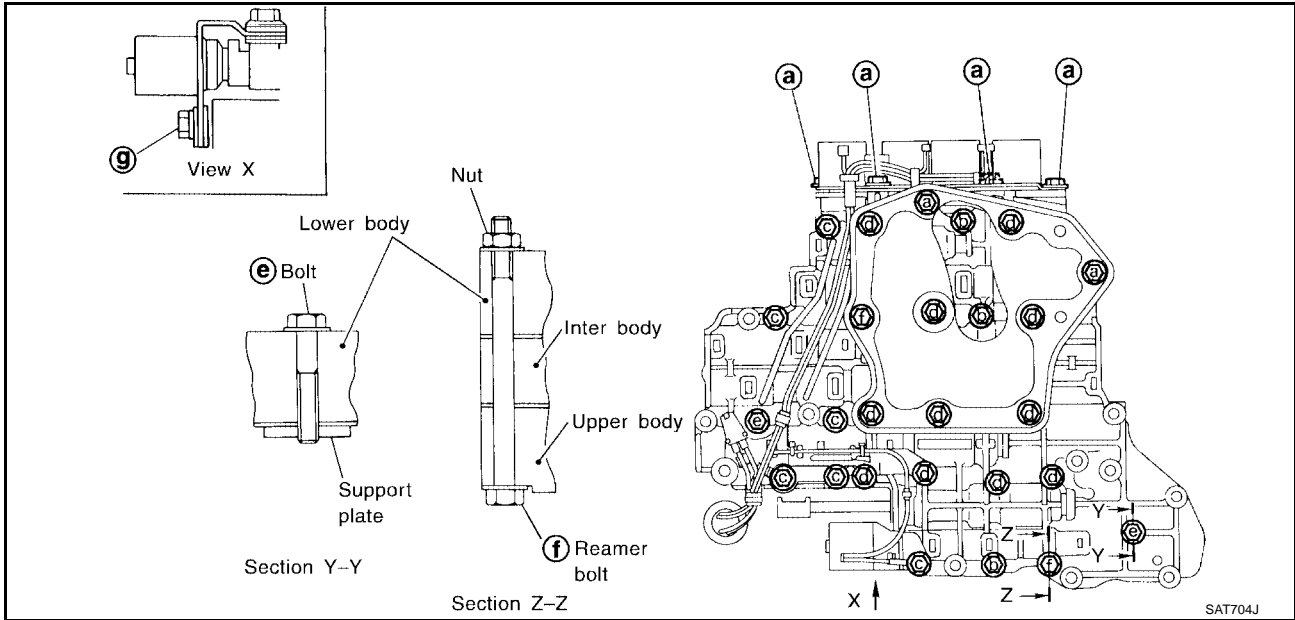
Disassemble upper, inter and lower bodies.

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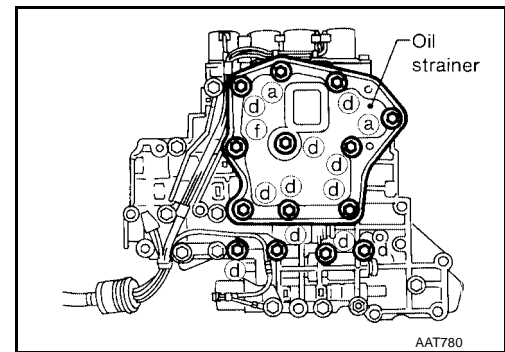
Bolt length, number and location:

| Bolt symbol | a | b | c | d | e | f | g |
|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Bolt length "ℓ" mm (in) | 13.5 (0.531) | 58.0 (2.283) | 40.0 (1.575) | 66.0 (2.598) | 33.0 (1.299) | 78.0 (3.071) | 18.0 (0.709) |
| Number of bolts | 6 | 3 | 6 | 11 | 2 | 2 | 1 |

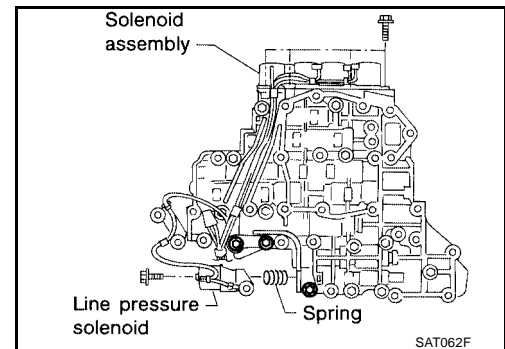
f: Reamer bolt and nut.



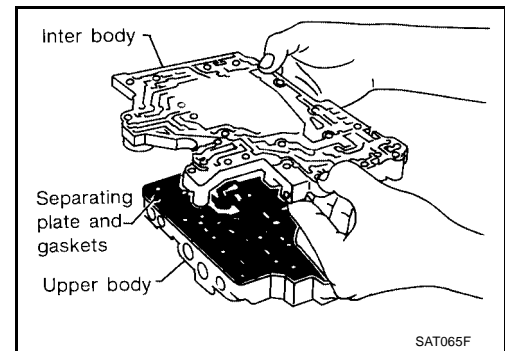
1. Remove bolts **a** , **d** and nut **f** and remove oil strainer from control valve assembly.



2. Remove solenoid valve assembly and line pressure solenoid valve from control valve assembly.

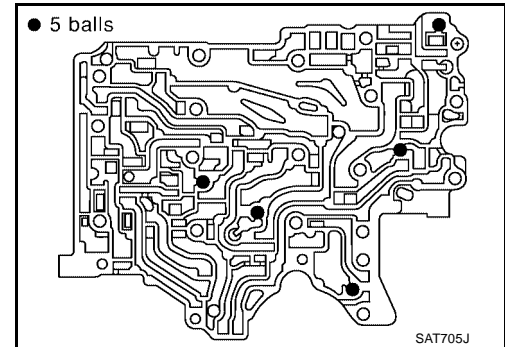


9. Remove inter body from upper body.



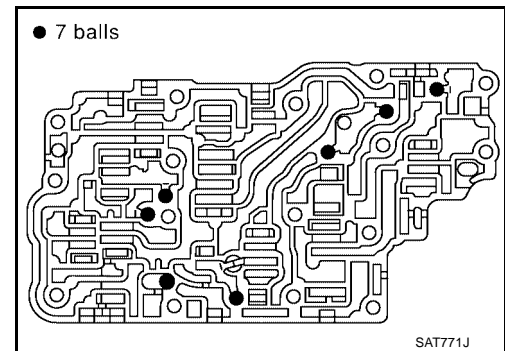
10. Check to see that steel balls are properly positioned in inter body and then remove them.

CAUTION:
Be careful not to lose steel balls.



11. Check to see that steel balls are properly positioned in upper body and then remove them.

CAUTION:
Be careful not to lose steel balls.



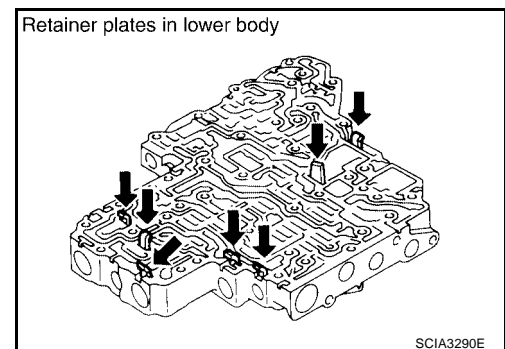
INSPECTION

Lower and Upper Bodies

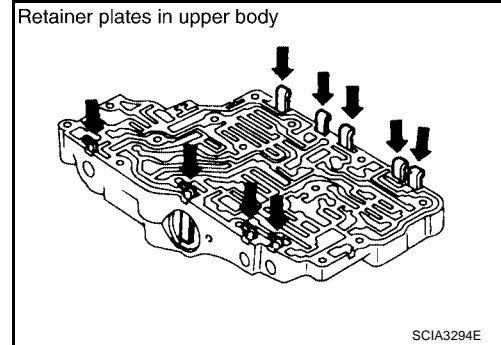
CAUTION:
Be careful not to lose these parts.

NOTE:

- Check to see that retainer plates are properly positioned in lower body.



- Check to see that retainer plates are properly positioned in upper body.



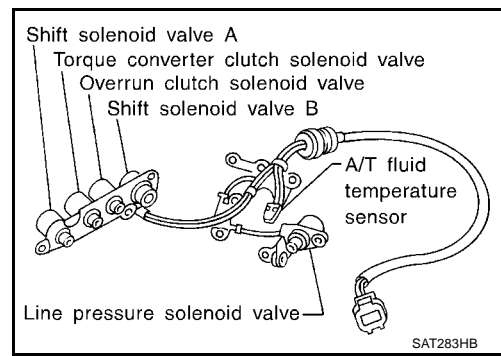
Oil Strainer

NOTE:

Check wire netting of oil strainer for damage.

Shift Solenoid Valves “A” and “B”, Line Pressure Solenoid Valve, Torque Converter Clutch Solenoid Valve and Overrun Clutch Solenoid Valve

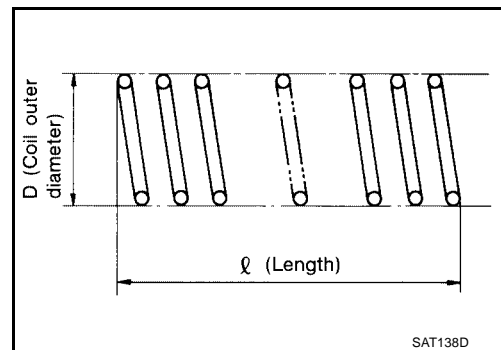
- Measure resistance.
- For shift solenoid valve A, refer to [AT-170, "Diagnostic Procedure"](#).
- For shift solenoid valve B, refer to [AT-175, "Diagnostic Procedure"](#).
- For line pressure solenoid valve, refer to [AT-164, "Diagnostic Procedure"](#).
- For torque converter clutch solenoid valve, refer to [AT-151, "Diagnostic Procedure"](#).
- For overrun clutch solenoid valve, refer to [AT-186, "Diagnostic Procedure"](#).



Oil Cooler Relief Valve Spring

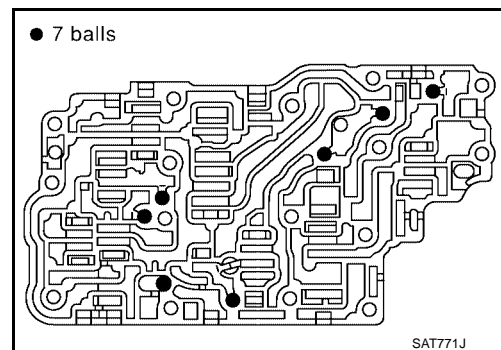
- Check springs for damage or deformation.
- Measure free length and outer diameter.

Inspection standard : Refer to [AT-377, "Control Valves"](#).



ASSEMBLY

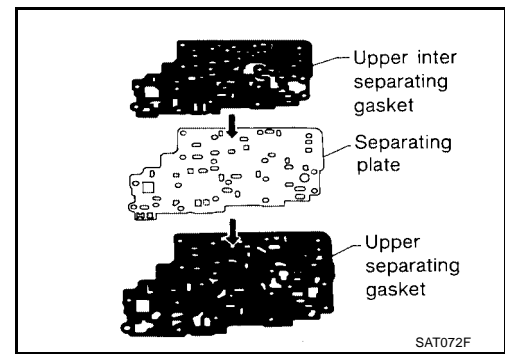
1. Install upper, inter and lower body.
 - a. Place oil circuit of upper body face up. Install steel balls in their proper positions.



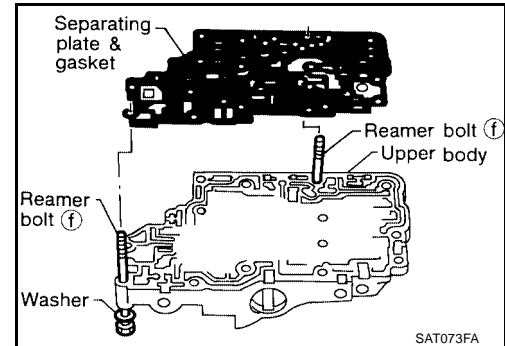
REPAIR FOR COMPONENT PARTS

[RE4F04B]

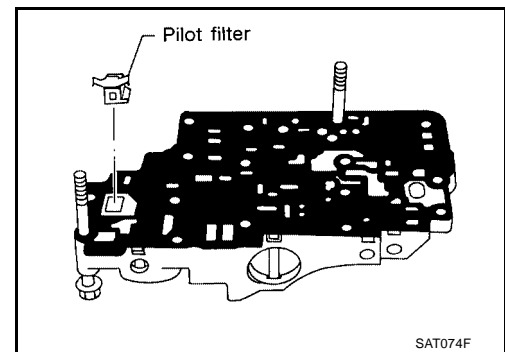
- b. Install upper separating gasket, upper inter separating gasket and upper separating plate in order shown in illustration.



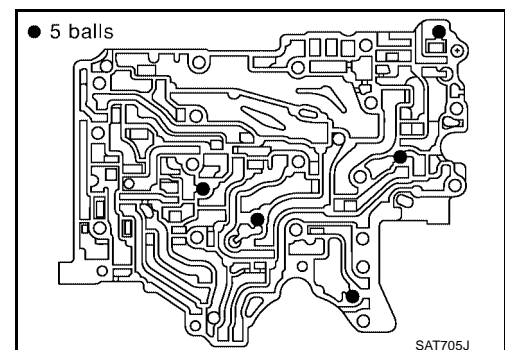
- c. Install reamer bolts **f** from bottom of upper body. Using reamer bolts as guides, install separating plate and gaskets as a set.



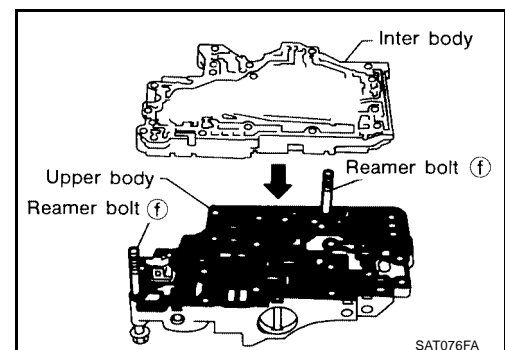
- d. Install pilot filter.



- e. Place lower body as shown in illustration (side of inter body face up). Install steel balls in their proper positions.



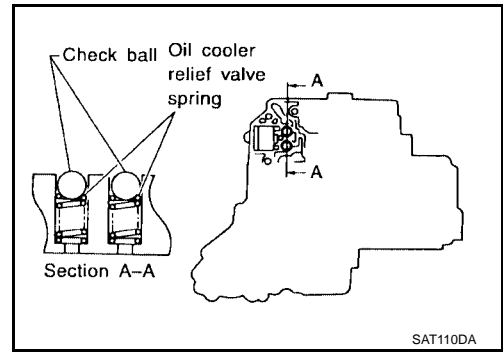
- f. Install inter body on upper body using reamer bolts **f** as guides.
CAUTION:
Be careful not to dislocate or drop steel check balls.



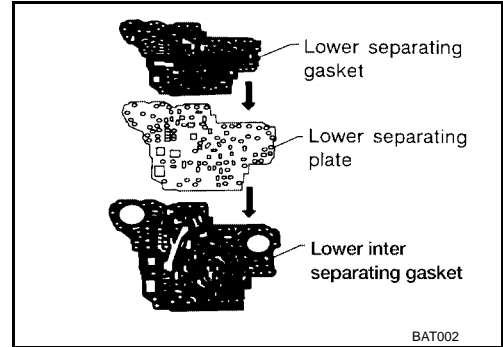
REPAIR FOR COMPONENT PARTS

[RE4F04B]

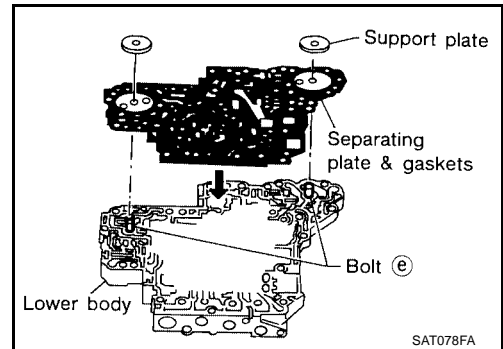
- g. Install check balls and oil cooler relief valve springs in their proper positions in lower body.



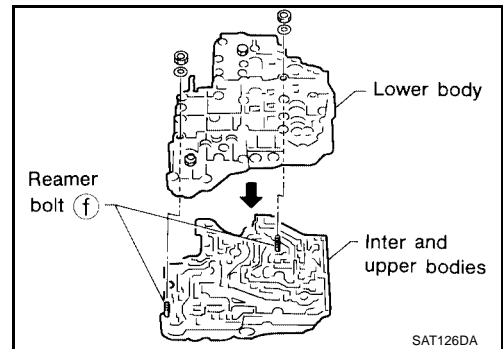
- h. Install lower separating gasket, lower inter separating gasket and lower separating plate in order shown in illustration.



- i. Install bolts **e** from bottom of lower body. Using bolts **e** as guides, install separating plate and gaskets as a set.



- j. Temporarily install support plates on lower body.
- k. Install lower body on inter body using reamer bolts **f** as guides and tighten reamer bolts **f** slightly.



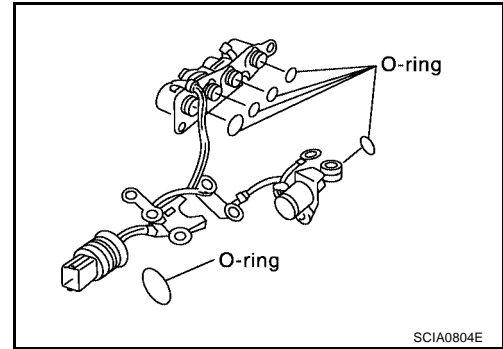
REPAIR FOR COMPONENT PARTS

[RE4F04B]

2. Install new O-rings to solenoid valves and terminal body.

NOTE:


Apply ATF to new O-rings

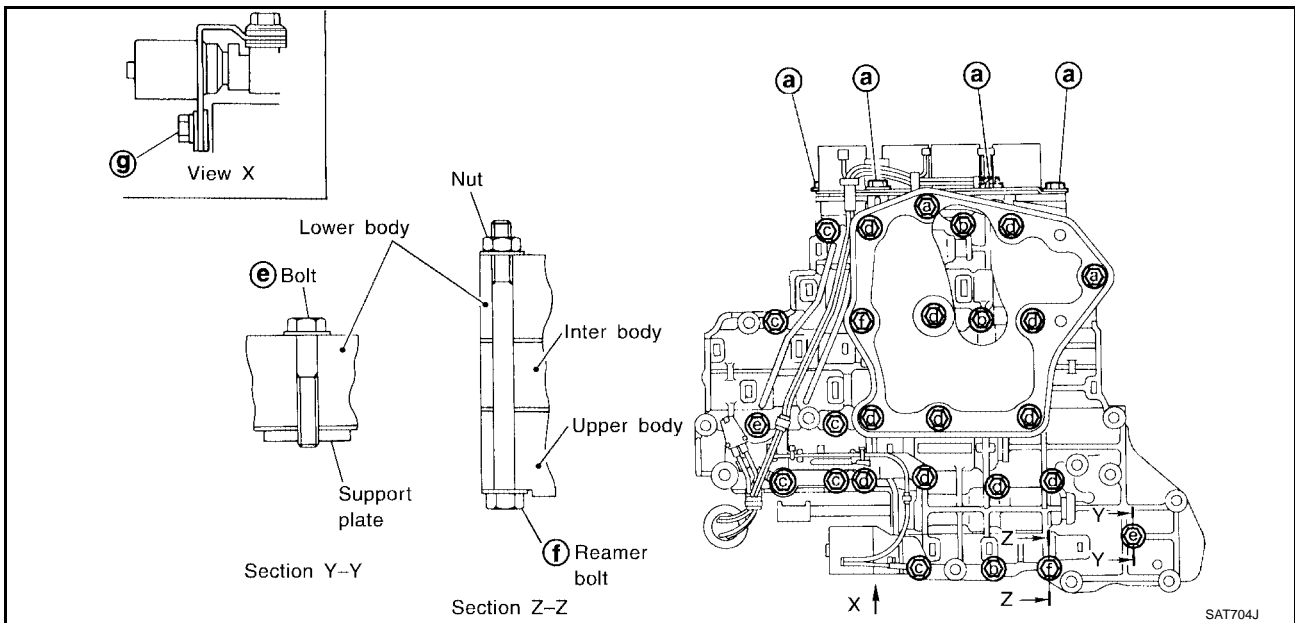


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3. Install and tighten bolts.

Bolt length, number and location:

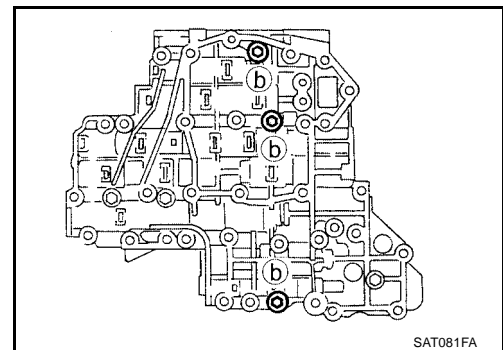
| Bolt symbol | a | b | c | d | e | f | g |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Bolt length "ℓ" mm (in)  | 13.5 (0.53 1) | 58.0 (2.28 3) | 40.0 (1.57 5) | 66.0 (2.59 8) | 33.0 (1.29 9) | 78.0 (3.07 1) | 18.0 (0.70 9) |
| Number of bolts | 6 | 3 | 6 | 11 | 2 | 2 | 1 |



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a. Install and tighten bolts **b** to specified torque.

b : 7 - 9 N-m (0.7 - 0.9 kg-m, 61 - 78 in-lb)

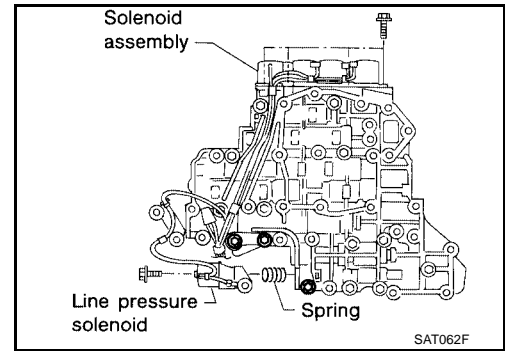


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REPAIR FOR COMPONENT PARTS

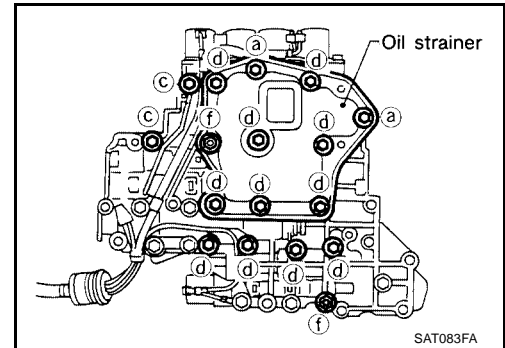
[RE4F04B]

- b. Install solenoid valve assembly and line pressure solenoid valve to lower body.



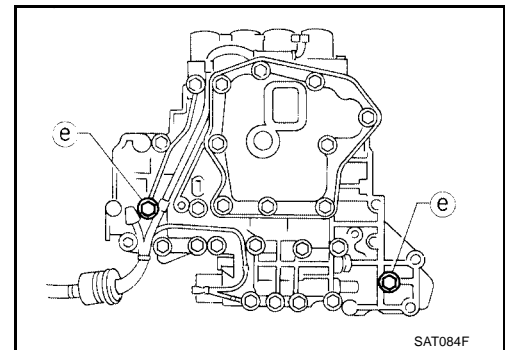
- c. Set oil strainer, then tighten bolts **a**, **c**, **d** and nuts **f** to specified torque.

a, c, d, f : 7 - 9 N-m (0.7 - 0.9 kg-m, 61 - 78 in-lb)



- d. Tighten bolts **e** to specified torque.

e : 3.4 - 4.4 N-m (0.35 - 0.45 kg-m, 30.4 - 39.1 in-lb)

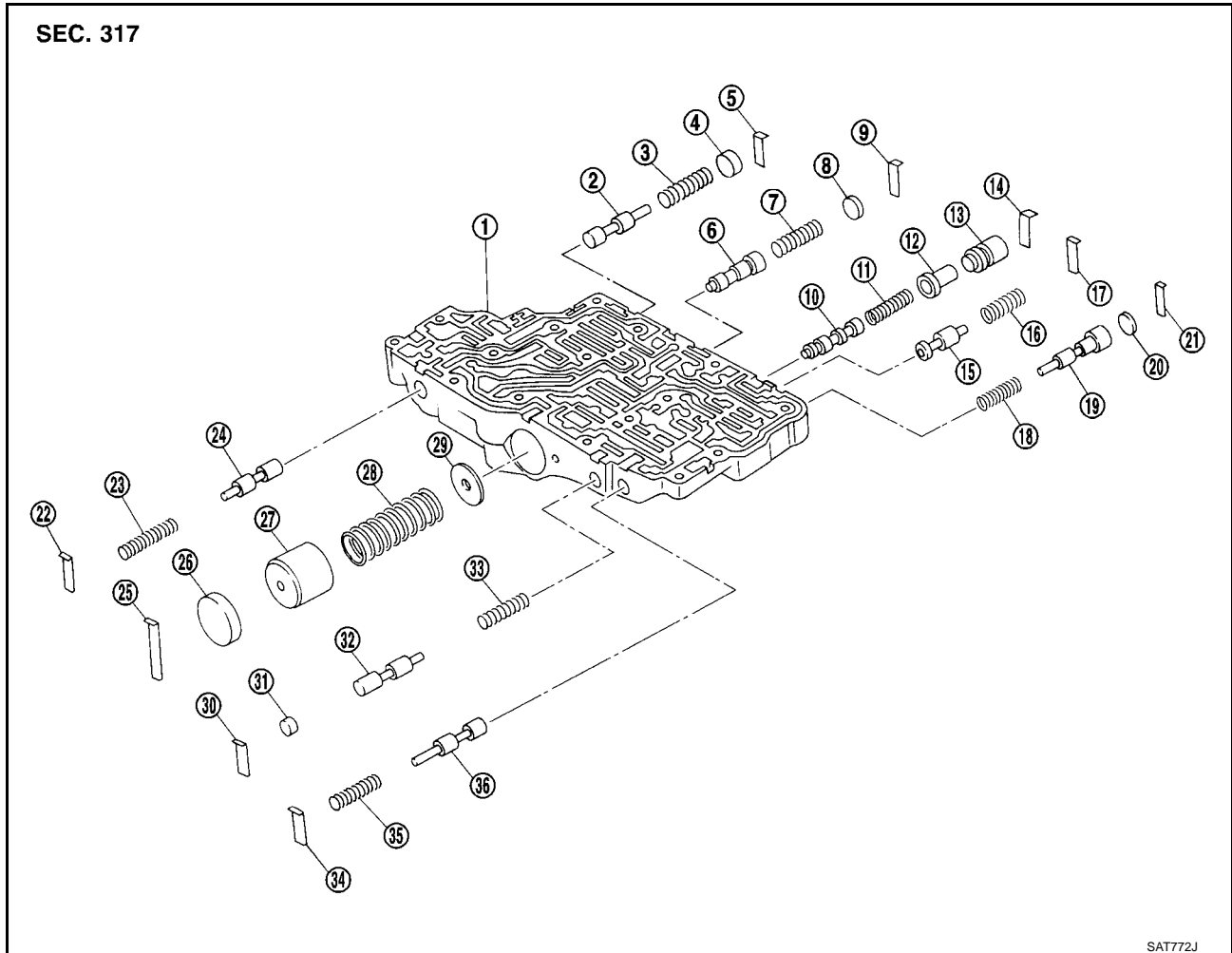


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Control Valve Upper Body COMPONENTS

NOTE:

Apply ATF to all components before installation.



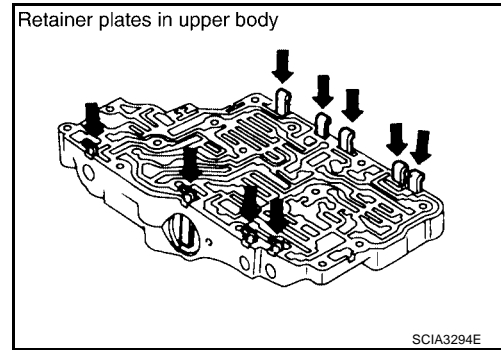
- | | | |
|--|------------------------------------|--|
| 1. Upper body | 2. Cooler check valve | 3. Return spring |
| 4. Plug | 5. Retainer plate | 6. 1-2 accumulator valve |
| 7. Return spring | 8. Plug | 9. Retainer plate |
| 10. Torque converter clutch control valve | 11. Return spring | 12. Torque converter clutch control plug |
| 13. Torque converter clutch control sleeve | 14. Retainer plate | 15. Torque converter relief valve |
| 16. Return spring | 17. Retainer plate | 18. Return spring |
| 19. Overrun clutch reducing valve | 20. Plug | 21. Retainer plate |
| 22. Retainer plate | 23. Return spring | 24. Pilot valve |
| 25. Retainer plate | 26. Plug | 27. 1-2 accumulator piston |
| 28. Return spring | 29. 1-2 accumulator retainer plate | 30. Retainer plate |
| 31. Plug | 32. 1st reducing valve | 33. Return spring |
| 34. Retainer plate | 35. Return spring | 36. 3-2 timing valve |

DISASSEMBLY

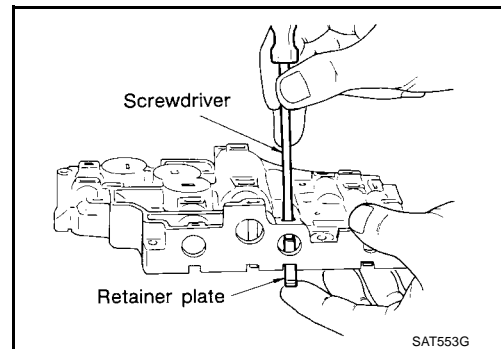
1. Remove valves at retainer plates.

NOTE:

Do not use a magnetic pick-up tool.



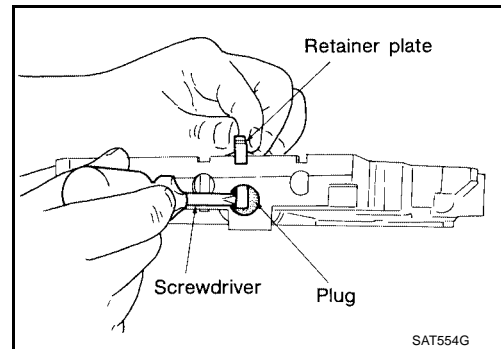
- a. Use a screwdriver to remove retainer plates.



- b. Remove retainer plates while holding spring, plugs or sleeves.

NOTE:

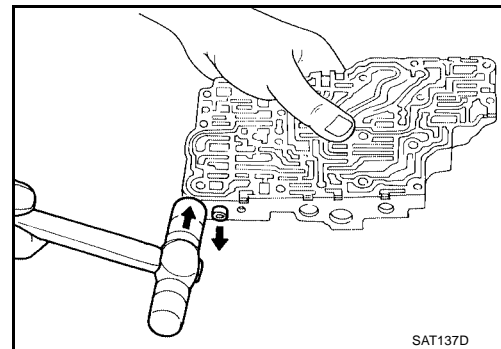
Remove plugs slowly to prevent internal parts from jumping out.



- c. Place mating surface of valve body face down, and remove internal parts.

NOTE:

- If a valve is hard to remove, place valve body face down and lightly tap it with a soft hammer.
- Be careful not to drop or damage valves and sleeves.



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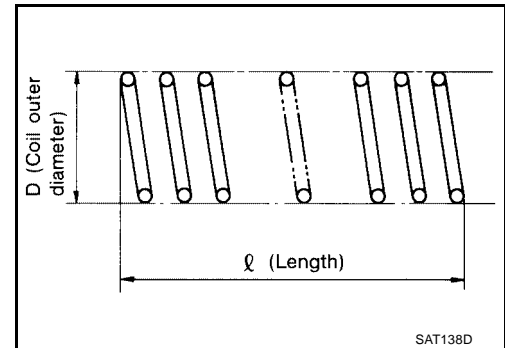
INSPECTION

Valve Spring

- Measure free length and outer diameter of each valve spring. Also check for damage or deformation.

Inspection standard : Refer to [AT-377, "Control Valves"](#) .

- Replace valve springs if deformed or fatigued.



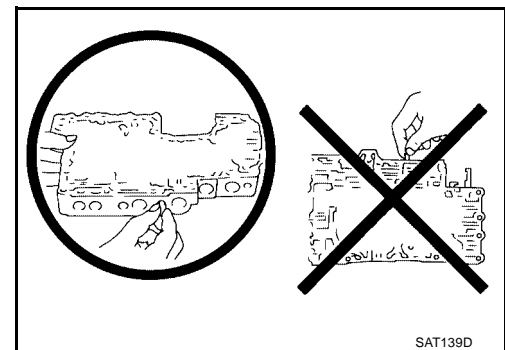
Control Valves

- Check sliding surfaces of valves, sleeves and plugs.

ASSEMBLY

NOTE:

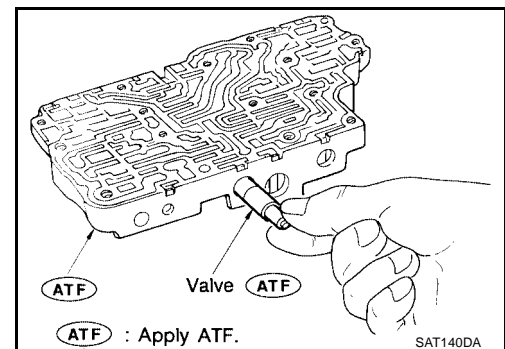
Lay control valve body down when installing valves. Do not stand the control valve body upright.



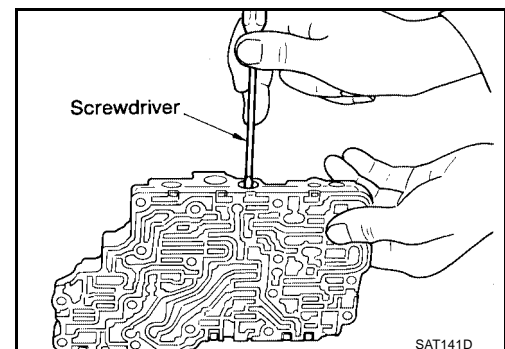
1. Lubricate the control valve body and all valves with ATF. Install control valves by sliding them carefully into their bores.

NOTE:

- Be careful not to scratch or damage valve body.

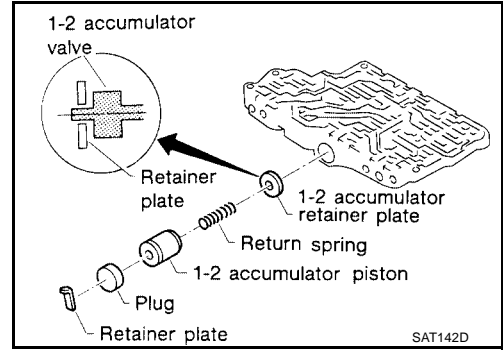


- Wrap a small screwdriver with vinyl tape and use it to insert the valves into their proper positions.

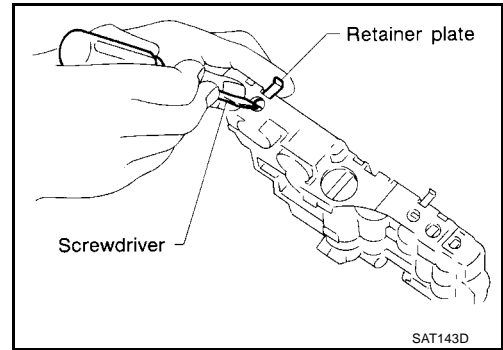


1-2 Accumulator Valve

- Install 1-2 accumulator valve. Align 1-2 accumulator retainer plate from opposite side of control valve body.
- Install return spring, 1-2 accumulator piston and plug.



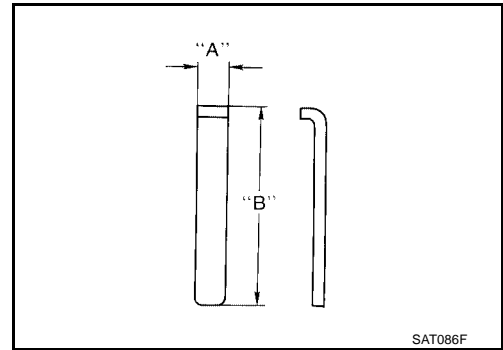
1. Install retainer plates.
 - While pushing plug or return spring using screwdriver, install retainer plate.



Retainer Plate (Upper Body)

Unit: mm (in)

| No. | Name of control valve | Width A | Length B |
|-----|---------------------------------------|-------------|--------------|
| 22 | Pilot valve | 6.0 (0.236) | 21.5 (0.846) |
| 30 | 1st reducing valve | | |
| 34 | 3-2 timing valve | | |
| 17 | Torque converter relief valve | | 38.5 (1.516) |
| 9 | 1-2 accumulator valve | | |
| 25 | 1-2 accumulator piston valve | | 24.0 (0.945) |
| 21 | Overrun clutch reducing valve | | |
| 5 | Cooler check valve | | 28.0 (1.102) |
| 14 | Torque converter clutch control valve | | |

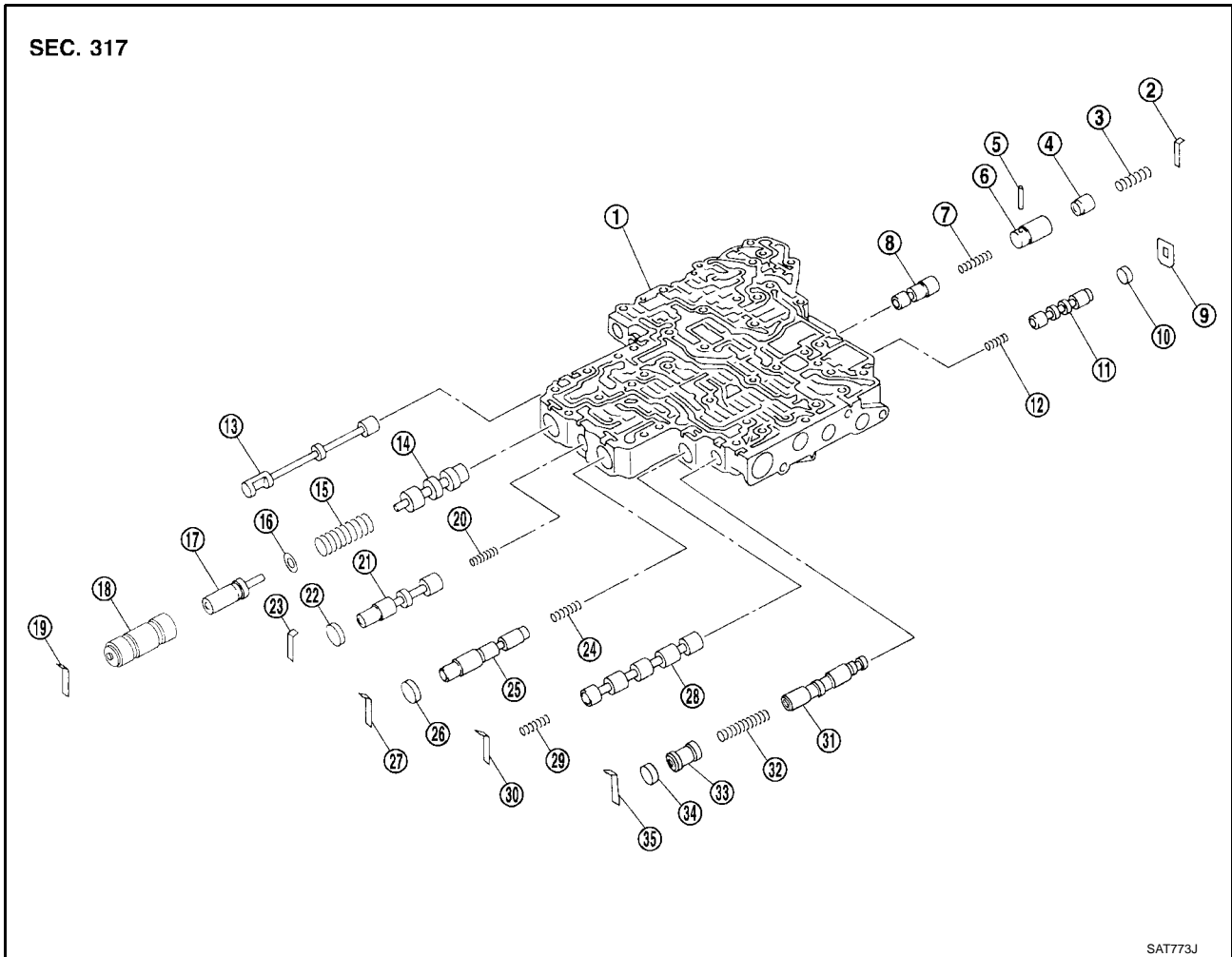


- Install proper retainer plates. Refer to [AT-312, "COMPONENTS"](#).

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Control Valve Lower Body COMPONENTS

SEC. 317

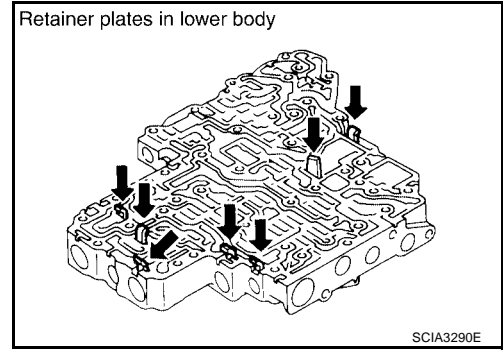


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- | | | |
|-------------------------------|------------------------------|----------------------------------|
| 1. Lower body | 2. Retainer plate | 3. Return spring |
| 4. Piston | 5. Parallel pin | 6. Sleeve |
| 7. Return spring | 8. Pressure modifier valve | 9. Retainer plate |
| 10. Plug | 11. Shift valve B | 12. Return spring |
| 13. Manual valve | 14. Pressure regulator valve | 15. Return spring |
| 16. Spring seat | 17. Plug | 18. Sleeve |
| 19. Retainer plate | 20. Return spring | 21. Overrun clutch control valve |
| 22. Plug | 23. Retainer plate | 24. Return spring |
| 25. Accumulator control valve | 26. Plug | 27. Retainer plate |
| 28. Shift valve A | 29. Return spring | 30. Retainer plate |
| 31. Shuttle valve | 32. Return spring | 33. Plug |
| 34. Plug | 35. Retainer plate | |

DISASSEMBLY

Remove valves at retainer plate.
For removal procedures, refer to [AT-316, "COMPONENTS"](#) .



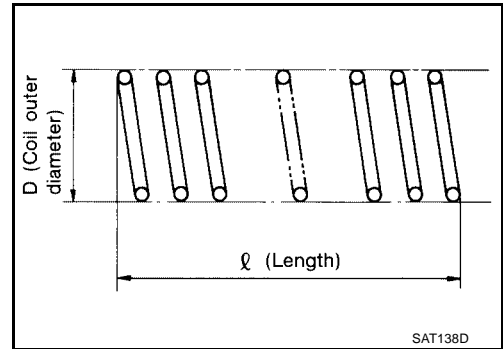
INSPECTION

Valve Springs

Check each valve spring for damage or deformation. Also measure free length and outer diameter.

Inspection standard : Refer to [AT-377, "Control Valves"](#) .

Replace valve springs if deformed or fatigued.



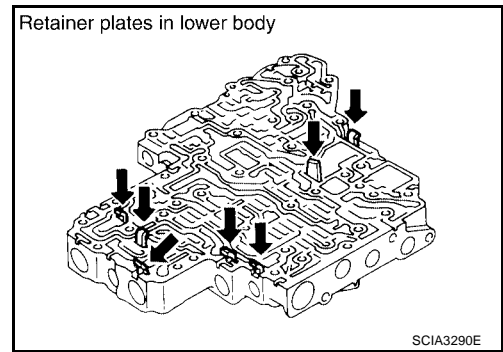
Control Valves

Check sliding surfaces of control valves, sleeves and plugs for damage.

ASSEMBLY

Install control valves.
For installation procedures, refer to [AT-316, "COMPONENTS"](#) .

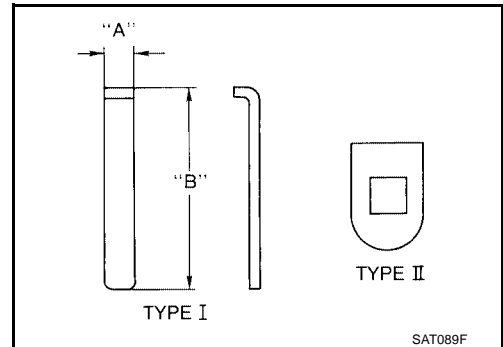
NOTE:
Apply ATF to all components before installation.



Retainer Plate (Lower Body)

Unit: mm (in)

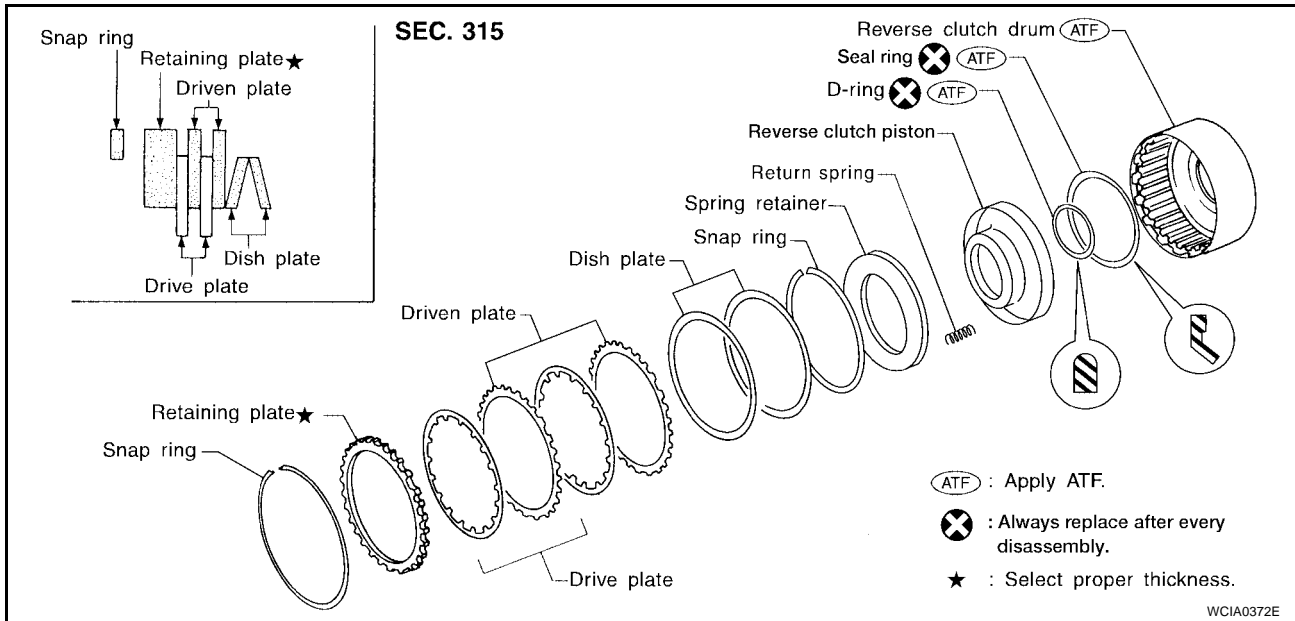
| No. | Name of control valve and plug | Width A | Length B | Type |
|-----|--------------------------------|----------------|-----------------|------|
| 19 | Pressure regulator valve | 6.0 (0.236) | 28.0 (1.102) | I |
| 27 | Accumulator control valve | | | |
| 30 | Shift valve A | | | |
| 23 | Overrun clutch control valve | | | |
| 2 | Pressure modifier valve | | | |
| 35 | Shuttle valve | — | — | II |
| 9 | Shift valve B | | | |



- Install proper retainer plates.
Refer to [AT-316, "COMPONENTS"](#) .

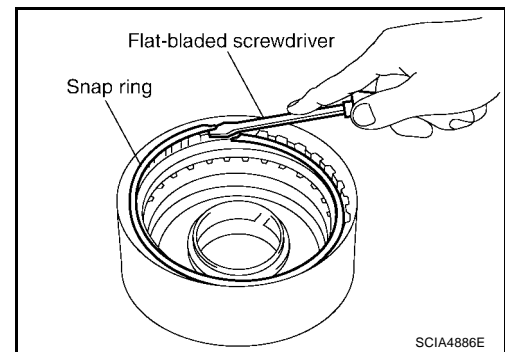
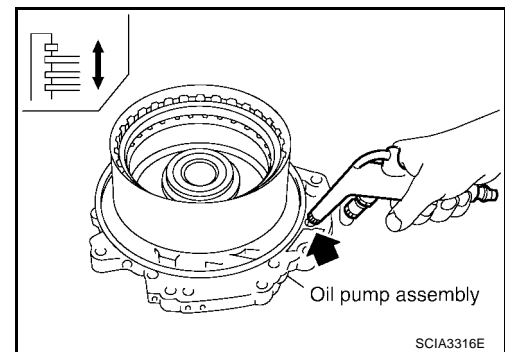
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Reverse Clutch COMPONENTS



DISASSEMBLY

1. Check operation of reverse clutch
 - a. Install seal ring onto drum support of oil pump cover and install reverse clutch assembly. Apply compressed air to oil hole.
 - b. Check to see that retaining plate moves to snap ring.
 - c. If retaining plate does not contact snap ring:
 - D-ring might be damaged.
 - Oil seal might be damaged.
 - Fluid might be leaking past piston check ball.
2. Remove snap ring using screwdriver.
3. Remove drive plates, driven plates, retaining plate, and dish plates.



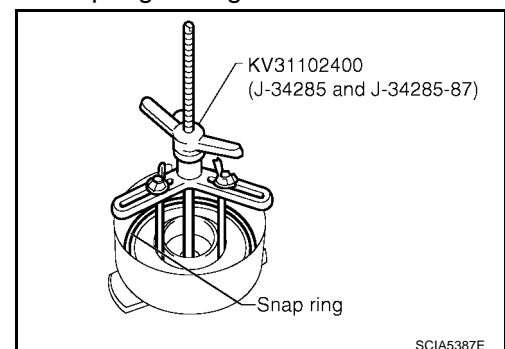
4. Remove snap ring from reverse clutch drum while compressing return springs using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

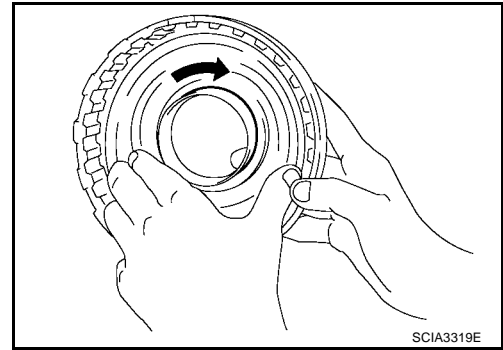
CAUTION:

- Be sure to set Tool directly over springs.
- Do not expand the snap ring excessively.

5. Remove spring retainer and return springs.



6. Remove reverse clutch piston from reverse clutch drum by turning it as shown.
7. Remove D-ring and oil seal from piston.



INSPECTION

Reverse Clutch Snap Ring, Spring Retainer and Return Springs

Check for deformation, fatigue or damage. If damaged, replace.

Reverse Clutch Drive Plates

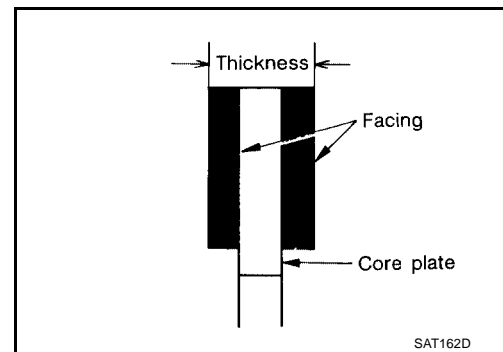
- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate:

Standard value : 1.6 mm (0.063 in)

Wear limit : 1.4 mm (0.055 in)

- If not within wear limit, replace.

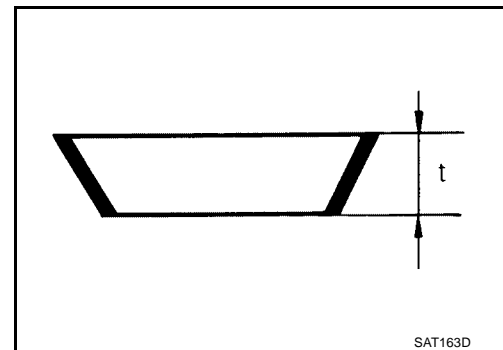


Reverse Clutch Dish Plates

- Check for deformation or damage.
- Measure thickness of dish plate.

Thickness of dish plate : 3.08 mm (0.1213 in)

- If deformed or fatigued, replace.



Reverse Clutch Piston

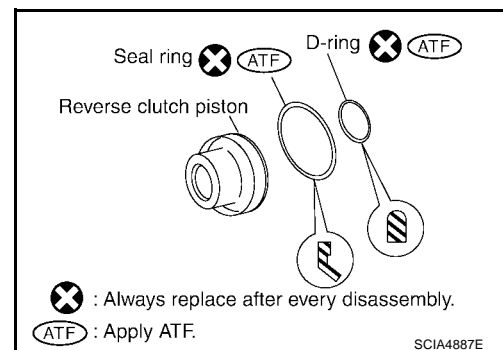
- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure that air leaks past ball.

ASSEMBLY

1. Install new D-ring and seal ring on piston.

NOTE:

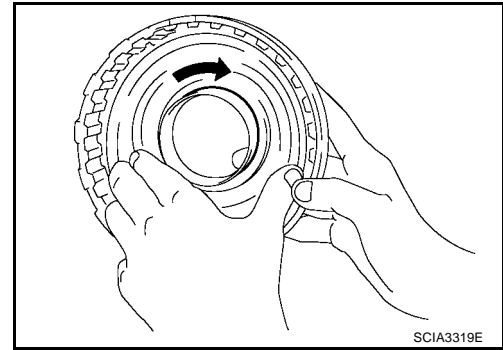
- Take care with the direction of new oil seal.
- Apply ATF to both parts.



- Install piston assembly by turning it slowly.

NOTE:

- Apply ATF to inner surface of the drum.

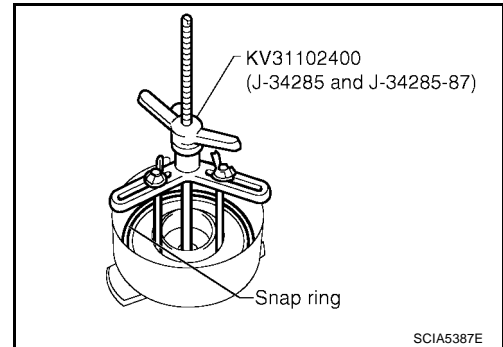


- Install return springs and spring retainer on piston using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

CAUTION:

- Be sure to set Tool directly over springs.



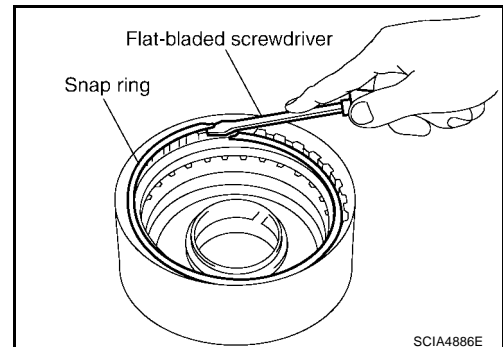
- Set Tool on spring retainer and install snap ring while compressing return springs.

- Install drive plates, driven plates, retaining plate and dish plates.

NOTE:

- Take care with the order of the plates

- Install snap ring using screwdriver.



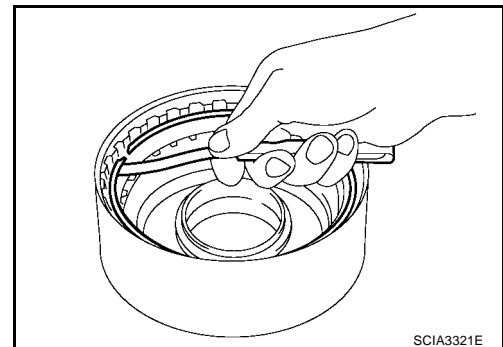
- Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate.

Specified clearance

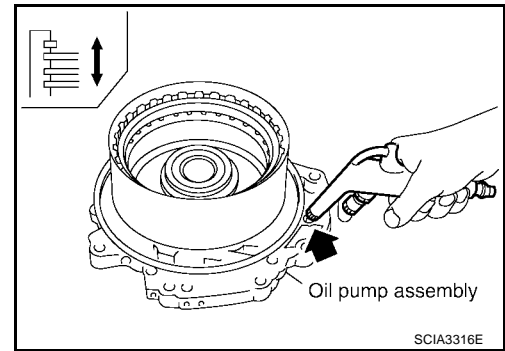
Standard : 0.5 - 0.8 mm
(0.020 - 0.031 in)

Allowable limit : 1.2 mm (0.047 in)

Retaining plate : Refer to [AT-378](#),
"REVERSE CLUTCH" .



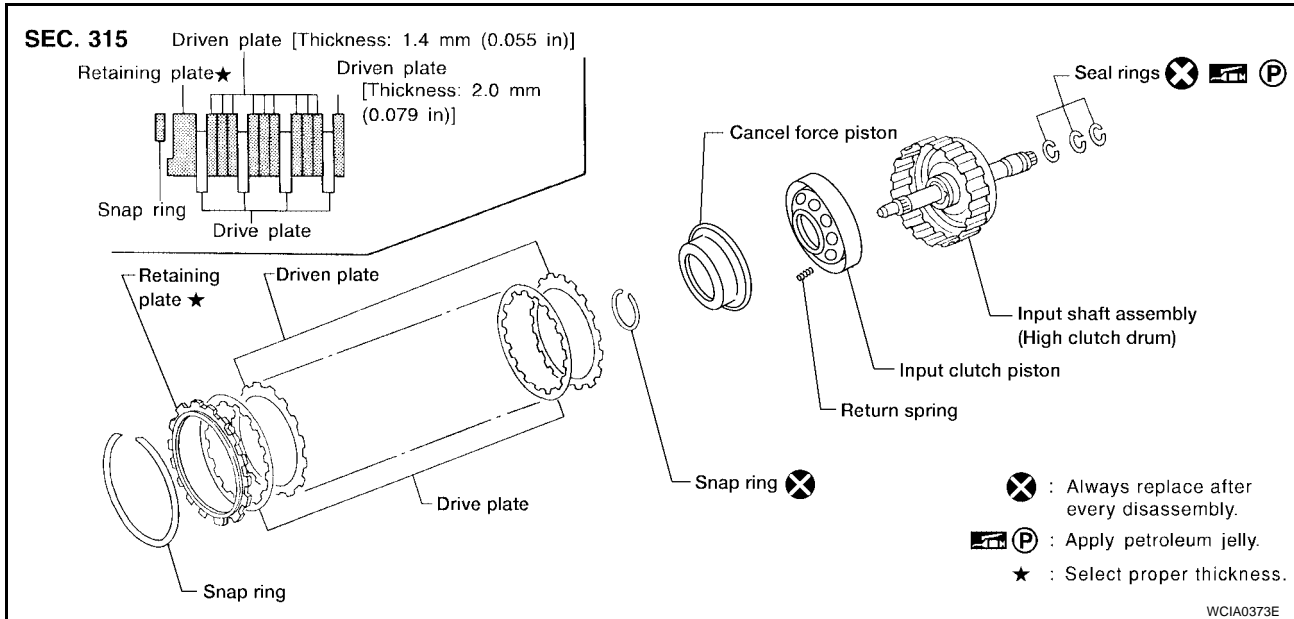
8. Check operation of reverse clutch using compressed air.



SCIA3316E

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High Clutch COMPONENTS



WCIA0373E

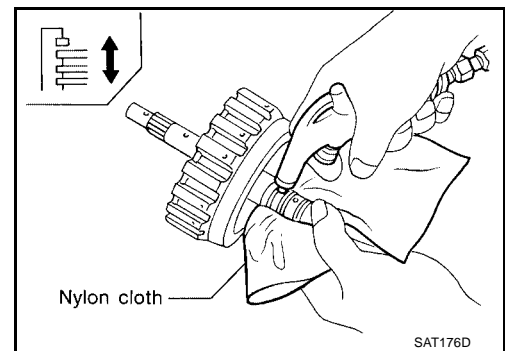
DISASSEMBLY

1. Check operation of high clutch using compressed air.
 - a. Apply compressed air to oil hole of input shaft with nylon cloth.

NOTE:
Stop up hole on opposite side of input shaft with nylon cloth.
 - b. Check to see that retaining plate moves to snap ring.
 - c. If retaining plate does not contact snap ring:

NOTE:

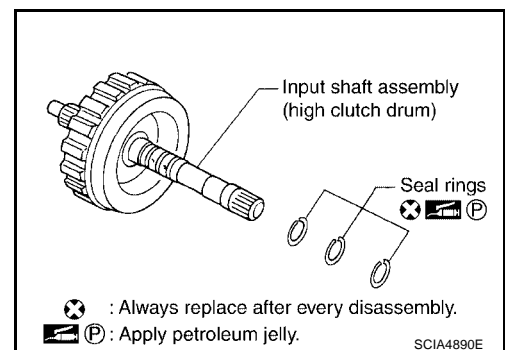
 - D-ring might be damaged.
 - Oil seal might be damaged.
 - Fluid might be leaking past piston check ball.



SAT176D

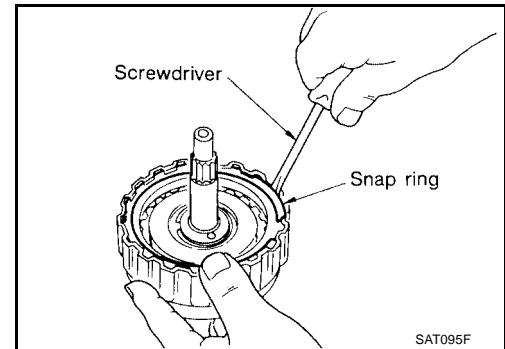
2. Remove seal rings from input shaft.

NOTE:
Do not reuse seal rings.



SCIA4890E

3. Remove snap ring using screwdriver.
4. Remove drive plates, driven plates and retaining plate.



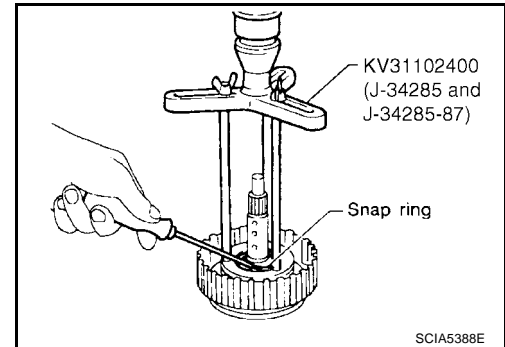
5. Remove snap ring from high clutch drum while compressing return springs using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

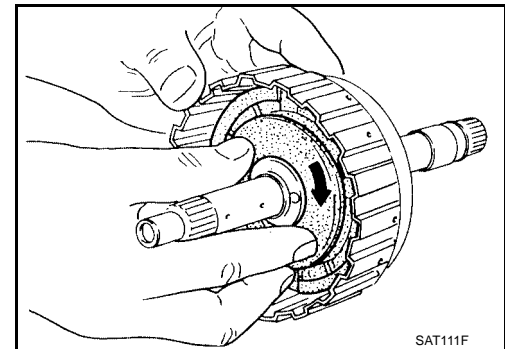
CAUTION:

- Set Tool directly over springs.
- Do not expand snap ring excessively.

6. Remove cancel force cover and return springs.



7. Remove piston from high clutch drum by turning it.



INSPECTION

High Clutch Snap Ring, Spring Retainer and Return Springs

Check for deformation, replace if fatigue or damage.

NOTE:

Always replace the spring retainer and return springs as a set.

High Clutch Drive Plates

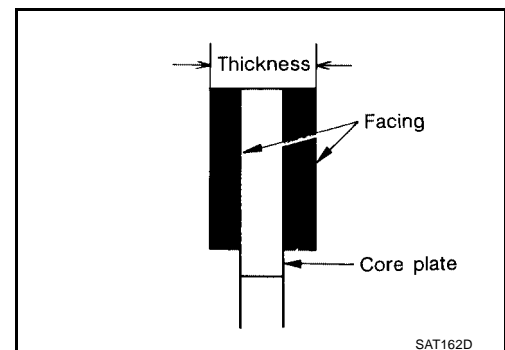
- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate:

Standard value : 1.6 mm (0.063 in)

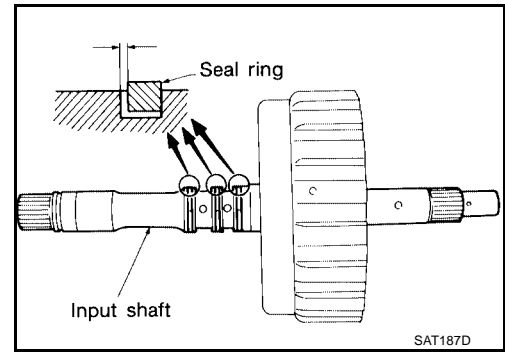
Wear limit : 1.4 mm (0.055 in)

- If not within wear limit, replace.



Seal Ring Clearance

- Install new seal rings onto input shaft.
- Measure clearance between seal ring and ring groove.
 - Standard clearance** : 0.08 - 0.23 mm
(0.0031 - 0.0091 in)
 - Allowable limit** : 0.23 mm (0.0091 in)
- If not within allowable limit, replace input shaft assembly.

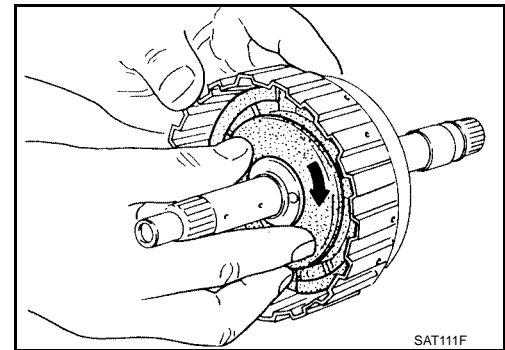


ASSEMBLY

1. Install return springs and cancel force spring on piston.
2. Install piston assembly by turning it slowly.

NOTE:

Apply ATF to inner surface of the drum

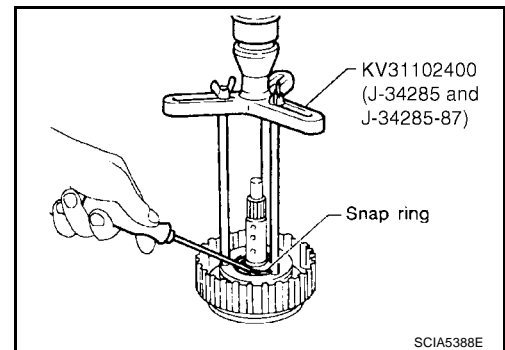


3. Install snap ring while compressing return springs using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

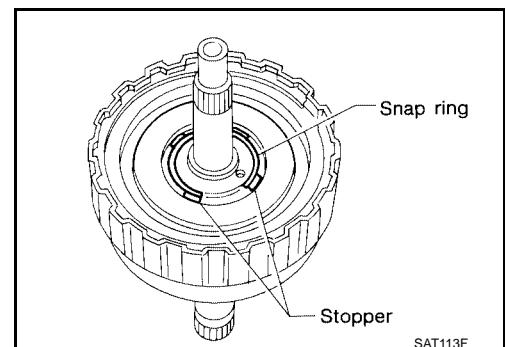
CAUTION:

Set Tool directly over return springs.



CAUTION:

Do not align the snap ring gap with the spring retainer stopper.



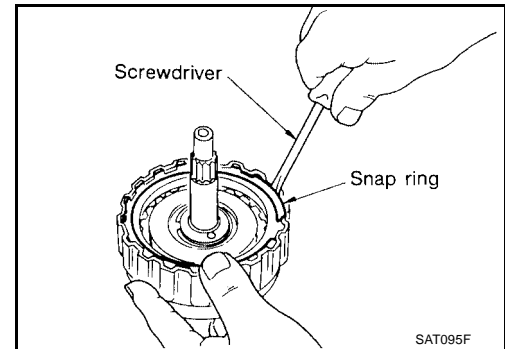
4. Install drive plates, driven plates and retaining plate.

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NOTE:

Take care of the order and direction of plates.

5. Install snap ring using screwdriver.



6. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate.

Specified clearance

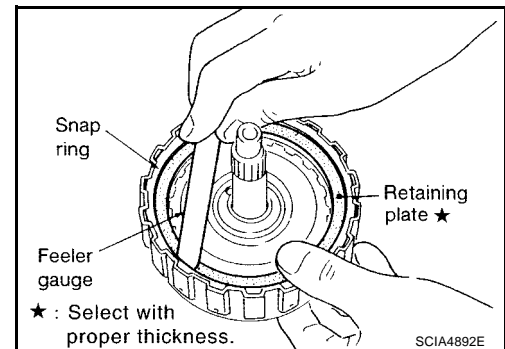
Standard : 1.8 - 2.2 mm (0.071 - 0.087 in)

Allowable limit : 2.8 mm (0.110 in)

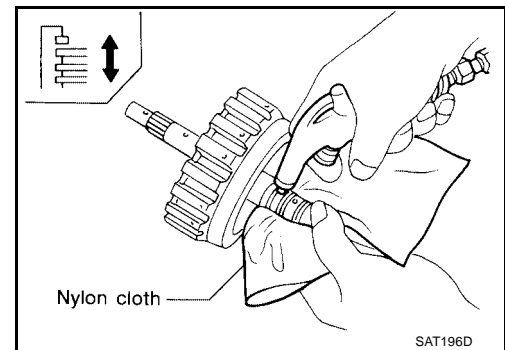
Retaining plate

: Refer to [AT-378, "HIGH CLUTCH"](#) .

: Refer to [AT-378, "HIGH CLUTCH"](#) .



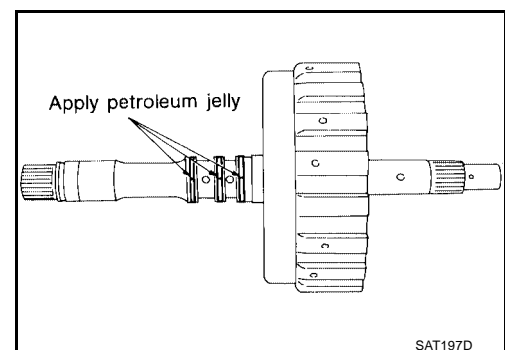
7. Check operation of high clutch.



8. Install seal rings to input shaft.

NOTE:

- Apply petroleum jelly to the new seal rings.
- Never reuse seal rings.

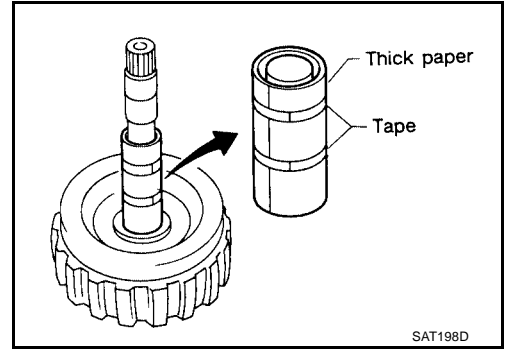


REPAIR FOR COMPONENT PARTS

[RE4F04B]

NOTE:

Roll paper around seal rings to prevent seal rings from spreading.



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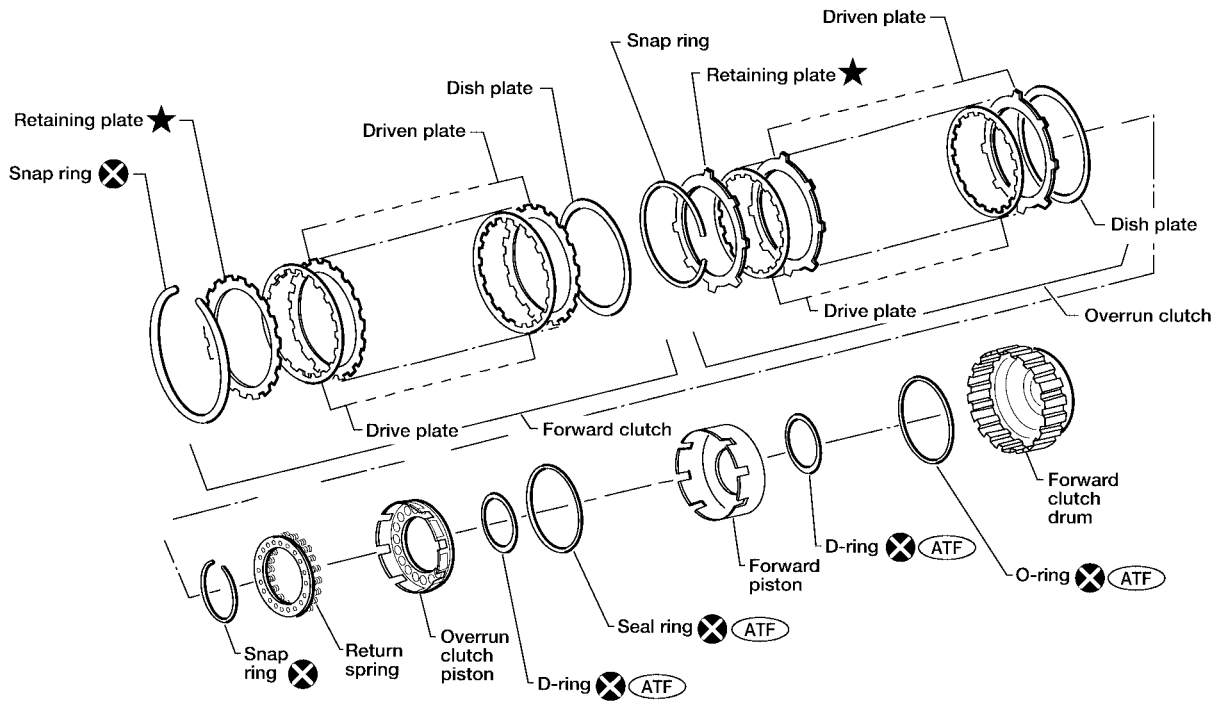
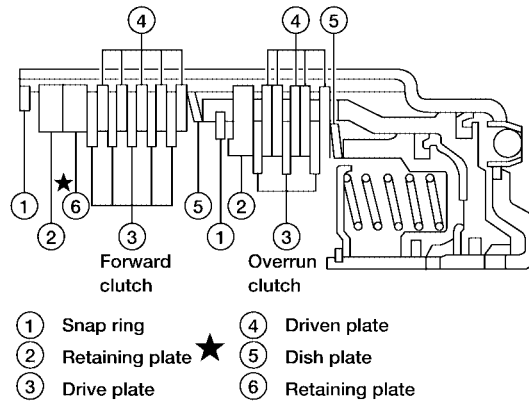
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Forward and Overrun Clutches
COMPONENTS

SEC. 315



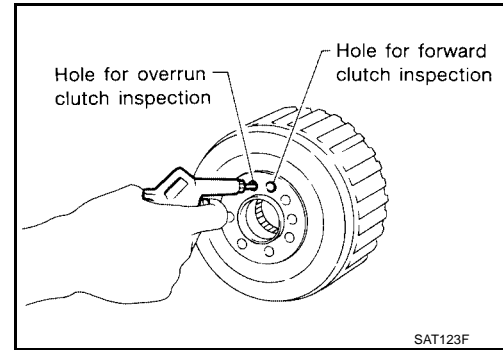
⊗ ATF : Apply ATF.

★ : Select proper thickness.

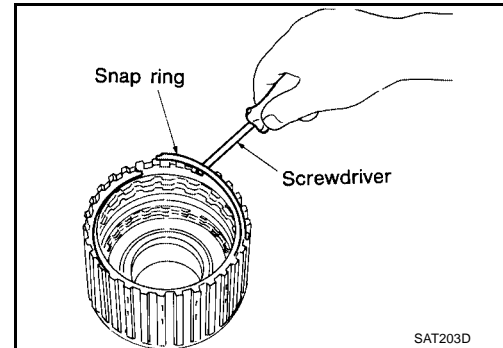
⊗ : Always replace after every disassembly.

DISASSEMBLY

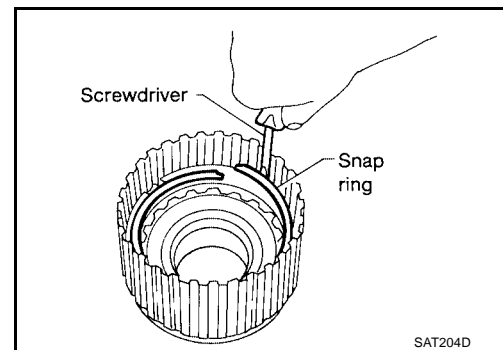
1. Check operation of forward clutch and overrun clutch.
 - a. Install bearing retainer on forward clutch drum.
 - b. Apply compressed air to oil hole of forward clutch drum.
 - c. Check to see that retaining plate moves to snap ring.
 - d. If retaining plate does not contact snap ring:
 - D-ring might be damaged.
 - Oil seal might be damaged.
 - Fluid might be leaking past piston check ball.



2. Remove snap ring for forward clutch.
3. Remove drive plates, driven plates, retaining plate and dish plate for forward clutch.



4. Remove snap ring for overrun clutch.
5. Remove drive plates, driven plates, retaining plate and dish plate for overrun clutch.

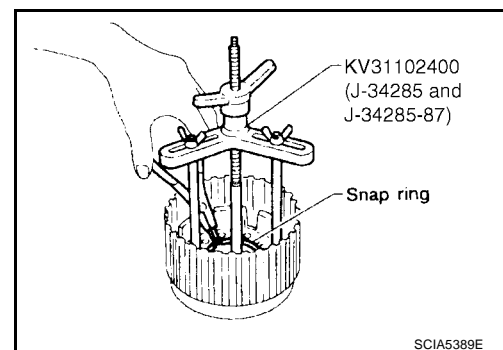


6. Remove snap ring from forward clutch drum while compressing return springs using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

CAUTION:

- Set Tool directly over return springs.
- Do not expand snap ring excessively.



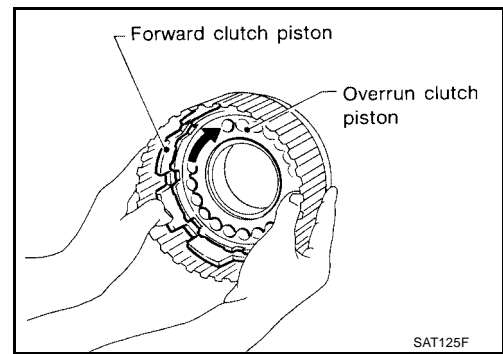
7. Remove spring retainer and return springs.

NOTE:

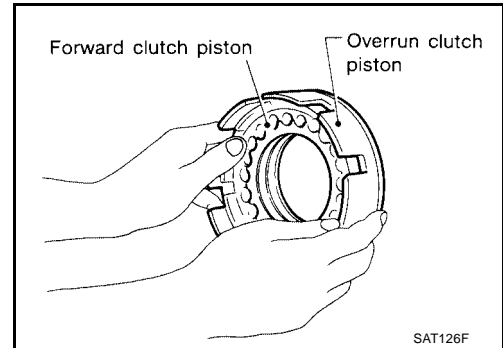
Do not remove return springs from the spring retainer.

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- Remove forward clutch piston with overrun clutch piston from forward clutch drum by turning it.



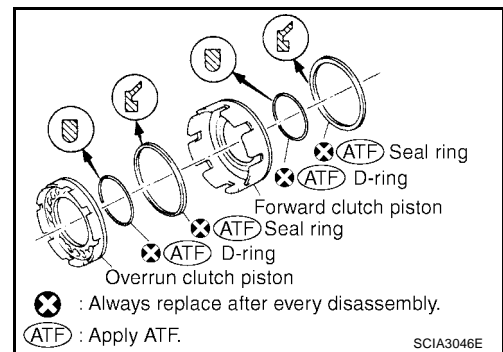
- Remove overrun clutch piston from forward clutch piston by turning it.



- Remove D-rings and seal rings from forward clutch piston and overrun clutch piston.

NOTE:

Do not reuse D-rings and seal rings.



INSPECTION

Snap Rings, Spring Retainer and Return Springs

- Always replace spring retainer and return springs as a set.
- Check for deformation, replace if fatigue or damage.

Forward Clutch and Overrun Clutch Drive Plates

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate:

Forward clutch

Standard value : 1.6 mm (0.063 in)

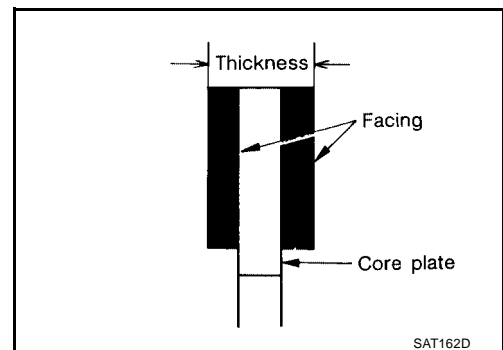
Wear limit : 1.4 mm (0.055 in)

Overrun clutch

Standard value : 1.6 mm (0.063 in)

Wear limit : 1.4 mm (0.055 in)

- If not within wear limit, replace.



Forward Clutch and Overrun Clutch Dish Plates

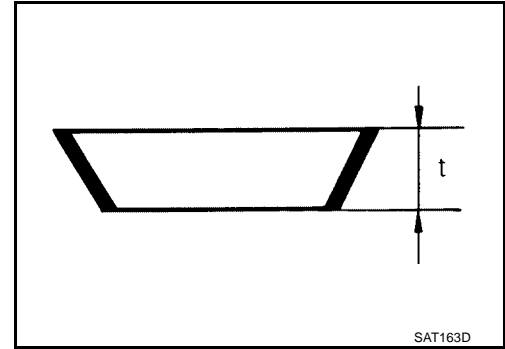
- Check for deformation or damage.
- Measure thickness of dish plate.

Thickness of dish plate

Forward clutch : 2.7 mm (0.106 in)

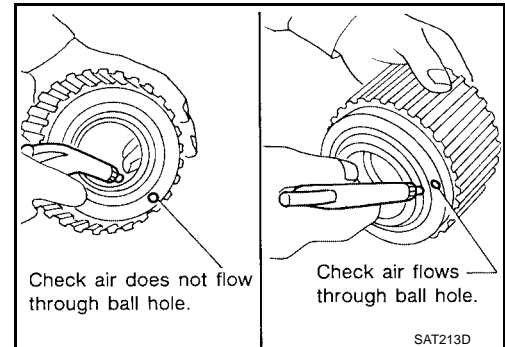
Overrun clutch : 2.7 mm (0.106 in)

- If deformed or fatigued, replace.



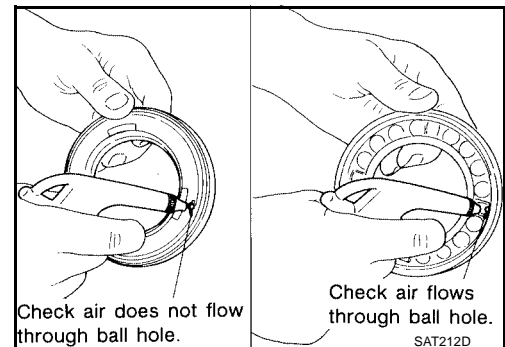
Forward Clutch Drum

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole from outside of forward clutch drum. Make sure air leaks past ball.
- Apply compressed air to oil hole from inside of forward clutch drum. Make sure there is no air leakage.



Overrun Clutch Piston

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side. Make sure that air leaks past ball.

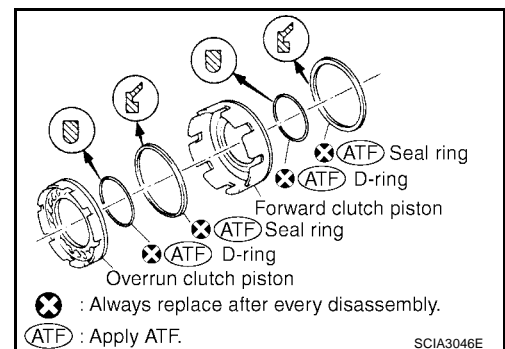


ASSEMBLY

1. Install new D-rings and seal rings on forward clutch piston and overrun clutch piston.

NOTE:

- Take care of the direction of the new seal rings.
- Apply ATF to both parts.



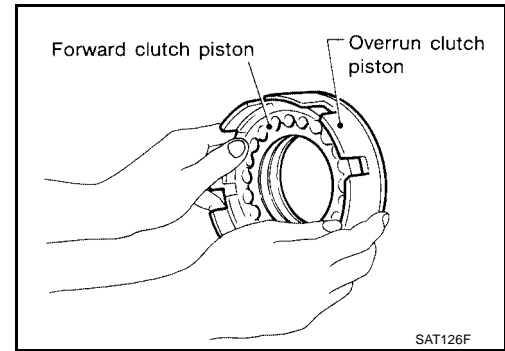
REPAIR FOR COMPONENT PARTS

[RE4F04B]

2. Install overrun clutch piston assembly on forward clutch piston by turning it slowly.

NOTE:

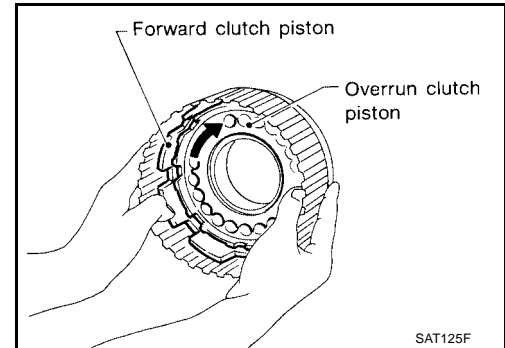
Apply ATF to inner surface of the forward clutch piston.



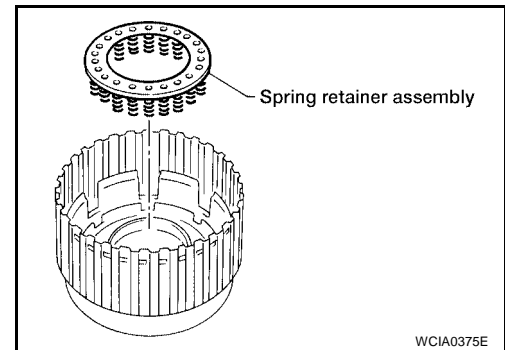
3. Install forward clutch piston assembly on forward clutch drum by turning it slowly.

NOTE:

Apply ATF to inner surface of the drum.

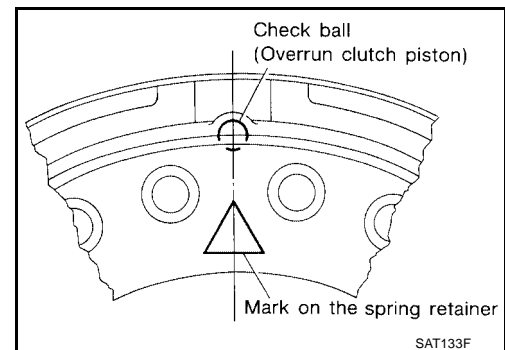


4. Install spring retainer assembly on overrun clutch piston.



NOTE:

Align the mark on spring retainer assembly with check ball in overrun clutch piston.



REPAIR FOR COMPONENT PARTS

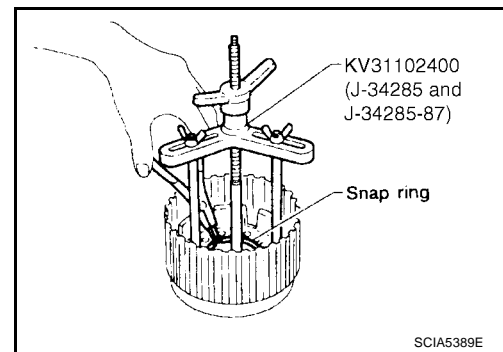
[RE4F04B]

5. Install snap ring while compressing spring retainer assembly Using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

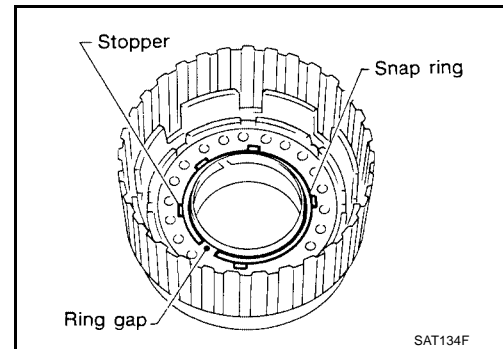
CAUTION:

- Set Tool directly over the spring retainer assembly.



NOTE:

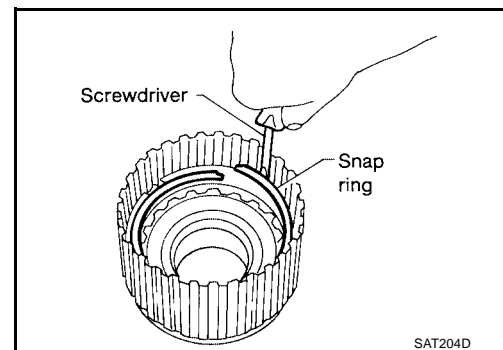
Do not align snap ring with the spring retainer assembly stopper.



6. Install drive plates, driven plates, retaining plate and dish plate for overrun clutch and install snap ring for the overrun clutch using screwdriver.

NOTE:

Take care of the order of the plates.



7. Measure clearance between overrun clutch retaining plate and snap ring.

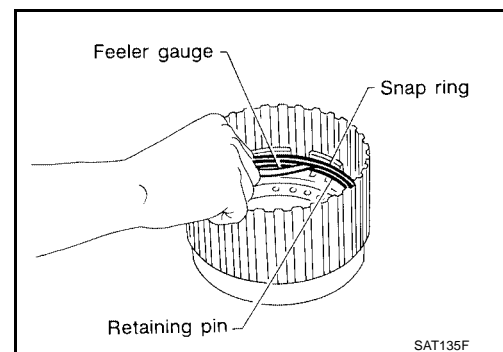
If not within allowable limit, select proper retaining plate.

Specified clearance

Standard : 0.7 - 1.1 mm (0.028 - 0.043 in)

Allowable limit : 1.7 mm (0.067 in)

Overrun clutch retaining plate Refer to [AT-379, "OVERRUN CLUTCH"](#) .



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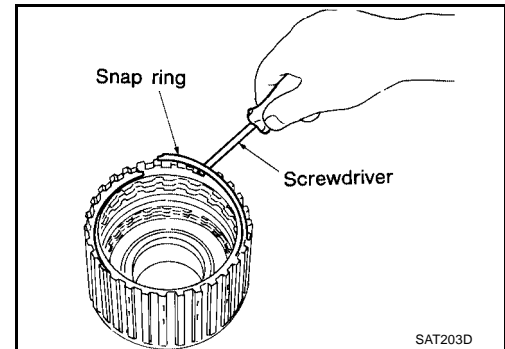
REPAIR FOR COMPONENT PARTS

[RE4F04B]

8. Install drive plates, driven plates, retaining plate and dish plate for forward clutch and install snap ring for the forward clutches using screwdriver.

NOTE:

Take care of the order of the plates.



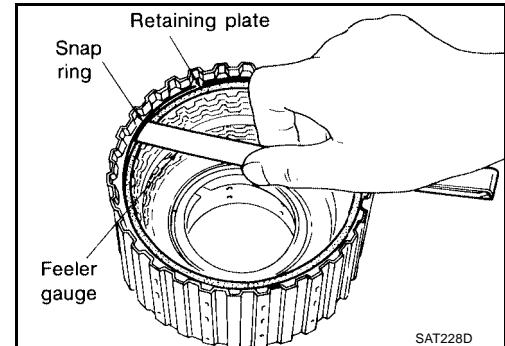
9. Measure clearance between forward clutch retaining plate and snap ring.
If not within allowable limit, select proper retaining plate.

Specified clearance

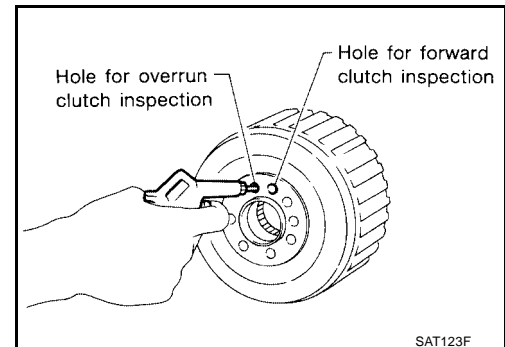
Standard : 0.45 - 0.85 mm
(0.0177 - 0.0335 in)

Allowable limit : 1.85 mm (0.0728 in)

Forward clutch retaining plate : Refer to [AT-378, "FORWARD CLUTCH"](#) .

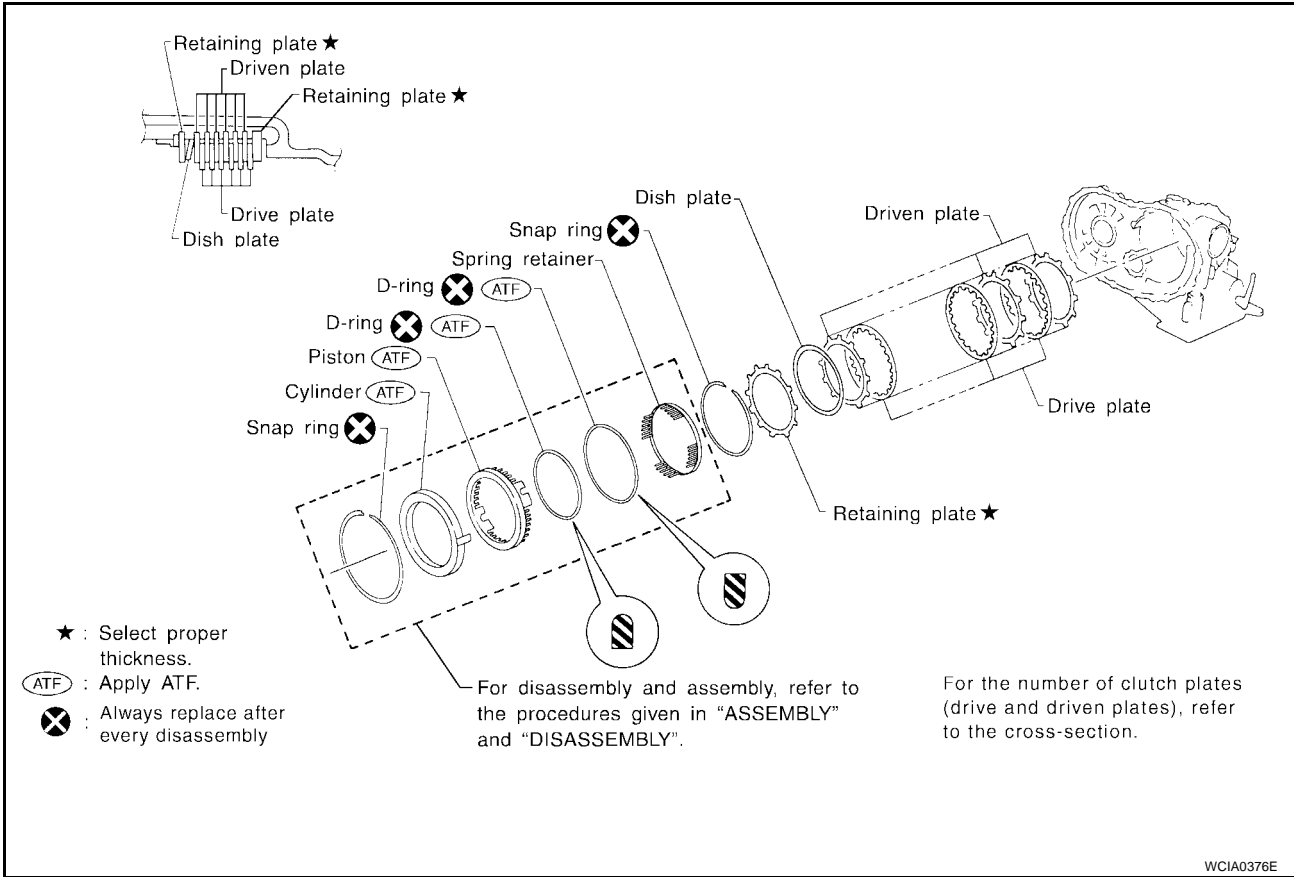


10. Check operation of forward clutch.
11. Check operation of overrun clutch.



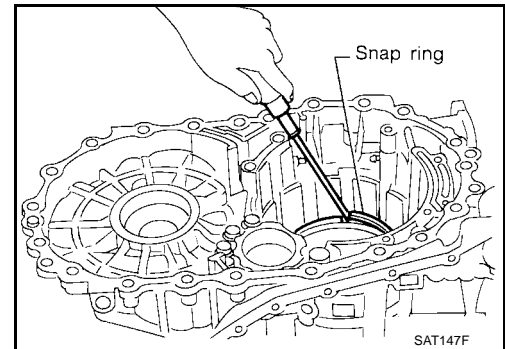
Low & Reverse Brake COMPONENTS

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DISASSEMBLY

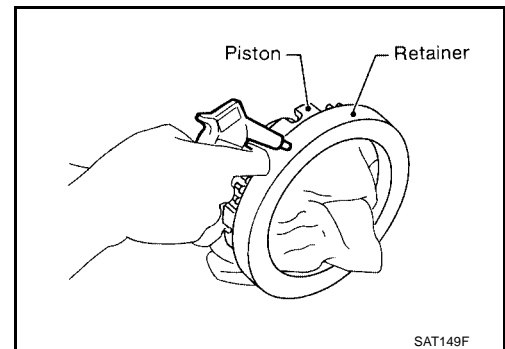
1. Check operation of low & reverse brake.
 - a. Apply compressed air to oil hole of transaxle case.
 - b. Check to see that retaining plate moves to snap ring:
 - c. If retaining plate does not contact snap ring:
 - D-ring might be damaged.
 - Fluid might be leaking past piston check ball.



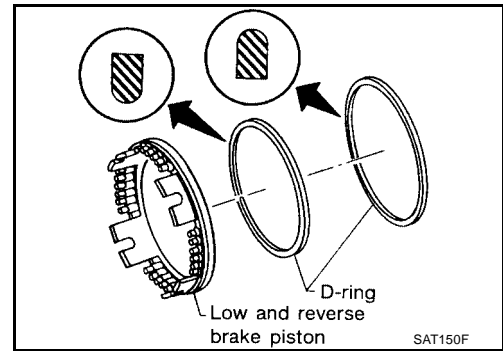
2. In order to remove piston, apply compressed air to oil hole of retainer while holding piston.

NOTE:

Apply compressed air gradually to allow the piston to come out evenly.



- Remove D-rings from piston and discard.



INSPECTION

Low and Reverse Brake Snap Ring, Spring Retainer and Return Springs

- Check for deformation, replace if fatigue or damage.
- Always replace the spring retainer and return springs as a set.

Low and Reverse Brake Drive Plate

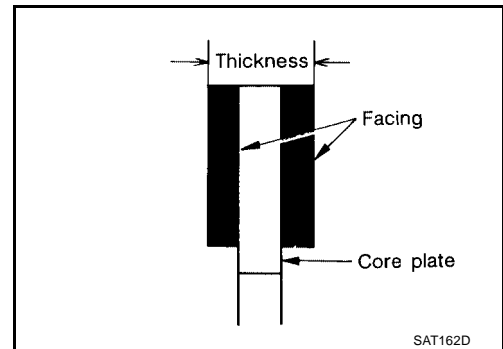
- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate

Standard value : 1.8 mm (0.071 in)

Wear limit : 1.6 mm (0.063 in)

- If not within wear limit, replace.

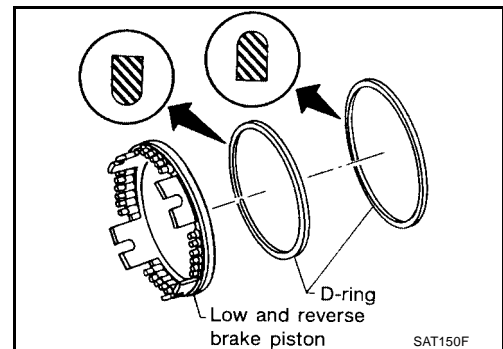


ASSEMBLY

- Install new D-rings on piston.

NOTE:

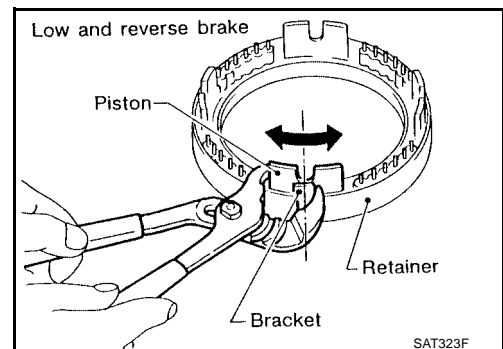
Apply ATF to both Parts



- Set and align piston with retainer using suitable tool.

NOTE:

This operation may be required in order to engage the protrusions of the piston to the return springs correctly.



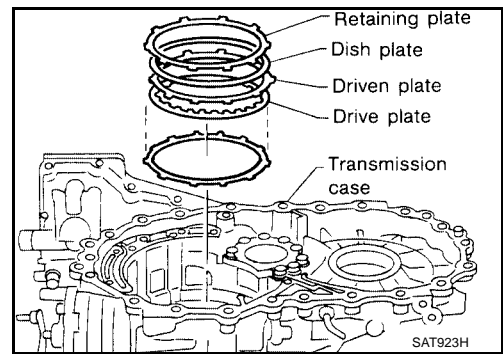
REPAIR FOR COMPONENT PARTS

[RE4F04B]

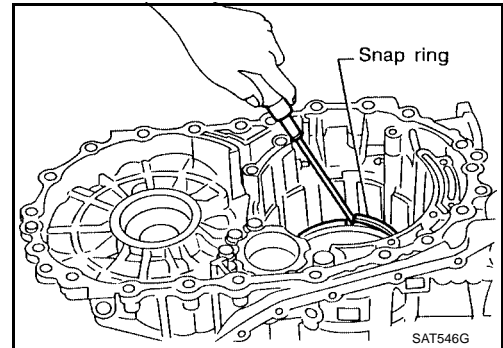
3. Install new driven plates, drive plates, retaining plate and dish plate on transaxle case.

NOTE:

Take care with the order and direction of the plates.



4. Install snap ring using screwdriver.



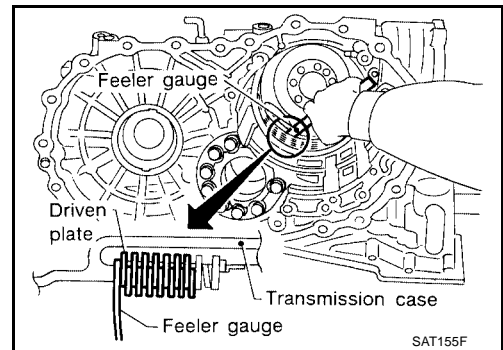
5. Measure clearance between driven plate and transaxle case. If not within allowable limit, select proper retaining plate. (front side)

Specified clearance

Standard : 1.7 - 2.1 mm (0.067 - 0.083 in)

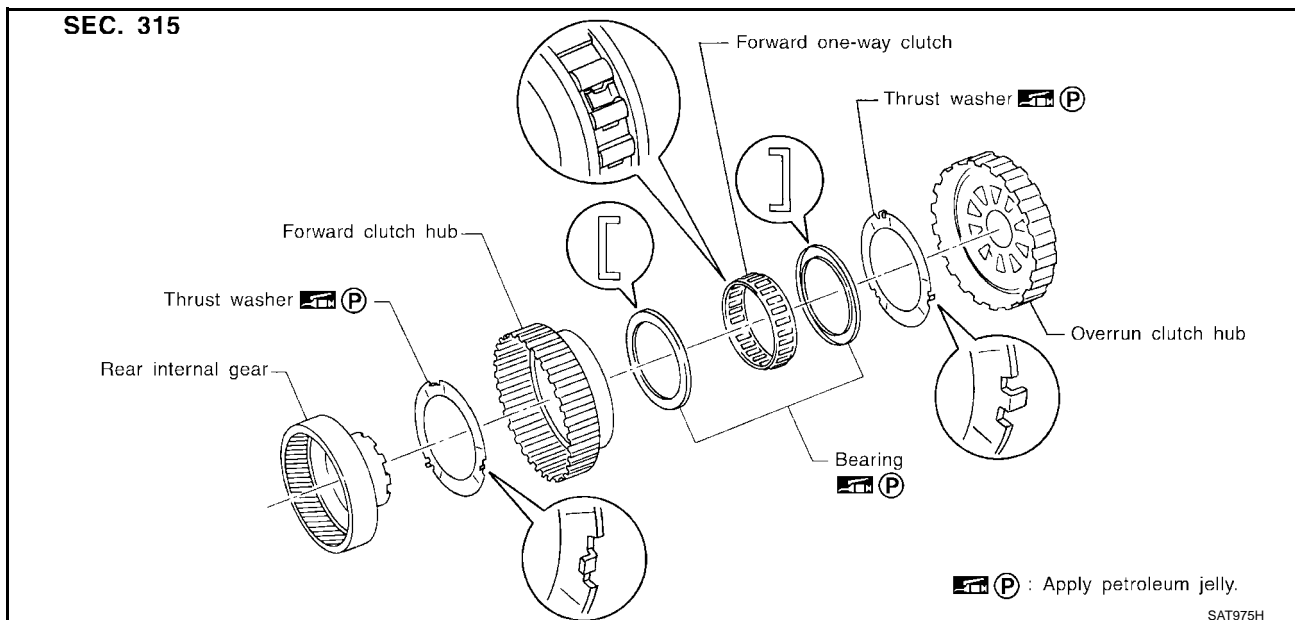
Allowable limit : 3.3 mm (0.130 in)

Retaining plate Refer to AT-379, "LOW & REVERSE BRAKE" .



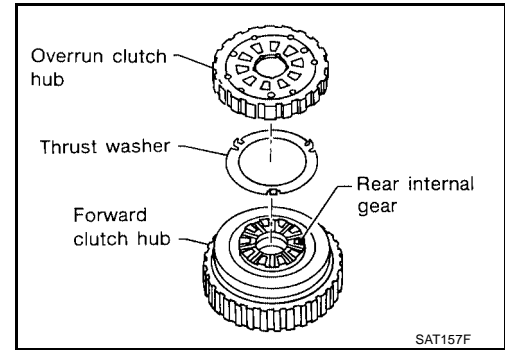
Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub COMPONENTS

ECS009BA

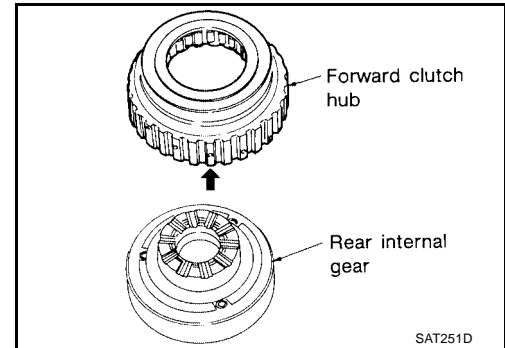


DISASSEMBLY

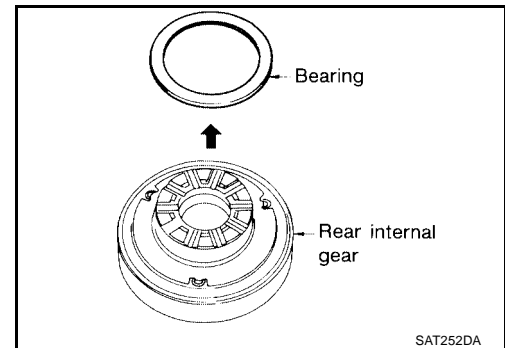
1. Remove overrun clutch hub and thrust washer from forward clutch hub.



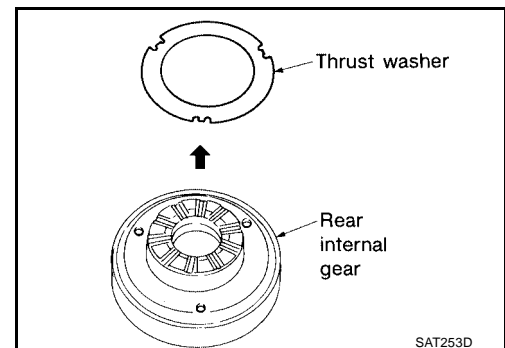
2. Remove forward clutch hub from rear internal gear.



3. Remove bearing from rear internal gear.



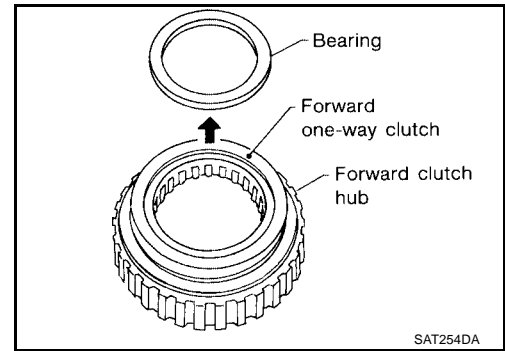
4. Remove thrust washer from rear internal gear.



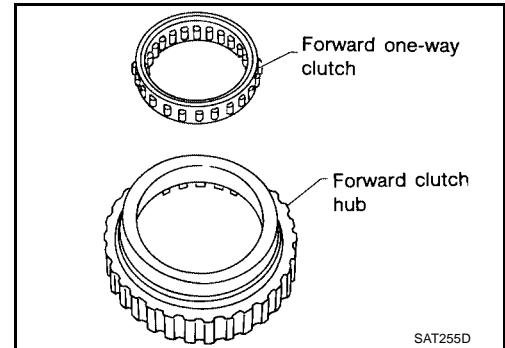
REPAIR FOR COMPONENT PARTS

[RE4F04B]

5. Remove bearing from forward one-way clutch.



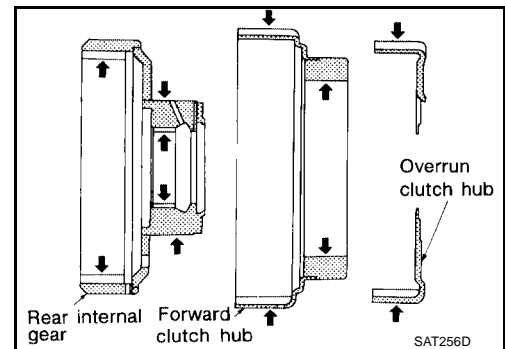
6. Remove forward one-way clutch from forward clutch hub.



INSPECTION

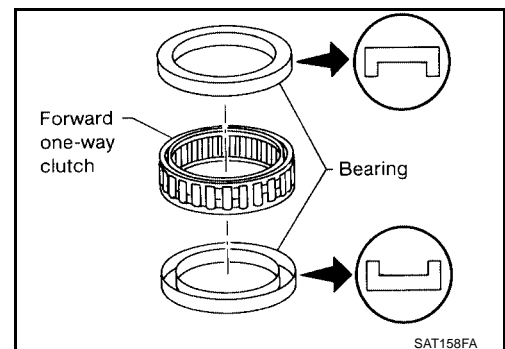
Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub

- Check rubbing surfaces for wear or damage.



Bearings and Forward One-Way Clutch

- Check bearings for deformation and damage.
- Check forward one-way clutch for wear and damage.



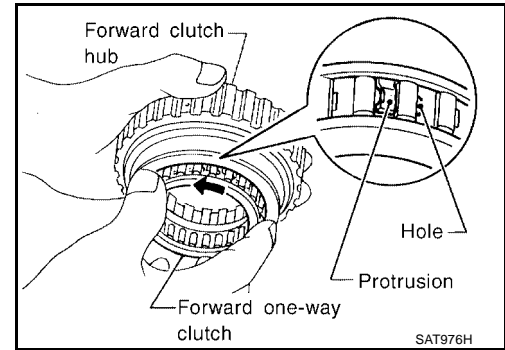
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ASSEMBLY

1. Install forward one-way clutch on forward clutch.

NOTE:

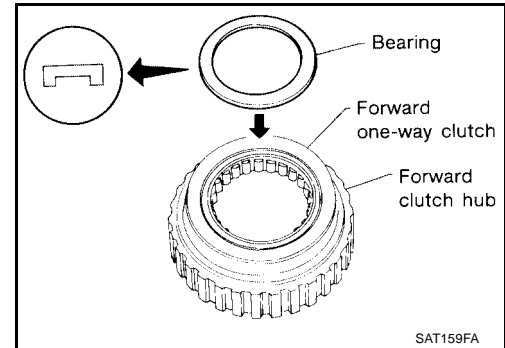
Take care with the direction of the forward one-way clutch.



2. Install bearing on forward one-way clutch.

NOTE:

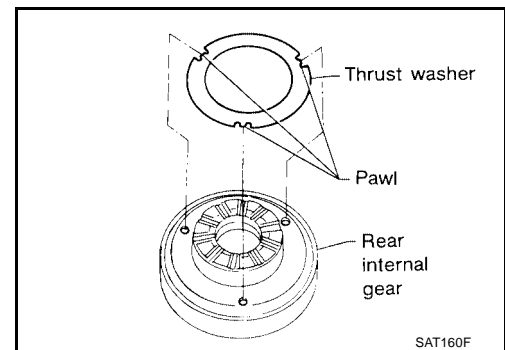
Apply petroleum jelly to the bearing.



3. Install thrust washer on rear internal gear.

NOTE:

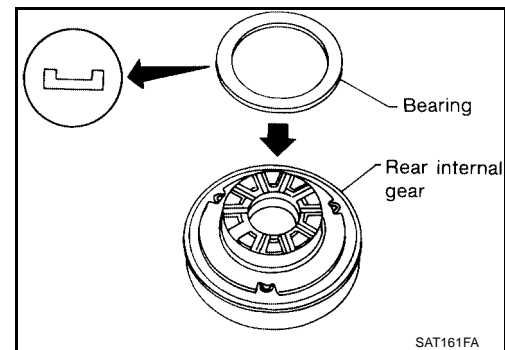
- Apply petroleum jelly to the thrust washer.
- Align hooks of the thrust washer with holes of the rear internal gear.



4. Install bearing on rear internal gear.

NOTE:

Apply petroleum jelly to the bearing.



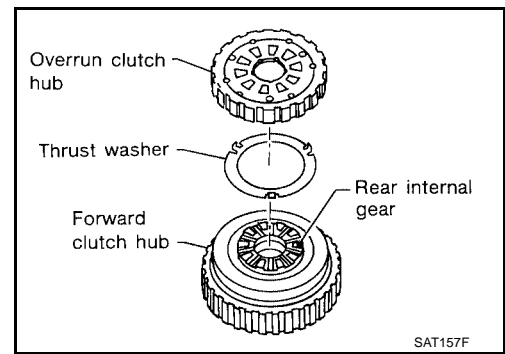
REPAIR FOR COMPONENT PARTS

[RE4F04B]

5. Install thrust washer and overrun clutch hub.

NOTE:

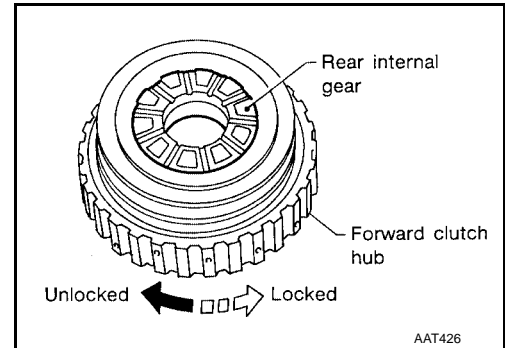
- Apply petroleum jelly to the thrust washer.
- Align hooks of the thrust washer with holes of the overrun clutch hub.
- Align protrusions of rear internal gear with the holes of the overrun clutch hub.



6. Install forward clutch hub on rear internal gear.

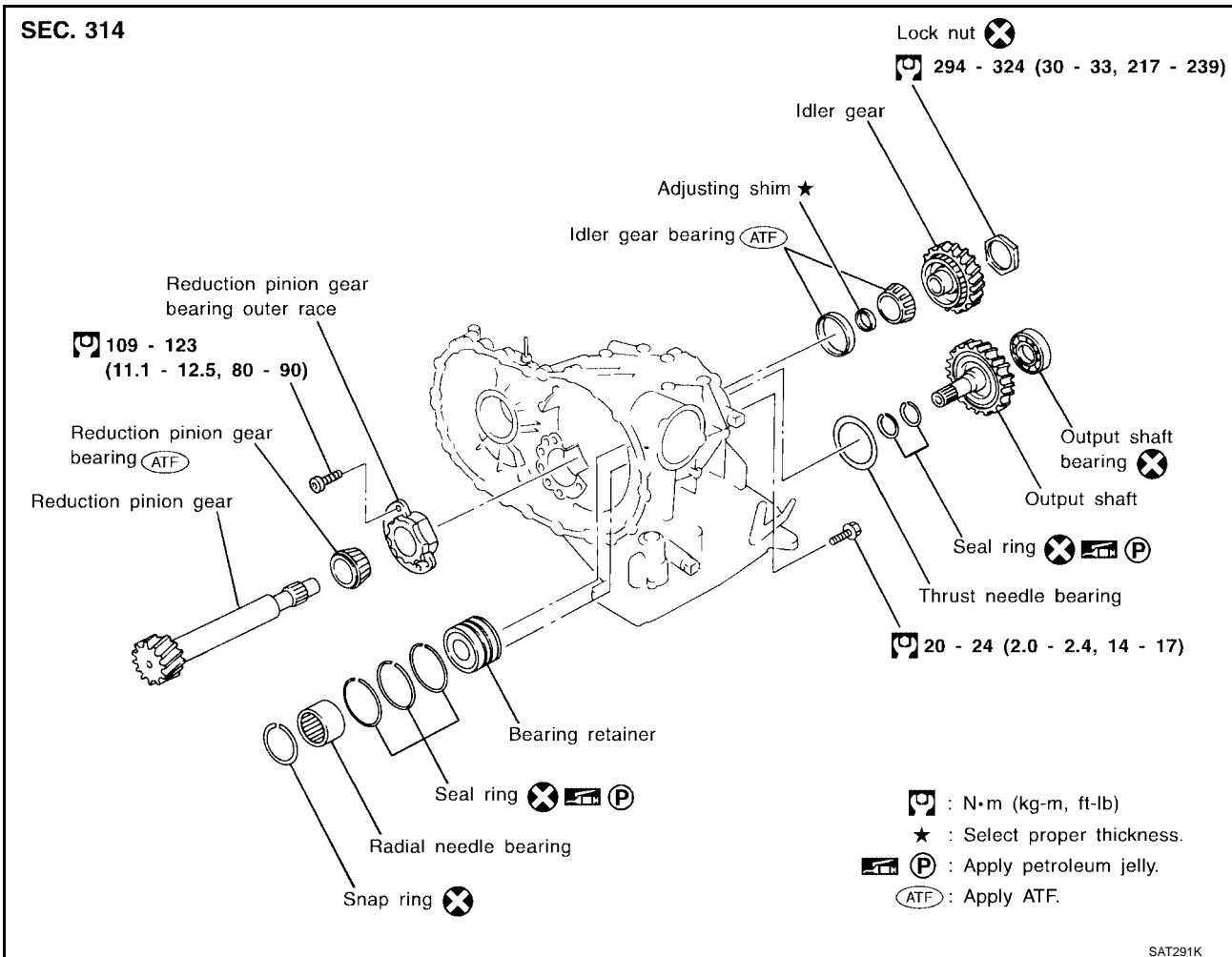
NOTE:

- Check operation of the forward one-way clutch.
- Hold the rear internal gear and turn the forward clutch hub.
- Check forward clutch hub for correct locking and unlocking directions as shown, if incorrect check assembly of the forward one-way clutch.



Output Shaft, Idler Gear, Reduction Pinion Gear and Bearing Retainer COMPONENTS

ECS009BB

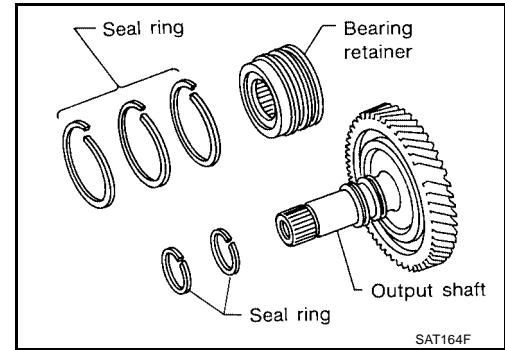


DISASSEMBLY

1. Remove seal rings from output shaft and bearing retainer.

NOTE:

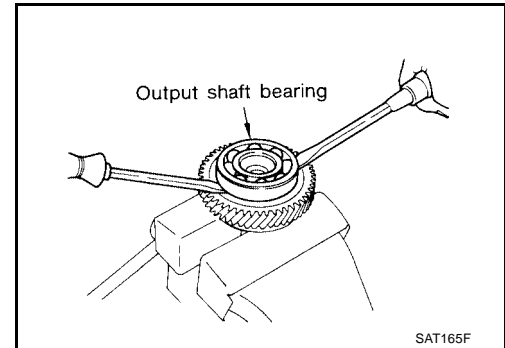
Do not reuse seal rings.



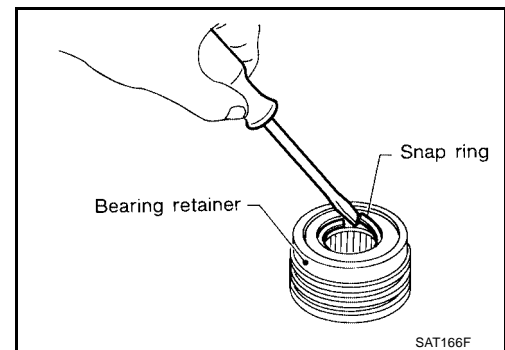
2. Remove output shaft bearing with screwdrivers.

NOTE:

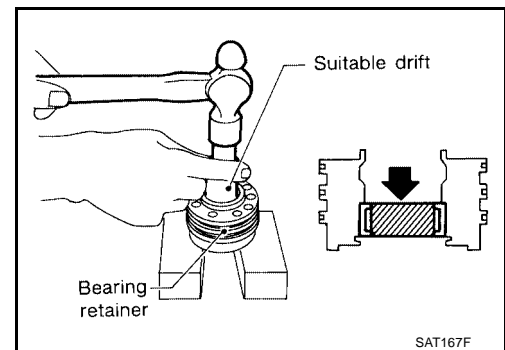
- Do not ruse output shaft bearing.
- Be careful not damage output shaft.



3. Remove snap ring from bearing retainer using suitable tool.



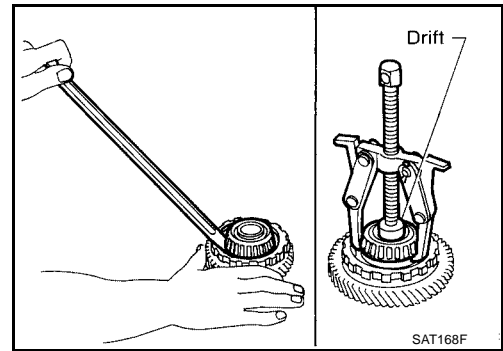
4. Remove needle bearing from bearing retainer suitable tool.



REPAIR FOR COMPONENT PARTS

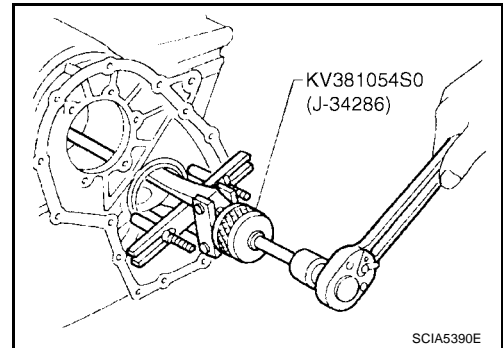
[RE4F04B]

5. Remove idler gear bearing inner race from idler gear using suitable tool.

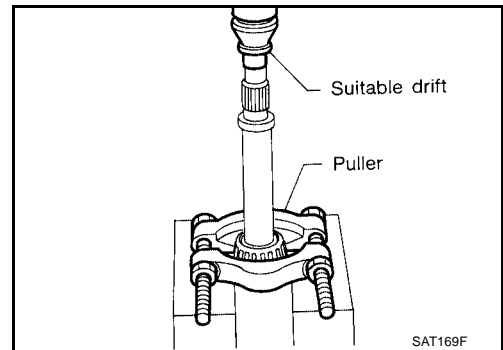


6. Remove idler gear bearing outer race from transaxle case using Tool.

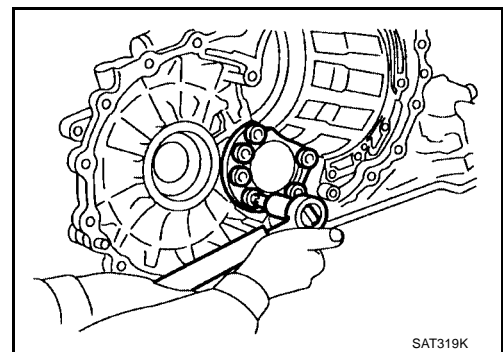
Tool number : KV381054S0 (J-34286)



7. Press out reduction pinion gear bearing inner race from reduction pinion gear using suitable tool.



8. Remove reduction pinion gear bearing outer race from transaxle case using suitable tool.



INSPECTION

Output Shaft, Idler Gear and Reduction Pinion Gear

- Check shafts for cracks, wear or bending.
- Check gears for wear, chips and cracks.

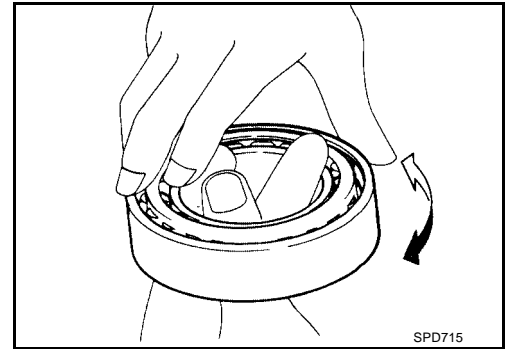
Bearing

NOTE:

- Make sure bearings roll freely and free from noise, cracks, pitting or wear.

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- Always replace roller bearing inner and outer races as a set.



Seal Ring Clearance

- Install new seal rings to output shaft.
- Measure clearance between seal ring and ring groove of output shaft.

Standard clearance : 0.10 - 0.25 mm
(0.0039 - 0.0098 in)

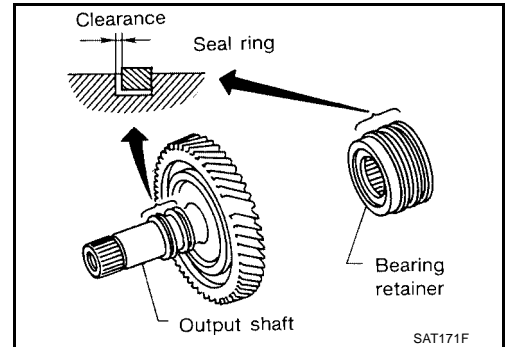
Allowable limit : 0.25 mm (0.0098 in)

- If not within allowable limit, replace output shaft.
- Install new seal rings to bearing retainer.
- Measure clearance between seal ring and ring groove of bearing retainer.

Standard clearance : 0.10 - 0.30 mm (0.0039 - 0.0118 in)

Allowable limit : 0.30 mm (0.0118 in)

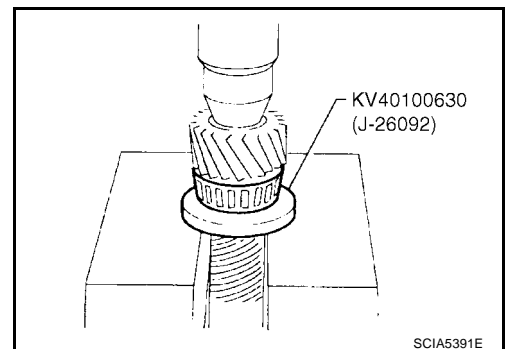
- If not within allowable limit, replace bearing retainer.



ASSEMBLY

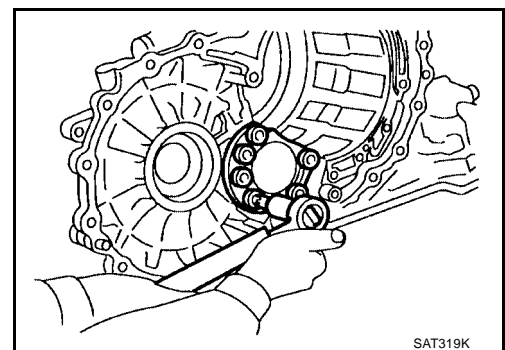
- Press reduction pinion gear bearing inner race on reduction pinion gear using Tool.

Tool number : KV40100630 (J-26092)



- Install reduction pinion gear bearing outer race on transaxle case.

Reduction pinion gear bearing outer race bolts : 109 - 123 N-m (11.1 - 12.5 kg-m, 80 - 90 ft-lb)

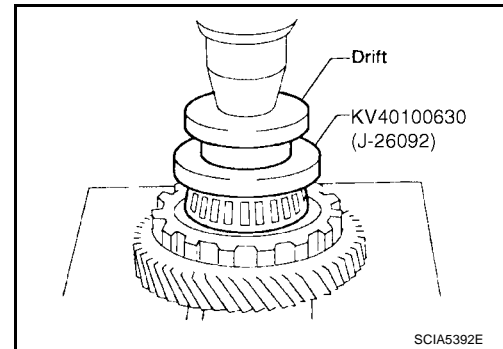


REPAIR FOR COMPONENT PARTS

[RE4F04B]

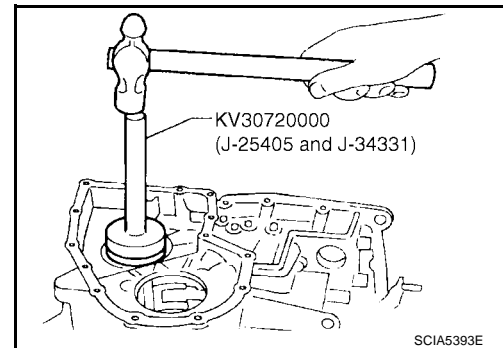
3. Press idler gear bearing inner race on idler gear using Tool.

Tool number : KV40100630 (J-26092)



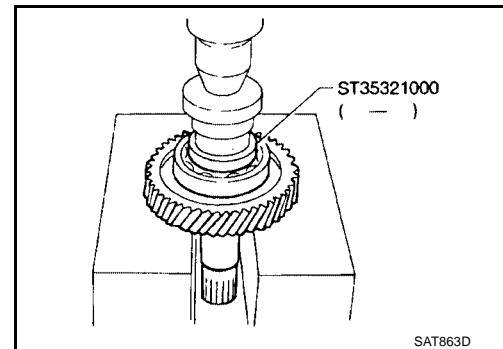
4. Install idler gear bearing outer race on transaxle case using Tool.

Tool number : ST30720000 (J-25405 and J-34331)

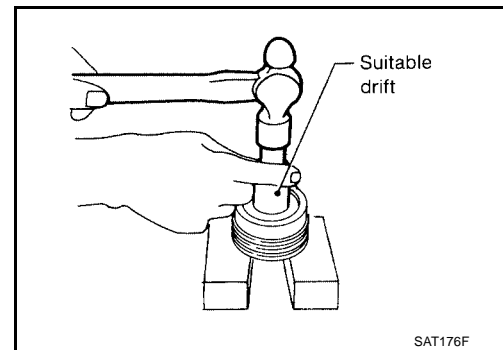


5. Press output shaft bearing on output shaft using Tool.

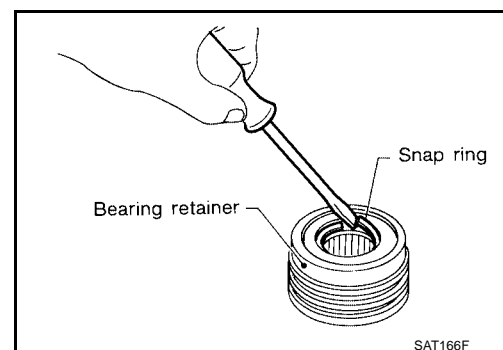
Tool number : ST 35321000 (—)



6. Press needle bearing on bearing retainer using suitable tool.



7. Install snap ring to bearing retainer using suitable tool.

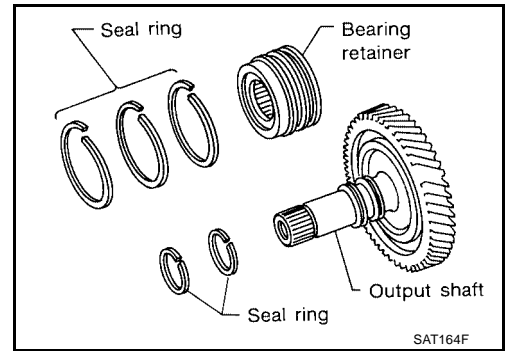


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REPAIR FOR COMPONENT PARTS

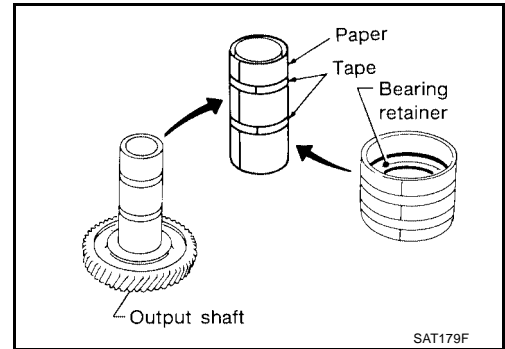
[RE4F04B]

- After packing ring grooves with petroleum jelly, carefully install new seal rings on output shaft and bearing retainer.



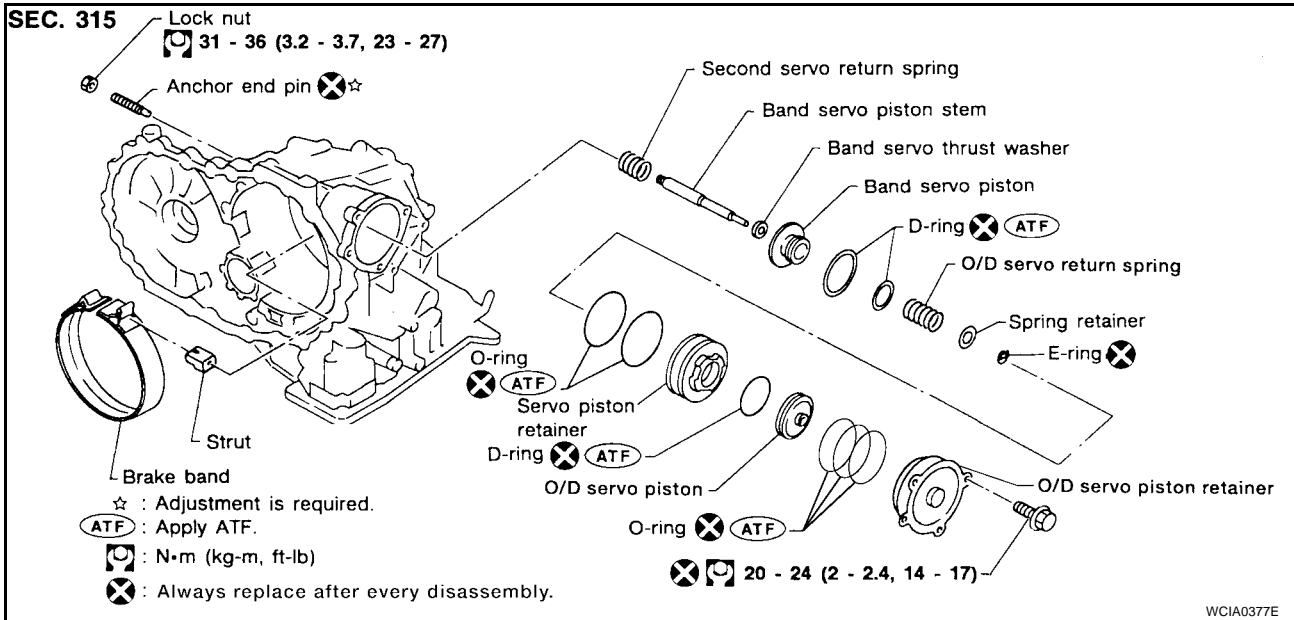
NOTE:

Roll paper around seal rings to prevent seal rings from spreading.



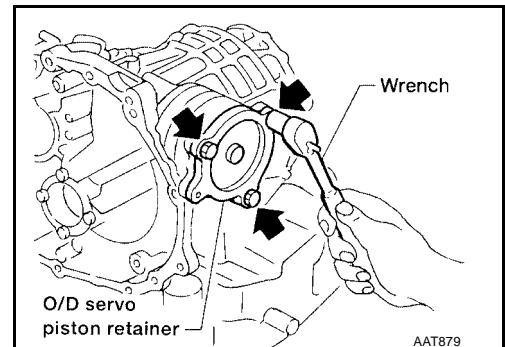
Band Servo Piston Assembly COMPONENTS

ECS009BC



DISASSEMBLY

- Remove band servo piston bolts using suitable tool.



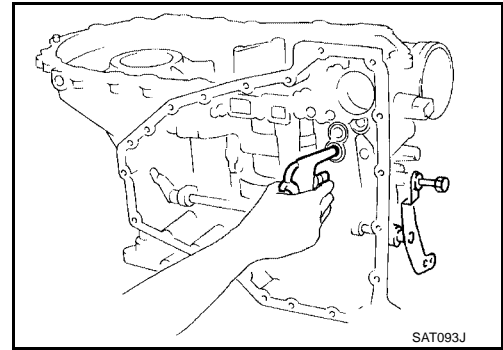
REPAIR FOR COMPONENT PARTS

[RE4F04B]

2. Apply compressed air to oil hole in transaxle case to remove O/D servo piston retainer and band servo piston assembly.

NOTE:

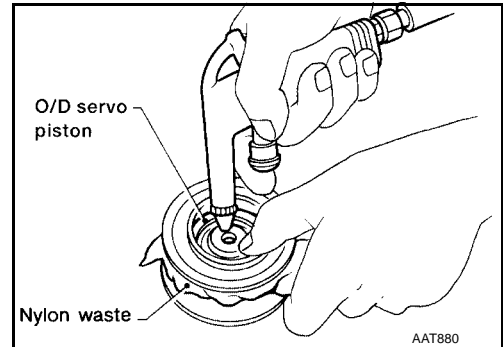
Hold band servo piston assembly with a rag or nylon waste.



3. Apply compressed air to oil hole in O/D servo piston retainer to remove O/D servo piston from retainer.

CAUTION:

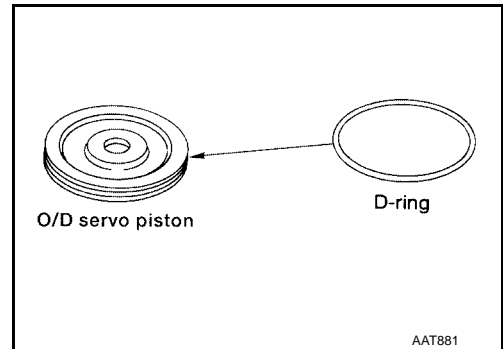
Hold O/D band servo while applying compressed air.



4. Remove D-ring from O/D servo piston.

NOTE:

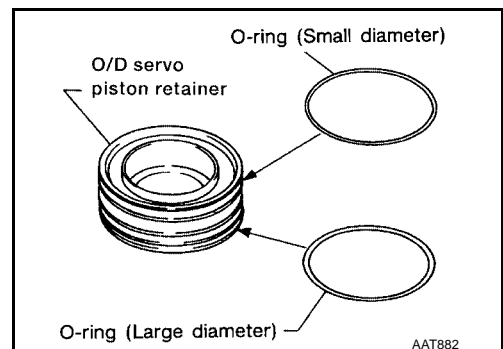
Do not reuse D-ring.



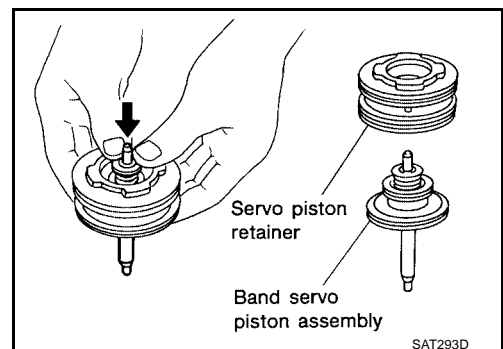
5. Remove O-rings from O/D servo piston retainer.

NOTE:

Do not reuse O-ring.



6. Remove band servo piston assembly from servo piston retainer by pushing it forward.

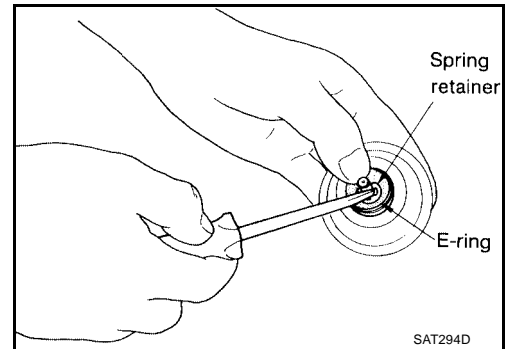


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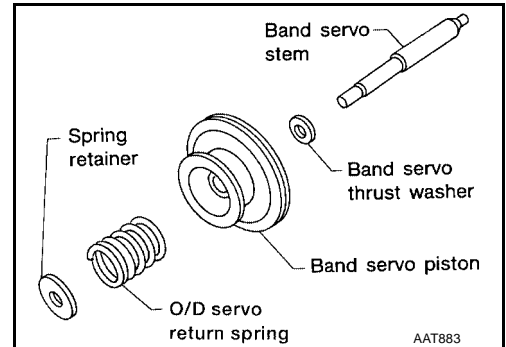
REPAIR FOR COMPONENT PARTS

[RE4F04B]

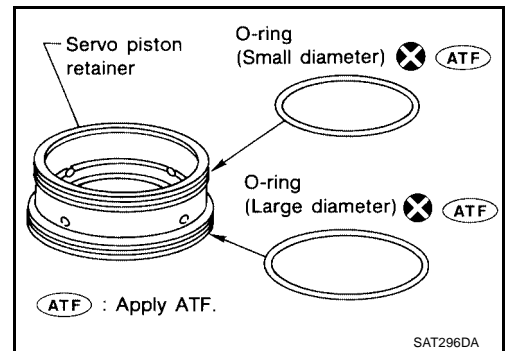
7. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, remove E-ring using suitable tool.



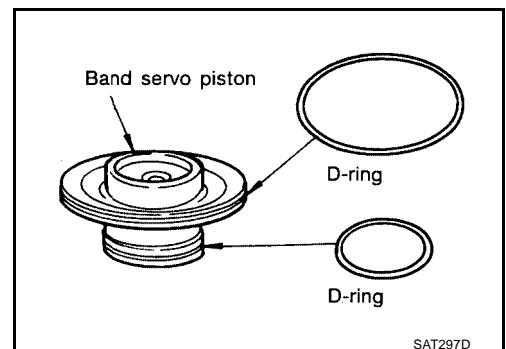
8. Remove O/D servo return spring, band servo thrust washer and band servo piston stem from band servo piston.



9. Remove O-rings from servo piston retainer.



10. Remove D-rings from band servo piston.



INSPECTION

Pistons, Retainers and Piston Stem

- Check frictional surfaces for abnormal wear or damage.

Return Springs

- Check for deformation or damage.
- Measure free length and outer diameter.

Inspection standard : Refer to [AT-382, "Band Servo"](#)

ASSEMBLY

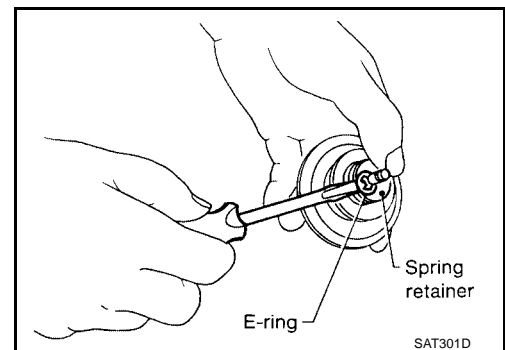
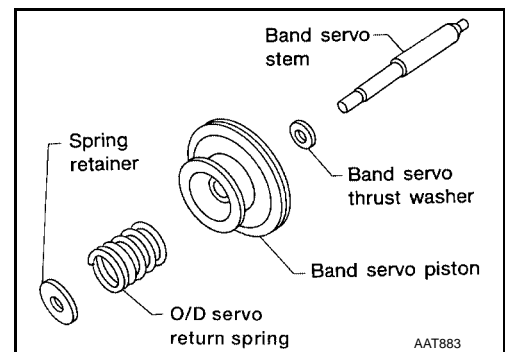
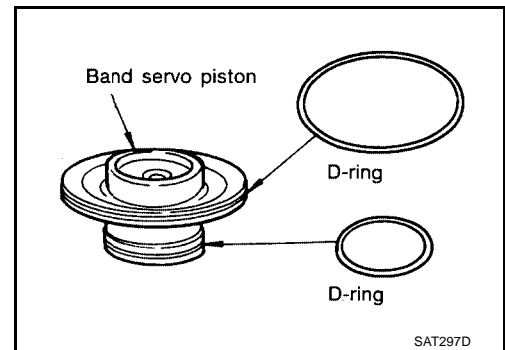
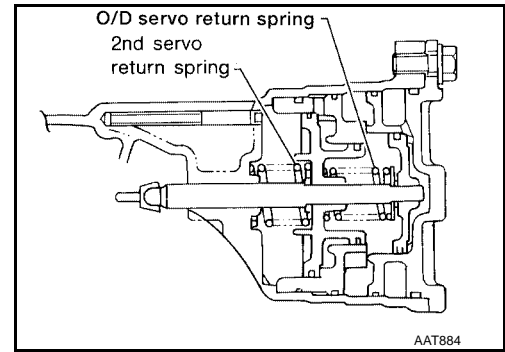
1. Install new D-rings to servo piston retainer.

NOTE:

- Apply ATF to new D-rings.
- Pay attention to the position of each D-ring.

2. Install band servo piston stem, band servo thrust washer, O/D servo return spring and spring retainer to band servo piston.

3. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, install E-ring using suitable tool.



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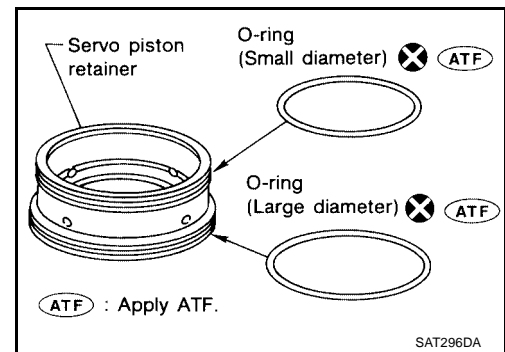
REPAIR FOR COMPONENT PARTS

[RE4F04B]

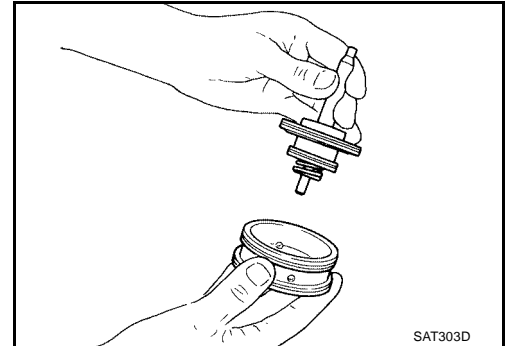
4. Install O-rings to servo piston retainer.

NOTE:

- Apply ATF to the new O-rings.
- Pay attention to the position of the new O-rings.



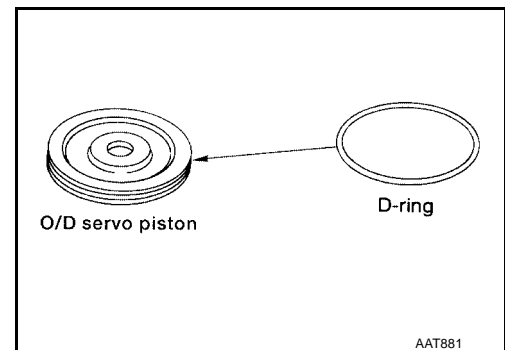
5. Install band servo piston assembly to servo piston retainer by pushing it inward.



6. Install new D-ring to O/D servo piston.

NOTE:

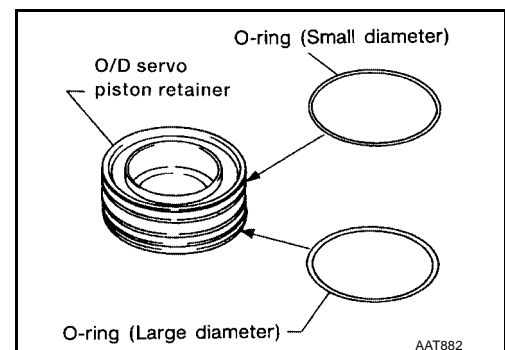
- Apply ATF to the new D-ring.
- Pay attention to the position of the new D-ring.



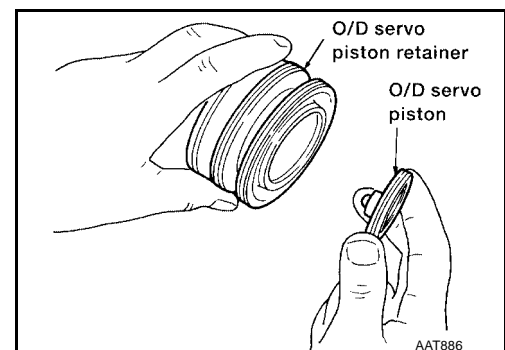
7. Install new O-rings to O/D servo piston retainer.

NOTE:

- Apply ATF to the new O-rings.
- Pay attention to the position of the new O-rings.



8. Install O/D servo piston to O/D servo piston retainer.



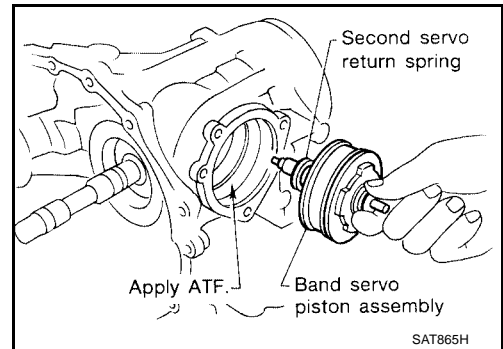
REPAIR FOR COMPONENT PARTS

[RE4F04B]

- Install band servo piston assembly and 2nd servo return spring to transaxle case.

NOTE:

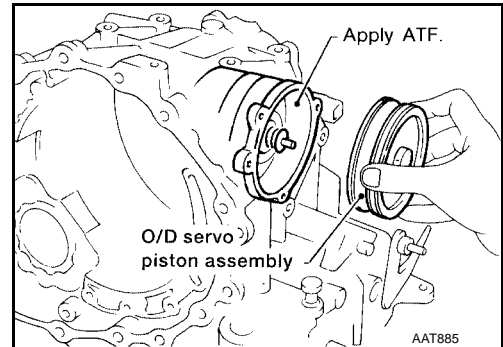
Apply ATF to O-ring of the band servo and transaxle case



- Install O/D servo piston assembly to transaxle case.

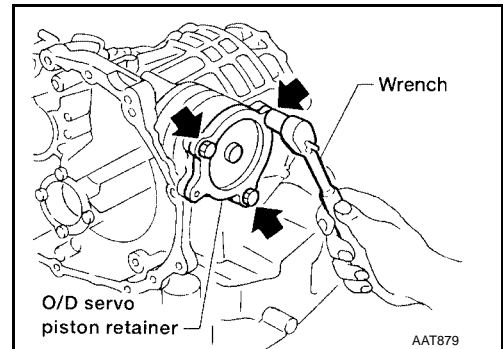
NOTE:

Apply ATF to O-ring of the O/D servo and transaxle case



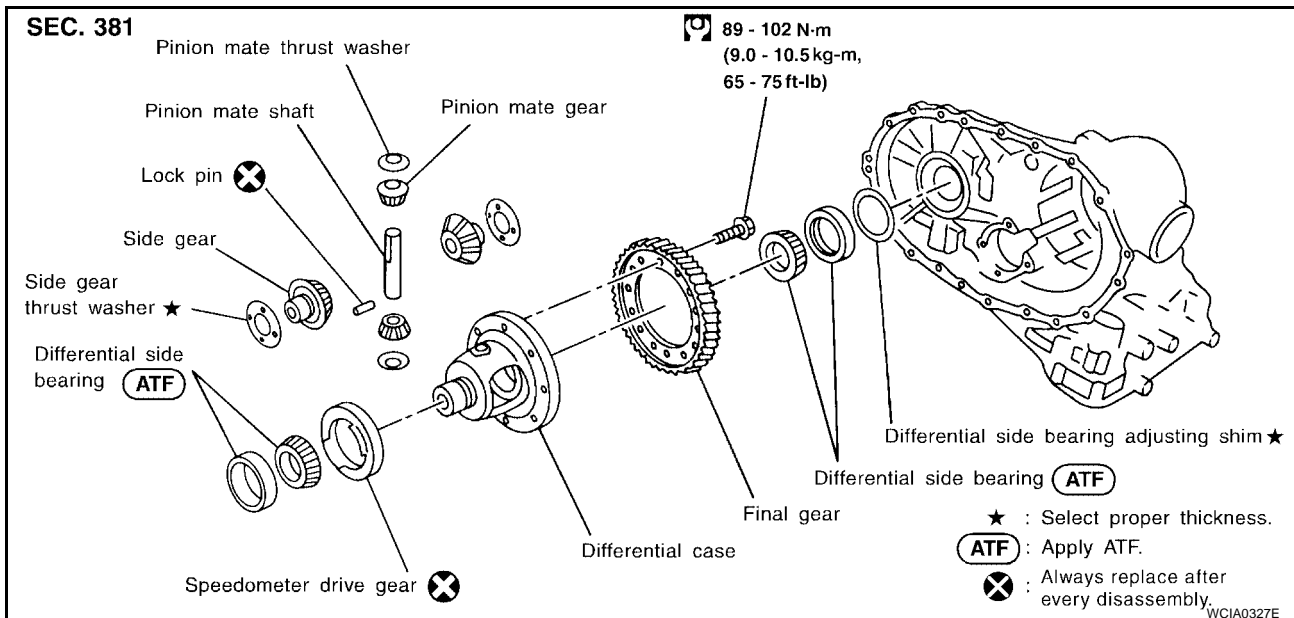
- Install O/D servo piston retainer to transaxle case using suitable tool.

Refer to [AT-303, "COMPONENTS"](#) .



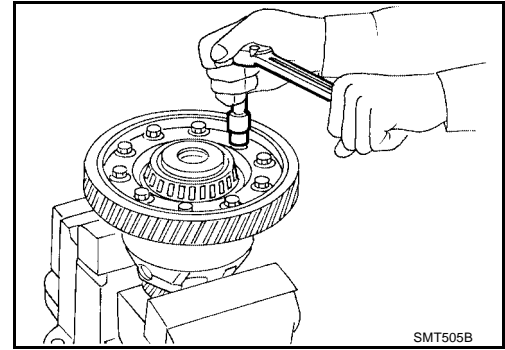
Final Drive COMPONENTS

ECS009BD



DISASSEMBLY

1. Remove final gear using suitable tool.



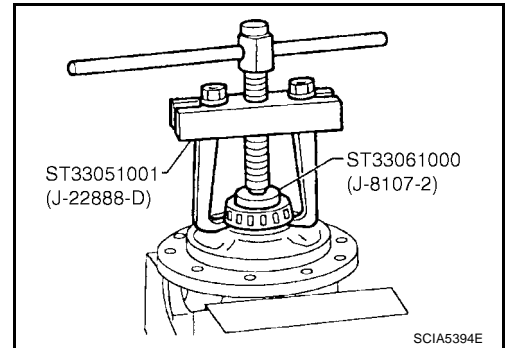
2. Press out differential side bearings using Tool.

Tool number : ST33051001 (J-22888-D)

Tool number : ST33061000 (J-8107-2)

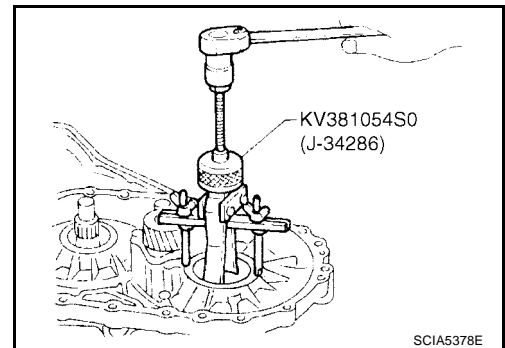
CAUTION:

Be careful not to mix up the right and left bearings.

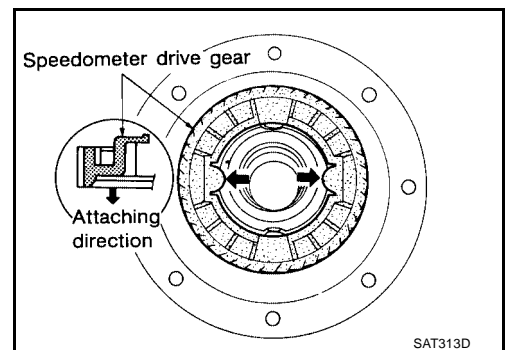


3. Remove differential side bearing outer race and side bearing adjusting shim from transaxle case using Tool.

Tool number :KV381054S0 (J-34286)

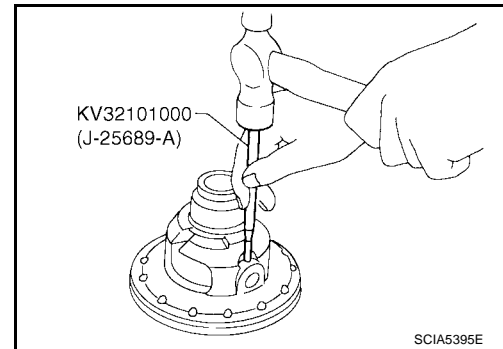


4. Remove speedometer drive gear.



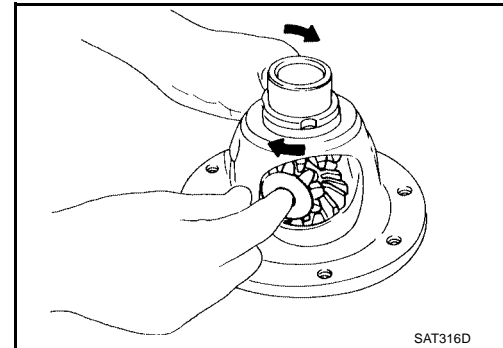
5. Drive out pinion mate shaft lock pin using Tool.

Tool number : KV32101000 (J-25689-A)



6. Draw out pinion mate shaft lock pin.

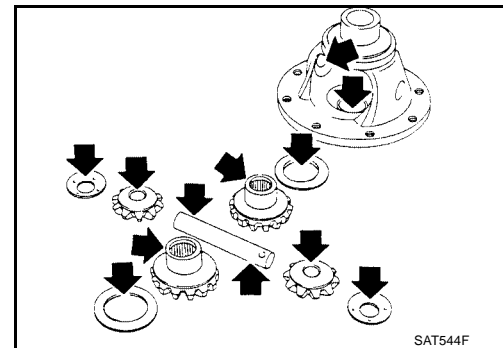
7. Remove pinion mate gears and side gears.



INSPECTION

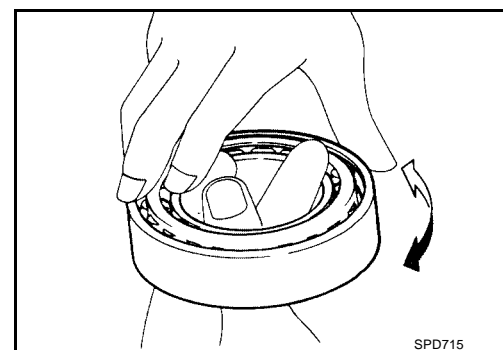
Gear, Washer, Shaft and Case

- Check mating surfaces of differential case, side gears and pinion mate gears.
- Check washers for wear.



Bearings

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- When replacing taper roller bearing, replace outer and inner race as a set.



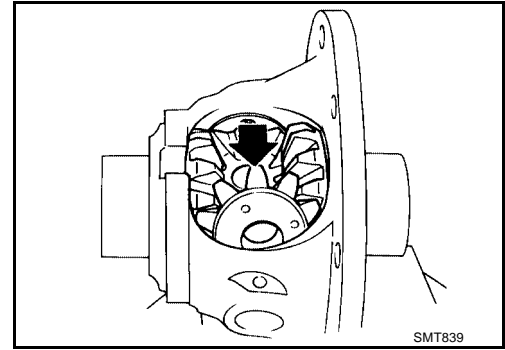
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ASSEMBLY

1. Attach side gear thrust washers to side gears, then install pinion mate thrust washers and pinion mate gears in place.

NOTE:

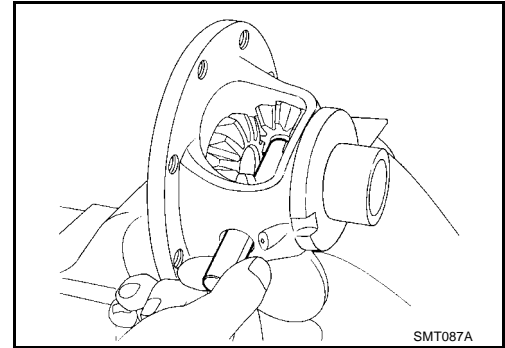
Apply ATF to any parts during assembly.



2. Insert pinion mate shaft.

CAUTION:

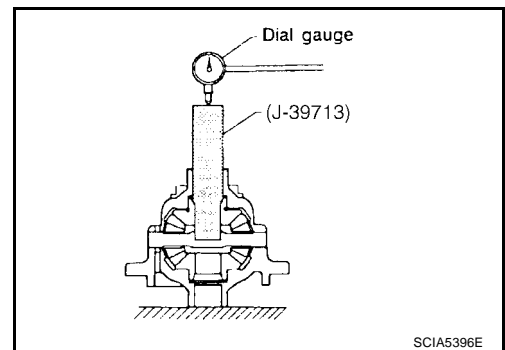
When inserting, be careful not to damage pinion mate thrust washers.



3. Measure clearance between side gear and differential case with washers following the procedure below using Tool:

Tool number (J-39713)

- a. Set Tool and dial indicator on side gear.

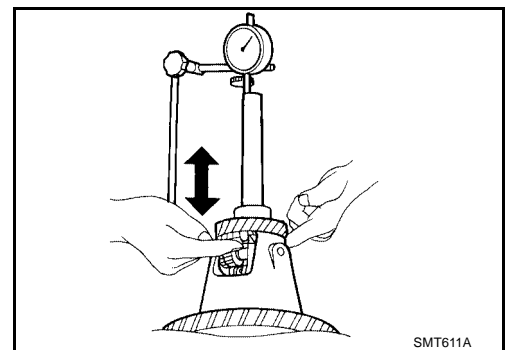


- b. Move side gear up and down to measure dial indicator deflection. Always measure indicator deflection on both side gears.

Clearance between side gear and differential case with washer : 0.1 - 0.2 mm (0.004 - 0.008 in)

- c. If not within specification, adjust clearance by changing thickness of differential side gear thrust washers.

Differential side gear thrust washers : Refer to [AT-380, "DIFFERENTIAL SIDE GEAR THRUST WASHERS"](#).



REPAIR FOR COMPONENT PARTS

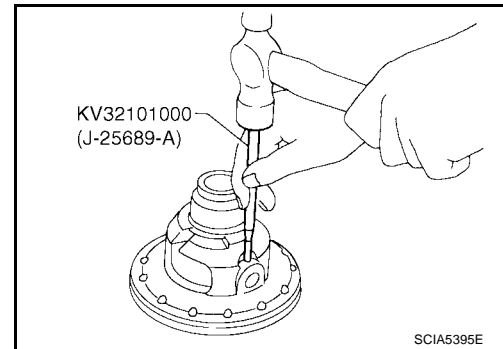
[RE4F04B]

4. Install lock pin. using Tool

Tool number :KV32101000 (J-25689-A)

NOTE:

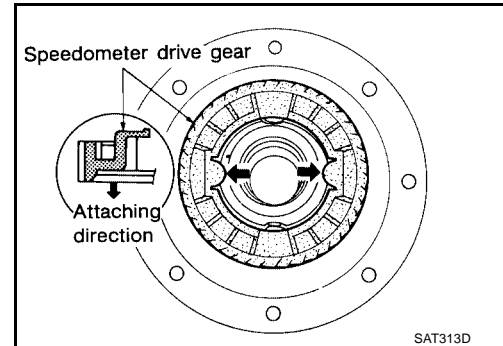
Make sure the pin is flush with case.



5. Install speedometer drive gear on differential case.

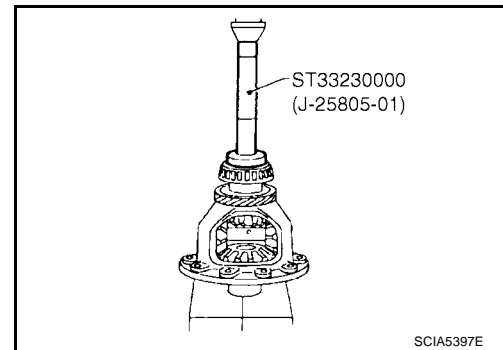
NOTE:

Align the projection of speedometer drive gear with the groove of differential case.

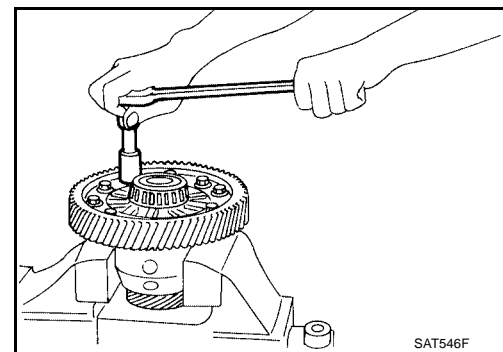


6. Press on differential side bearings using Tool.

Tool number :ST33230000 (J-25805-01)



7. Install final gear and tighten final gear bolts in a crisscross pattern to the specified torque using suitable tool. Refer to [AT-349](#), "[COMPONENTS](#)".



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ASSEMBLY

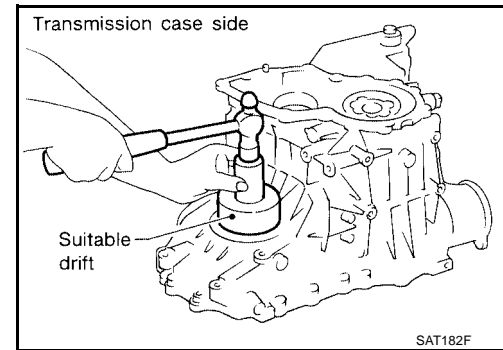
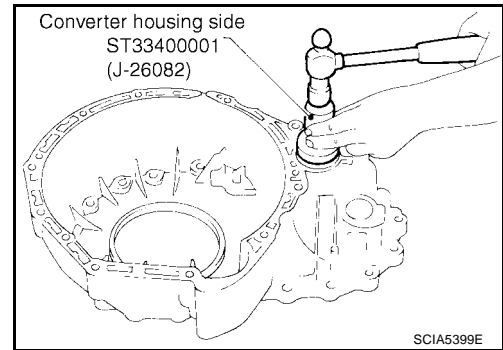
PFP:00000

Assembly (1)

ECS009BE

1. Install new differential side oil seals on transaxle case and converter housing using Tool.

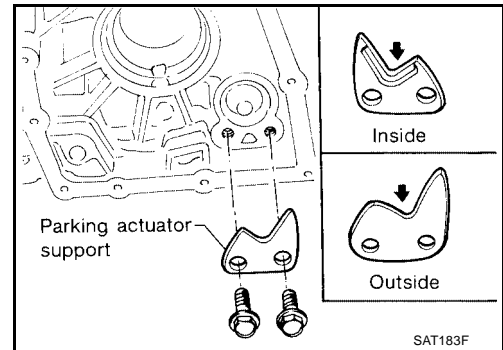
Tool number : ST33400001 (J-26082)



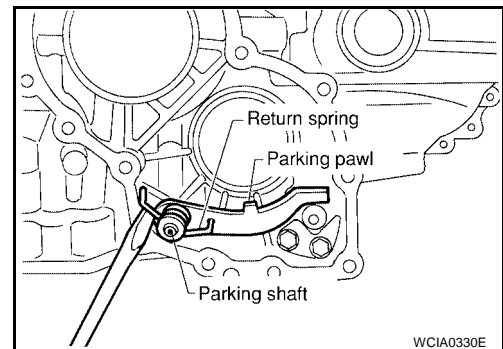
2. Install parking actuator support to transaxle case. Tighten parking actuator support bolts to the specified torque. Refer to [AT-275, "Components"](#).

NOTE:

Pay attention to the direction of the parking actuator support.

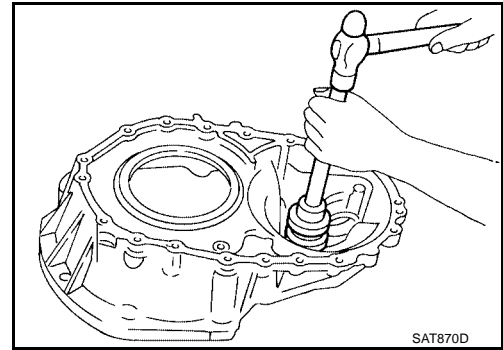


3. Install parking pawl on transaxle case and fix it with parking shaft.
4. Install return spring.

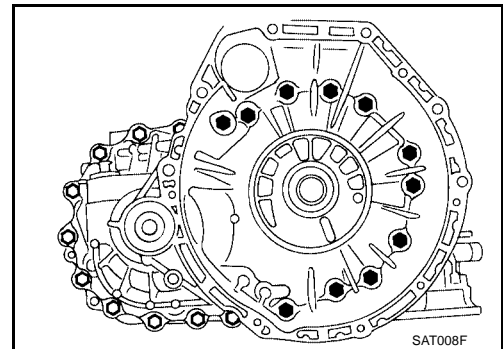


Adjustment (1) DIFFERENTIAL SIDE BEARING PRELOAD

1. Install differential side bearing outer race without adjusting shim on transaxle case.
2. Install differential side bearing outer race on converter housing using suitable tool.



3. Place final drive assembly on transaxle case.
4. Install transaxle case on converter housing. Tighten transaxle case bolts to the specified torque. Refer to [AT-275, "Components"](#).



5. Attach dial indicator on differential case at converter housing side.
6. Insert Tool into differential side gear from transaxle case side.

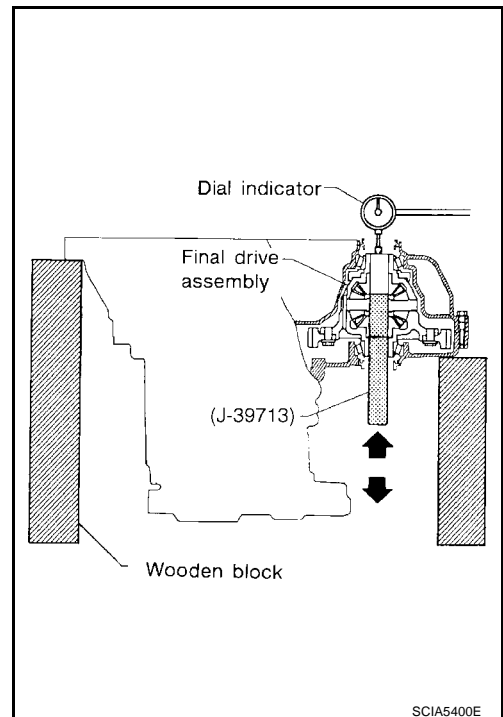
Tool number (J-39713)

7. Move Tool up and down and measure dial indicator deflection.
8. Select proper thickness of differential side bearing adjusting shim(s).

Suitable shim thickness = Dial indicator deflection + Specified bearing preload

Differential side bearing preload adjusting shim : Refer to [AT-380, "DIFFERENTIAL SIDE BEARING PRELOAD ADJUSTING SHIMS"](#).

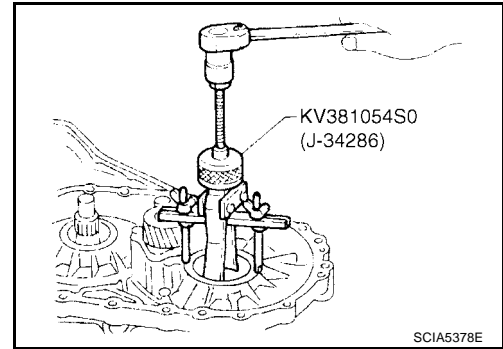
Bearing preload : 0.05 - 0.09 mm (0.0020 - 0.0035 in)



9. Remove converter housing from transaxle case.
10. Remove final drive assembly from transaxle case.
11. Remove differential side bearing outer race from transaxle case using Tool.

Tool number : KV381054S0 (J-34286)

12. Reinstall differential side bearing outer race and shim(s) selected from SDS table on transaxle case.
13. Reinstall converter housing on transaxle case and tighten transaxle case bolts to the specified torque. Refer to [AT-275](#), "OVERHAUL".



14. Measure turning torque of final drive assembly using Tool.

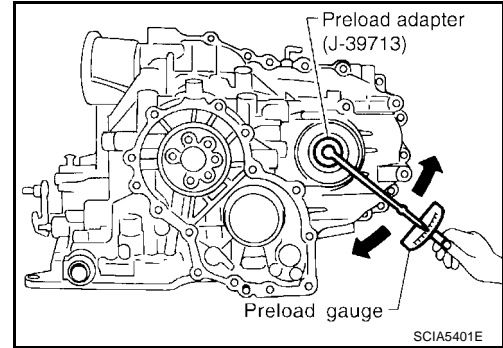
Tool number (J-39713)

NOTE:

- Turn the final drive assembly in both directions several times to seat the bearing rollers correctly

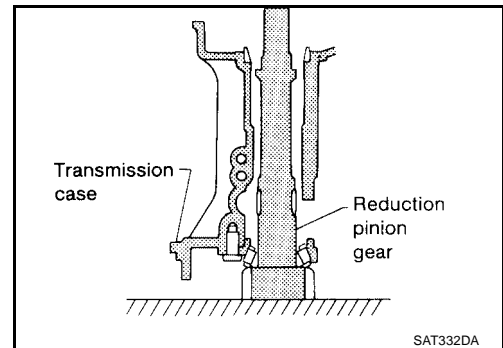
Turning torque of final drive assembly (New bearing) : 0.78 - 1.54 N-m (8.0 - 15.7 kg-cm, 6.9 - 13.6 in-lb)

- When old bearing is being used again, turning torque will be slightly less than above.
- Make sure torque is close to the specified range.



REDUCTION PINION GEAR BEARING PRELOAD

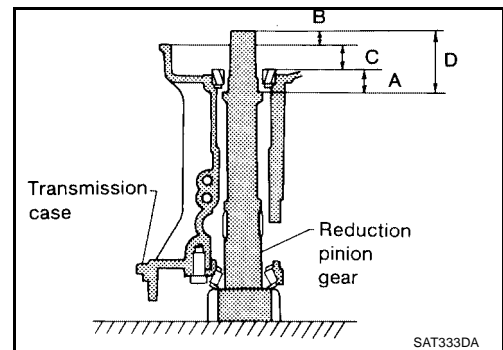
1. Remove transaxle case and final drive assembly from converter housing.
2. Select proper thickness of reduction pinion gear bearing adjusting shim using the following procedures.
 - a. Place reduction pinion gear on transaxle case as shown.



- b. Place idler gear bearing on transaxle case.
 - c. Measure dimensions "B" "C" and "D" and calculate dimension "A".

$A = D - (B + C)$

"A" : Distance between the surface of idler gear bearing inner race and the adjusting shim mating surface of reduction pinion gear.



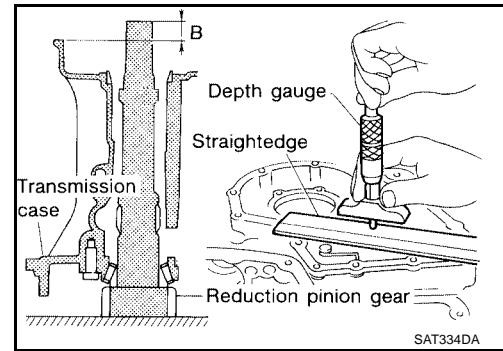
ASSEMBLY

[RE4F04B]

- Measure dimension "B" between the end of reduction pinion gear and the surface of transaxle case using straightedge and depth gauge.

NOTE:

Measure dimension "B" in at least two places.

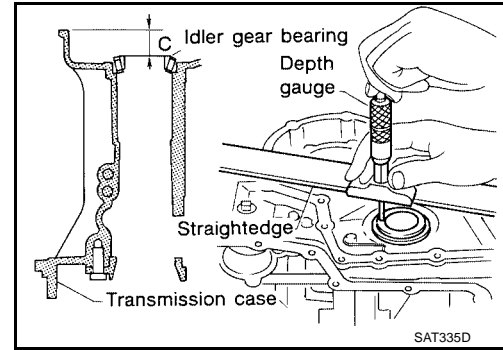


A
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- Measure dimension "C" between the surface of idler gear bearing inner race and the surface of transaxle case using straightedge and depth gauge.

● **NOTE:**

Measure dimension "C" in at least two places.



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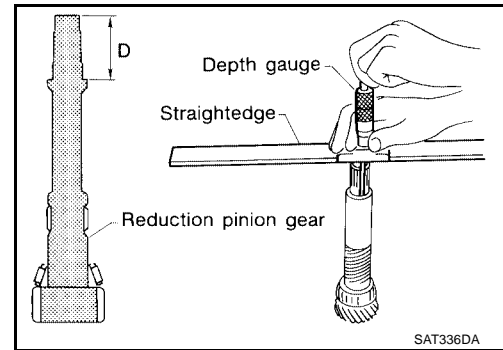
- Measure dimension "D" between the end of reduction pinion gear and the adjusting shim mating surface of reduction pinion gear using straightedge and depth gauge.

● **NOTE:**

Measure dimension "D" in at least two places.

- Calculate dimension "A".

$$A = D - (B + C)$$



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- d. Measure dimension "E" between the end of idler gear and the idler gear bearing inner race mating surface of idler gear using depth gauge.

NOTE:

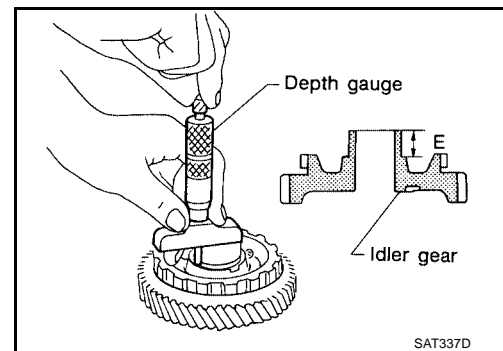
Measure dimension "E" in at least two places.

- e. Select proper thickness of reduction pinion gear bearing adjusting shim.

$$\text{Proper shim thickness} = A - E - 0.05 \text{ mm (0.0020 in)*}$$

(*: Bearing preload)

Reduction pinion gear bearing adjusting shim : Refer to [AT-381](#), "[REDUCTION PINION GEAR BEARING ADJUSTING SHIMS](#)".



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ASSEMBLY

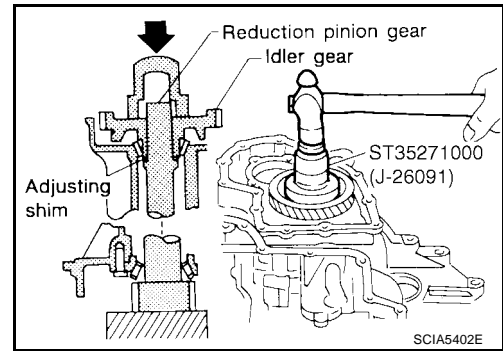
[RE4F04B]

3. Install reduction gear and reduction gear bearing adjusting shim selected in step 2-e on transaxle case.
4. Press idler gear bearing inner race on idler gear.
5. Install idler gear on reduction gear using Tool.

Tool number : ST35271000 (J-26091)

NOTE:

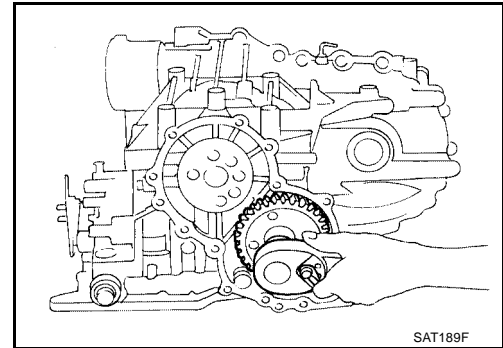
Press idler gear until idler gear fully contacts adjusting shim.



6. Tighten idler gear lock nut to the specified torque using suitable tool. Refer to [AT-275, "Components"](#).

NOTE:

Lock idler gear with parking pawl when tightening the lock nut.



7. Measure turning torque of reduction pinion gear using Tool.

Tool number : ST3127S000 (J-25765-A)

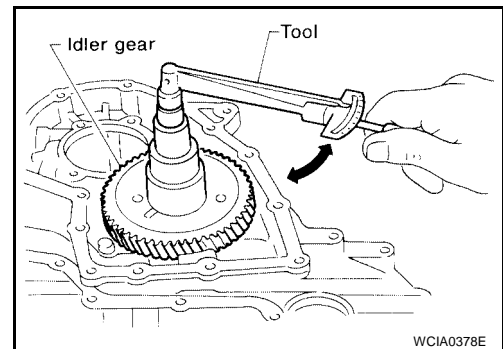
NOTE:

When measuring turning torque, turn the reduction pinion gear in both directions several times to seat bearing rollers correctly.

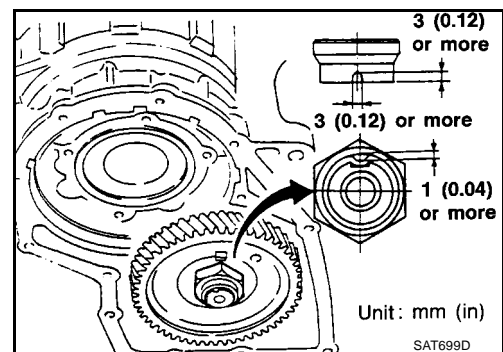
Turning torque of reduction pinion gear : 0.05 - 0.39 N-m (0.5 - 4.0 kg-cm, 0.43 - 3.47 in-lb)

NOTE:

If turning torque is out of specification, select the correct reduction pinion gear adjusting shim.

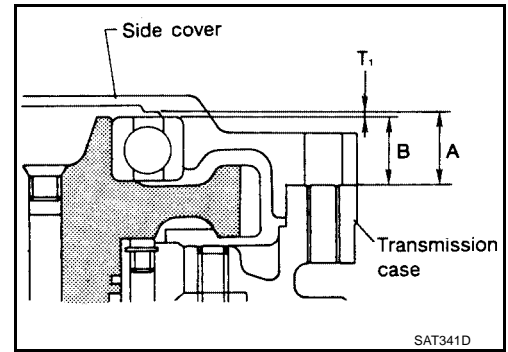


8. After properly adjusting turning torque, clinch idler gear lock nut as shown.

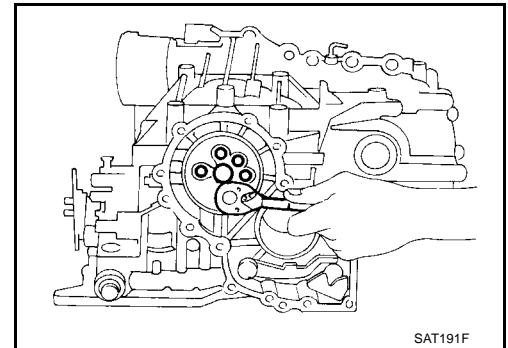


OUTPUT SHAFT END PLAY

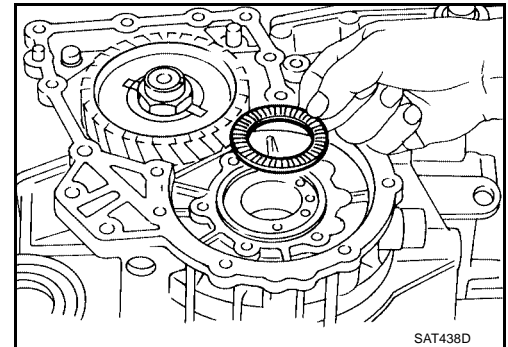
- Measure clearance between side cover and the end of the output shaft bearing.
- Select proper thickness of adjusting shim so that clearance is within specifications.



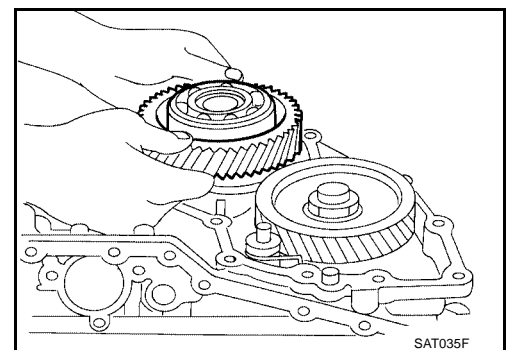
1. Install bearing retainer for output shaft using suitable tool.



2. Install output shaft thrust needle bearing on bearing retainer.



3. Install output shaft on transaxle case.



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ASSEMBLY

[RE4F04B]

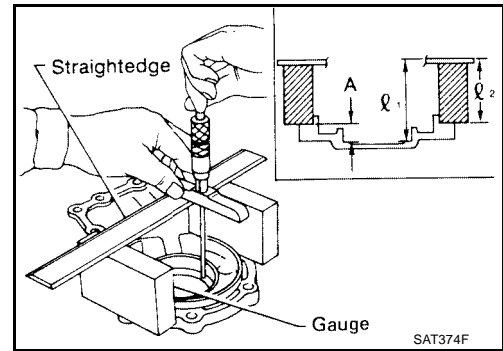
4. Measure dimensions " ℓ_1 " and " ℓ_2 " at side cover and then calculate dimension "A" using straightedge and depth gauge.

- Measure dimension " ℓ_1 " and " ℓ_2 " in at least two places.

"A" : Distance between transaxle case fitting surface and adjusting shim mating surface.

$$A = \ell_1 - \ell_2$$

ℓ_2 : Height of gauge



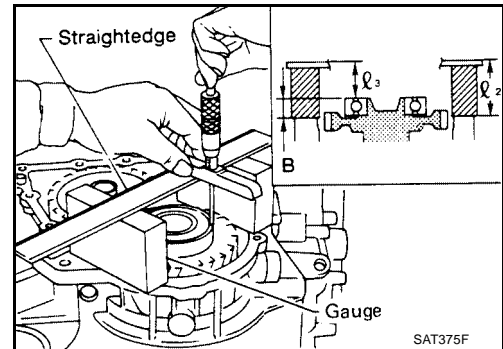
5. Measure dimensions " ℓ_2 " and " ℓ_3 " and then calculate dimension "B" using straightedge and depth gauge.

- Measure " ℓ_2 " and " ℓ_3 " in at least two places.

"B" : Distance between the end of output shaft bearing outer race and the side cover fitting surface of transaxle case.

$$B = \ell_2 - \ell_3$$

ℓ_2 : Height of gauge

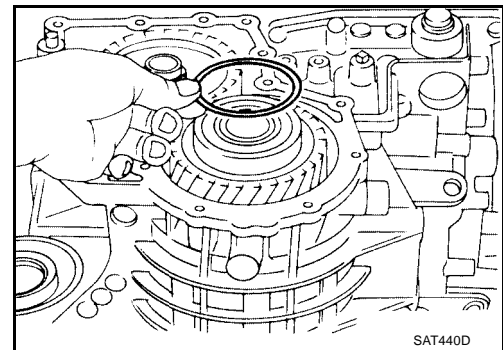


6. Select proper thickness of adjusting shim so that output shaft end play (clearance between side cover and output shaft bearing) is within specifications.

Output shaft end play (A - B) : 0 - 0.15 mm (0 - 0.0059 in)

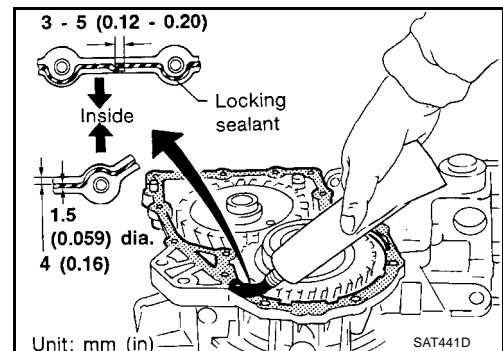
Output shaft end play adjusting shims : Refer to [AT-382, "OUTPUT SHAFT ADJUSTING SHIMS"](#).

7. Install adjusting shim on output shaft bearing.

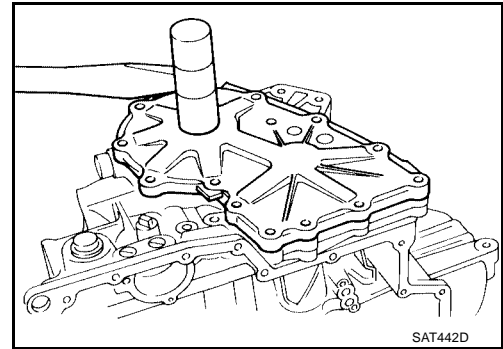


Assembly (2)

1. Apply anaerobic liquid gasket to transaxle case as shown. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#).



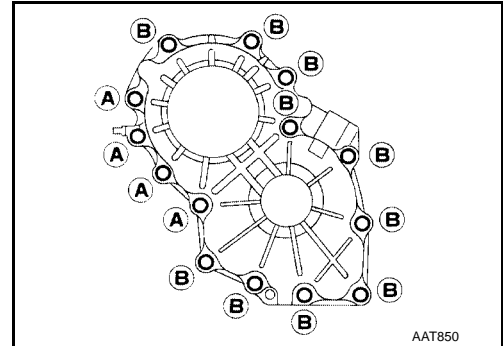
2. Set side cover on transaxle case using suitable tool.



3. Tighten side cover bolts to specified torque. Refer to [AT-275](#), "Components".

CAUTION:

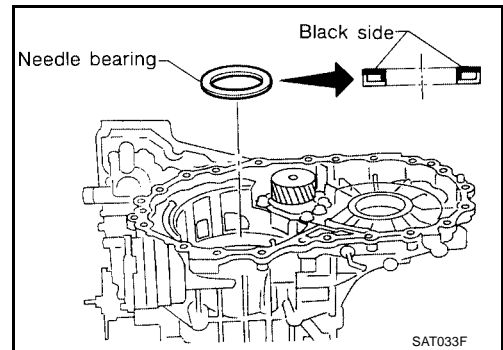
- Do not mix bolts A and B.
- Always replace bolts A as they are self-sealing bolts.



4. Remove paper rolled around bearing retainer.
5. Install thrust washer on bearing retainer.

NOTE:

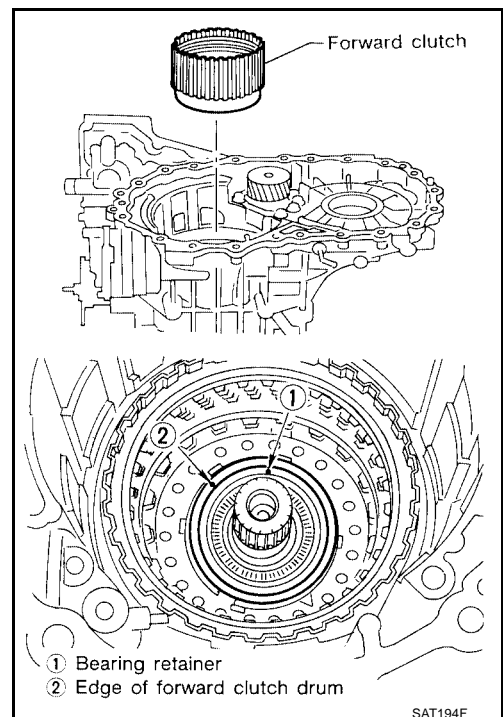
Apply petroleum jelly to thrust washer.



6. Install forward clutch assembly.

NOTE:

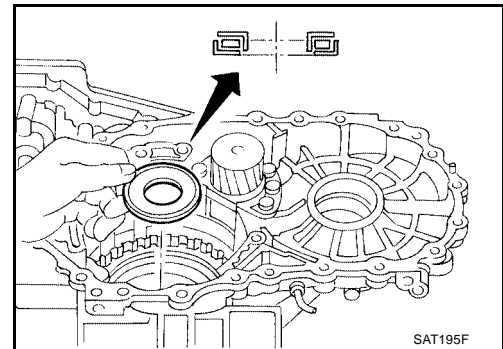
- Align teeth of low and reverse brake drive plates before installing.
- Make sure that the bearing retainer seal rings have not spread.
- If forward clutch assembly is correctly seated, points 1 and 2 are at the same level.



7. Install thrust needle bearing on bearing retainer.

NOTE:

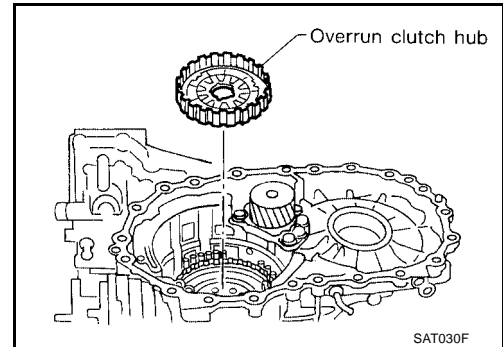
- Apply petroleum jelly to the thrust needle bearing.
- Pay attention to the direction of the thrust needle bearing as shown.



8. Install overrun clutch hub.

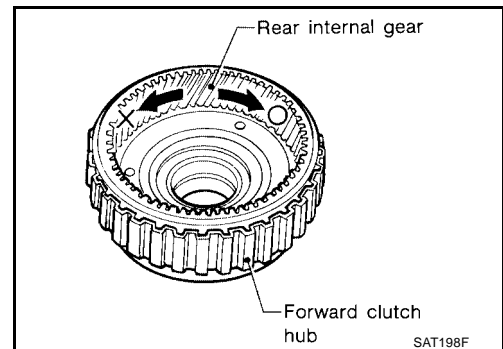
NOTE:

- Apply petroleum jelly to the thrust needle bearing.
- Align the teeth of overrun clutch drive plates before installing.



9. Hold forward clutch hub and turn rear internal gear.

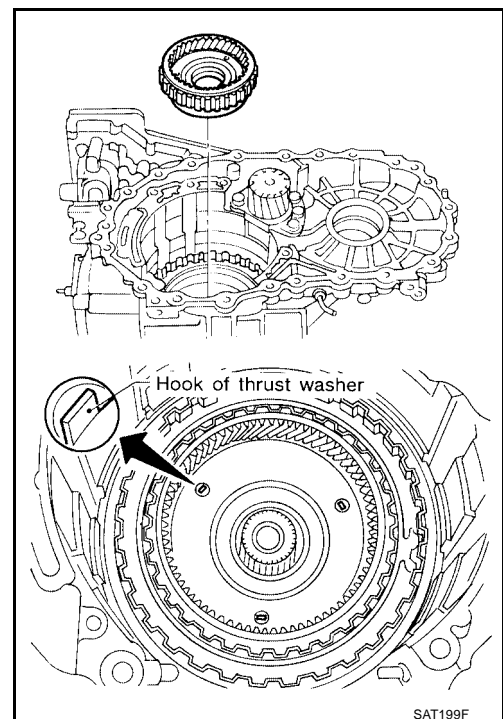
- Check overrun clutch hub for correct directions of lock and unlock.
- If not shown as illustrated, check installed direction of forward one-way clutch.



10. Install forward clutch hub and rear internal gear assembly.

NOTE:

- Align teeth of forward clutch drive plates before installing.
- Check the three hooks of the thrust washer are correctly aligned before installing.



ASSEMBLY

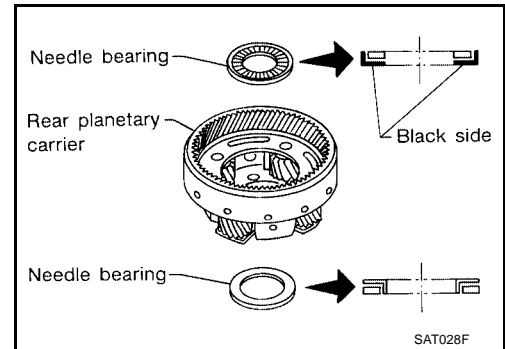
[RE4F04B]

11. Install rear planetary carrier assembly and rear sun gear according to the following procedures.

a. Install needle bearings on rear planetary carrier.

NOTE:

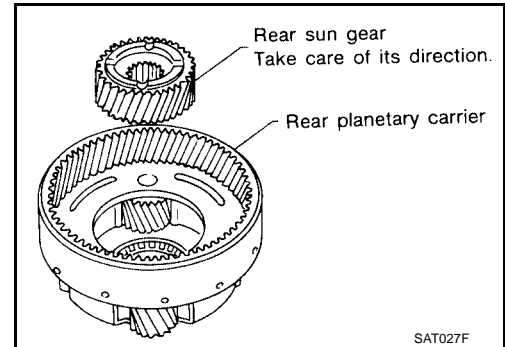
- Apply petroleum jelly to needle bearings.
- Pay attention to direction of needle bearings.



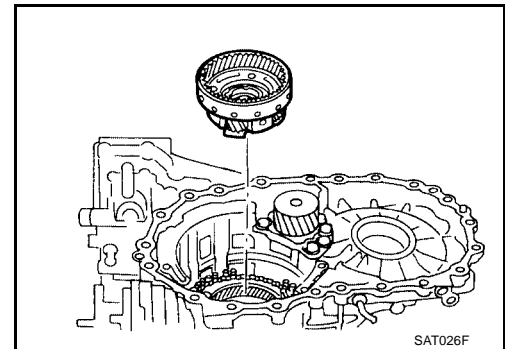
b. Install rear sun gear on rear planetary carrier.

NOTE:

Pay attention to direction of rear sun gear.



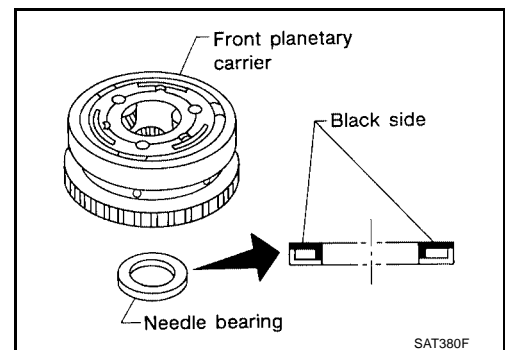
c. Install rear planetary carrier on transaxle case.



12. Install thrust needle bearing on front planetary carrier, then install them together on transaxle case.

NOTE:

- Apply petroleum jelly to thrust needle bearing.
- Pay attention to direction of thrust needle bearing.

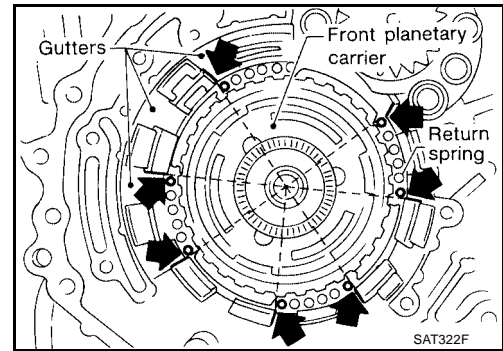


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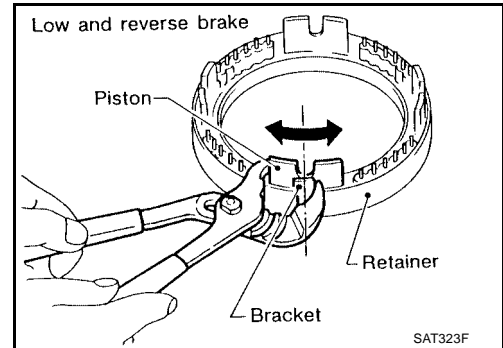
ASSEMBLY

[RE4F04B]

13. Install low and reverse brake piston according to the following procedures.
- a. Set and align return springs to transaxle case gutters as shown in illustration.



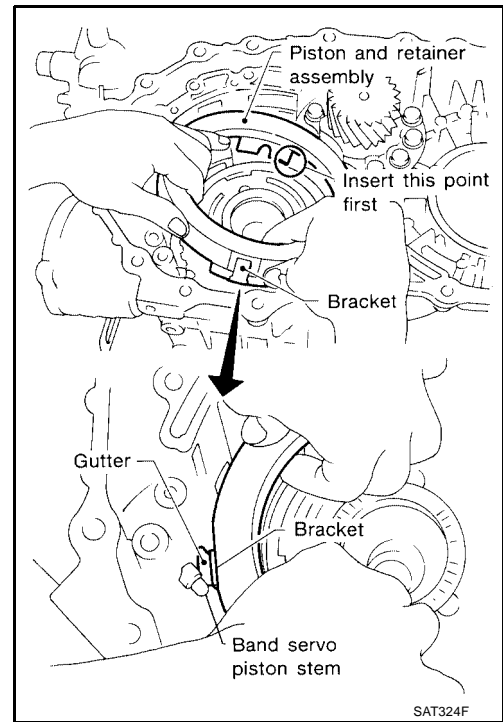
- b. Set and align piston with retainer using suitable tool.



- c. Install piston and retainer assembly on the transaxle case.

NOTE:

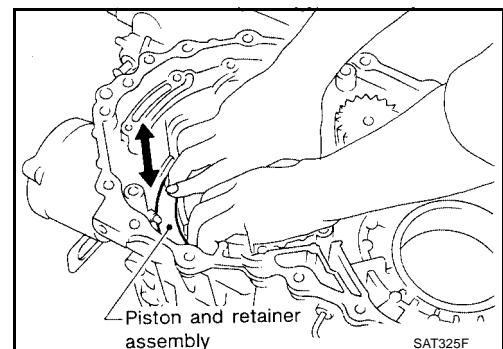
Align bracket to specified gutter in illustration as shown.



- d. Check that each protrusion of piston is correctly set to corresponding return spring as follows.

NOTE:

- Push piston and retainer assembly evenly and confirm they move smoothly.
- If they can not move smoothly, remove piston and retainer assembly and align return spring correctly as instructed in step "a".

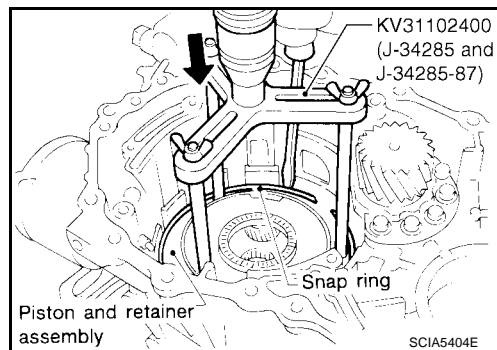


ASSEMBLY

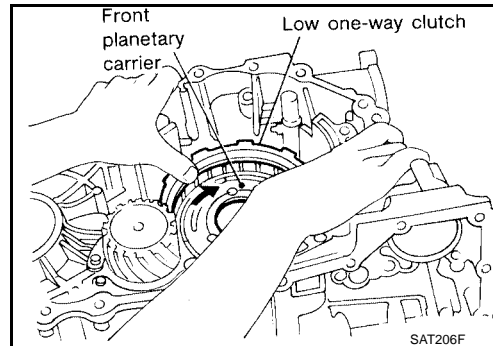
[RE4F04B]

- e. Push down piston and retainer assembly and install snap ring using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)



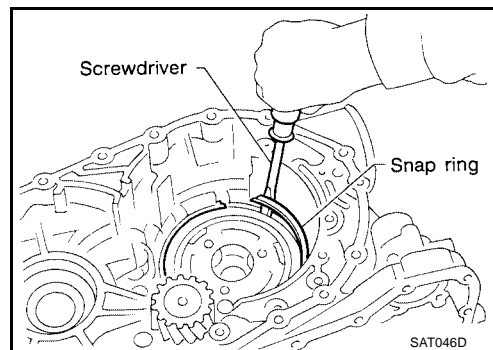
14. Install low one-way clutch to front planetary carrier by turning carrier in the direction of the arrow shown.



15. Install snap ring using screwdriver.

NOTE:

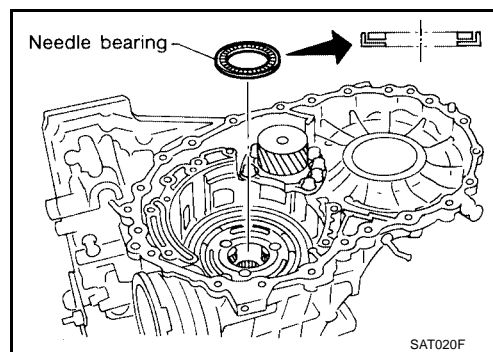
Forward clutch and bearing must be correctly installed for snap ring to fit into groove of transaxle case.



16. Install needle bearing on transaxle case.

NOTE:

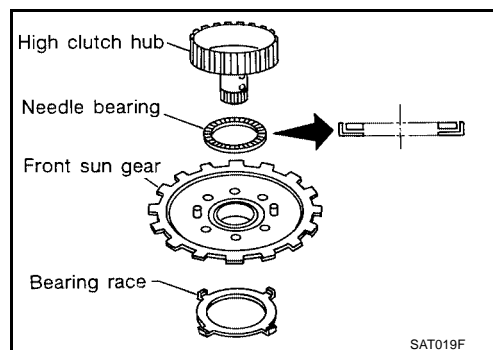
- Apply petroleum jelly to needle bearing.
- Pay attention to direction of needle bearing.



17. Install bearing race, needle bearing and high clutch hub on front sun gear.

NOTE:

- Apply petroleum jelly to needle bearing.
- Pay attention to direction of needle bearing.

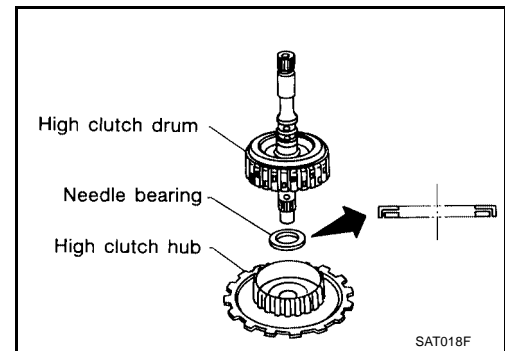


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ASSEMBLY

[RE4F04B]

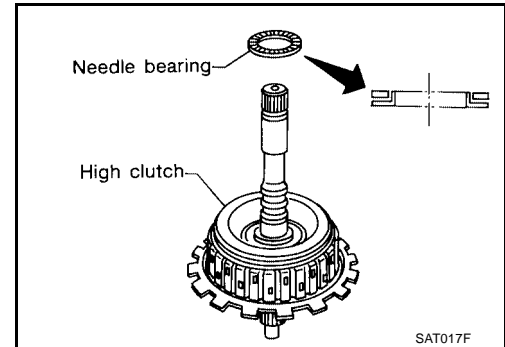
18. Install needle bearing and high clutch drum on high clutch hub.



19. Install needle bearing on high clutch drum.

NOTE:

- Apply petroleum jelly to needle bearing.
- Pay attention to direction of needle bearing.

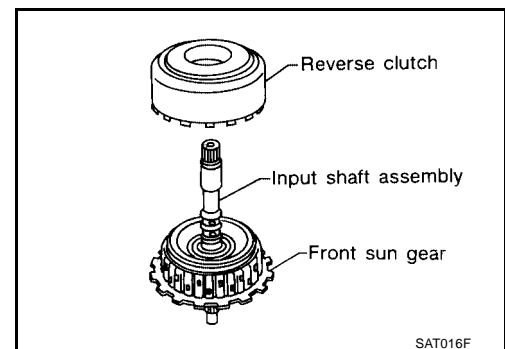


20. Remove paper rolled around input shaft.

21. Install input shaft assembly in reverse clutch.

NOTE:

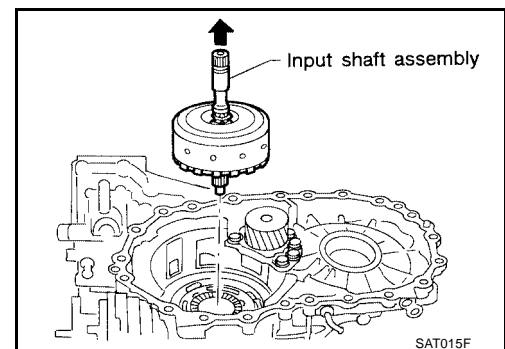
Align teeth of reverse clutch drive plates before installing.



22. Install reverse clutch assembly on transaxle case.

NOTE:

Align teeth of high clutch drive plates before installing.



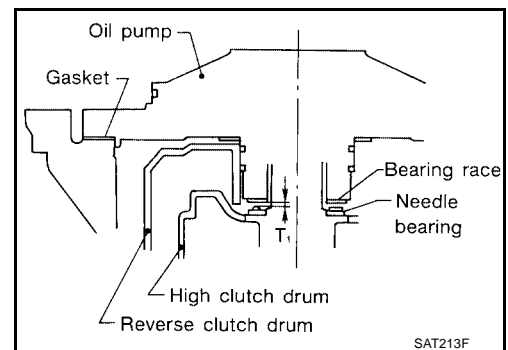
Adjustment (2)

When any parts listed below are replaced, adjust total end play and reverse clutch end play.

| Part name | Total end play | Reverse clutch end play |
|-------------------------|----------------|-------------------------|
| Transaxle case | ● | ● |
| Overrun clutch hub | ● | ● |
| Rear internal gear | ● | ● |
| Rear planetary carrier | ● | ● |
| Rear sun gear | ● | ● |
| Front planetary carrier | ● | ● |
| Front sun gear | ● | ● |
| High clutch hub | ● | ● |
| High clutch drum | ● | ● |
| Oil pump cover | ● | ● |
| Reverse clutch drum | — | ● |

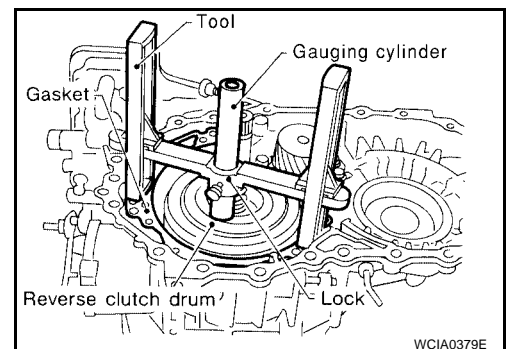
TOTAL END PLAY

1. Adjust total end play "T1".



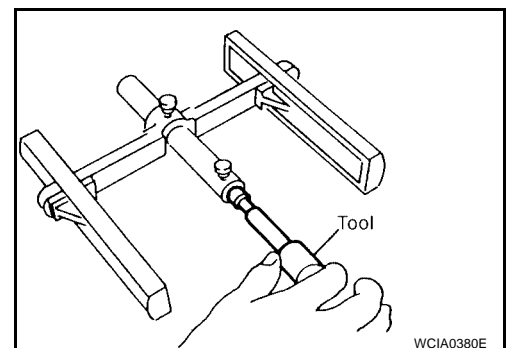
- a. With original bearing race installed, place Tool onto oil pump. The long ends of legs should be placed firmly on machined surface of oil pump assembly. The gauging cylinder should rest on top of bearing race. Lock gauging cylinder in place with set screw.

Tool number : — (J-34291-A)



- b. Install gauging plunger into cylinder.

Tool number : — (J-34290)



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ASSEMBLY

[RE4F04B]

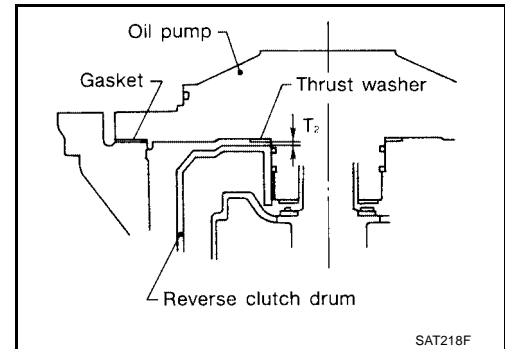
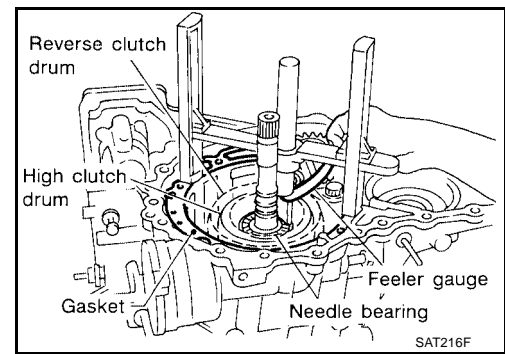
- c. With needle bearing installed on high clutch drum, place Tool legs on machined surface of transaxle case (with gasket). Then allow plunger to rest on needle bearing.
- d. Measure gap between cylinder and plunger. This measurement should give exact total end play.

Total end play "T1" : **0.25 - 0.55 mm**
(**0.0098 - 0.0217 in**)

- If end play is out of specification, decrease or increase thickness of bearing race as necessary.

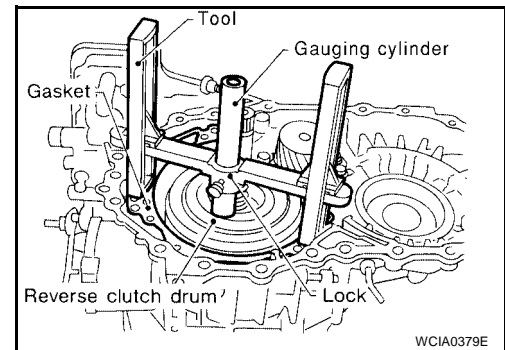
Available bearing race for adjusting total end play : Refer to [AT-383, "BEARING RACE FOR ADJUSTING TOTAL END PLAY"](#).

2. Adjust reverse clutch drum end play "T2".



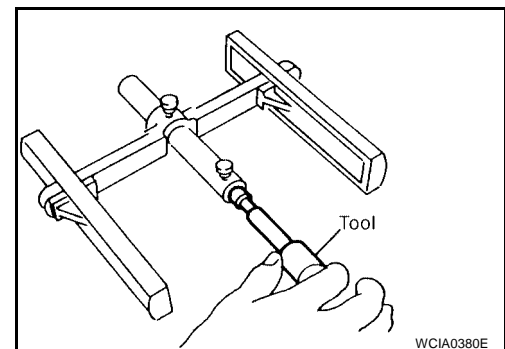
- a. Place Tool on machined surface of transaxle case (with gasket). Then allow gauging cylinder to rest on reverse clutch drum. Lock cylinder in place with set screw.

Tool number : — (**J-34291-A**)



- b. Install gauging plunger into cylinder, using Tool.

Tool number : — (**J-34290**)



ASSEMBLY

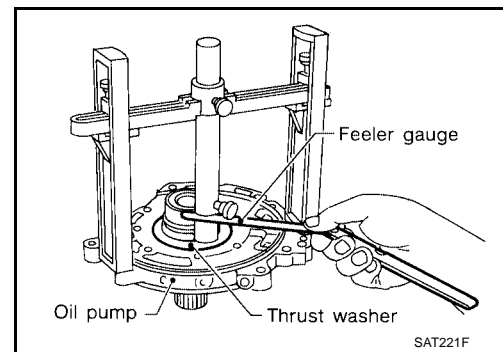
[RE4F04B]

- c. With original thrust washer installed on oil pump, place Tool legs onto machined surface of oil pump assembly. Then allow plunger to rest on thrust washer.
- d. Measure gap between cylinder and plunger with feeler gauge. This measurement should give exact reverse clutch drum end play.

Reverse clutch drum end play "T₂" : 0.55 - 0.90 mm
(0.0217 - 0.0354 in)

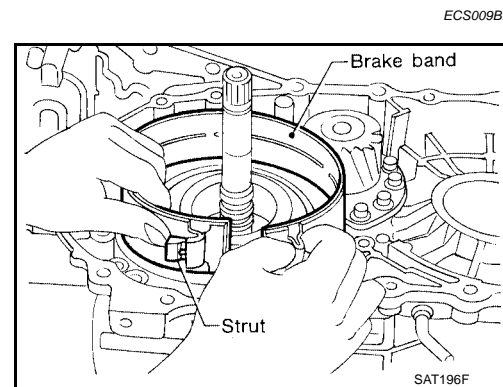
- If end play is out of specification, decrease or increase thickness of thrust washer as necessary.

Available thrust washer for adjusting reverse clutch drum end play : Refer to [AT-383](#), "[THRUST WASHERS FOR ADJUSTING REVERSE CLUTCH DRUM END PLAY](#)".



Assembly (3)

1. Install anchor end pin and lock nut on transaxle case.
2. Place brake band on outside of reverse clutch drum. Tighten anchor end pin just enough so that brake band is evenly fitted on reverse clutch drum.



3. Place bearing race selected in total end play adjustment step on oil pump cover.

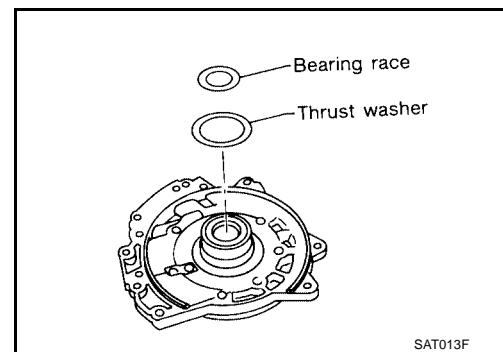
NOTE:

Apply petroleum jelly to bearing race.

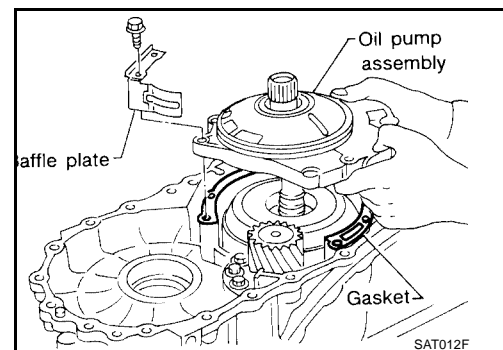
4. Place thrust washer selected in reverse clutch end play step on reverse clutch drum.

NOTE:

Apply petroleum jelly to thrust washer.



5. Install oil pump assembly, baffle plate and gasket on transaxle case.
6. Tighten oil pump bolts to the specified torque.



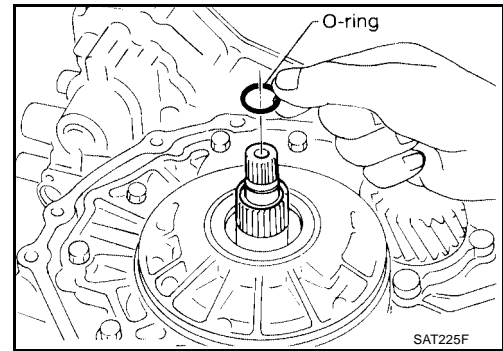
ASSEMBLY

[RE4F04B]

7. Install new O-ring to input shaft.

NOTE:

Apply ATF to new O-ring.



8. Adjust brake band.

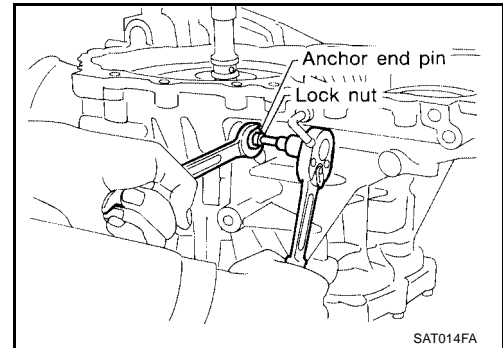
- a. Tighten anchor end pin to the specified torque using suitable tool.

Anchor end pin : Refer to [AT-380, "BRAKE BAND"](#) .

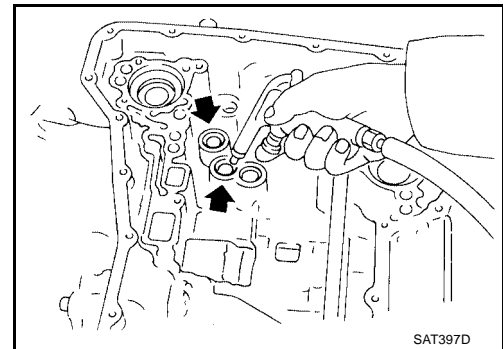
- b. Back off anchor end pin two and a half turns.

- c. While holding anchor end pin, tighten lock nut.

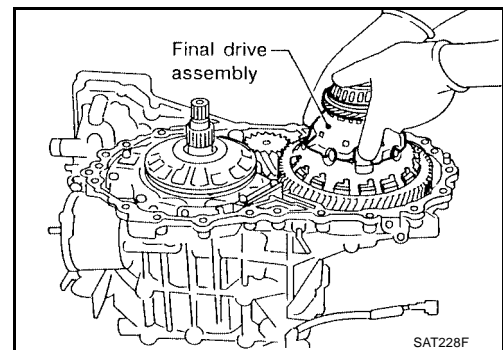
Lock nut : Refer to [AT-380, "BRAKE BAND"](#) .



9. Apply compressed air to oil holes of transaxle case and check operation of brake band.



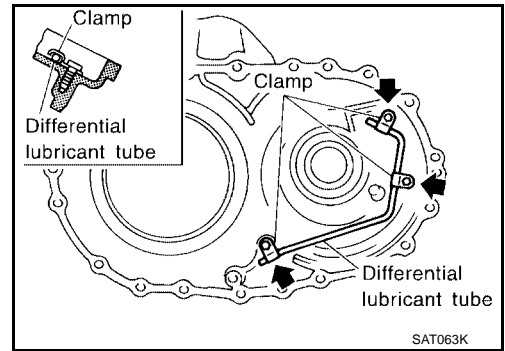
10. Install final drive assembly on transaxle case.



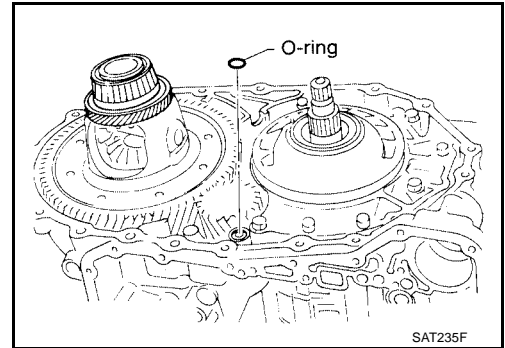
ASSEMBLY

[RE4F04B]

11. Install differential lubricant tube on converter housing. Tighten differential lubricant tube bolts to the specified torque. Refer to [AT-275, "Components"](#).



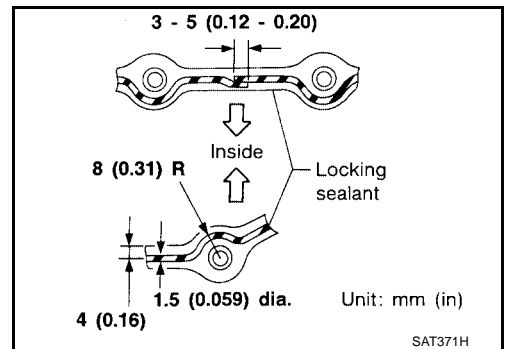
12. Install new O-ring on differential oil port of transaxle case.



13. Install converter housing on transaxle case.

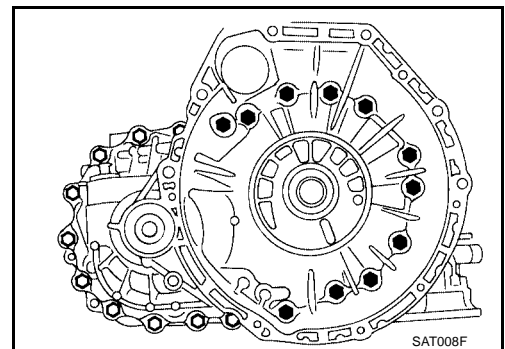
NOTE:

Apply locking sealant to mating surface of converter housing. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#).



NOTE:

Tighten converter housing bolts to the specified torque. Refer to [AT-275, "Components"](#).

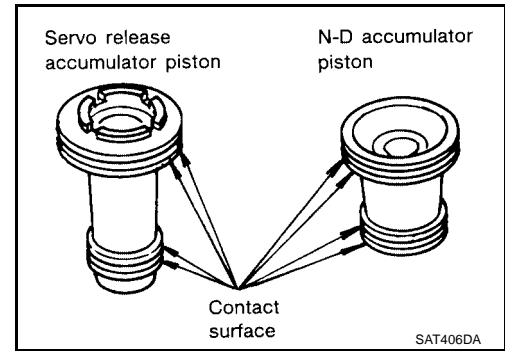


ASSEMBLY

[RE4F04B]

14. Install accumulator piston.

a. Check contact surface of accumulator piston for damage.

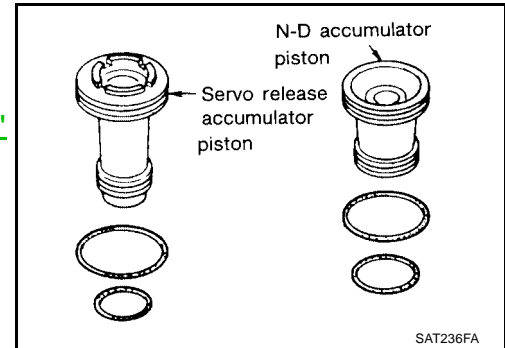


b. Install new O-rings on accumulator piston.

NOTE:

Apply ATF to new O-rings.

Accumulator piston O-rings : Refer to [AT-377, "O-RING"](#)

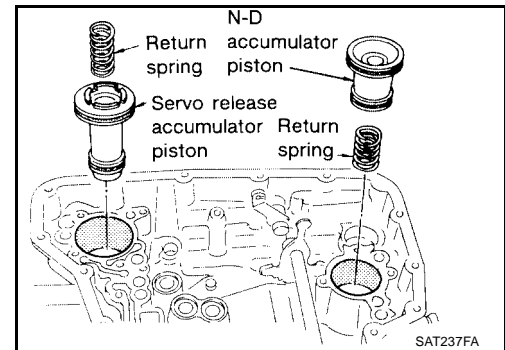


c. Install accumulator pistons and return springs on transaxle case.

NOTE:

Apply ATF to inner surface of transaxle case.

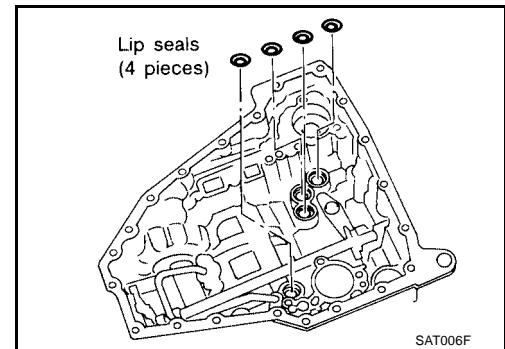
Return springs : Refer to [AT-377, "RETURN SPRING"](#) .



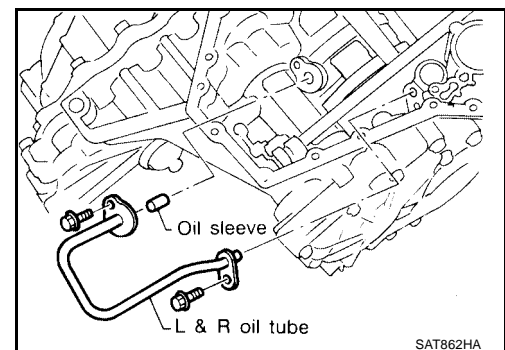
15. Install new lip seals for band servo oil holes on transaxle case.

NOTE:

Apply petroleum jelly to new lip seals.



16. Install L & R oil tube and oil sleeve. Tighten L & R oil tube bolts to the specified torque. Refer to [AT-275, "Components"](#) .

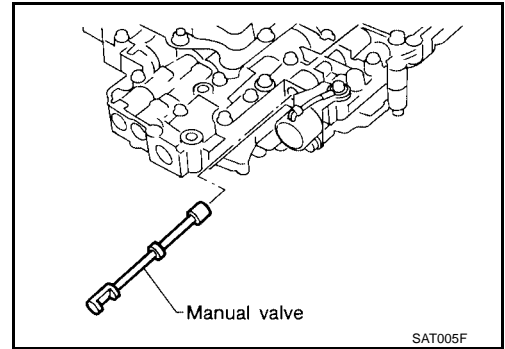


17. Install control valve assembly.

a. Insert manual valve into control valve assembly.

NOTE:

Apply ATF to manual valve.

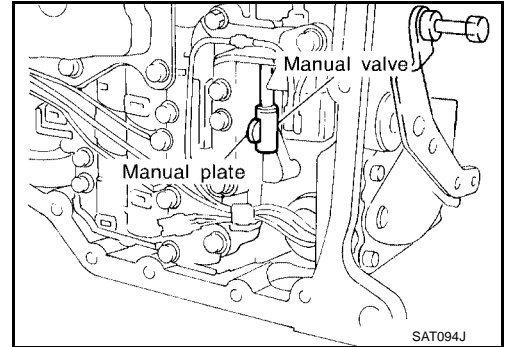


b. Set manual shaft in Neutral position.

c. Install control valve assembly on transaxle case while aligning manual valve with manual plate.

d. Pass solenoid harness through transaxle case and install terminal body on transaxle case by pushing it.

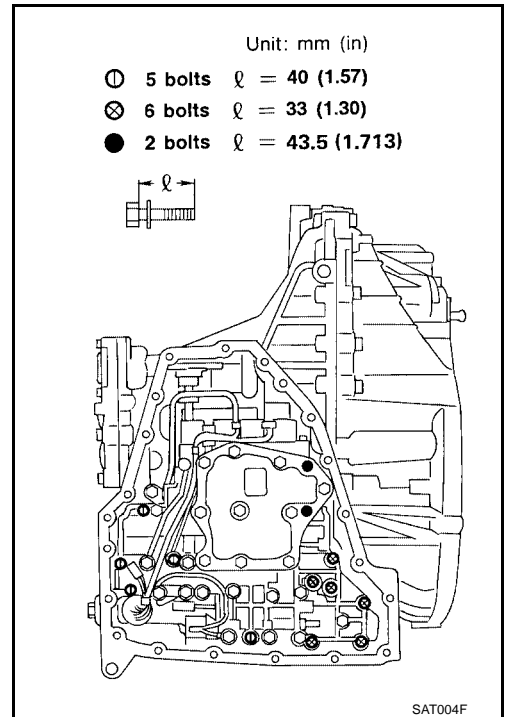
e. Install stopper ring to terminal body.



f. Tighten bolts I, X and ●.

Bolt length, number and location:

| Bolt symbol | I | X | ● |
|-------------------------|-----------|-----------|--------------|
| Bolt length "ℓ" mm (in) | 40 (1.57) | 33 (1.30) | 43.5 (1.713) |
| Number of bolts | 5 | 6 | 2 |



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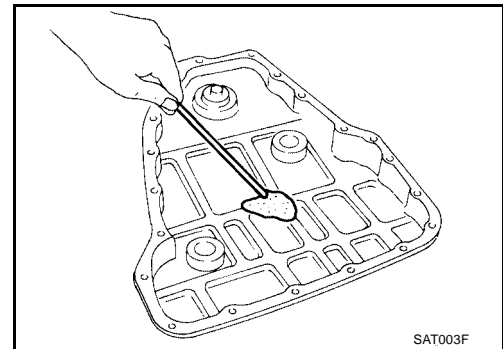
18. Install oil pan.

- a. Attach a magnet to oil pan.
- b. Install new oil pan gasket on transaxle case.
- c. Install oil pan on transaxle case.

NOTE:

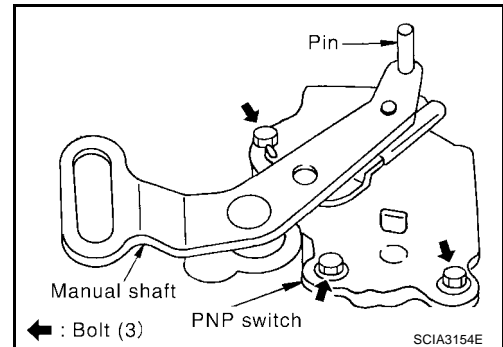
- Always replace oil pan bolts as they are self-sealing bolts.
- Tighten four bolts in a criss-cross pattern to prevent dislocation of gasket.

- d. Tighten oil pan bolts and drain plug to the specified torque. Refer to [AT-275, "Components"](#).



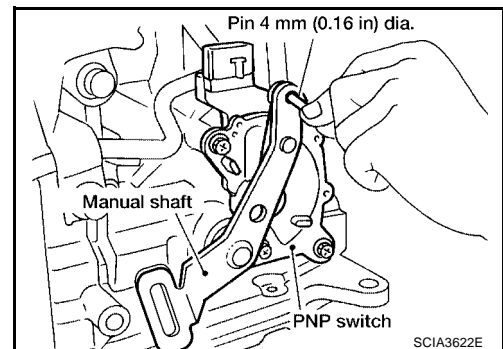
19. Install park/neutral position (PNP) switch.

- a. Set manual shaft in P position.
- b. Temporarily install park/neutral position (PNP) switch on manual shaft.
- c. Move selector lever to N position.

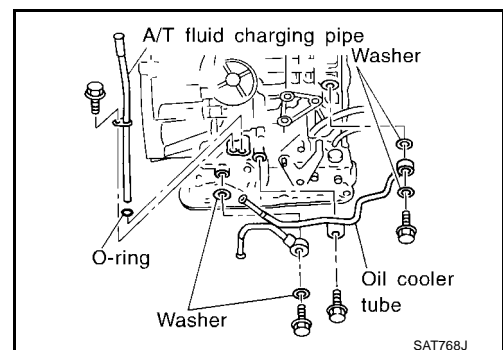


- d. Use a 4 mm (0.16 in) pin for this adjustment.

- i. Insert the pin straight into the manual shaft adjustment hole.
 - ii. Rotate park/neutral position (PNP) switch until the pin can also be inserted straight into hole in park/neutral position (PNP) switch.
- e. Tighten park/neutral position (PNP) switch fixing bolts. Refer to [AT-275, "Components"](#).
 - f. Remove pin from adjustment hole after adjusting park/neutral position (PNP) switch.



20. Install A/T fluid charging pipe and fluid cooler tube to transaxle case. Tighten A/T fluid charging pipe and fluid cooler tube bolts to the specified torque. Refer to [AT-275, "Components"](#).

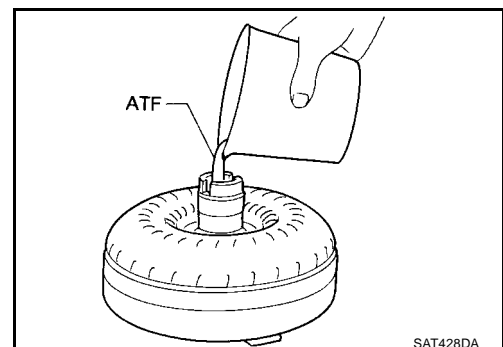


21. Install torque converter.

- a. Pour ATF into torque converter.

NOTE:

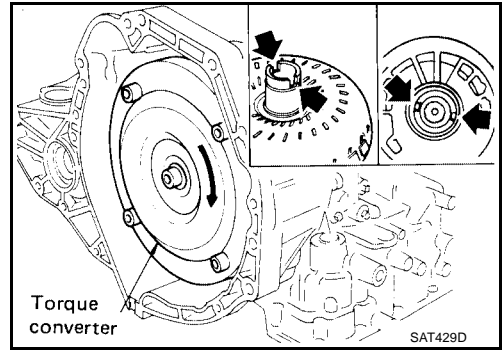
- Approximately 1 liter (1-1/8 US qt, 7/8 Imp qt) of fluid is required for a new torque converter.
- When reusing old torque converter, add the same amount of fluid as was drained.



ASSEMBLY

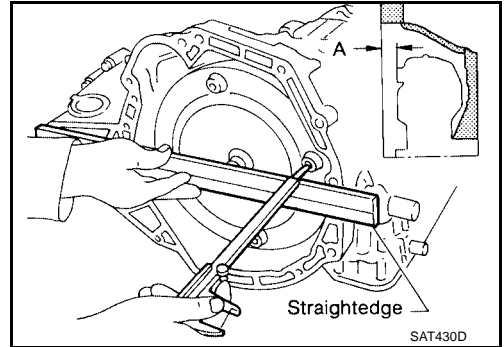
[RE4F04B]

- b. Install torque converter while aligning notches of torque converter with notches of oil pump.



- c. Measure distance "A" to check that torque converter is in proper position.

Distance A : 14 mm (0.55 in) or more



SERVICE DATA AND SPECIFICATIONS (SDS)

[RE4F04B]

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ECS009BJ

| | | |
|----------------------------------|-------------------|---|
| Engine | | QR25DE |
| Automatic transaxle model | | RE4F04B |
| Automatic transaxle assembly | Model code number | 89X05 |
| Transaxle gear ratio | 1st | 2.785 |
| | 2nd | 1.545 |
| | 3rd | 1.000 |
| | 4th | 0.694 |
| | Reverse | 2.272 |
| | Final drive | 4.425 |
| Recommended fluid | | Nissan Matic "D" (Continental U.S. and Alaska) or Canada Nissan Automatic Transmission Fluid* |
| Fluid capacity ℓ (US qt, Imp qt) | | 9.2 (9.3/4, 8.1/8) |

*: Refer to [MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS"](#).

Shift Schedule

ECS009BK

VEHICLE SPEED WHEN SHIFTING GEARS THROTTLE POSITION

| Throttle position | Shift pattern | Vehicle speed km/h (MPH) | | | | | |
|-------------------|---------------|--------------------------|-----------------------|-------------------------|------------------------|----------------------|----------------------|
| | | D1 → D2 | D2 → D3 | D3 → D4 | D4 → D3 | D3 → D2 | D2 → D1 |
| Full throttle | Comfort | 52 - 60 (32 - 37) | 97 - 105 (60 - 65) | 153 - 161 (95 - 100) | 149 - 157 (93 - 98) | 87 - 95 (54 - 59) | 39 - 47 (24 - 29) |
| | Auto power | 52 - 60 (35 - 40) | 97 - 105 (60 - 65) | 153 - 161 (95 - 98) | 149 - 157 (93 - 98) | 87 - 95 (54 - 59) | 39 - 47 (24 - 29) |
| Half throttle | Comfort | 28 - 36 (17 - 22) | 57 - 65 (35 - 40) | 121 - 129 (75 - 80) | 61 - 69 (38 - 43) | 32 - 40 (20 - 25) | 15 - 23 (9 - 14) |
| | Auto power | 38 - 46 (24 - 29) | 72 - 80 (45 - 50) | 121 - 129 (75 - 80) | 61 - 69 (38 - 43) | 43 - 51 (27 - 32) | 15 - 23 (9 - 14) |

VEHICLE SPEED WHEN PERFORMING AND RELEASING LOCK-UP

Unit: km/h (MPH)

| Selector lever position | D position | | 3 position | |
|-------------------------|-------------------|-------------------|-------------------|-------------------|
| | Comfort | Auto power | Comfort | Auto power |
| Lock-up "ON" | 86 - 94 (53 - 58) | 86 - 94 (53 - 58) | 86 - 94 (53 - 58) | 86 - 94 (53 - 58) |
| Lock-up "OFF" | 65 - 73 (41 - 46) | 65 - 73 (41 - 46) | 83 - 91 (52 - 57) | 83 - 91 (52 - 57) |

NOTE:

- Lock-up vehicle speed indicates the speed in D4 position.
- Perform lock-up inspection after warming up engine.
- Lock-up vehicle speed may vary depending on the driving conditions and circumstances.

Stall Revolution

ECS009BL

| Engine | Stall revolution rpm |
|--------|----------------------|
| QR25DE | 2,300 - 2,750 |

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE4F04B]

Line Pressure

ECS009BM

| Engine speed rpm | Line pressure kPa (kg/cm ² , psi) | |
|---------------------|--|-------------------|
| | D, 2 and 1 positions | R position |
| | QR25DE | QR25DE |
| Idle | 500 (5.1, 73) | 778 (7.9, 113) |
| Stall | 1,223 (12.6, 179) | 1,918 (19.6, 278) |

Control Valves CONTROL VALVE AND PLUG RETURN SPRINGS

ECS009BN

Unit: mm (in)

| | Parts | | Item | | |
|------------|--------------------------------|---------------------------------------|---------------|---------------|----------------|
| | | | Part No.* | Free length | Outer diameter |
| Upper body | 23 | Pilot valve spring | 31742-80L13 | 38.98 (1.535) | 8.9 (0.350) |
| | 7 | 1-2 accumulator valve spring | 31742-80L15 | 20.5 (0.807) | 6.95 (0.274) |
| | 28 | 1-2 accumulator piston spring | 31742-80L14 | 55.26 (2.176) | 19.6 (0.772) |
| | 33 | 1st reducing valve spring | 31742-80X05 | 27.0 (1.063) | 7.0 (0.276) |
| | 35 | 3-2 timing valve spring | 31736-01X00 | 23.0 (0.906) | 6.65 (0.262) |
| | 18 | Overrun clutch reducing valve spring | 31742-80L09 | 37.5 (1.476) | 6.9 (0.272) |
| | 16 | Torque converter relief valve spring | 31742-80L10 | 31.0 (1.220) | 9.0 (0.354) |
| | 11 | Torque converter clutch control valve | 31742-80L16 | 56.98 (2.243) | 6.5 (0.256) |
| | 3 | Cooler check valve spring | 31742-85X01 | 29.4 (1.157) | 6.0 (0.236) |
| Lower body | 15 | Pressure regulator valve spring | 31742-80L01 | 45.0 (1.772) | 15.0 (0.591) |
| | 20 | Overrun clutch control valve spring | 31762-80L00 | 21.7 (0.854) | 7.0 (0.276) |
| | 24 | Accumulator control valve spring | 31742-80L02 | 22.0 (0.866) | 6.5 (0.256) |
| | 29 | Shift valve A spring | 31762-80L00 | 21.7 (0.854) | 7.0 (0.276) |
| | 32 | Shuttle valve spring | 31762-41X04 | 51.0 (2.008) | 5.65 (0.222) |
| | 12 | Shift valve B spring | 31762-80L00 | 21.7 (0.854) | 7.0 (0.276) |
| | 7 | Pressure modifier valve spring | 31742-80L03 | 30.5 (1.201) | 9.8 (0.386) |
| | 3 | Pressure modifier piston spring | 31742-80L04 | 32.0 (1.260) | 6.9 (0.272) |
| — | Oil cooler relief valve spring | 31742-80L12 | 17.02 (0.670) | 8.0 (0.315) | |

*: Always check with the Parts Department for the latest parts information.

** : This part is for model code number "88X02".

Accumulator O-RING

ECS009BO

Unit: mm (in)

| Accumulator | Part No.* | Inner diameter (Small) | Part No.* | Inner diameter (Large) |
|---------------------------|-------------|---------------------------|-------------|---------------------------|
| Servo release accumulator | 31526-41X03 | 26.9 (1.059) | 31526-41X02 | 44.2 (1.740) |
| N-D accumulator | 31526-31X08 | 34.6 (1.362) | 31672-21X00 | 39.4 (1.551) |

*: Always check with the Parts Department for the latest parts information.

RETURN SPRING

Unit: mm (in)

| Accumulator | Part number* | Free length | Outer diameter |
|---------------------------|--------------|--------------|----------------|
| Servo release accumulator | 31605-85X00 | 62.8 (2.473) | 21 (0.827) |
| N-D accumulator | 31605-31X02 | 43.5 (1.713) | 27.0 (1.063) |

*: Always check with the Parts Department for the latest parts information.

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE4F04B]

ECS009BP

Clutch and Brakes REVERSE CLUTCH

| | | | |
|--------------------------------|-----------------|---------------------------|--------------|
| Model code number | | 89X05 | |
| Number of drive plates | | 2 | |
| Number of driven plates | | 2 | |
| Drive plate thickness mm (in) | Standard | 1.6 (0.063) | |
| | Allowable limit | 1.4 (0.055) | |
| Driven plate thickness mm (in) | | 1.8 (0.070) | |
| Clearance mm (in) | Standard | 0.5 - 0.8 (0.020 - 0.031) | |
| | Allowable limit | 1.2 (0.047) | |
| Thickness of retaining plates | | Thickness mm (in) | Part number* |
| | | 6.6 (0.260) | 31537-89X00 |
| | | 6.8 (0.268) | 31537-89X01 |
| | | 7.0 (0.276) | 31537-89X02 |
| | | 7.2 (0.283) | 31537-89X03 |
| | | 7.4 (0.291) | 31537-89X04 |
| | | 7.6 (0.299) | 31537-89X05 |
| | | 7.8 (0.307) | 31537-89X06 |

*: Always check with the Parts Department for the latest parts information.

HIGH CLUTCH

| | | | |
|--------------------------------|-----------------|---------------------------|--------------|
| Model code number | | 89X05 | |
| Number of drive plates | | 3 | |
| Number of driven plates | | g*1 + 1*2 | |
| Drive plate thickness mm (in) | Standard | 1.6 (0.063) | |
| | Allowable limit | 1.4 (0.055) | |
| Driven plate thickness mm (in) | Standard | *1 | *2 |
| | | 1.4 (0.055) | 2.0 (0.079) |
| Clearance mm (in) | Standard | 1.8 - 2.2 (0.071 - 0.087) | |
| | Allowable limit | 2.8 (0.110) | |
| Thickness of retaining plates | | Thickness mm (in) | Part number* |
| | | 3.0 (0.118) | 31537-81X10 |
| | | 3.2 (0.126) | 31537-81X11 |
| | | 3.4 (0.134) | 31537-81X12 |
| | | 3.6 (0.142) | 31537-81X13 |
| | | 3.8 (0.150) | 31537-81X14 |

*: Always check with the Parts Department for the latest parts information.

FORWARD CLUTCH

| | | | |
|--------------------------------|-----------------|-------------------------------|--|
| Model code number | | 89X05 | |
| Number of drive plates | | 5 | |
| Number of driven plates | | 5 | |
| Drive plate thickness mm (in) | Standard | 1.6 (0.063) | |
| | Allowable limit | 1.4 (0.055) | |
| Driven plate thickness mm (in) | | 1.8 (0.071) | |
| Clearance mm (in) | Standard | 0.45 - 0.85 (0.0177 - 0.0335) | |
| | Allowable limit | 1.85 (0.0728) | |

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE4F04B]

| | Thickness mm (in) | Part number* |
|--|-------------------------------|---|
| | Thickness of retaining plates | 3.2 (0.126) 3.4 (0.134) 3.6 (0.142) 3.8 (0.150) 4.0 (0.157) 4.2 (0.165) 4.4 (0.173) |

*: Always check with the Parts Department for the latest parts information.

OVERRUN CLUTCH

| Model code number | 89X05 | |
|--------------------------------|-------------------------------|---|
| Number of drive plates | 3 | |
| Number of driven plates | 5 | |
| Drive plate thickness mm (in) | Standard | 1.6 (0.063) |
| | Allowable limit | 1.4 (0.055) |
| Driven plate thickness mm (in) | Standard | 1.8 (0.071) |
| Clearance mm (in) | Standard | 0.7 - 1.1 (0.028 - 0.043) |
| | Allowable limit | 1.7 (0.067) |
| | Thickness mm (in) | Part number* |
| | Thickness of retaining plates | 3.0 (0.118) 3.2 (0.126) 3.4 (0.134) 3.6 (0.142) 3.8 (0.150) |

*: Always check with the Parts Department for the latest parts information.

LOW & REVERSE BRAKE

| Model code number | 89X05 | |
|--------------------------------|-------------------------------|--|
| Number of drive plates | 6 | |
| Number of driven plates | 6 | |
| Drive plate thickness mm (in) | Standard | 1.8 (0.071) |
| | Allowable limit | 1.6 (0.063) |
| Driven plate thickness mm (in) | Standard | 1.8 (0.071) |
| Clearance mm (in) | Standard | 1.7 - 2.1 (0.067 - 0.083) |
| | Allowable limit | 3.3 (0.130) |
| | Thickness mm (in) | Part number* |
| | Thickness of retaining plates | 2.0 (0.079) 2.2 (0.087) 2.4 (0.094) 2.6 (0.102) 2.8 (0.110) 3.0 (0.118) 3.2 (0.126) 3.4 (0.134) |

*: Always check with the Parts Department for the latest parts information.

CLUTCH AND BRAKE RETURN SPRINGS

Unit: mm (in)

| Parts | Part number* | Free length | Outer diameter |
|---|--------------|--------------|----------------|
| Forward clutch (Overrun clutch) (22 pcs) | 31505-80X02 | 21.4 (0.843) | 10.3 (0.406) |
| High clutch (18 pcs) | 31505-89X04 | 20.0 (0.787) | 8.3 (0.327) |
| Low & reverse brake (24 pcs) | 31505-89X02 | 21.6 (0.850) | 6.6 (0.260) |

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE4F04B]

*: Always check with the Parts Department for the latest parts information.

BRAKE BAND

| | |
|--|--------------------------------|
| Anchor end pin tightening torque N-m (kg-m, in-lb) | 4.0 - 5.8 (0.4 - 0.6, 36 - 52) |
| Number of returning revolutions for anchor end pin | 2.5 |
| Lock nut tightening torque N-m (kg-m, ft-lb) | 31 - 36 (3.2 - 3.7, 23 - 27) |

Final Drive

DIFFERENTIAL SIDE GEAR CLEARANCE

ECS009BQ

| | |
|---|---------------------------|
| Clearance between side gear and differential case with washer mm (in) | 0.1 - 0.2 (0.004 - 0.008) |
|---|---------------------------|

DIFFERENTIAL SIDE GEAR THRUST WASHERS

| Thickness mm (in) | Part number* |
|-------------------|--------------|
| 0.75 (0.0295) | 38424-81X00 |
| 0.80 (0.0315) | 38424-81X01 |
| 0.85 (0.0335) | 38424-81X02 |
| 0.90 (0.0354) | 38424-81X03 |
| 0.95 (0.0374) | 38424-81X04 |

*: Always check with the Parts Department for the latest parts information.

DIFFERENTIAL SIDE BEARING PRELOAD ADJUSTING SHIMS

| Thickness mm (in) | Part number* |
|-------------------|--------------|
| 0.48 (0.0189) | 31438-80X00 |
| 0.52 (0.0205) | 31438-80X01 |
| 0.56 (0.0220) | 31438-80X02 |
| 0.60 (0.0236) | 31438-80X03 |
| 0.64 (0.0252) | 31438-80X04 |
| 0.68 (0.0268) | 31438-80X05 |
| 0.72 (0.0283) | 31438-80X06 |
| 0.76 (0.0299) | 31438-80X07 |
| 0.80 (0.0315) | 31438-80X08 |
| 0.84 (0.0331) | 31438-80X09 |
| 0.88 (0.0346) | 31438-80X10 |
| 0.92 (0.0362) | 31438-80X11 |

*: Always check with the Parts Department for the latest parts information.

BEARING PRELOAD

| | |
|---|-------------------------------|
| Differential side bearing preload mm (in) | 0.05 - 0.09 (0.0020 - 0.0035) |
|---|-------------------------------|

TURNING TORQUE

| | |
|---|--------------------------------------|
| Turning torque of final drive assembly N-m (kg-cm, in-lb) | 0.78 - 1.54 (8.0 - 15.7, 6.9 - 13.6) |
|---|--------------------------------------|

Planetary Carrier and Oil Pump

PLANETARY CARRIER

ECS009BR

| | | |
|---|-----------------|-------------------------------|
| Clearance between planetary carrier and pinion washer mm (in) | Standard | 0.20 - 0.70 (0.0079 - 0.0276) |
| | Allowable limit | 0.80 (0.0315) |

OIL PUMP

| | |
|---------------------------------|---------------------------------|
| Oil pump side clearance mm (in) | 0.030 - 0.050 (0.0012 - 0.0020) |
|---------------------------------|---------------------------------|

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE4F04B]

| | | | |
|---|-----------------|---------------------------------|--------------|
| Thickness of inner gears and outer gears | | Inner gear | |
| | | Thickness mm (in) | Part number* |
| | | 11.99 - 12.0 (0.4720 - 0.4724) | 31346-80L00 |
| | | 11.98 - 11.99 (0.4717 - 0.4720) | 31346-80L01 |
| | | 11.97 - 11.98 (0.4713 - 0.4717) | 31346-80L02 |
| | | Outer gear | |
| | | Thickness mm (in) | Part number* |
| | | 11.99 - 12.0 (0.4720 - 0.4724) | 31347-80L00 |
| | | 11.98 - 11.99 (0.4717 - 0.4720) | 31347-80L01 |
| | | 11.97 - 11.98 (0.4713 - 0.4717) | 31347-80L02 |
| Clearance between oil pump housing and outer gear mm (in) | Standard | 0.111 - 0.181 (0.0044 - 0.0071) | |
| | Allowable limit | 0.181 (0.0071) | |
| Oil pump cover seal ring clearance mm (in) | Standard | 0.1 - 0.25 (0.0039 - 0.0098) | |
| | Allowable limit | 0.25 (0.0098) | |

*: Always check with the Parts Department for the latest parts information.

Input Shaft SEAL RING CLEARANCE

ECS009BS

| | | |
|---|-----------------|-------------------------------|
| Input shaft seal ring clearance mm (in) | Standard | 0.08 - 0.23 (0.0031 - 0.0091) |
| | Allowable limit | 0.23 (0.0091) |

SEAL RING

| Outer diameter mm (in) | Inner diameter mm (in) | Width mm (in) | Part number* |
|------------------------|------------------------|---------------|--------------|
| 26 (1.024) | 22.4 (0.882) | 1.971 (0.078) | 31525-80X02 |

*: Always check with the Parts Department for the latest parts information.

Reduction Pinion Gear TURNING TORQUE

ECS009BT

| | |
|--|--------------------------------------|
| Turning torque of reduction pinion gear N-m (kg-cm, in-lb) | 0.05 - 0.39 (0.5 - 4.0, 0.43 - 3.47) |
|--|--------------------------------------|

REDUCTION PINION GEAR BEARING ADJUSTING SHIMS

| NO. | Thickness mm (in) | Part number | NO. | Thickness mm (in) | Part number* |
|-----|-------------------|-------------|-----|-------------------|--------------|
| 1 | 5.00 (0.1969) | 31439-81X00 | 18 | 5.34 (0.2102) | 31439-81X17 |
| 2 | 5.02 (0.1976) | 31439-81X01 | 19 | 5.36 (0.2110) | 31439-81X18 |
| 3 | 5.04 (0.1984) | 31439-81X02 | 20 | 5.38 (0.2118) | 31439-81X19 |
| 4 | 5.06 (0.1992) | 31439-81X03 | 21 | 5.40 (0.2126) | 31439-81X20 |
| 5 | 5.08 (0.2000) | 31439-81X04 | 22 | 5.42 (0.2134) | 31439-81X21 |
| 6 | 5.10 (0.2008) | 31439-81X05 | 23 | 5.44 (0.2142) | 31439-81X22 |
| 7 | 5.12 (0.2016) | 31439-81X06 | 24 | 5.46 (0.2150) | 31439-81X23 |
| 8 | 5.14 (0.2024) | 31439-81X07 | 25 | 5.48 (0.2157) | 31439-81X24 |
| 9 | 5.16 (0.2031) | 31439-81X08 | 26 | 5.50 (0.2165) | 31439-81X46 |
| 10 | 5.18 (0.2039) | 31439-81X09 | 27 | 5.52 (0.2173) | 31439-81X47 |
| 11 | 5.20 (0.2047) | 31439-81X10 | 28 | 5.54 (0.2181) | 31439-81X48 |
| 12 | 5.22 (0.2055) | 31439-81X11 | 29 | 5.56 (0.2189) | 31439-81X49 |
| 13 | 5.24 (0.2063) | 31439-81X12 | 30 | 5.58 (0.2197) | 31439-81X60 |
| 14 | 5.26 (0.2071) | 31439-81X13 | 31 | 5.60 (0.2205) | 31439-81X61 |
| 15 | 5.28 (0.2079) | 31439-81X14 | 32 | 5.62 (0.2213) | 31439-81X62 |
| 16 | 5.30 (0.2087) | 31439-81X15 | 33 | 5.64 (0.2220) | 31439-81X63 |
| 17 | 5.32 (0.2094) | 31439-81X16 | 34 | 5.66 (0.2228) | 31439-81X64 |

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE4F04B]

| NO. | Thickness mm (in) | Part number | NO. | Thickness mm (in) | Part number* |
|-----|-------------------|-------------|-----|-------------------|--------------|
| 35 | 5.68 (0.2236) | 31439-81X65 | 50 | 4.70 (0.1850) | 31439-85X06 |
| 36 | 5.70 (0.2244) | 31439-81X66 | 51 | 4.72 (0.1858) | 31439-83X11 |
| 37 | 5.72 (0.2252) | 31439-81X67 | 52 | 4.74 (0.1866) | 31439-83X12 |
| 38 | 5.74 (0.2260) | 31439-81X68 | 53 | 4.76 (0.1874) | 31439-83X13 |
| 39 | 5.76 (0.2268) | 31439-81X69 | 54 | 4.78 (0.1882) | 31439-83X14 |
| 40 | 5.78 (0.2276) | 31439-81X70 | 55 | 4.80 (0.1890) | 31439-83X15 |
| 41 | 5.80 (0.2283) | 31439-81X71 | 56 | 4.82 (0.1898) | 31439-83X16 |
| 42 | 5.82 (0.2291) | 31439-81X72 | 57 | 4.84 (0.1906) | 31439-83X17 |
| 43 | 5.84 (0.2299) | 31439-81X73 | 58 | 4.86 (0.1913) | 31439-83X18 |
| 44 | 5.86 (0.2307) | 31439-81X74 | 59 | 4.88 (0.1921) | 31439-83X19 |
| 45 | 4.60 (0.1811) | 31439-85X01 | 60 | 4.90 (0.1929) | 31439-83X20 |
| 46 | 4.62 (0.1819) | 31439-85X02 | 61 | 4.92 (0.1937) | 31439-83X21 |
| 47 | 4.64 (0.1827) | 31439-85X03 | 62 | 4.94 (0.1945) | 31439-83X22 |
| 48 | 4.66 (0.1835) | 31439-85X04 | 63 | 4.96 (0.1953) | 31439-83X23 |
| 49 | 4.68 (0.1843) | 31439-85X05 | 64 | 4.98 (0.1961) | 31439-83X24 |

*: Always check with the Parts Department for the latest parts information.

Band Servo RETURN SPRING

ECS009BU

Unit: mm (in)

| Return spring | Part number* | Free length | Outer diameter |
|-------------------------|--------------|--------------|----------------|
| 2nd servo return spring | 31605-80L05 | 32.5 (1.280) | 25.9 (1.020) |
| OD servo return spring | 31605-80L06 | 62.6 (2.465) | 21.7 (0.854) |

*: Always check with the Parts Department for the latest parts information.

Output Shaft SEAL RING CLEARANCE

ECS009BV

| | | |
|--|-----------------|-------------------------------|
| Output shaft seal ring clearance mm (in) | Standard | 0.10 - 0.25 (0.0039 - 0.0098) |
| | Allowable limit | 0.25 (0.0098) |

SEAL RING

| Outer diameter mm (in) | Inner diameter mm (in) | Width mm (in) | Part number* |
|------------------------|------------------------|---------------|--------------|
| 33.71 (1.327) | 30.25 (1.191) | 1.95 (0.077) | 31525-80X09 |

*: Always check with the Parts Department for the latest parts information.

END PLAY

| | |
|-------------------------------|-----------------------|
| Output shaft end play mm (in) | 0 - 0.15 (0 - 0.0059) |
|-------------------------------|-----------------------|

OUTPUT SHAFT ADJUSTING SHIMS

| Thickness mm (in) | Part number* |
|-------------------|--------------|
| 0.80 (0.0315) | 31438-80X60 |
| 0.84 (0.0331) | 31438-80X61 |
| 0.88 (0.0346) | 31438-80X62 |
| 0.92 (0.0362) | 31438-80X63 |
| 0.96 (0.0378) | 31438-80X64 |
| 1.00 (0.0394) | 31438-80X65 |
| 1.04 (0.0409) | 31438-80X66 |
| 1.08 (0.0425) | 31438-80X67 |
| 1.12 (0.0441) | 31438-80X68 |
| 1.16 (0.0457) | 31438-80X69 |
| 1.20 (0.0472) | 31438-80X70 |

*: Always check with the Parts Department for the latest parts information.

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE4F04B]

Bearing Retainer SEAL RING CLEARANCE

ECS009BW

| | | |
|--|-----------------|-------------------------------|
| Bearing retainer seal ring clearance mm (in) | Standard | 0.10 - 0.30 (0.0039 - 0.0118) |
| | Allowable limit | 0.30 (0.0118) |

Total End Play

ECS009BX

| | |
|------------------------|-------------------------------|
| Total end play mm (in) | 0.25 - 0.55 (0.0098 - 0.0217) |
|------------------------|-------------------------------|

BEARING RACE FOR ADJUSTING TOTAL END PLAY

| Thickness mm (in) | Part number* |
|-------------------|--------------|
| 0.8 (0.031) | 31435-80X00 |
| 1.0 (0.039) | 31435-80X01 |
| 1.2 (0.047) | 31435-80X02 |
| 1.4 (0.055) | 31435-80X03 |
| 1.6 (0.063) | 31435-80X04 |
| 1.8 (0.071) | 31435-80X05 |
| 2.0 (0.079) | 31435-80X06 |
| 0.9 (0.035) | 31435-80X09 |
| 1.1 (0.043) | 31435-80X10 |
| 1.3 (0.051) | 31435-80X11 |
| 1.5 (0.059) | 31435-80X12 |
| 1.7 (0.067) | 31435-80X13 |
| 1.9 (0.075) | 31435-80X14 |

*: Always check with the Parts Department for the latest parts information.

Reverse Clutch End Play

ECS009BY

| | |
|---------------------------------|-------------------------------|
| Reverse clutch end play mm (in) | 0.61 - 1.00 (0.0240 - 0.0394) |
|---------------------------------|-------------------------------|

THRUST WASHERS FOR ADJUSTING REVERSE CLUTCH DRUM END PLAY

| Thickness mm (in) | Part number* |
|-------------------|--------------|
| 0.80 (0.0315) | 31508-80X13 |
| 0.95 (0.0374) | 31508-80X14 |
| 1.10 (0.0433) | 31508-80X15 |
| 1.25 (0.0492) | 31508-80X16 |
| 1.40 (0.0551) | 31508-80X17 |
| 1.55 (0.0610) | 31508-80X18 |
| 1.70 (0.0669) | 31508-80X19 |
| 1.85 (0.0728) | 31508-80X20 |

*: Always check with the Parts Department for the latest parts information.

Removal and Installation

ECS009BZ

Unit: mm (in)

| | |
|--|-----------|
| Distance between end of converter housing and torque converter | 14 (0.55) |
|--|-----------|

Shift Solenoid Valves

ECS009C0

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

Solenoid Valves

ECS009C1

| Solenoid valves | Resistance (Approx.) Ω | Terminal No. |
|-------------------------------|------------------------|--------------|
| Shift solenoid valve A | 20 - 30 | 2 |
| Shift solenoid valve B | 5 - 20 | 1 |
| Overrun clutch solenoid valve | 20 - 30 | 3 |

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE4F04B]

| | | |
|--|---------|---|
| Line pressure solenoid valve | 2.5 - 5 | 4 |
| Torque converter clutch solenoid valve | 5 - 20 | 5 |

A/T Fluid Temperature Sensor

ECS009C2

Remarks: Specification data are reference values.

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

Revolution Sensor

ECS009C3

| Condition | Judgement standard |
|---|-------------------------|
| When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item. | 450 Hz (Approx.) |
| When vehicle parks. | Under 1.3V or over 4.5V |

Dropping Resistor

ECS009C4

| | |
|------------|-----------|
| Resistance | 10 - 15 Ω |
|------------|-----------|

Turbine Revolution Sensor (Power Train Revolution Sensor)

ECS009C5

| Condition | Judgement standard |
|---|-------------------------|
| When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 CAUTION: Connect the diagnosis data link cable to the vehicle diagnosis connector. *1: A circuit tester cannot be used to test this item. | 240 Hz (Approx.) |
| When vehicle parks. | Under 1.3V or over 4.5V |

INDEX FOR DTC

Alphabetical Index

NOTE:

If DTC U1000 is displayed with other DTCs, first perform the trouble diagnosis for DTC U1000. Refer to [AT-464](#).

| Items (CONSULT-II screen terms) | DTC | | Reference page |
|------------------------------------|---------------------|--|------------------------|
| | OBD-II | Except OBD-II | |
| | CONSULT-II GST*1 | CONSULT-II only "TRANSMIS- SION" | |
| A/T 1ST GR FNCTN | P0731 | P0731 | AT-496 |
| A/T 2ND GR FNCTN | P0732 | P0732 | AT-499 |
| A/T 3RD GR FNCTN | P0733 | P0733 | AT-505 |
| A/T 4TH GR FNCTN | P0734 | P0734 | AT-511 |
| A/T 5TH GR FNCTN | P0735 | P0735 | AT-516 |
| A/T TCC S/V FNCTN | P0744 | P0744 | AT-522 |
| ATF TEMP SEN/CIRC | P0710 | P0710 | AT-476 |
| CAN COMM CIRCUIT | U1000 | U1000 | AT-464 |
| ELEC TH CONTROL | — | P1726 | AT-590 |
| ENG SPD INP PERFOR | — | P0726 | AT-494 |
| FLUID TEMP SEN | P0711 | P0711 | AT-481 |
| MANUAL MODE SWITCH | — | P0826 | AT-579 |
| PC SOL A(L/PRESS) | P0745 | P0745 | AT-525 |
| PC SOL B(SFT/PRS) | P0775 | P0775 | AT-560 |
| PC SOL C(TCC&SFT) | P0795 | P0795 | AT-569 |
| PC SOL C STC ON | P0797 | P0797 | AT-574 |
| PNP SW/CIRC | P0705 | P0705 | AT-471 |
| SHIFT | P0780 | P0780 | AT-565 |
| SHIFT SOL A | P0750 | P0750 | AT-530 |
| SHIFT SOL B | P0755 | P0755 | AT-535 |
| SHIFT SOL C | P0760 | P0760 | AT-540 |
| SHIFT SOL D | P0765 | P0765 | AT-550 |
| SHIFT SOL E | P0770 | P0770 | AT-555 |
| SFT SOL C STUCK ON | P0762 | P0762 | AT-545 |
| TCM POWER INPT SIG | P0882 | P0882 | AT-585 |
| TCM PROCESSOR | — | P0613 | AT-469 |
| TURBINE SENSOR | P0717 | P0717 | AT-486 |
| VEH SPD SE/CIR-MTR | — | P0500 | AT-467 |
| VHCL SPEED SEN-A/T | P0722 | P0722 | AT-490 |

*1: These numbers are prescribed by SAE J2012.

INDEX FOR DTC

[RE5F22A]

ECS009C7

DTC No. Index

NOTE:

If DTC U1000 is displayed with other DTCs, first perform the trouble diagnosis for DTC U1000. Refer to [AT-464](#).

| 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-467 |
| — | P0613 | TCM PROCESSOR | AT-469 |
| P0705 | P0705 | PNP SW/CIRC | AT-471 |
| P0710 | P0710 | ATF TEMP SEN/CIRC | AT-476 |
| P0711 | P0711 | FLUID TEMP SEN | AT-481 |
| P0717 | P0717 | TURBINE SENSOR | AT-486 |
| P0722 | P0722 | VHCL SPEED SEN-A/T | AT-490 |
| — | P0726 | ENG SPD INP PERFOR | AT-494 |
| P0731 | P0731 | A/T 1ST GR FNCTN | AT-496 |
| P0732 | P0732 | A/T 2ND GR FNCTN | AT-499 |
| P0733 | P0733 | A/T 3RD GR FNCTN | AT-505 |
| P0734 | P0734 | A/T 4TH GR FNCTN | AT-511 |
| P0735 | P0735 | A/T 5TH GR FNCTN | AT-516 |
| P0744 | P0744 | A/T TCC S/V FNCTN | AT-522 |
| P0745 | P0745 | PC SOL A(L/PRESS) | AT-525 |
| P0750 | P0750 | SHIFT SOL A | AT-530 |
| P0755 | P0755 | SHIFT SOL B | AT-535 |
| P0760 | P0760 | SHIFT SOL C | AT-540 |
| P0762 | P0762 | SFT SOL C STUCK ON | AT-545 |
| P0765 | P0765 | SHIFT SOL D | AT-550 |
| P0770 | P0770 | SHIFT SOL E | AT-555 |
| P0775 | P0775 | PC SOL B(SFT/PRS) | AT-560 |
| P0780 | P0780 | SHIFT | AT-565 |
| P0795 | P0795 | PC SOL C(TCC&SFT) | AT-569 |
| P0797 | P0797 | PC SOL C STC ON | AT-574 |
| — | P0826 | MANUAL MODE SWITCH | AT-579 |
| P0882 | P0882 | TCM POWER INPT SIG | AT-585 |
| — | P1726 | ELEC TH CONTROL | AT-590 |
| U1000 | U1000 | CAN COMM CIRCUIT | AT-464 |

*1: These numbers are prescribed by SAE J2012.

PRECAUTIONS

PFP:00001

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

ECS009C8

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

ECS009C9

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

[RE5F22A]

ECS009CA

Precautions for A/T Assembly or TCM Replacement

- 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:

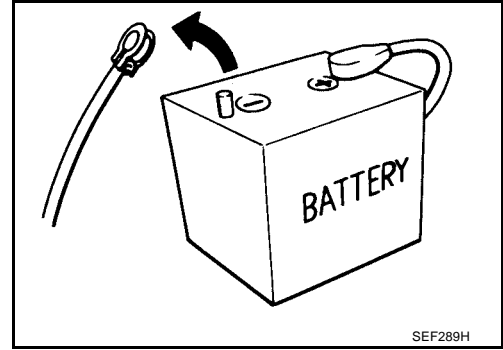
"Old one" is the TCM or A/T assembly that has been used on other vehicles.

METHOD FOR TCM INITIALIZATION

1. Perform "CONSULT-II SETTING PROCEDURE". Refer to [AT-455, "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.

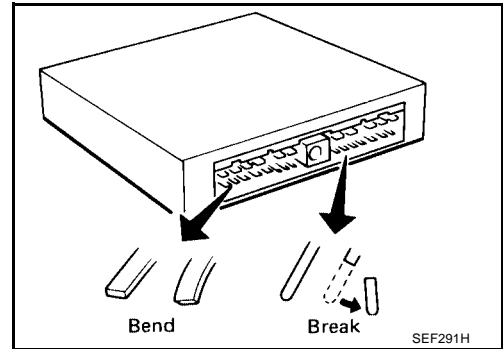
Precautions

- 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”.



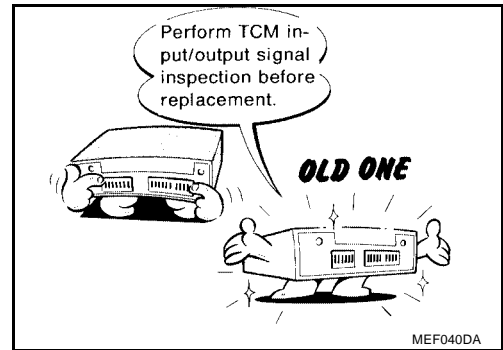
SEF289H

- 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.



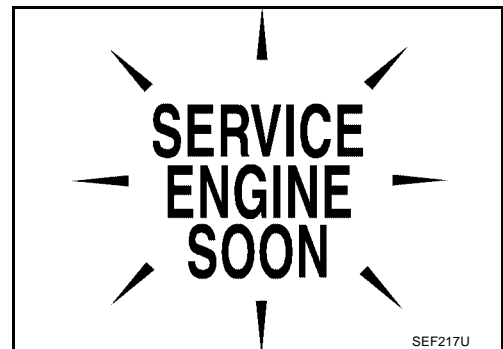
SEF291H

- Before replacing TCM, perform TCM input/output signal inspection and make sure whether TCM functions properly or not. [AT-453, "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-12, "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.

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PRECAUTIONS

[RE5F22A]

- 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-396, "Changing A/T Fluid"](#) , [AT-396, "Checking A/T Fluid"](#) .

Service Notice or Precautions

ECS009CC

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 Bullitens for latest A/T oil cooler cleaning procedure. For radiator replacement, refer to [CO-11, "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-456, "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-422, "HOW TO ERASE DTC"](#) to complete the repair and avoid unnecessary blinking of the MIL.
- For details of OBD-II, refer to [EC-668, "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-66, "HARNESS CONNECTOR"](#) .**

Wiring Diagrams and Trouble Diagnosis

ECS009CD

When you read wiring diagrams, refer to the following:

- [GI-14, "How to Read Wiring Diagrams"](#).
- [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#) for power distribution circuit.

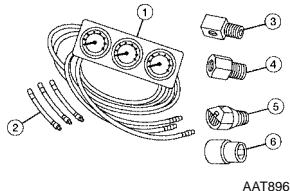
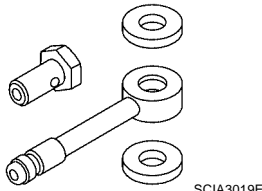
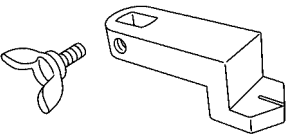
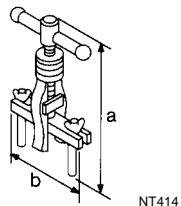
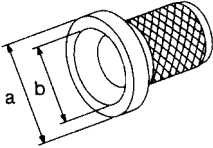
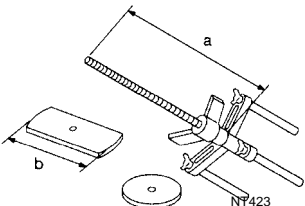
When you perform trouble diagnosis, refer to the following:

- [GI-9, "How to Follow Trouble Diagnoses"](#).
- [GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident"](#).

PREPARATION

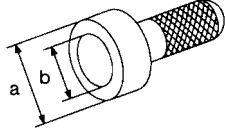
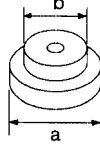
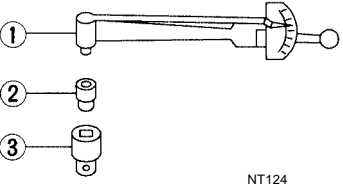
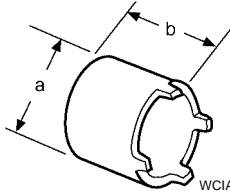
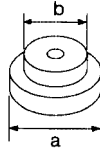
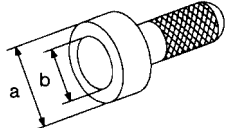
Special Service Tools

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 | Measuring line pressure  |
| KV311J0010 (J-45542) Adapter | Measuring line pressure  |
| KV991J0060 (J-45404) Alignment tool | Adjusting park/neutral position (PNP) switch  |
| ST33290001 (J-34286) Puller | <ul style="list-style-type: none"> ● Removing oil pump assembly ● Removing thrust roller bearing a: 250 mm (9.84 in) b: 160 mm (6.30in)  |
| ST33400001 (J-26082) Drift | Installing differential side oil seals a: 60 mm (2.36 in) dia. b: 74 mm (1.85 in) dia.  |
| 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)  |

PREPARATION

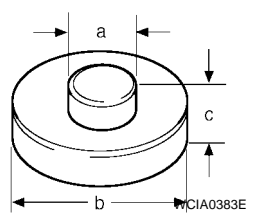
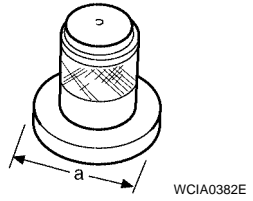
[RE5F22A]

| Tool number (Kent-Moore No.) Tool name | Description | |
|--|--|---------------------|
| ST30720000 (J-25405) Drift |  <p style="text-align: center;">NT115</p> | A B AT |
| ST30612000 (J-25742-2) Drift |  <p style="text-align: center;">NT073</p> | D E |
| ST3127S000 (J-25765-A) Preload gauge 1 GG91030000 (J-25765-A) Torque wrench 2 HT62940000 (—) Socket adapter 3 HT62900000 (—) Socket adapter |  <p style="text-align: center;">NT124</p> | F G H |
| KV40102500 (J-28815) Drift |  <p style="text-align: center;">WCIA0381E</p> | I J K |
| ST33061000 (J-8107-2) Drift |  <p style="text-align: center;">NT073</p> | L M |
| KV38100500 (—) Drift |  <p style="text-align: center;">NT115</p> | A B AT |

PREPARATION

[RE5F22A]

| Tool number (Kent-Moore No.) Tool name | Description |
|--|---|
| KV40100621 (J-25273) Drift | Installing outer race and adjust shim a: 76 mm (2.992 in) dia. |
| ST30022000 (—) Drift | Installing outer race and adjust shim a: 56 mm (2.205 in) dia. b: 110 mm (4.331 in) dia. c: 15 mm (0.591 in) dia. |

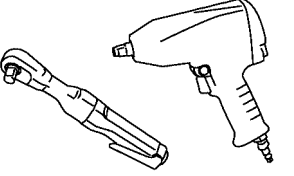
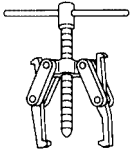
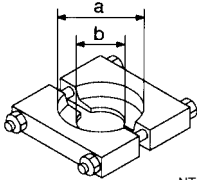


PREPARATION

[RE5F22A]

Commercial Service Tools

ECS009CF

| Tool name | Description |
|--|--|
| Power tool  <p>PBIC0190E</p> | Loosening bolts and nuts |
| Puller  <p>NT077</p> | Removing tapered roller bearing |
| Puller  <p>NT411</p> | Removing tapered roller bearings a: 60 mm (2.36 in) dia. b: 35 mm (1.38 in) dia. |

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A/T FLUID

PFK:KLE40

Changing A/T Fluid

ECS009CG

Refer to [MA-31, "Changing A/T Fluid"](#) .

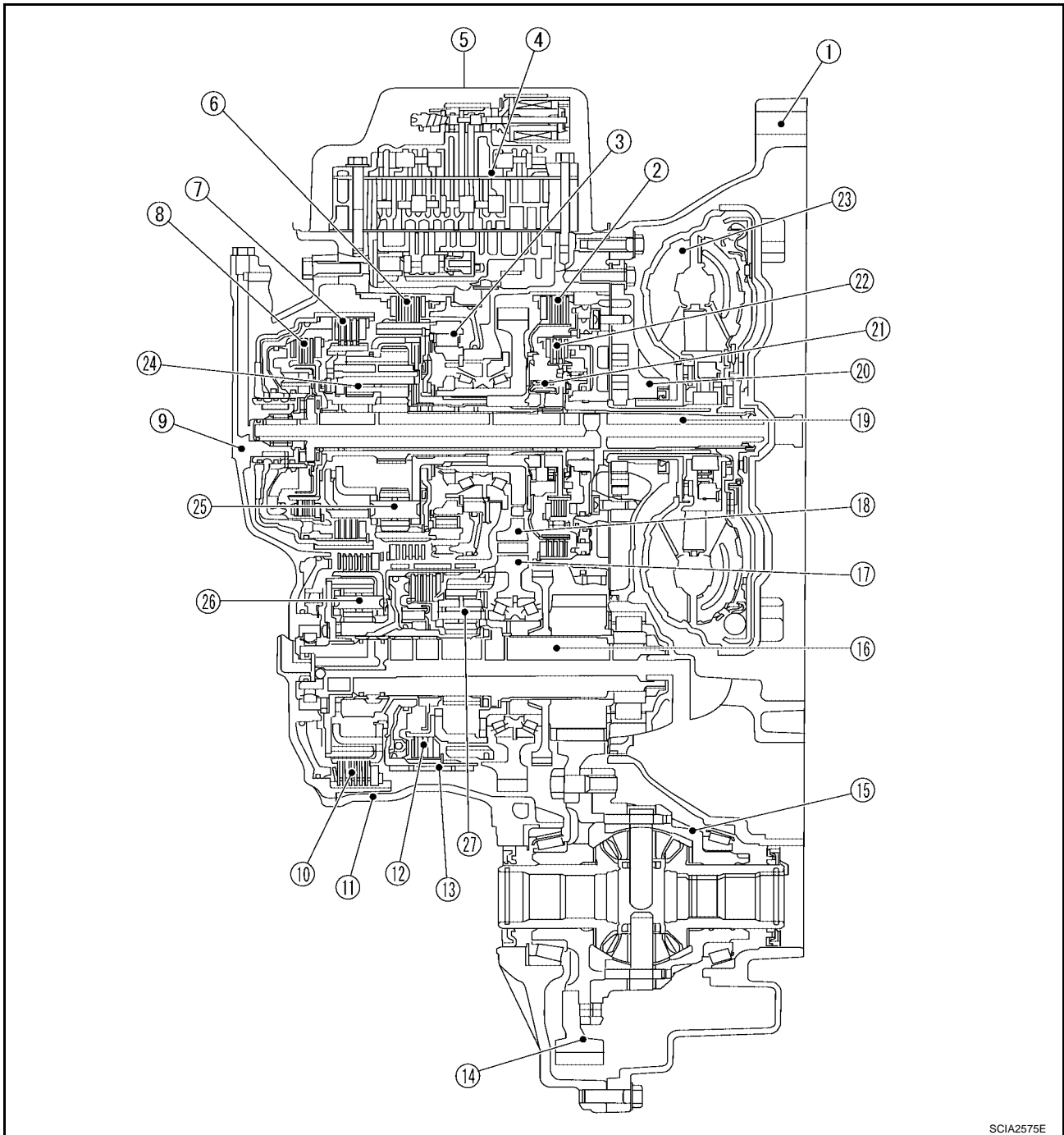
Checking A/T Fluid

ECS009CH

Refer to [MA-30, "Checking A/T Fluid"](#) .

A/T CONTROL SYSTEM

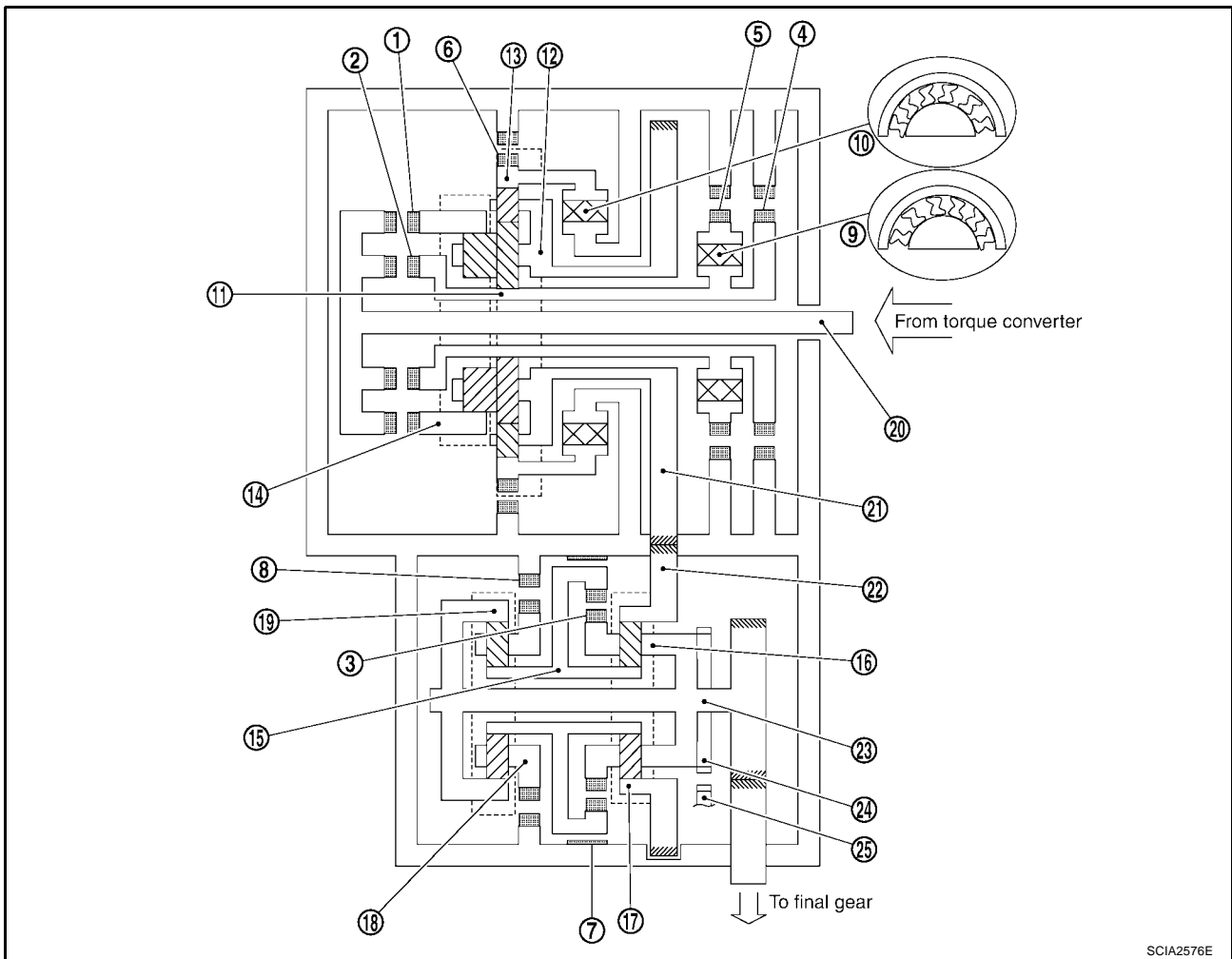
Cross-Sectional View



- | | | |
|-------------------------------|-----------------------------|------------------------------|
| 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 |

SCIA2575E

Shift Mechanism CONSTRUCTION



SCIA2576E

- | | | |
|---------------------------------|-----------------------------|--------------------------------|
| 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 | | |

A/T CONTROL SYSTEM

[RE5F22A]

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 | ○ | △ | ○ | △ | ○ | | | △ | | |
| 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-418, "MANUAL MODE"](#)

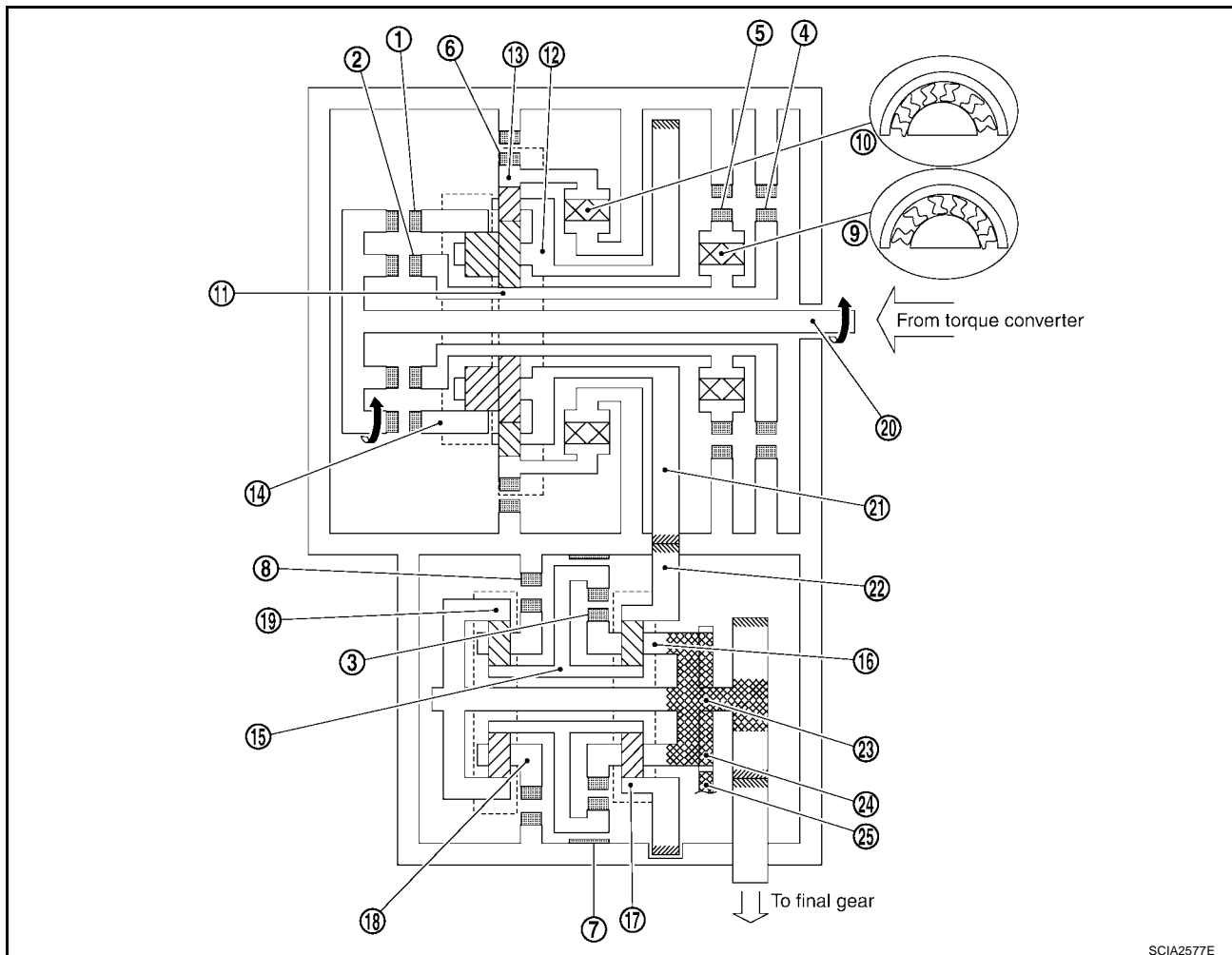
POWER TRANSMISSION

“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.



SCIA2577E

- | | | |
|---------------------------------|-----------------------------|--------------------------------|
| 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 | | |

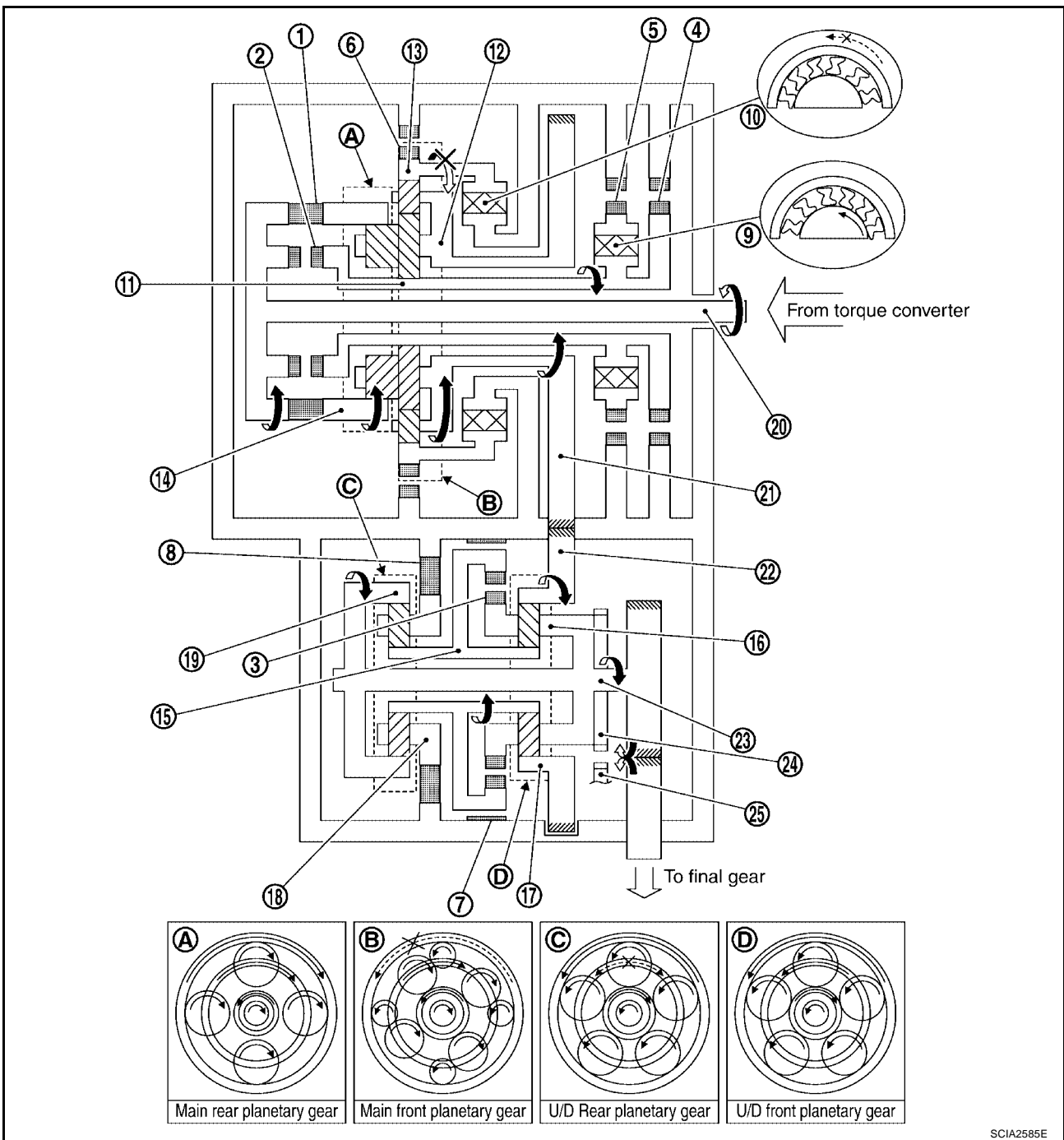
“D” position 1st gear

- | | |
|--|-----------|
| 1. Input shaft rotates clockwise. | A |
| 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. | B |
| 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. | AT |
| 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. | D |
| 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. | E |
| 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. | F |
| 16. B5 brake operate. (Lock rotation of U/D rear planetary carrier.) | |
| 17. U/D rear internal gear rotates counterclockwise. | G |
| 18. U/D front planetary carrier and output shaft rotates counterclockwise for U/D rear internal gear and one. | |
| 19. Final gear clockwise. | |
| <ul style="list-style-type: none"> ● 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. | H |

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L
M

A/T CONTROL SYSTEM

[RE5F22A]



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. | A |
| 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. | B |
| 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. | AT |
| 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. | D |
| 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. | E |
| 13. U/D front planetary pinion gear rotates itself counterclockwise. | |
| 14. U/D sun gear rotates clockwise. | F |
| 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. | G |
| 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. | H |

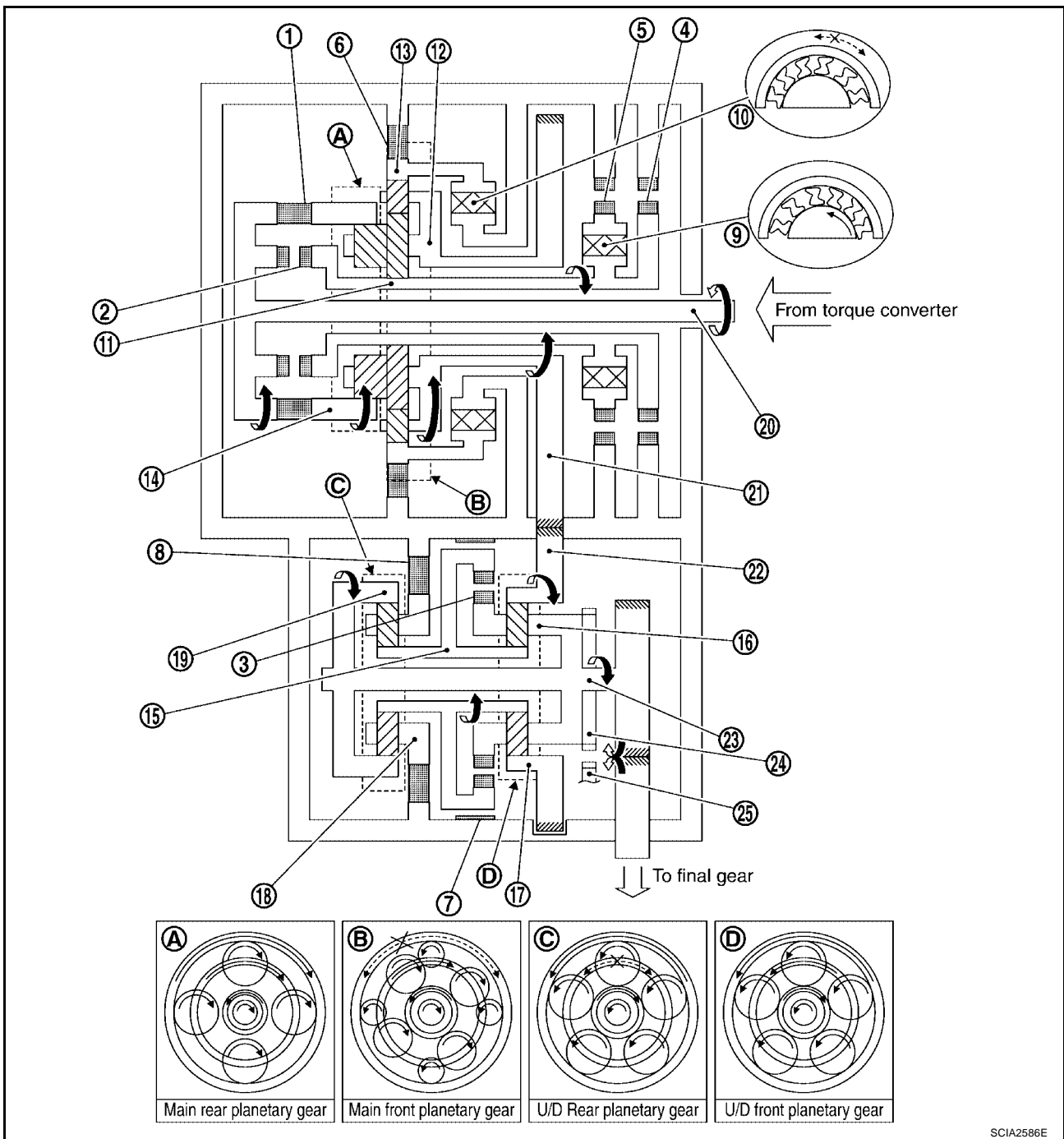
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SCIA2586E

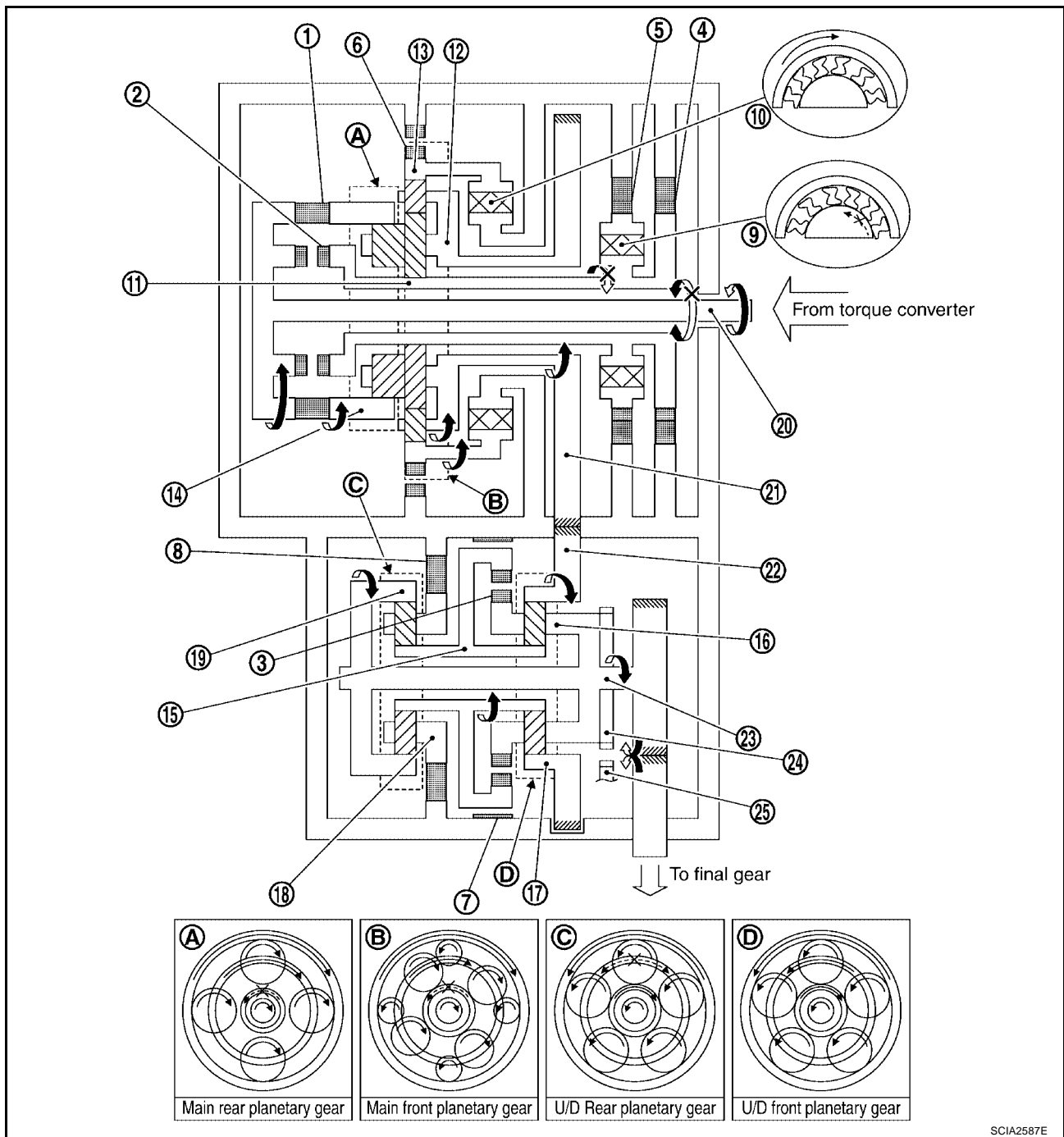
- | | | |
|---------------------------------|-----------------------------|--------------------------------|
| 1. Forward clutch | 2. Direct clutch | 3. U/D clutch |
| 4. 2nd coast brake | 5. 2nd brake | 6. 1st and reverse brake |
| 7. U/D brake | 8. B5 brake | 9. One-way clutch No. 1 |
| 10. One-way 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

- | | |
|---|--|
| <ol style="list-style-type: none"> 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. | <p>A</p> <p>B</p> <p style="background-color: black; color: white; padding: 2px;">AT</p> <p>D</p> <p>E</p> <p>F</p> <p>G</p> <p>H</p> <p>I</p> <p>J</p> <p>K</p> <p>L</p> <p>M</p> |
|---|--|

A/T CONTROL SYSTEM

[RE5F22A]



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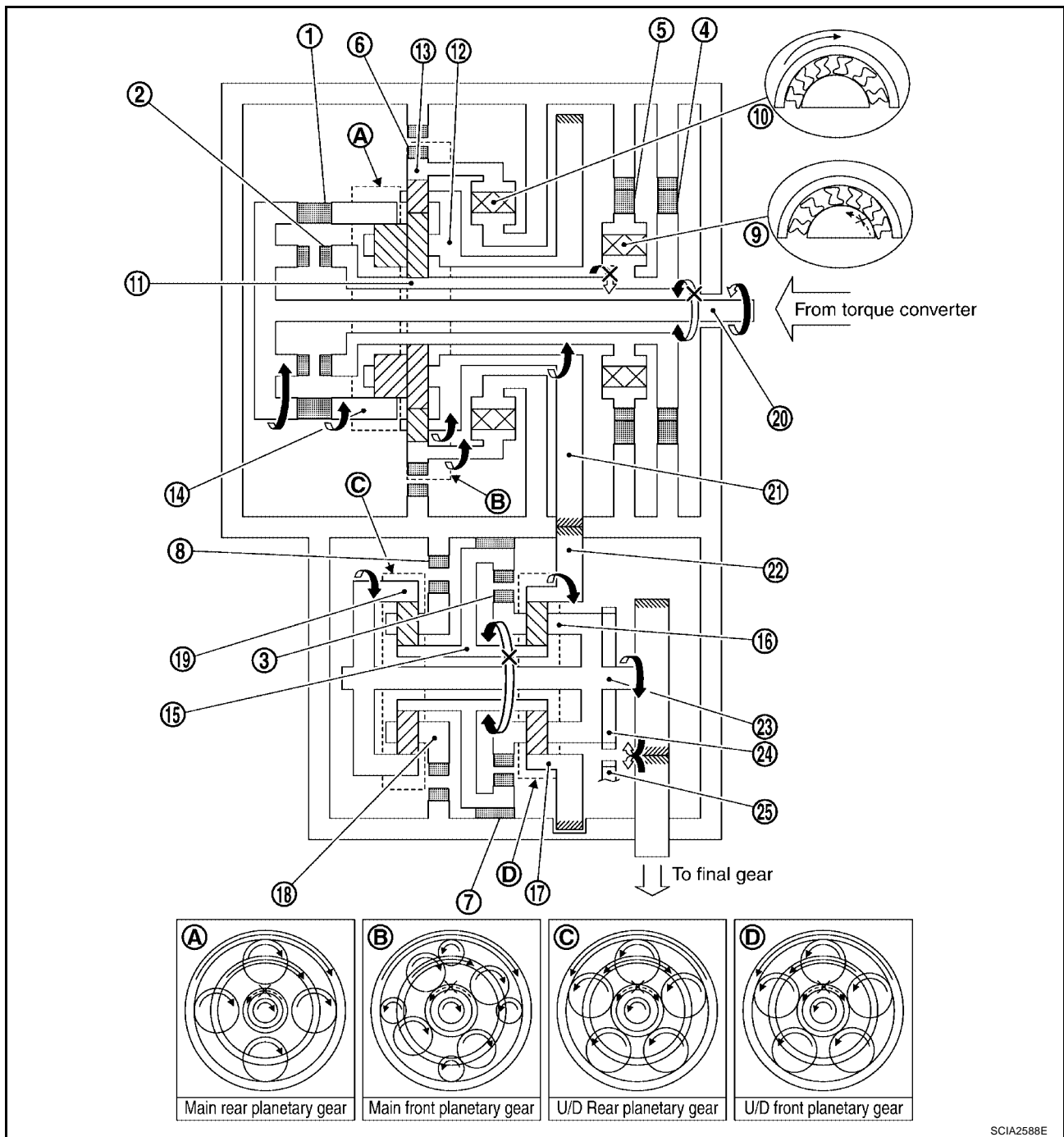
- | | | |
|---------------------------------|-----------------------------|--------------------------------|
| 1. Forward clutch | 2. Direct clutch | 3. U/D clutch |
| 4. 2nd coast brake | 5. 2nd brake | 6. 1st and reverse brake |
| 7. U/D brake | 8. B5 brake | 9. One-way clutch No. 1 |
| 10. One-way 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

- | | |
|--|--|
| <ol style="list-style-type: none"> 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. <ul style="list-style-type: none"> ● During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates. | <p>A</p> <p>B</p> <p style="background-color: black; color: white; padding: 2px;">AT</p> <p>D</p> <p>E</p> <p>F</p> <p>G</p> <p>H</p> <p>I</p> <p>J</p> <p>K</p> <p>L</p> <p>M</p> |
|--|--|

A/T CONTROL SYSTEM

[RE5F22A]



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 | | |

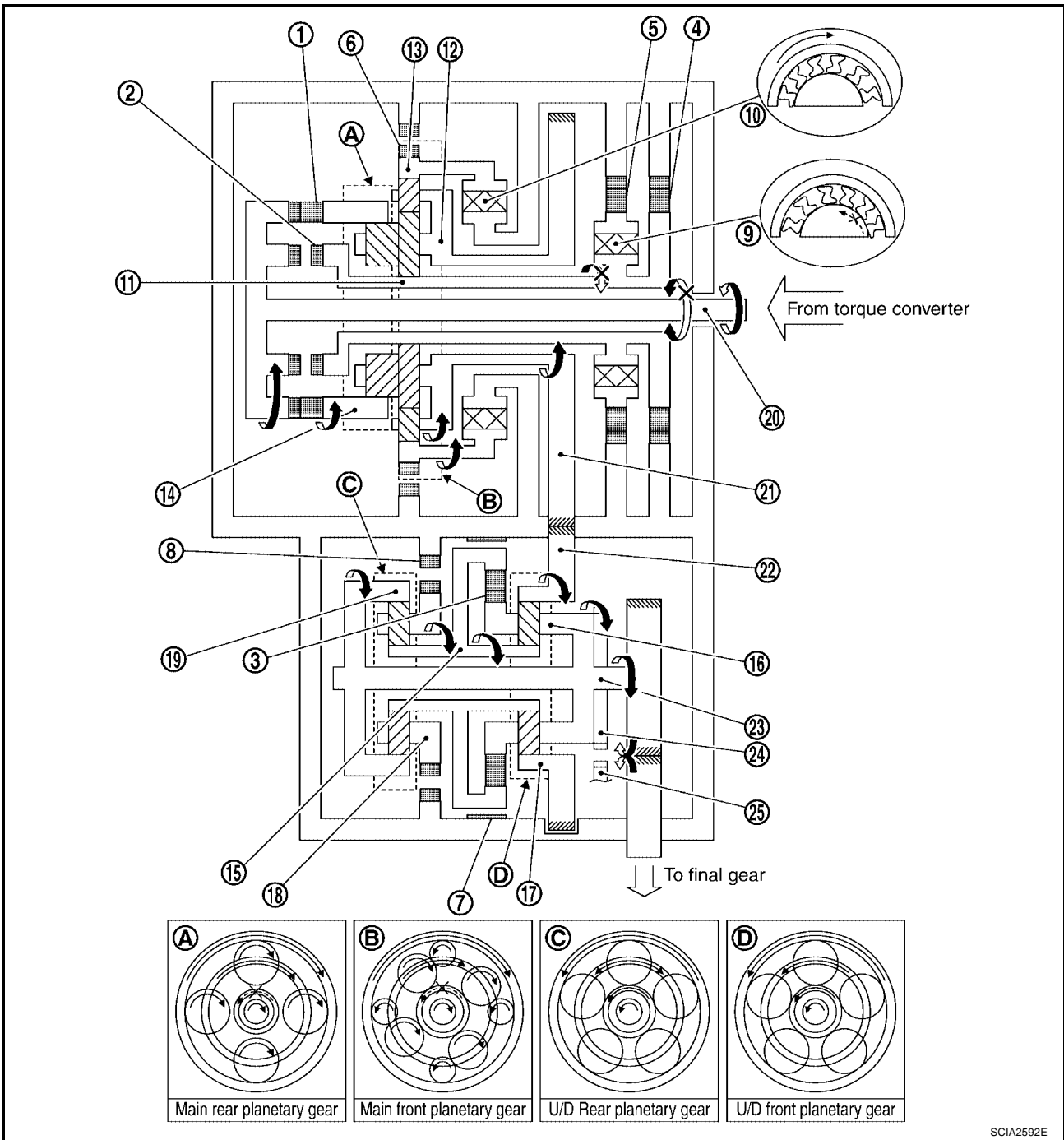
“D”, “M4” positions 4th gear

- 1. Input shaft rotates clockwise. A
- 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. B
- 5. Main front large planetary pinion gear rotates itself clockwise for rear planetary pinion and one.
- 6. 2nd brake and 2nd coast brake operates. AT
- 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. D
- 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.) E
- 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. F
- 15. Final gear clockwise. G
- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates. H

A
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AT
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A/T CONTROL SYSTEM

[RE5F22A]



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. A
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. B
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. AT
7. Counter driven gear rotates counterclockwise.
8. U/D front internal gear rotates counterclockwise for counter driven gear and one. D
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. E
12. Final gear clockwise.
- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates. F

G

H

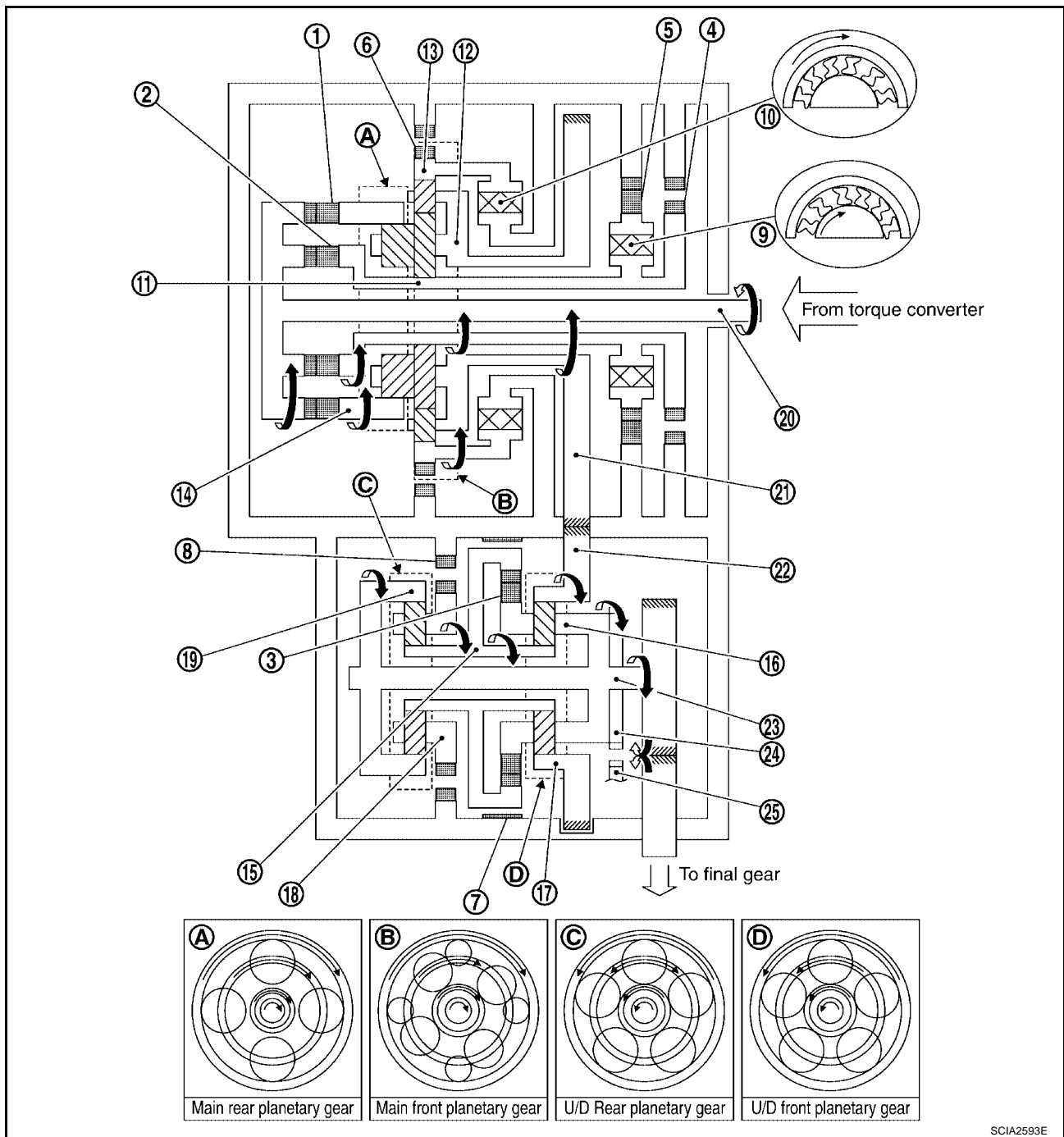
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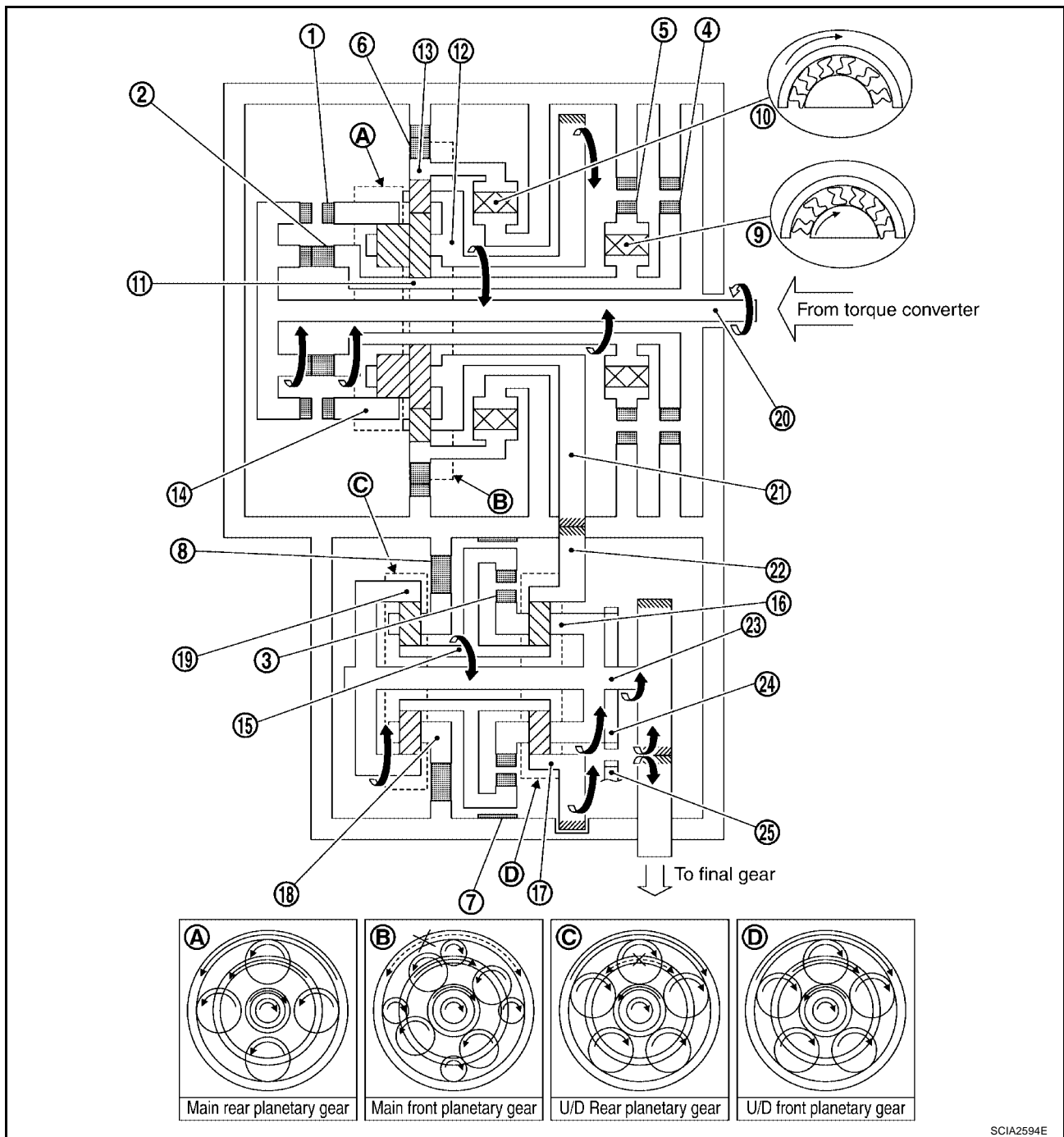
- | | | |
|---------------------------------|-----------------------------|--------------------------------|
| 1. Forward clutch | 2. Direct clutch | 3. U/D clutch |
| 4. 2nd coast brake | 5. 2nd brake | 6. 1st and reverse brake |
| 7. U/D brake | 8. B5 brake | 9. One-way clutch No. 1 |
| 10. One-way 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. | A |
| 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. | B |
| 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. | AT |
| 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. | D |
| 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. | E |
| 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. | F |
| 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. | G |
| 18. Final gear counterclockwise. | |
| ● During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates. | H |

A/T CONTROL SYSTEM

[RE5F22A]



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

The function of the TCM is to:

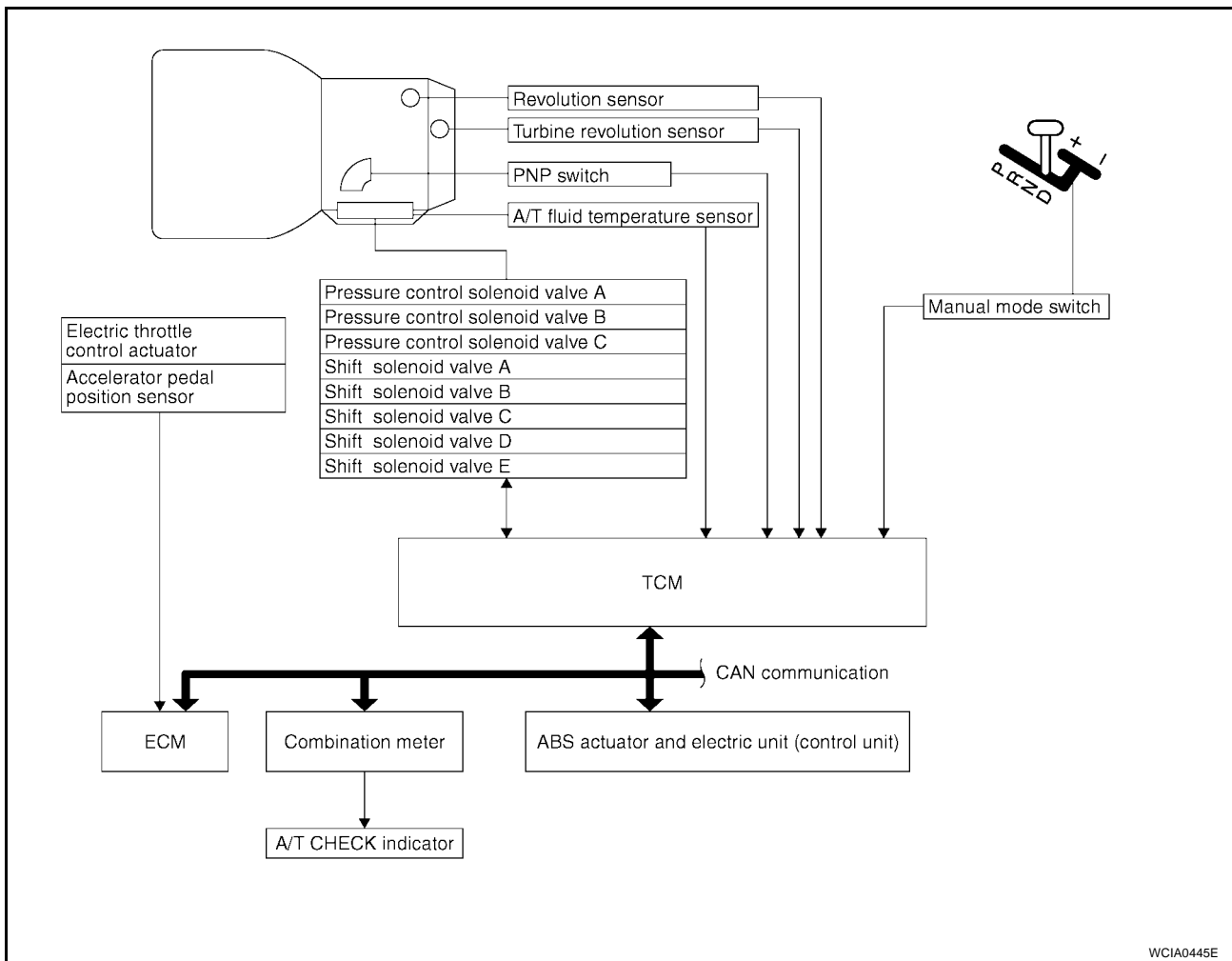
- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids.

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



WCIA0445E

Input/Output Signal of TCM

| 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 SYSTEM DESCRIPTION

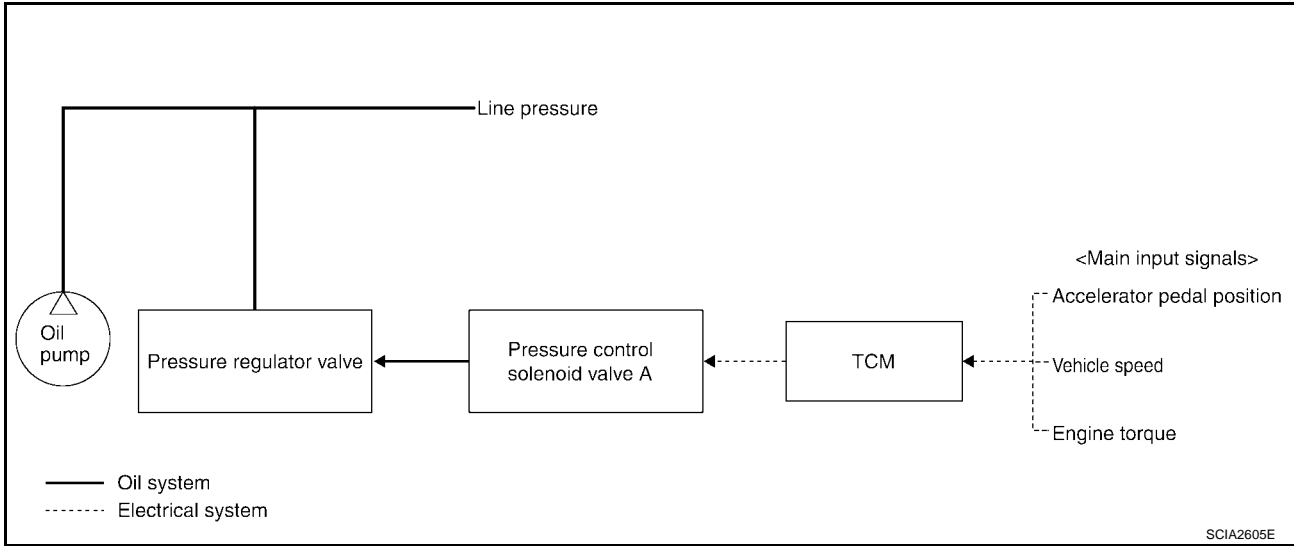
CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information 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-21, "CAN COMMUNICATION"](#).

ECS009CN

Line Pressure Control

- 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.



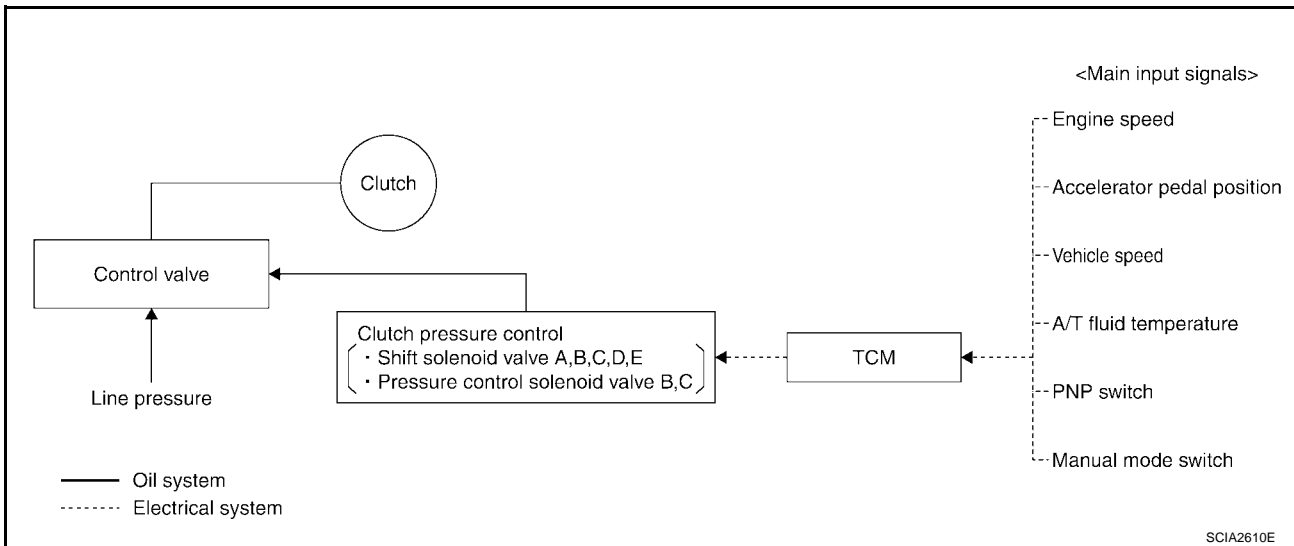
LINE PRESSURE CONTROL IS BASED ON THE TCM LINE PRESSURE CHARACTERISTIC PATTERN

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

ECS009CO

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 ↔ 2 ↔ 3 ↔ 4 ↔ 5.

If accelerator pedal is depressed rapidly, this control establishes the upper limit value of engine torque and avoids engine flare at 2 ↔ 3, 3 ↔ 4 and 4 ⇒ 2 of clutch to clutch shift.

Lock-Up Control

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

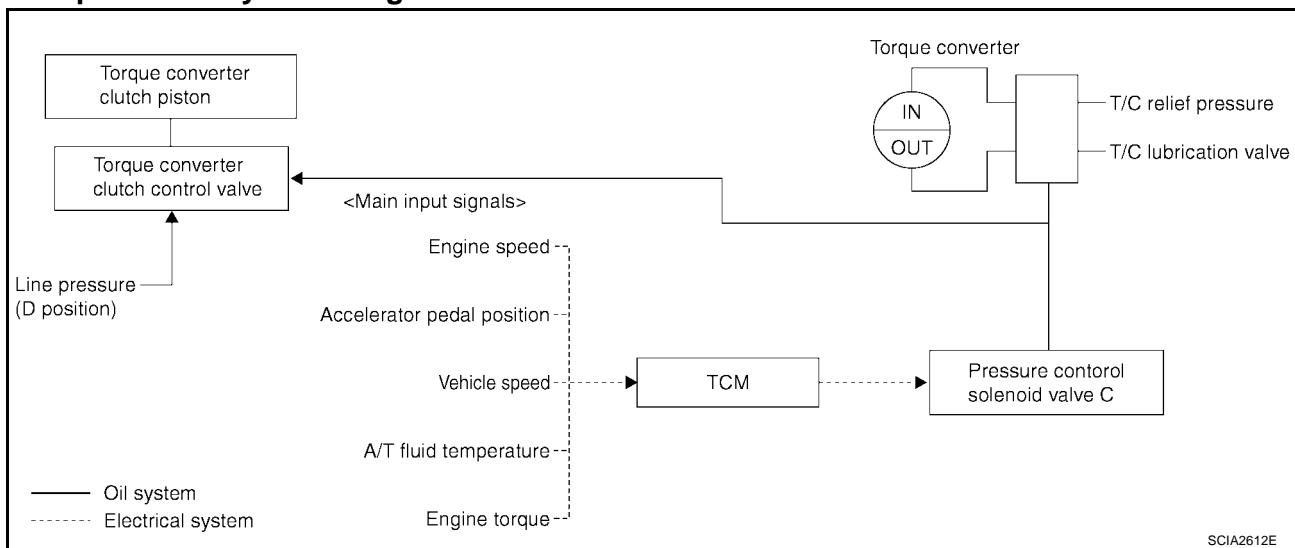
The torque converter clutch control valve operation is controlled by the pressure control solenoid valve C, which is controlled by a signal from TCM, and the torque converter clutch control valve engages or releases the torque converter clutch piston.

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

ECS009CQ

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-456. "SELF-DIAG RESULT MODE"](#).

OBD-II Function for A/T System

ECS009CR

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

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

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

ECS009CS

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) HOW TO READ DTC AND 1ST TRIP DTC

ECS009CT

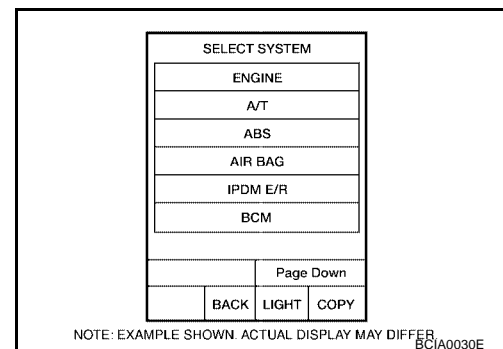
DTC and 1st trip DTC can be read by the following methods.

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



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-674, "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.**

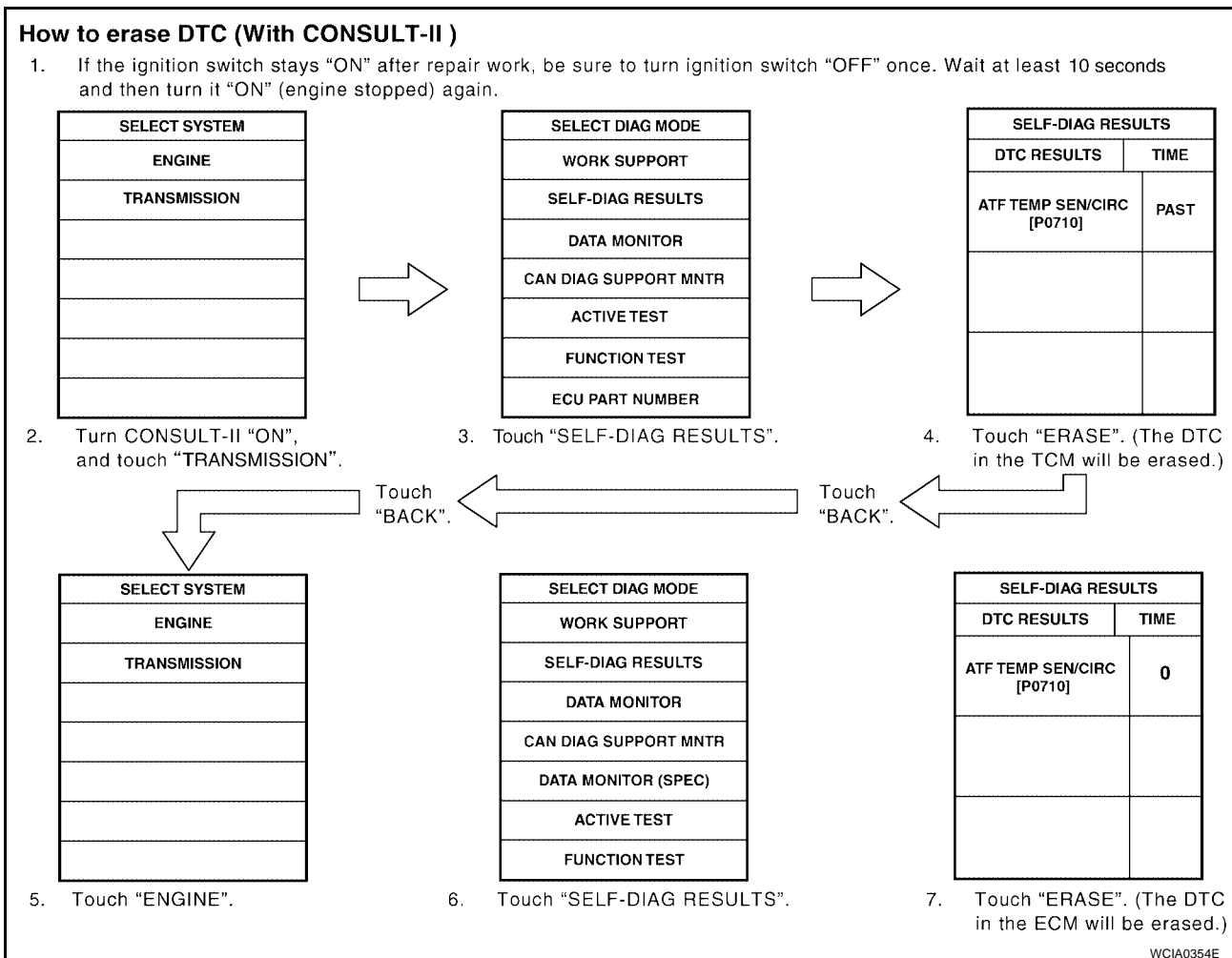
The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to [EC-669, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS"](#).

- **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 "TRANSMISSION".
 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 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-463. "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-763. "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-463, "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-682, "How to Erase DTC"](#) .

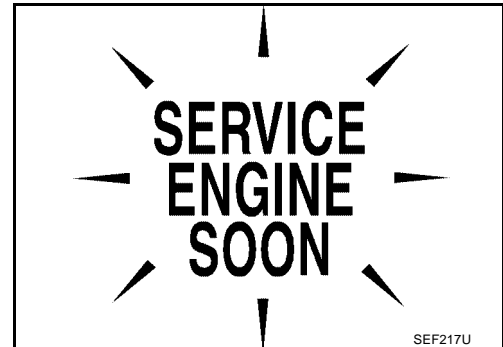
Malfunction Indicator Lamp (MIL)

ECS009CU

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-30, "WARNING LAMPS"](#) , or see [EC-685, "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

ECS009CV

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-464](#).

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

Fail-Safe

ECS009CW

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-429](#)).

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. |

TROUBLE DIAGNOSIS

[RE5F22A]

| DTC | Malfunction items | Fail-safe* |
|-------|--|--|
| P0750 | Shift solenoid valve A | Any one of fail-safe modes <ul style="list-style-type: none"> ● 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 <ul style="list-style-type: none"> ● Fail-safe mode 1 ● Fail-safe mode 8 |
| P0760 | Shift solenoid valve C | Any one of fail-safe modes <ul style="list-style-type: none"> ● 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 <ul style="list-style-type: none"> ● 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 <ul style="list-style-type: none"> ● 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 | <ul style="list-style-type: none"> ● 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 <ul style="list-style-type: none"> ● 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-426. "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) | | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| | Manual mode: - (down shift) | 2nd | OFF | OFF | ON | OFF | OFF | OFF | OFF | OFF |
| | R position | Reverse | OFF | OFF | OFF | OFF | ON | OFF | OFF | OFF |

TROUBLE DIAGNOSIS

[RE5F22A]

| 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) | | OFF | OFF | ON | OFF | OFF | OFF | OFF | OFF |
| | 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) | | OFF | OFF | ON | OFF | ON | OFF | OFF | OFF |
| | 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) | | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| | 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) | | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| | 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) | | OFF | OFF | ON | OFF | OFF | OFF | OFF | OFF |
| | 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) | | ON | OFF | ON | OFF | OFF | OFF | OFF | OFF |
| | 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) | | OFF | ON | ON | OFF | OFF | OFF | OFF | OFF |
| | 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) | | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF |
| | 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) | | OFF | OFF | ON | ON | OFF | OFF | OFF | OFF |
| | 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)

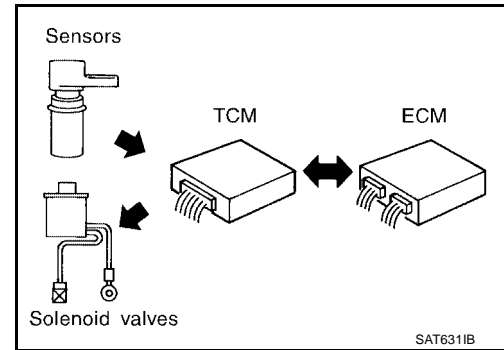
How To Perform Trouble Diagnosis For Quick and Accurate Repair

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.

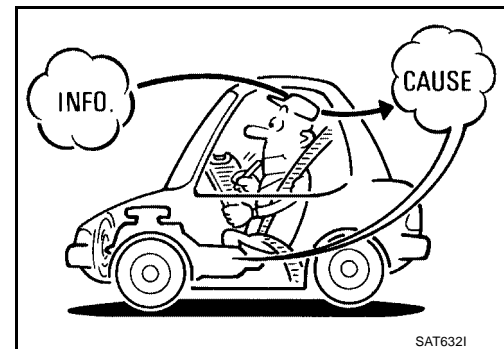
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.

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.

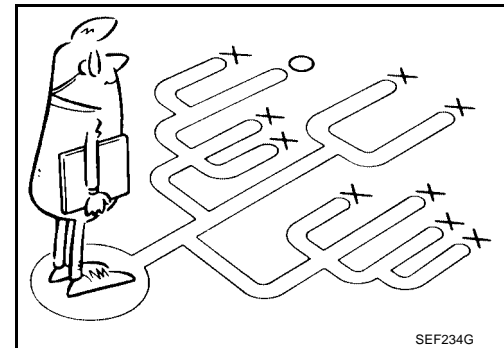
A visual check only may not find the cause of the errors. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the [AT-429, "WORK FLOW"](#).



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-430](#)) should be used.

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

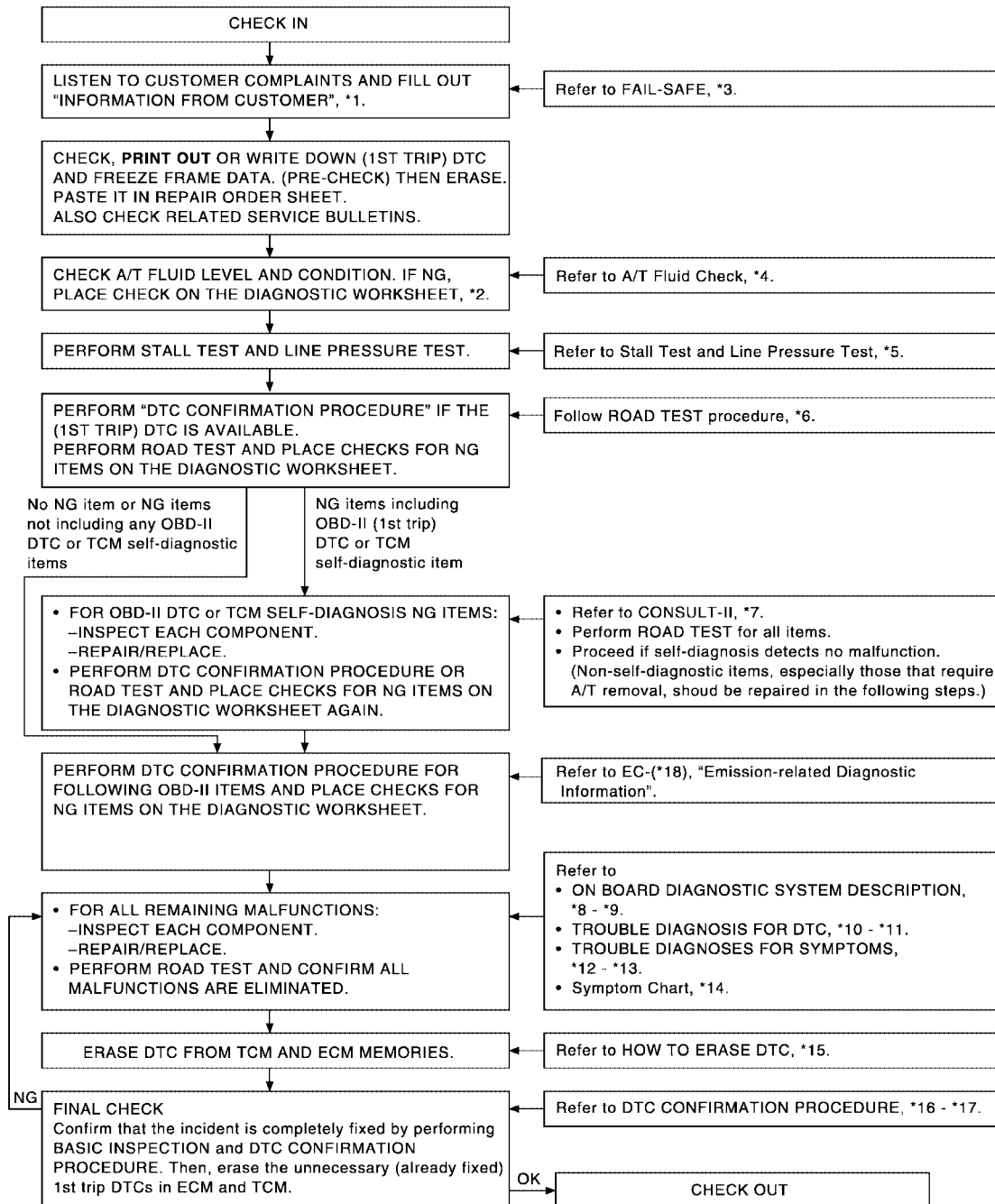
Also check related Service bulletins.



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-430](#)) and "Diagnostic Worksheet" (Refer to [AT-430](#)), to perform the best troubleshooting possible.

Work Flow Chart



- | | | |
|-----------------------------|------------------------------------|-----------------------------|
| *1. AT-430 | *2. AT-430 | *3. AT-425 |
| *4. AT-435 | *5. AT-435, AT-437 | *6. AT-438 |
| *7. AT-455 | *8. AT-421 | *9. AT-424 |
| *10. AT-464 | *11. AT-590 | *12. AT-591 |
| *13. AT-610 | *14. AT-445 | *15. AT-422 |
| *16. AT-464 | *17. AT-590 | *18. EC-669 |

SCIA0501E

TROUBLE DIAGNOSIS

[RE5F22A]

DIAGNOSTIC WORKSHEET

Information From Customer

KEY POINTS

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

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

Diagnostic Worksheet Chart

| | | | | | | |
|---|---|---|--|---|--|---|
| 1 | <input type="checkbox"/> Read the item on cautions concerning fail-safe and understand the customer's complaint. | AT-425 | | | | |
| 2 | <input type="checkbox"/> A/T fluid inspection <input type="checkbox"/> Leak (Repair leak location.) <input type="checkbox"/> State <input type="checkbox"/> Amount | AT-435 | | | | |
| 3 | <input type="checkbox"/> Stall test, time lag test and line pressure test <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <input type="checkbox"/> Stall test <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding: 2px;"> <input type="checkbox"/> Engine <input type="checkbox"/> Torque converter one-way clutch <input type="checkbox"/> Line pressure is low <input type="checkbox"/> Forward clutch <input type="checkbox"/> Direct clutch <input type="checkbox"/> 1st and reverse brake </td> <td style="width: 50%; padding: 2px;"> <input type="checkbox"/> B5 brake <input type="checkbox"/> One-way clutch No. 2 <input type="checkbox"/> Oil pump <input type="checkbox"/> Oil strainer <input type="checkbox"/> Oil leak for each range circuit </td> </tr> </table> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <input type="checkbox"/> Time lag test <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding: 2px;"> <input type="checkbox"/> Line pressure is low <input type="checkbox"/> Forward clutch <input type="checkbox"/> Direct clutch <input type="checkbox"/> 1st and reverse brake <input type="checkbox"/> One-way clutch No. 2 </td> <td style="width: 50%; padding: 2px;"> <input type="checkbox"/> Oil pump <input type="checkbox"/> Oil strainer <input type="checkbox"/> Oil leak for "D" position circuit <input type="checkbox"/> Oil leak for "R" position circuit </td> </tr> </table> </div> <input type="checkbox"/> Line pressure inspection - Suspected part: | <input type="checkbox"/> Engine <input type="checkbox"/> Torque converter one-way clutch <input type="checkbox"/> Line pressure is low <input type="checkbox"/> Forward clutch <input type="checkbox"/> Direct clutch <input type="checkbox"/> 1st and reverse brake | <input type="checkbox"/> B5 brake <input type="checkbox"/> One-way clutch No. 2 <input type="checkbox"/> Oil pump <input type="checkbox"/> Oil strainer <input type="checkbox"/> Oil leak for each range circuit | <input type="checkbox"/> Line pressure is low <input type="checkbox"/> Forward clutch <input type="checkbox"/> Direct clutch <input type="checkbox"/> 1st and reverse brake <input type="checkbox"/> One-way clutch No. 2 | <input type="checkbox"/> Oil pump <input type="checkbox"/> Oil strainer <input type="checkbox"/> Oil leak for "D" position circuit <input type="checkbox"/> Oil leak for "R" position circuit | AT-435 , AT-437 |
| <input type="checkbox"/> Engine <input type="checkbox"/> Torque converter one-way clutch <input type="checkbox"/> Line pressure is low <input type="checkbox"/> Forward clutch <input type="checkbox"/> Direct clutch <input type="checkbox"/> 1st and reverse brake | <input type="checkbox"/> B5 brake <input type="checkbox"/> One-way clutch No. 2 <input type="checkbox"/> Oil pump <input type="checkbox"/> Oil strainer <input type="checkbox"/> Oil leak for each range circuit | | | | | |
| <input type="checkbox"/> Line pressure is low <input type="checkbox"/> Forward clutch <input type="checkbox"/> Direct clutch <input type="checkbox"/> 1st and reverse brake <input type="checkbox"/> One-way clutch No. 2 | <input type="checkbox"/> Oil pump <input type="checkbox"/> Oil strainer <input type="checkbox"/> Oil leak for "D" position circuit <input type="checkbox"/> Oil leak for "R" position circuit | | | | | |

TROUBLE DIAGNOSIS

[RE5F22A]

| | | | |
|------|---|------------------------|----|
| | <input type="checkbox"/> Perform all road tests and enter checks in required inspection items. | AT-438 | A |
| 4 | Check before engine is started | | |
| | <input type="checkbox"/> The A/T CHECK Indicator Lamp does come on. AT-591 . <input type="checkbox"/> Perform self-diagnostics. Enter checks for detected items. | AT-439 | B |
| | <input type="checkbox"/> Vehicle speed sensor-MTR. AT-467 . <input type="checkbox"/> TCM processor. AT-469 . <input type="checkbox"/> PNP switch. AT-471 . <input type="checkbox"/> A/T fluid temperature sensor circuit. AT-476 . <input type="checkbox"/> A/T fluid temperature sensor performance. AT-481 . <input type="checkbox"/> Turbine revolution sensor circuit. AT-486 . <input type="checkbox"/> Vehicle speed sensor-A/T (revolution sensor) circuit. AT-490 . <input type="checkbox"/> Engine speed input circuit performance. AT-494 . <input type="checkbox"/> 1st gear function. AT-496 . <input type="checkbox"/> 2nd gear function. AT-499 . <input type="checkbox"/> 3rd gear function. AT-505 . <input type="checkbox"/> 4th gear function. AT-511 . <input type="checkbox"/> 5th gear function. AT-516 . <input type="checkbox"/> Lock-up function. AT-522 . <input type="checkbox"/> Shift function. AT-565 . <input type="checkbox"/> Pressure control solenoid valve A. AT-525 . <input type="checkbox"/> Pressure control solenoid valve B. AT-560 . <input type="checkbox"/> Pressure control solenoid valve C. AT-569 . <input type="checkbox"/> Shift solenoid valve A. AT-530 . <input type="checkbox"/> Shift solenoid valve B. AT-535 . <input type="checkbox"/> Shift solenoid valve C. AT-540 . <input type="checkbox"/> Shift solenoid valve D. AT-550 . <input type="checkbox"/> Shift solenoid valve E. AT-555 . <input type="checkbox"/> Pressure control solenoid valve C stuck ON. AT-574 . <input type="checkbox"/> Shift solenoid valve C stuck ON. AT-545 . <input type="checkbox"/> Manual mode switch circuit. AT-579 . <input type="checkbox"/> TCM power input signal. AT-585 . <input type="checkbox"/> Electric throttle control system. AT-590 . <input type="checkbox"/> CAN communication. AT-464 . <input type="checkbox"/> Battery <input type="checkbox"/> Other | | AT |
| 4-1. | | | D |
| 4-2. | Idle inspection <input type="checkbox"/> Engine Cannot Be Started in "P" and "N" Position. AT-593 . <input type="checkbox"/> In " P" Position, Vehicle Moves When Pushed. AT-593 . <input type="checkbox"/> In "N" Position Vehicle Moves. AT-594 . <input type="checkbox"/> Large Shock "N" to "D" Position. AT-595 . <input type="checkbox"/> Vehicle Does Not Creep Backward In "R" Position. AT-596 . <input type="checkbox"/> Vehicle does Not Creep Forward In "D" Position. AT-597 . | AT-439 | K |
| 4-3. | Driving tests Part 1 <input type="checkbox"/> Vehicle Cannot Be Started From D1. AT-598 . <input type="checkbox"/> A/T Does Not Shift: D1 → D2. AT-598 . <input type="checkbox"/> A/T Does Not Shift: D2 → D3. AT-599 . <input type="checkbox"/> A/T Does Not Shift: D3 → D4. AT-600 . <input type="checkbox"/> A/T Does Not Shift: D4 → D5. AT-601 . <input type="checkbox"/> A/T Does Not Perform Lock-up. AT-602 . <input type="checkbox"/> A/T Does Not Hold Lock-up Condition. AT-603 . <input type="checkbox"/> Lock-up Is Not Released. AT-604 . | AT-441 | L |
| | | | M |

TROUBLE DIAGNOSIS

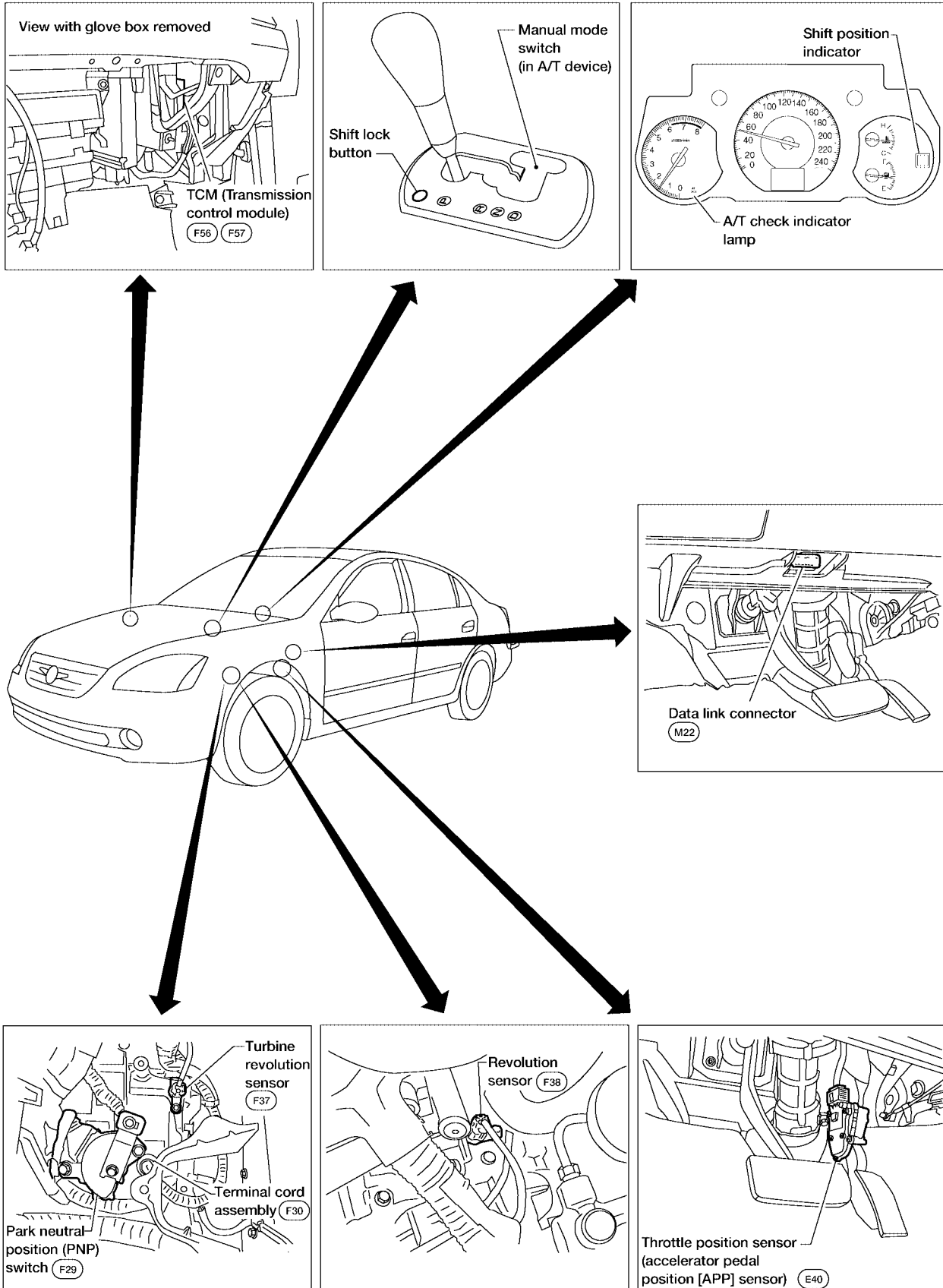
[RE5F22A]

| | | | |
|---|-----|---|---|
| | | <p>Part 2</p> <ul style="list-style-type: none"> <input type="checkbox"/> Vehicle Cannot Be Started From D1. AT-598 . <input type="checkbox"/> A/T Does Not Shift: D1 → D2. AT-598 . <input type="checkbox"/> A/T Does Not Shift: D2 → D3. AT-599 . <input type="checkbox"/> A/T Does Not Shift: D3 → D4. AT-600 . <p>Part 3</p> <ul style="list-style-type: none"> <input type="checkbox"/> Cannot Be Changed To Manual Mode. AT-605 . <input type="checkbox"/> A/T Does Not Shift: 5th gear → 4th gear. AT-606 . <input type="checkbox"/> A/T Does Not Shift: 4th gear → 3rd gear. AT-607 . <input type="checkbox"/> A/T Does Not Shift: 3rd gear → 2nd gear. AT-607 . <input type="checkbox"/> A/T Does Not Shift: 2nd gear → 1st gear. AT-608 . <input type="checkbox"/> Vehicle Does Not Decelerate By Engine Brake. AT-609 . <input type="checkbox"/> Perform self-diagnostics Enter checks for detected items. | <p>AT-442</p> <p>AT-443</p> |
| 4 | 4-3 | <ul style="list-style-type: none"> <input type="checkbox"/> Vehicle speed sensor-MTR. AT-467 . <input type="checkbox"/> TCM processor. AT-469 . <input type="checkbox"/> PNP switch. AT-471 . <input type="checkbox"/> A/T fluid temperature sensor circuit. AT-476 . <input type="checkbox"/> A/T fluid temperature sensor performance. AT-481 . <input type="checkbox"/> Turbine revolution sensor circuit. AT-486 . <input type="checkbox"/> Vehicle speed sensor-A/T (revolution sensor) circuit. AT-490 . <input type="checkbox"/> Engine speed input circuit performance. AT-494 . <input type="checkbox"/> 1st gear function. AT-496 . <input type="checkbox"/> 2nd gear function. AT-499 . <input type="checkbox"/> 3rd gear function. AT-505 . <input type="checkbox"/> 4th gear function. AT-511 . <input type="checkbox"/> 5th gear function. AT-516 . <input type="checkbox"/> Lock-up function. AT-522 . <input type="checkbox"/> Shift function. AT-565 . <input type="checkbox"/> Pressure control solenoid valve A. AT-525 . <input type="checkbox"/> Pressure control solenoid valve B. AT-560 . <input type="checkbox"/> Pressure control solenoid valve C. AT-569 . <input type="checkbox"/> Shift solenoid valve A. AT-530 . <input type="checkbox"/> Shift solenoid valve B. AT-535 . <input type="checkbox"/> Shift solenoid valve C. AT-540 . <input type="checkbox"/> Shift solenoid valve D. AT-550 . <input type="checkbox"/> Shift solenoid valve E. AT-555 . <input type="checkbox"/> Pressure control solenoid valve C stuck ON. AT-574 . <input type="checkbox"/> Shift solenoid valve C stuck ON. AT-545 . <input type="checkbox"/> Manual mode switch circuit. AT-579 . <input type="checkbox"/> TCM power input signal. AT-585 . <input type="checkbox"/> Electric throttle control system. AT-590 . <input type="checkbox"/> CAN communication. AT-464 . <input type="checkbox"/> Battery <input type="checkbox"/> Other | |
| 5 | | <input type="checkbox"/> Inspect each system for items found to be NG in the self-diagnostics and repair or replace the malfunction parts. | |
| 6 | | <input type="checkbox"/> Perform all road tests and enter the checks again for the required items. | AT-438 |
| 7 | | <input type="checkbox"/> 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-445 |
| 8 | | <input type="checkbox"/> Erase the results of the self-diagnostics from the TCM. | AT-463 |

A/T Electrical Parts Location

ECS009CY

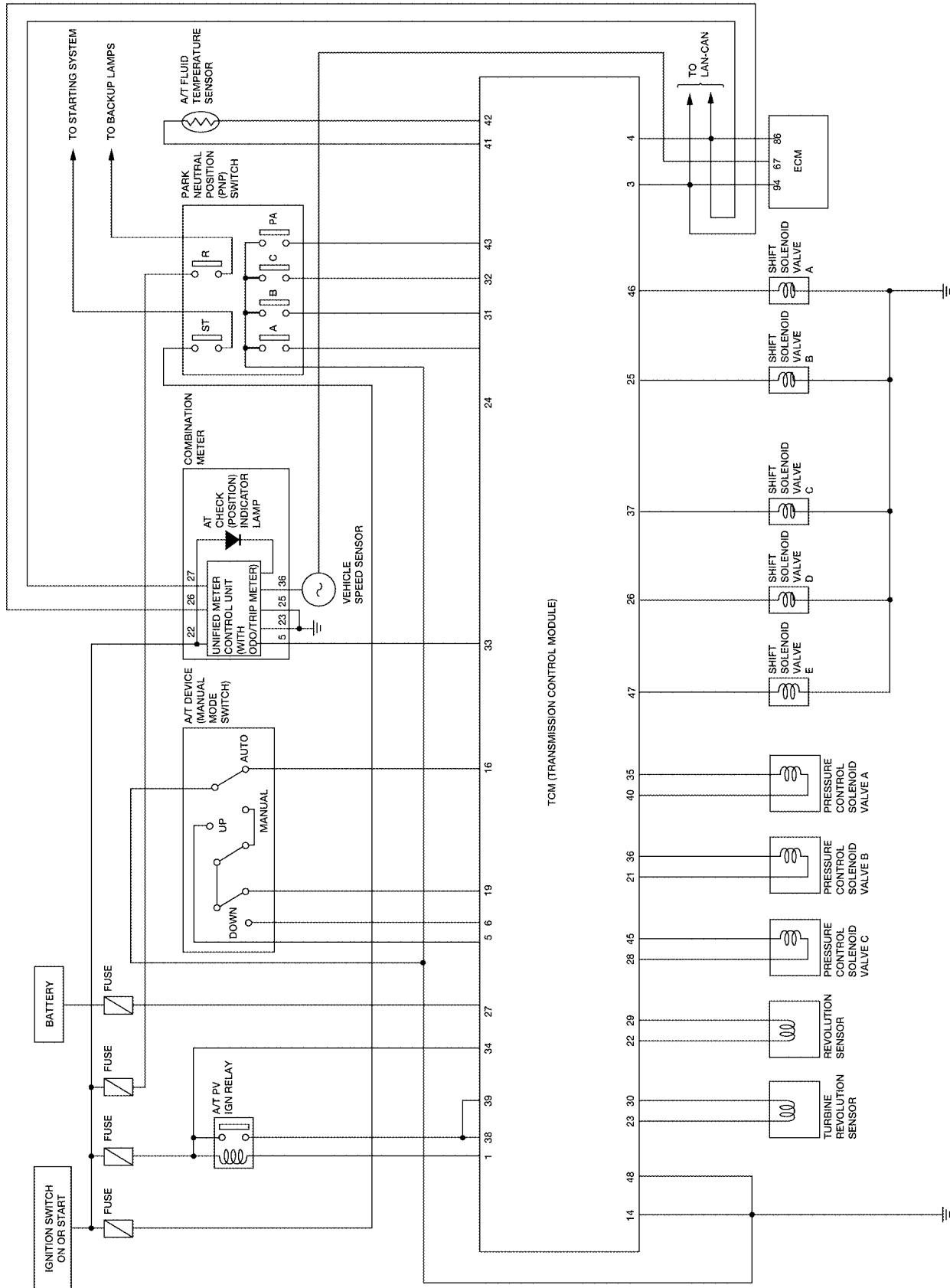
A
B
AT
D
E
F
G
H
I
J
K
L
M



WCIA0350E

Circuit Diagram

ECS009CZ



WCWA0223E

Inspections Before Trouble Diagnosis

A/T FLUID CHECK

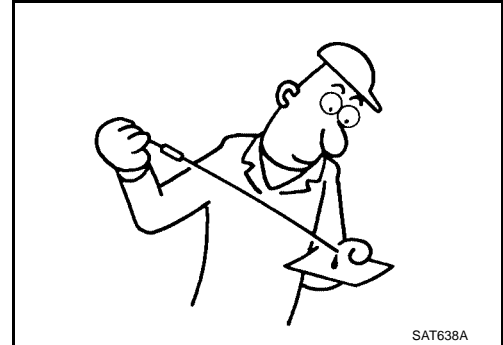
Fluid leakage and fluid level check

- Inspect for fluid leakage and check the fluid level. Refer to [MA-30, "Checking A/T Fluid"](#).

Fluid condition check

Inspect the fluid condition.

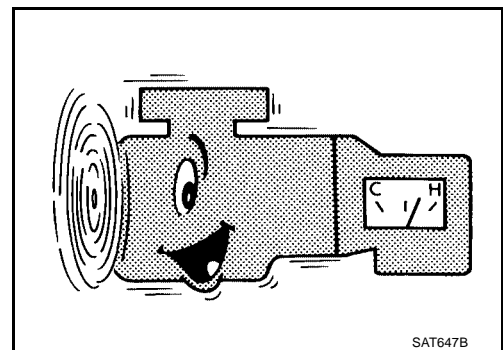
| Fluid status | Conceivable Cause | Required Operation |
|---------------------------------------|--|---|
| Varnished (viscous varnish state) | Clutch, brake scorched | Replace the A/T fluid and check the A/T main unit and the vehicle for malfunctions (wire harnesses, cooler pipes, etc.) |
| Milky white 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. |



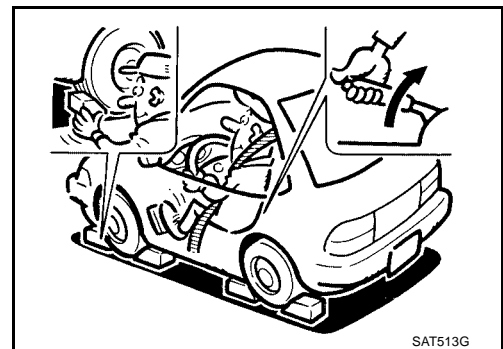
STALL TEST

Stall test procedure

- Inspect the amount of engine oil. Replenish the engine oil if necessary.
- 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.
- Switch of A/C and light etc. are off.



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

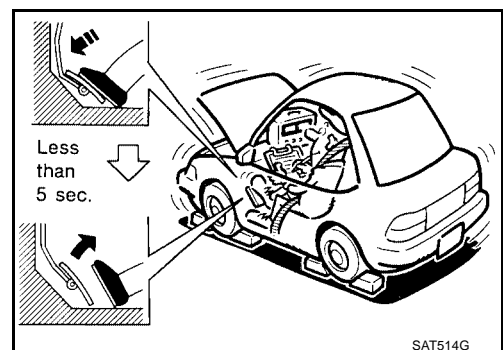


- Engine start, apply foot brake, and place selector lever in "D" position.
- While holding down the foot brake, gradually press down the accelerator pedal.
- Quickly read off the stall speed, then quickly remove your foot from the accelerator pedal.

CAUTION:

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

- Move the selector lever to the "N" position.
- Cool down the A/T fluid.



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

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 | <ul style="list-style-type: none"> ● Line pressure is low (pressure control solenoid valve A malfunction, primary regulator valve malfunction) ● Forward clutch (slipping) ● One-way clutch No. 2 |
| | O | H | <ul style="list-style-type: none"> ● Line pressure is low (pressure control solenoid valve A malfunction, primary regulator valve malfunction) ● Direct clutch (slipping) ● 1st and reverse brake (slipping) |
| | L | L | <ul style="list-style-type: none"> ● Engine or torque converter one-way clutch |
| | H | H | <ul style="list-style-type: none"> ● 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

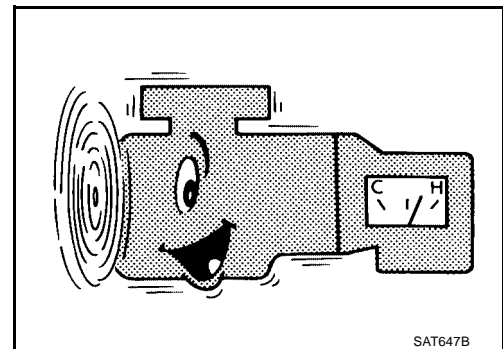
H: Stall speed higher than standard value

L: Stall speed lower than standard value

TIME LAG TEST

Time lag test procedure

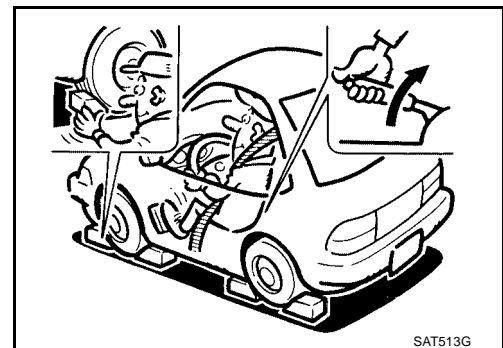
1. Inspect the amount of engine oil. Replenish the engine oil if necessary.
2. Drive for about 10 minutes to warm up the vehicle so that the A/T fluid temperature is 50 to 80°C (122 to 176°F). Check the amount of A/T fluid. Replenish if necessary.
3. Switch of A/C and light etc. are off.



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.)



Time lag:

“N” to “D” position: **Less than 0.7 sec.**

“N” to “R” position: **Less than 1.2 sec.**

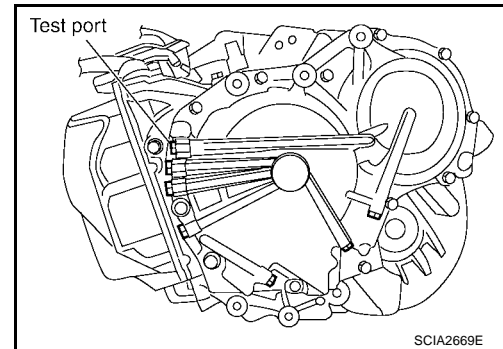
Judgement time lag test

| Result of time lag test | Possible cause |
|---|--|
| Longer than standards “N” to “D” position | <ul style="list-style-type: none"> ● 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 | <ul style="list-style-type: none"> ● 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:

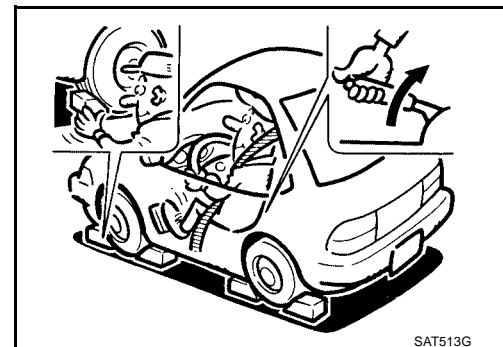
The automatic fluid temperature rises in range of 50 to 80°C (122 to 176°F) during 10 minutes of driving.

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.




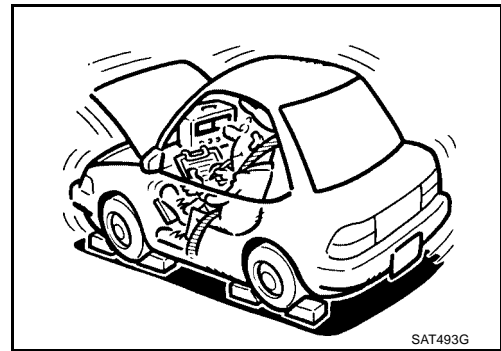
6. Start the engine, then measure the line pressure at both idle and the stall speed.

CAUTION:

- Keep the brake pedal pressed all the way down during measurement.
- When measuring the line pressure at the stall speed, refer to [AT-435, "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)



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) |

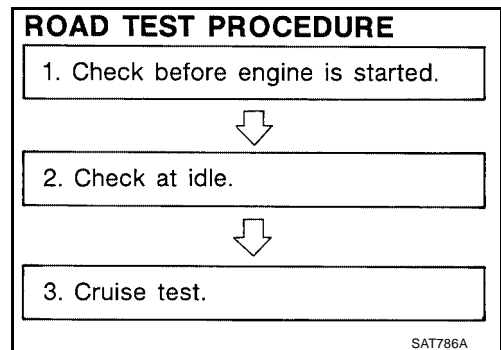
Judgement of line pressure test

| Judgement | Possible cause |
|---|--|
| Higher than standards both "D", "M" and "R" positions | <ul style="list-style-type: none"> ● Pressure control solenoid valve A malfunction ● Primary regulator valve malfunction |
| Lower than standards both "D", "M" and "R" positions | <ul style="list-style-type: none"> ● 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 | <ul style="list-style-type: none"> ● Oil leak for "D" range circuit malfunction ● Forward clutch malfunction |
| Lower than standards only "R" position | <ul style="list-style-type: none"> ● 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 performed in the following three stages.
1. Check before engine is started. Refer to [AT-439](#) .
 2. Check at idle. Refer to [AT-439](#) .
 3. Cruise test
 - Inspect all the items from Part 1 to Part 3. Refer to [AT-441](#) , [AT-442](#) , [AT-443](#) .



- 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.



SAT496G

ECS009D1

Check Before Engine is Started

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-456](#), [AT-461](#).
 3. Go to [AT-439, "Check at Idle"](#).
- No >> Stop the road test and go to [AT-591, "A/T CHECK Indicator Lamp does not come on"](#).

Check at Idle

ECS009D2

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-593, "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-593, "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-441, "Cruise Test - Part 1"](#) , [AT-442, "Cruise Test - Part 2"](#) , and [AT-443, "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**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-444](#).

Ⓜ 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-444](#).

Ⓜ 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-444](#).

Ⓜ 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-444](#).

Ⓢ 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-444](#).

Ⓢ 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-442](#)).

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-442](#)).

Cruise Test - Part 2

ECS009D4

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-444](#).

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-444](#).

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-443](#)).

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

ECS009D5

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-456, "SELF-DIAG RESULT MODE"](#) , [AT-461, "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

ECS009D6

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 % | 67 (42) | 105 (65) | 170 (106) | 241 (150) | 230 (143) | 160 (99) | 92 (57) | 45 (28) |
| 90 % | 67 (42) | 105 (65) | 170 (106) | 241 (150) | 230 (143) | 160 (99) | 92 (57) | 45 (28) |
| 80 % | 65 (40) | 100 (62) | 152 (94) | 227 (141) | 178 (111) | 142 (88) | 86 (53) | 45 (28) |
| 70 % | 53 (33) | 80 (50) | 125 (78) | 185 (115) | 147 (91) | 137 (85) | 68 (42) | 38 (24) |
| 60 % | 46 (29) | 71 (44) | 106 (66) | 156 (97) | 108 (67) | 78 (48) | 46 (29) | 22 (14) |
| 50 % | 43 (27) | 67 (42) | 97 (60) | 145 (90) | 98 (61) | 68 (42) | 40 (25) | 18 (11) |
| 40 % | 38 (24) | 60 (37) | 89 (55) | 130 (81) | 89 (55) | 56 (35) | 30 (19) | 13 (8) |
| 30 % | 33 (21) | 50 (31) | 70 (43) | 108 (67) | 68 (42) | 45 (28) | 25 (16) | 12 (7) |
| 20 % | 23 (14) | 35 (22) | 49 (30) | 77 (48) | 49 (30) | 32 (20) | 22 (14) | 8 (5) |
| 10 % | 17 (11) | 29 (18) | 39 (24) | 58 (36) | 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 % | 190 (118) | 137 (85) |
| 15% | 101 (63) | 72 (45) |
| 0 - 8 % | 73 (45) | 70 (43) |

- 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 | 45 (28) | 42 (26) |
| | 5th | 58 (36) | 55 (34) |

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

TROUBLE DIAGNOSIS

[RE5F22A]

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

Symptom Chart

ECS009D7

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-435 |
| | | 2. Control cable and PNP switch adjustment | AT-621, AT-619 |
| | | 3. TCM | AT-452 |
| | | 4. Pressure control solenoid valve A | AT-525 |
| | | 5. Control valve assembly | AT-622 |
| | OFF vehicle | 6. Torque converter | AT-624 |
| | | 7. Forward and direct clutch assembly | AT-633 |
| | | 8. B5 brake | AT-660 |
| | | 9. One-way clutch No.2 | AT-633 |
| With selector lever in R position, driving is not possible. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Control cable and PNP switch adjustment | AT-621, AT-619 |
| | | 3. TCM | AT-452 |
| | | 4. Shift solenoid valve A | AT-530 |
| | | 5. Shift solenoid valve B | AT-535 |
| | | 6. Pressure control solenoid valve A | AT-525 |
| | | 7. Control valve assembly | AT-622 |
| | OFF vehicle | 8. Torque converter | AT-633 |
| | | 9. Forward and direct clutch assembly | AT-633 |
| | | 10. 1st and reverse brake | AT-633 |
| | | 11. B5 brake | AT-660 |
| No shock at all or the clutch slips when vehicle changes speed. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Control cable and PNP switch adjustment | AT-621, AT-619 |
| | | 3. TCM | AT-452 |
| | | 4. Shift solenoid valve A | AT-530 |
| | | 5. Shift solenoid valve B | AT-535 |
| | | 6. Shift solenoid valve E | AT-555 |
| | | 7. Pressure control solenoid valve A | AT-525 |
| | | 8. Pressure control solenoid valve C | AT-569 |
| | | 9. Control valve assembly | AT-622 |
| | OFF vehicle | 10. Accumulator | AT-633 |

TROUBLE DIAGNOSIS

[RE5F22A]

| Symptom | Condition | Diagnostic Item | Reference page |
|---|-------------|--|--------------------------------|
| Time lag is large. ("N" → "D" position) | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Actual engine torque signal | AT-494 |
| | | 3. Turbine revolution sensor | AT-486 |
| | | 4. TCM | AT-452 |
| | | 5. Control valve assembly | AT-622 |
| | OFF vehicle | 6. Accumulator | AT-633 |
| | | 7. Forward and direct clutch assembly | AT-633 |
| Time lag is large. ("N" → "R" position) | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Actual engine torque signal | AT-494 |
| | | 3. Turbine revolution sensor | AT-486 |
| | | 4. TCM | AT-452 |
| | | 5. Shift solenoid valve E | AT-555 |
| | | 6. Control valve assembly | AT-622 |
| | OFF vehicle | 7. Forward and direct clutch assembly | AT-633 |
| | | 8. 1st and reverse brake | AT-633 |
| Engine does not start in "N", "P" position. | ON vehicle | 1. Ignition switch and starter | PG-4, SC-9 |
| | | 2. Control cable adjustment | AT-621 |
| | | 3. PNP switch | AT-471 |
| Engine starts in positions other than "N" or "P". | ON vehicle | 1. Ignition switch and starter | PG-4, SC-9 |
| | | 2. Control cable adjustment | AT-621 |
| | | 3. PNP switch | AT-471 |
| Engine stalls when selector lever shifted "N" → "D", "R". | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. TCM | AT-452 |
| | | 3. Shift solenoid valve D | AT-550 |
| | | 4. Pressure control solenoid valve C | AT-569 |
| | | 5. Control valve assembly | AT-622 |
| Engine stall when vehicle slow down. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. TCM | AT-452 |
| | | 3. Shift solenoid valve D | AT-550 |
| | | 4. Shift solenoid valve E | AT-555 |
| | | 5. Pressure control solenoid valve C | AT-569 |
| | | 6. Control valve assembly | AT-622 |
| Acceleration is extremely poor. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Control cable and PNP switch adjustment | AT-621, AT-619 |
| | | 3. Engine speed signal | AT-494 |
| | | 4. Electric throttle control signal | AT-590 |

TROUBLE DIAGNOSIS

[RE5F22A]

| Symptom | Condition | Diagnostic Item | Reference page |
|---|-------------|---------------------------------------|--------------------------------|
| Gear does not change from D1 → D2 or from M1 → M2 . | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. TCM | AT-452 |
| | | 3. Electric throttle control signal | AT-590 |
| | | 4. Shift solenoid valve A | AT-530 |
| | | 5. Shift solenoid valve B | AT-535 |
| | | 6. Shift solenoid valve C | AT-540 |
| | | 7. Shift solenoid valve D | AT-550 |
| | | 8. Control valve assembly | AT-622 |
| | OFF vehicle | 9. 2nd coast brake | AT-652, AT-658 |
| | | 10. 2nd brake | AT-652 |
| | | 11. One-way clutch No.1 | AT-658 |
| | | 12. One-way clutch No.2 | AT-633 |
| Gear does not change from D2 → D3 or from M2 → M3 . | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. TCM | AT-452 |
| | | 3. Electric throttle control signal | AT-590 |
| | | 4. Shift solenoid valve B | AT-535 |
| | | 5. Shift solenoid valve C | AT-540 |
| | | 6. Shift solenoid valve D | AT-550 |
| | | 7. Pressure control solenoid valve A | AT-525 |
| | | 8. Control valve assembly | AT-622 |
| | OFF vehicle | 9. U/D brake | AT-633 |
| | | 10. B5 brake | AT-660 |
| Gear does not change from D3 → D4 or from M3 → M4 . | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. TCM | AT-452 |
| | | 3. Electric throttle control signal | AT-590 |
| | | 4. Shift solenoid valve B | AT-535 |
| | | 5. Shift solenoid valve C | AT-540 |
| | | 6. Shift solenoid valve D | AT-550 |
| | | 7. Control valve assembly | AT-622 |
| | OFF vehicle | 8. U/D clutch | AT-633 |
| | | 9. U/D brake | AT-633 |
| Gear does not change from D4 → D5 or from M4 → M5 . | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. TCM | AT-452 |
| | | 3. Electric throttle control signal | AT-590 |
| | | 4. Shift solenoid valve B | AT-535 |
| | | 5. Shift solenoid valve C | AT-540 |
| | | 6. Control valve assembly | AT-622 |
| | OFF vehicle | 7. Forward and direct clutch assembly | AT-633 |
| | | 8. 2nd coast brake | AT-652, AT-658 |
| | | 9. One-way clutch No.1 | AT-658 |

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TROUBLE DIAGNOSIS

[RE5F22A]

| 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-435 |
| | | 2. TCM | AT-452 |
| | | 3. Electric throttle control signal | AT-590 |
| | | 4. Shift solenoid valve A | AT-530 |
| | | 5. Shift solenoid valve B | AT-535 |
| | | 6. Shift solenoid valve C | AT-540 |
| | | 7. Shift solenoid valve D | AT-550 |
| | | 8. Control valve assembly | AT-622 |
| | OFF vehicle | 9. 2nd coast brake | AT-652, AT-658 |
| | | 10. 2nd brake | AT-652 |
| | | 11. One-way clutch No.1 | AT-658 |
| | | 12. One-way clutch No.2 | AT-633 |
| In D or M range, does not downshift to 2nd gear. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. TCM | AT-452 |
| | | 3. Electric throttle control signal | AT-590 |
| | | 4. Shift solenoid valve B | AT-535 |
| | | 5. Shift solenoid valve C | AT-540 |
| | | 6. Shift solenoid valve D | AT-550 |
| | | 7. Pressure control solenoid valve A | AT-525 |
| | | 8. Control valve assembly | AT-622 |
| | OFF vehicle | 9. U/D brake | AT-633 |
| | | 10. B5 brake | AT-660 |
| In D or M range, does not downshift to 3rd gear. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. TCM | AT-452 |
| | | 3. Electric throttle control signal | AT-590 |
| | | 4. Shift solenoid valve B | AT-535 |
| | | 5. Shift solenoid valve C | AT-540 |
| | | 6. Shift solenoid valve D | AT-550 |
| | | 7. Control valve assembly | AT-622 |
| | OFF vehicle | 8. U/D clutch | AT-633 |
| | | 9. U/D brake | AT-633 |
| In D or M range, does not downshift to 4th gear. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. TCM | AT-452 |
| | | 3. Electric throttle control signal | AT-590 |
| | | 4. Shift solenoid valve B | AT-535 |
| | | 5. Shift solenoid valve C | AT-540 |
| | | 6. Control valve assembly | AT-622 |
| | OFF vehicle | 7. Forward and direct clutch assembly | AT-633 |
| | | 8. 2nd coast brake | AT-652, AT-658 |
| | | 9. One-way clutch No.1 | AT-658 |

TROUBLE DIAGNOSIS

[RE5F22A]

| Symptom | Condition | Diagnostic Item | Reference page |
|--|-------------|--|--------------------------------|
| Does not lock-up or lock-up is not released. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Stop lamp switch signal | AT-610 |
| | | 3. ATF temperature sensor | AT-476 |
| | | 4. TCM | AT-452 |
| | | 5. Shift solenoid valve C | AT-540 |
| | | 6. Shift solenoid valve D | AT-550 |
| | | 7. Pressure control solenoid valve C | AT-569 |
| | | 8. Control valve assembly | AT-622 |
| | OFF vehicle | 9. Torque converter | AT-624 |
| Engine brake does not work. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. TCM | AT-452 |
| | | 3. Shift solenoid valve E | AT-555 |
| | | 4. Electric throttle control signal | AT-590 |
| | | 5. Control valve assembly | AT-622 |
| | OFF vehicle | 6. 2nd coast brake | AT-652, AT-658 |
| | | 7. U/D brake | AT-633 |
| | | 8. B5 brake | AT-660 |
| Shift point is high or low. | ON vehicle | 1. Pressure control solenoid valve A | AT-525 |
| | | 2. Engine speed signal | AT-494 |
| | | 3. Electric throttle control signal | AT-590 |
| | | 4. Revolution sensor | AT-490 |
| | | 5. TCM | AT-452 |
| | | 6. Control valve assembly | AT-622 |
| Large shock. ("N" → "D" position) | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Actual engine torque signal | AT-494 |
| | | 3. Turbine revolution sensor | AT-486 |
| | | 4. ATF temperature sensor | AT-476 |
| | | 5. Shift solenoid valve A | AT-530 |
| | | 6. Shift solenoid valve B | AT-535 |
| | | 7. Pressure control solenoid valve A | AT-525 |
| | | 8. TCM | AT-452 |
| | | 9. Control valve assembly | AT-622 |
| | OFF vehicle | 10. Accumulator | AT-633 |
| | | 11. Forward and direct clutch assembly | AT-633 |

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TROUBLE DIAGNOSIS

[RE5F22A]

| Symptom | Condition | Diagnostic Item | Reference page |
|------------------------------------|-------------|---------------------------------------|------------------------|
| Large shock. ("N" → "R" position) | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Actual engine torque signal | AT-494 |
| | | 3. Turbine revolution sensor | AT-486 |
| | | 4. ATF temperature sensor | AT-476 |
| | | 5. Shift solenoid valve E | AT-555 |
| | | 6. Pressure control solenoid valve B | AT-560 |
| | | 7. TCM | AT-452 |
| | | 8. Control valve assembly | AT-622 |
| | OFF vehicle | 9. Forward and direct clutch assembly | AT-633 |
| | | 10. 1st and reverse brake | AT-633 |
| Shock is too large when shift up. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Actual engine torque signal | AT-494 |
| | | 3. Turbine revolution sensor | AT-486 |
| | | 4. ATF temperature sensor | AT-476 |
| | | 5. TCM power input signal | AT-585 |
| | | 6. Shift solenoid valve A | AT-530 |
| | | 7. Shift solenoid valve B | AT-535 |
| | | 8. Shift solenoid valve C | AT-540 |
| | | 9. Shift solenoid valve D | AT-550 |
| | | 10. Shift solenoid valve E | AT-555 |
| | | 11. Pressure control solenoid valve A | AT-525 |
| | | 12. Pressure control solenoid valve B | AT-560 |
| | | 13. Pressure control solenoid valve C | AT-569 |
| | | 14. TCM | AT-452 |
| | | 15. Control valve assembly | AT-622 |
| Shock is too large for coast down. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Actual engine torque signal | AT-494 |
| | | 3. Turbine revolution sensor | AT-486 |
| | | 4. ATF temperature sensor | AT-476 |
| | | 5. TCM power input signal | AT-585 |
| | | 6. Shift solenoid valve A | AT-530 |
| | | 7. Shift solenoid valve B | AT-535 |
| | | 8. Shift solenoid valve C | AT-540 |
| | | 9. Shift solenoid valve D | AT-550 |
| | | 10. Shift solenoid valve E | AT-555 |
| | | 11. Pressure control solenoid valve A | AT-525 |
| | | 12. Pressure control solenoid valve B | AT-560 |
| | | 13. Pressure control solenoid valve C | AT-569 |
| | | 14. TCM | AT-452 |
| | | 15. Control valve assembly | AT-622 |

TROUBLE DIAGNOSIS

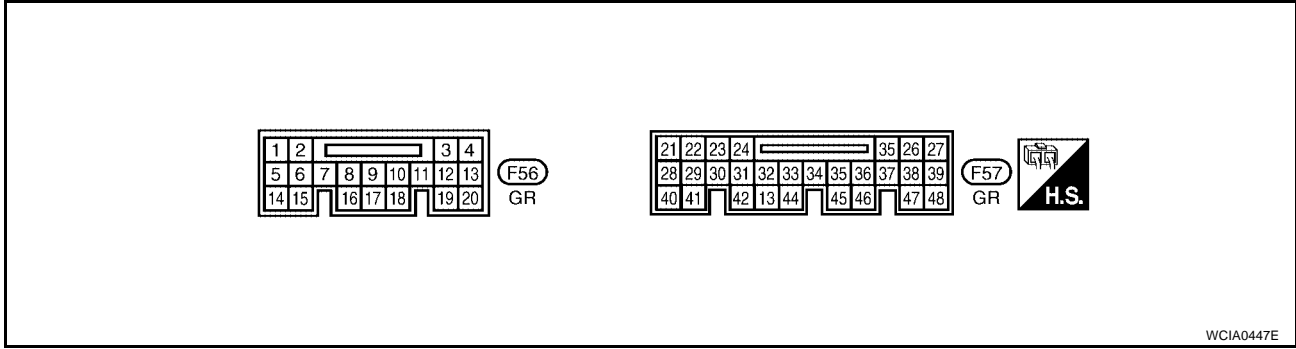
[RE5F22A]

| Symptom | Condition | Diagnostic Item | Reference page |
|--|-------------|--|--------------------------------|
| Shock is too large for kick down. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Actual engine torque signal | AT-494 |
| | | 3. Turbine revolution sensor | AT-486 |
| | | 4. ATF temperature sensor | AT-476 |
| | | 5. TCM power input signal | AT-585 |
| | | 6. Shift solenoid valve A | AT-530 |
| | | 7. Shift solenoid valve B | AT-535 |
| | | 8. Shift solenoid valve C | AT-540 |
| | | 9. Shift solenoid valve D | AT-550 |
| | | 10. Shift solenoid valve E | AT-555 |
| | | 11. Pressure control solenoid valve A | AT-525 |
| | | 12. Pressure control solenoid valve B | AT-560 |
| | | 13. Pressure control solenoid valve C | AT-569 |
| | | 14. TCM | AT-452 |
| | | 15. Control valve assembly | AT-622 |
| Strange noise in "R", "N" or "D" position. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. Control valve assembly | AT-622 |
| | OFF vehicle | 3. Torque converter | AT-633 |
| | | 4. Parking component | AT-626 |
| | | 5. Gear system | AT-633 |
| 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-471 |
| | | 2. Control cable adjustment | AT-621 |
| | | 3. Control valve assembly | AT-622 |
| | OFF vehicle | 4. Parking component | AT-626 |
| Vehicle runs with transaxle in "P" position. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. PNP switch | AT-471 |
| | | 3. Control cable and PNP switch adjustment | AT-621, AT-619 |
| | | 4. Line pressure test | AT-437 |
| Vehicle runs with transaxle in "N" position. | ON vehicle | 1. Fluid level and state | AT-435 |
| | | 2. PNP switch | AT-471 |
| | | 3. Control cable and PNP switch adjustment | AT-621, AT-619 |
| | | 4. Line pressure test | AT-437 |

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TCM Input/Output Signal Reference Values TCM TERMINAL CONNECTOR LAYOUT

ECS009D8


















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TROUBLE DIAGNOSIS

[RE5F22A]













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 | L/Y | 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 | P/B | 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. |
| 23 | G | Turbine revolution sensor power supply |  | When turning ignition switch ON. | Battery voltage |
| | | | |  | When turning ignition switch OFF. |
| 24 | OR/B | 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 | PU/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 | |
| 28 | W | Pressure control solenoid valve C ground |  | When engine is running with idle speed and setting selector lever to "P" position. | 0V |




TROUBLE DIAGNOSIS

[RE5F22A]

| Terminal | Wire color | Item | | Condition | Data (Approx.) | |
|----------|------------|--|---|--|-----------------|---------|
| 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 | R/B | 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 | OR/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 | |
| 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 | |

TROUBLE DIAGNOSIS

[RE5F22A]

| Terminal | Wire color | Item | Condition | Data (Approx.) | |
|----------|------------|-----------------------------------|---|--|-----------------|
| 43 | PU/W | PNP switch PA |  | Selector lever: "P" and "N" position | 0V |
| | | | | Other than the above | Battery voltage |
| 45 | OR | 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 (TCM)

ECS009D9

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-456](#)), place check marks for results on the [AT-430, "DIAGNOSTIC WORKSHEET"](#) . Reference pages are provided following the items.

NOTICE:

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

CONSULT-II SETTING PROCEDURE

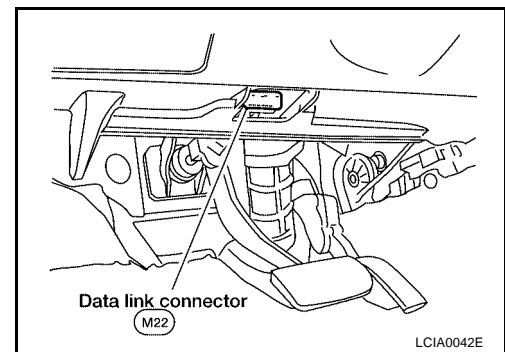
CAUTION:

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

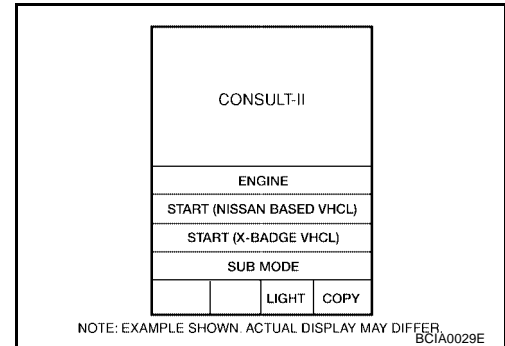
TROUBLE DIAGNOSIS

[RE5F22A]

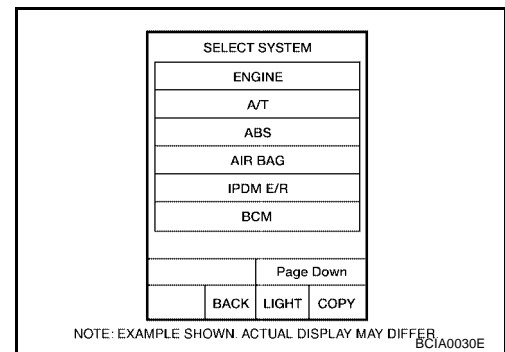
- For details, refer to the separate "CONSULT-II Operations Manual".
- 1. Turn ignition switch "OFF".
- 2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector, which is located in driver instrument panel (lower).
- 3. Turn ignition switch "ON". (Do not start engine.)



- 4. Touch "START (NISSAN BASED VHCL)".



- 5. Touch "TRANSMISSION".
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. <ul style="list-style-type: none"> ● 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-388, "Precautions for A/T Assembly or TCM Replacement" . |

SELF-DIAG RESULT MODE

Operation procedure

- 1. Perform "CONSULT-II SETTING PROCEDURE". Refer to [AT-455, "CONSULT-II SETTING PROCEDURE"](#) .

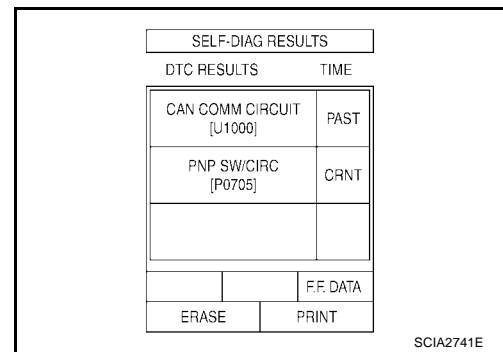
TROUBLE DIAGNOSIS

[RE5F22A]

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-459, "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} |

TROUBLE DIAGNOSIS

[RE5F22A]

| 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) | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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) | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Manual mode switch signal is incorrectly input due to open, short, and so on. | — | P0826 | — |
| TCM POWER INPT SIG | <ul style="list-style-type: none"> Voltage supplied to TCM is too low. | — | P0882 | P0882 |
| ELEC TH CONTROL | <ul style="list-style-type: none"> The electric throttle control system for ECM is in a malfunction, after that TCM inputs the result by CAN communication. | X | P1726 | P1726 |
| NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED. | <ul style="list-style-type: none"> No NG item has been detected. | — | X | X |

*1: Refer to [AT-424, "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-461, "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-464](#).

DATA MONITOR MODE

Operation procedure

1. Perform "CONSULT-II SETTING PROCEDURE". Refer to [AT-455, "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.

TROUBLE DIAGNOSIS

[RE5F22A]

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 | |
| COOLANT 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. |

TROUBLE DIAGNOSIS

[RE5F22A]

| 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 OUT* (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 | |
| ENGINE TORQUE* (Nm) | — | — | X | Signal input with CAN communication line. |
| TRQ REDCT REQ* (Nm) | — | — | X | Torque reduction request |
| TRQ LIMIT REQ* (Nm) | — | — | X | Torque limitation request |
| WO AT REQ TRQ* (Nm) | — | — | X | Engine torque without A/T request |
| G-RATE (G) | — | — | X | |
| F-SAFE MODE (OK/1 to 10) | — | X | X | Numbers indicate types of fail-safe modes. Refer to AT-426, "Fail-safe mode list" . |
| VDC SIGNAL (ON/OFF) | X | — | X | Signal input with CAN communication line. |

TROUBLE DIAGNOSIS

[RE5F22A]

| Monitored item (Unit) | Monitor item selection | | | Remarks |
|-----------------------|------------------------|--------------|---------------------|---|
| | ECU INPUT SIGNALS | MAIN SIGNALS | SELECTION FROM MENU | |
| SHIFT SCHEDULE | — | — | 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") |
| 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-456, "SELF-DIAG RESULT MODE"](#).

ACTIVE TEST MODE

Test item

| Test item | Condition | Description |
|------------------------|--|---|
| SHIFT SOLENOID A | Under the following conditions. <ul style="list-style-type: none"> ● 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

ECS009DA

OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)

Refer to [EC-763, "Generic Scan Tool \(GST\) Function"](#).

OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer to [EC-685, "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-591, "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

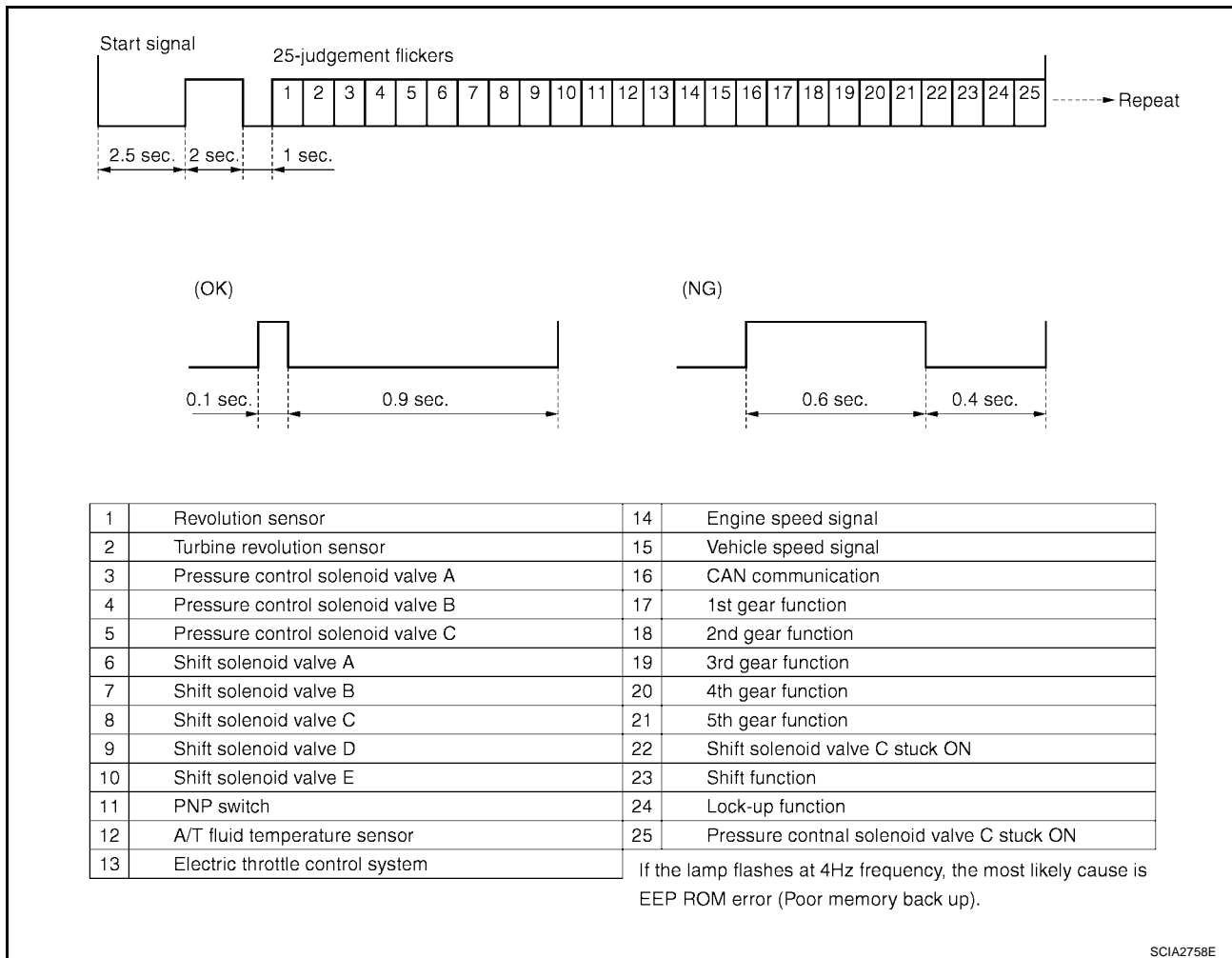
Check A/T CHECK indicator lamp. Refer to [AT-463, "Judgement self-diagnosis code"](#) .

If the system does not go into self-diagnostics, refer to [AT-610, "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.



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

ECS009DB

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

ECS009DC

- 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

ECS009DD

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

DTC Confirmation Procedure

ECS009DE

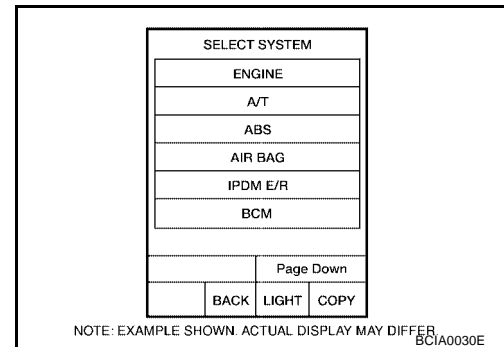
NOTE:

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

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

④ WITH CONSULT-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-466, "Diagnostic Procedure"](#).



④ WITH GST

Follow the procedure "WITH CONSULT-II".




DTC U1000 CAN COMMUNICATION LINE

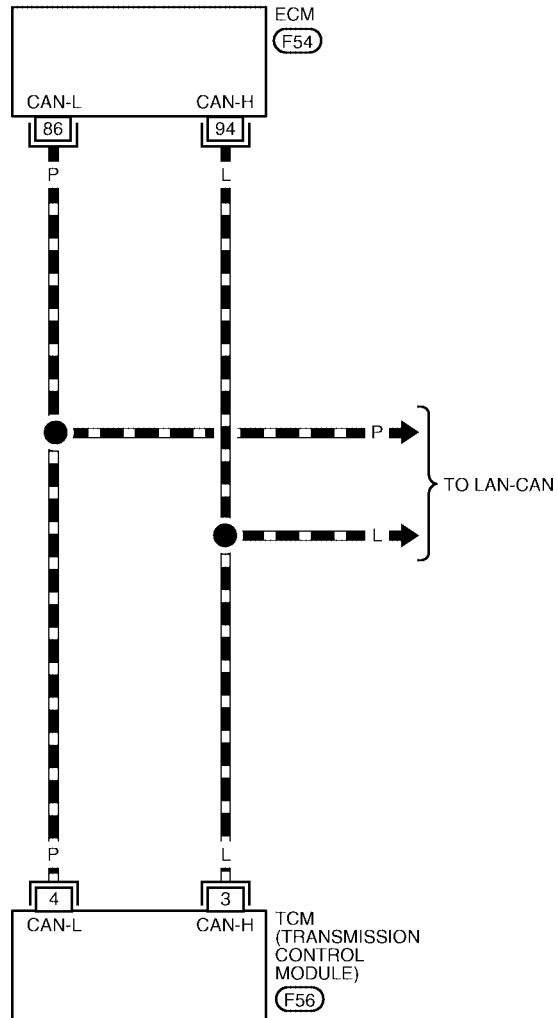
[RE5F22A]

Wiring Diagram — AT — CAN

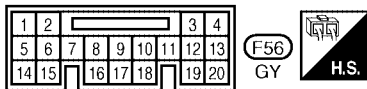
ECS009DF

AT-CAN-01

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



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



REFER TO THE FOLLOWING.
 - ELECTRICAL UNITS

WCWA0187E

DTC U1000 CAN COMMUNICATION LINE

[RE5F22A]

TCM terminals and data are reference value.

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

Diagnostic Procedure

ECS009DG

1. CHECK CAN COMMUNICATION CIRCUIT

④ With CONSULT-II

1. Turn ignition switch "ON" and start engine.
2. Select "A/T" with "SELF-DIAG RESULTS" mode in CONSULT-II.
3. The "CAN COMM CIRCUIT" is detected.

Yes or No?

- Yes >> Print out CONSULT-II screen, GO TO [LAN-4, "Precautions When Using CONSULT-II"](#).
- No >> **INSPECTION END**

| SELF-DIAG RESULTS | |
|--------------------------|-----------|
| DTC RESULTS | TIME |
| CAN COMM CIRCUIT [U1000] | CRNT |
| | |
| | |
| | F.F. DATA |
| ERASE | PRINT |

SCIA2818E

DTC P0500 VEHICLE SPEED SENSOR MTR

PF2:24814

Description

ECS009DH

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

On Board Diagnosis Logic

ECS009DI

- 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 combination meter.

Possible Cause

ECS009DJ

- Harness or connectors
(The signal circuit is open or shorted.)
- Combination meter
- ABS actuator and electric unit (control unit)
- Wheel sensor

DTC Confirmation Procedure

ECS009DK

CAUTION:

Always drive vehicle at a safe speed.

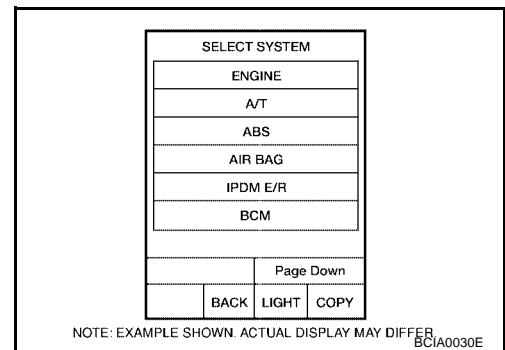
NOTE:

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-468, "Diagnostic Procedure"](#).



Diagnostic Procedure

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.

| DATA MONITOR | |
|-----------------|----------|
| MONITOR | NO DTC |
| VHCL/S SE · A/T | xxx km/h |
| VHCL/S SE · MTR | xxx km/h |

SCIA2922E

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

Refer to [BRC-8, "TROUBLE DIAGNOSIS"](#) (with ABS), [BRC-51, "TROUBLE DIAGNOSIS"](#) (with 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 COMBINATION METER

Refer to [DI-4, "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-467, "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-452, "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.

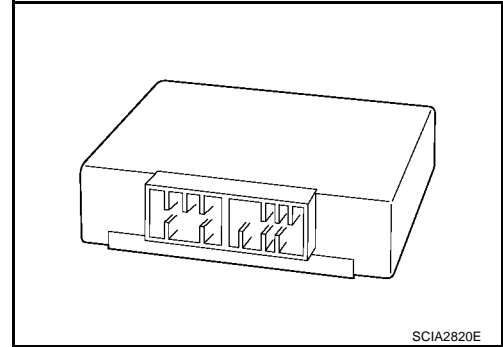
DTC P0613 TCM PROCESSOR

PF3:31036

Description

ECS009DM

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



ECS009DN

On Board Diagnosis Logic

- 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

ECS009DO

TCM

DTC Confirmation Procedure

ECS009DP

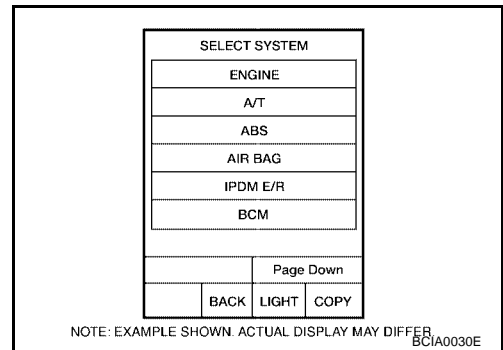
NOTE:

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-470, "Diagnostic Procedure"](#) .



Diagnostic Procedure

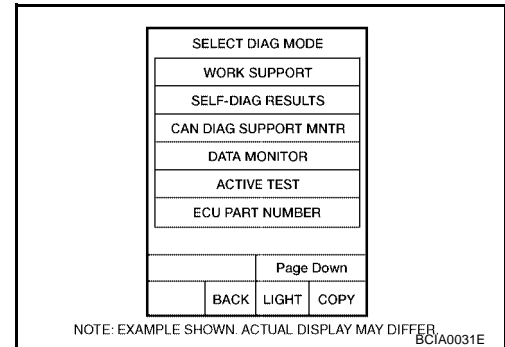
1. CHECK DTC

④ 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-469, "DTC Confirmation Procedure"](#).

Is the "TCM PROCESSOR" displayed again?

- YES >> Replace TCM.
 NO >> Inspection End.



DTC P0705 PARK/NEUTRAL POSITION SWITCH

PFP:32006

Description

ECS009DR

- 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

ECS009DS

- 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

ECS009DT

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

DTC Confirmation Procedure

ECS009DU

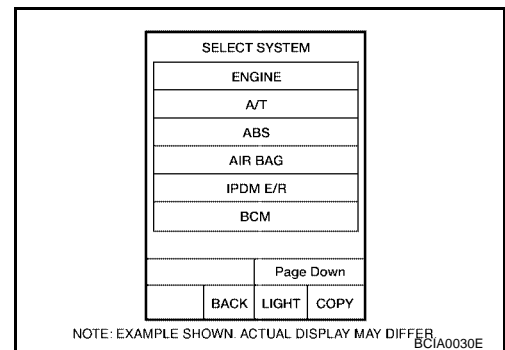
NOTE:

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-473, "Diagnostic Procedure"](#).



WITH GST

Follow the procedure “With CONSULT-II”.

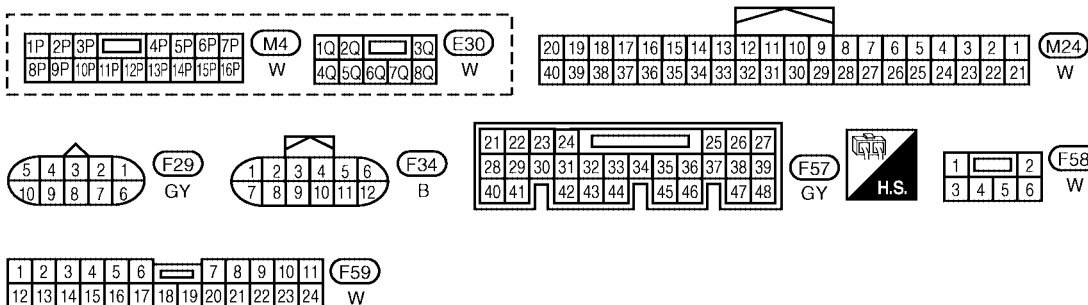
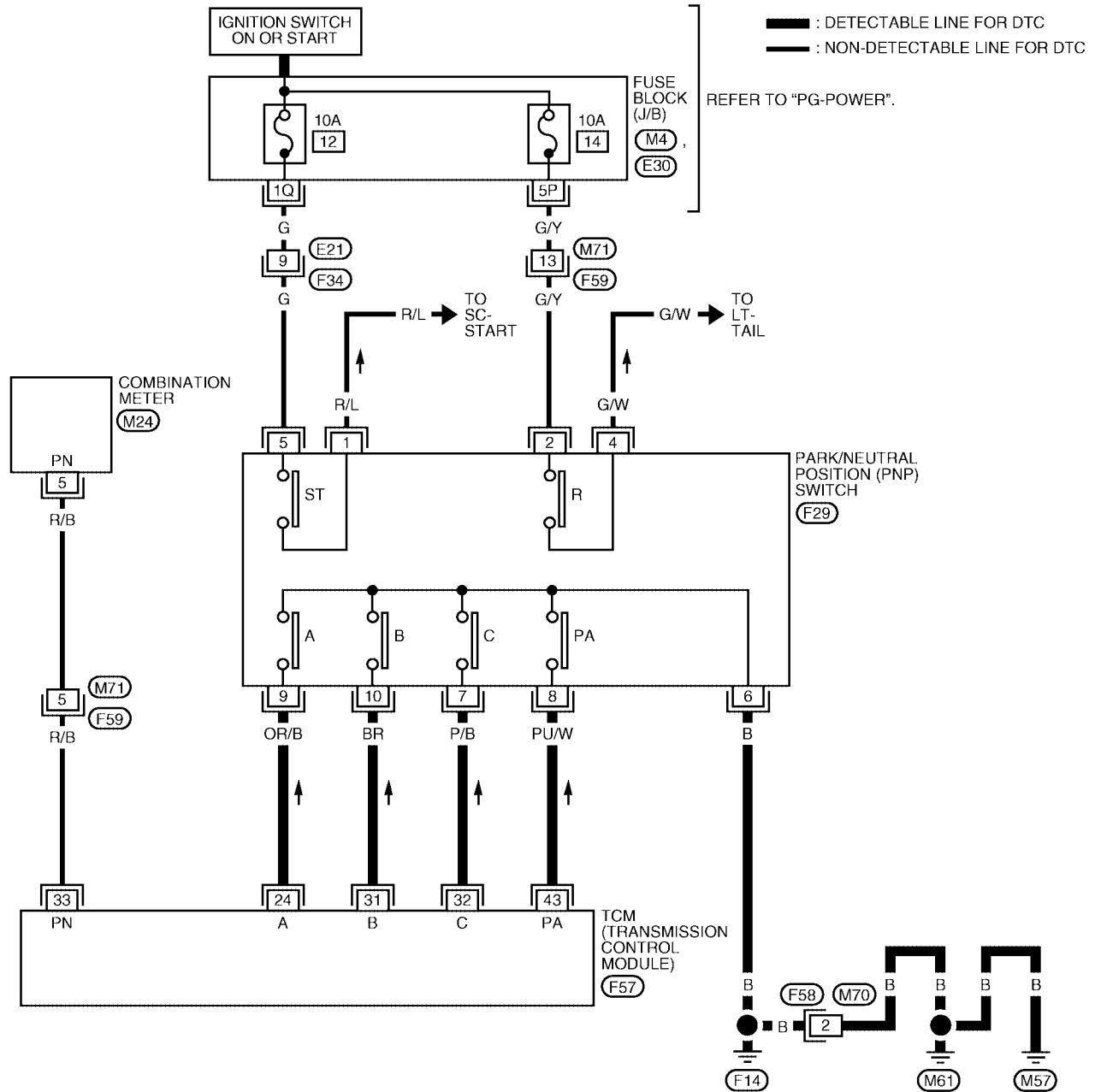
DTC P0705 PARK/NEUTRAL POSITION SWITCH

[RE5F22A]

Wiring Diagram — AT — PNP/SW

ECS009DV

AT-PNP/SW-01



WCWA0188E

DTC P0705 PARK/NEUTRAL POSITION SWITCH

[RE5F22A]

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

| Terminal | Wire color | Item | Condition | Data (Approx.) |
|----------|------------|---------------|--|-----------------|
| 24 | OR/B | 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 | R/B | PNP switch PN | Selector lever: "P" and "N" position | Battery voltage |
| | | | Other than the above | 0V |
| 43 | PU/W | PNP switch PA | Selector lever: "P" and "N" position | 0V |
| | | | Other than the above | Battery voltage |



Diagnostic Procedure

ECS009DW

1. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

- Turn ignition switch "ON". (Do not start engine.)
- Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 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 |

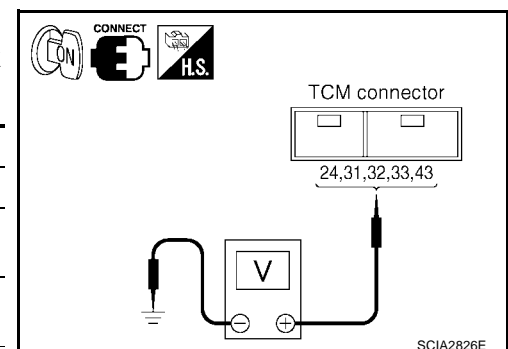
| DATA MONITOR | |
|--------------|--------|
| MONITOR | NO DTC |
| PNP SW A | OFF |
| PNP SW B | ON |
| PNP SW C | ON |
| PNP SW PA | OFF |
| PNP SW PN | OFF |

SCIA2823E

Without CONSULT-II

- Turn ignition switch "ON". (Do not start engine.)
- 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 (Wire color) | | | | | |
| | 24 (OR/B) - Ground | 31 (BR) - Ground | 32 (P/B) - Ground | 33 (R/B) - Ground | 43 (PU/W) - 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 | |



SCIA2826E

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 (Wire color) | Voltage |
|-----------|-----------------------|-----------------|
| F29 | 2 (GY) - Ground | Battery voltage |
| | 5 (G) - Ground | |

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

| Connector | Terminal (Wire color) | Voltage |
|-----------|-----------------------|---------|
| F29 | 2 (GY) - Ground | 0V |
| | 5 (G) - Ground | |

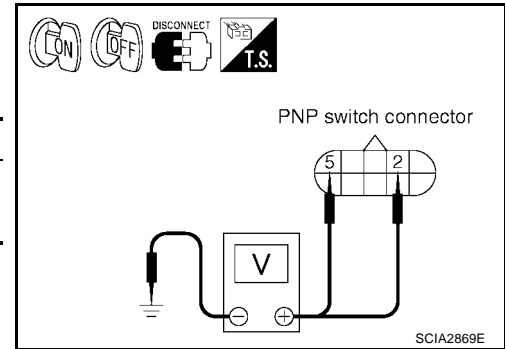
7. If OK, check harness for short-circuit to ground or power source.

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.

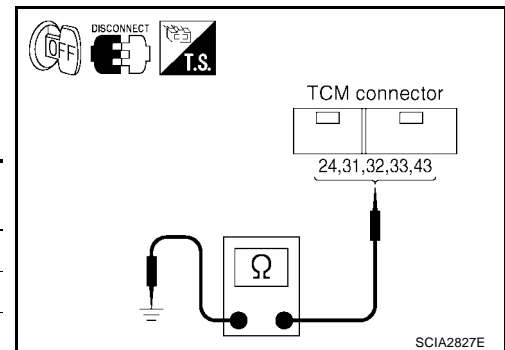
| Connector | Terminal (Wire color) | Condition | Continuity |
|--------------------|--------------------------------------|--|------------|
| F57 | 24 (OR/B) - Ground | Selector lever: "P" and "R" position | Yes |
| | | Other than the above | No |
| | 31 (BR) - Ground | Selector lever: "R", "N", "D" and manual mode position | Yes |
| | | Other than the above | No |
| | 32 (P/B) - Ground | Selector lever: "D" and manual mode position | Yes |
| | | Other than the above | No |
| 43 (PU/W) - 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 combination meter 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-475, "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-471, "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-452, "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 PNP SWITCH

ECS009DX

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. | 5 | 1 | 2 | 4 | 6 | 9 | 10 | 7 | 8 |
| Lever position | | | | | | | | | |
| P | ○—○ | | | | ○—○ | ○—○ | ○—○ | | ○—○ |
| R | | | ○—○ | ○—○ | ○—○ | ○—○ | ○—○ | | ○—○ |
| N | ○—○ | | | | ○—○ | ○—○ | ○—○ | | ○—○ |
| D | | | | | ○—○ | ○—○ | ○—○ | | ○—○ |

○—○ : Continuity

DISCONNECT

PNP switch connector

1 2 3 4 5
6 7 8 9 10

1,4,6 2,5,7,8,9,10

1-5
4-2
6-7,8,9,10

SCIA2825E

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-621, "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-619, "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

ECS009DY

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

On Board Diagnosis Logic

ECS009DZ

- 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

ECS009E0

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

DTC Confirmation Procedure

ECS009E1

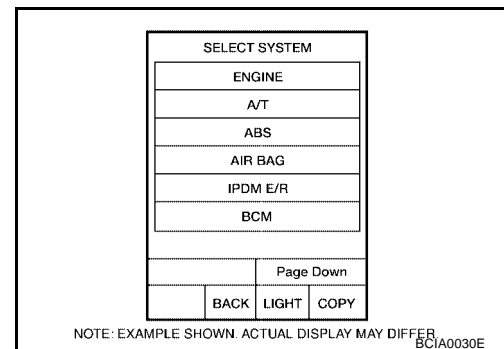
NOTE:

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-478, "Diagnostic Procedure"](#).



Ⓟ WITH GST

Follow the procedure “With CONSULT-II”.

DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

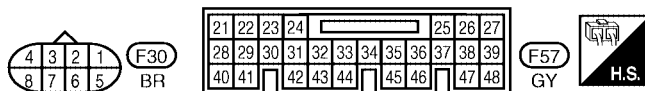
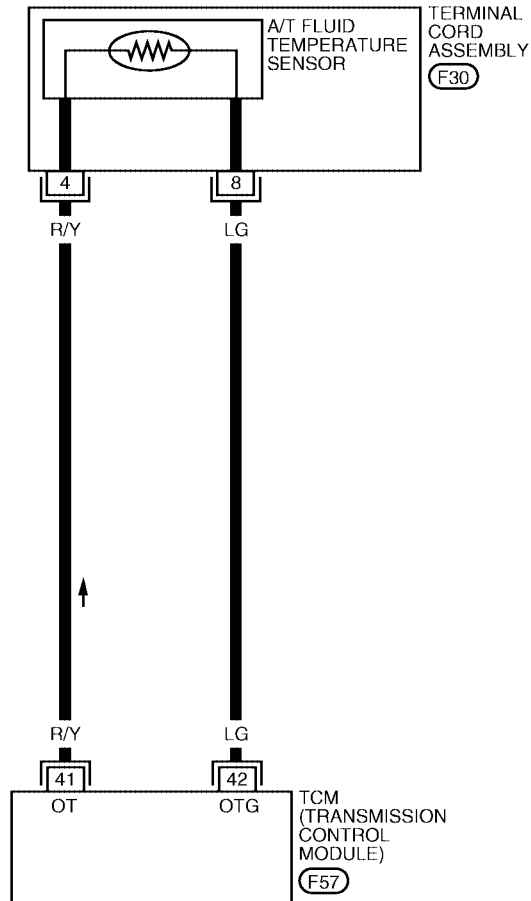
[RE5F22A]

Wiring Diagram — AT — FTS

ECS009E2

AT-FTS-01

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




WCWA0189E

DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

[RE5F22A]

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

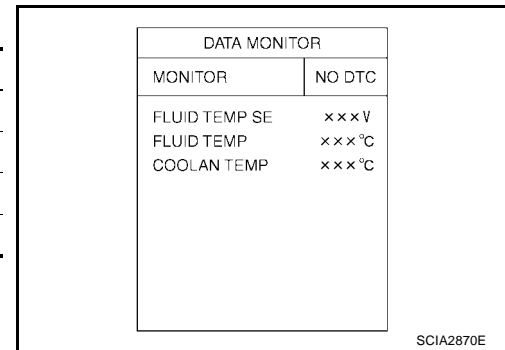
ECS009E3

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".

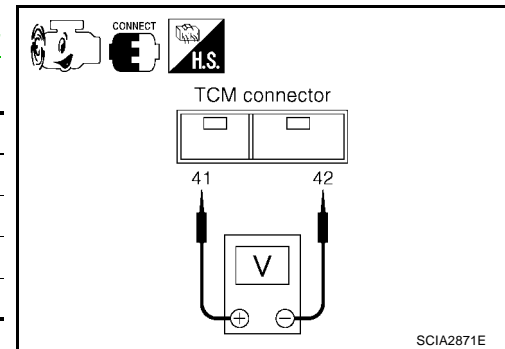
| Item name | Condition | Display value (Approx.) |
|--------------------------|---------------|-------------------------|
| Fluid temperature sensor | 0°C (32°F) | 4.0V |
| | 20°C (68°F) | 3.0V |
| | 80°C (176°F) | 0.8V |
| | 100°C (212°F) | 0.5V |



ⓧ Without CONSULT-II

1. Start engine.
2. Check voltage between TCM connector terminals 41 and 42 while warming up A/T. Refer to [AT-477, "Wiring Diagram — AT — FTS"](#).

| Connector | Terminal (Wire color) | Temperature | Voltage (Approx.) |
|-----------|-----------------------------|---------------|-------------------|
| F57 | 41 (R/Y) - 42 (LG) (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.

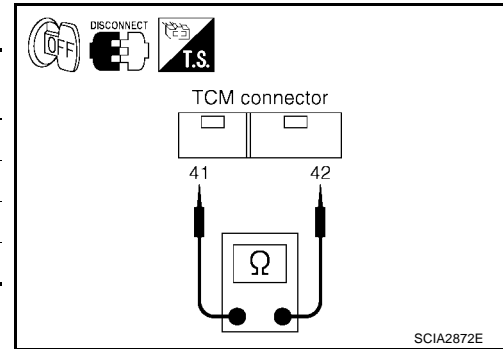
OK or NG

- 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 (Wire color) | Temperature | Resistance (Approx.) |
|-----------|-----------------------------|---------------|----------------------|
| F57 | 41 (R/Y) - 42 (LG) (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.

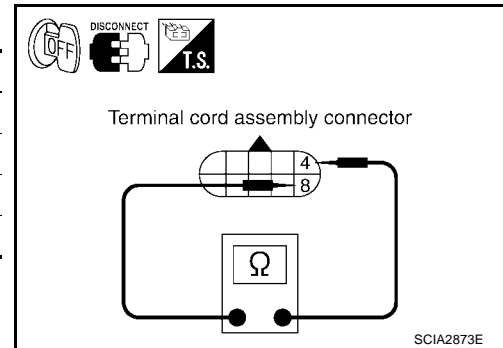
OK or NG

- 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.

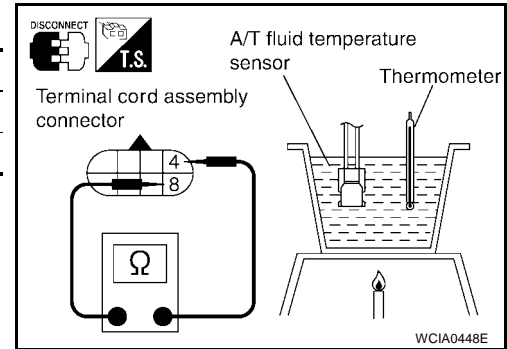
5. CHECK A/T FLUID TEMPERATURE SENSOR

1. Remove side cover. Refer to [AT-622, "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 terminal cord assembly. Refer to [AT-622, "Terminal Cord Assembly"](#) .



6. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-476, "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-452, "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.

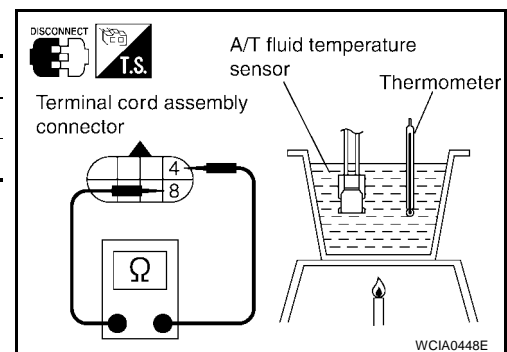
Component Inspection A/T FLUID TEMPERATURE SENSOR

ECS009E4

1. Remove side cover. Refer to [AT-622, "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 terminal cord assembly. Refer to [AT-622, "Terminal Cord Assembly"](#) .



DTC P0711 FLUID TEMPERATURE SENSOR PERFORMANCE

[RE5F22A]

DTC P0711 FLUID TEMPERATURE SENSOR PERFORMANCE

PF3:31940

Description

ECS009E5

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

On Board Diagnosis Logic

ECS009E6

- 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

ECS009E7

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

DTC Confirmation Procedure

ECS009E8

CAUTION:

Always drive vehicle at a safe speed.

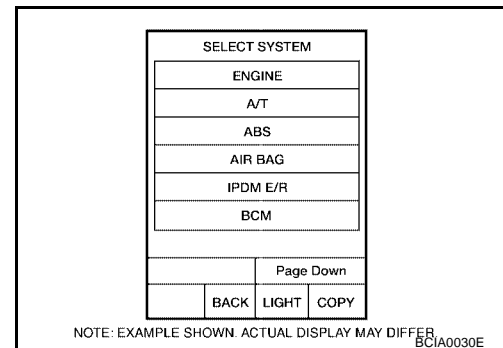
NOTE:

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-483, "Diagnostic Procedure"](#).



WITH GST

Follow the procedure "With CONSULT-II".

DTC P0711 FLUID TEMPERATURE SENSOR PERFORMANCE

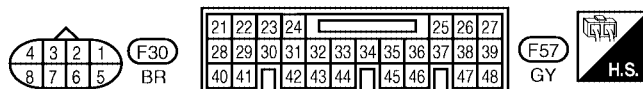
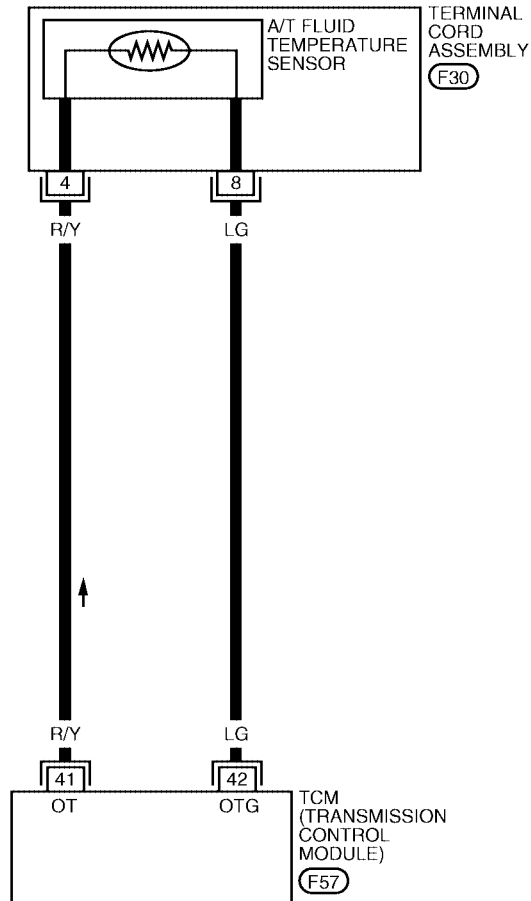
[RE5F22A]

Wiring Diagram — AT — FTSP

ECS009E9

AT-FTSP-01

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




WCWA0190E

DTC P0711 FLUID TEMPERATURE SENSOR PERFORMANCE

[RE5F22A]

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

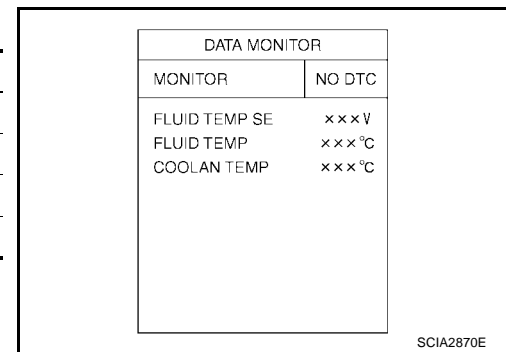
ECS009EA

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".

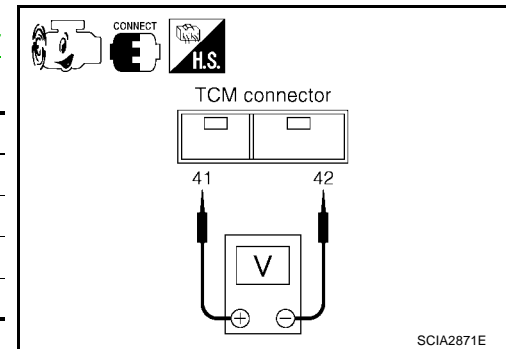
| Item name | Condition | Display value (Approx.) |
|--------------------------|---------------|-------------------------|
| Fluid temperature sensor | 0°C (32°F) | 4.0V |
| | 20°C (68°F) | 3.0V |
| | 80°C (176°F) | 0.8V |
| | 100°C (212°F) | 0.5V |



Without CONSULT-II

1. Start engine.
2. Check voltage between TCM connector terminals 41 and 42 while warming up A/T. Refer to [AT-482, "Wiring Diagram — AT — FTSP"](#).

| Connector | Terminal (Wire color) | Temperature | Voltage (Approx.) |
|-----------|-----------------------------|---------------|-------------------|
| F57 | 41 (R/Y) - 42 (LG) (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.

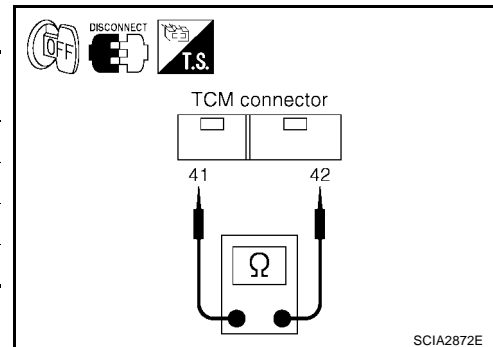
OK or NG

- 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 (Wire color) | Temperature | Resistance (Approx.) |
|-----------|-----------------------------|---------------|----------------------|
| F57 | 41 (R/Y) - 42 (LG) (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.

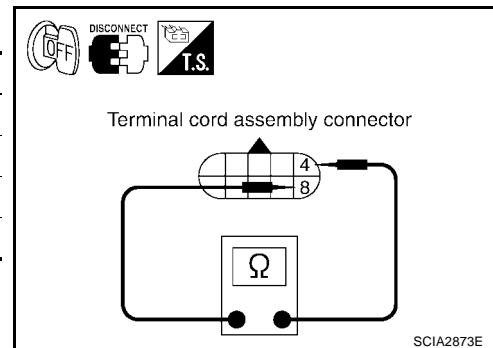
OK or NG

- 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

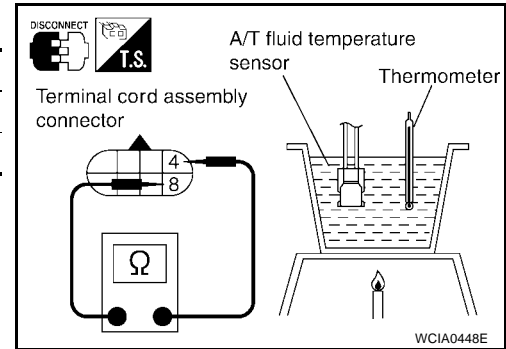
1. Remove side cover. Refer to [AT-622, "Side cover"](#) .
2. Disconnect A/T fluid temperature sensor.
3. Check resistance between terminals 4 and 8.

| 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-622, "Terminal Cord Assembly"](#) .



6. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-481, "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-452, "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**

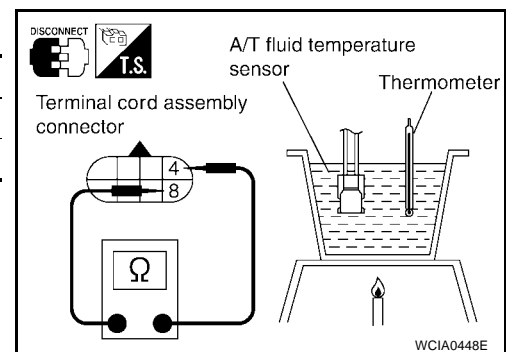
NG >> Repair or replace damaged parts.

Component Inspection A/T FLUID TEMPERATURE SENSOR

1. Remove side cover. Refer to [AT-622, "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-622, "Terminal Cord Assembly"](#) .



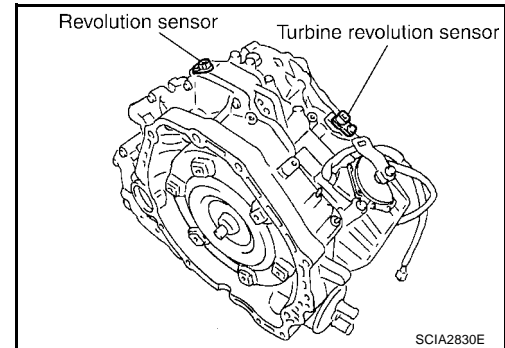
DTC P0717 TURBINE REVOLUTION SENSOR CIRCUIT

PF3:31935

Description

ECS009EC

- 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

ECS009ED

- 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

ECS009EE

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

DTC Confirmation Procedure

ECS009EF

CAUTION:

Always drive vehicle at a safe speed.

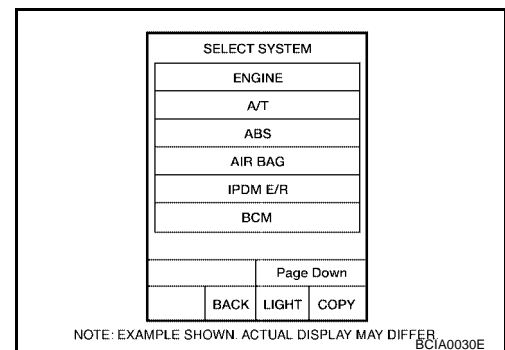
NOTE:

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-488, "Diagnostic Procedure"](#).



WITH GST

Follow the procedure "With CONSULT-II".

DTC P0717 TURBINE REVOLUTION SENSOR CIRCUIT

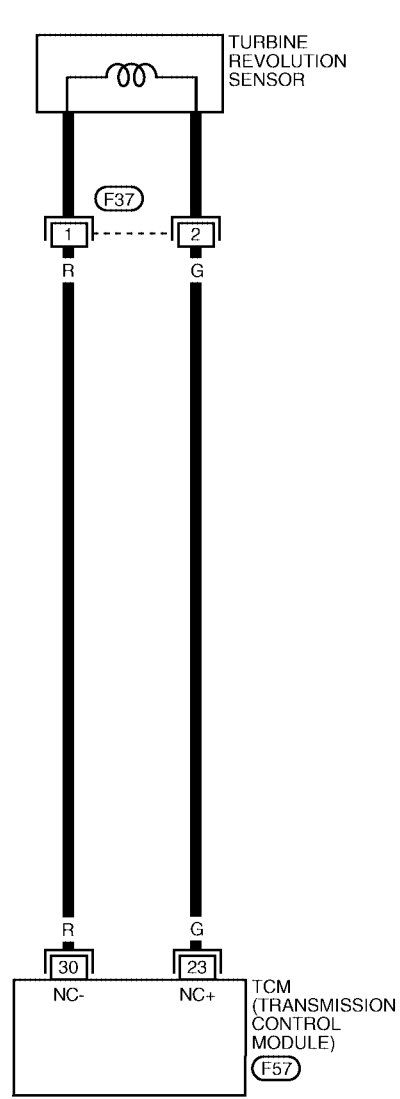
[RE5F22A]

Wiring Diagram — AT — TRSC

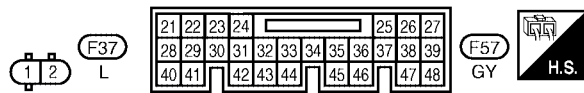
ECS009EG

AT-TRSC-01

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



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






WCWA0191E

DTC P0717 TURBINE REVOLUTION SENSOR CIRCUIT

[RE5F22A]

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

ECS009EH

1. CHECK TURBINE REVOLUTION SENSOR CIRCUIT

④ 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. |

| DATA MONITOR | |
|--------------|---------|
| MONITOR | NO DTC |
| ENGINE SPEED | xxx rpm |
| TURBINE REV | xxx rpm |
| LOCK-UP | ON |

SCIA2924E

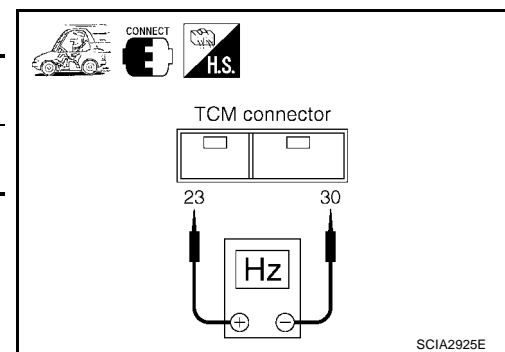
⊗ Without CONSULT-II

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

| Connector | Terminal (Wire color) | Condition | Data (Approx.) |
|-----------|--------------------------|--|----------------|
| F57 | 23 (G) - 30 (R) (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-489, "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-486, "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-452, "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
TURBINE REVOLUTION SENSOR

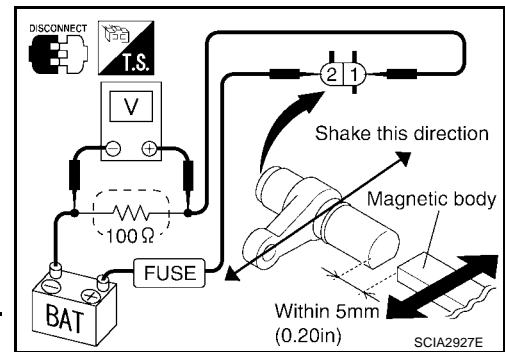
ECS009E/

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 [RE5F22A]

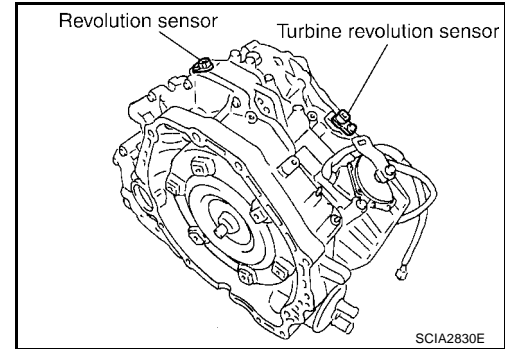
DTC P0722 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR) CIRCUIT

PFP:31935

Description

ECS009EJ

- 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

ECS009EK

- 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

ECS009EL

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

DTC Confirmation Procedure

ECS009EM

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

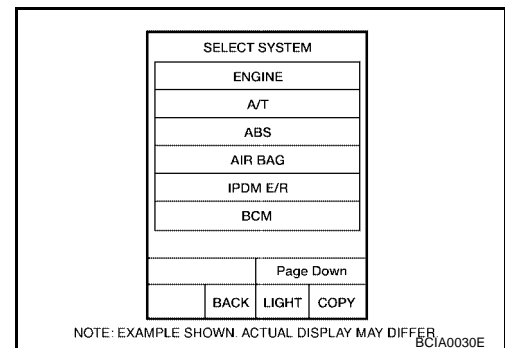
1. Turn ignition switch "ON". (Do not start engine.)
2. Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
3. Start engine.
4. Drive vehicle and check for an increase of "VHCL/S SE-A/T" value in response to "VHCL/S SE-MTR" value.
If the check result is NG, go to [AT-492, "Diagnostic Procedure"](#).
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-492, "Diagnostic Procedure"](#).



WITH GST

Follow the procedure "With CONSULT-II".

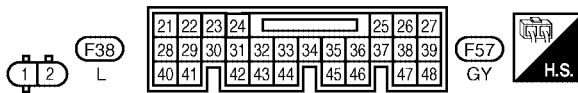
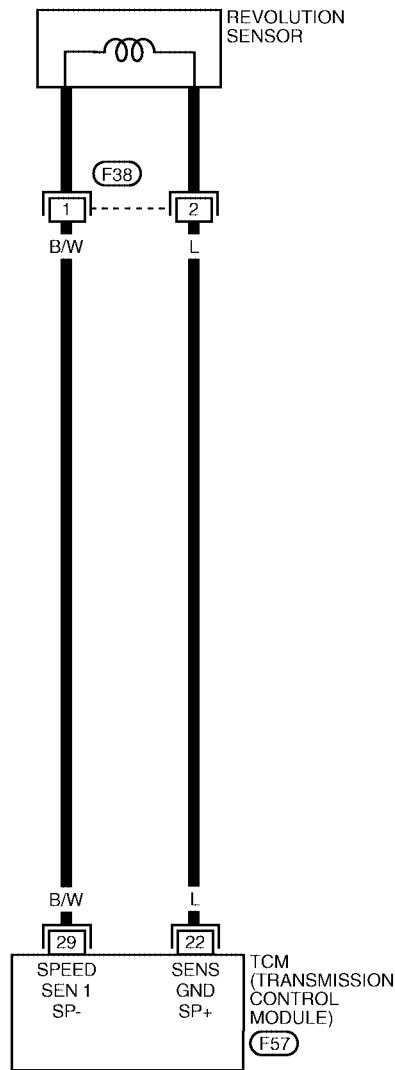
DTC P0722 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR) CIRCUIT [RE5F22A]

Wiring Diagram — AT — VSSATC

ECS009EN

AT-VSSATC-01




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



WCWA0192E

DTC P0722 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR) CIRCUIT [RE5F22A]

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

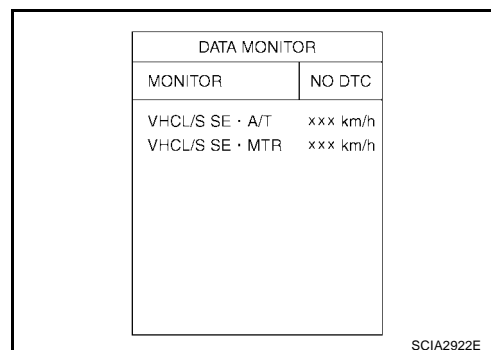
ECS009E0

1. CHECK REVOLUTION SENSOR CIRCUIT

With CONSULT-II

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

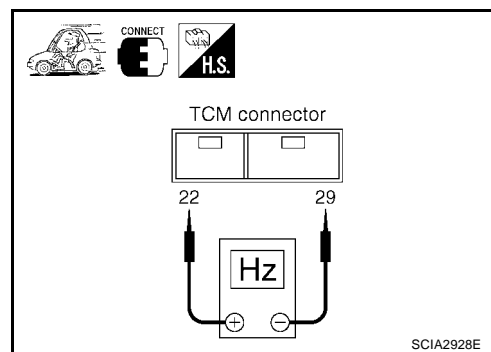
| Monitor item | Condition | Specification |
|--------------|----------------|--|
| VHCL/S SE-AT | During driving | Approximately matches the speedometer reading. |



Without CONSULT-II

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

| Connector | Terminal (Wire color) | Condition | Data (Approx.) |
|-----------|----------------------------|--|----------------|
| F57 | 22 (L) - 29 (B/W) (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-493, "Component Inspection"](#).

OK or NG

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

DTC P0722 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR) CIRCUIT [RE5F22A]

3. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-490, "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-452, "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 REVOLUTION SENSOR

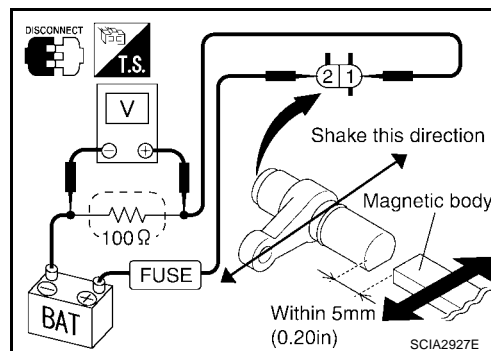
ECS009EP

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

ECS009EQ

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

On Board Diagnosis Logic

ECS009ER

- 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

ECS009ES

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

DTC Confirmation Procedure

ECS009ET

CAUTION:

Always drive vehicle at a safe speed.

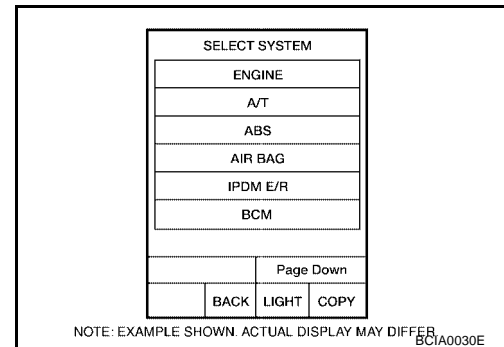
NOTE:

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

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

④ WITH CONSULT-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-494, "Diagnostic Procedure"](#) .



ECS009EU

Diagnostic Procedure

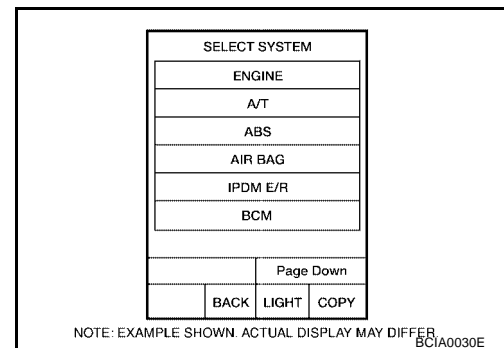
1. CHECK DTC WITH ECM

④ 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-455, "CONSULT-II Function \(TCM\)"](#) .

OK or NG

- OK >> GO TO 2.
- NG >> Check the DTC detected item, go to [EC-627, "INDEX FOR DTC"](#) .
- If CAN communication line is detected, go to [AT-464, "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-1287, "IGNITION SIGNAL"](#).

| DATA MONITOR | |
|--------------|---------|
| MONITOR | NO DTC |
| ENGINE SPEED | xxx rpm |
| ACCELE ANGLE | xxx % |

SCIA2929E

3. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-494, "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-452, "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

PF3:31940

Description

ECS009EV

- 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

ECS009EW

- 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

ECS009EX

- 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

ECS009EY

CAUTION:

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

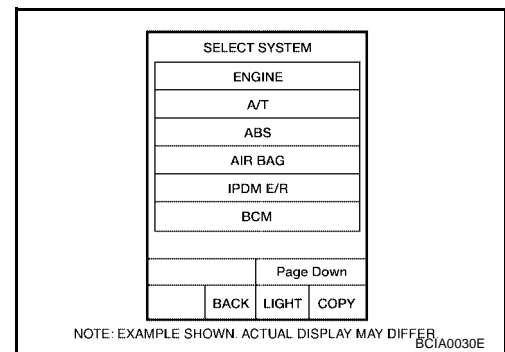
NOTE:

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-692, "VEHICLE SPEED WHEN SHIFTING GEARS - 9J500 MODELS" .)]
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-498, "Diagnostic Procedure"](#) .



WITH GST

Follow the procedure "With CONSULT-II".



DTC P0731 A/T 1ST GEAR FUNCTION

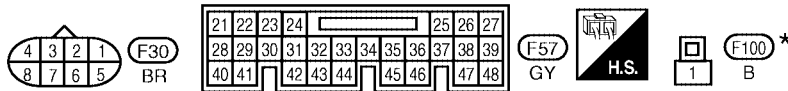
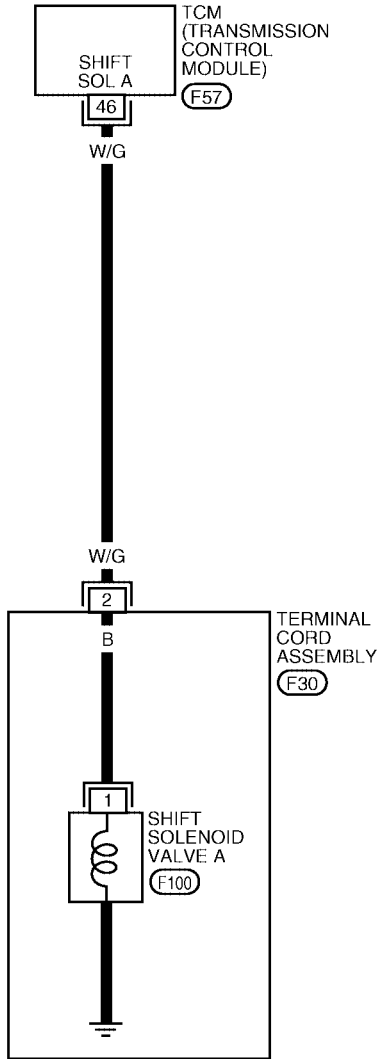
[RE5F22A]

Wiring Diagram — AT — 1ST SIG

ECS009EZ

AT-1STSIG-01

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




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

WCWA0193E

DTC P0731 A/T 1ST GEAR FUNCTION

[RE5F22A]

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

ECS009F0

1. CHECK SHIFT SOLENOID VALVE A CIRCUIT

Perform "Diagnostic Procedure" for DTC P0750. Refer to [AT-532, "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-622, "Control Valve Assembly"](#).
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#).
3. Check the following item:
 - 2nd brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#).
 - 2nd coast brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#), [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#).
 - One-way clutch No.1. Refer to [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#).
 - One-way clutch No.2. Refer to [AT-633, "DISASSEMBLY"](#).

OK or NG

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

3. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-496, "DTC Confirmation Procedure"](#).

OK or NG

- OK >> **INSPECTION END**
- NG >> Replace control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#).

DTC P0732 A/T 2ND GEAR FUNCTION

PF3:31940

Description

ECS009F1

- 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

ECS009F2

- 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

ECS009F3

- 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

ECS009F4

CAUTION:

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

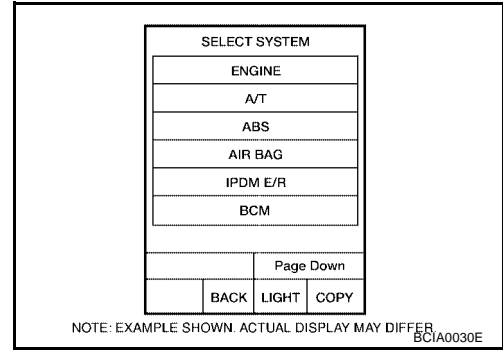
NOTE:

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-692, "VEHICLE SPEED WHEN SHIFTING GEARS - 9J500 MODELS"](#) .)]
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-503, "Diagnostic Procedure"](#) .



Ⓟ WITH GST

Follow the procedure "With CONSULT-II".



DTC P0732 A/T 2ND GEAR FUNCTION

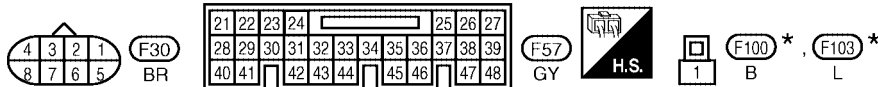
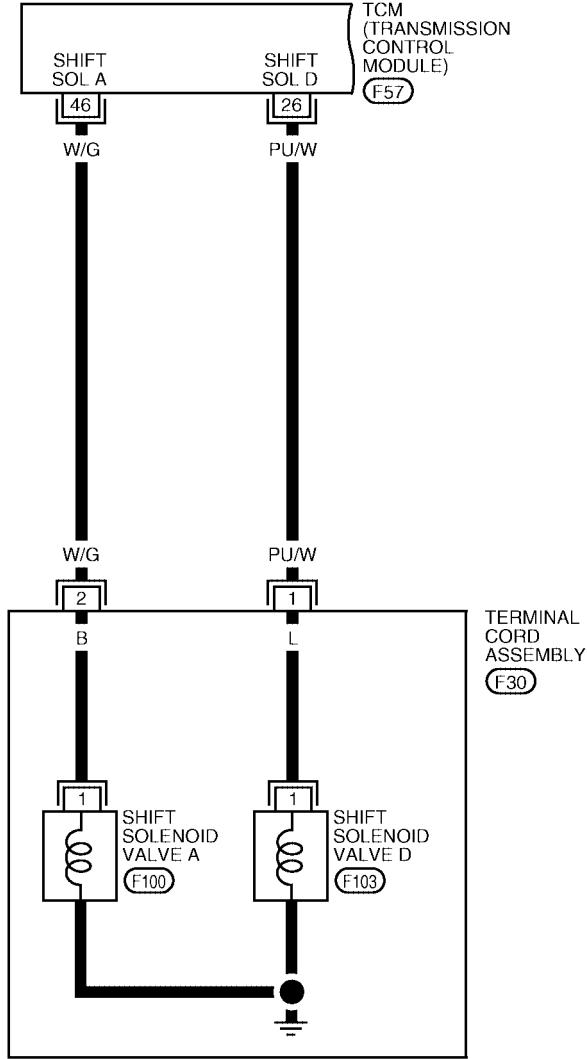
[RE5F22A]

Wiring Diagram — AT — 2NDSIG

ECS009F5

AT-2NDSIG-01

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



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

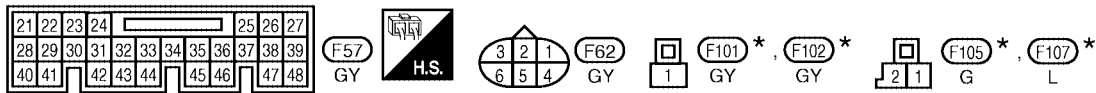
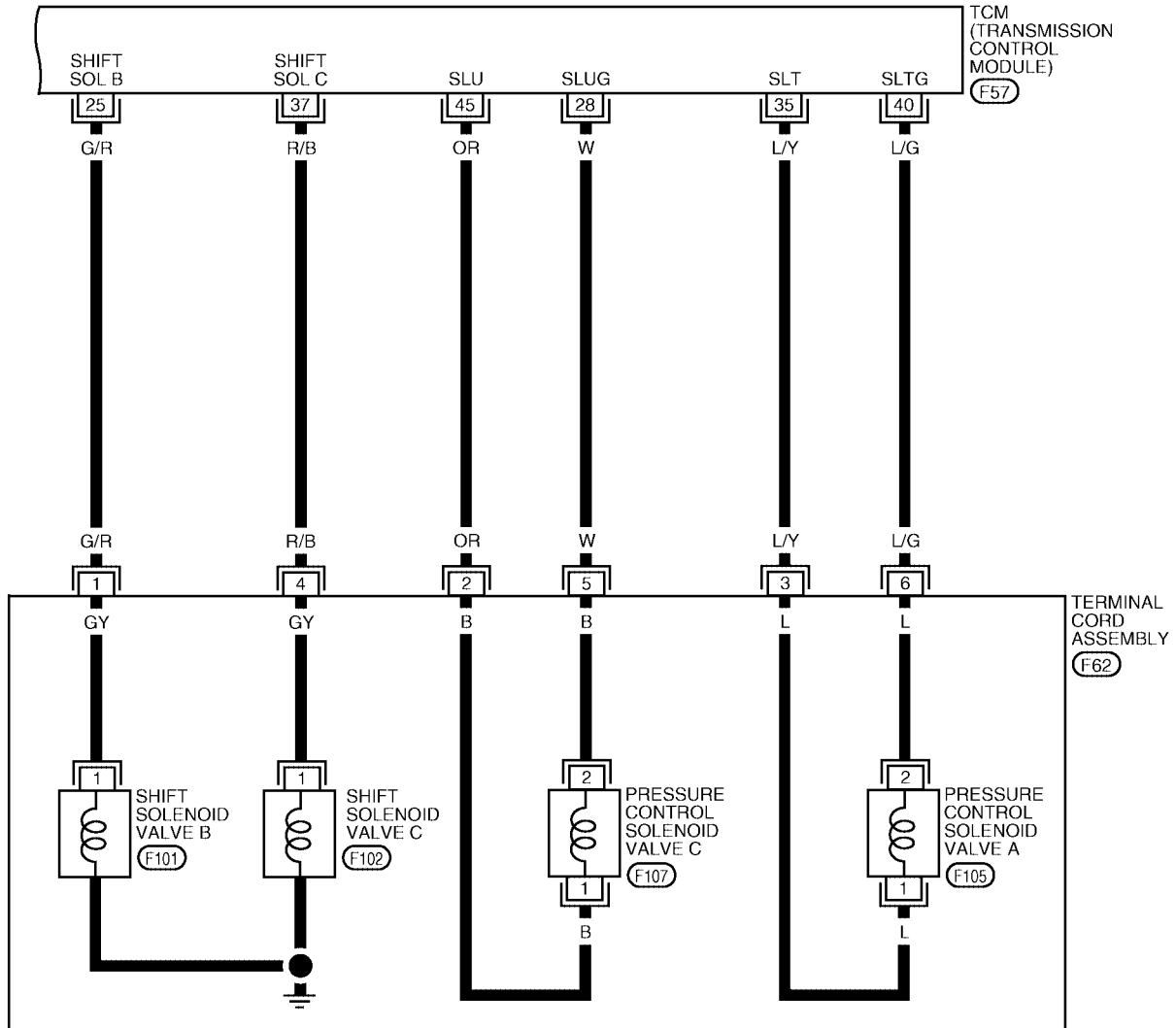
WCWA0194E

DTC P0732 A/T 2ND GEAR FUNCTION

[RE5F22A]

AT-2NDSIG-02

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









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

WCWA0195E

DTC P0732 A/T 2ND GEAR FUNCTION

[RE5F22A]

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 | PU/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 | OR | 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

ECS009F6

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform "Diagnostic Procedure" for the following DTCs.

- "DTC P0750 SHIFT SOLENOID VALVE A" (Refer to [AT-532, "Diagnostic Procedure"](#) .)
- "DTC P0755 SHIFT SOLENOID VALVE B" (Refer to [AT-537, "Diagnostic Procedure"](#) .)
- "DTC P0760 SHIFT SOLENOID VALVE C" (Refer to [AT-542, "Diagnostic Procedure"](#) .)
- "DTC P0765 SHIFT SOLENOID VALVE D" (Refer to [AT-552, "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-527, "Diagnostic Procedure"](#) .)
- "DTC P0795 PRESSURE CONTROL SOLENOID VALVE C" (Refer to [AT-571, "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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following item:
 - U/D brake. Refer to [AT-633, "DISASSEMBLY"](#) .
 - 2nd coast brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#) , [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#) .
 - 2nd brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#) .
 - One-way clutch No.1. Refer to [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#) .
 - One-way clutch No.2. Refer to [AT-633, "DISASSEMBLY"](#) .
 - B5 brake. Refer to [AT-660, "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-499, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
NG >> Replace control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#) .

DTC P0733 A/T 3RD GEAR FUNCTION

PF3:31940

Description

ECS009F7

- 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

ECS009F8

- 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

ECS009F9

- 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

ECS009FA

CAUTION:

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

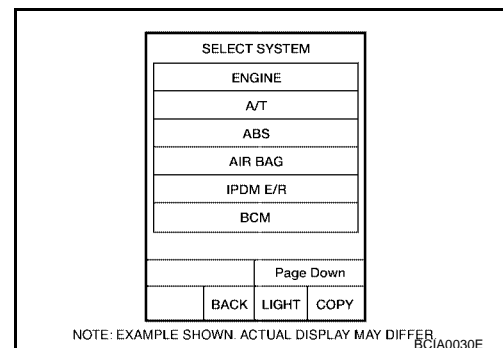
NOTE:

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



DTC P0733 A/T 3RD GEAR FUNCTION

[RE5F22A]

[Vehicle speed and accelerator angle: 3rd gear position retainable condition. (Refer to [AT-692](#), "[VEHICLE SPEED WHEN SHIFTING GEARS - 9J500 MODELS](#)" .)]

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-509](#), "[Diagnostic Procedure](#)".



WITH GST

Follow the procedure "With CONSULT-II".



DTC P0733 A/T 3RD GEAR FUNCTION

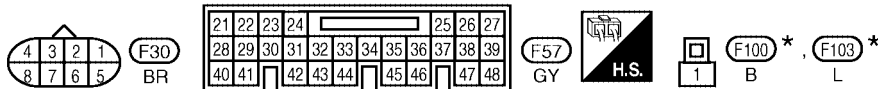
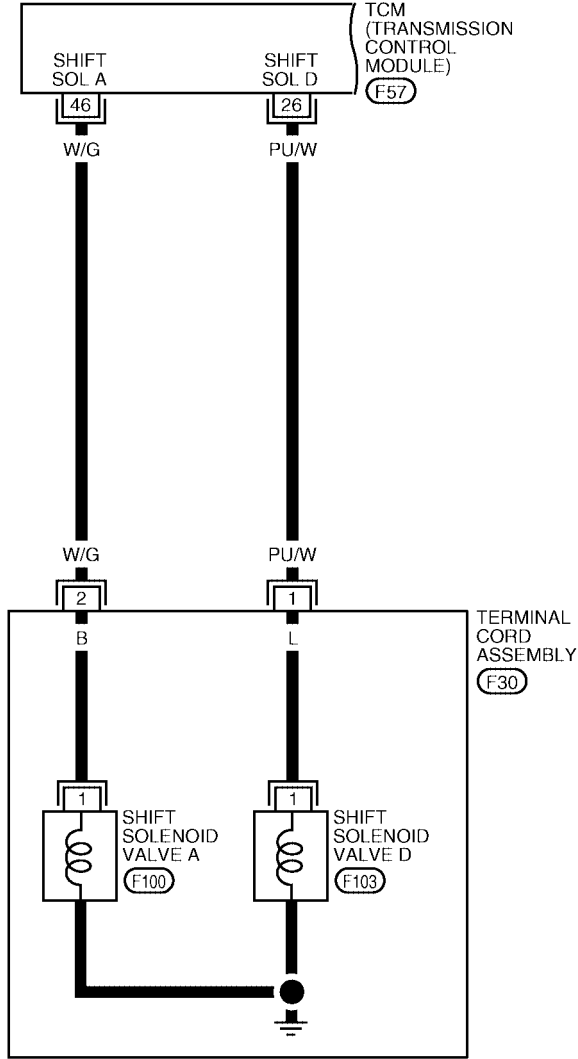
[RE5F22A]

Wiring Diagram — AT — 3RDSIG

ECS009FB

AT-3RDSIG-01

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



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

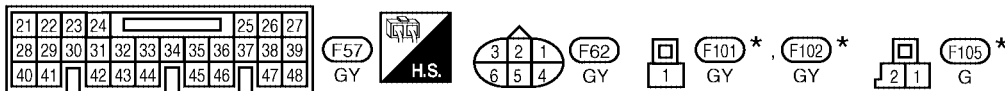
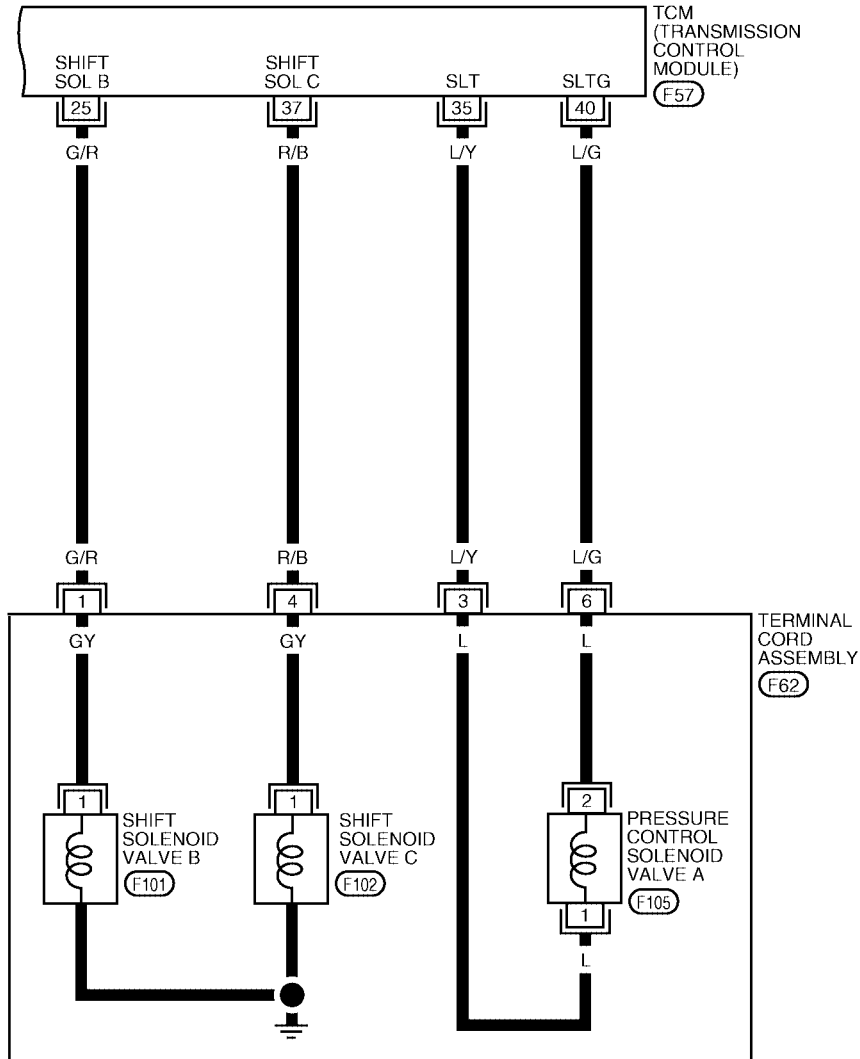
WCWA0196E

DTC P0733 A/T 3RD GEAR FUNCTION

[RE5F22A]

AT-3RDSIG-02

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









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

WCWA0197E

DTC P0733 A/T 3RD GEAR FUNCTION

[RE5F22A]

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 | PU/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

ECS009FC

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform "Diagnostic Procedure" for the following DTCs.

- "DTC P0750 SHIFT SOLENOID VALVE A" (Refer to [AT-532, "Diagnostic Procedure"](#) .)
- "DTC P0755 SHIFT SOLENOID VALVE B" (Refer to [AT-537, "Diagnostic Procedure"](#) .)
- "DTC P0760 SHIFT SOLENOID VALVE C" (Refer to [AT-542, "Diagnostic Procedure"](#) .)
- "DTC P0765 SHIFT SOLENOID VALVE D" (Refer to [AT-552, "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-527, "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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following item:
 - B5 brake. Refer to [AT-660, "Transaxle Case Cover & B5 Brake"](#) .
 - U/D clutch. Refer to [AT-633, "DISASSEMBLY"](#) .
 - U/D brake. Refer to [AT-633, "DISASSEMBLY"](#) .

OK or NG

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

4. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-505, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> Replace the control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#) .

DTC P0734 A/T 4TH GEAR FUNCTION

PFP:31940

Description

ECS009FD

- 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

ECS009FE

- 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

ECS009FF

- 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

ECS009FG

CAUTION:

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

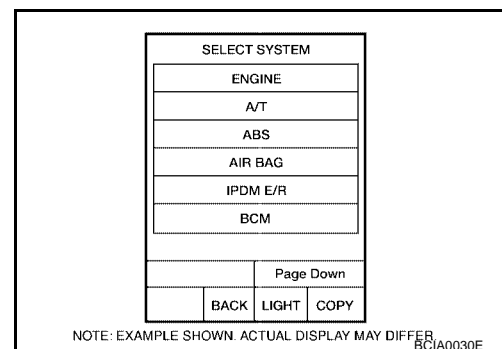
NOTE:

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



DTC P0734 A/T 4TH GEAR FUNCTION

[RE5F22A]

[Vehicle speed and accelerator angle: 4th gear position retainable condition. (Refer to [AT-692](#), "[VEHICLE SPEED WHEN SHIFTING GEARS - 9J500 MODELS](#)" .)]

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-514](#), "[Diagnostic Procedure](#)".



WITH GST

Follow the procedure "With CONSULT-II".

DTC P0734 A/T 4TH GEAR FUNCTION

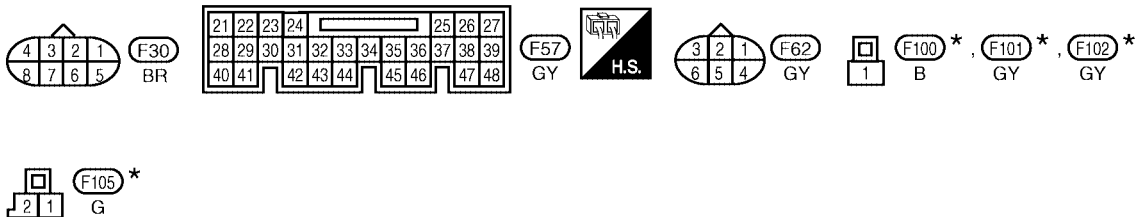
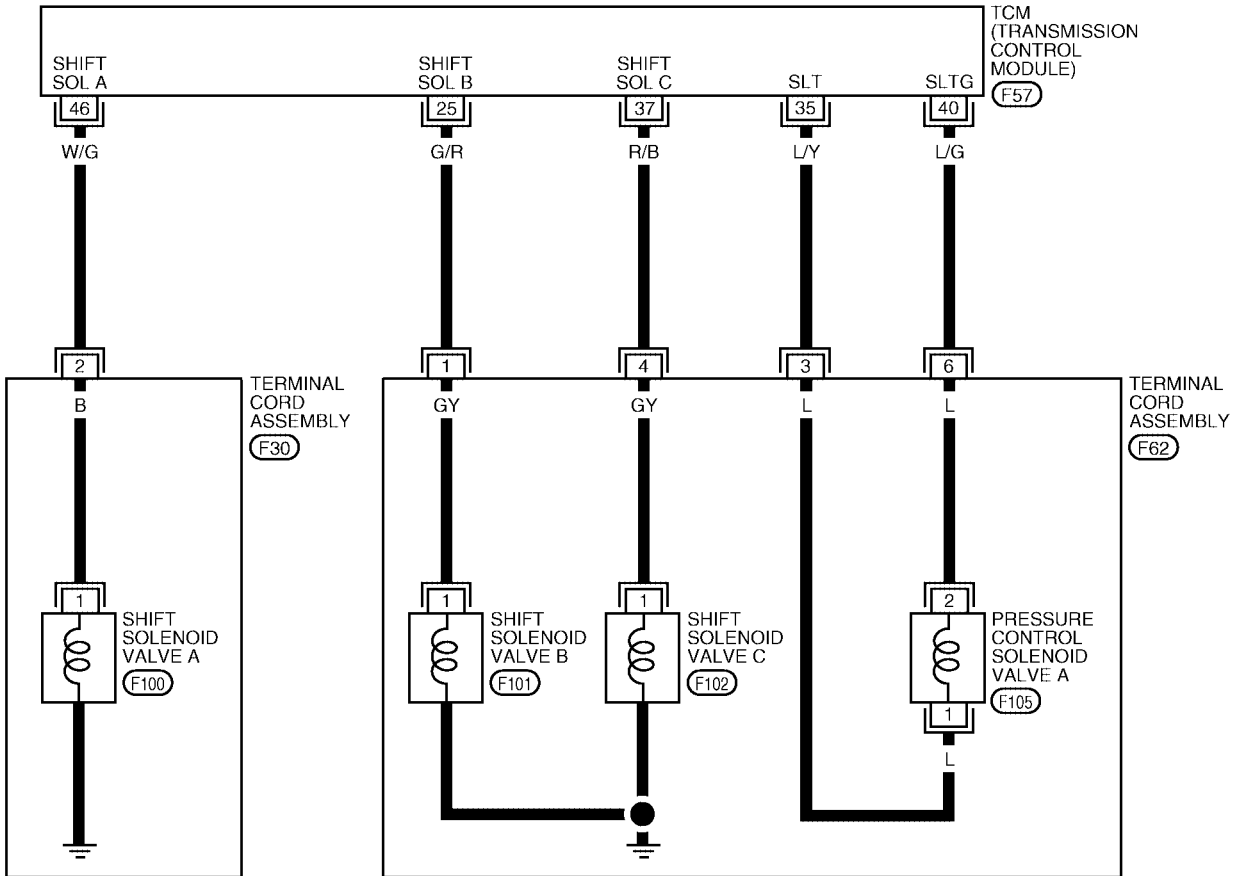
[RE5F22A]

Wiring Diagram — AT — 4THSIG

ECS009FH

AT-4THSIG-01

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








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

WCWA0198E

DTC P0734 A/T 4TH GEAR FUNCTION

[RE5F22A]

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

ECS009FI

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform "Diagnostic Procedure" for the following DTCs.

- "DTC P0750 SHIFT SOLENOID VALVE A" (Refer to [AT-532, "Diagnostic Procedure"](#) .)
- "DTC P0755 SHIFT SOLENOID VALVE B" (Refer to [AT-537, "Diagnostic Procedure"](#) .)
- "DTC P0760 SHIFT SOLENOID VALVE C" (Refer to [AT-542, "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-527, "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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following item:
 - Forward and direct clutch assembly. Refer to [AT-633, "DISASSEMBLY"](#) .
 - 2nd coast brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#) , [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#) .
 - U/D brake. Refer to [AT-633, "DISASSEMBLY"](#) .
 - U/D clutch. Refer to [AT-633, "DISASSEMBLY"](#) .
 - One-way clutch No.1. Refer to [AT-658, "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-511, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
 NG >> Replace the control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#) .

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DTC P0735 A/T 5TH GEAR FUNCTION

PF3:31940

Description

ECS009FJ

- 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

ECS009FK

- 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

ECS009FL

- 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
- 2nd coast brake
- One-way clutch No.1
- Hydraulic control circuit

DTC Confirmation Procedure

ECS009FM

CAUTION:

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

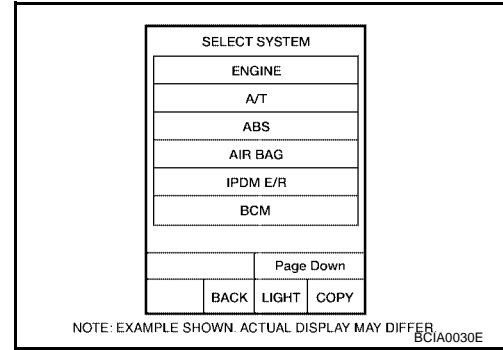
NOTE:

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-692, "VEHICLE SPEED WHEN SHIFTING GEARS - 9J500 MODELS" .)]
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-520, "Diagnostic Procedure"](#) .



WITH GST

Follow the procedure "With CONSULT-II".

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DTC P0735 A/T 5TH GEAR FUNCTION

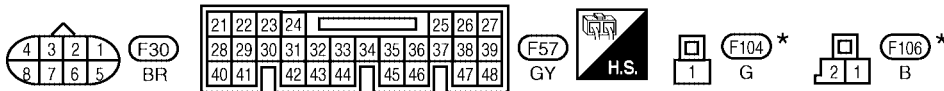
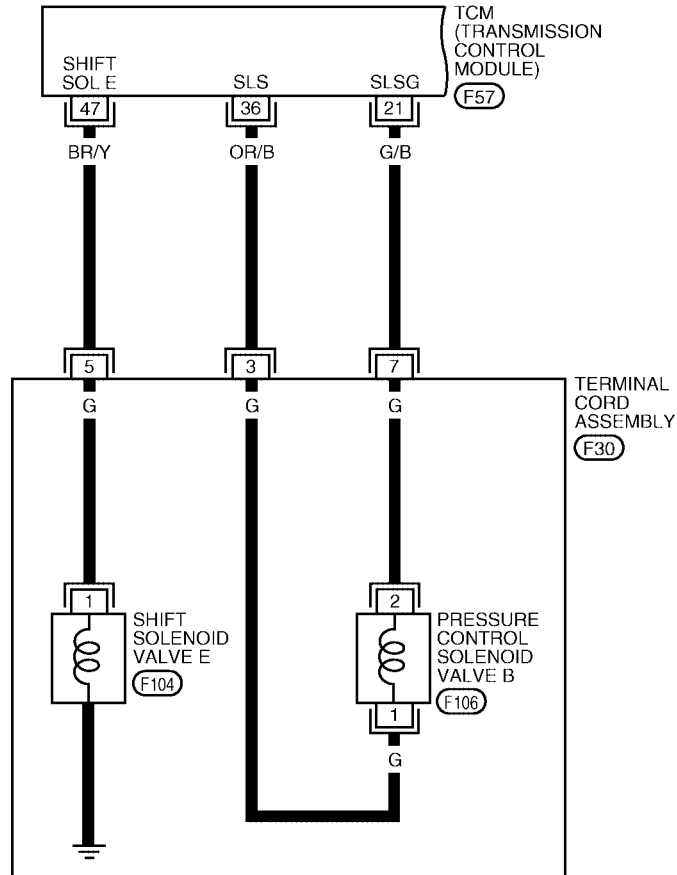
[RE5F22A]

Wiring Diagram — AT — 5THSIG

ECS009FN

AT-5THSIG-01

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



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

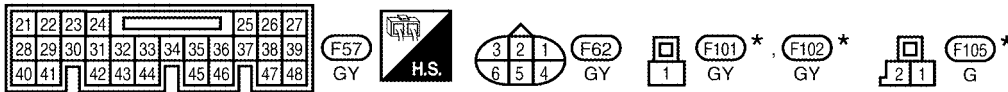
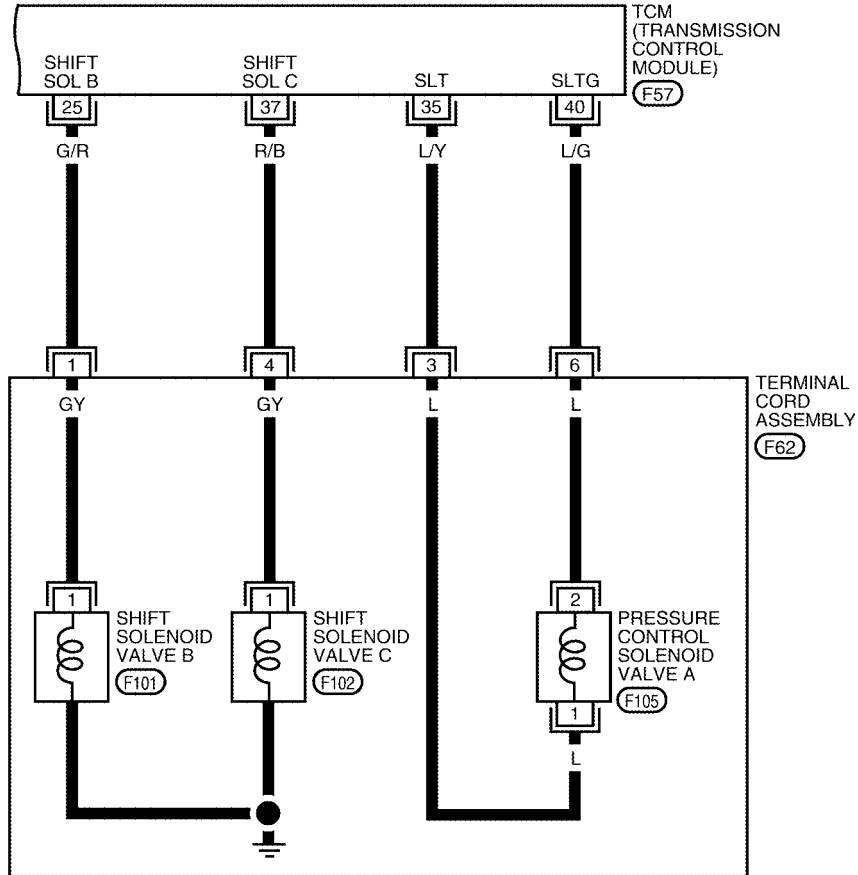
WCWA0199E

DTC P0735 A/T 5TH GEAR FUNCTION

[RE5F22A]

AT-5THSIG-02

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









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

WCWA0224E

DTC P0735 A/T 5TH GEAR FUNCTION

[RE5F22A]

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 | OR/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

ECS009FO

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform "Diagnostic Procedure" for the following DTCs.

- "DTC P0755 SHIFT SOLENOID VALVE B" (Refer to [AT-537, "Diagnostic Procedure"](#) .)
- "DTC P0760 SHIFT SOLENOID VALVE C" (Refer to [AT-542, "Diagnostic Procedure"](#) .)
- "DTC P0770 SHIFT SOLENOID VALVE E" (Refer to [AT-557, "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-527, "Diagnostic Procedure"](#) .)
- "DTC P0775 PRESSURE CONTROL SOLENOID VALVE B" (Refer to [AT-562, "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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following item:
 - Forward and direct clutch assembly. Refer to [AT-633, "DISASSEMBLY"](#) .
 - 2nd brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#) .
 - One-way clutch No.1. Refer to [AT-658, "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-516, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> Replace the control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#) .

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

PFP:31940

Description

ECS009FP

- 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

ECS009FQ

- 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

ECS009FR

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

DTC Confirmation Procedure

ECS009FS

CAUTION:

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

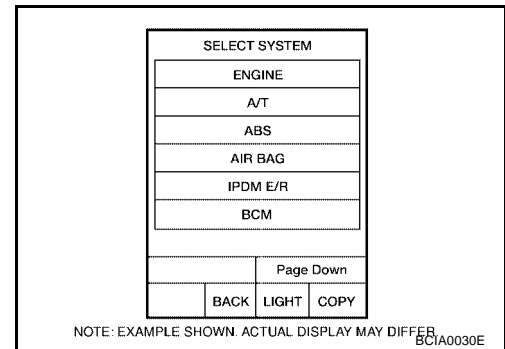
NOTE:

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-693](#), "VEHICLE SPEED WHEN PERFORMING AND RELEASING COMPLETE LOCK-UP- 9J500 Models" .)
[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-524](#), "Diagnostic Procedure" .



WITH GST

Follow the procedure "With CONSULT-II".

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

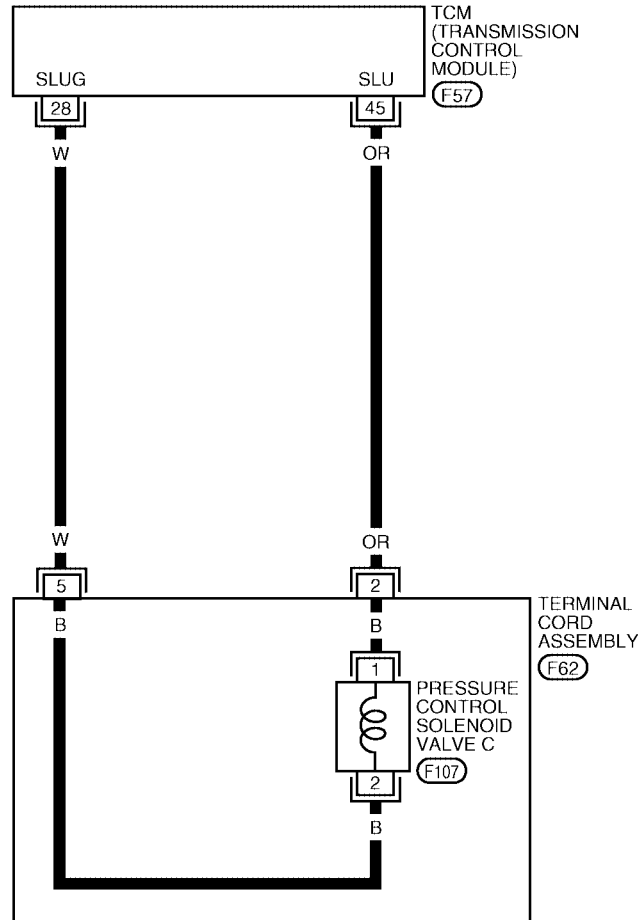
[RE5F22A]

Wiring Diagram — AT — TCCSIG

ECS009FT

AT-TCCSIG-01

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




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

WCWA0201E

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

[RE5F22A]

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 | OR | Pressure control solenoid valve C | | When engine is running with idle speed and setting selector lever to "P" position. | 300Hz |

Diagnostic Procedure

ECS009FU

1. CHECK SHIFT SOLENOID VALVE D CIRCUIT

Perform "Diagnostic Procedure" for DTC P0765. Refer to [AT-552, "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-571, "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-622, "Control Valve Assembly"](#).
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#).
3. Check the following item:
 - Torque converter clutch. Refer to [AT-633, "DISASSEMBLY"](#).

OK or NG

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

4. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-522, "DTC Confirmation Procedure"](#).

OK or NG

- OK >> **INSPECTION END**
- NG >> Replace the control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#).

DTC P0745 PRESSURE CONTROL SOLENOID VALVE A (LINE PRESSURE) [RE5F22A]

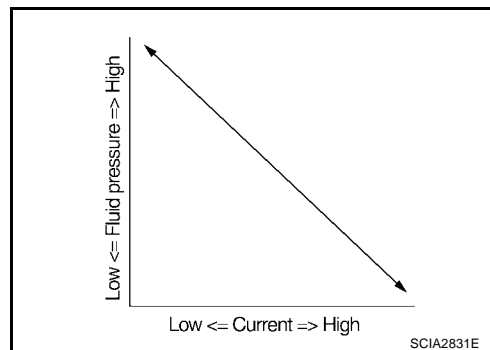
DTC P0745 PRESSURE CONTROL SOLENOID VALVE A (LINE PRESSURE)

PFP:31940

Description

ECS009FV

- 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

ECS009FW

- 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

ECS009FX

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

DTC Confirmation Procedure

ECS009FY

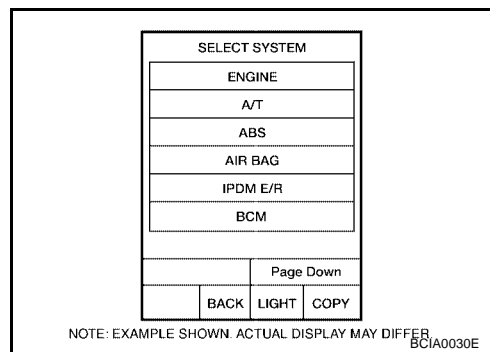
NOTE:

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-527, "Diagnostic Procedure"](#).



WITH GST

Follow the procedure "With CONSULT-II".

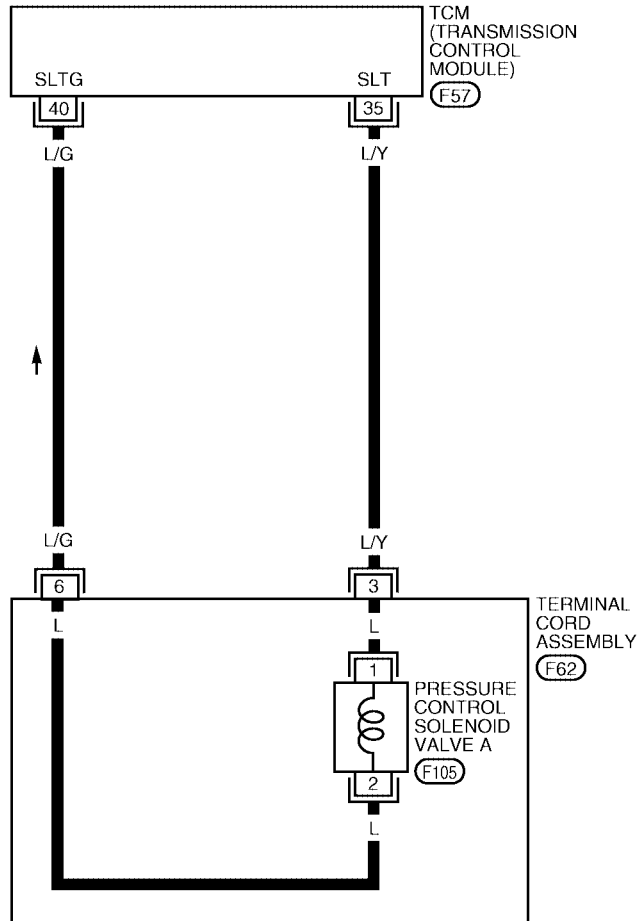
DTC P0745 PRESSURE CONTROL SOLENOID VALVE A (LINE PRESSURE) [RE5F22A]

Wiring Diagram — AT — PC/A

ECS009FZ

AT-PC/A-01

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




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

WCWA0202E

DTC P0745 PRESSURE CONTROL SOLENOID VALVE A (LINE PRESSURE)

[RE5F22A]

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

ECS009G0

1. CHECK PRESSURE CONTROL SOLENOID VALVE A SIGNAL

With CONSULT-II

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

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

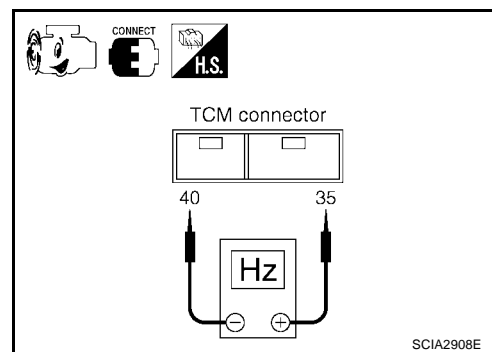
| DATA MONITOR | |
|--------------|--------|
| MONITOR | NO DTC |
| PC SOL A OUT | xxx A |
| PC SOL A MON | xxx A |
| PC SOL B OUT | xxx A |
| PC SOL B MON | xxx A |
| PC SOL C OUT | xxx A |
| PC SOL C MON | xxx A |

SCIA2907E

Without CONSULT-II

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

| Connector | Terminal (Wire color) | Condition | Data (Approx.) |
|-----------|-----------------------|--|----------------|
| F57 | 35 (L/Y) - 40 (L/G) | 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.

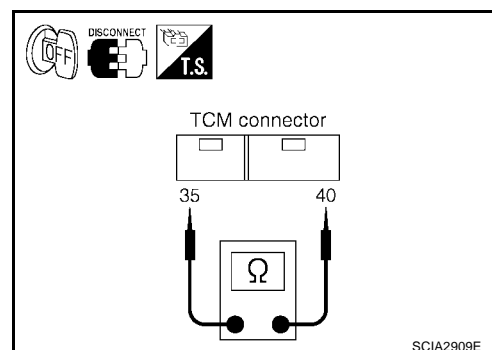
2. CHECK PRESSURE CONTROL SOLENOID VALVE A CIRCUIT

- Turn ignition switch "OFF".
- Disconnect the TCM connector.
- Check resistance between TCM connector terminals 35 and 40.

| Connector | Terminal (Wire color) | Condition | Resistance (Approx.) |
|-----------|-----------------------|--------------------------|----------------------|
| F57 | 35 (L/Y) - 40 (L/G) | Temperature: 20°C (68°F) | 5.0 - 5.6 Ω |

OK or NG

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



DTC P0745 PRESSURE CONTROL SOLENOID VALVE A (LINE PRESSURE) [RE5F22A]

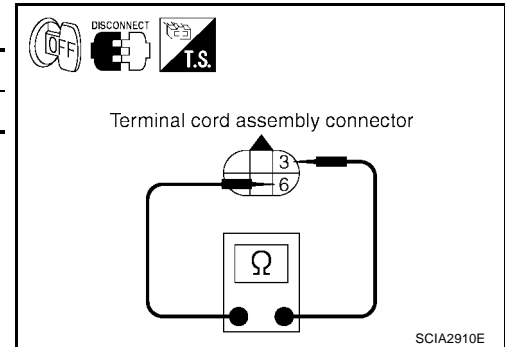
3. CHECK TERMINAL CORD ASSEMBLY WITH PRESSURE CONTROL SOLENOID VALVE A

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.

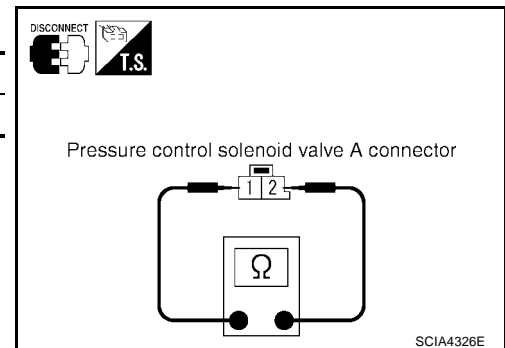
5. CHECK PRESSURE CONTROL SOLENOID VALVE A

1. Remove side cover. Refer to [AT-622, "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-622, "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-622, "Terminal Cord Assembly"](#) .

7. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-525, "DTC Confirmation Procedure"](#) .

OK or NG

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

DTC P0745 PRESSURE CONTROL SOLENOID VALVE A (LINE PRESSURE) [RE5F22A]

8. CHECK TCM

1. Check TCM input/output signal. Refer to [AT-452, "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.

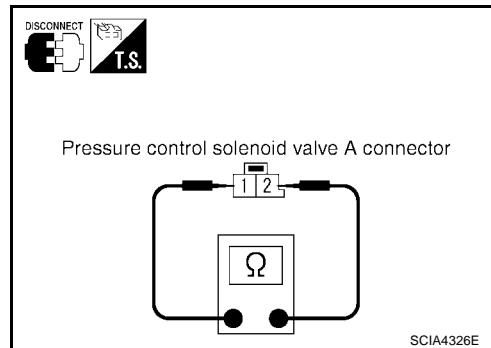
Component Inspection PRESSURE CONTROL SOLENOID VALVE A

ECS009G1

1. Remove side cover. Refer to [AT-622, "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-622, "Control Valve Assembly"](#) .



DTC P0750 SHIFT SOLENOID VALVE A

PFP:31940

Description

ECS009G2

- 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 | D1 , M1 | D2 , M2 | D3 , M3 | D4 , M4 | D5 , M5 | Reverse |
|------------------------|-------------|------------|------------|------------|------------|------------|
| Shift solenoid valve A | ON (Closed) | OFF (Open) | OFF (Open) | OFF (Open) | OFF (Open) | OFF (Open) |

On Board Diagnosis Logic

ECS009G3

- 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

ECS009G4

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

DTC Confirmation Procedure

ECS009G5

CAUTION:

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

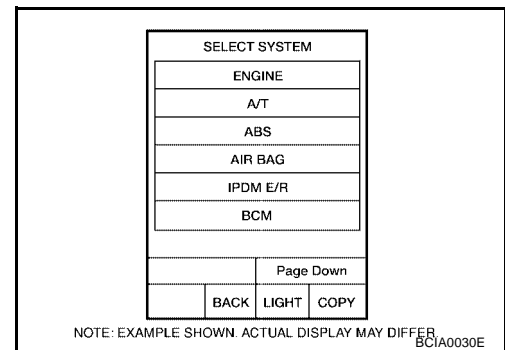
NOTE:

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-532, "Diagnostic Procedure"](#).



Ⓞ WITH GST

Follow the procedure “With CONSULT-II”.

DTC P0750 SHIFT SOLENOID VALVE A

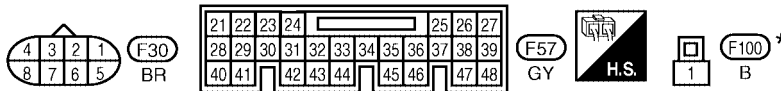
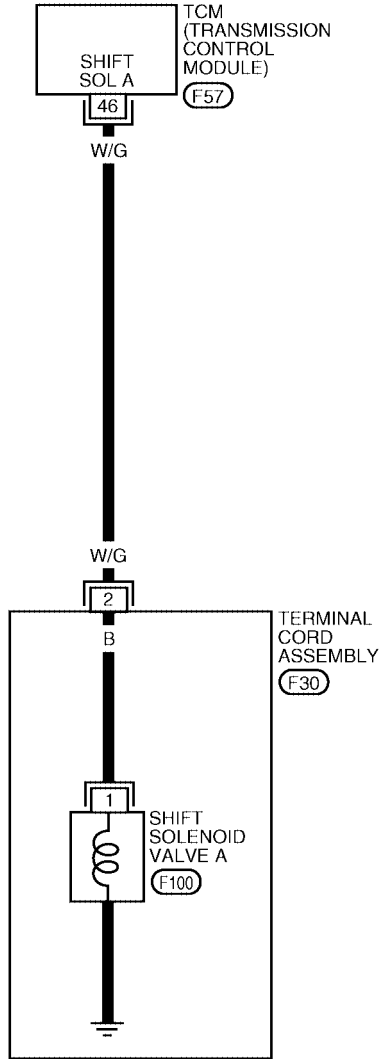
[RE5F22A]

Wiring Diagram — AT — SSV/A

ECS009G6

AT-SSV/A-01

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




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

WCWA0203E

DTC P0750 SHIFT SOLENOID VALVE A

[RE5F22A]

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

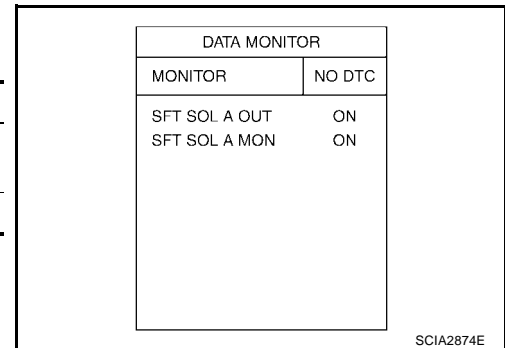
ECS009G7

1. CHECK SHIFT SOLENOID VALVE A SIGNAL

④ With CONSULT-II

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

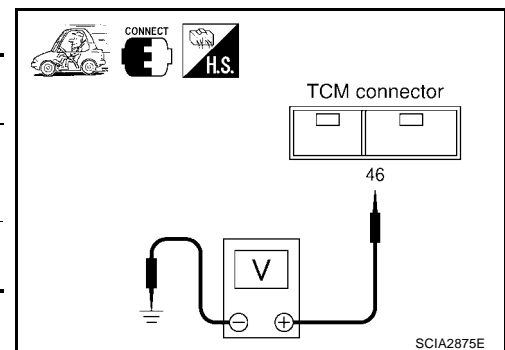
| Monitor item | Condition | Indication |
|--|---|------------|
| <ul style="list-style-type: none"> SFT SOL A OUT SFT SOL A MON | When shift solenoid valve A operates. (When driving in 1st gear.) | ON |
| | When shift solenoid valve A does not operate. | OFF |



⊗ Without CONSULT-II

- Drive vehicle.
- Check voltage between TCM connector terminal and ground.

| Connector | Terminal (Wire color) | Condition | Voltage (Approx.) |
|-----------|-----------------------|---|-------------------|
| F57 | 46 (W/G) - 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.

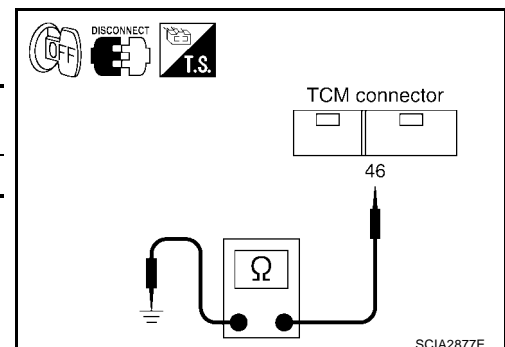
2. CHECK SHIFT SOLENOID VALVE A CIRCUIT

- Turn ignition switch "OFF".
- Disconnect the TCM connector.
- Check resistance between TCM connector terminal 46 and ground.

| Connector | Terminal (Wire color) | Condition | Resistance (Approx.) |
|-----------|-----------------------|--------------------------|----------------------|
| F57 | 46 (W/G) - Ground | Temperature: 20°C (68°F) | 11 - 16 Ω |

OK or NG

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



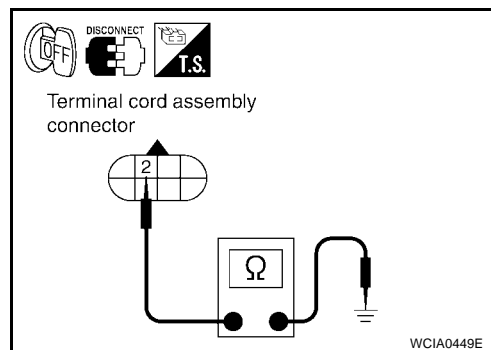
3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE A

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.

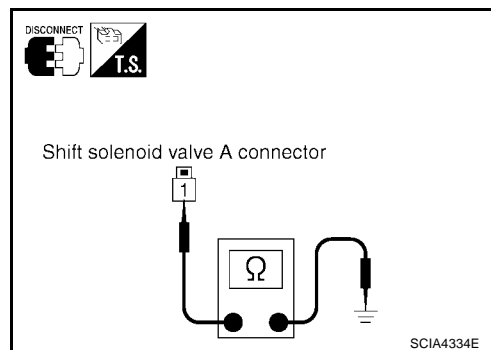
5. CHECK SHIFT SOLENOID VALVE A

1. Remove side cover. Refer to [AT-622, "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-622, "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-622, "Terminal Cord Assembly"](#).

7. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-530, "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-452, "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.

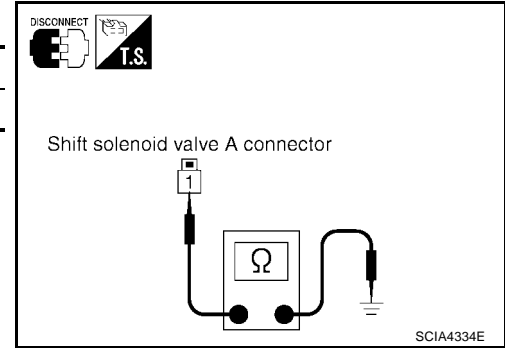
**Component Inspection
SHIFT SOLENOID VALVE A**

ECS009G8

1. Remove side cover. Refer to [AT-622, "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-622, "Control Valve Assembly"](#) .



DTC P0755 SHIFT SOLENOID VALVE B

PFP:31940

Description

ECS009G9

- 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 | D1 , M1 | D2 , M2 | D3 , M3 | D4 , M4 | D5 , M5 | Reverse |
|------------------------|-----------|--------------|--------------|--------------|-----------|--------------|
| Shift solenoid valve B | ON (Open) | OFF (Closed) | OFF (Closed) | OFF (Closed) | ON (Open) | OFF (Closed) |

On Board Diagnosis Logic

ECS009GA

- 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

ECS009GB

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

DTC Confirmation Procedure

ECS009GC

CAUTION:

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

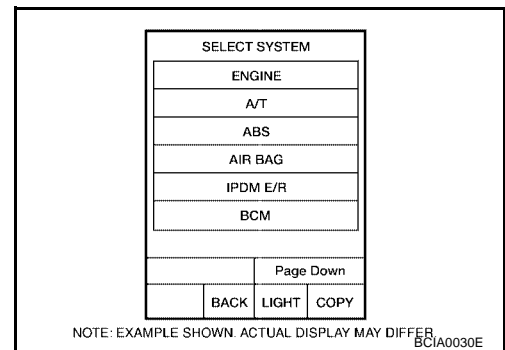
NOTE:

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-537, "Diagnostic Procedure"](#) .



Ⓟ WITH GST

Follow the procedure “With CONSULT-II”.

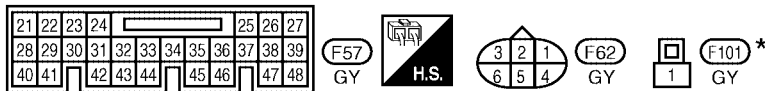
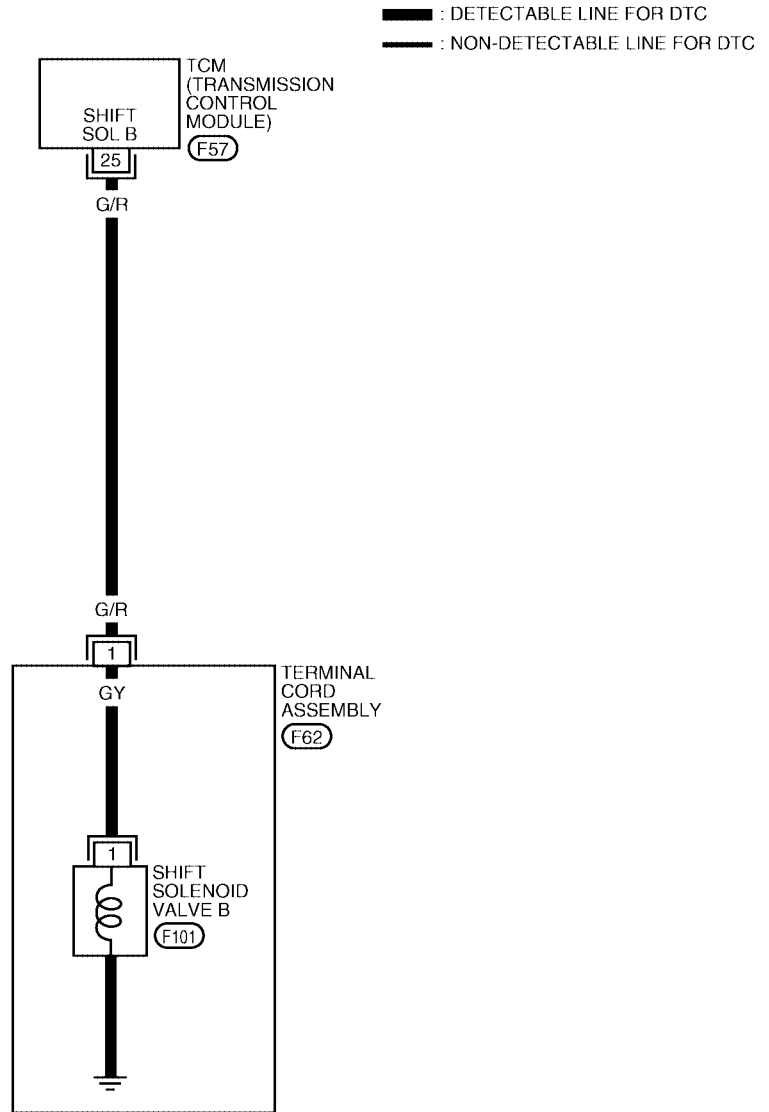
DTC P0755 SHIFT SOLENOID VALVE B

[RE5F22A]

Wiring Diagram — AT — SSV/B

ECS009GD

AT-SSV/B-01



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

WCWA0204E

DTC P0755 SHIFT SOLENOID VALVE B

[RE5F22A]

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

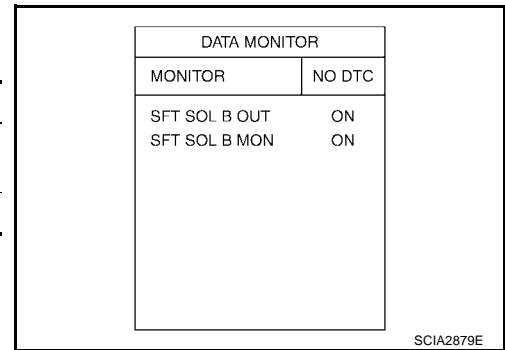
ECS009GE

1. CHECK SHIFT SOLENOID VALVE B SIGNAL

Ⓜ With CONSULT-II

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

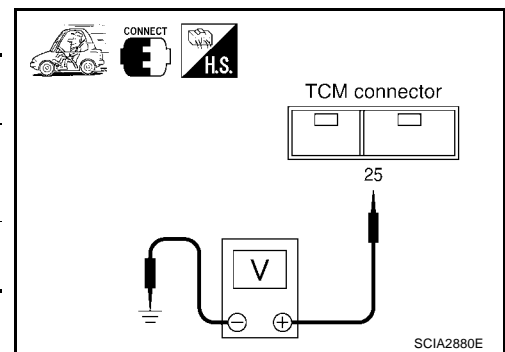
| Monitor item | Condition | Indication |
|--|---|------------|
| <ul style="list-style-type: none"> SFT SOL B OUT SFT SOL B MON | When shift solenoid valve B operates. (When driving in 1st or 5th gear.) | ON |
| | When shift solenoid valve B does not operate. | OFF |



⊗ Without CONSULT-II

- Drive vehicle.
- Check voltage between TCM connector terminal and ground.

| Connector | Terminal (Wire color) | Condition | Voltage (Approx.) |
|-----------|-----------------------|---|-------------------|
| F57 | 25 (G/R) - 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.

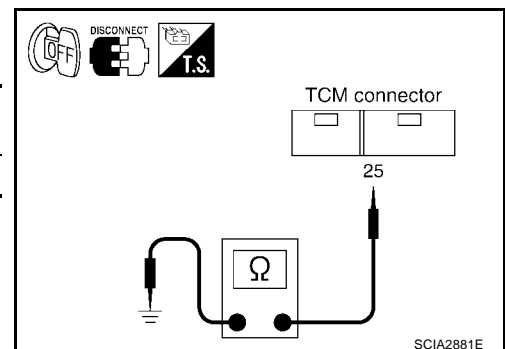
2. CHECK SHIFT SOLENOID VALVE B CIRCUIT

- Turn ignition switch "OFF".
- Disconnect the TCM connector.
- Check resistance between TCM connector terminal 25 and ground.

| Connector | Terminal (Wire color) | Condition | Resistance (Approx.) |
|-----------|-----------------------|--------------------------|----------------------|
| F57 | 25 (G/R) - Ground | Temperature: 20°C (68°F) | 11 - 16 Ω |

OK or NG

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



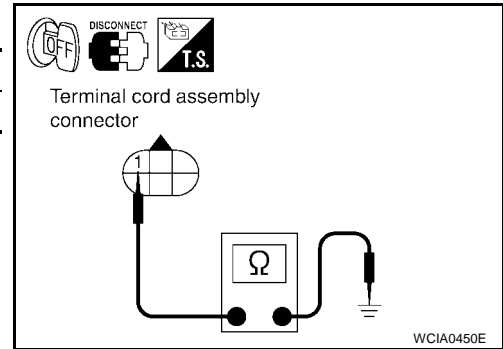
3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE B

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.

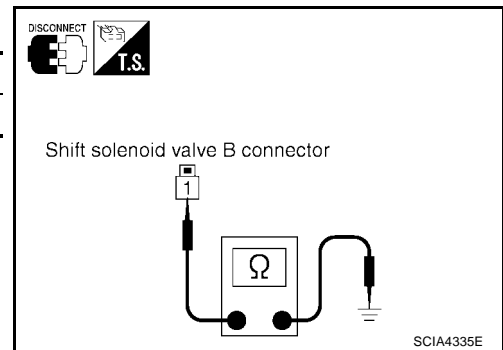
5. CHECK SHIFT SOLENOID VALVE B

1. Remove side cover. Refer to [AT-622, "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-622, "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-622, "Terminal Cord Assembly"](#) .

7. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-535, "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-452, "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.

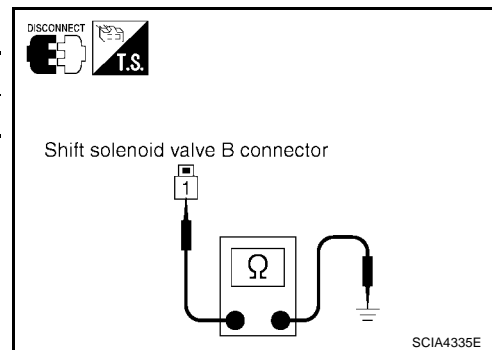
**Component Inspection
SHIFT SOLENOID VALVE B**

ECS009GF

1. Remove side cover. Refer to [AT-622, "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-622, "Control Valve Assembly"](#) .



DTC P0760 SHIFT SOLENOID VALVE C

PFP:31940

Description

ECS009GG

- 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 | D1 , M1 | D2 , M2 | D3 , M3 | D4 , M4 | D5 , M5 | Reverse |
|------------------------|-----------|-----------|-----------|--------------|--------------|-----------|
| Shift solenoid valve C | ON (Open) | ON (Open) | ON (Open) | OFF (Closed) | OFF (Closed) | ON (Open) |

On Board Diagnosis Logic

ECS009GH

- 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

ECS009GI

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

DTC Confirmation Procedure

ECS009GJ

CAUTION:

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

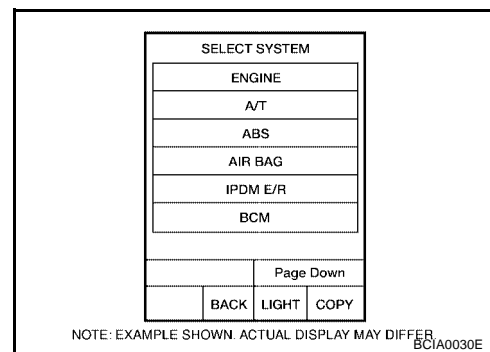
NOTE:

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-542, "Diagnostic Procedure"](#).



Ⓞ WITH GST

Follow the procedure “With CONSULT-II”.

DTC P0760 SHIFT SOLENOID VALVE C

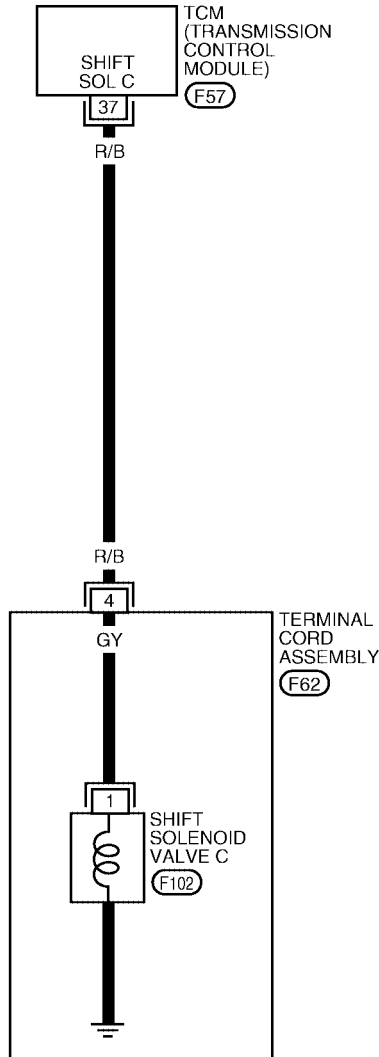
[RE5F22A]

Wiring Diagram — AT — SSV/C

ECS009GK

AT-SSV/C-01

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




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

WCWA0205E

DTC P0760 SHIFT SOLENOID VALVE C

[RE5F22A]

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

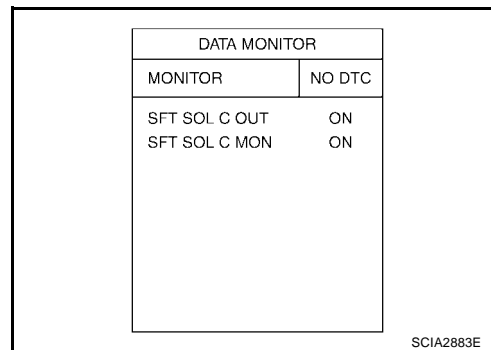
ECS009GL

1. CHECK SHIFT SOLENOID VALVE C SIGNAL

Ⓜ With CONSULT-II

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

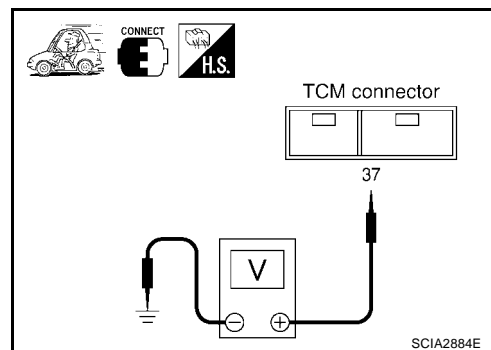
| Monitor item | Condition | Indication |
|--|--|------------|
| <ul style="list-style-type: none"> SFT SOL C OUT SFT SOL C MON | When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.) | ON |
| | When shift solenoid valve C does not operate. | OFF |



⊗ Without CONSULT-II

- Drive vehicle.
- Check voltage between TCM connector terminal and ground.

| Connector | Terminal (Wire color) | Condition | Voltage (Approx.) |
|-----------|-----------------------|--|-------------------|
| F57 | 37 (R/B) - 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.

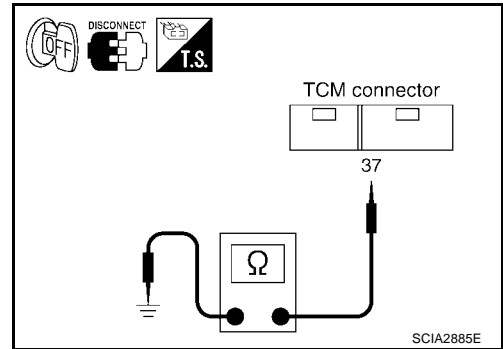
2. CHECK SHIFT SOLENOID VALVE C CIRCUIT

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

| Connector | Terminal (Wire color) | Condition | Resistance (Approx.) |
|-----------|-----------------------|--------------------------|----------------------|
| F57 | 37 (R/B) - Ground | Temperature: 20°C (68°F) | 11 - 16 Ω |

OK or NG

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



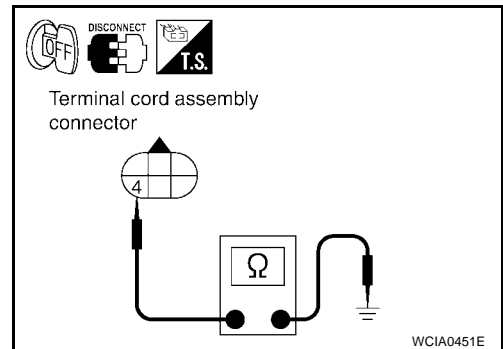
3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE C

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.

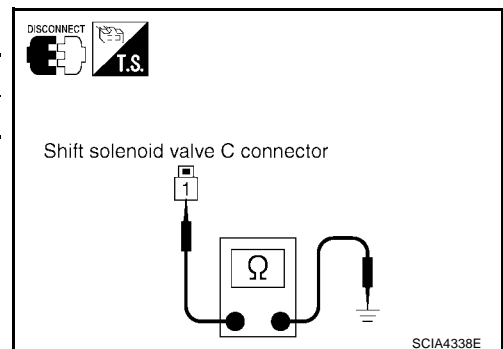
5. CHECK SHIFT SOLENOID VALVE C

1. Remove side cover. Refer to [AT-622, "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-622, "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-540, "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-452, "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.

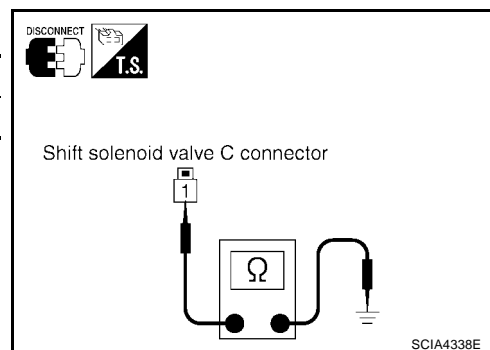
Component Inspection SHIFT SOLENOID VALVE C

ECS009GM

1. Remove side cover. Refer to [AT-622, "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-622, "Control Valve Assembly"](#).



DTC P0762 SHIFT SOLENOID VALVE C STUCK ON

PF3:31940

Description

ECS009GN

- 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 | D1 , M1 | D2 , M2 | D3 , M3 | D4 , M4 | D5 , M5 | Reverse |
|------------------------|-----------|-----------|-----------|--------------|--------------|-----------|
| Shift solenoid valve C | ON (Open) | ON (Open) | ON (Open) | OFF (Closed) | OFF (Closed) | ON (Open) |

On Board Diagnosis Logic

ECS009G0

- 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

ECS009GP

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

DTC Confirmation Procedure

ECS009GQ

CAUTION:

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

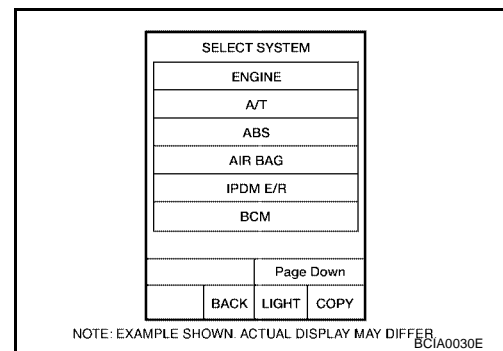
NOTE:

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-547, "Diagnostic Procedure"](#) .



WITH GST

Follow the procedure “With CONSULT-II”.

DTC P0762 SHIFT SOLENOID VALVE C STUCK ON

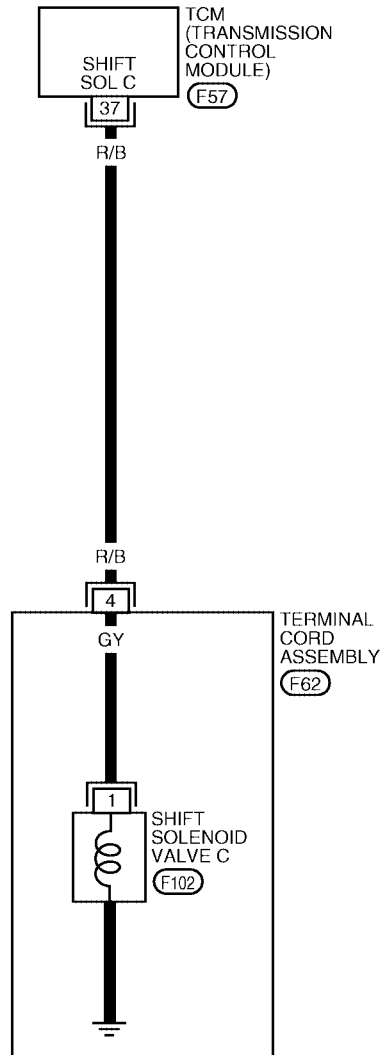
[RE5F22A]

Wiring Diagram — AT — SSV/CS

ECS009GR

AT-SSV/CS-01

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




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

WCWA0206E

DTC P0762 SHIFT SOLENOID VALVE C STUCK ON

[RE5F22A]

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

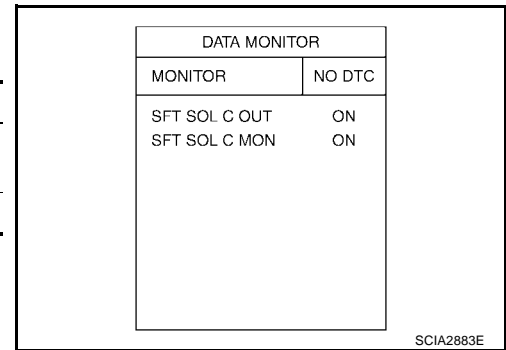
ECS009GS

1. CHECK SHIFT SOLENOID VALVE C SIGNAL

Ⓜ With CONSULT-II

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

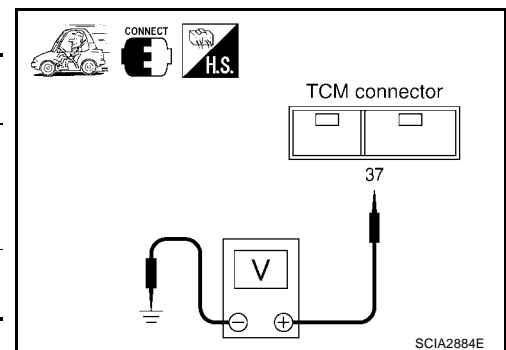
| Monitor item | Condition | Indication |
|--|---|------------|
| <ul style="list-style-type: none"> SFT SOL C OUT SFT SOL C MON | When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.) | ON |
| | When shift solenoid valve C does not operate. | OFF |



⊗ Without CONSULT-II

- Drive vehicle.
- Check voltage between TCM connector terminal and ground.

| Connector | Terminal (Wire color) | Condition | Voltage (Approx.) |
|-----------|-----------------------|---|-------------------|
| F57 | 37 (R/B) - 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.

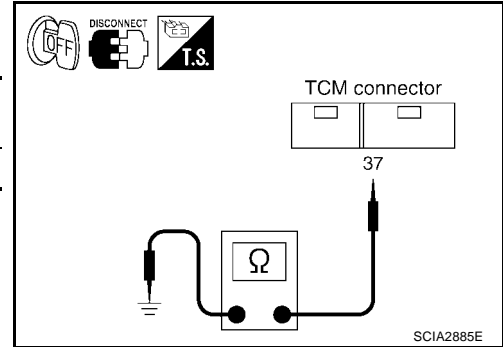
2. CHECK SHIFT SOLENOID VALVE C CIRCUIT

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

| Connector | Terminal (Wire color) | Condition | Resistance (Approx.) |
|-----------|-----------------------|--------------------------|----------------------|
| F57 | 37 (R/B) - Ground | Temperature: 20°C (68°F) | 11 - 16 Ω |

OK or NG

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



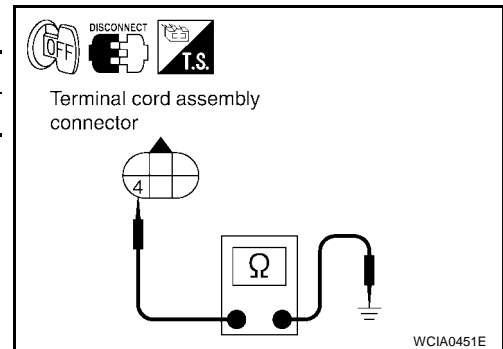
3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE C

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.

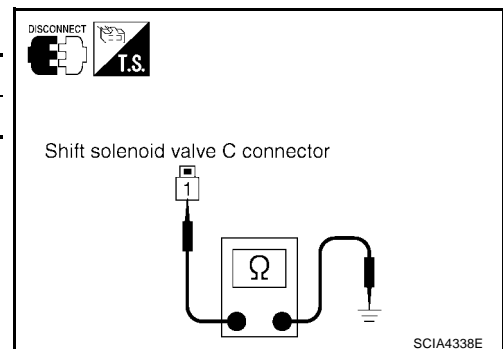
5. CHECK SHIFT SOLENOID VALVE C

1. Remove side cover. Refer to [AT-622, "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-622, "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-622, "Terminal Cord Assembly"](#).

7. CHECK TCM

1. Check TCM input/output signal. Refer to [AT-452, "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-545, "DTC Confirmation Procedure"](#).

OK or NG

OK >> **INSPECTION END**

NG >> Replace the control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#).

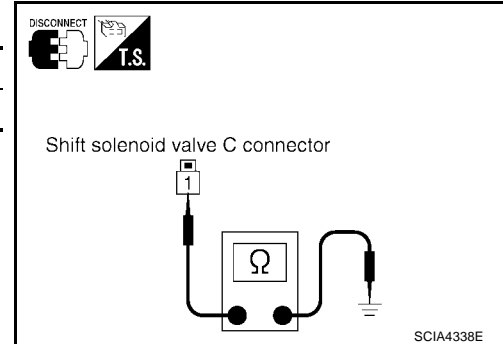
**Component Inspection
SHIFT SOLENOID VALVE C**

ECS009GT

1. Remove side cover. Refer to [AT-622, "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-622, "Control Valve Assembly"](#).



DTC P0765 SHIFT SOLENOID VALVE D

PFP:31940

Description

ECS009GU

- 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 | D1 , M1 | D2 , M2 | D3 , M3 | D4 , M4 | D5 , M5 | Reverse |
|------------------------|------------|------------|-------------|-------------|-------------|------------|
| Shift solenoid valve D | OFF (Open) | OFF (Open) | ON (Closed) | ON (Closed) | ON (Closed) | OFF (Open) |

On Board Diagnosis Logic

ECS009GV

- 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

ECS009GW

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

DTC Confirmation Procedure

ECS009GX

CAUTION:

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

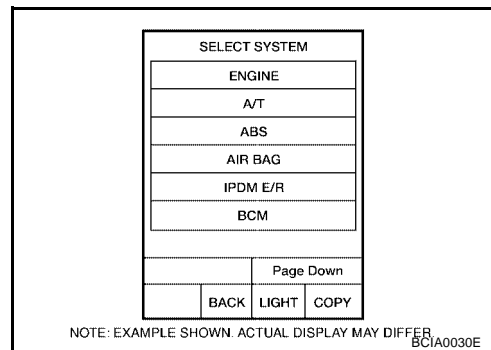
NOTE:

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-552, "Diagnostic Procedure"](#) .



Ⓞ WITH GST

Follow the procedure “With CONSULT-II”.



DTC P0765 SHIFT SOLENOID VALVE D

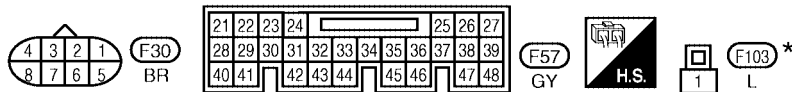
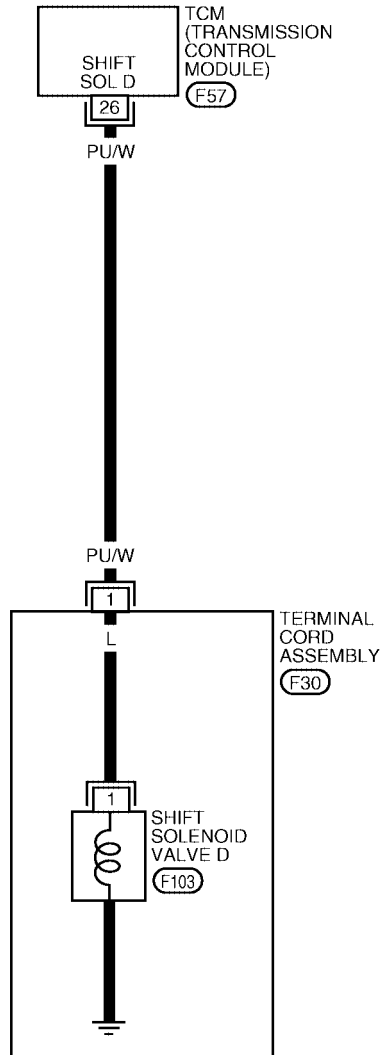
[RE5F22A]

Wiring Diagram — AT — SSV/D

ECS009GY

AT-SSV/D-01

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




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

WCWA0207E

DTC P0765 SHIFT SOLENOID VALVE D

[RE5F22A]

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

| Terminal | Wire color | Item | Condition | Data (Approx.) |
|----------|------------|------------------------|---|-----------------|
| 26 | PU/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

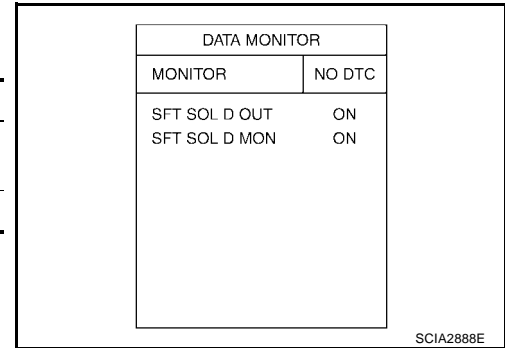
ECS009GZ

1. CHECK SHIFT SOLENOID VALVE D SIGNAL

Ⓜ With CONSULT-II

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

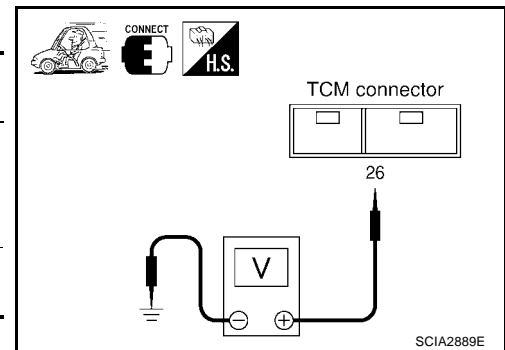
| Monitor item | Condition | Indication |
|--|---|------------|
| <ul style="list-style-type: none"> SFT SOL D OUT SFT SOL D MON | When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.) | ON |
| | When shift solenoid valve D does not operate. | OFF |



⊗ Without CONSULT-II

- Drive vehicle.
- Check voltage between TCM connector terminal and ground.

| Connector | Terminal (Wire color) | Condition | Voltage (Approx.) |
|-----------|-----------------------|---|-------------------|
| F57 | 26 (PU/W) - 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.

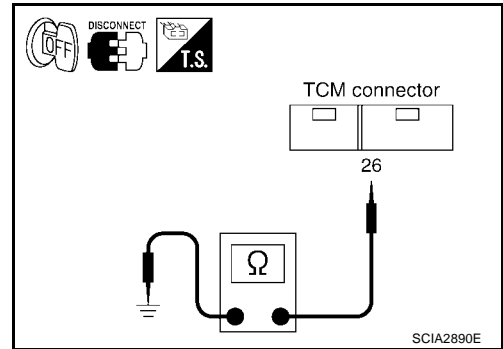
2. CHECK SHIFT SOLENOID VALVE D CIRCUIT

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

| Connector | Terminal (Wire color) | Condition | Resistance (Approx.) |
|-----------|-----------------------|--------------------------|----------------------|
| F57 | 26 (PU/W) - Ground | Temperature: 20°C (68°F) | 11 - 16 Ω |

OK or NG

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



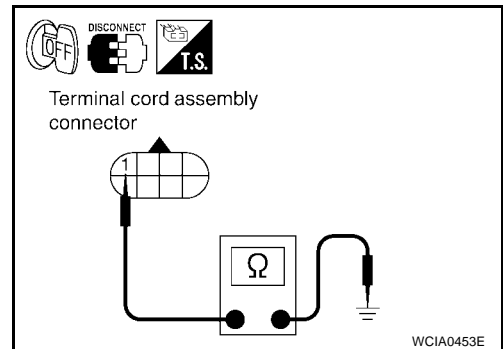
3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE D

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.

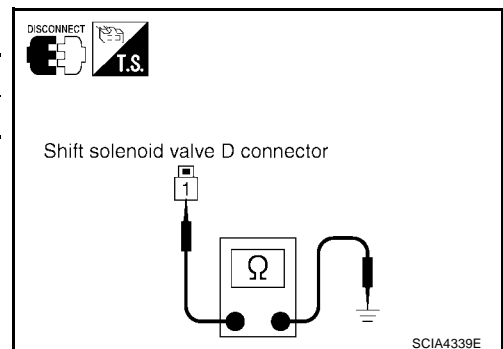
5. CHECK SHIFT SOLENOID VALVE D

1. Remove side cover. Refer to [AT-622, "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-622, "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-622, "Terminal Cord Assembly"](#).

7. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-550, "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-452, "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.

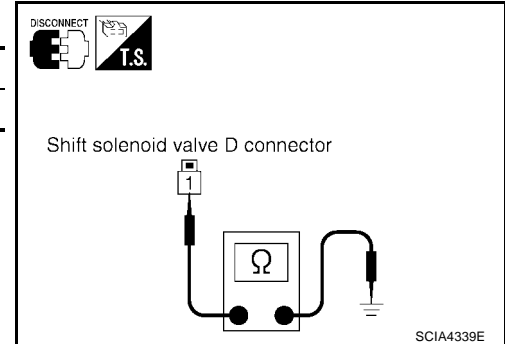
**Component Inspection
SHIFT SOLENOID VALVE D**

ECS009H0

1. Remove side cover. Refer to [AT-622, "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-622, "Control Valve Assembly"](#).



DTC P0770 SHIFT SOLENOID VALVE E

PFP:31940

Description

ECS009H1

- 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 | D1 | M1 | D 2 , M2 | D3 , M3 | D4 , M4 | D5 , M5 | 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 D2 ↔ D3 and D3 ↔ D4 .

On Board Diagnosis Logic

ECS009H2

- 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

ECS009H3

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

DTC Confirmation Procedure

ECS009H4

CAUTION:

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

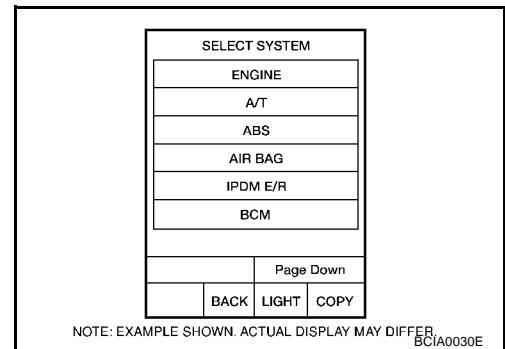
NOTE:

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-557. "Diagnostic Procedure"](#) .



WITH GST

Follow the procedure “With CONSULT-II”.

DTC P0770 SHIFT SOLENOID VALVE E

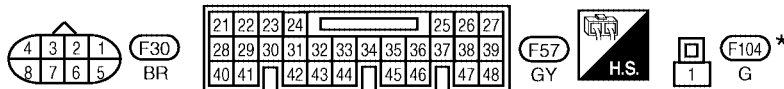
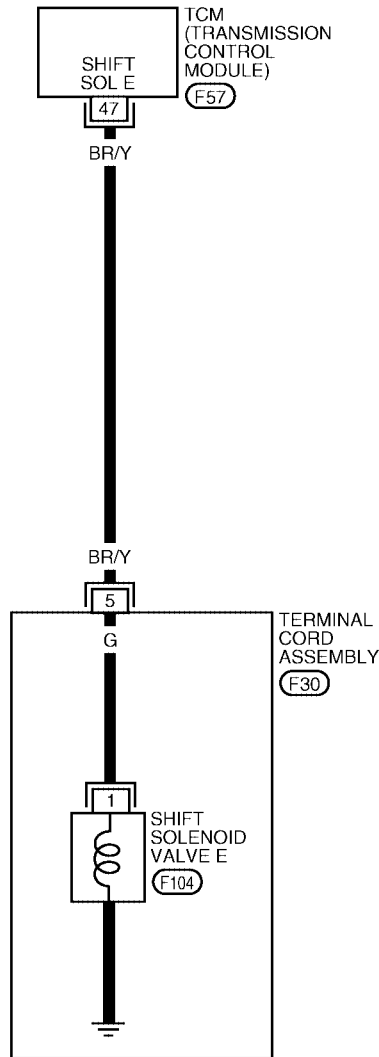
[RE5F22A]

Wiring Diagram — AT — SSV/E

ECS009H5

AT-SSV/E-01

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



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

WCWA0208E

DTC P0770 SHIFT SOLENOID VALVE E

[RE5F22A]

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

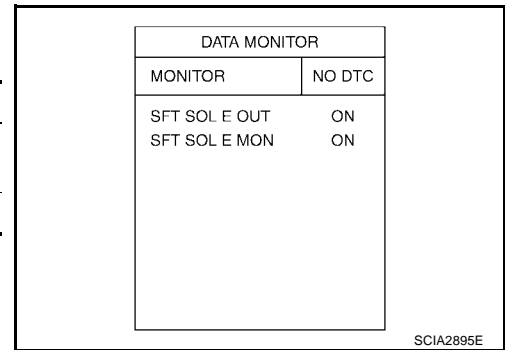
ECS009H6

1. CHECK SHIFT SOLENOID VALVE E SIGNAL

With CONSULT-II

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

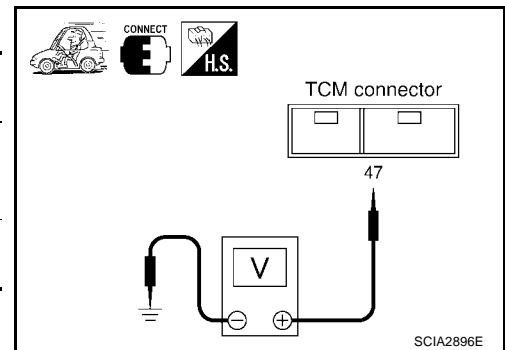
| Monitor item | Condition | Indication |
|-----------------|--|------------|
| ● SFT SOL E OUT | When shift solenoid valve E operates. (When driving in reverse gear.) | ON |
| ● SFT SOL E MON | When shift solenoid valve E does not operate. | OFF |



Without CONSULT-II

- Drive vehicle.
- Check voltage between TCM connector terminal and ground.

| Connector | Terminal (Wire color) | Condition | Voltage (Approx.) |
|-----------|-----------------------|--|-------------------|
| F57 | 47 (BR/Y) - 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.

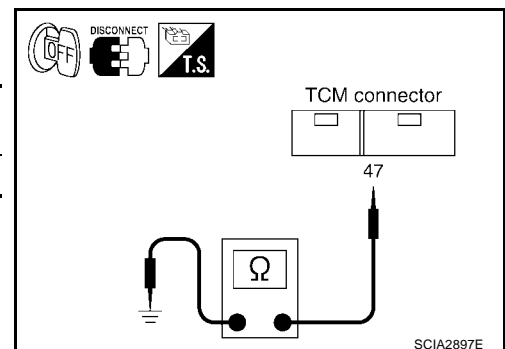
2. CHECK SHIFT SOLENOID VALVE E CIRCUIT

- Turn ignition switch "OFF".
- Disconnect the TCM connector.
- Check resistance between TCM connector terminal 47 and ground.

| Connector | Terminal (Wire color) | Condition | Resistance (Approx.) |
|-----------|-----------------------|--------------------------|----------------------|
| F57 | 47 (BR/Y) - Ground | Temperature: 20°C (68°F) | 11 - 16 Ω |

OK or NG

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



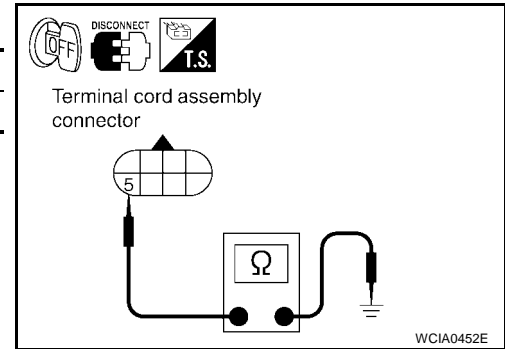
3. CHECK TERMINAL CORD ASSEMBLY WITH SHIFT SOLENOID VALVE E

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.

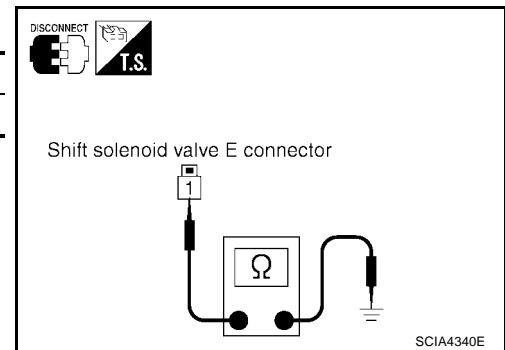
5. CHECK SHIFT SOLENOID VALVE E

1. Remove side cover. Refer to [AT-622, "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-622, "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-622, "Terminal Cord Assembly"](#) .

7. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-555, "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-452, "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.

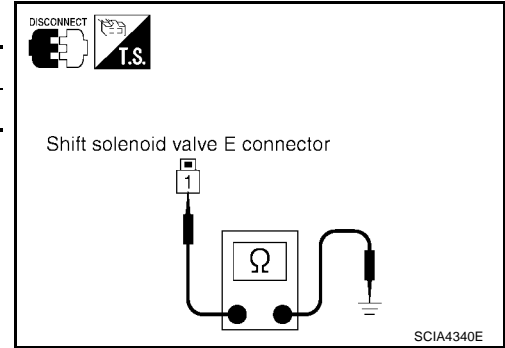
**Component Inspection
SHIFT SOLENOID VALVE E**

ECS009H7

1. Remove side cover. Refer to [AT-622, "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-622, "Control Valve Assembly"](#) .



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

DTC P0775 PRESSURE CONTROL SOLENOID VALVE B (SHIFT PRESSURE) [RE5F22A]

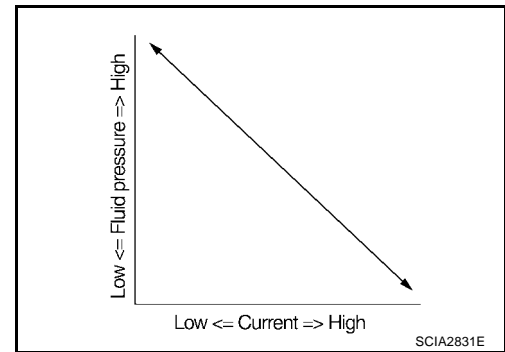
DTC P0775 PRESSURE CONTROL SOLENOID VALVE B (SHIFT PRESSURE)

PFP:31940

Description

ECS009HB

- 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

ECS009HB

- 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

ECS009HA

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

DTC Confirmation Procedure

ECS009HB

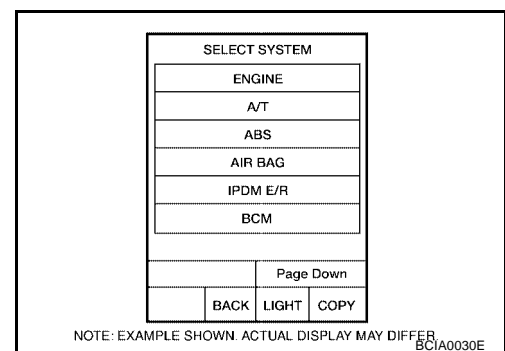
NOTE:

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-562, "Diagnostic Procedure"](#) .



WITH GST

Follow the procedure “With CONSULT-II”.

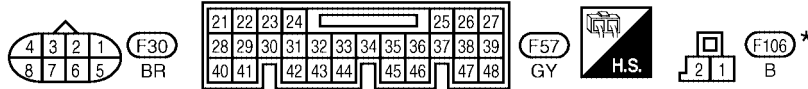
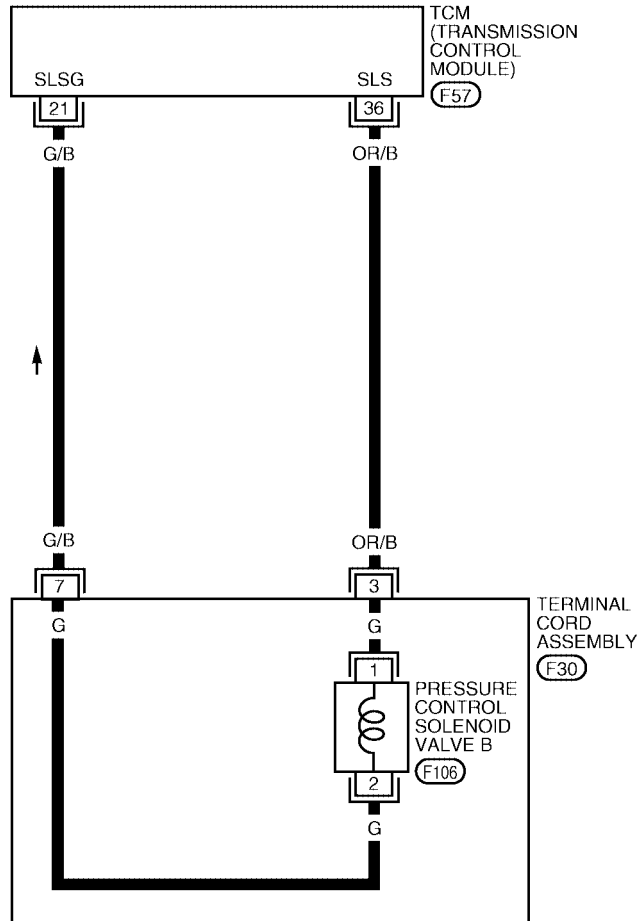
DTC P0775 PRESSURE CONTROL SOLENOID VALVE B (SHIFT PRESSURE) [RE5F22A]

Wiring Diagram — AT — PC/B

ECS009HC

AT-PC/B-01

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




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

WCWA0209E

DTC P0775 PRESSURE CONTROL SOLENOID VALVE B (SHIFT PRESSURE) [RE5F22A]

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 | OR/B | | | Pressure control solenoid valve B |

Diagnostic Procedure

ECS009HD

1. CHECK PRESSURE CONTROL SOLENOID VALVE B SIGNAL

With CONSULT-II

- After warming up the engine and transaxle, turn ignition switch "OFF".
- Turn ignition switch "ON". (Do not start engine.)
- Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
- 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 |

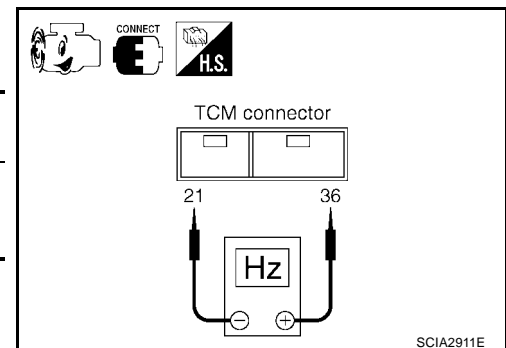
| DATA MONITOR | |
|--------------|--------|
| MONITOR | NO DTC |
| PC SOL A OUT | xxx A |
| PC SOL A MON | xxx A |
| PC SOL B OUT | xxx A |
| PC SOL B MON | xxx A |
| PC SOL C OUT | xxx A |
| PC SOL C MON | xxx A |

SCIA2907E

Without CONSULT-II

- Start the engine.
- Check pulse between TCM connector terminals 21 and 36.

| Connector | Terminal (Wire color) | Condition | Data (Approx.) |
|-----------|----------------------------------|--|----------------|
| F57 | 36 (OR/B) - 21 (G/B) (Ground) | When engine is running with idle speed and setting selector lever to "P" position. | 300 Hz |



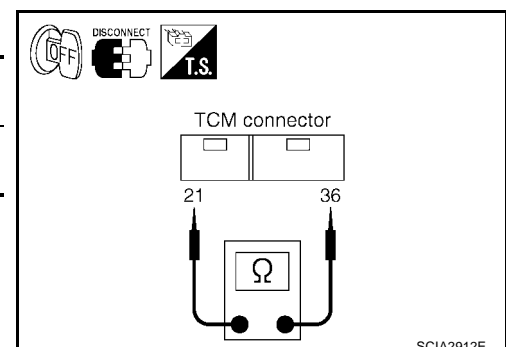
OK or NG

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

2. CHECK PRESSURE CONTROL SOLENOID VALVE B CIRCUIT

- Turn ignition switch "OFF".
- Disconnect the TCM connector.
- Check resistance between TCM connector terminals 21 and 36.

| Connector | Terminal (Wire color) | Condition | Resistance (Approx.) |
|-----------|----------------------------------|--------------------------|----------------------|
| F57 | 36 (OR/B) - 21 (G/B) (Ground) | Temperature: 20°C (68°F) | 5.0 - 5.6 Ω |



OK or NG

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

DTC P0775 PRESSURE CONTROL SOLENOID VALVE B (SHIFT PRESSURE) [RE5F22A]

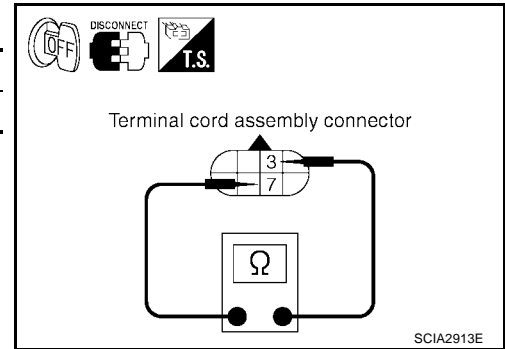
3. CHECK TERMINAL CORD ASSEMBLY WITH PRESSURE CONTROL SOLENOID VALVE B

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.) |
|-----------|----------|--------------------------|----------------------|
| F30 | 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.

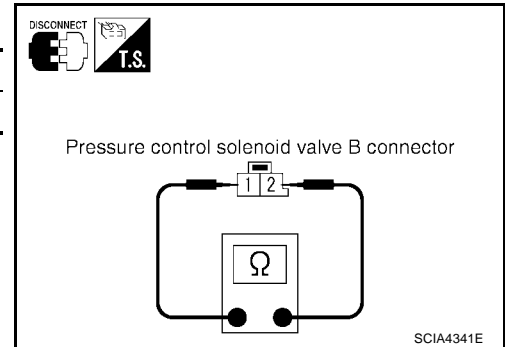
5. CHECK PRESSURE CONTROL SOLENOID VALVE B

1. Remove side cover. Refer to [AT-622, "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-622, "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-622, "Terminal Cord Assembly"](#).

7. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-560, "DTC Confirmation Procedure"](#).

OK or NG

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

DTC P0775 PRESSURE CONTROL SOLENOID VALVE B (SHIFT PRESSURE) [RE5F22A]

8. CHECK TCM

1. Check TCM input/output signal. Refer to [AT-452, "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.

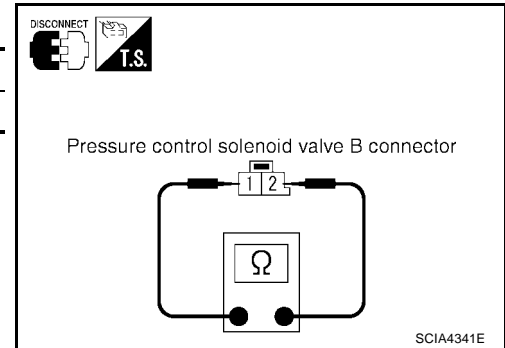
Component Inspection PRESSURE CONTROL SOLENOID VALVE B

ECS009HE

1. Remove side cover. Refer to [AT-622, "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-622, "Control Valve Assembly"](#) .



DTC P0780 SHIFT

PF3:31940

Description

ECS009HF

- 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

ECS009HG

- 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

ECS009HH

- 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

ECS009HI

CAUTION:

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

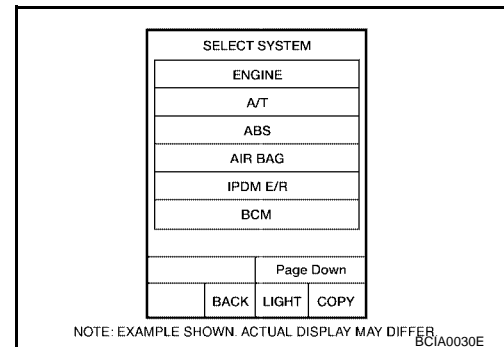
NOTE:

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-692, "VEHICLE SPEED WHEN SHIFTING GEARS - 9J500 MODELS" .)
4. If DTC is detected, go to [AT-568, "Diagnostic Procedure"](#) .



WITH GST

Follow the procedure "With CONSULT-II".

DTC P0780 SHIFT

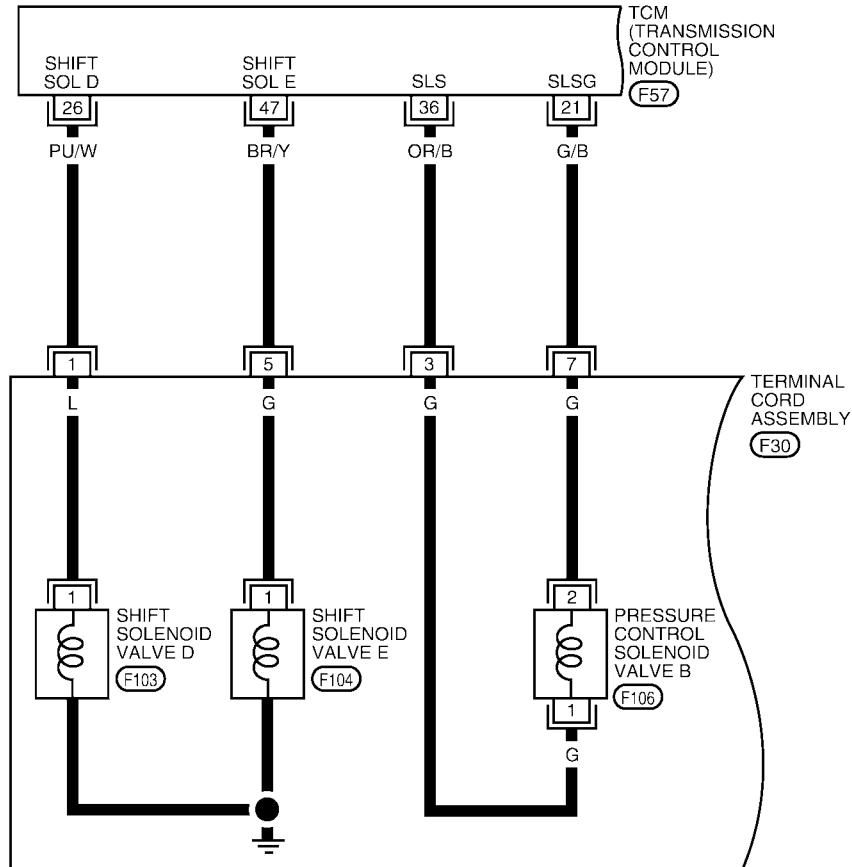
[RE5F22A]

Wiring Diagram — AT — SFTFNC

ECS009HJ

AT-SFTFNC-01

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

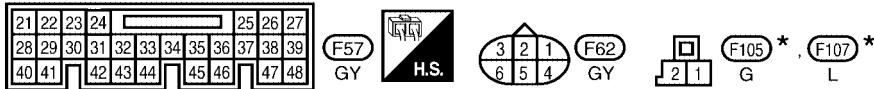
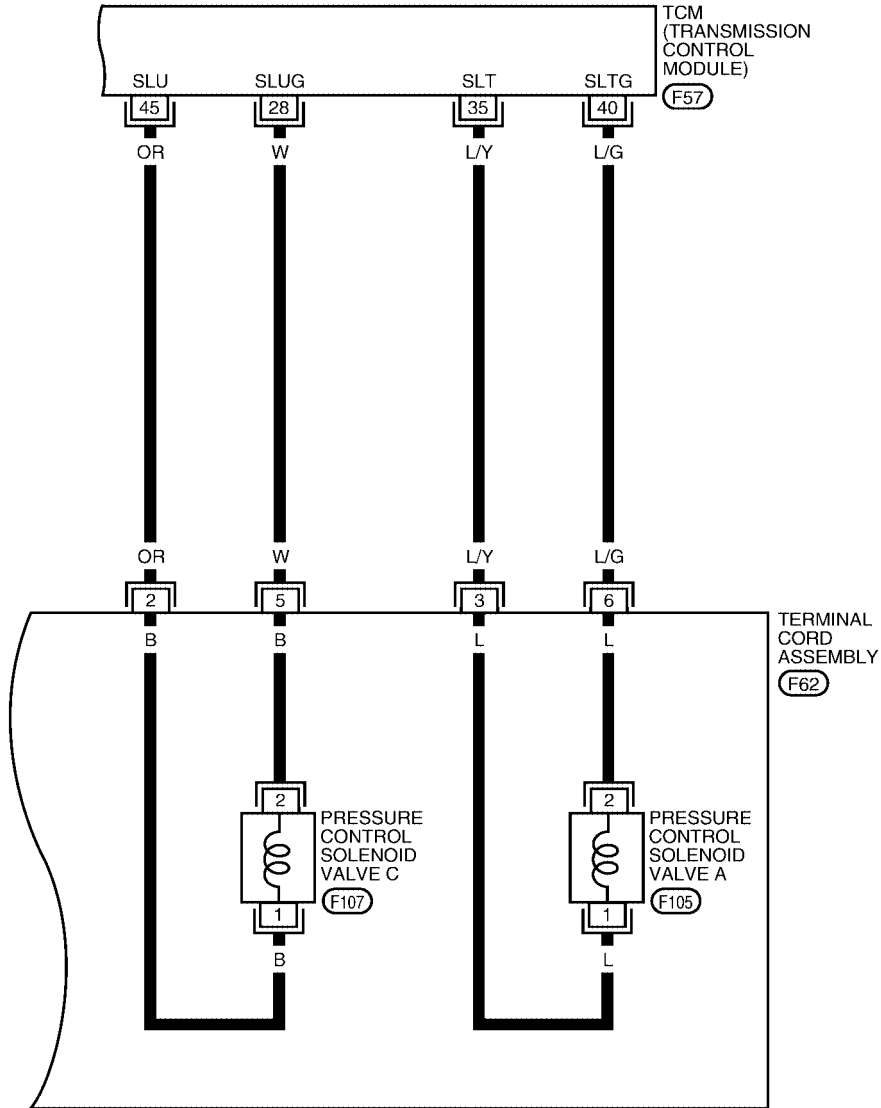


* : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

WCWA0210E

AT-SFTFNC-02

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







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

DTC P0780 SHIFT

[RE5F22A]

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 | PU/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 |  | 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 | OR/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 | OR | 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

ECS009HK

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform "Diagnostic Procedure" for the following DTCs.

- "DTC P0765 SHIFT SOLENOID VALVE D" (Refer to [AT-552, "Diagnostic Procedure"](#) .)
- "DTC P0770 SHIFT SOLENOID VALVE E" (Refer to [AT-557, "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-527, "Diagnostic Procedure"](#) .)
- "DTC P0775 PRESSURE CONTROL SOLENOID VALVE B" (Refer to [AT-562, "Diagnostic Procedure"](#) .)
- "DTC P0795 PRESSURE CONTROL SOLENOID VALVE C" (Refer to [AT-571, "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-565, "DTC Confirmation Procedure"](#) .

OK or NG

- OK >> **INSPECTION END**
- NG >> Replace the control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#) .

DTC P0795 PRESSURE CONTROL SOLENOID VALVE C (TCC AND SHIFT PRESSURE)

[RE5F22A]

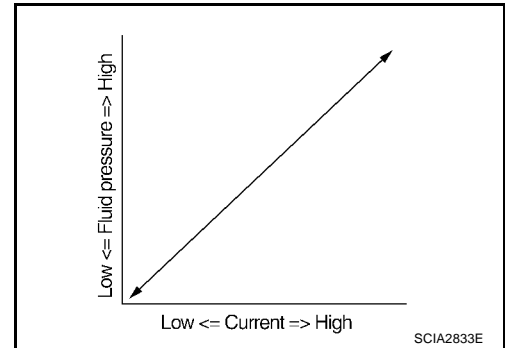
DTC P0795 PRESSURE CONTROL SOLENOID VALVE C (TCC AND SHIFT PRESSURE)

PFP:31940

Description

ECS009HL

- 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

ECS009HM

- 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

ECS009HN

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

DTC Confirmation Procedure

ECS009HO

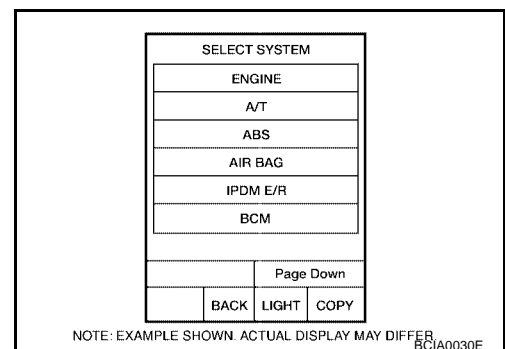
NOTE:

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 "TRANSMISSION" 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-571, "Diagnostic Procedure"](#).



WITH GST

Follow the procedure "With CONSULT-II".

DTC P0795 PRESSURE CONTROL SOLENOID VALVE C (TCC AND SHIFT PRESSURE)

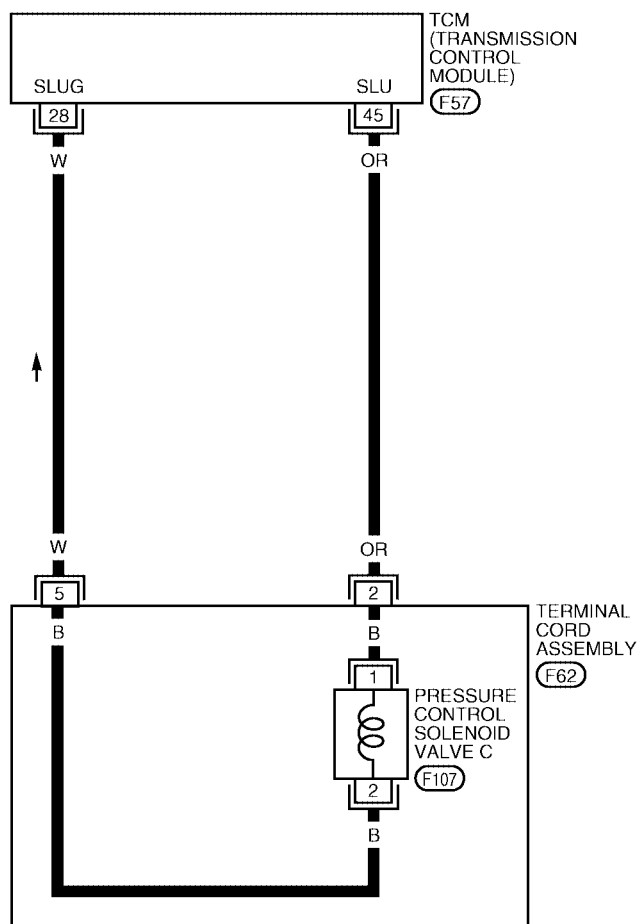
[RE5F22A]

Wiring Diagram — AT — PC/C

ECS009HP

AT-PC/C-01

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




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

WCWA0212E

DTC P0795 PRESSURE CONTROL SOLENOID VALVE C (TCC AND SHIFT PRESSURE)

[RE5F22A]

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 | OR | Pressure control solenoid valve C | | When engine is running with idle speed and setting selector lever to "P" position. | 300Hz |

Diagnostic Procedure

ECS009HO

1. CHECK PRESSURE CONTROL SOLENOID VALVE C SIGNAL

With CONSULT-II

- After warming up the engine and transaxle, turn ignition switch "OFF".
- Turn ignition switch "ON". (Do not start engine.)
- Select "A/T" with "DATA MONITOR" mode in CONSULT-II.
- 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 |

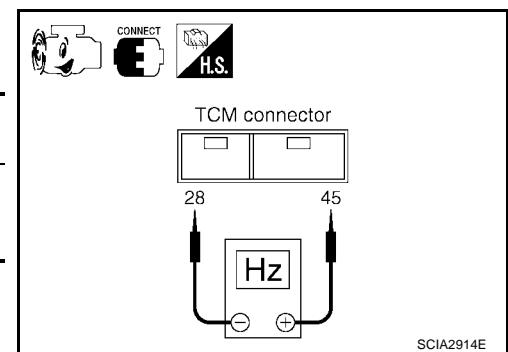
| DATA MONITOR | |
|--------------|--------|
| MONITOR | NO DTC |
| PC SOL A OUT | xxx A |
| PC SOL A MON | xxx A |
| PC SOL B OUT | xxx A |
| PC SOL B MON | xxx A |
| PC SOL C OUT | xxx A |
| PC SOL C MON | xxx A |

SCIA2907E

Without CONSULT-II

- Start the engine.
- Check pulse between TCM connector terminals 28 and 45.

| Connector | Terminal (Wire color) | Condition | Data (Approx.) |
|-----------|------------------------------|--|----------------|
| F57 | 45 (OR) - 28 (W) (Ground) | When engine is running with idle speed and setting selector lever to "P" position. | 300 Hz |



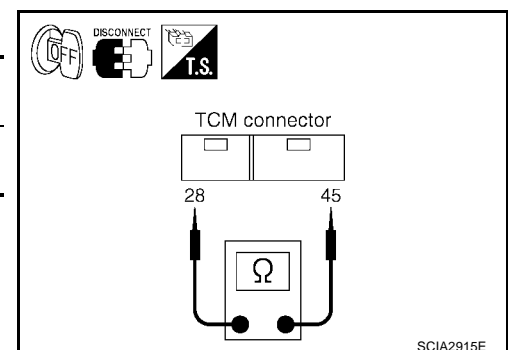
OK or NG

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

2. CHECK PRESSURE CONTROL SOLENOID VALVE C CIRCUIT

- Turn ignition switch "OFF".
- Disconnect the TCM connector.
- Check resistance between TCM connector terminals 28 and 45.

| Connector | Terminal (Wire color) | Condition | Resistance (Approx.) |
|-----------|------------------------------|--------------------------|----------------------|
| F57 | 45 (OR) - 28 (W) (Ground) | Temperature: 20°C (68°F) | 5.0 - 5.6 Ω |



OK or NG

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

DTC P0795 PRESSURE CONTROL SOLENOID VALVE C (TCC AND SHIFT PRESSURE)

[RE5F22A]

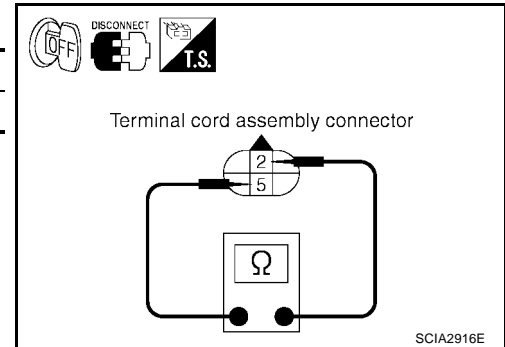
3. CHECK TERMINAL CORD ASSEMBLY WITH PRESSURE CONTROL SOLENOID VALVE C

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.

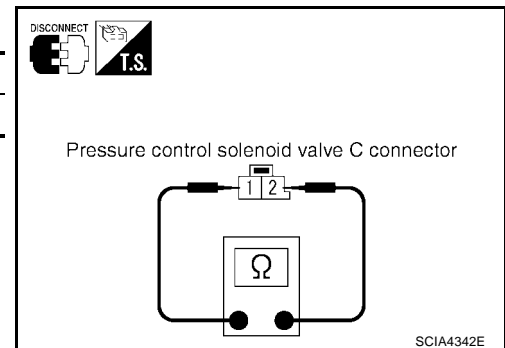
5. CHECK PRESSURE CONTROL SOLENOID VALVE C

1. Remove side cover. Refer to [AT-622, "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-622, "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-622, "Terminal Cord Assembly"](#).

7. CHECK DTC

Perform "DTC Confirmation Procedure". Refer to [AT-569, "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-452, "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.

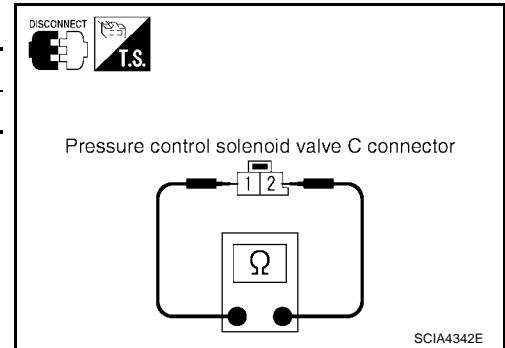
Component Inspection PRESSURE CONTROL SOLENOID VALVE C

ECS009HR

1. Remove side cover. Refer to [AT-622, "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-622, "Control Valve Assembly"](#) .



DTC P0797 PRESSURE CONTROL SOLENOID VALVE C STUCK ON

[RE5F22A]

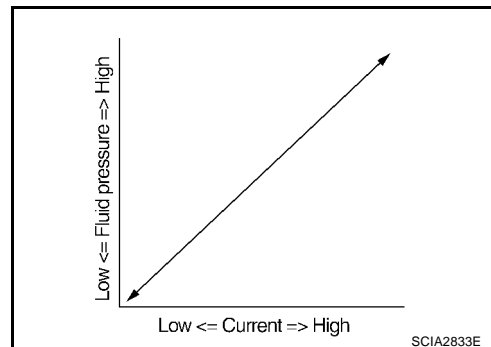
DTC P0797 PRESSURE CONTROL SOLENOID VALVE C STUCK ON

PF3:31940

Description

ECS009HS

- 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

ECS009HT

- 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

ECS009HU

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

DTC Confirmation Procedure

ECS009HV

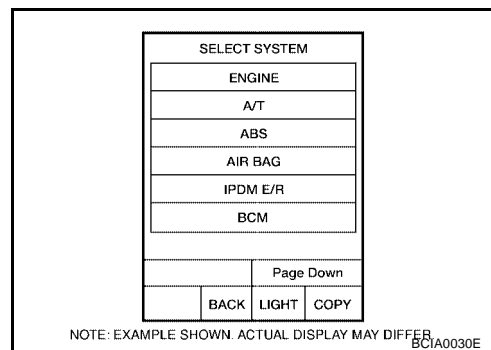
NOTE:

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 "TRANSMISSION" 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-576, "Diagnostic Procedure"](#).



WITH GST

Follow the procedure "With CONSULT-II".

DTC P0797 PRESSURE CONTROL SOLENOID VALVE C STUCK ON

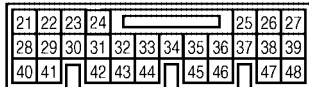
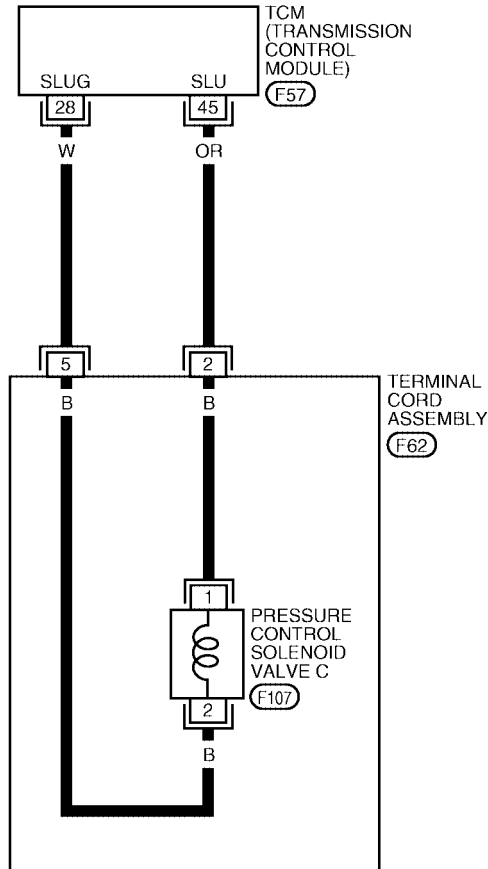
[RE5F22A]

Wiring Diagram — AT — PC/CS

ECS009HW

AT-PC/CS-01

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



F57
GY



F62
GY



F107
L *


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

WCWA0213E

DTC P0797 PRESSURE CONTROL SOLENOID VALVE C STUCK ON

[RE5F22A]

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. |
| 45 | OR | Pressure control solenoid valve C | | When engine is running with idle speed and setting selector lever to "P" position. |

Diagnostic Procedure

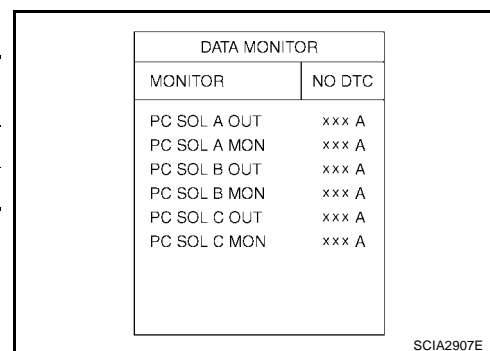
ECS009HX

1. CHECK PRESSURE CONTROL SOLENOID VALVE C SIGNAL

With CONSULT-II

- After warming up the engine and transaxle, turn ignition switch "OFF".
- Turn ignition switch "ON". (Do not start engine.)
- Select "TRANSMISSION" with "DATA MONITOR" mode in CONSULT-II.
- Read out the value of "PC SOL C OUT" and "PC SOL C MON".

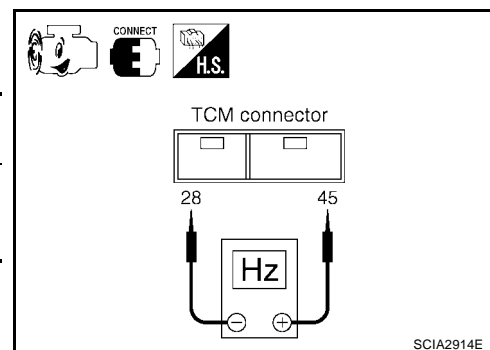
| Monitor item | Condition | Display value (Approx.) |
|----------------|--|-------------------------|
| ● PC SOL C OUT | Selector lever: Manual shift gate position | 1.00 A |
| ● PC SOL C MON | Other than the above. | 0.20 A |



Without CONSULT-II

- Start the engine.
- Check pulse between TCM connector terminals 28 and 45.

| Connector | Terminal (Wire color) | Condition | Data (Approx.) |
|-----------|------------------------------|--|----------------|
| F57 | 45 (OR) - 28 (W) (Ground) | When engine is running with idle speed and setting selector lever to "P" position. | 300 Hz |



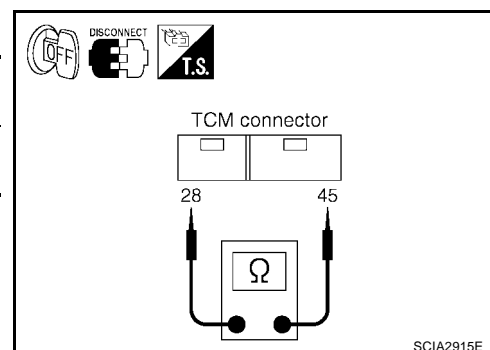
OK or NG

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

2. CHECK PRESSURE CONTROL SOLENOID VALVE C CIRCUIT

- Turn ignition switch "OFF".
- Disconnect the TCM connector.
- Check resistance between TCM connector terminals 28 and 45.

| Connector | Terminal (Wire color) | Condition | Resistance (Approx.) |
|-----------|------------------------------|--------------------------|----------------------|
| F57 | 45 (OR) - 28 (W) (Ground) | Temperature: 20°C (68°F) | 5.0 - 5.6 Ω |



OK or NG

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

DTC P0797 PRESSURE CONTROL SOLENOID VALVE C STUCK ON

[RE5F22A]

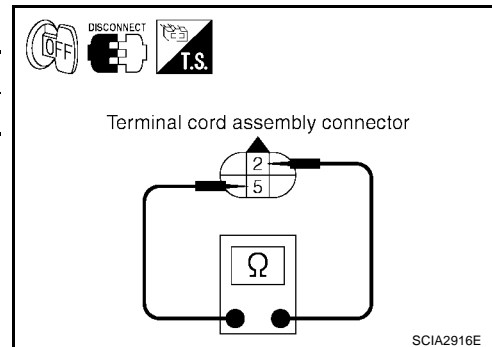
3. CHECK TERMINAL CORD ASSEMBLY WITH PRESSURE CONTROL SOLENOID VALVE C

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.

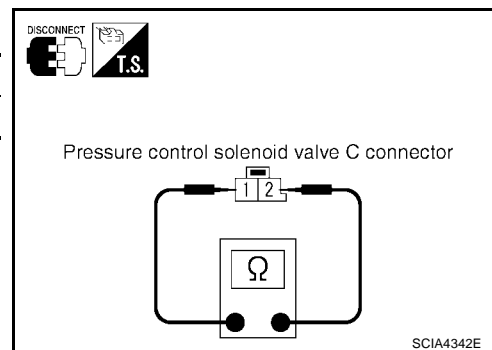
5. CHECK PRESSURE CONTROL SOLENOID VALVE C

1. Remove side cover. Refer to [AT-622, "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-622, "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-622, "Terminal Cord Assembly"](#).

7. CHECK TCM

1. Check TCM input/output signal. Refer to [AT-452, "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-574, "DTC Confirmation Procedure"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> Replace the control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#) .

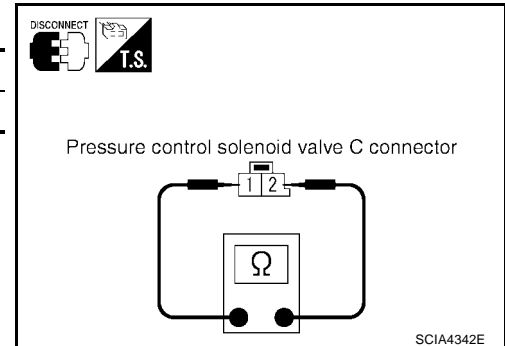
Component Inspection
PRESSURE CONTROL SOLENOID VALVE C

ECS009HY

1. Remove side cover. Refer to [AT-622, "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-622, "Control Valve Assembly"](#) .



DTC P0826 MANUAL MODE SWITCH CIRCUIT

PF3:34901

Description

ECS009HZ

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 combination meter by CAN communication line. Then manual mode switch position is indicated on the A/T indicator. For inspection, refer to [AT-584, "Position Indicator"](#).

CONSULT-II Reference Value in Data Monitor Mode

ECS009I0

| 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

ECS009I1

- 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

ECS009I2

- Harness or connectors (These switches circuit is open or shorted.)
- Manual mode switch (built into A/T device)

DTC Confirmation Procedure

ECS009I3

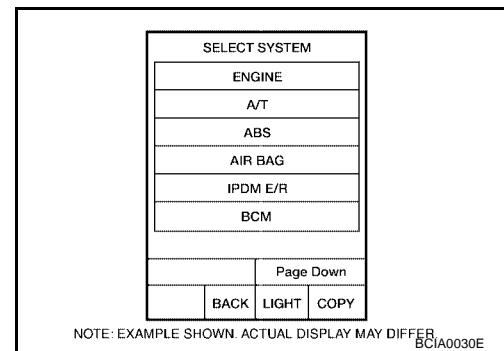
NOTE:

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 "TRANSMISSION" 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-582, "Diagnostic Procedure"](#).



DTC P0826 MANUAL MODE SWITCH CIRCUIT

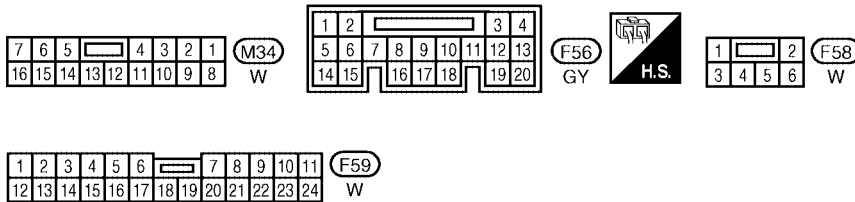
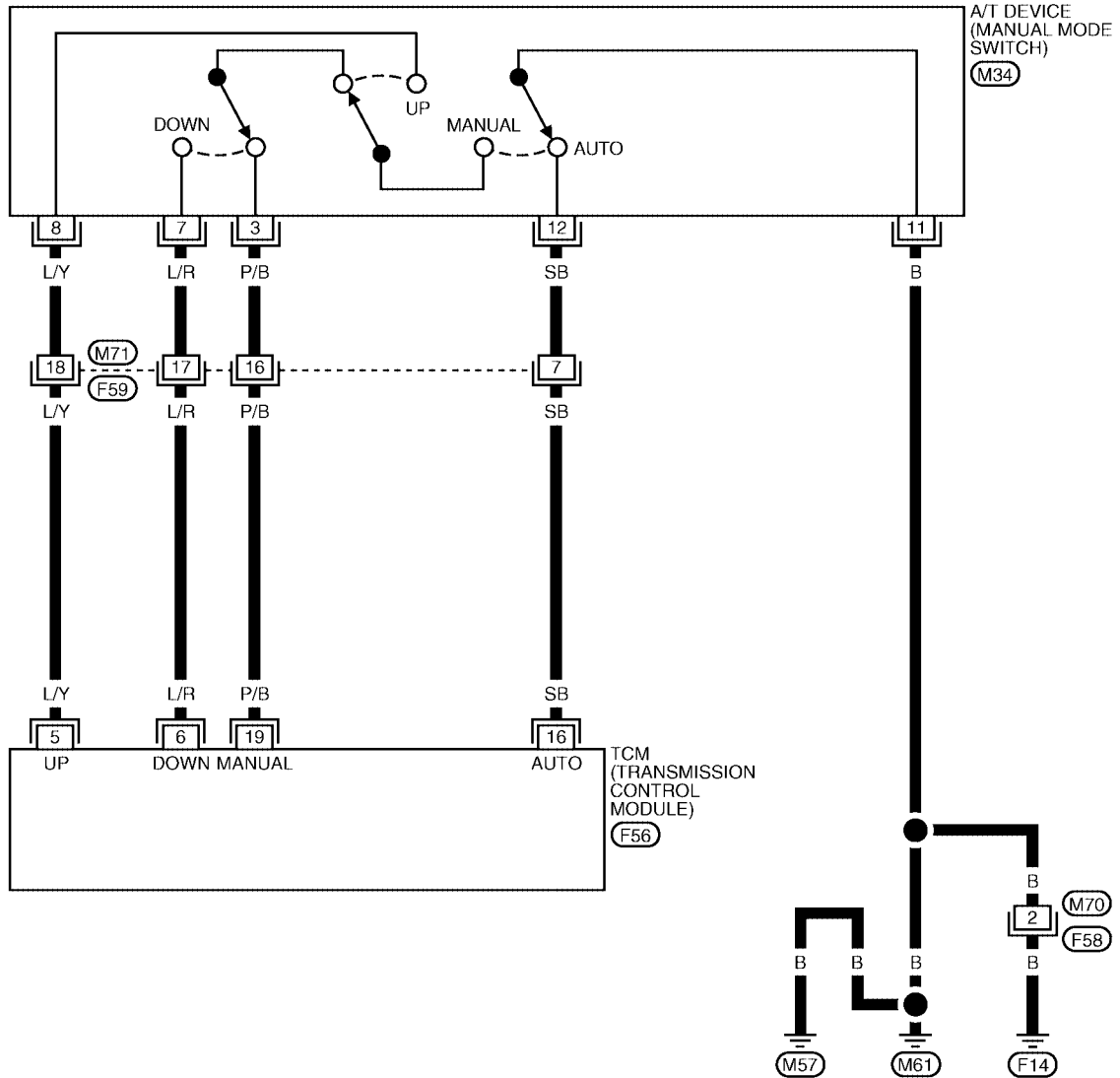
[RE5F22A]

Wiring Diagram — AT — MMSW

ECS00914

AT-MMSW-01

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



WCWA0214E

DTC P0826 MANUAL MODE SWITCH CIRCUIT

[RE5F22A]

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

| Terminal | Wire color | Item | Condition | Data (Approx.) |
|----------|------------|-----------------------------|--|-----------------|
| 5 | L/Y | 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 | P/B | Manual mode switch MANUAL | Selector lever: Manual shift gate position (neutral) | 0V |
| | | | Other than the above | Battery voltage |



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

Diagnostic Procedure

1. CHECK MANUAL MODE SWITCH CIRCUIT

With CONSULT-II

1. Turn ignition switch "ON". (Do not start engine.)
2. Select "TRANSMISSION" 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".

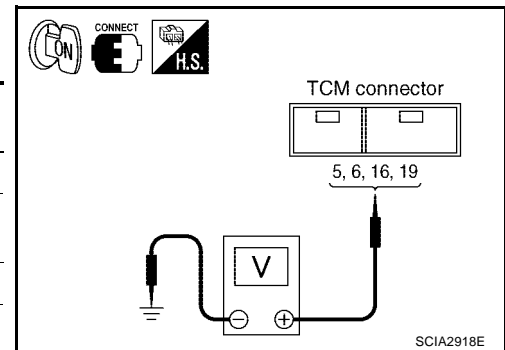
| DATA MONITOR | |
|---------------|--------|
| MONITOR | NO DTC |
| MANU MODE SW | ON |
| NON M-MODE SW | OFF |
| UP SW | OFF |
| DOWN SW | OFF |

SCIA2917E

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 (Wire color) | Condition | Voltage (Approx.) |
|-------------------|--|---|-------------------|
| F56 | 5 (L/Y) - Ground | Selector lever: + side | 0V |
| | | Other than the above | Battery voltage |
| | 6 (L/R) - Ground | Selector lever: - side | 0V |
| | | Other than the above | Battery voltage |
| | 16 (SB) - Ground | Selector lever: "P", "R", "N" or "D" position | 0V |
| | | Selector lever: Manual shift gate position | Battery voltage |
| 19 (P/B) - Ground | Selector lever: Manual shift gate position (neutral) | 0V | |
| | Other than the above | Battery voltage | |



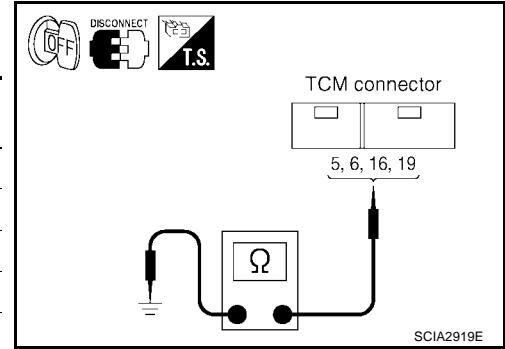
OK or NG

- 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 (Wire color) | Condition | Continuity |
|-------------------|--|---|------------|
| F56 | 5 (L/Y) - Ground | Selector lever: + side | Yes |
| | | Other than the above | No |
| | 6 (L/R) - Ground | Selector lever: - side | Yes |
| | | Other than the above | No |
| | 16 (SB) - Ground | Selector lever: "P", "R", "N" or "D" position | Yes |
| | | Selector lever: Manual shift gate position | No |
| 19 (P/B) - 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-584, "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-579, "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-452, "TCM Input/Output Signal Reference Values"](#) .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

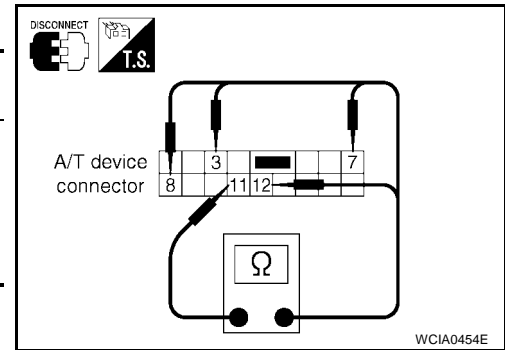
- OK >> **INSPECTION END**
- NG >> Repair or replace damaged parts.

ECS00916

Component Inspection 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 | |



ECS00917

Position Indicator DIAGNOSTIC PROCEDURE

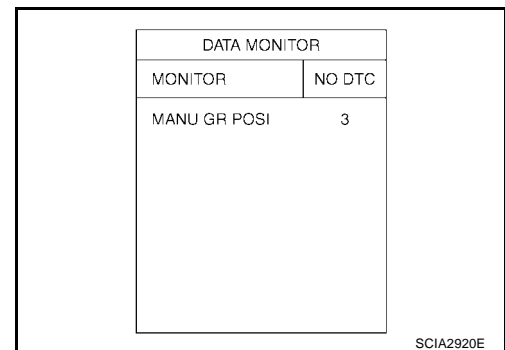
1. CHECK INPUT SIGNALS (WITH CONSULT-II)

Ⓜ With CONSULT-II

- Start engine.
- Select "TRANSMISSION" with "DATA MONITOR" mode in CONSULT-II and read out the value of "MANU GR POSI".
- 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-456, "SELF-DIAG RESULT MODE"](#) .

OK or NG

- OK >> Check combination meter. Refer to [DI-42, "A/T INDICATOR"](#) .
 NG >> Check the malfunctioning system.

DTC P0882 TCM POWER INPUT SIGNAL

PFP:31036

Description

ECS00918

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

ECS00919

- 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

ECS0091A

- Harness or connectors
(Battery or ignition switch and TCM circuit is open or shorted.)
- A/T PV IGN relay

DTC Confirmation Procedure

ECS0091B

CAUTION:

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

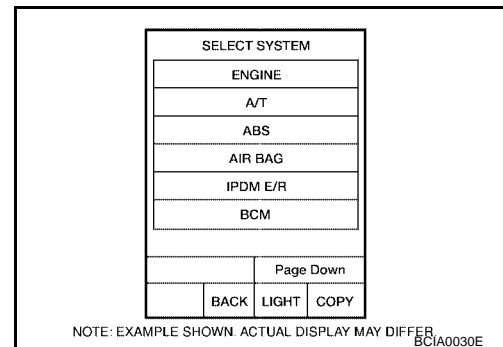
NOTE:

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 "TRANSMISSION" 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-588, "Diagnostic Procedure"](#).



DTC P0882 TCM POWER INPUT SIGNAL

[RE5F22A]

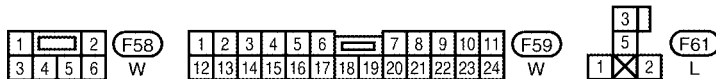
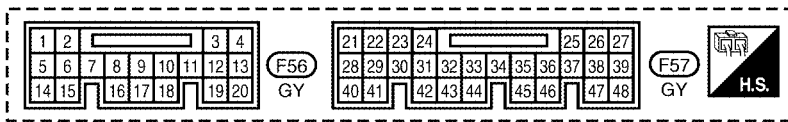
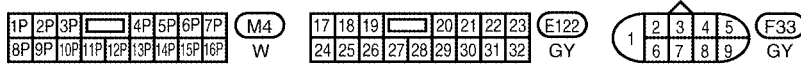
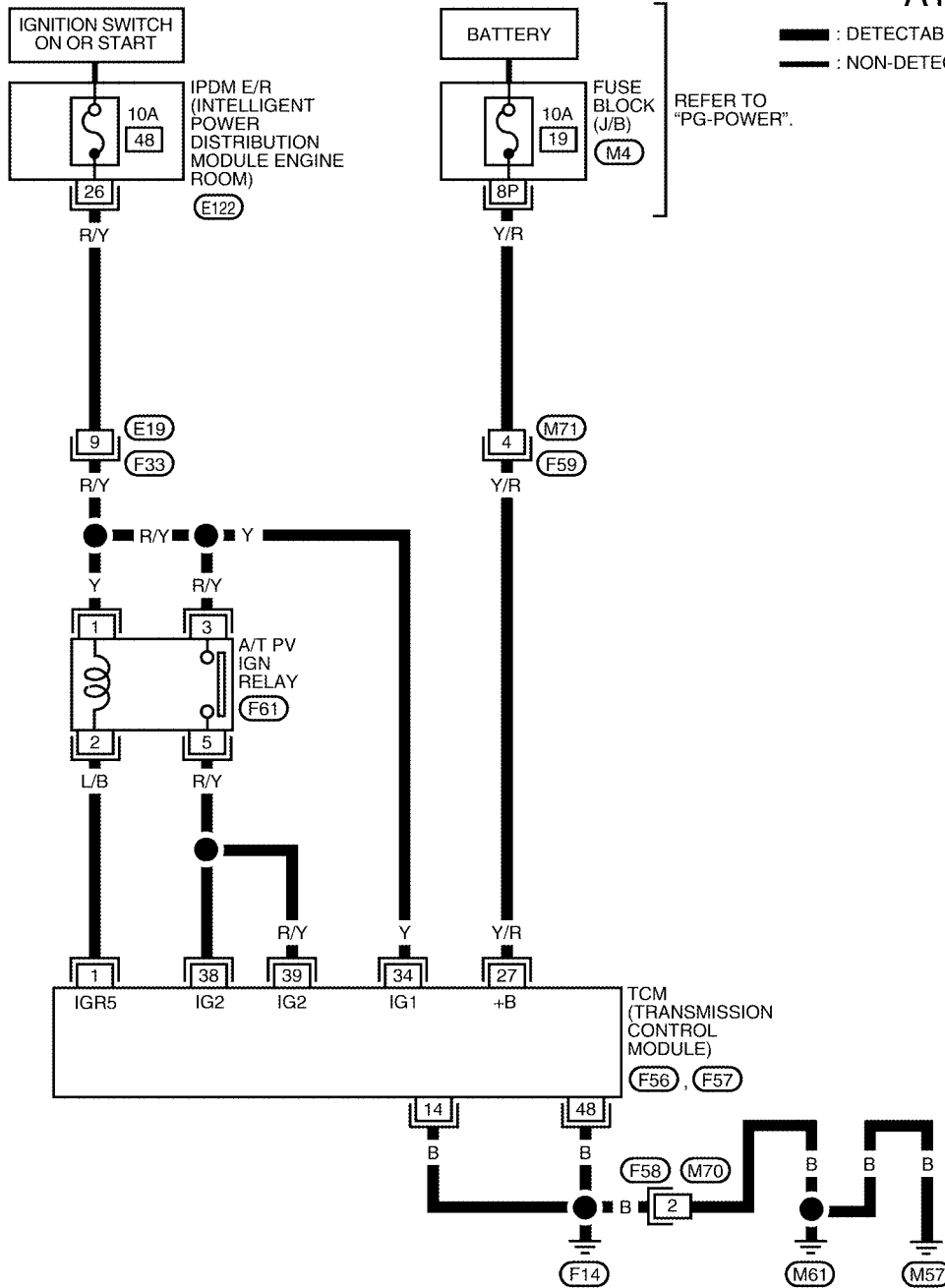
ECS0091C

Wiring Diagram — AT — PWR/IN

AT-PWR/IN-01

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

REFER TO "PG-POWER".













WCWA0225E

DTC P0882 TCM POWER INPUT SIGNAL

[RE5F22A]

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 |

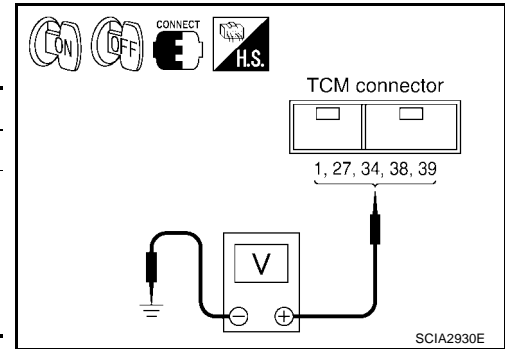
A
B
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Diagnostic Procedure

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 (Wire color) | Voltage (Approx.) |
|-----------|-----------------------|-------------------|
| F56 | 1 (L/B) - Ground | 0 - 1.5V |
| F57 | 27 (Y/R) - Ground | Battery voltage |
| | 34 (Y) - Ground | |
| | 38 (R/Y) - Ground | |
| | 39 (R/Y) - Ground | |



3. Turn ignition switch "OFF".
4. Check voltage between TCM terminals and ground.

| Connector | Terminal (Wire color) | Voltage (Approx.) |
|-----------|-----------------------|-------------------|
| F56 | 1 (L/B) - Ground | 0V |
| F57 | 27 (Y/R) - Ground | Battery voltage |
| | 34 (Y) - Ground | 0V |
| | 38 (R/Y) - Ground | 0V |
| | 39 (R/Y) - 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-589, "Component Inspection"](#)

OK or NG

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

3. CHECK TCM GROUND CIRCUIT

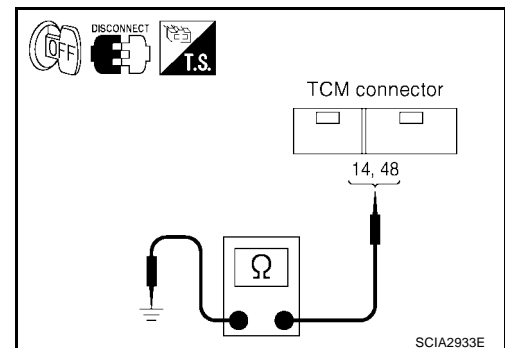
1. Turn ignition switch "OFF".
2. Disconnect TCM harness connector.
3. Check continuity between TCM terminals 14 (B), 48 (B) and ground.

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-585, "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-452, "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.

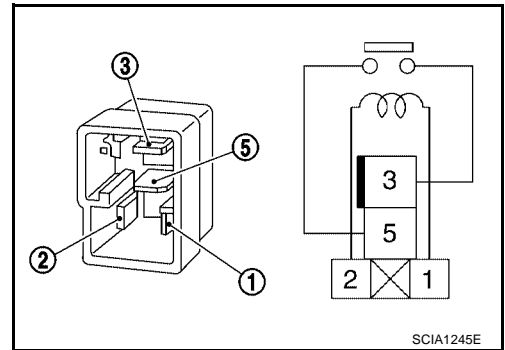
Component Inspection
A/T PV IGN RELAY

ECS009IE

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

PF2:23710

Description

ECS009/F

This DTC is displayed with other DTCs regarding ECM. Perform the trouble diagnosis for other DTCs displayed. Refer to [EC-716. "TROUBLE DIAGNOSIS"](#).

When this DTC is detected, lock-up operation and learning control are canceled.

TROUBLE DIAGNOSIS FOR SYMPTOMS**A/T CHECK Indicator Lamp does not come on**
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

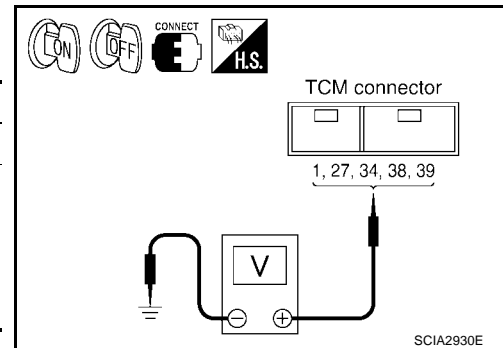
YES >> Check the CAN communication line. Refer to [AT-464, "DTC U1000 CAN COMMUNICATION LINE"](#).

NO >> GO TO 2.

2. CHECK TCM POWER SOURCE CIRCUIT

- Turn ignition switch "ON". (Do not start engine.)
- Check voltage between TCM connector terminals and ground. Refer to [AT-586, "Wiring Diagram — AT — PWR/IN"](#).

| Connector | Terminal (Wire color) | Voltage (Approx.) |
|-----------|-----------------------|-------------------|
| F56 | 1 (L/B) - Ground | 0 - 1.5V |
| F57 | 27 (Y/R) - Ground | Battery voltage |
| | 34 (Y) - Ground | |
| | 38 (R/Y) - Ground | |
| | 39 (R/Y) - Ground | |



- Turn ignition switch "OFF".
- Check voltage between TCM connector terminals and ground. Refer to [AT-586, "Wiring Diagram — AT — PWR/IN"](#).

| Connector | Terminal (Wire color) | Voltage (Approx.) |
|-----------|-----------------------|-------------------|
| F56 | 1 (L/B) - Ground | 0V |
| F57 | 27 (Y/R) - Ground | Battery voltage |
| | 34 (Y) - Ground | 0V |
| | 38 (R/Y) - Ground | 0V |
| | 39 (R/Y) - 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-589, "Component Inspection"](#).

OK or NG

OK >> GO TO 4.

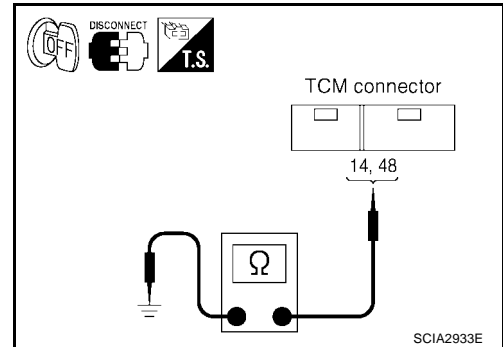
NG >> Repair or replace damaged parts.

4. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch "OFF".
2. Disconnect the TCM harness connector.
3. Check continuity between TCM terminals 14 (B), 48 (B) and ground. Refer to [AT-586, "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-4, "COMBINATION METERS"](#).

OK or NG

- OK >> GO TO 6.
 NG >> Replace the combination meter. Refer to [IP-13, "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-452, "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

ECS009IH

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-9, "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-621, "Control Cable Adjustment"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Adjust control cable. Refer to [AT-621, "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-471, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#) .
- NO >> **INSPECTION END**

In “P” Position, Vehicle Moves When Pushed

ECS009II

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-471, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#) .
- NO >> GO TO 2.

2. CHECK CONTROL CABLE

Check the control cable.

- Refer to [AT-621, "Control Cable Adjustment"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Adjust control cable. Refer to [AT-621, "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**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-435, "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-471, "DTC P0705 PARK/NEUTRAL POSITION SWITCH"](#) .
- NO >> GO TO 3.

3. CHECK CONTROL CABLE

Check the control cable.

- Refer to [AT-621, "Control Cable Adjustment"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Adjust control cable. Refer to [AT-621, "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-452, "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)**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-435, "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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following items:
 - Accumulator. Refer to [AT-633, "DISASSEMBLY"](#) .
 - Forward and direct clutch assembly. Refer to [AT-633, "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-452, "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**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-435, "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-621, "Control Cable Adjustment"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Adjust control cable and PNP switch position. Refer to [AT-621, "Control Cable Adjustment"](#) or [AT-619, "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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following items:
 - Forward and direct clutch assembly. Refer to [AT-633, "DISASSEMBLY"](#) .
 - 1st and reverse brake. Refer to [AT-633, "DISASSEMBLY"](#) .
 - B5 brake. Refer to [AT-660, "Transaxle Case Cover & B5 Brake"](#) .
 - Torque convertor. Refer to [AT-633, "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-452, "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**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-435, "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-621, "Control Cable Adjustment"](#) .

OK or NG

- OK >> GO TO 3.
- NG >> Adjust control cable and PNP switch position. Refer to [AT-621, "Control Cable Adjustment"](#) or [AT-619, "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-525, "DTC P0745 PRESSURE CONTROL SOLENOID VALVE A \(LINE PRESSURE\)"](#) .
- NO >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following items:
 - Forward and direct clutch assembly. Refer to [AT-633, "DISASSEMBLY"](#) .
 - One-way clutch No.2. Refer to [AT-633, "DISASSEMBLY"](#) .
 - B5 brake. Refer to [AT-660, "Transaxle Case Cover & B5 Brake"](#) .
 - Torque convertor. Refer to [AT-633, "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-452, "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**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-596, "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-437, "LINE PRESSURE TEST"](#) .

OK or NG

OK >> GO TO 4.

NG >> Check the malfunctioning item. Refer to [AT-438, "Judgement of line pressure test"](#) .

4. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#) .

2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .

3. Check the following items:

- Forward and direct clutch assembly. Refer to [AT-633, "DISASSEMBLY"](#) .

- One-way clutch No.2. Refer to [AT-633, "DISASSEMBLY"](#) .

- B5 brake. Refer to [AT-660, "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-452, "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**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 D1.

OK or NG

OK >> GO TO 2.

NG >> Refer to [AT-597, "Vehicle Does Not Creep Forward In "D" Position"](#) , [AT-598, "Vehicle Cannot Be Started From D1"](#) .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to [AT-435, "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-622, "Control Valve Assembly"](#) .

2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .

3. Check the following items:

- One-way clutch No.1. Refer to [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#) .

- One-way clutch No.2. Refer to [AT-633, "DISASSEMBLY"](#) .

- 2nd coast brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#) , [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#) .

- 2nd brake. Refer to [AT-652, "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-452, "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: D2 → D3**SYMPTOM:**

The vehicle does not shift-up from D2 to D3 gear at the specified speed.

ECS0091P

DIAGNOSTIC PROCEDURE**1. CONFIRM THE SYMPTOM**

Check if vehicle creeps forward in "D" position and vehicle can be started from D1.

OK or NG

OK >> GO TO 2.

NG >> Refer to [AT-597, "Vehicle Does Not Creep Forward In "D" Position"](#) ,[AT-598, "Vehicle Cannot Be Started From D1"](#) .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to [AT-435, "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-622, "Control Valve Assembly"](#) .

2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .

3. Check the following items:

- U/D brake. Refer to [AT-633, "DISASSEMBLY"](#) .

- B5 brake. Refer to [AT-660, "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-452, "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: D3 → D4**SYMPTOM:**

- The vehicle does not shift-up from the D3 to D4 gear at the specified speed.

ECS0091Q

DIAGNOSTIC PROCEDURE**1. CONFIRM THE SYMPTOM**

Check if vehicle creeps forward in "D" position and vehicle can be started from D1.

OK or NG

OK >> GO TO 2.

NG >> Refer to [AT-597, "Vehicle Does Not Creep Forward In "D" Position"](#) , [AT-598, "Vehicle Cannot Be Started From D1"](#) .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to [AT-435, "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-622, "Control Valve Assembly"](#) .

2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .

3. Check the following items:

- U/D brake. Refer to [AT-633, "DISASSEMBLY"](#) .

- U/D clutch. Refer to [AT-633, "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-452, "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: D4 → D5**SYMPTOM:**

- The vehicle does not shift-up from the D4 to D5 gear at the specified speed.

ECS0091R

DIAGNOSTIC PROCEDURE**1. CONFIRM THE SYMPTOM**

Check if vehicle creeps forward in "D" position and vehicle can be started from D1.

OK or NG

OK >> GO TO 2.

NG >> Refer to [AT-597, "Vehicle Does Not Creep Forward In "D" Position"](#) ,[AT-598, "Vehicle Cannot Be Started From D1"](#) .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level. Refer to [AT-435, "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-622, "Control Valve Assembly"](#) .

2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .

3. Check the following items:

- Forward and direct clutch assembly. Refer to [AT-633, "DISASSEMBLY"](#) .

- 2nd coast brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#) , [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#) .

- One-way clutch No.1. Refer to [AT-658, "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-452, "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
SYMPTOM:**

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

ECS009IS

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

Check the A/T fluid level. Refer to [AT-435, "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-8, "TROUBLE DIAGNOSIS"](#) (with ABS), [BRC-51, "TROUBLE DIAGNOSIS"](#) (with 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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following items:
 - Torque converter. Refer to [AT-633, "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-452, "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
SYMPTOM:**

ECS0091T

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-435, "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-8, "TROUBLE DIAGNOSIS"](#) (with ABS), [BRC-51, "TROUBLE DIAGNOSIS"](#) (with 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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following items:
 - Torque converter. Refer to [AT-633, "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-452, "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
SYMPTOM:

The lock-up condition cannot be cancelled even after releasing the accelerator pedal.

ECS009IU

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

Check the A/T fluid level. Refer to [AT-435, "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-8, "TROUBLE DIAGNOSIS"](#) (with ABS), [BRC-51, "TROUBLE DIAGNOSIS"](#) (with 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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following items:
 - Torque converter. Refer to [AT-633, "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-452, "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
SYMPTOM:**

Does not change to manual mode when manual shift gate is used.

ECS009IV

DIAGNOSTIC PROCEDURE**1. CHECK MANUAL MODE SWITCH CIRCUIT**

Check the manual mode switch circuit. Refer to [AT-579, "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
SYMPTOM:**

ECS009IW

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-435, "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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following items:
 - Forward and direct clutch assembly. Refer to [AT-633, "DISASSEMBLY"](#) .
 - 2nd coast brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#) , [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#) .
 - One-way clutch No.1. Refer to [AT-658, "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-452, "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

ECS009IX

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-435, "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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following items:
 - U/D clutch. Refer to [AT-633, "DISASSEMBLY"](#) .
 - U/D brake. Refer to [AT-633, "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-452, "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

ECS009IY

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-435, "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-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following items:
 - U/D brake. Refer to [AT-633, "DISASSEMBLY"](#) .
 - B5 brake. Refer to [AT-660, "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-452, "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
SYMPTOM:**

ECS009IZ

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-435, "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-622, "Control Valve Assembly"](#).
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#).
3. Check the following items:
 - 2nd coast brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#), [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#).
 - 2nd brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#).
 - One-way clutch No.1. Refer to [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#).
 - One-way clutch No.2. Refer to [AT-633, "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-452, "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 SYMPTOM:

ECS009J0

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-435, "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-555, "DTC P0770 SHIFT SOLENOID VALVE E"](#), [AT-590, "DTC P1726 ELECTRIC THROTTLE CONTROL SYSTEM"](#).
NO >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

1. Control valve assembly. Refer to [AT-622, "Control Valve Assembly"](#) .
2. Disassemble A/T. Refer to [AT-633, "DISASSEMBLY"](#) .
3. Check the following items:
 - 2nd coast brake. Refer to [AT-652, "Oil Pump, 2nd Coast Brake & 2nd Brake"](#) , [AT-658, "One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1"](#) .
 - U/D brake. Refer to [AT-633, "DISASSEMBLY"](#) .
 - B5 brake. Refer to [AT-660, "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-452, "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

ECS009J1

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-471, "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-8, "TROUBLE DIAGNOSIS"](#) (with ABS), [BRC-51, "TROUBLE DIAGNOSIS"](#) (with 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-669, "EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS"](#).

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 "TRANSMISSION" 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.

| DATA MONITOR | |
|--------------|--------|
| MONITOR | NO DTC |
| BRAKE SW | OFF |
| CLSD THL POS | ON |

SCIA2946E

5. CHECK TCM

1. Check TCM input/output signal. Refer to [AT-452, "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-464, "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

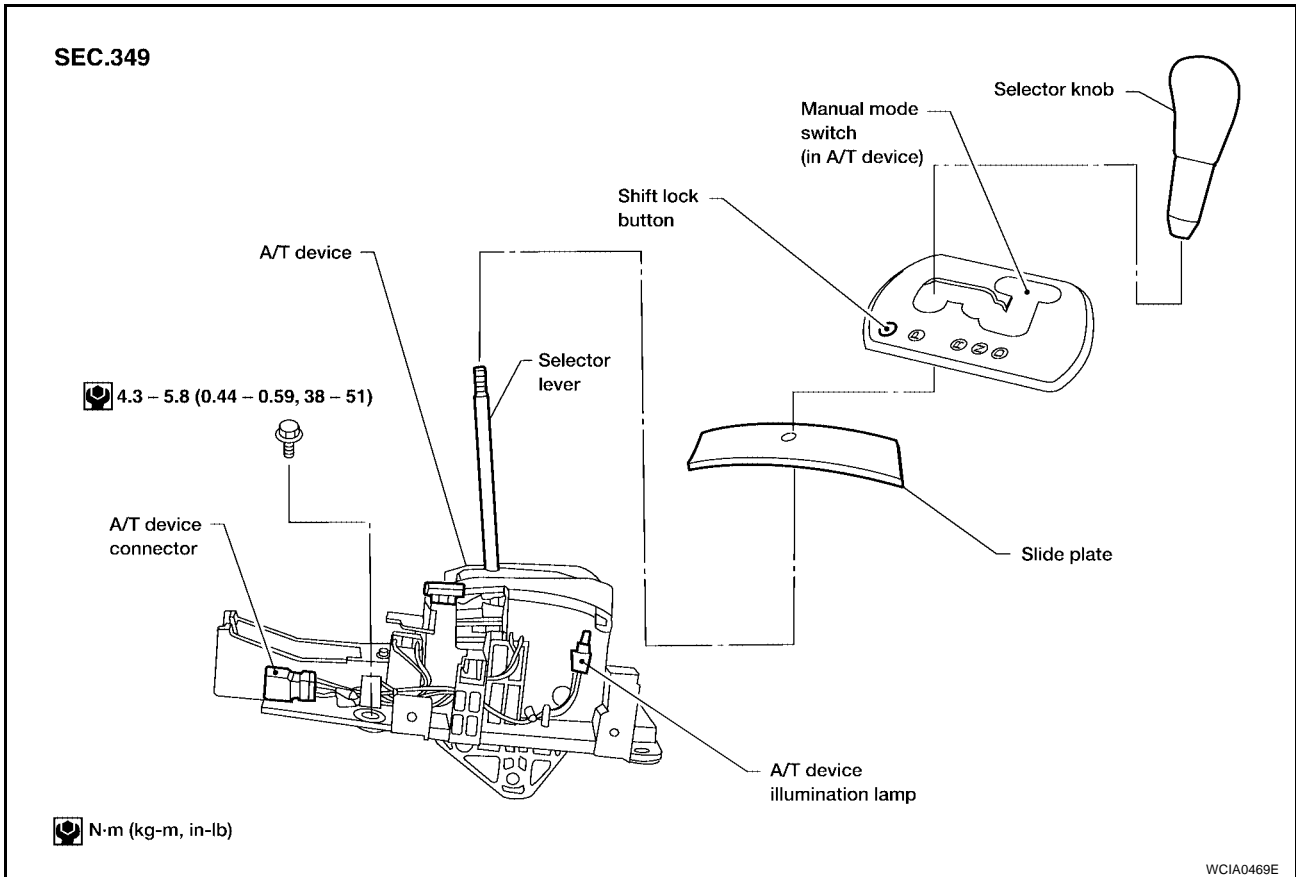
- OK >> **INSPECTION END**
- NG >> Replace the TCM.

SHIFT CONTROL SYSTEM

PF3:34901

Control Device

ECS009J2

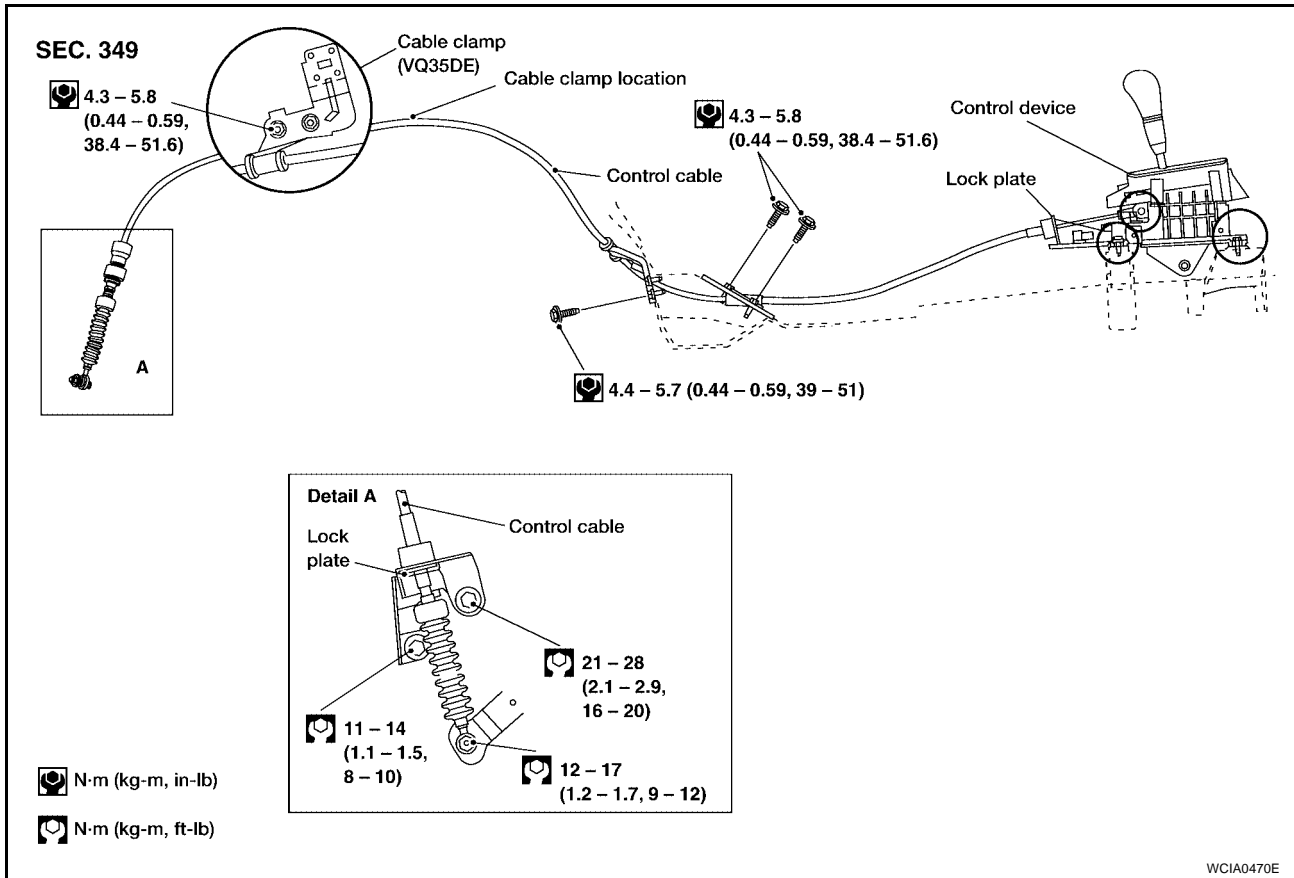


SHIFT CONTROL SYSTEM

[RE5F22A]

ECS009J3

Control Cable



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A/T SHIFT LOCK SYSTEM

PFP:34950

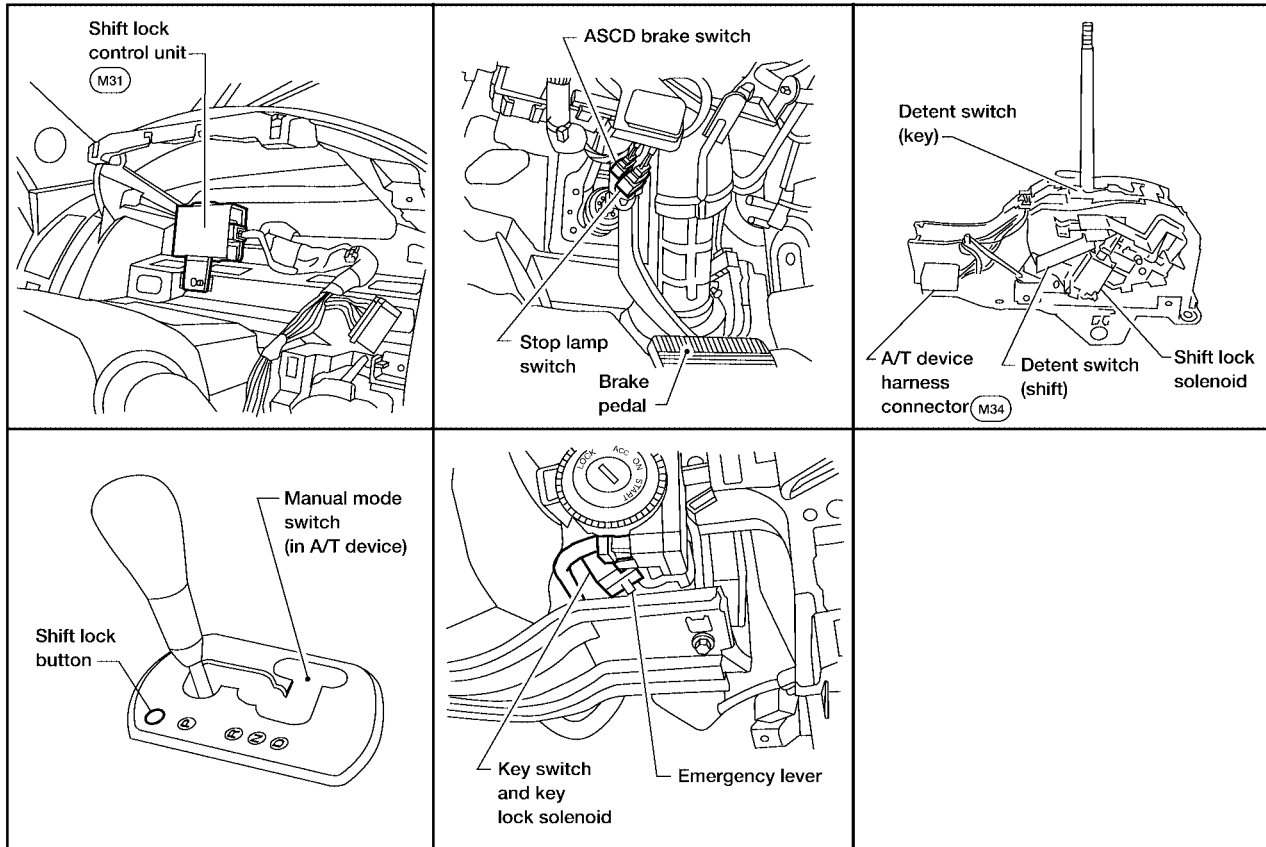
Description

ECS009J4

- 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

ECS009J5



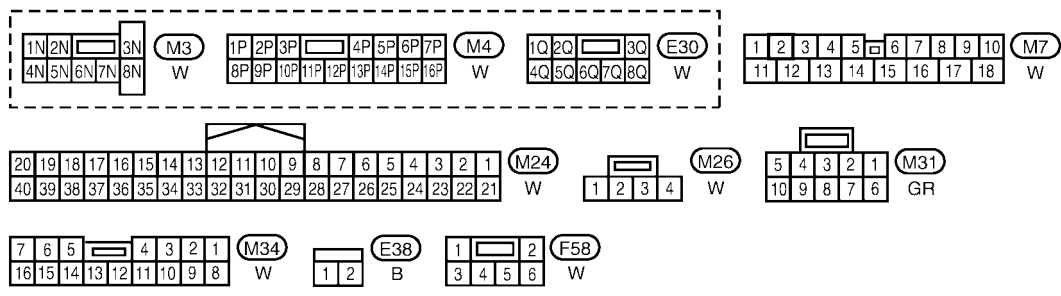
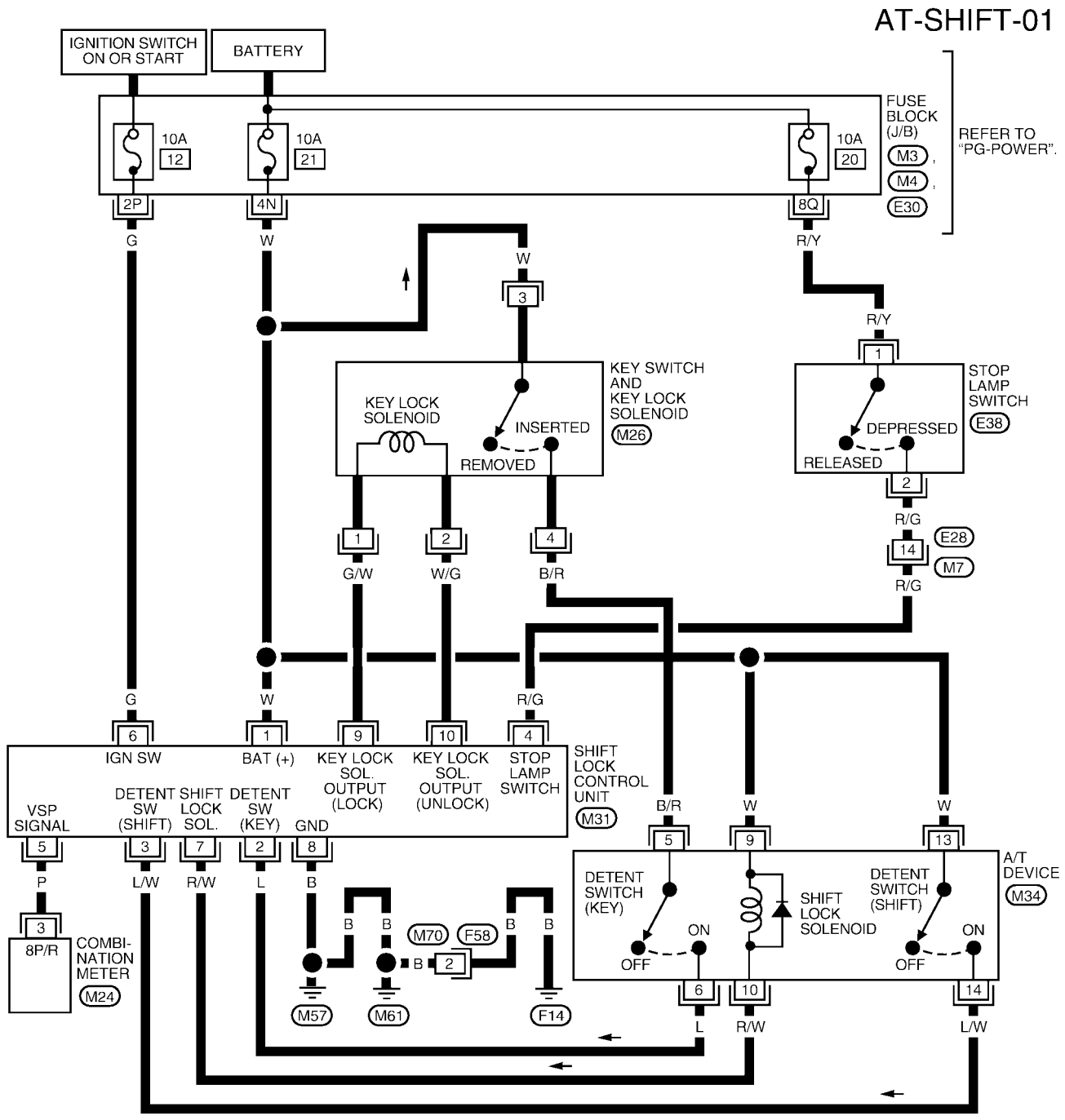
WCIA0468E

A/T SHIFT LOCK SYSTEM

[RE5F22A]

Wiring Diagram — AT — SHIFT

ECS009J6



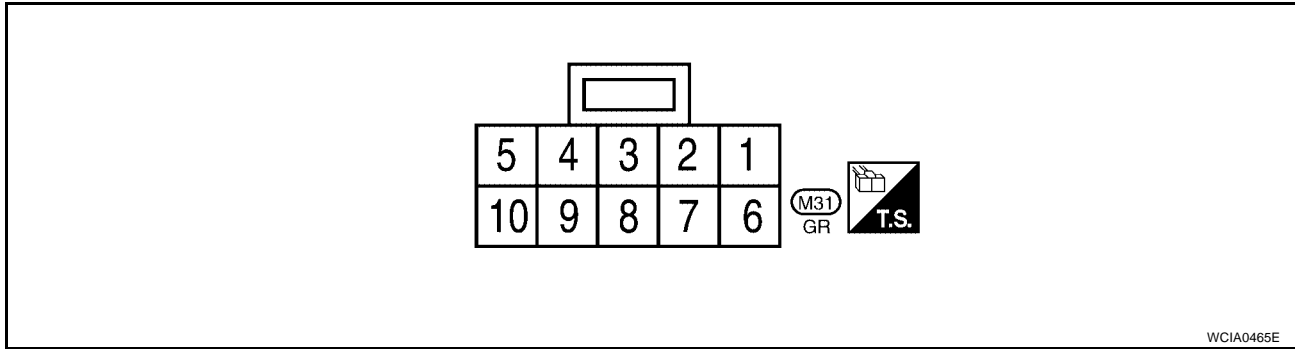
WCWA0186E

A/T SHIFT LOCK SYSTEM

[RE5F22A]

ECS009J7

Shift Lock Control Unit Reference Values 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 (W) | 8 (B) | Power source | Always | Battery voltage |
| 2 (L) | 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 (R/G) | 8 (B) | Stop lamp switch | When brake pedal is depressed | Battery voltage |
| | | | When brake pedal is released | Approx. 0V |
| 5 (P) | 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 (G/W) | 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.

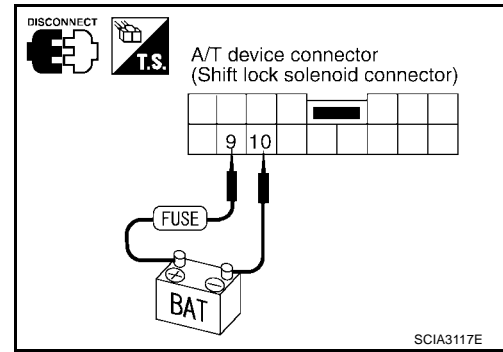
Component Inspection SHIFT LOCK SOLENOID

- 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) |

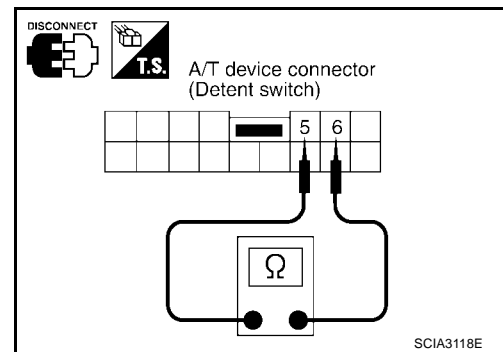


DETENT SWITCH

For Key:

- Check continuity between terminals of the A/T device connector.

| Condition | Connector | 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 | M34 | 5 - 6 | Yes |
| Except the above | | | No |



KEY LOCK SOLENOID

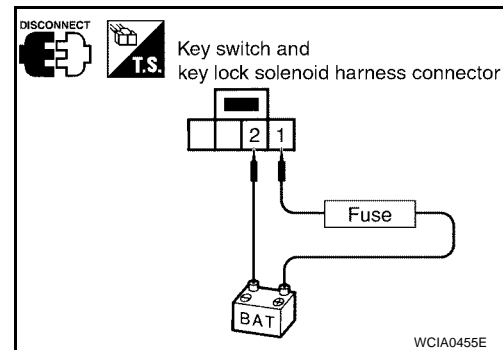
Key Lock

- Check operation by applying battery voltage to key switch and key lock solenoid connector.

CAUTION:

Be careful not to cause burnout of the harness.

| Connector | Terminal |
|-----------|----------------------------------|
| M26 | 1 (Battery voltage) - 2 (Ground) |



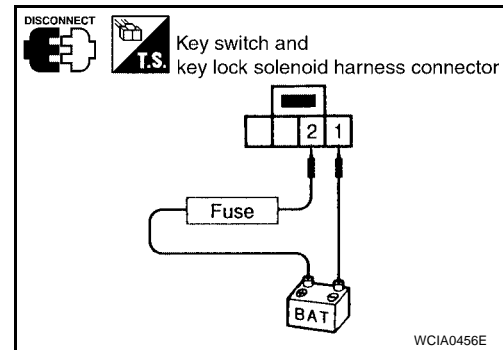
Key Unlock

- Check operation by applying battery voltage to key switch and key lock solenoid connector.

CAUTION:

Be careful not to cause burnout of the harness.

| Connector | Terminal |
|-----------|----------------------------------|
| M26 | 2 (Battery voltage) - 1 (Ground) |

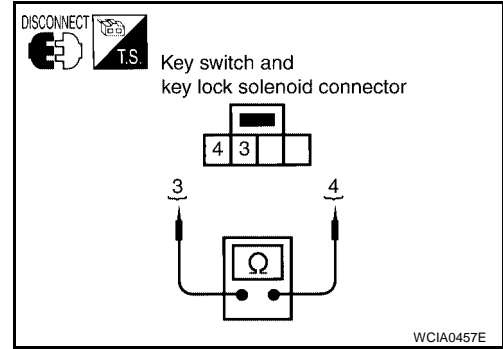


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KEY SWITCH

- Check continuity between terminals of the key switch and key lock solenoid connector.

| Condition | Connector | Terminal | Continuity |
|--------------|-----------|----------|------------|
| Key inserted | M26 | 3 - 4 | Yes |
| Key removed | | | No |

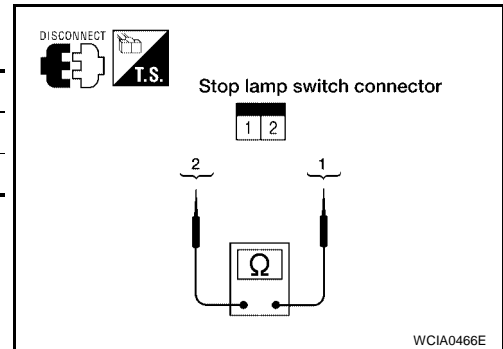


STOP LAMP SWITCH

- Check continuity between terminals of the stop lamp switch connector.

| Condition | Connector | Terminal | Continuity |
|-------------------------------|-----------|----------|------------|
| When brake pedal is depressed | E38 | 1 - 2 | Yes |
| When brake pedal is released | | | No |

Check stop lamp switch after adjusting brake pedal. Refer to [BR-6](#). "[Inspection and Adjustment](#)".



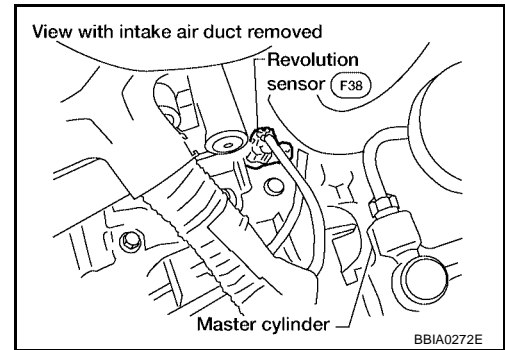
ON-VEHICLE SERVICE

Revolution Sensor Replacement

1. Remove intake air duct.
2. Disconnect electrical connector.
3. Remove revolution sensor from A/T.
4. Reinstall any part removed.

NOTE:

Do not reuse seal bolt.

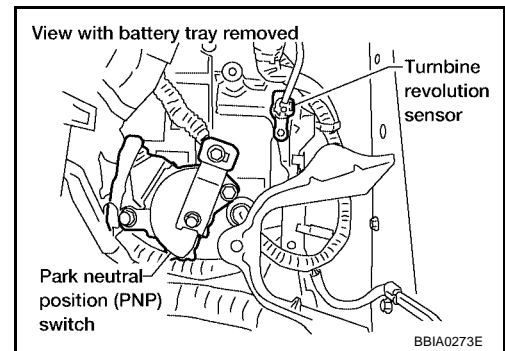


Turbine Revolution Sensor Replacement

1. Remove battery and bracket.
2. Disconnect electrical connector.
3. Remove bolt, and turbine revolution sensor from A/T.
4. Reinstall any part removed.

NOTE:

Do not reuse seal bolt.

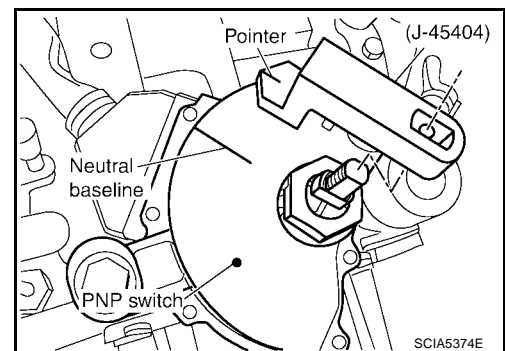


Park/Neutral Position (PNP) Switch Adjustment

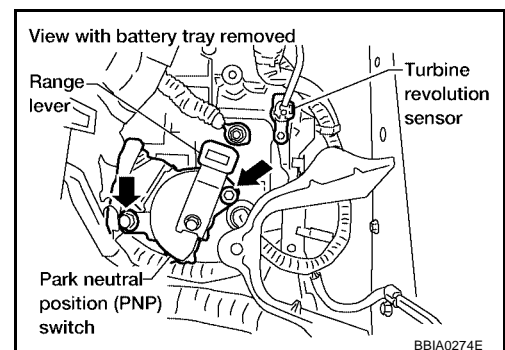
1. Remove battery and bracket.
2. Remove cable from range lever.
3. Set range lever in neutral position.
4. Remove range lever and install Tool.

Tool number : KV991J0060 (J-45404)

5. Loosen park/neutral position (PNP) switch bolts.
6. Adjust park/neutral position (PNP) switch so that Tool pointer aligns with neutral base line on park/neutral position (PNP) switch body.



7. Tighten park/neutral position (PNP) switch bolts.
8. Reinstall range lever and cable.
9. Adjust control cable. Refer to [AT-621, "Control Cable Adjustment"](#).
10. Reinstall battery and bracket.
11. Check continuity of park/neutral position (PNP) switch. Refer to [AT-475, "Component Inspection"](#).



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**ATF Cooler
REMOVAL**

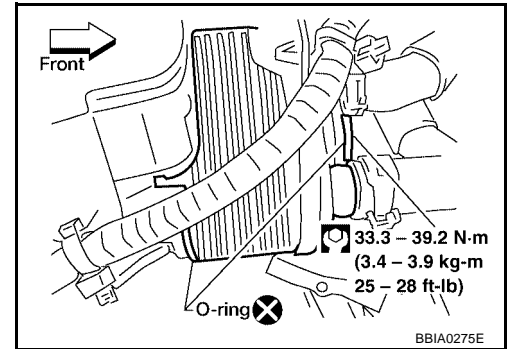
1. Drain ATF. Refer to [MA-31, "Changing A/T Fluid"](#) .
2. Drain engine coolant. Refer to [MA-22, "DRAINING ENGINE COOLANT"](#) .
3. Remove hose clamps and hoses from ATF cooler.
4. Remove bolt from ATF cooler and remove ATF cooler.

INSTALLATION

Installation is in the reverse order of removal.

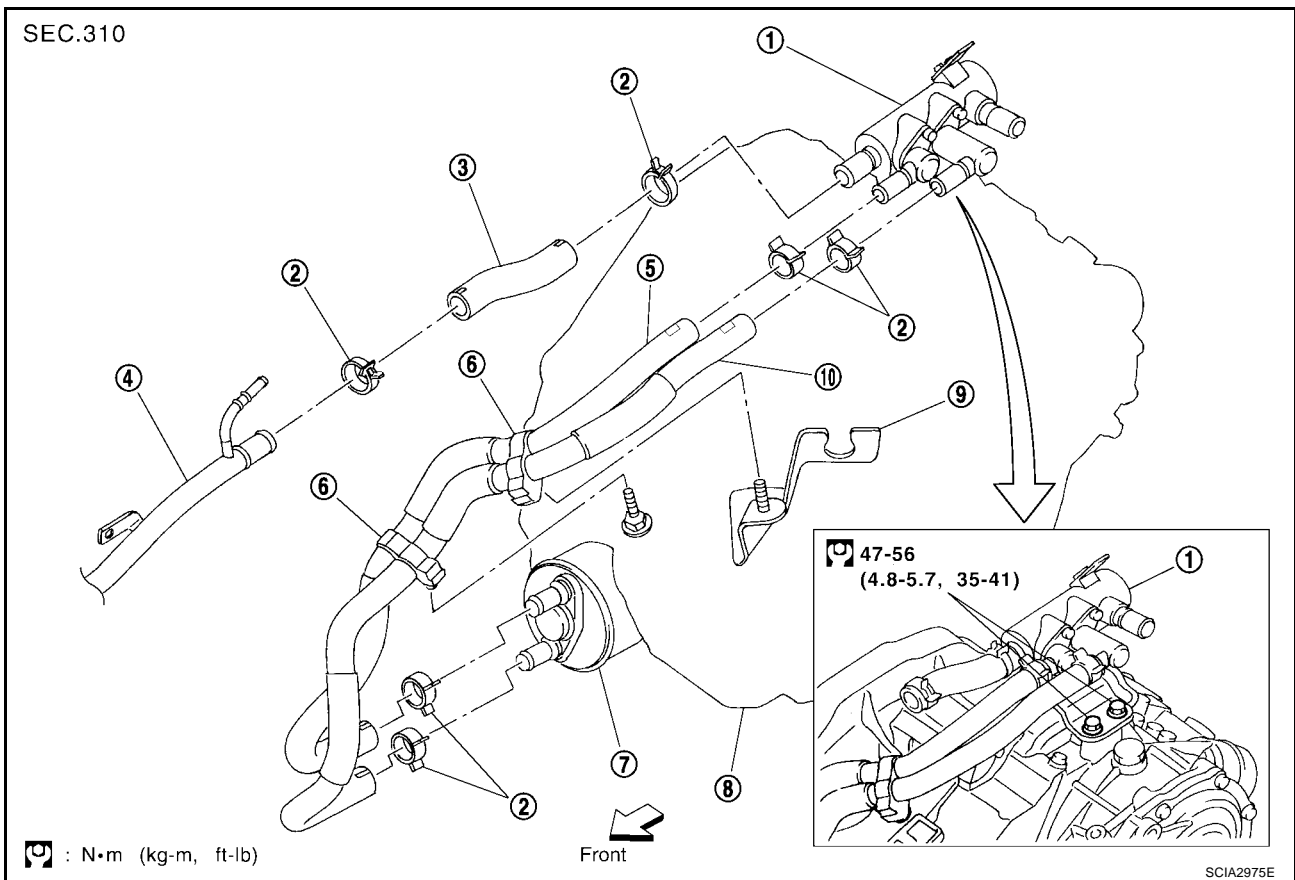
NOTE:

Do not reuse sealing parts.



ATF Cooler Valve

Refer to the figure for ATF cooler valve and hoses removal and installation information.



: N·m (kg-m, ft-lb)

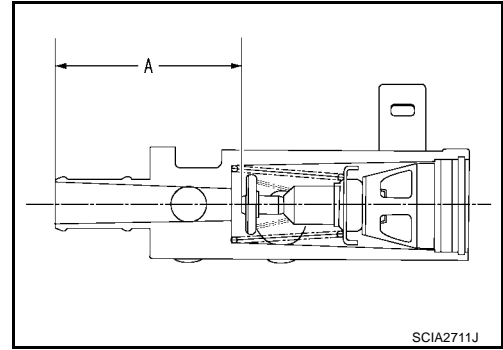
- | | | |
|------------------------------|-----------------------|--------------------------|
| 1. ATF cooler valve assembly | 2. Hose clamp | 3. Heater hose |
| 4. Heater pipe | 5. Outlet water hose | 6. Hose clip |
| 7. ATF cooler assembly | 8. Transaxle assembly | 9. Control cable bracket |
| 10. Inlet water hose | | |

COMPONENT INSPECTION

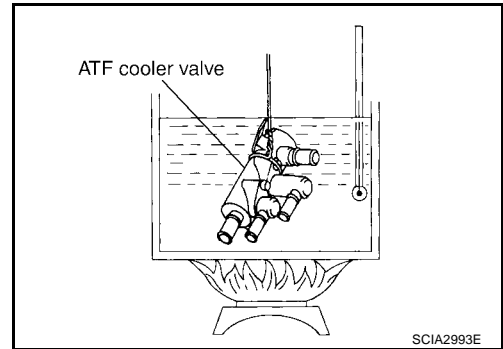
1. Make sure that ATF cooler valve is fully opened at room temperature.

Dimension "A": More than 72.0 mm (2.835 in)

A: Distance between ATF cooler valve port end face and valve shaft end face.



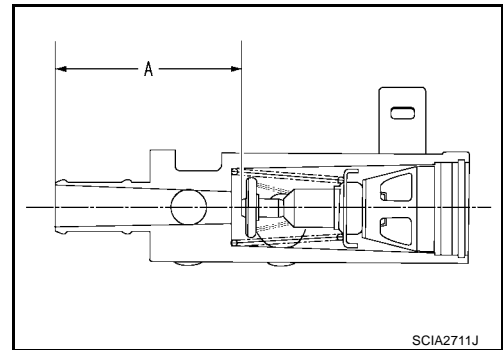
2. Submerge ATF cooler valve in a water-filled container, and then heat it up with temperature of over 82°C (180°F) for 10 minutes more.



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

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.

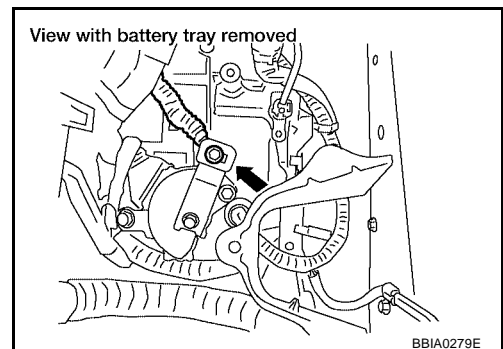
1. Place selector lever in the P position.

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 in the illustration.

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.

NOTE:

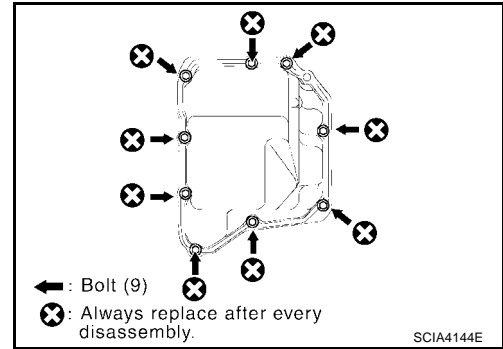
- Make sure that the starter operates when the selector lever is placed in the N or P position.
- Make sure that the transmission is locked properly when the selector lever is placed in the P position.

**Side cover
REMOVAL**

1. Remove engine under cover.
2. Drain ATF. Refer to [MA-31, "Changing A/T Fluid"](#) .
3. Remove side cover bolts and side cover.

NOTE:

Do not reuse sealing bolts.

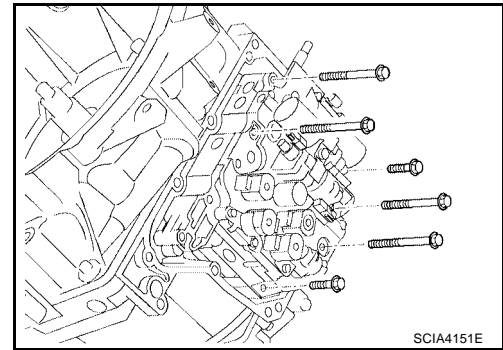


INSTALLATION

Installation is in the reverse order of removal. Refer to [AT-626, "Components"](#) .

**Control Valve Assembly
REMOVAL**

1. Remove side cover. Refer to [AT-622, "Side cover"](#) .
2. Disconnect solenoid valve connectors.
3. Disconnect control valve assembly bolts and remove control valve assembly.

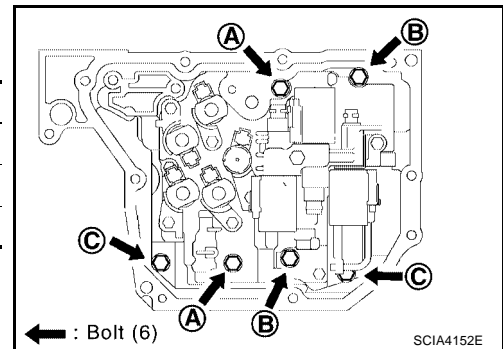


INSTALLATION

Installation is in the reverse order of removal.

- Install bolts in sequence as shown. Refer to [AT-626, "Components"](#) for specified torque.

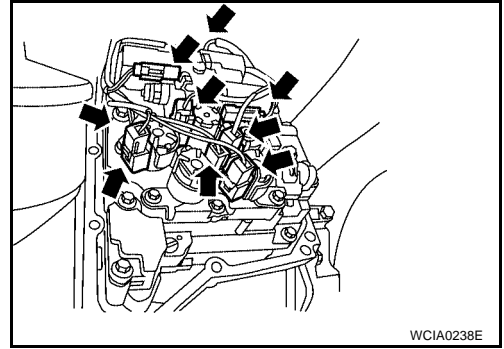
| Bolt symbol | Length mm (in) | Number of bolts |
|-------------|----------------|-----------------|
| A | 55 (2.17) | 2 |
| B | 50 (1.97) | 2 |
| C | 16 (0.63) | 2 |



**Terminal Cord Assembly
REMOVAL**

1. Remove PNP switch. Refer to [AT-626, "Components"](#) .
2. Remove side cover. Refer to [AT-622, "Terminal Cord Assembly"](#) .

3. Disconnect solenoid valve connectors.
4. Remove terminal cord assembly.



INSTALLATION

Installation is in the reverse order of removal.

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REMOVAL AND INSTALLATION

PFP:00000

Removal

ECS009JI

CAUTION:

When removing the transaxle assembly from engine, be sure to remove the crankshaft position sensor from the assembly.

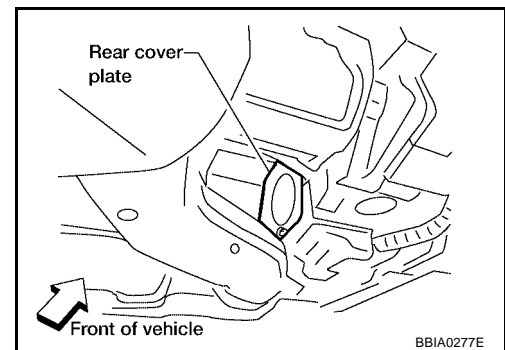
Be careful not to damage sensor edge.

1. Drain engine coolant. Refer to [MA-22, "DRAINING ENGINE COOLANT"](#) .
2. Remove battery and bracket.
3. Remove air cleaner assembly. Refer to [EM-120, "AIR CLEANER AND AIR DUCT"](#) .
4. Disconnect terminal cord assembly harness connector and park/neutral position (PNP) switch harness connectors.
5. Disconnect harness connectors of revolution sensor, ground, mass air flow sensor, and turbine revolution sensor.
6. Remove ATF cooler valve assembly bracket bolts.
7. Disconnect ATF cooler line retainers.
8. Disconnect ATF cooler lines from ATF cooler valve assembly.
9. Disconnect control cable at transaxle side.
10. Drain ATF. Refer to [MA-31, "Changing A/T Fluid"](#) .
11. Remove push clips and engine undercover.
12. Remove upper transaxle to engine bolts.
13. Support engine using suitable tool.
14. Remove drive shafts. Refer to [FAX-11, "Removal and Installation"](#) .
15. Remove crankshaft position sensor from transaxle.
16. Support transaxle with a suitable jack.
17. Remove starter motor from transaxle. Refer to [FAX-11, "Removal and Installation"](#) .
18. Remove front suspension member. Refer to [FSU-15, "Removal and Installation"](#) .
19. Remove rear cover plate and torque converter to drive plate bolts.

NOTE:

Rotate crankshaft for access to torque converter to drive plate bolts.

20. Remove lower transaxle to engine bolts.
21. Lower transaxle while supporting it with a jack.
22. If replacing the transaxle as a unit, remove the LH transaxle mount from the transaxle case.



ECS009JJ

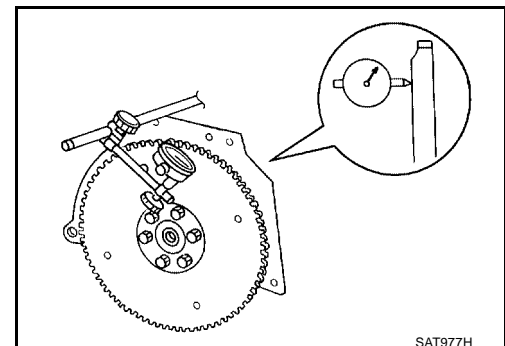
Inspection After Removal

Check the drive plate runout as shown.

If this runout is out of allowance, replace drive plate and ring gear. Refer to [AT-692, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#) .

CAUTION:

Do not allow any magnetic materials to contact the ring gear teeth.

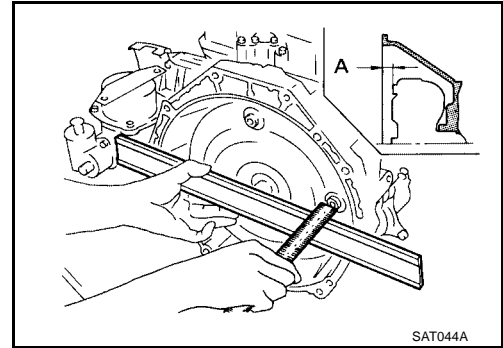


Installation

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

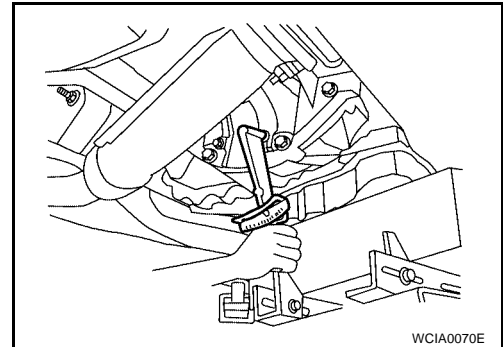


2. Install the torque converter to drive plate.

Torque converter to drive plate bolts : 49 - 58 N·m (5.0 - 5.9 kg·m, 37 - 42 ft·lb)

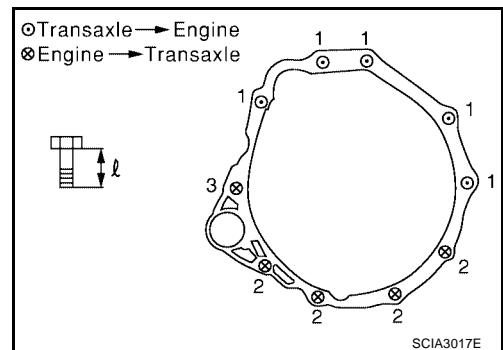
NOTE:

With converter installed, rotate crankshaft several turns to check that transaxle rotates freely without binding.



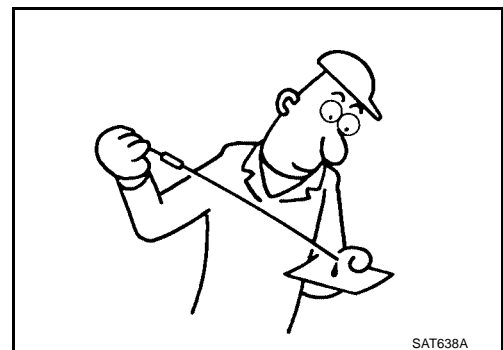
3. Tighten bolts securing transaxle.

| 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) |



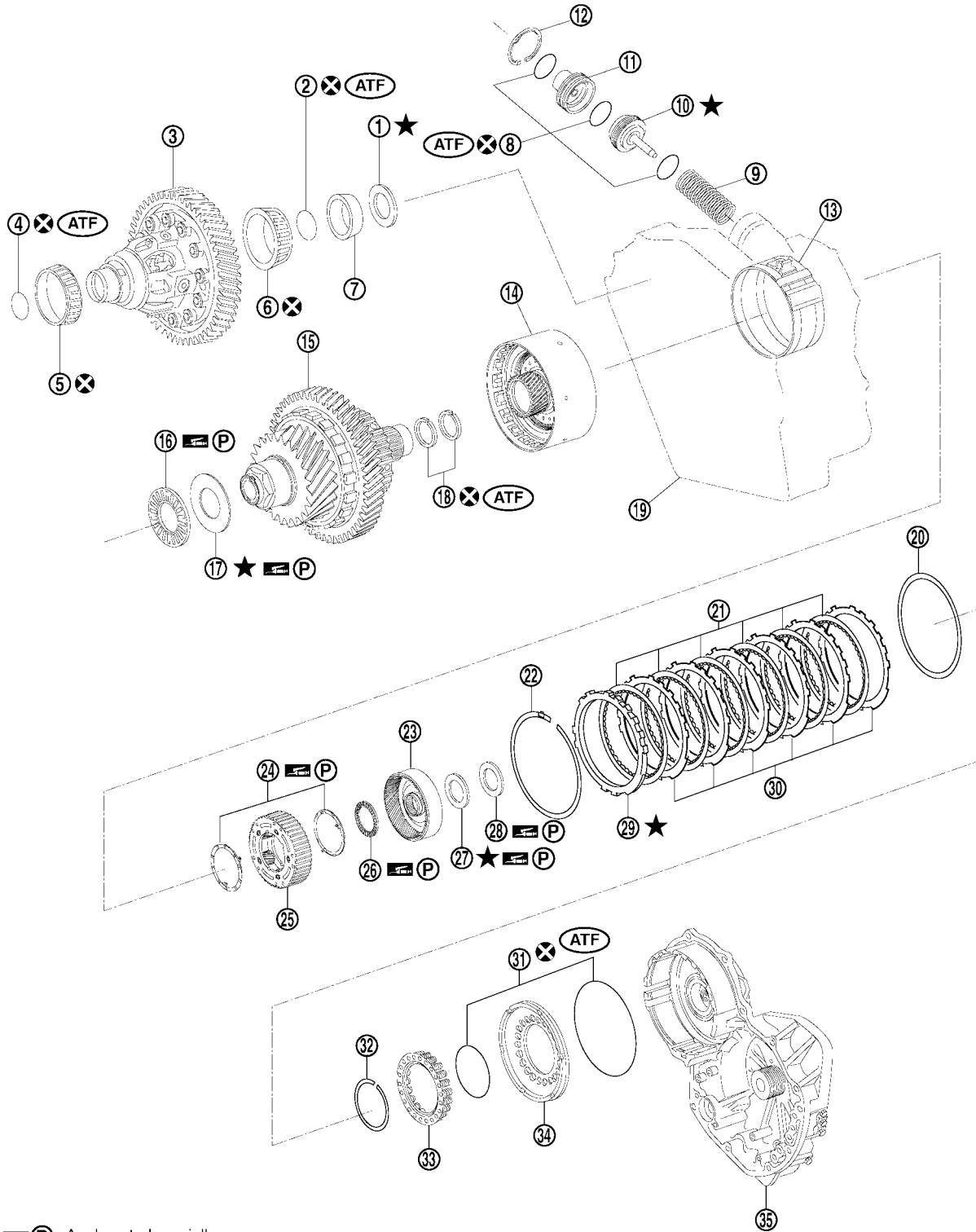
4. Installation of the remaining components is in the reverse order of removal.

- Check fluid level in transaxle.
- Move selector lever through all positions to be sure that transaxle operates correctly.
With parking brake applied, rotate engine at idling. Move selector lever through N to D and to R position. A slight shock should be felt by hand gripping selector each time transaxle is shifted.
- When replacing the A/T assembly, initialize TCM. Refer to [AT-388, "Precautions for A/T Assembly or TCM Replacement"](#).
- Perform road test. Refer to [AT-438, "ROAD TEST"](#).



OVERHAUL Components

SEC.313 · 314 · 315 · 316



☐ P : Apply petroleum jelly.

⊗ ATF : Apply ATF.

★ : Select with proper thickness.

⊗ : Always replace after every disassembly

OVERHAUL

[RE5F22A]

- | | | |
|---------------------------------------|---|-------------------------------|
| 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. Adjusting shim |
| 28. Thrust bearing race | 29. B5 brake flange | 30. B5 brake plate |
| 31. O-ring | 32. Snap ring | 33. Return spring |
| 34. B5 brake piston | 35. Transaxle case cover | |

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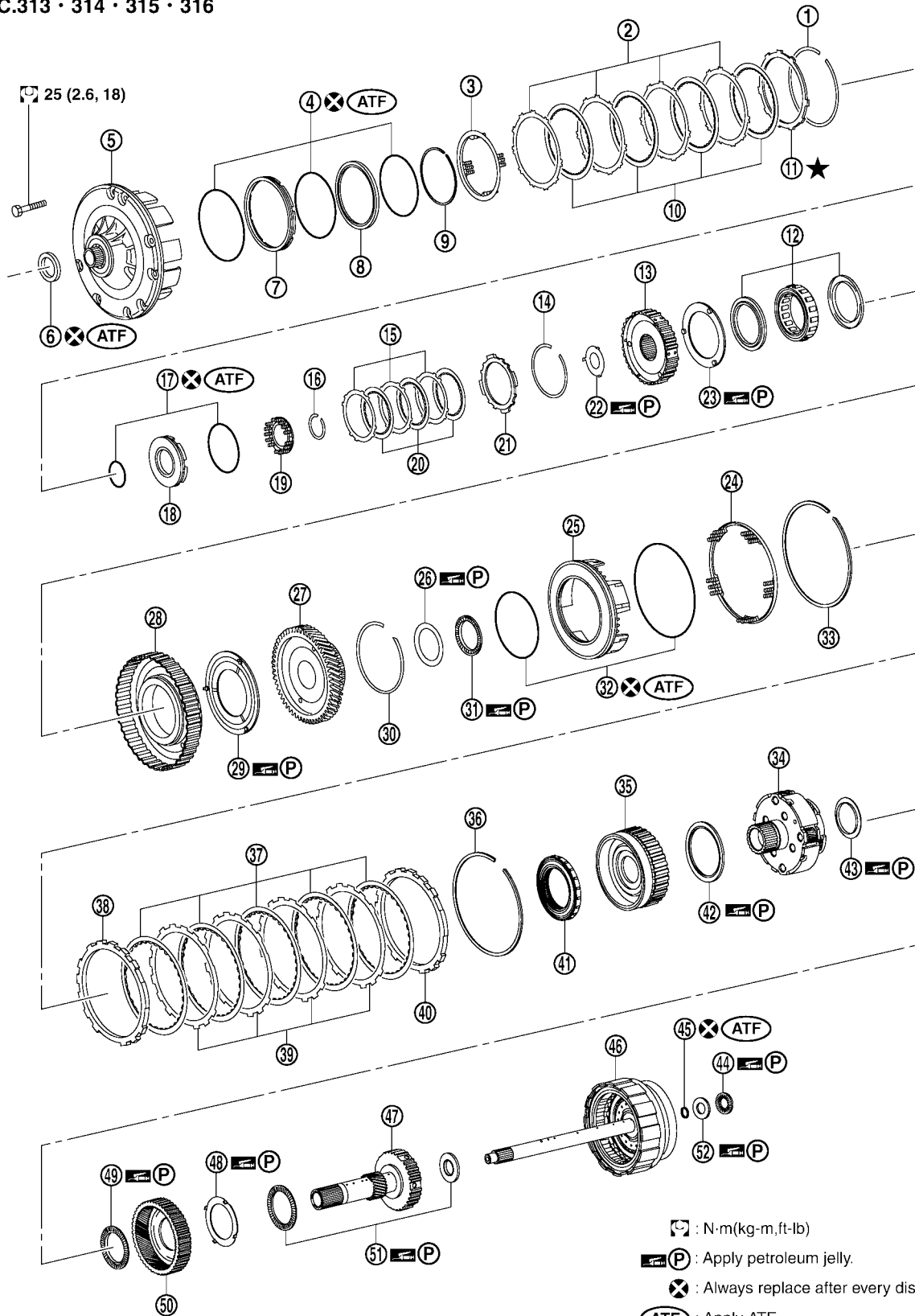
L

M

OVERHAUL

[RE5F22A]

SEC.313 · 314 · 315 · 316



: N·m(kg·m,ft·lb)

: Apply petroleum jelly.

: Always replace after every disassembly.

: Apply ATF.

: Select with proper thickness.

- 1. Snap ring
- 4. O-ring
- 7. 2nd brake piston

- 2. 2nd brake plate
- 5. Oil pump assembly
- 8. 2nd brake sleeve

- 3. Return spring
- 6. Oil seal
- 9. Snap ring

WCIA0385E

OVERHAUL

[RE5F22A]

- | | | |
|--|-------------------------------------|-------------------------------------|
| 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 | | |

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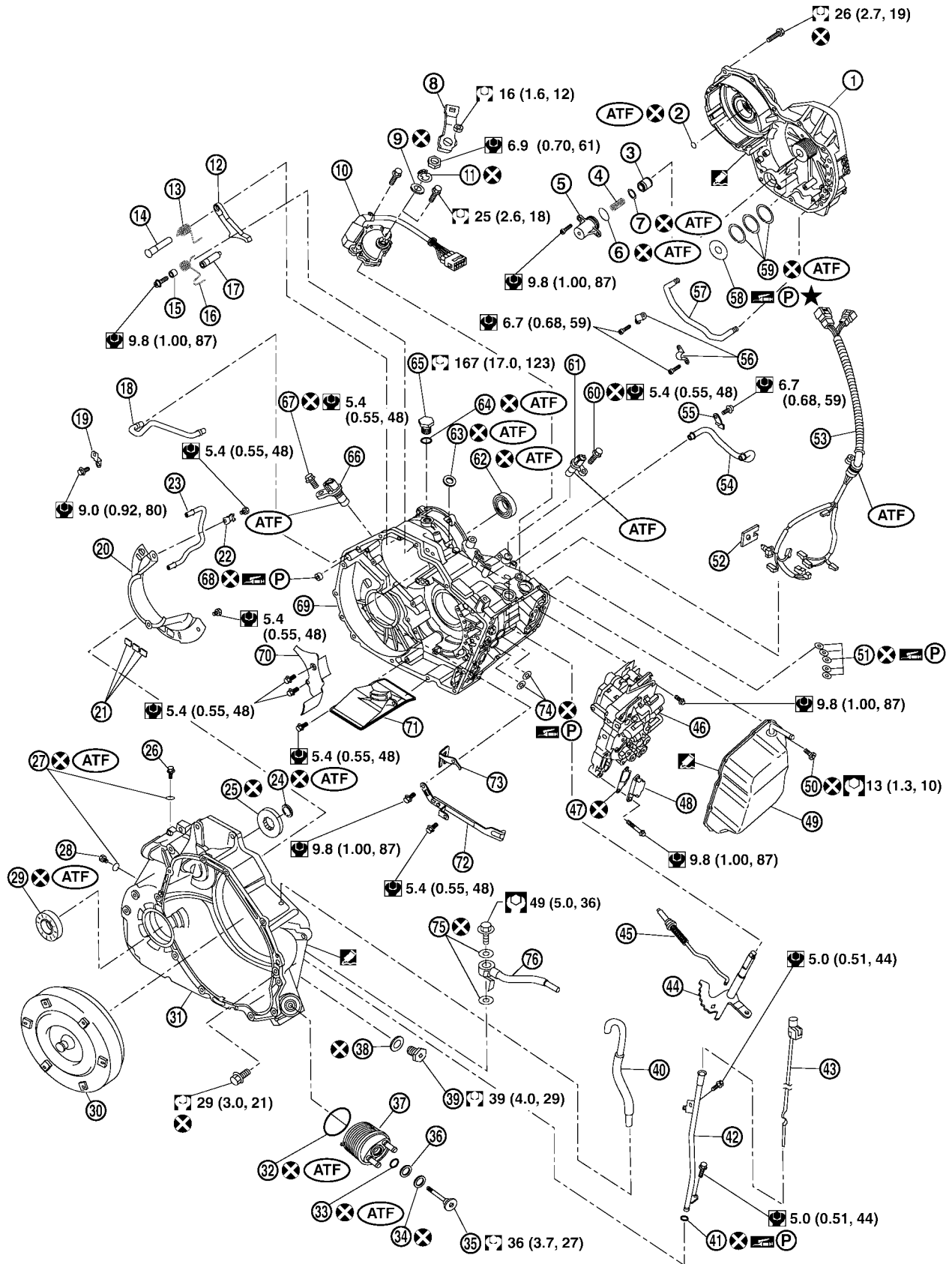
K

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OVERHAUL

[RE5F22A]



- 1. Transaxle case cover
- 4. Compression spring
- 7. Seal ring

- 2. Seal ring
- 5. Accumulator cover
- 8. Range lever

- 3. Forward clutch accumulator piston
- 6. O-ring
- 9. Washer plate

WCIA0533E

OVERHAUL

[RE5F22A]

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|-------------------------------|---------------------------------------|--|----|
| 10. PNP switch | 11. Lock washer | 12. Parking lock pawl | |
| 13. Torsion spring No.1 | 14. Parking lock pawl shaft | 15. Spring guide sleeve | A |
| 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 | B |
| 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 | AT |
| 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 | D |
| 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 | E |
| 52. Sensor clamp | 53. Terminal cord assembly | 54. Transaxle lube apply tube | |
| 55. Tube clamp | 56. Tube clamp | 57. U/D clutch apply tube sub assembly | F |
| 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 | G |
| 67. Seal bolt | 68. Governor apply gasket | 69. Transaxle case | |
| 70. Oil reserver plate | 71. Oil strainer sub assembly | 72. Manual detent spring sub assembly | |
| 73. Parking lock pawl braket | 74. Governor apply gasket | 75. Copper washer | H |
| 76. A/T fluid cooler tube | | | |

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OVERHAUL

[RE5F22A]

ECS009JM

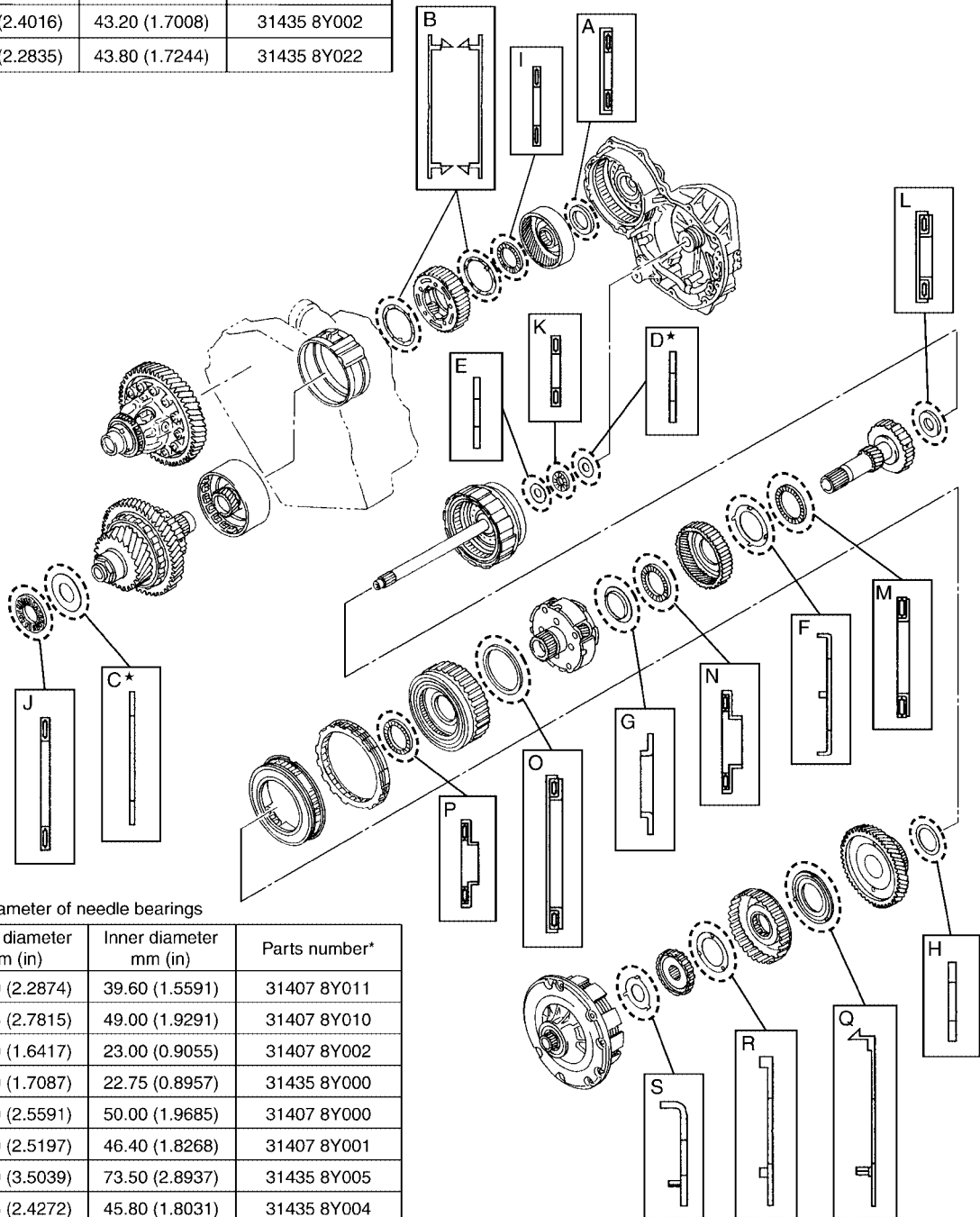
Locations of Needle Bearings, Bearing Races and Thrust Washers

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 8Y060 |
| E | 41.00 (1.6142) | 13.50 (0.5315) | 31435 8Y011 |
| 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.

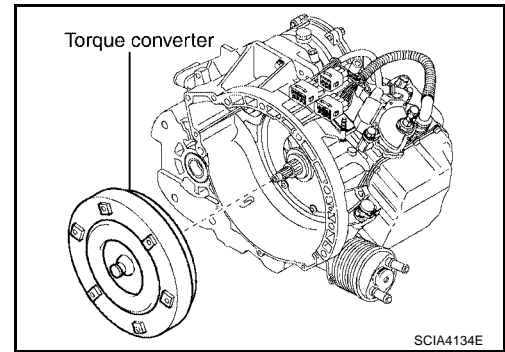
* : Always check with the Parts Department for the latest parts information.

WCIA0336E

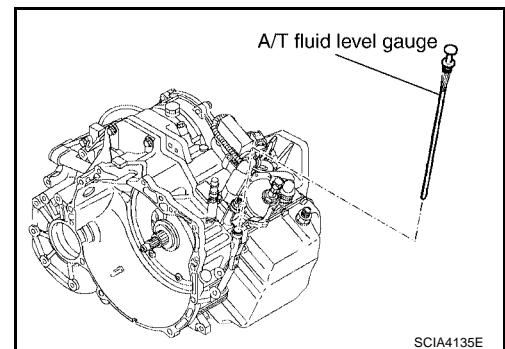
DISASSEMBLY

Disassembly

1. Drain ATF through drain plug. Refer to [MA-31, "Changing A/T Fluid"](#).
2. Remove torque converter by transaxle case it firmly and turning while pulling straight out.



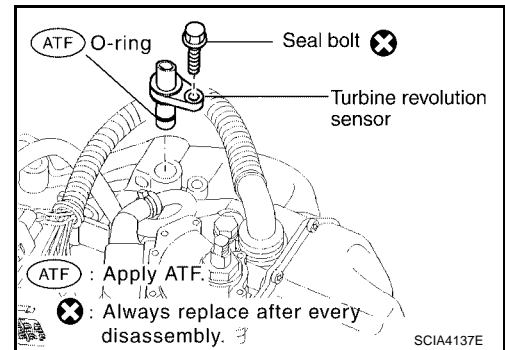
3. Remove A/T fluid level gauge.
4. Remove A/T fluid charging pipe.
5. Remove O-ring from A/T fluid charging pipe.
6. Remove air breather hose.
7. Remove A/T fluid cooler tube.



8. Remove turbine revolution sensor.

CAUTION:

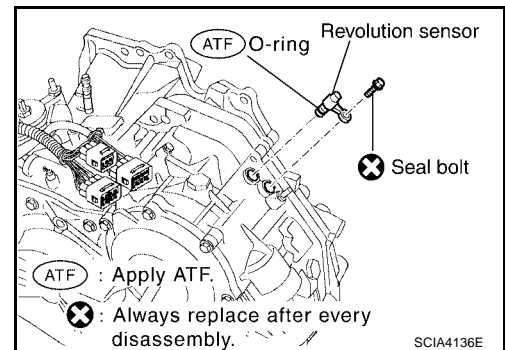
Be careful not to damage the turbine revolution sensor and transaxle case.



9. Remove revolution sensor.

CAUTION:

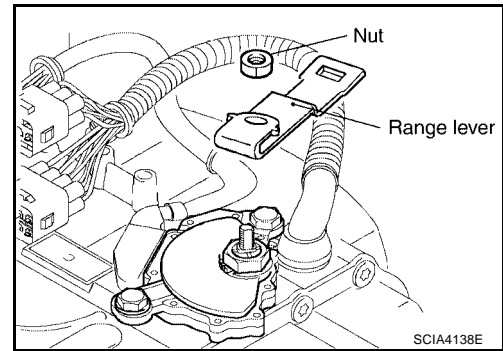
Be careful not to damage the revolution sensor and transaxle case.



DISASSEMBLY

[RE5F22A]

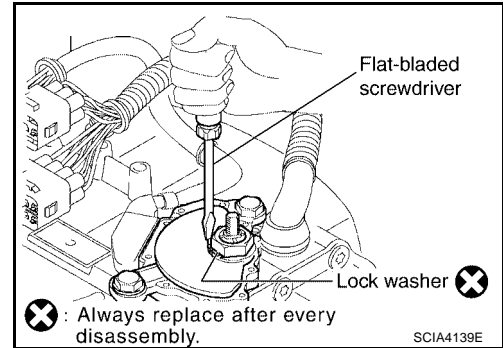
10. Remove nut and range lever.



11. Pry off the lock washer using flat blade screwdriver.

NOTE:

Do not reuse lock washer.

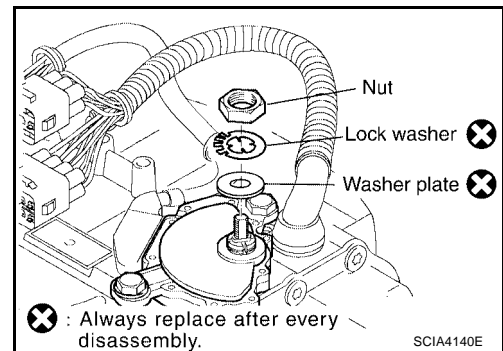


12. Loosen nut and remove lock washer.

13. Remove washer plate.

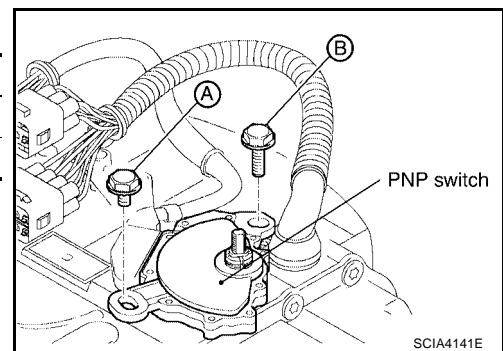
NOTE:

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 |



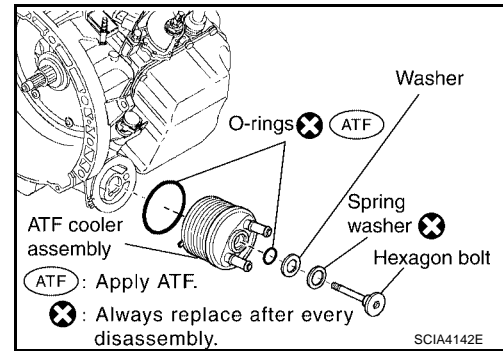
DISASSEMBLY

[RE5F22A]

15. Remove hexagon bolt.
16. Remove ATF cooler assembly, washer and spring washer.
17. Remove O-rings from the ATF cooler assembly.

NOTE:

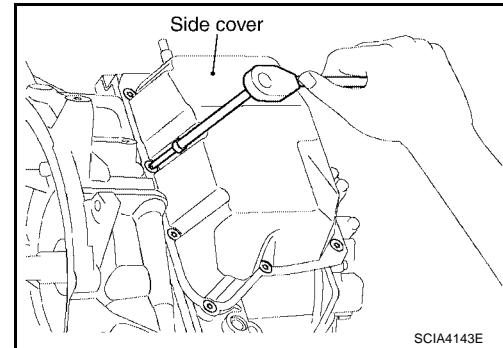
Do not reuse spring washer or O-rings.



18. Remove side cover.

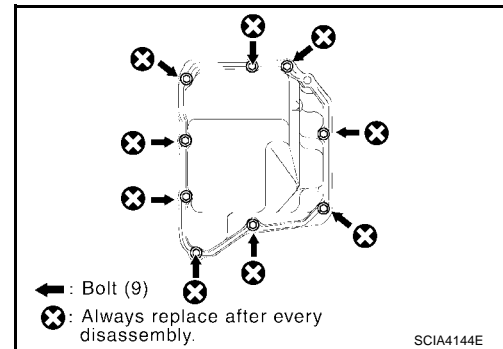
CAUTION:

Be careful not to damage side cover and transaxle case.



NOTE:

Do not reuse seal bolts.



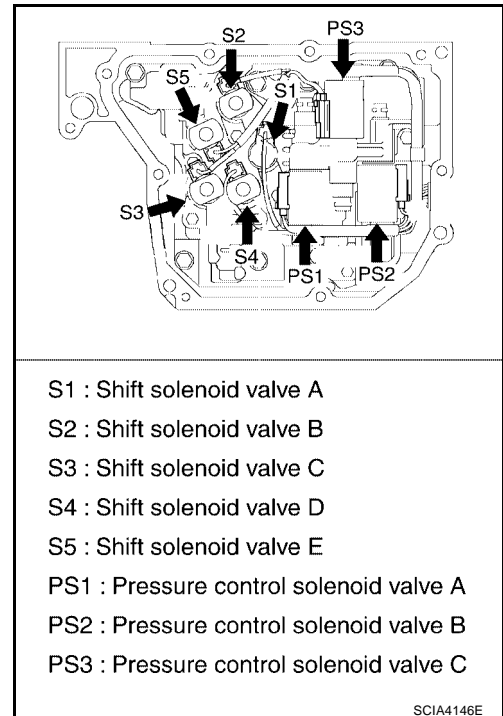
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DISASSEMBLY

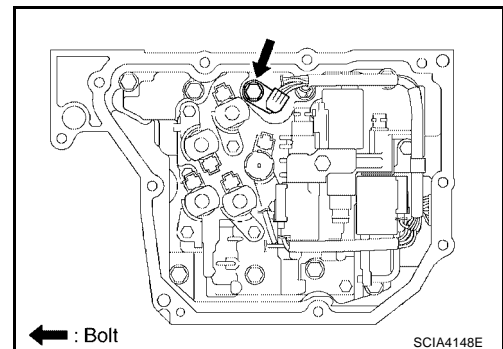
[RE5F22A]

19. Disconnect solenoid connectors.

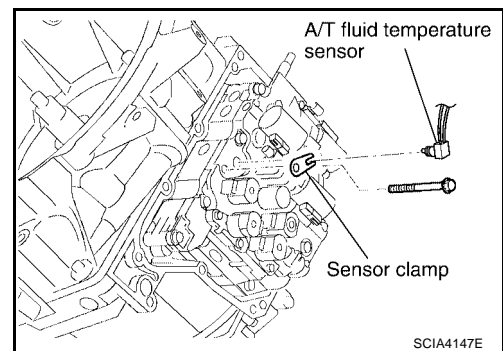
CAUTION:
Be careful not to damage connector.



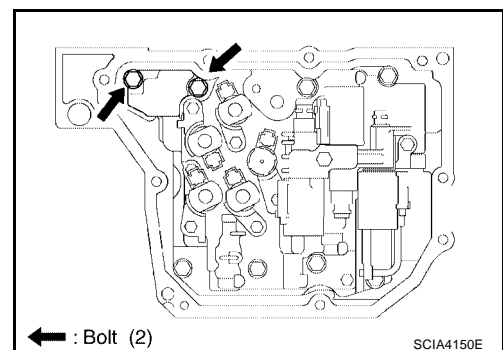
20. Remove sensor clamp tightening bolt.



21. Remove sensor clamp and A/T fluid temperature sensor.
CAUTION:
Be careful not to damage A/T fluid temperature sensor.



22. Remove suction cover bolts.



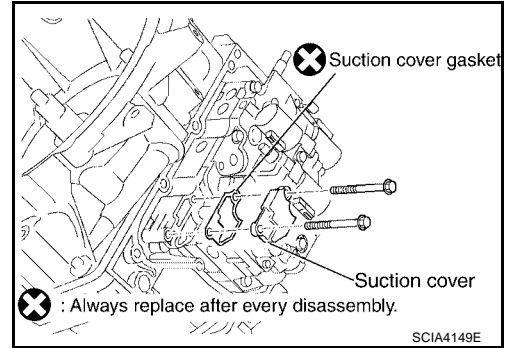
DISASSEMBLY

[RE5F22A]

23. Remove suction cover and suction cover gasket.

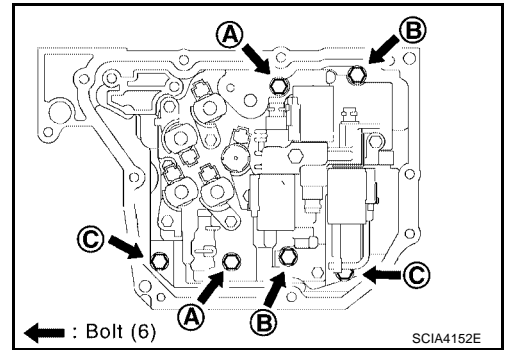
NOTE:

Do not reuse gasket.



24. Remove control valve assembly tightening bolts from transaxle case.

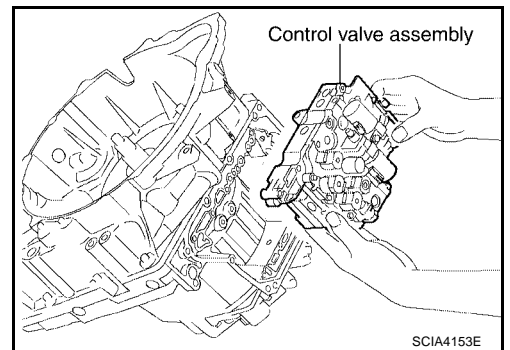
| Bolt symbol | Length mm (in) | Number of bolts |
|-------------|----------------|-----------------|
| A | 55 (2.17) | 2 |
| B | 50 (1.97) | 2 |
| C | 16 (0.63) | 2 |



25. While holding control valve assembly, disconnect parking lock rod sub assembly from manual valve lever sub assembly and remove control valve assembly.

NOTE:

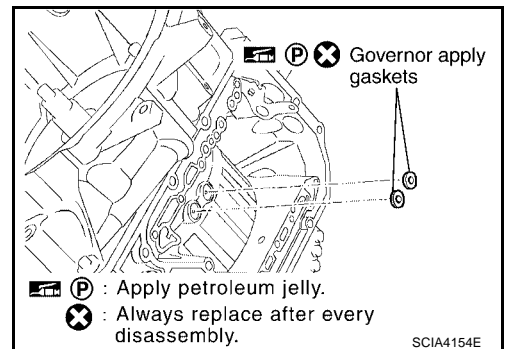
Shift position is "N".



26. Remove governor apply gaskets.

NOTE:

Do not reuse gaskets.



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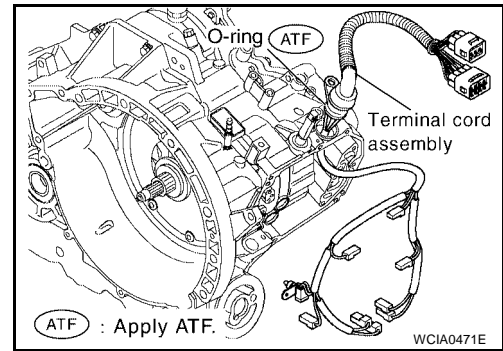
DISASSEMBLY

[RE5F22A]

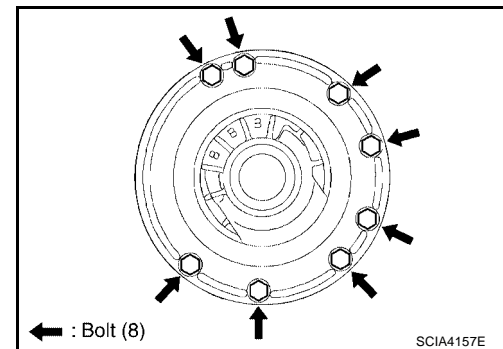
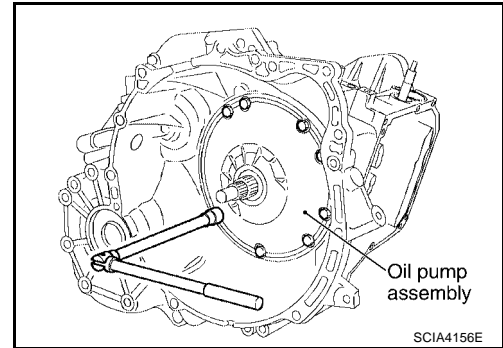
27. Remove terminal cord assembly.

CAUTION:

Be careful not to damage solenoid connectors and A/T fluid temperature sensor.

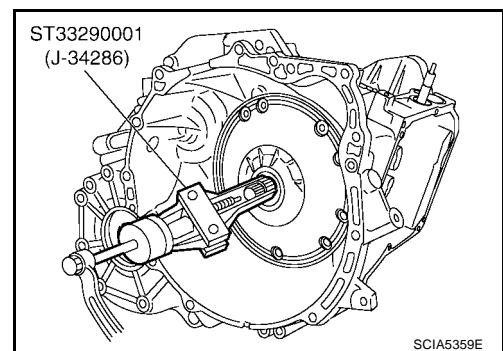


28. Remove oil pump assembly bolts from transaxle case.



29. Remove oil pump assembly, using Tool.

Tool number : ST33290001 (J-34280)



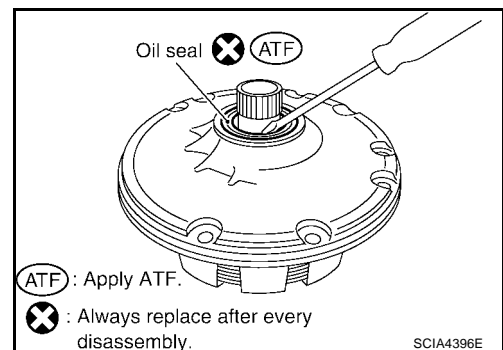
30. Remove oil seal from oil pump assembly, using suitable tool.

CAUTION:

Be careful not to scratch oil pump assembly.

NOTE:

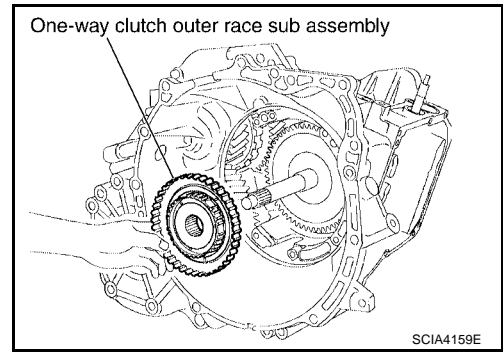
Do not reuse oil seal.



DISASSEMBLY

[RE5F22A]

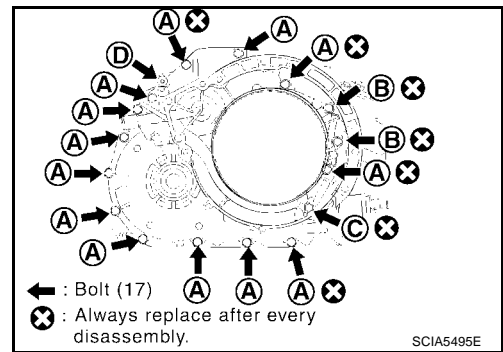
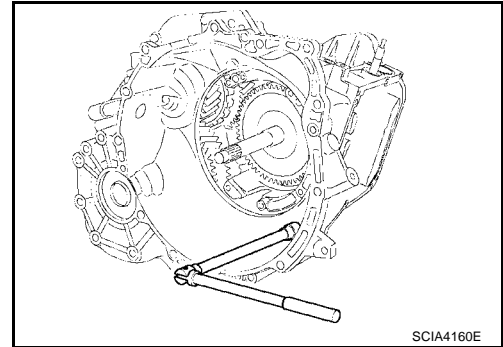
31. Remove one-way clutch outer race sub assembly.
32. Remove thrust washer.



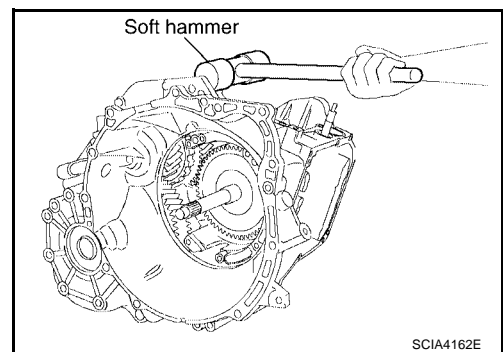
33. Remove transaxle housing tightening bolts from transaxle case.

| 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



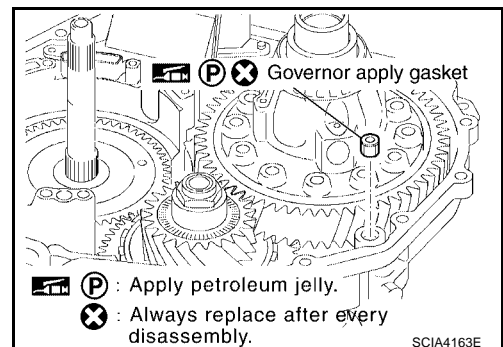
34. Remove transaxle housing using a soft hammer.



35. Remove governor apply gasket.
36. Remove seal ring.

NOTE:

Do not reuse gasket or oil seal.

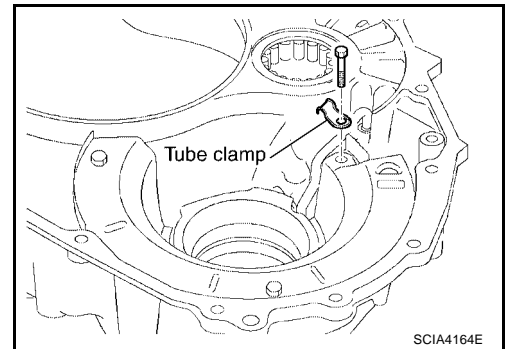


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DISASSEMBLY

[RE5F22A]

37. Remove tube clamp.

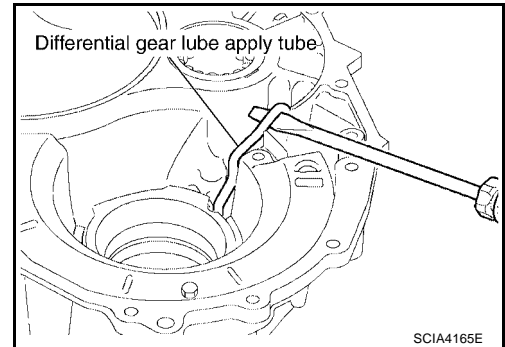


38. Remove differential gear lube apply tube, using a suitable tool.

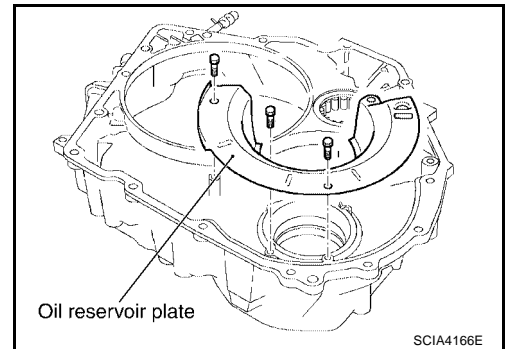
CAUTION:

Be careful not to bend or damage differential gear lube apply tube.

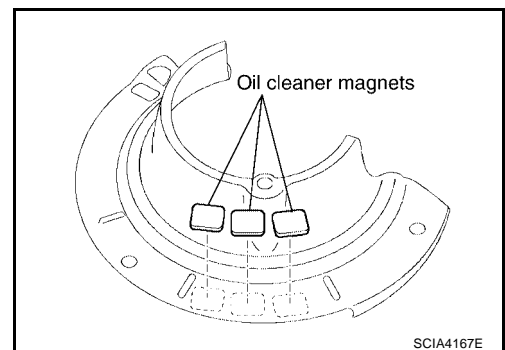
Be careful not to damage transaxle housing.



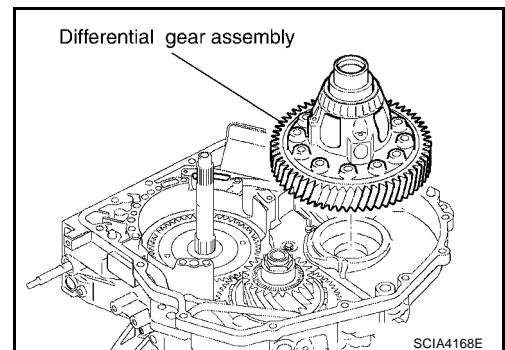
39. Remove oil reservoir plate.



40. Remove oil cleaner magnets from oil reservoir plate.



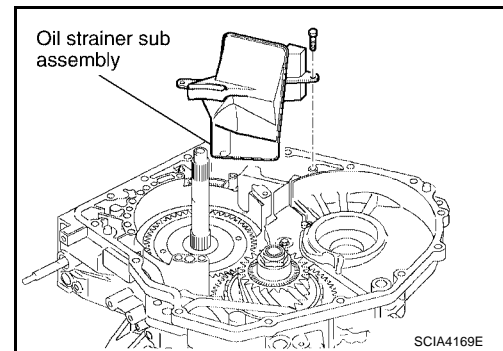
41. Remove differential gear assembly.



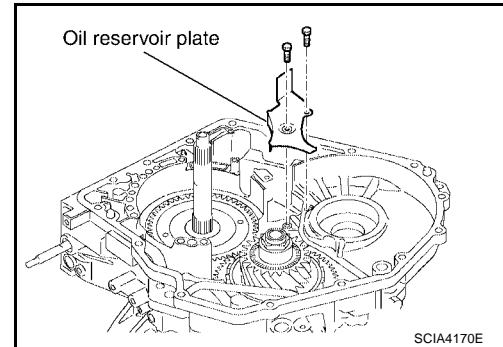
DISASSEMBLY

[RE5F22A]

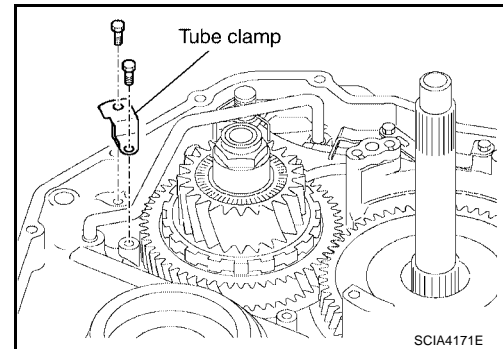
42. Remove oil strainer sub assembly.



43. Remove oil reservoir plate.



44. Remove tube clamp.

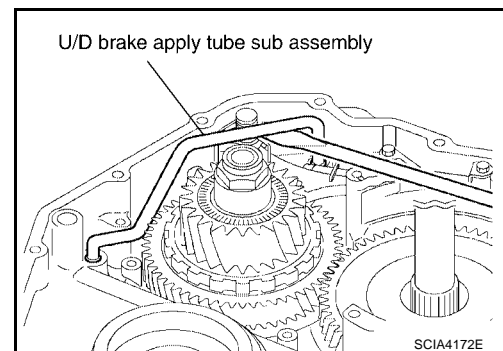


45. Remove U/D brake apply tube sub assembly, using a suitable tool.

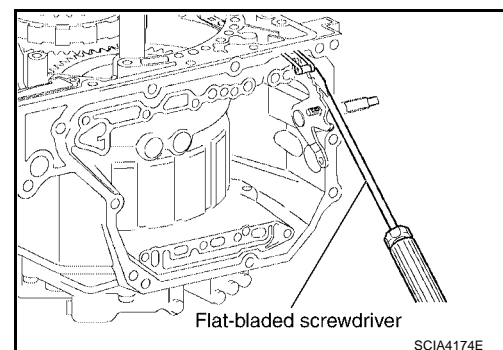
CAUTION:

Be careful not to bend or damage U/D brake apply tube sub assembly.

Be careful not to damage transaxle case.



46. Disconnect manual detent spring sub assembly from manual valve lever sub assembly, using suitable tool.

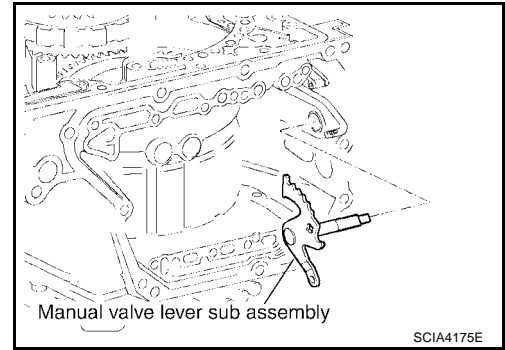


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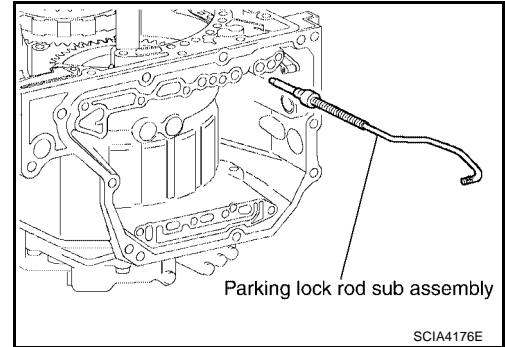
DISASSEMBLY

[RE5F22A]

47. Remove manual valve lever sub assembly from parking lock rod sub assembly.

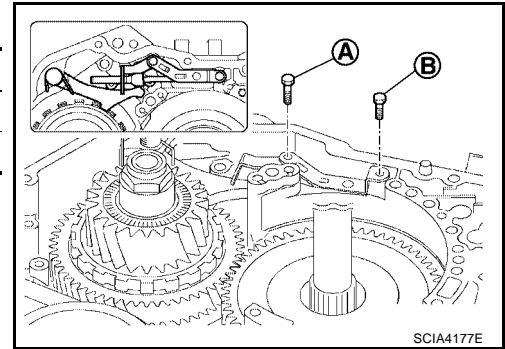


48. Remove parking lock rod sub assembly.

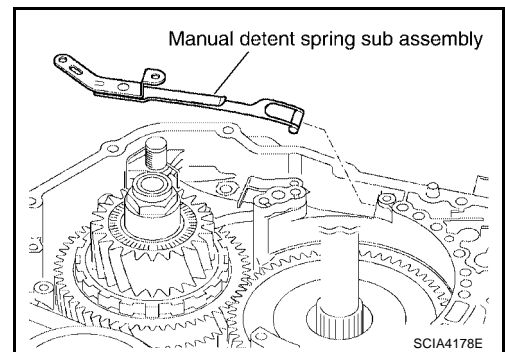


49. Remove bolts for manual detent spring sub assembly.

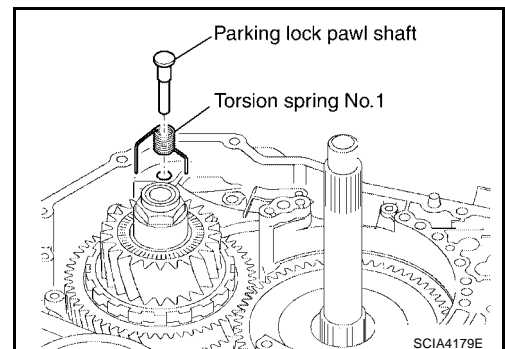
| Bolt symbol | Length mm (in) | Number of bolts |
|-------------|----------------|-----------------|
| A | 16.7 (0.657) | 1 |
| B | 14.0 (0.551) | 1 |



50. Remove manual detent spring sub assembly.



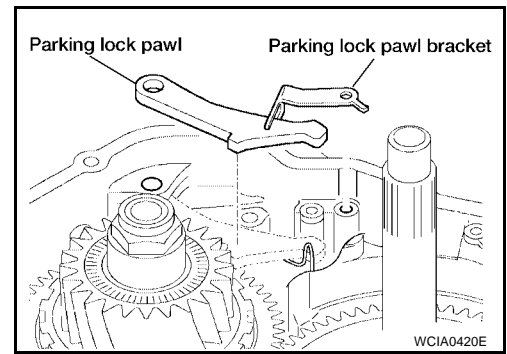
51. Remove parking lock pawl shaft and torsion spring No.1.



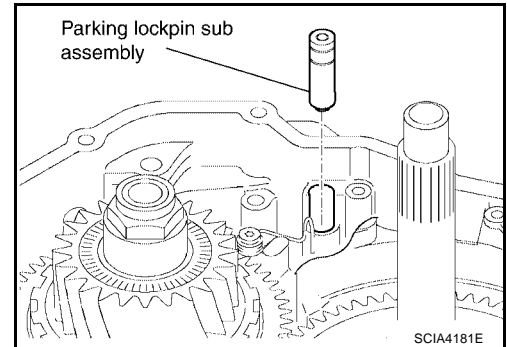
DISASSEMBLY

[RE5F22A]

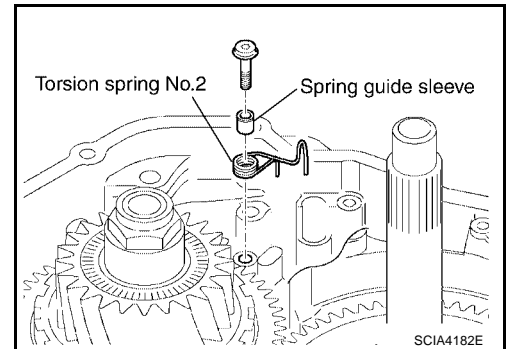
52. Remove parking lock pawl bracket and parking lock pawl.



53. Remove parking lockpin sub assembly.



54. Remove spring guide sleeve and torsion spring No.2.



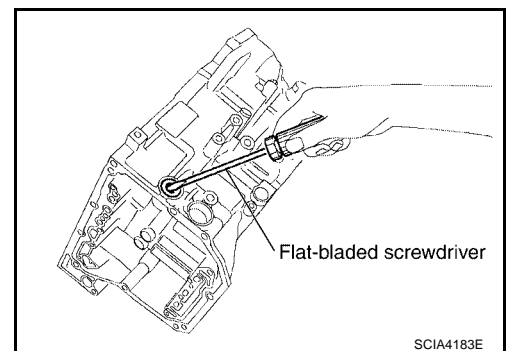
55. Remove manual valve oil seal, using a flat blade screwdriver.

CAUTION:

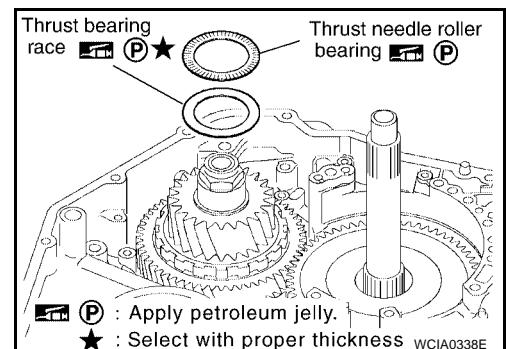
Be careful not to damage transaxle case.

NOTE:

Do not reuse oil seal.



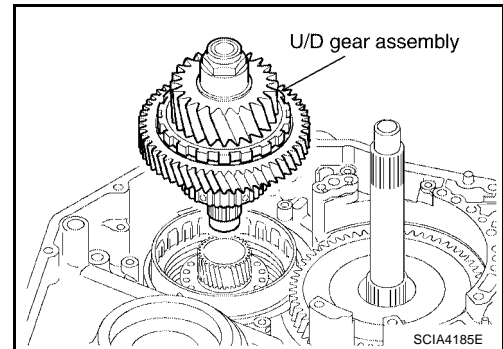
56. Remove thrust needle roller bearing and thrust bearing race from U/D gear assembly.



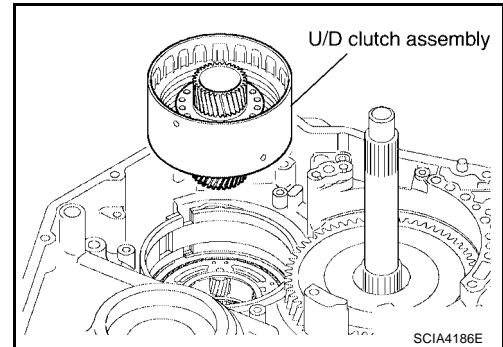
DISASSEMBLY

[RE5F22A]

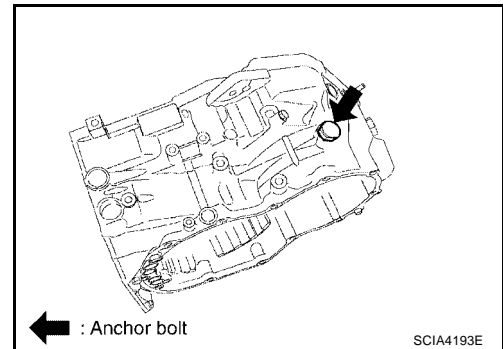
- 57. Remove U/D gear assembly.
- 58. Remove seal rings from U/D gear assembly.



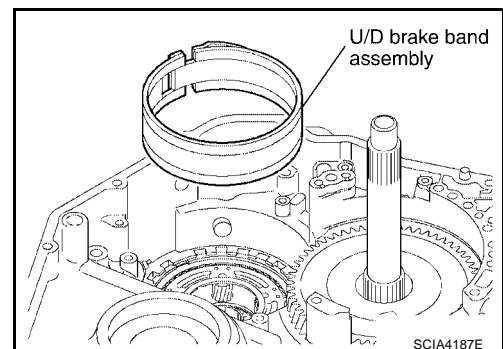
- 59. Remove U/D clutch assembly.



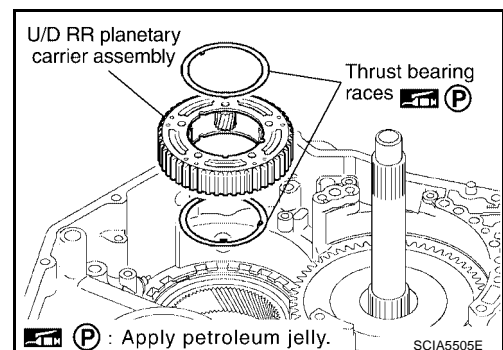
- 60. Remove anchor bolt.



- 61. Remove U/D brake band assembly.
CAUTION:
Be careful not to damage transaxle case.



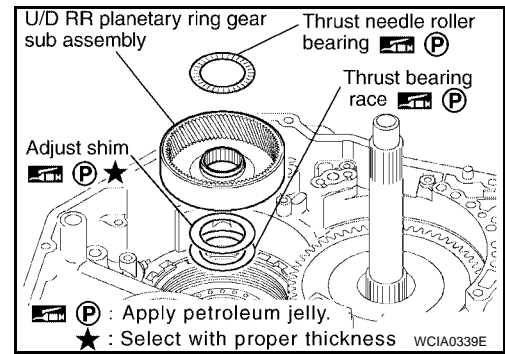
- 62. Remove U/D RR planetary carrier assembly and thrust bearing races.



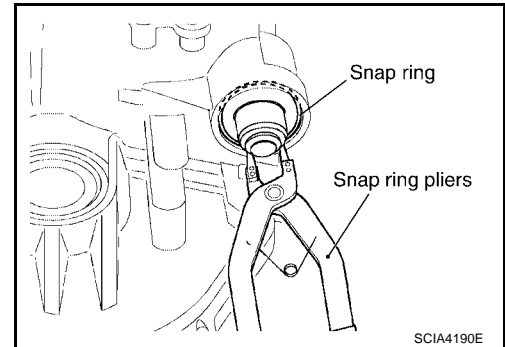
DISASSEMBLY

[RE5F22A]

63. Remove U/D RR planetary ring gear sub assembly.
64. Remove thrust needle roller bearing adjust shims and thrust bearing race from U/D RR planetary ring gear sub assembly.

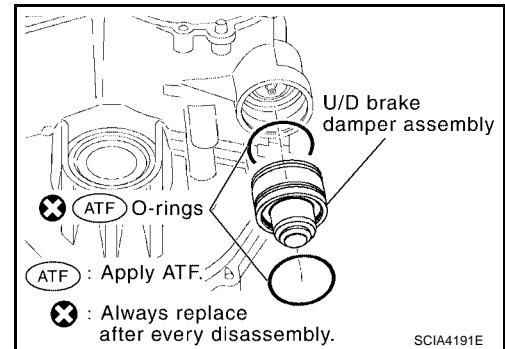


65. Remove snap ring, using suitable snap ring pliers.



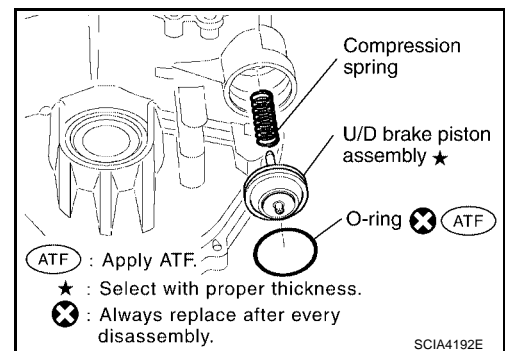
66. Remove U/D brake damper assembly.
67. Remove O-rings from U/D brake damper assembly.

NOTE:
Do not reuse O-rings.



68. Remove U/D brake piston assembly and compression spring.
69. Remove O-ring from U/D brake piston assembly.

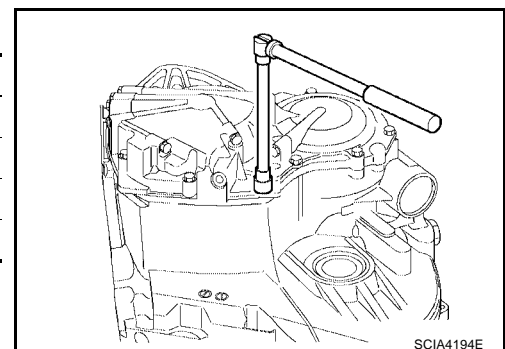
NOTE:
Do not reuse O-rings.



70. 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) | 1 |
| C | 48 (1.89) | 2 |
| D* | — | 1 |

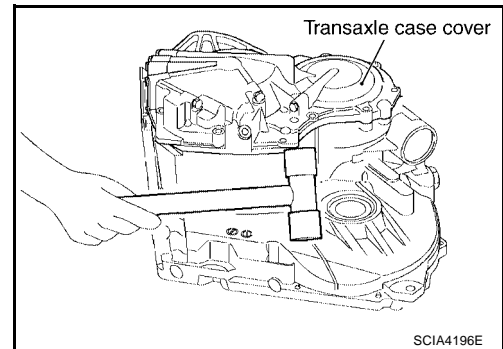
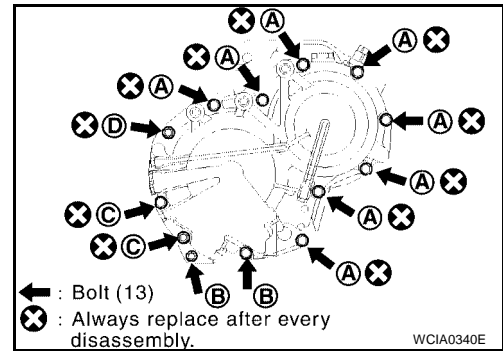
*:Stud bolt



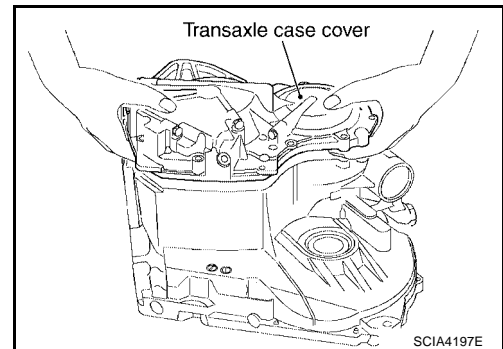
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71. Remove the transaxle case cover using a soft hammer.

CAUTION:
Be careful not to damage transaxle case cover.

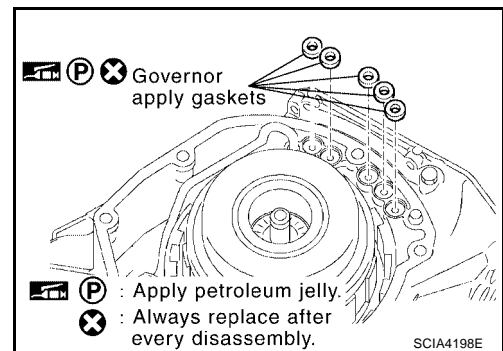


72. Remove transaxle case cover.



73. Remove governor apply gaskets from transaxle case.

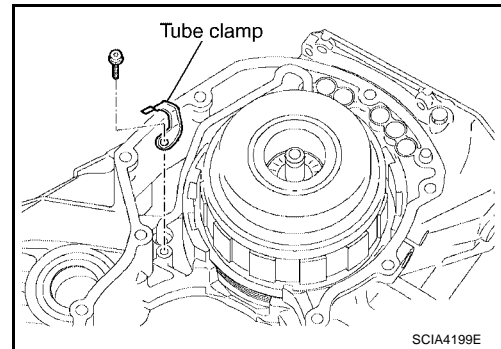
NOTE:
Do not reuse gaskets.



DISASSEMBLY

[RE5F22A]

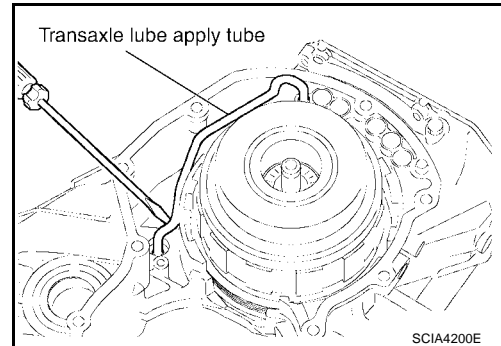
74. Remove tube clamp.



75. Remove transaxle lube apply tube, using a suitable tool.

CAUTION:

**Be careful not to bend or damage transaxle lube apply tube.
Be careful not to damage transaxle case.**

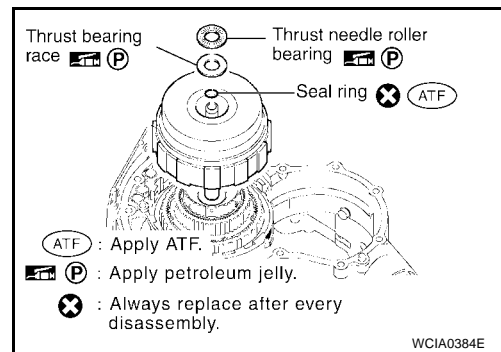


76. Remove forward and direct clutch assembly.

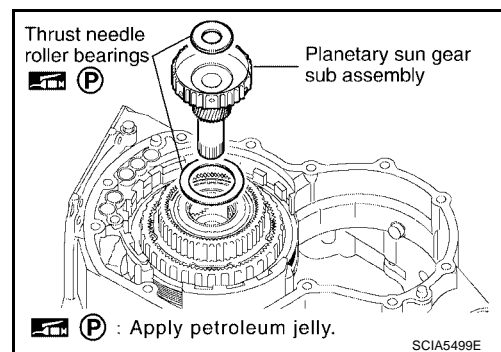
77. Remove thrust bearing race, thrust needle roller bearing and seal ring from forward and direct clutch assembly.

NOTE:

Do not reuse seal ring.



78. Remove planetary sun gear sub assembly and thrust needle roller bearings.

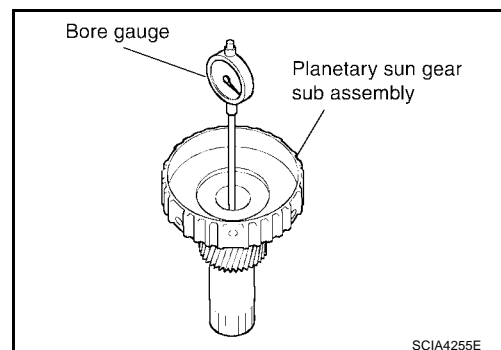


79. Measure the inner diameter of planetary sun gear sub assembly bushing, using a suitable bore gauge.

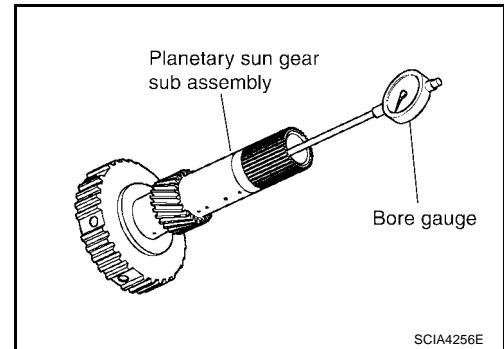
CAUTION:

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.

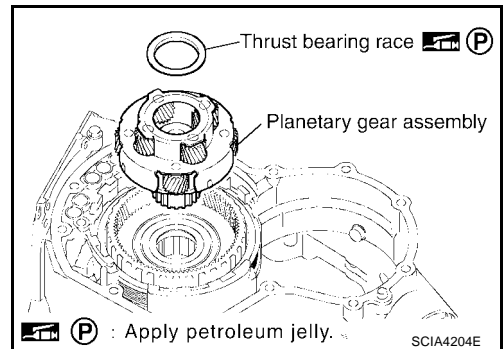
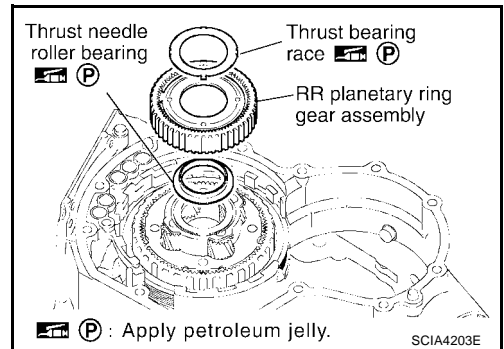
Standard :22.200 - 22.226mm (0.8740 - 0.8750in)
Allowable limit :22.276 (0.8770in)



80. Remove RR planetary ring gear assembly.
81. Remove thrust needle roller bearing and thrust bearing race from RR planetary ring gear assembly.



82. Remove planetary gear assembly.
83. Remove thrust bearing race from planetary gear assembly.



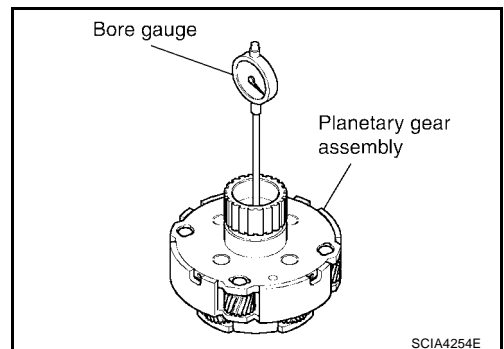
84. Measure the inner diameter of planetary gear assembly bushing, using a suitable bore gauge

CAUTION:

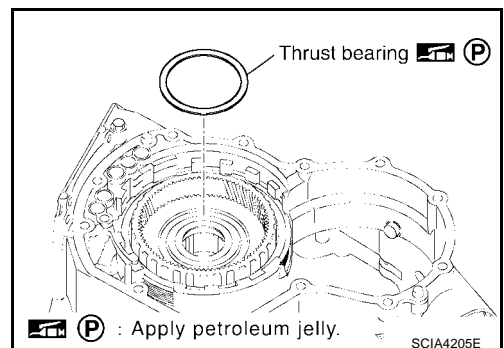
Measure at different places and take an average. If it is greater than the maximum, replace it with a new planetary gear assembly.

Standard :30.056 - 30.082mm (1.1833 - 1.1843in)

Allowable limit :30.132 (1.1863in)



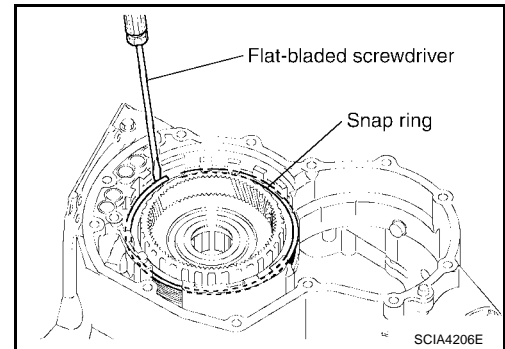
85. Remove thrust bearing.



DISASSEMBLY

[RE5F22A]

86. Remove snap ring, using flat blade screwdriver.



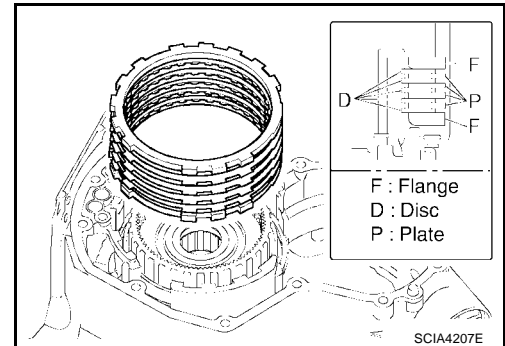
87. Remove 1st and reverse brake flanges, 1st and reverse brake discs and 1st and reverse brake plates.

- INSPECTION

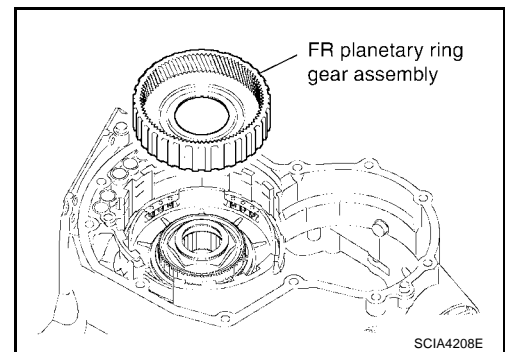
- Check that the sliding surface of discs are not worn and burnt. If necessary, replace them.

CAUTION:

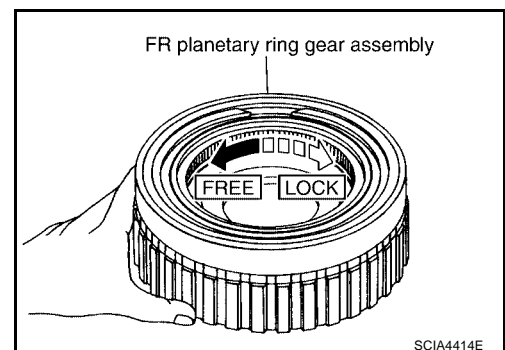
Replace new discs by soaking them at least 2 hours in A/T fluid.



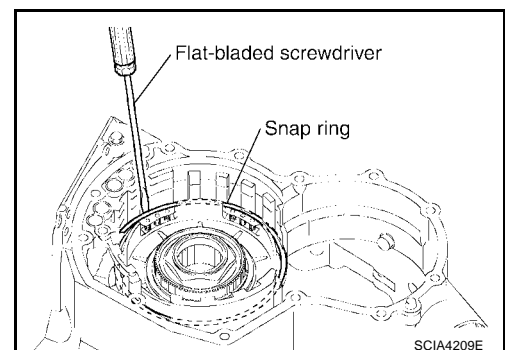
88. Remove FR planetary ring gear assembly with one-way clutch No. 2.



89. Make sure that the FR planetary ring gear assembly should turn freely counterclockwise and should lock clockwise.



90. Remove snap ring, using a flat blade screwdriver.

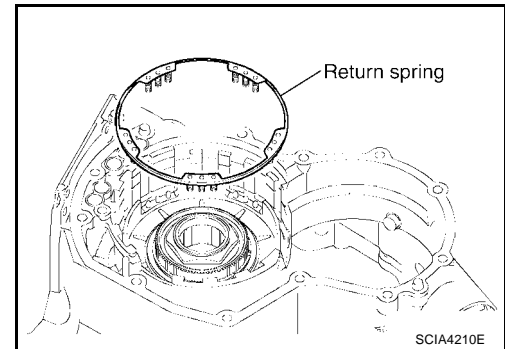


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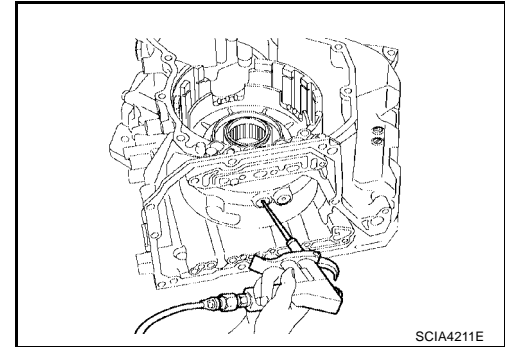
DISASSEMBLY

[RE5F22A]

91. Remove return spring.



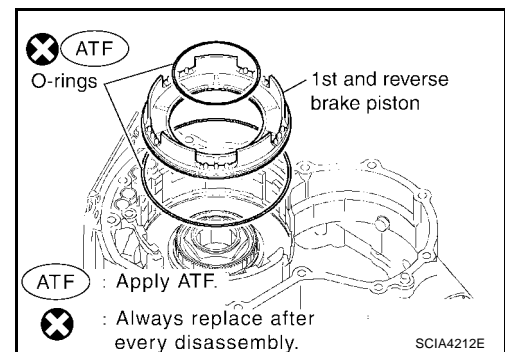
92. While pushing the piston by hand, apply compressed air (4Kg/cm²) into the oil passage of transaxle case as shown and remove 1st and reverse brake piston.



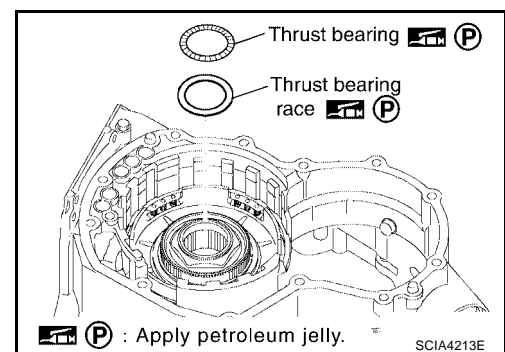
93. Remove O-rings from 1st and reverse brake piston.

NOTE:

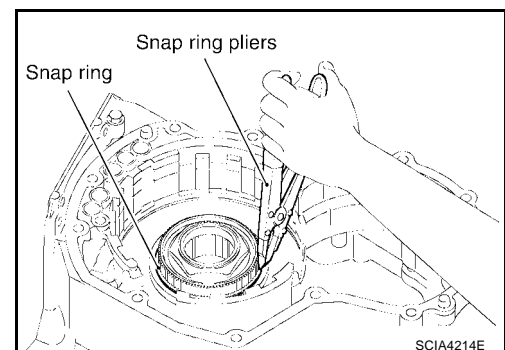
Do not reuse O-rings.



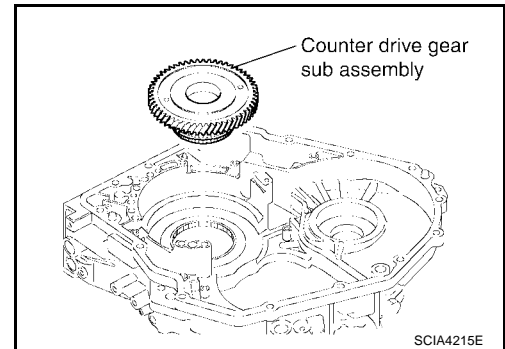
94. Remove thrust bearing and thrust bearing race from counter drive gear sub assembly.



95. Remove snap ring, using suitable snap ring pliers.



96. Remove counter drive gear sub assembly.



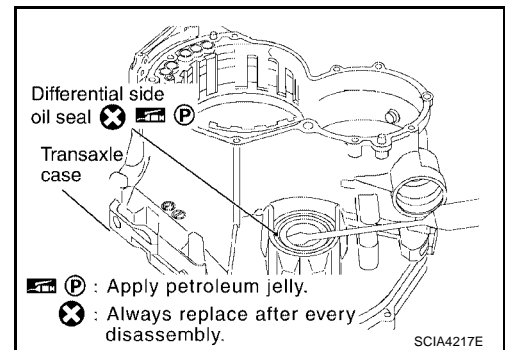
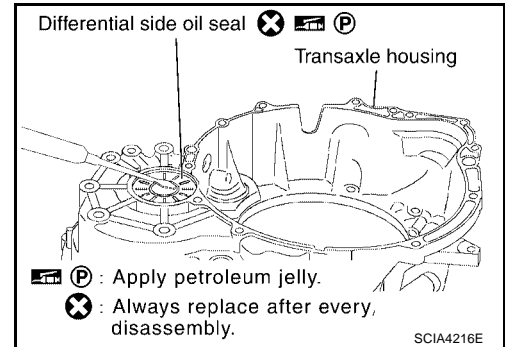
97. Remove differential side oil seal from transaxle case and transaxle housing, using a suitable tool.

CAUTION:

Be careful not to scratch transaxle case and transaxle housing.

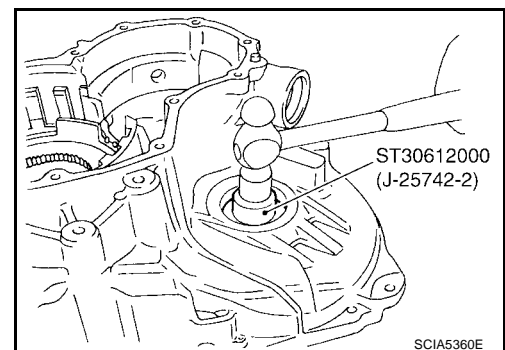
NOTE:

Do not reuse oil seals.



98. Remove outer race and adjust shim from transaxle case, using Tool.

Tool number : ST30612000 (J-25742-2)

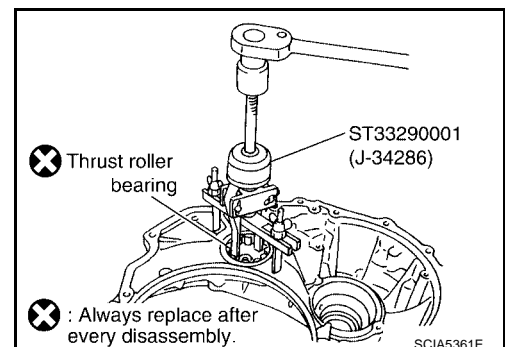


99. Remove thrust roller bearing from transaxle housing, using Tool.

Tool number : ST33290001 (J-34286)

NOTE:

Do not reuse thrust roller bearing.



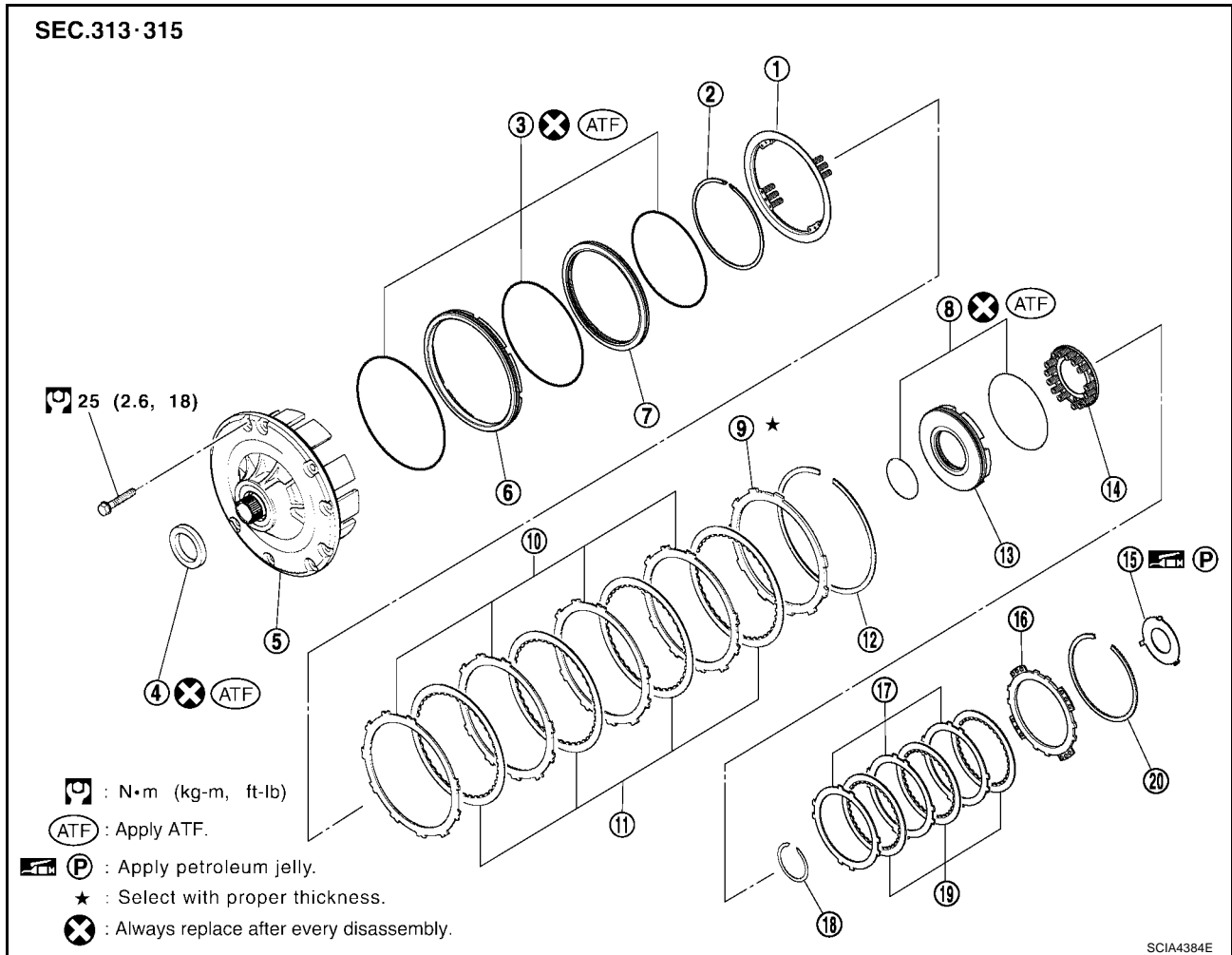
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REPAIR FOR COMPONENT PARTS

PF0:0000

Oil Pump, 2nd Coast Brake & 2nd Brake COMPONENTS

ECS009J0



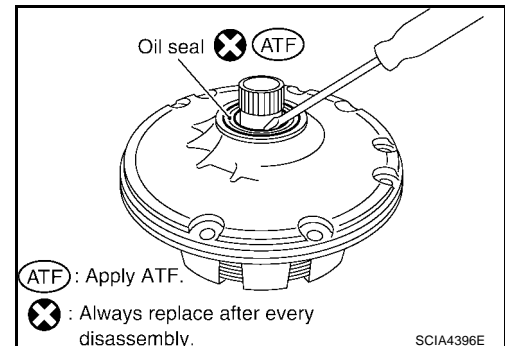
- | | | |
|----------------------------|---------------------------|---------------------|
| 1. Return spring | 2. Snap ring | 3. O-ring |
| 4. Oil seal | 5. Oil pump assembly | 6. 2nd brake piston |
| 7. 2nd brake sleeve | 8. O-ring | 9. 2nd brake flange |
| 10. 2nd brake plate | 11. 2nd brake disc | 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:
 Be careful not to scratch oil pump assembly.

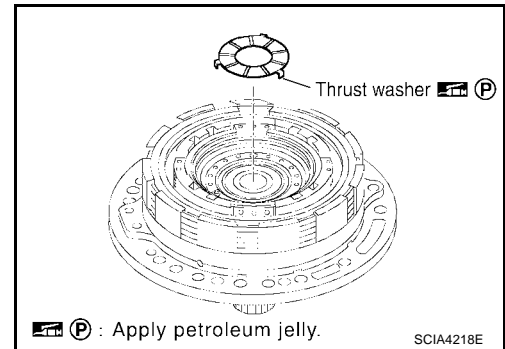
NOTE:
 Do not reuse old seal.



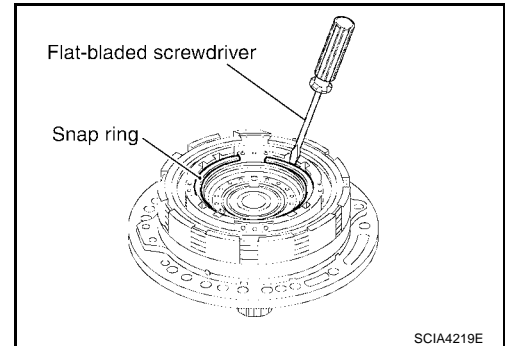
REPAIR FOR COMPONENT PARTS

[RE5F22A]

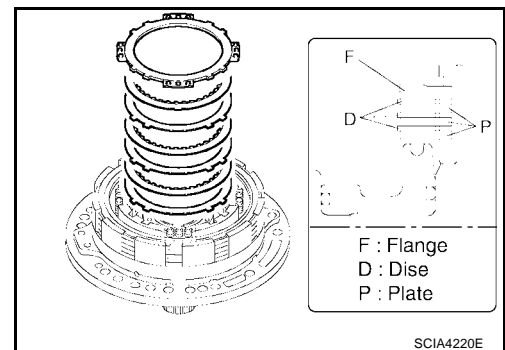
2. Remove thrust washer from oil pump assembly.



3. Remove snap ring, using a flat-bladed screwdriver.



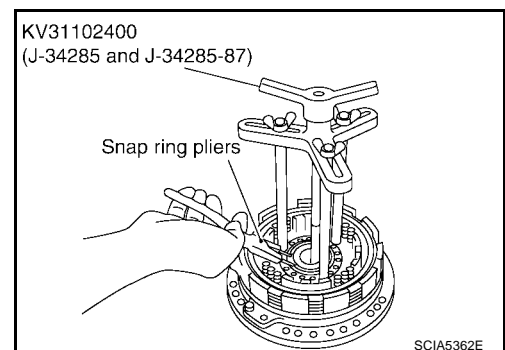
4. Remove 2nd coast brake flange, 2nd coast brake disc and 2nd coast brake plate.



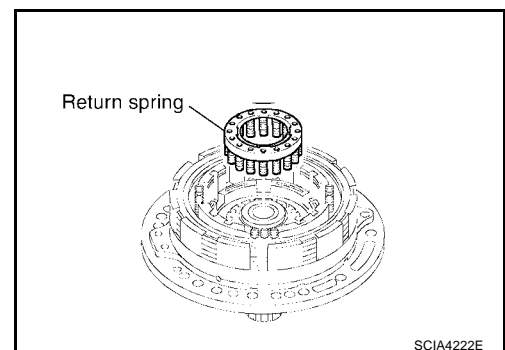
5. Compress return spring with a press, using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

6. Remove snap ring, using suitable snap ring pliers.



7. Remove return spring.



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REPAIR FOR COMPONENT PARTS

[RE5F22A]

8. While pushing the 2nd coast brake piston by hand, apply compressed air (4kg/cm²) into the oil passage as shown and remove 2nd coast brake piston.

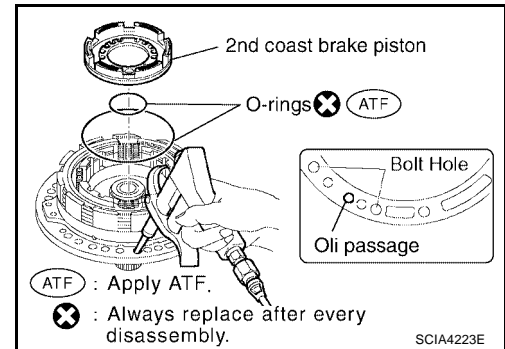
CAUTION:

Be careful not to damage the O-ring and 2nd coast brake piston.

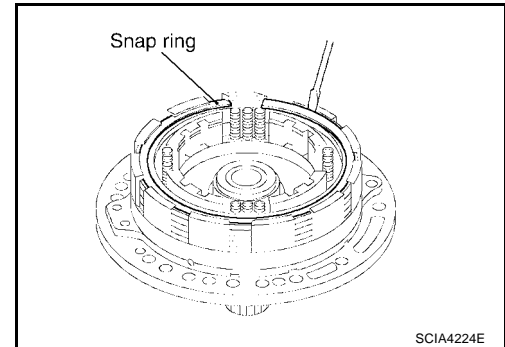
9. Remove O-rings from 2nd coast brake piston.

NOTE:

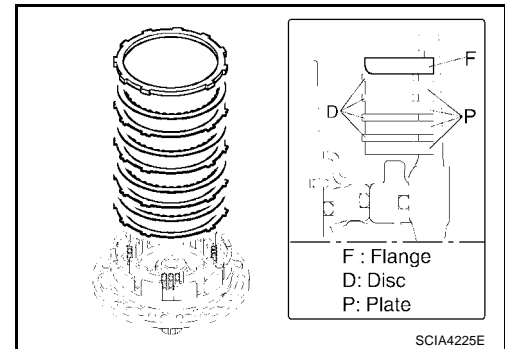
Do not reuse O-rings.



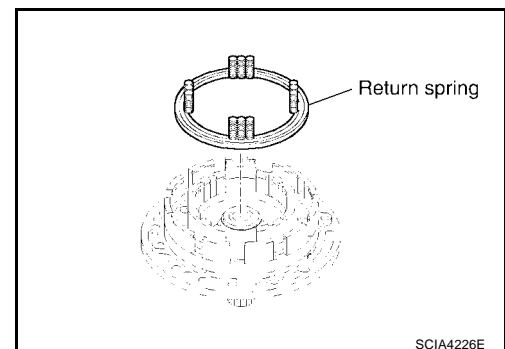
10. Remove snap ring, using suitable tool.



11. Remove 2nd brake flange, 2nd brake discs and 2nd brake plates.



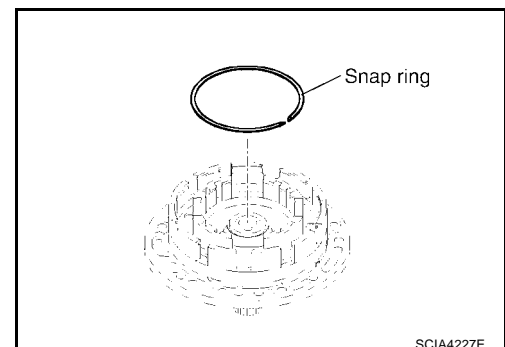
12. Remove return spring.



13. Remove snap ring, using suitable tool.

CAUTION:

Be careful not to damage oil pump assembly and 2nd brake piston.



REPAIR FOR COMPONENT PARTS

[RE5F22A]

14. While pushing the 2nd brake piston by hand, apply compressed air (4kg/cm²) into the oil passage as shown in the figure and remove 2nd brake piston (With 2nd brake sleeve).

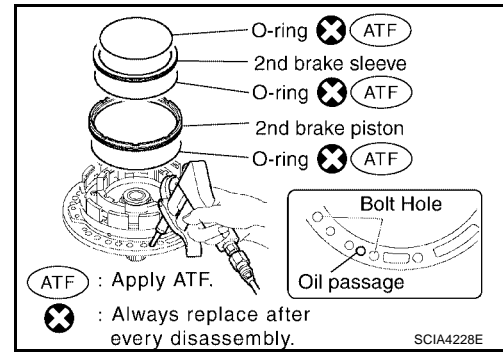
CAUTION:

Be careful not to damage 2nd brake piston and 2nd brake sleeve.

15. Remove O-rings from 2nd brake piston and 2nd brake sleeve.

NOTE:

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

NOTE:

Replace new clutch discs by soaking them at least 2 hours in ATF.

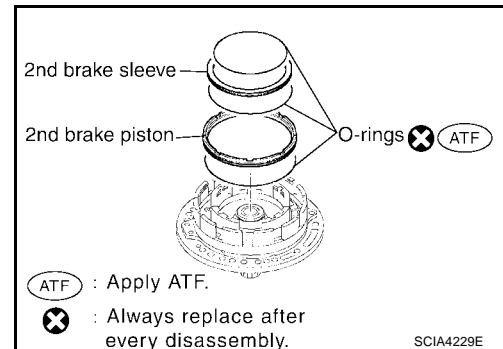
ASSEMBLY

1. Install new O-rings in 2nd brake sleeve and 2nd brake piston.

NOTE:

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

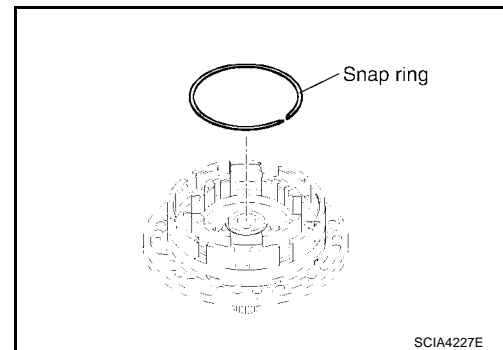
2. Coat the inner surfaces of oil pump assembly with ATF.
3. Press 2nd brake piston and 2nd brake sleeve into oil pump assembly.



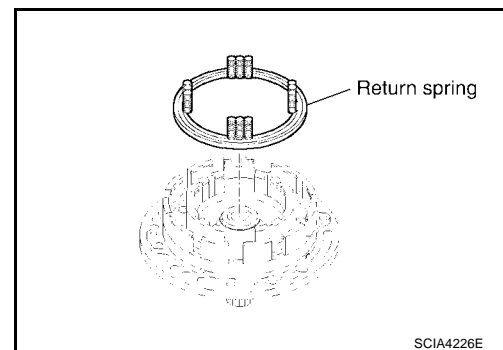
4. Install snap ring, using suitable tool.

CAUTION:

Be careful not to damage oil pump assembly.



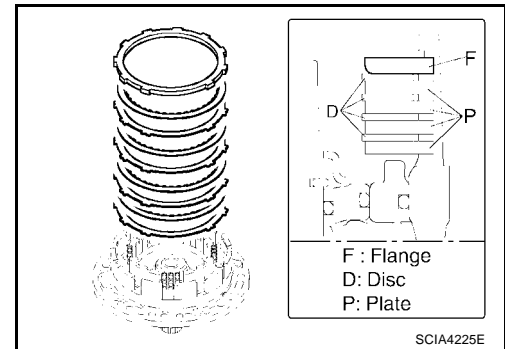
5. Place return spring on 2nd brake piston with the spring side up.



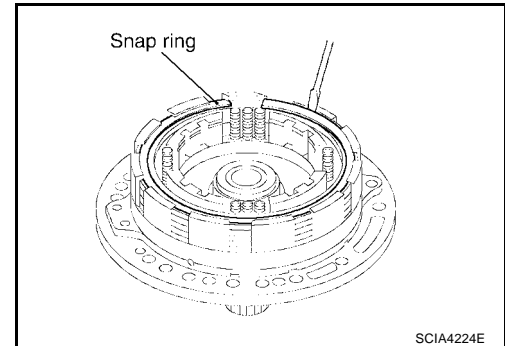
REPAIR FOR COMPONENT PARTS

[RE5F22A]

6. Install 2nd brake flange, 2nd brake discs and 2nd brake plates.



7. Install snap ring, using suitable tool.



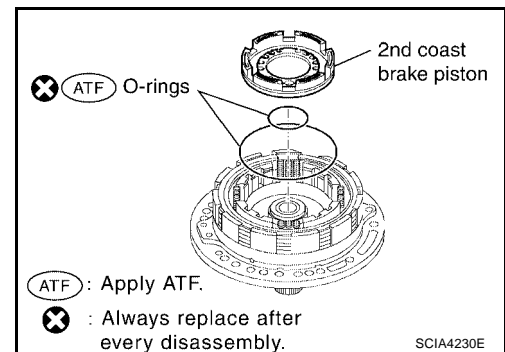
8. Install new O-rings in 2nd coast brake piston.

NOTE:

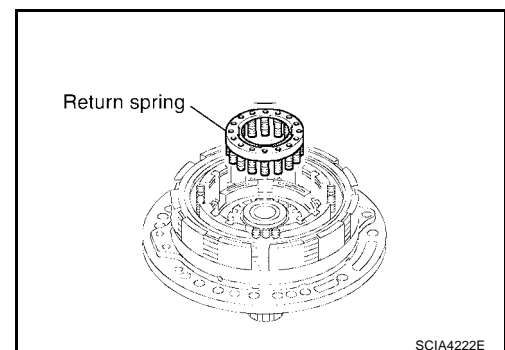
- Do not reuse O-rings.
- Apply ATF to O-rings.

9. Coat the inner surfaces of oil pump assembly with ATF.

10. Press 2nd coast brake piston into oil pump assembly.



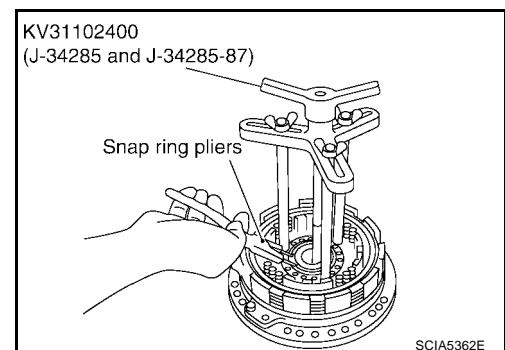
11. Install return spring.



12. Compress return spring, using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

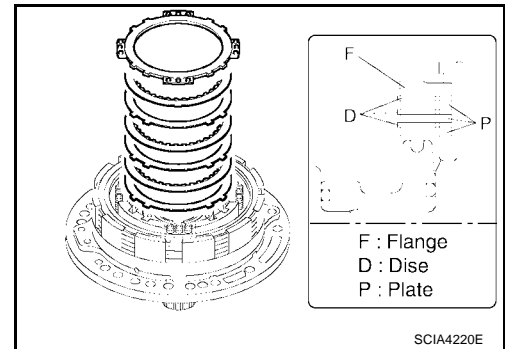
13. Install snap ring, using suitable snap ring pliers.



REPAIR FOR COMPONENT PARTS

[RE5F22A]

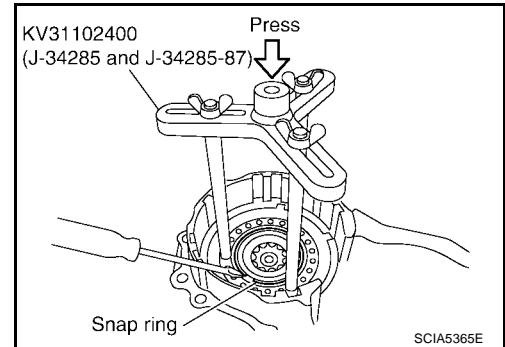
14. Install 2nd coast brake flange, 2nd coast brake disc and 2nd coast brake plate.



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.

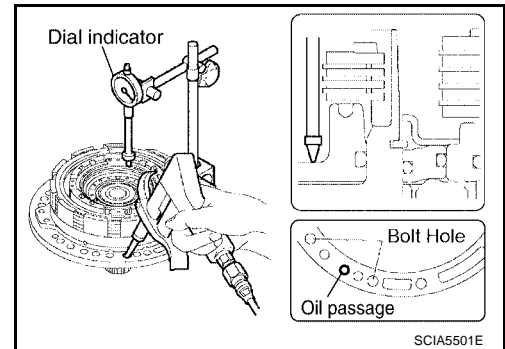


17. Set a dial indicator as shown in the figure.

18. When applying compressed air (4Kg/cm²) 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)

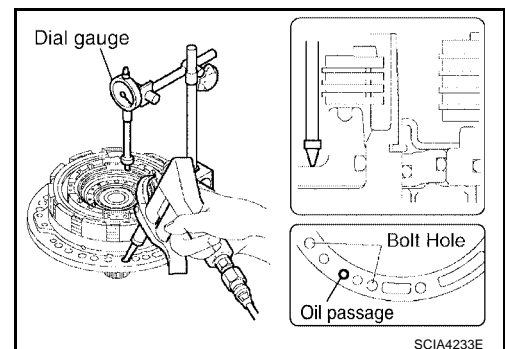
If 2nd brake piston stroke is out standards, select another flange. Refer to [AT-695, "2ND BRAKE"](#) .



19. Set a dial indicator as shown in the figure.

20. When applying compressed air (4Kg/cm²) into the oil passage as shown, measure 2nd coast brake piston stroke and check 2nd coast brake piston moves smoothly.

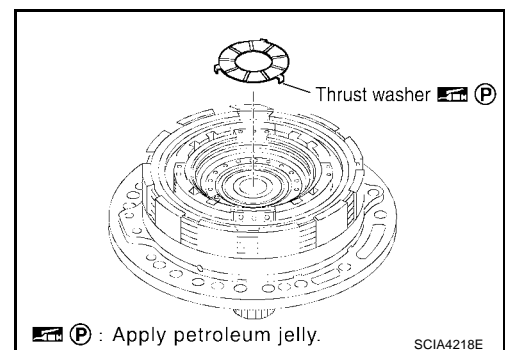
Piston stroke :0.76 - 1.44mm (0.0299 - 0.0567in)



21. Install thrust washer facing the flat surface up.

NOTE:

Apply petroleum jelly to thrust washer.

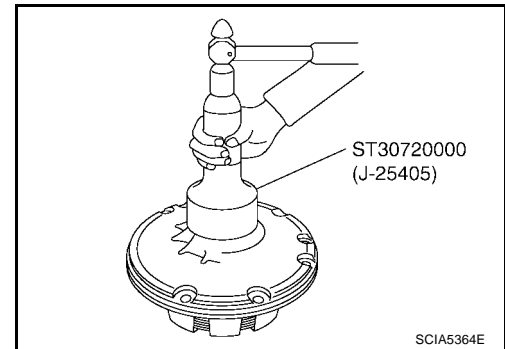


22. Install new oil seal into oil pump assembly until it is flush with the oil pump face, using Tool.

Tool number : ST30720000 (J-25405)

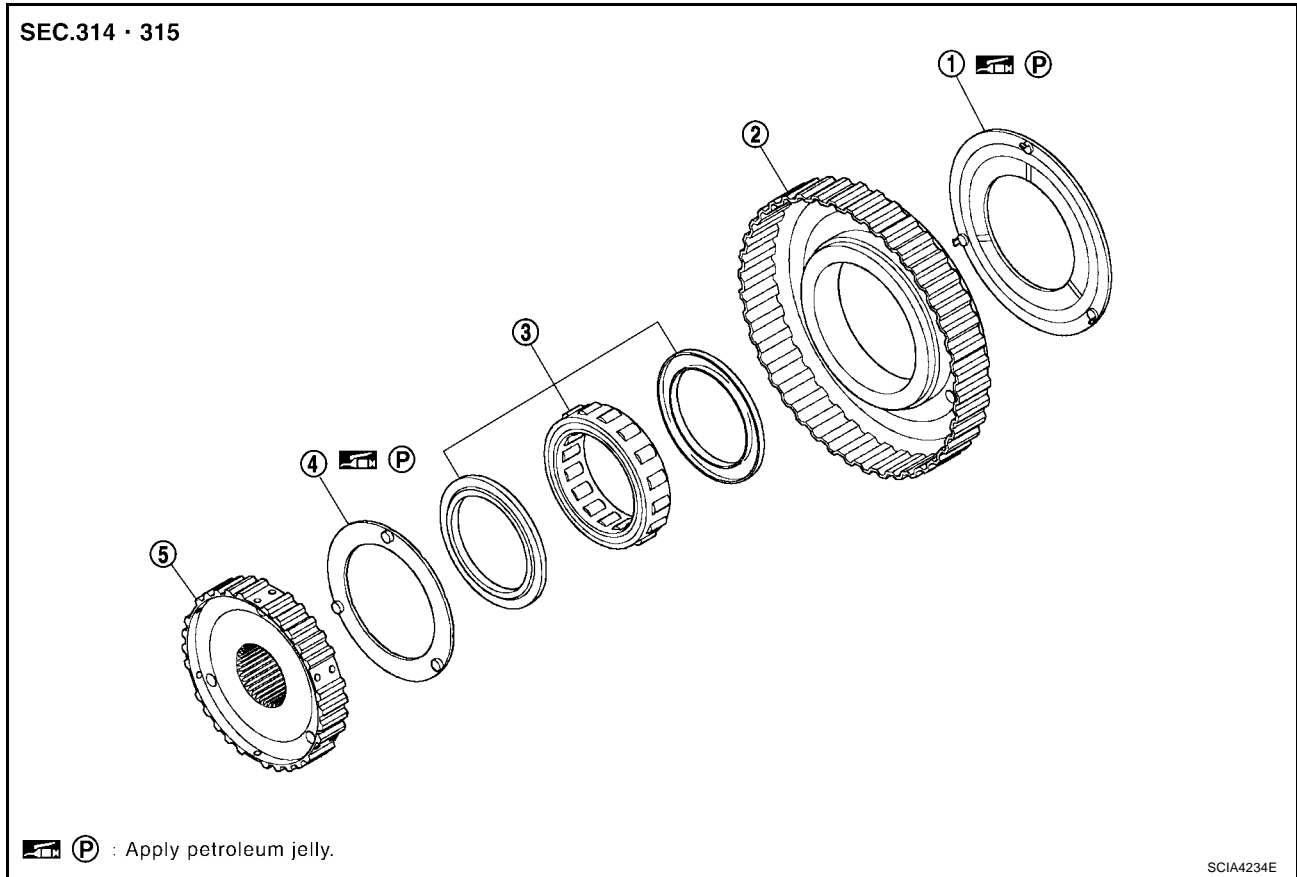
NOTE:

- Do not reuse oil seal.
- Apply ATF to oil seal.



One-Way Clutch Outer Race Sub Assembly & 2nd Coast Brake Hub & One-Way Clutch No.1 COMPONENTS

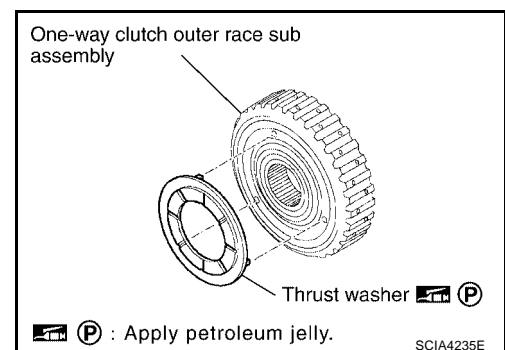
ECS009JP



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|------------------|---|------------------------|
| 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

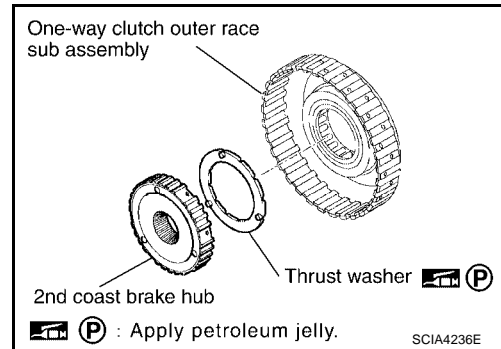
1. Remove thrust washer from one-way clutch outer race sub assembly.



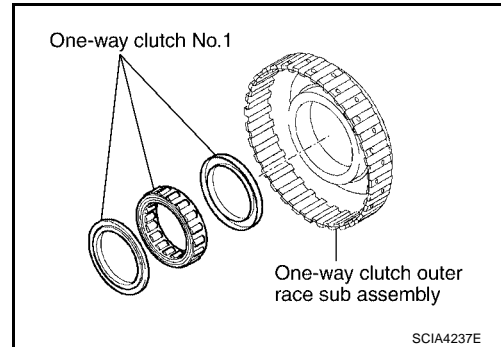
REPAIR FOR COMPONENT PARTS

[RE5F22A]

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.

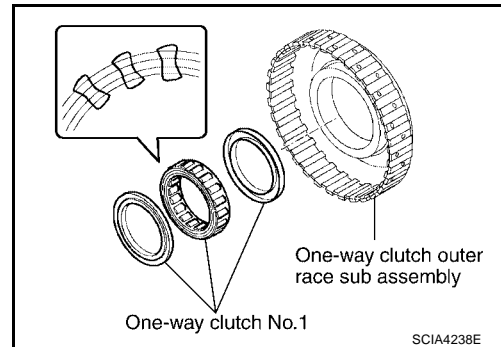


ASSEMBLY

1. Install one-way clutch No.1 into the one-way clutch outer race sub assembly.

CAUTION:

Do not mistake the direction of one-way clutch No.1.



2. Install thrust washer into 2nd coast brake hub.

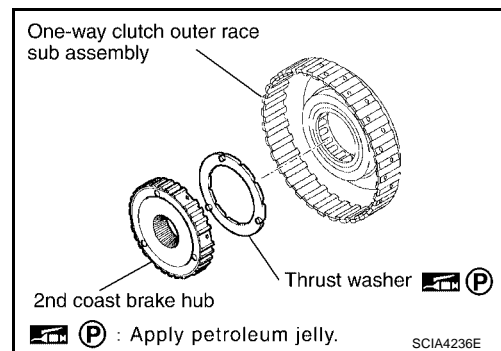
NOTE:

- 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.



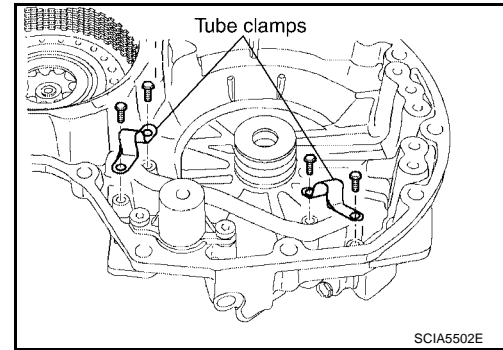
REPAIR FOR COMPONENT PARTS

[RE5F22A]

- | | | |
|----------------------------|---------------------------------------|---------------------------------------|
| 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

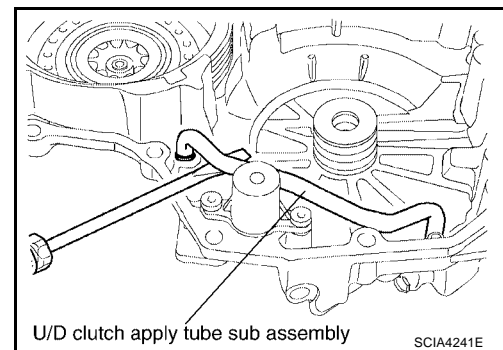
1. Remove tube clamps.



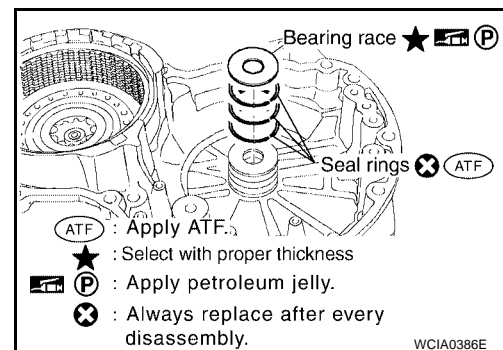
2. Remove U/D clutch apply tube sub assembly, using suitable flat blade screwdriver.

CAUTION:

Be careful not to damage the U/D clutch apply tube sub assembly and transaxle case cover.



3. Remove bearing race and seal rings from transaxle case cover.



4. Remove accumulator cover, compression spring and forward clutch accumulator piston.

5. Remove O-ring from the accumulator cover.

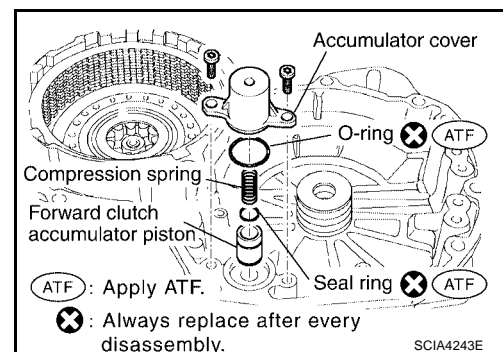
NOTE:

Do not reuse O-rings.

6. Remove seal ring from the forward clutch accumulator piston.

NOTE:

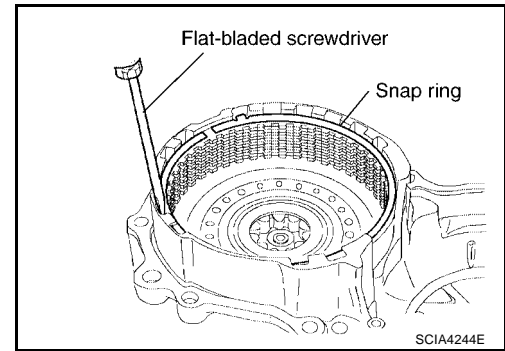
Do not reuse seal ring.



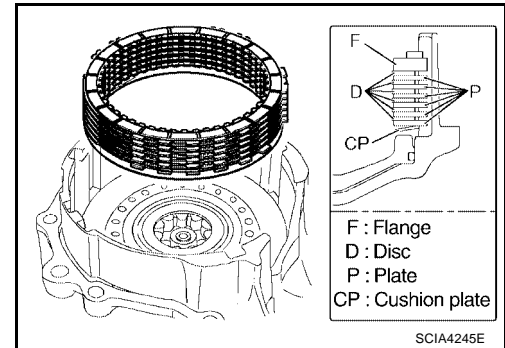
REPAIR FOR COMPONENT PARTS

[RE5F22A]

7. Remove snap ring, using suitable flat blade screwdriver.



8. Remove B5 brake flange, B5 brake discs, B5 brake plates and B5 brake cushion plate.



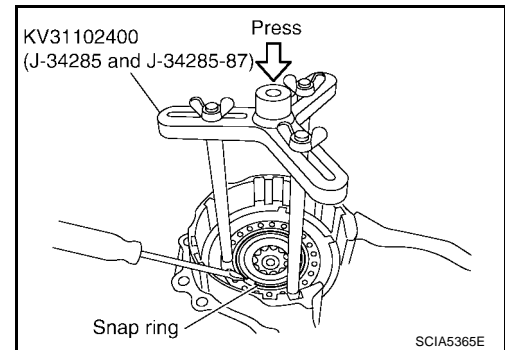
9. Compress return spring with a press, using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

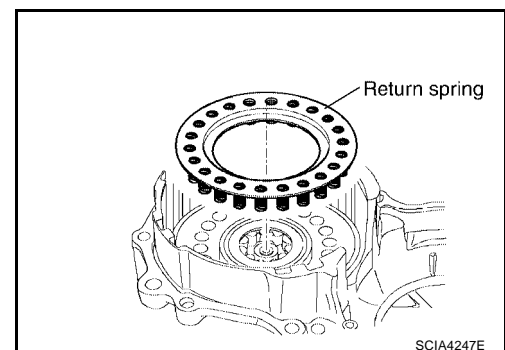
CAUTION:

Do not press return spring too much to avoid deformation.

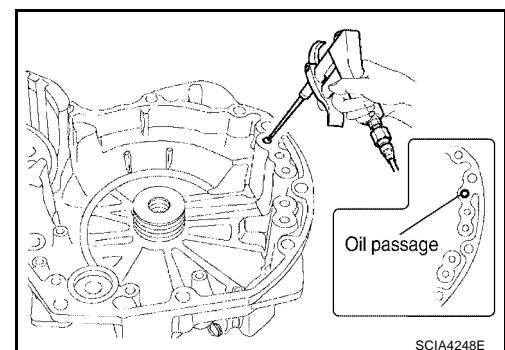
10. Remove snap ring, using suitable tool.



11. Remove return spring.



12. While pushing B5 brake piston by hand, apply compressed air (4Kg/cm²) into the oil passage as shown and remove B5 brake piston.



- Remove O-rings from B5 brake piston.

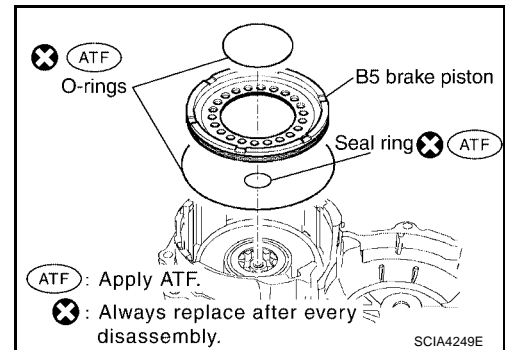
NOTE:

Do not reuse O-rings.

- Remove seal ring from transaxle case cover.

NOTE:

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

NOTE:

Replace new clutch discs by soaking them at least 2 hours in ATF.

ASSEMBLY

- Install new seal ring in transaxle case cover.

NOTE:

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

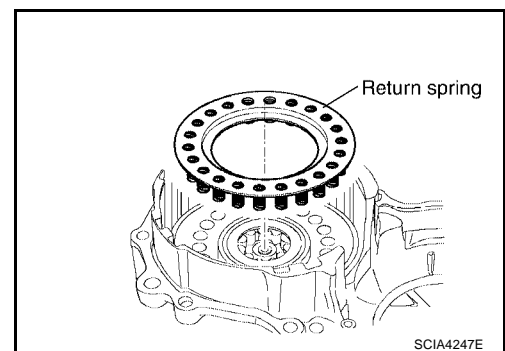
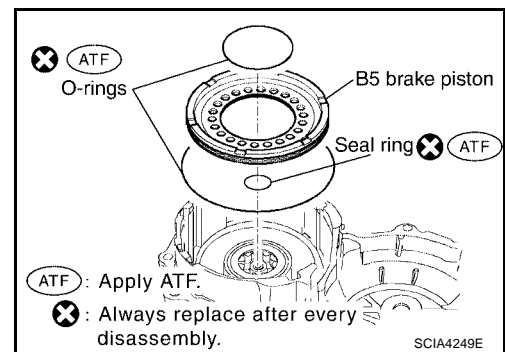
- Install new O-rings in B5 brake piston.

NOTE:

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

- Coat the inner surface of transaxle case cover with ATF.
- Press B5 brake piston into the transaxle case cover.

- Place return spring on B5 brake piston.



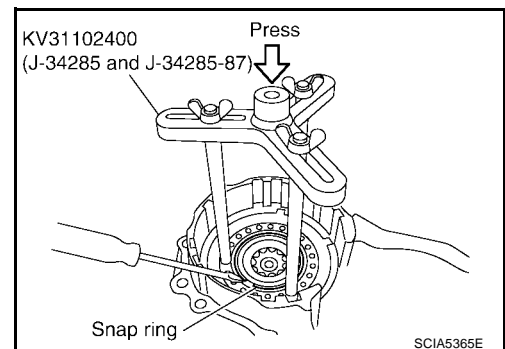
- Compress return spring with a press, using Tool.

Tool number : KV31102400 (J-34285 and J-34285-87)

CAUTION:

Do not press return spring too much to avoid deformation.

- Install snap ring, using suitable tool.



REPAIR FOR COMPONENT PARTS

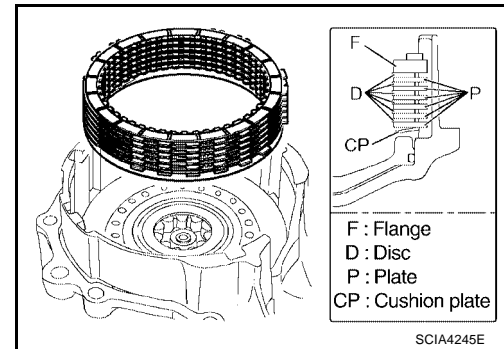
[RE5F22A]

8. Install B5 brake cushion plate.

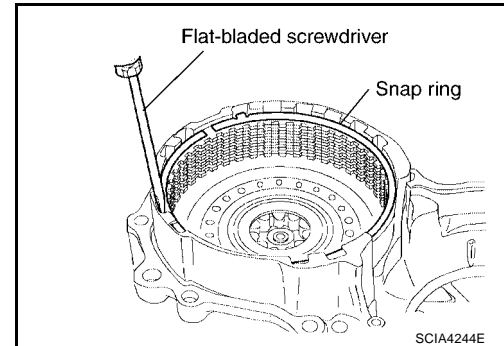
CAUTION:

Be sure 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 flat blade screwdriver.



11. Install new O-ring in accumulator cover.

NOTE:

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

12. Install new seal ring in forward clutch accumulator piston.

NOTE:

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

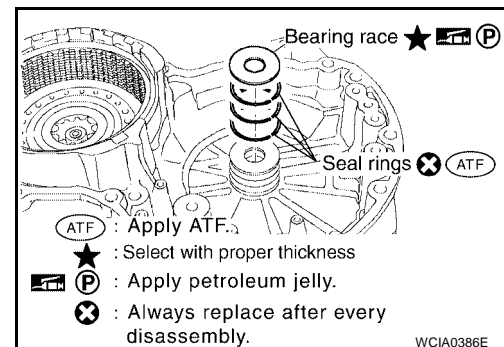
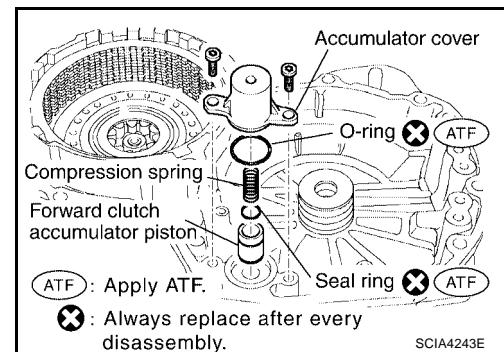
13. Install forward clutch accumulator piston, compression spring and accumulator cover in transaxle case cover.

14. Tighten accumulator cover torx bolts to specified torque. Refer to [AT-660, "COMPONENTS"](#).

15. Install new seal rings and bearing race in transaxle case cover.

NOTE:

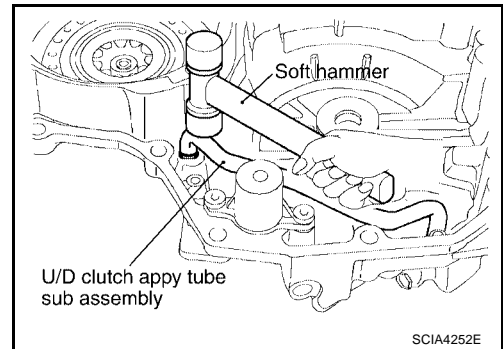
- Do not reuse seal ring.
- Apply ATF to O-ring.
- Refer to ASSEMBLY to select proper bearing race.



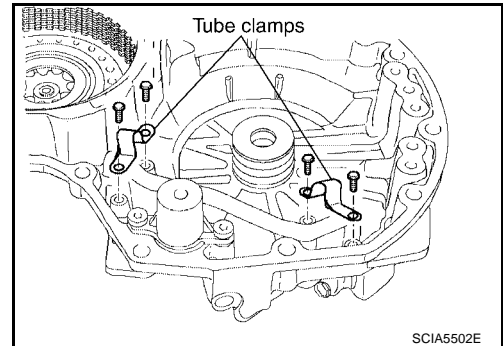
REPAIR FOR COMPONENT PARTS

[RE5F22A]

16. Install the U/D clutch apply tube sub assembly, using suitable soft hammer.



17. Tighten tube clamp bolts to specified torque. Refer to [AT-660](#), "[COMPONENTS](#)".

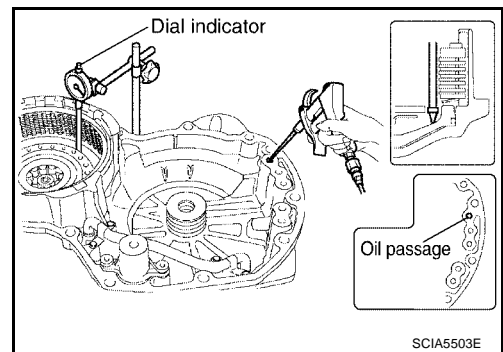


18. Set a dial indicator as shown.

19. When applying compressed air (4kg/cm²) into the oil passage as shown, measure the B5 brake piston stroke and check the B5 brake piston moves smoothly.

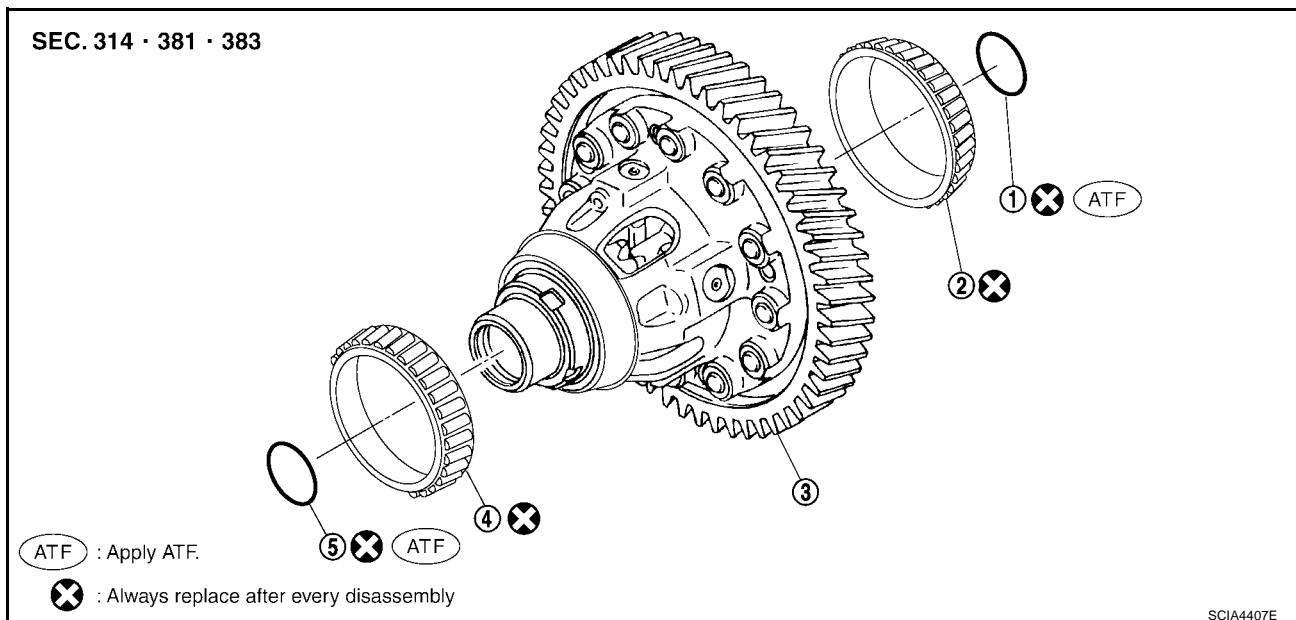
Piston stroke :2.34 - 2.70mm (0.0921 - 0.1063in)

If the B5 brake piston stroke is out standards, select another flange. Refer to [AT-696](#), "[B5 BRAKE](#)".



Differential Gear Assembly COMPONENTS

ECS009JR



REPAIR FOR COMPONENT PARTS

[RE5F22A]

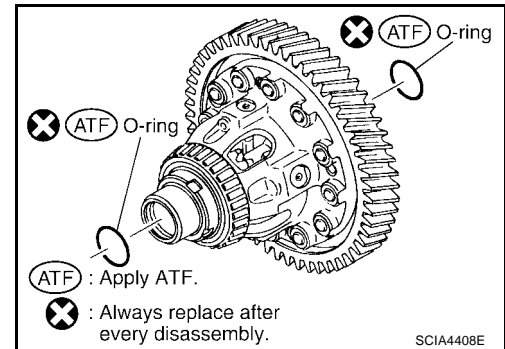
1. O-ring
2. Tapered roller bearing
3. Differential gear assembly
4. Tapered roller bearing
5. O-ring

DISASSEMBLY

1. Remove O-rings from differential gear assembly.

NOTE:

Do not reuse O-rings.

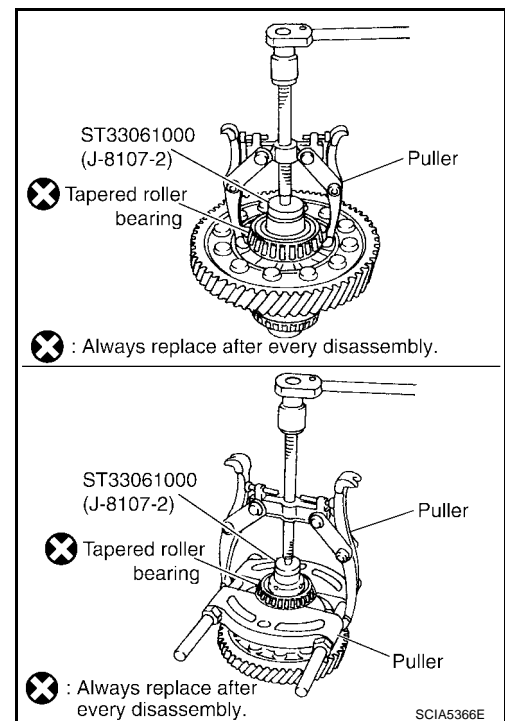


2. Remove tapered roller bearings, using suitable puller and Tool.

Tool number : ST33061000 (J-8107-2)

NOTE:

Do not reuse tapered roller bearings.



ASSEMBLY

1. Install new tapered roller bearings in differential gear assembly, using Tool.

Tool number : KV38100500 (—)
 : ST33720000 (J-25405)

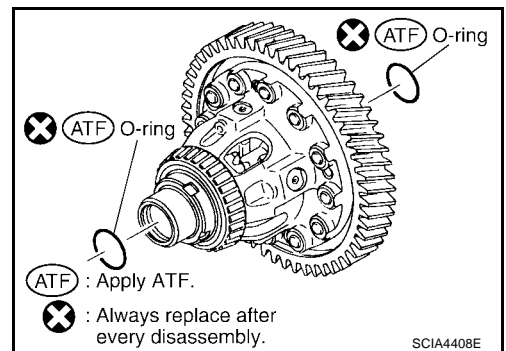
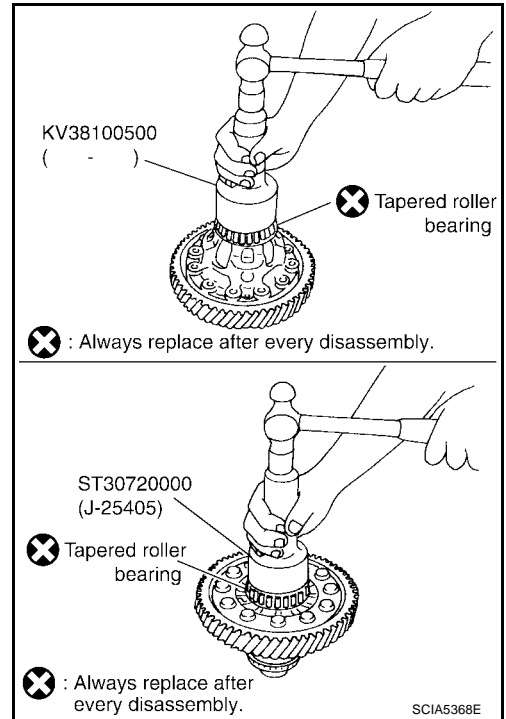
NOTE:

Do not reuse tapered roller bearings.

2. Install new O-rings in differential gear assembly.

NOTE:

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



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ASSEMBLY

Assembly (1)

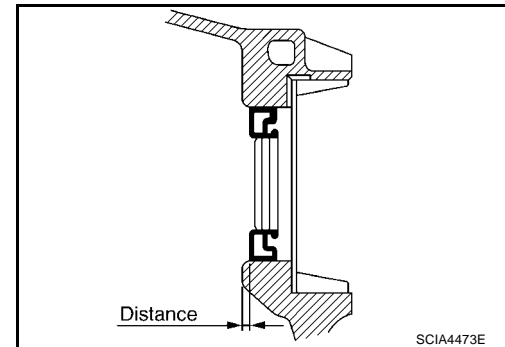
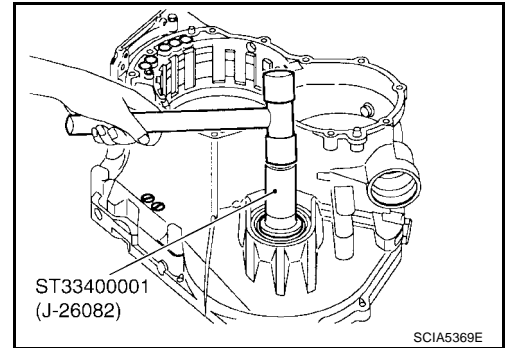
1. Install new differential side oil seal into transaxle case as specified using Tool.

Tool number : ST33400001 (J-26082)

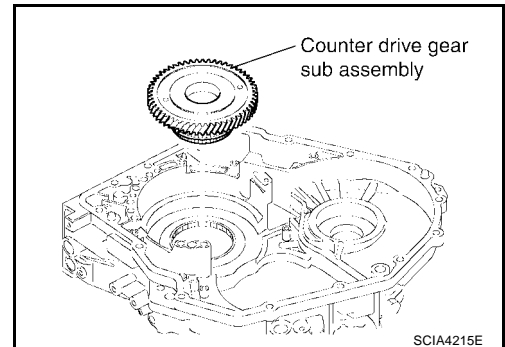
Distance : 3.0 - 4.0 mm (0.118 - 0.157 in)

NOTE:

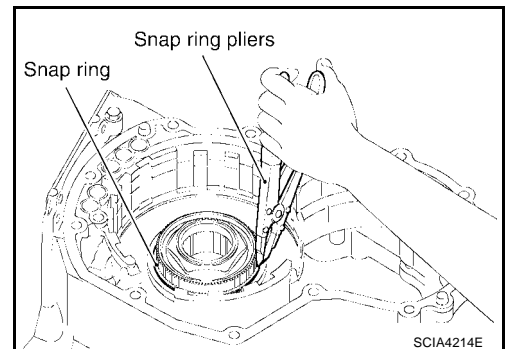
- Do not reuse differential side oil seal.
- Apply ATF to differential side oil seal.



2. Install counter drive gear sub assembly.



3. Install snap ring using a snap ring pliers.



ASSEMBLY

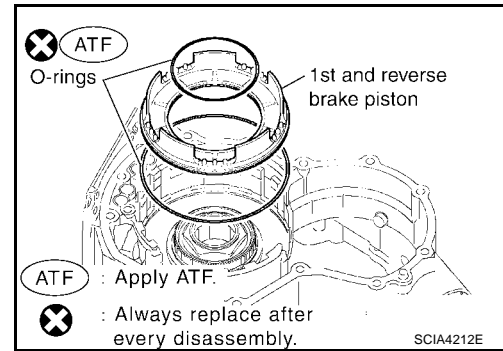
[RE5F22A]

4. Install new O-rings in 1st and reverse brake piston.

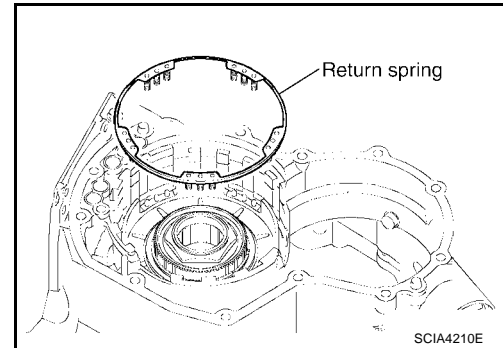
NOTE:

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

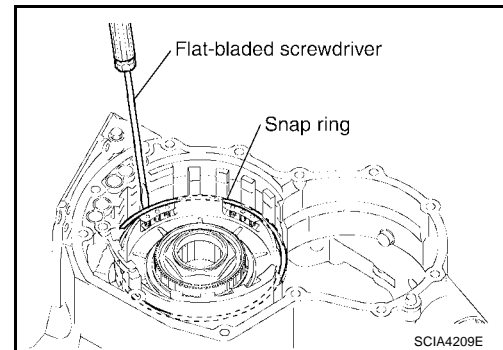
5. Coat the inner surface of transaxle case with ATF.
6. Install 1st and reverse brake piston in transaxle case.



7. Put return spring on 1st and reverse brake piston.



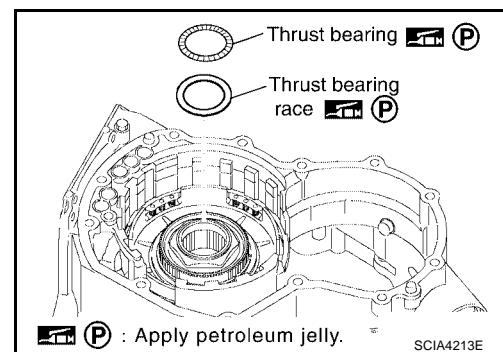
8. Install the snap ring into groove while compressing the return spring by hand with a flat-bladed screwdriver.



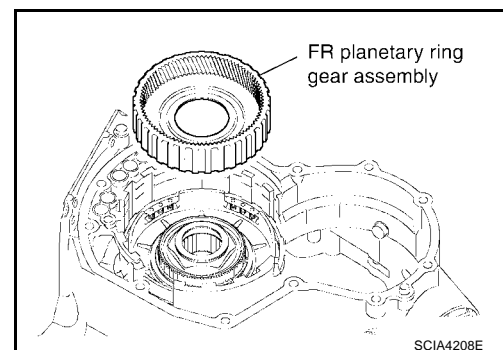
9. Put thrust bearing race and thrust bearing on counter drive gear sub assembly.

NOTE:

Apply petroleum jelly to thrust and thrust bearing race.



10. Install FR planetary ring gear assembly with one-way clutch No.2.

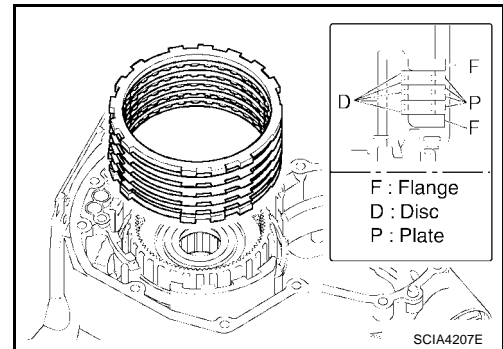


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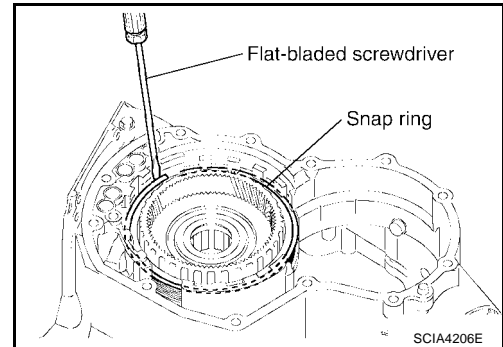
ASSEMBLY

[RE5F22A]

11. Install 1st and reverse brake flanges, 1st and reverse brake discs and 1st and reverse brake plates.



12. Install snap ring using a flat-bladed screwdriver.



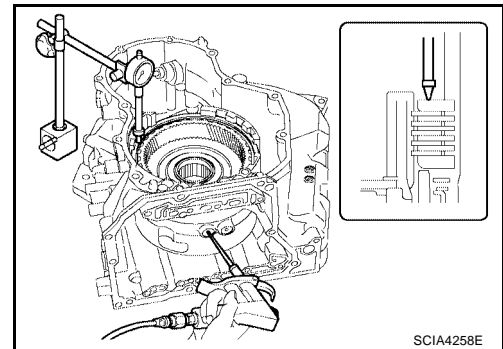
13. Set a dial indicator as shown.

14. Applying compressed air (4Kg/cm²) 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:

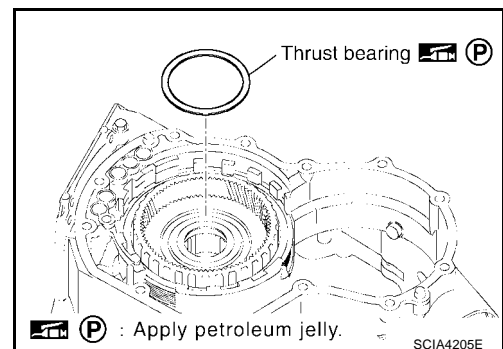
- Oil pressure leak
- Damage of O-ring
- Wear damage of disc



15. Install thrust bearing.

NOTE:

Apply petroleum jelly to thrust bearing.

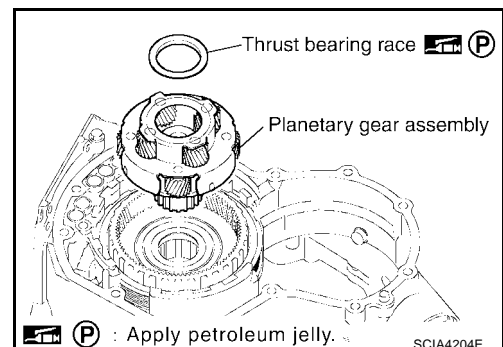


16. Install planetary gear assembly.

17. Install thrust bearing race in planetary gear assembly.

NOTE:

Apply petroleum jelly to thrust bearing race.



ASSEMBLY

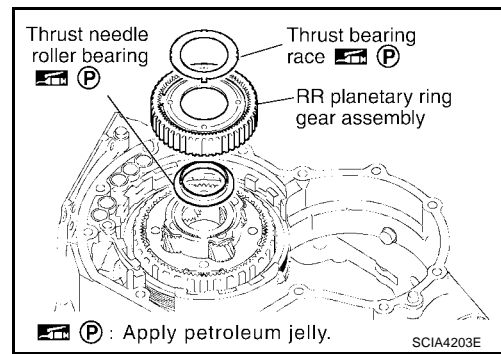
[RE5F22A]

18. Install thrust needle roller bearing and thrust bearing race in RR planetary ring gear assembly.

NOTE:

Apply petroleum jelly to thrust needle roller bearing.

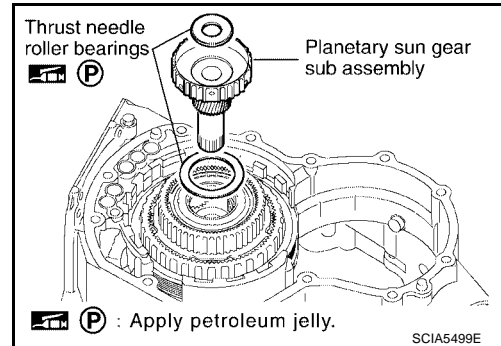
19. Install RR planetary ring gear assembly.



20. Install planetary sun gear sub assembly and thrust needle roller bearing.

NOTE:

Apply petroleum jelly to thrust needle roller bearing.

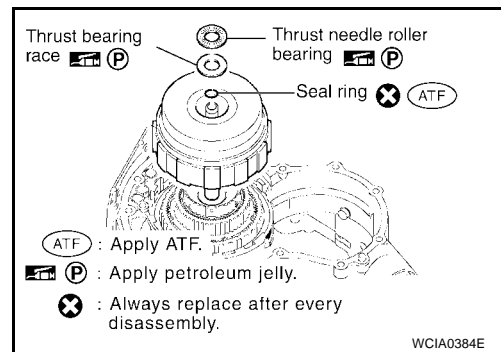


21. Install forward and direct clutch assembly.

22. Install thrust bearing race, thrust needle roller bearing and new seal ring in forward and direct clutch assembly.

NOTE:

- Do not reuse old seal ring.
- Apply ATF to seal ring.
- Apply petroleum jelly to thrust needle roller bearing and thrust bearing race.

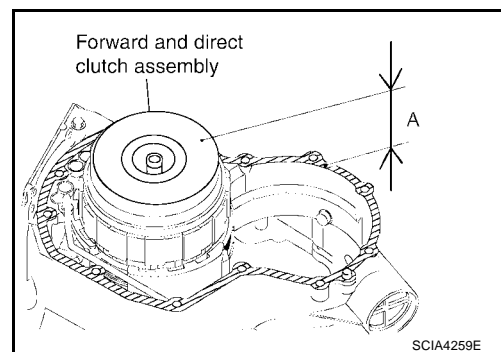


23. Check the distance of "A".

**Dimension "A" : 50.850 - 51.825 mm
(2.0020 - 2.0404 in)**

CAUTION:

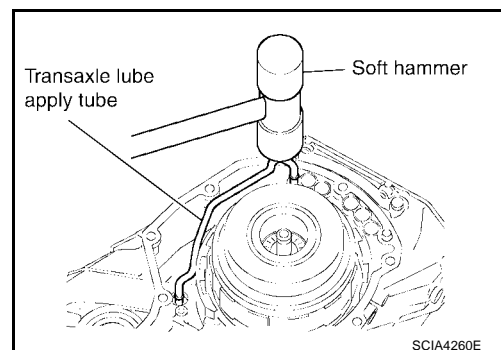
If the distance is out of standards, adjust with in standards again.



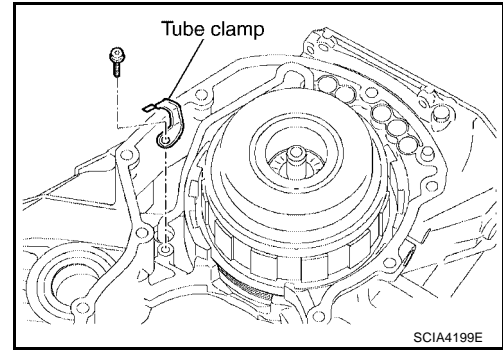
24. Install transaxle lube apply tube using a soft hammer.

CAUTION:

Be careful not to bend and damage transaxle lube apply tube.



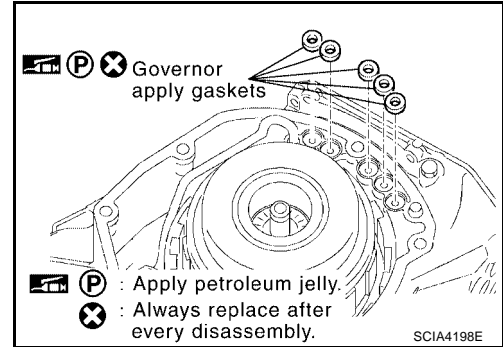
25. Tighten tube clamp bolt to specified torque. Refer to [AT-626](#), "[Components](#)".



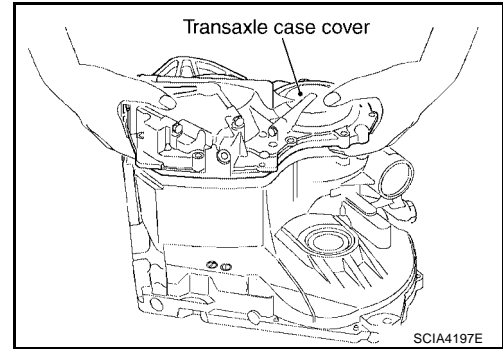
26. Install new governor apply gaskets in transaxle case.

NOTE:

- Do not reuse gaskets.
- Apply petroleum jelly to gaskets.



27. Install transaxle case cover in transaxle case.

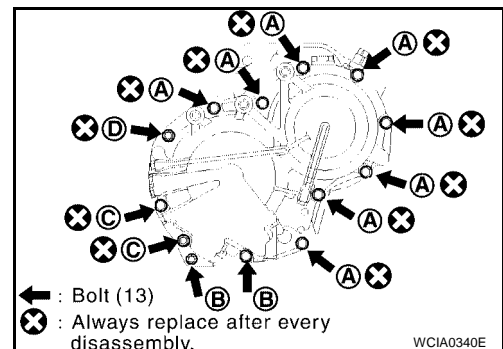
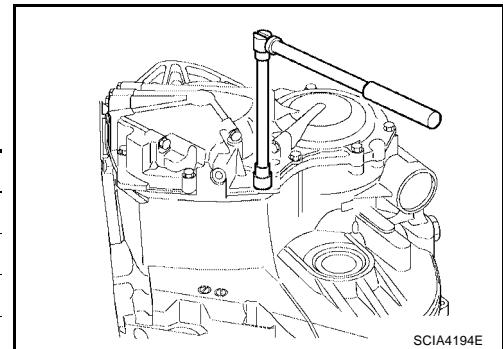


28. Tighten transaxle case cover bolts to specified torque. Refer to [AT-626](#), "[Components](#)".

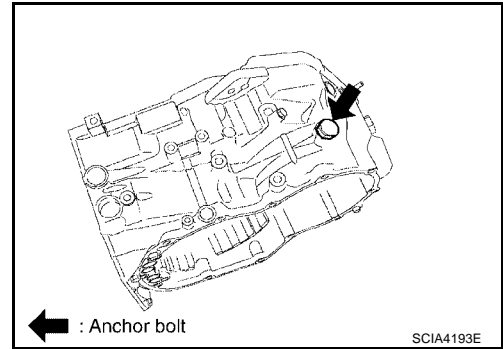
CAUTION:
Do not reuse seal bolts.

| Bolt symbol | Length mm (in) | Number of bolts |
|-------------|----------------|-----------------|
| A | 30 (1.18) | 8 |
| B | 45 (1.77) | 1 |
| C | 48 (1.89) | 2 |
| D* | — | 1 |

*:Stud bolt



29. Tighten anchor bolt to specified torque. Refer to [AT-626, "Components"](#).

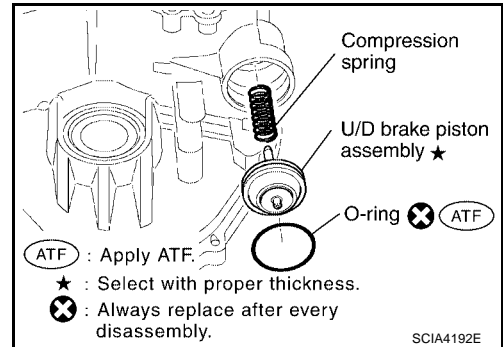


30. Install new O-ring in U/D brake piston assembly.

NOTE:

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

31. Coat the inner surface of transaxle case with ATF.
32. Install compression spring and U/D brake piston assembly.

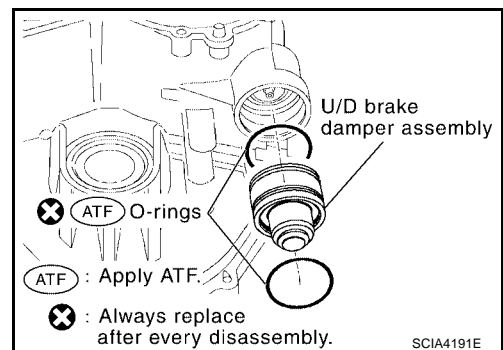


33. Install new O-rings in U/D brake damper assembly.

NOTE:

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

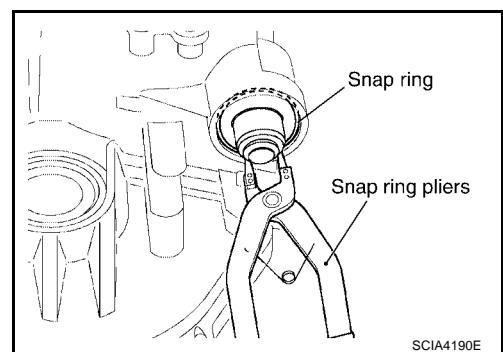
34. Install U/D brake damper assembly.



35. Install snap ring using a snap ring pliers.

CAUTION:

If the snap ring is deformed, replace it.

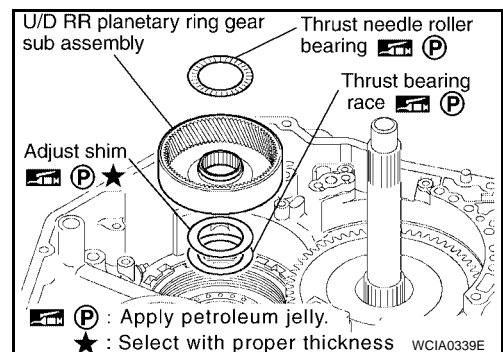


36. Install thrust needle roller bearing adjust shim and thrust bearing race in U/D RR planetary ring gear sub assembly.

NOTE:

Apply petroleum jelly to adjust shim, thrust needle roller bearing and thrust bearing race.

37. Install U/D RR planetary ring gear sub assembly.



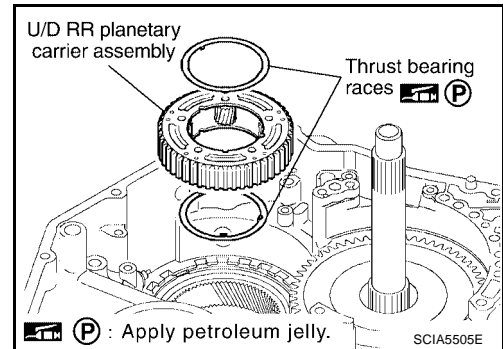
ASSEMBLY

[RE5F22A]

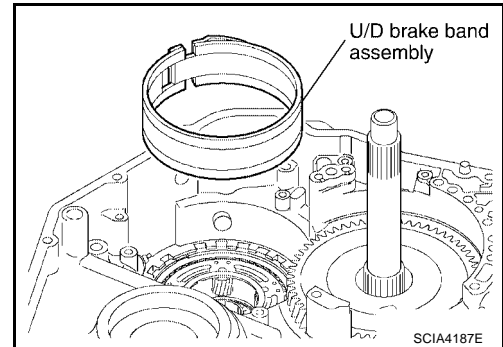
38. Install U/D RR planetary carrier assembly and thrust bearing races.

NOTE:

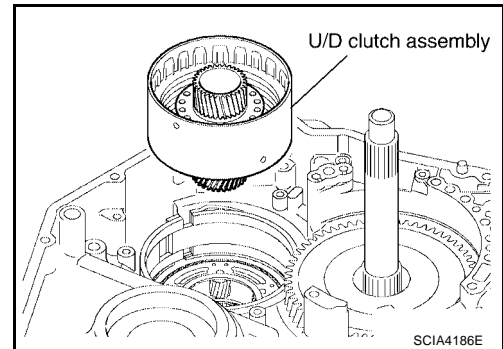
Apply petroleum jelly to bearing races.



39. Install U/D brake band assembly.



40. Install U/D clutch assembly.

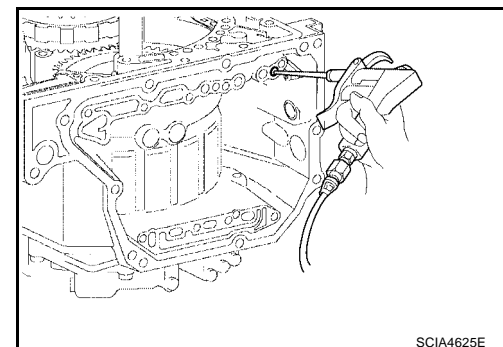
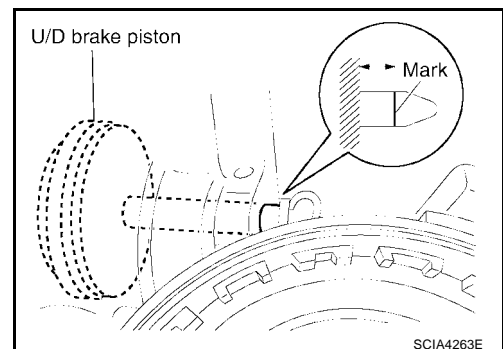


41. Measure the U/D brake piston stroke applying and releasing the compressed air (4Kg/cm²) as shown.

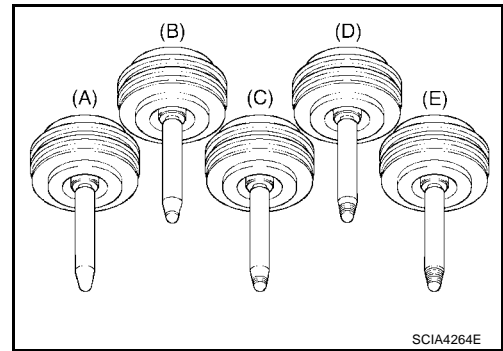
CAUTION:

Measure U/D brake piston stroke after assembling U/D clutch assembly.

Piston Stroke : 5.76 - 6.76 mm (0.2268 - 0.2661 in)



42. If the piston stroke is out of standards, select another U/D brake piston. Refer to [AT-696, "U/D BRAKE"](#) .



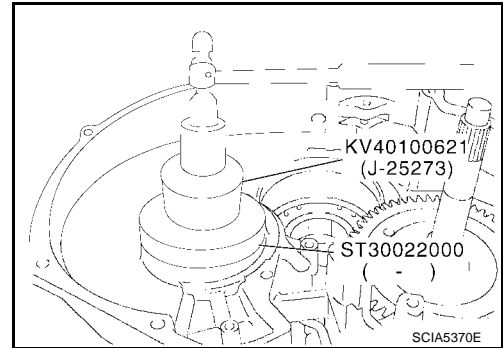
ECS009JT

Adjustment

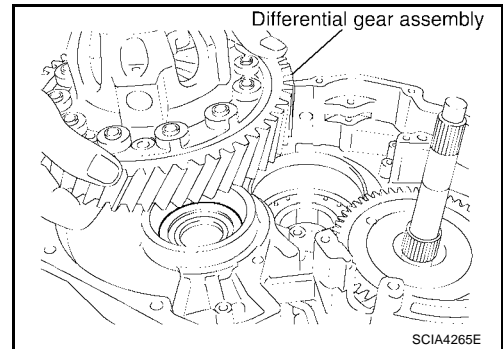
ADJUST PRELOAD OF TAPERED ROLLER BEARING

1. Install adjust shim and outer race in transaxle case using Tool.

Tool number : **KV40100621 (J-25273)**
 : **ST30022000 (—)**



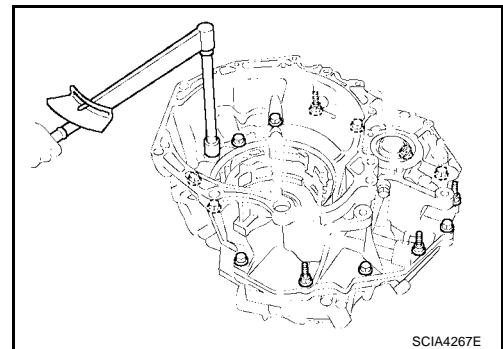
2. Install differential gear assembly in transaxle case.
3. Install transaxle housing into transaxle case.



4. Tighten transaxle housing and transaxle case bolts to specified torque. Refer to [AT-626, "Components"](#) .

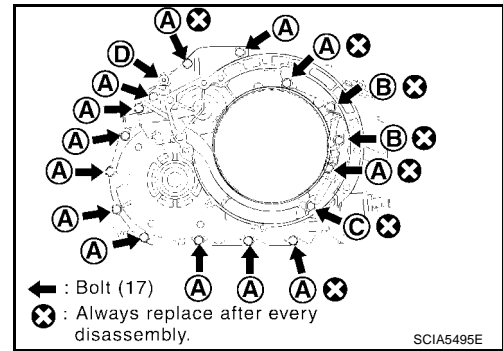
CAUTION:

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



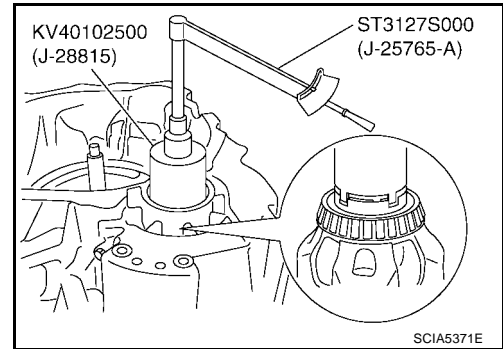
5. Measure turning torque of differential gear assembly using Tool.

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)

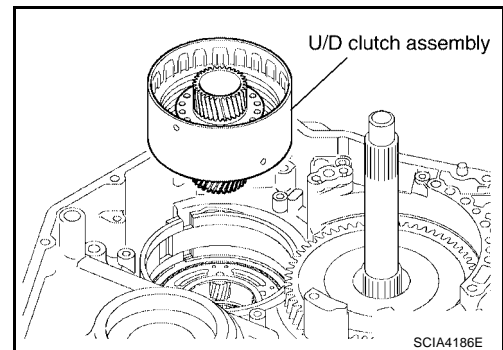
If the preload is not within specification, remove differential gear assembly from transaxle case. Re-select adjust shim. Refer to [AT-697, "DIFFERENTIAL SIDE BEARING ADJUSTING SHIMS"](#)



Assembly (2)

ECS009JU

1. Remove transaxle housing and differential gear assembly from transaxle case.
2. Install U/D clutch assembly.

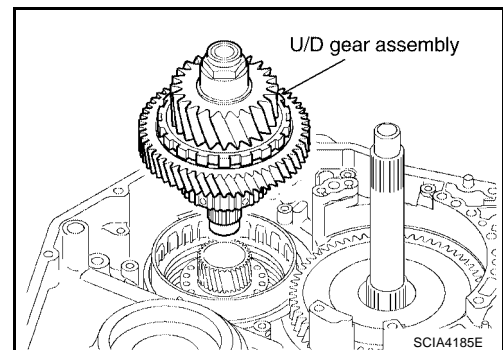


3. Install new seal rings in U/D gear assembly.

NOTE:

- Do not reuse seal rings.
- Apply ATF to seal rings.

4. Install U/D gear assembly.



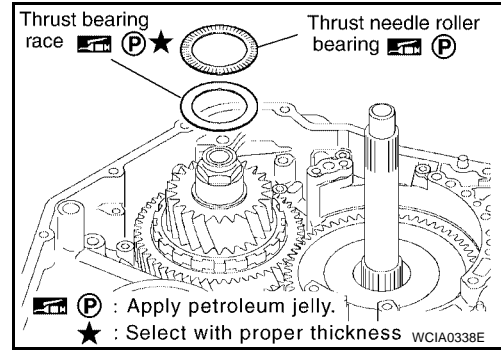
ASSEMBLY

[RE5F22A]

5. Install thrust needle roller bearing and thrust bearing race in U/D gear assembly.

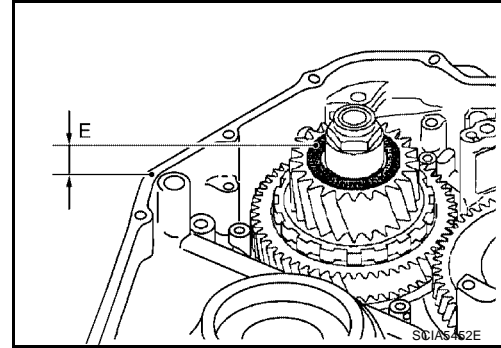
NOTE:

Apply petroleum jelly to thrust needle roller bearing and thrust bearing race.



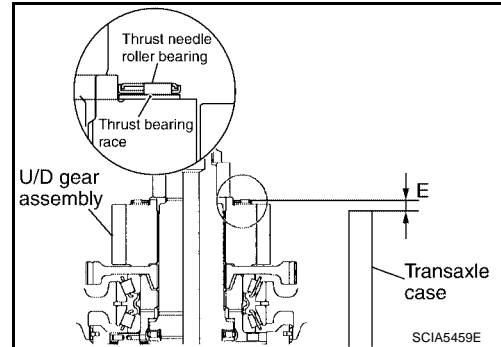
- a. Make sure that measurement "E" is within the specifications.

**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.



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ASSEMBLY

[RE5F22A]

- b. If measurement "E" is outside the specification, replace "T" with a one that has applicable thickness. Refer to [AT-697, "U/D GEAR ASSEMBLY"](#) .

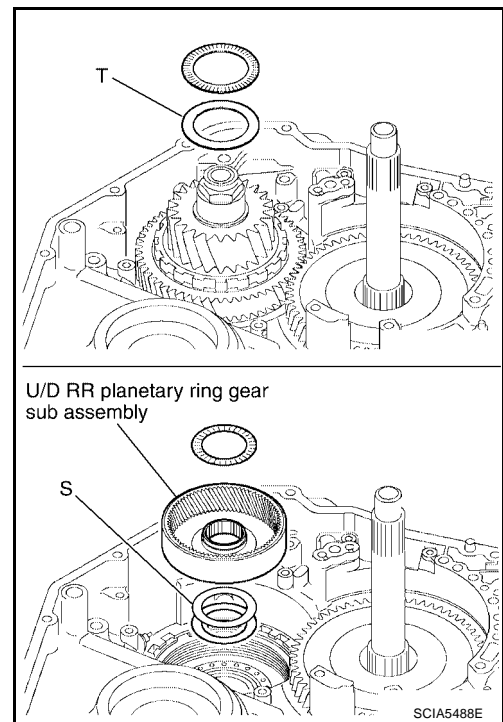
CAUTION:

When adjusting "T", use "S" of thickness 0.81 mm (0.32 in).

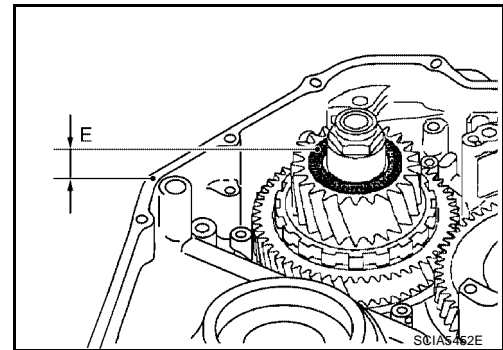
- c. If all of "T" do not fit "E" within the specifications, replace "S" with a one that has applicable thickness. Refer to [AT-697, "U/D RR PLANETARY RING GEAR SUB ASSEMBLY"](#) .

CAUTION:

When adjusting "S", use "T" of thickness 0.80 mm (0.31 in).



- d. Make sure that measurement "E" is within specifications.

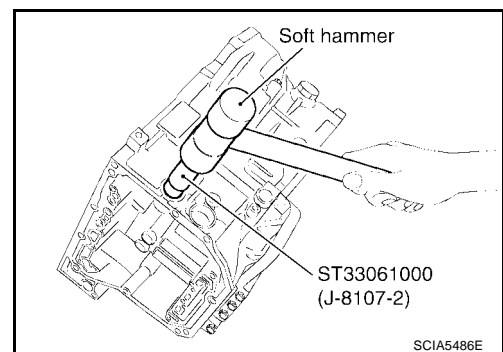


6. Install new manual valve oil seal into transaxle case until it is flush with the transaxle case face, using Tool.

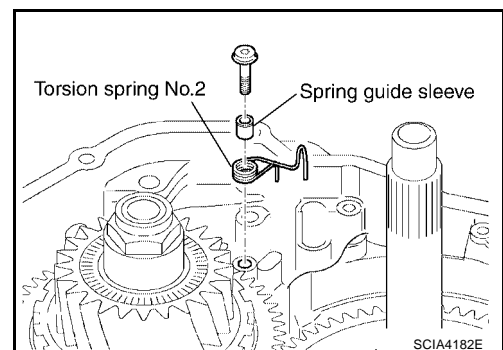
Tool number : ST33061000 (J-8107-2)

NOTE:

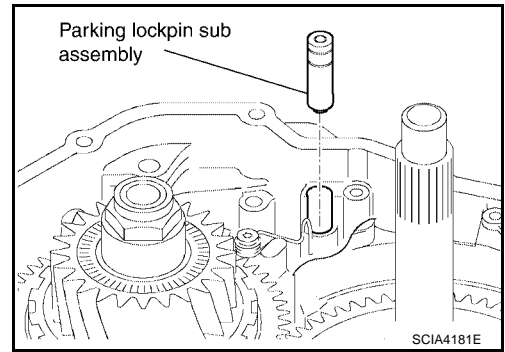
- Do not reuse manual valve oil seal.
- Apply ATF to manual valve oil seal.



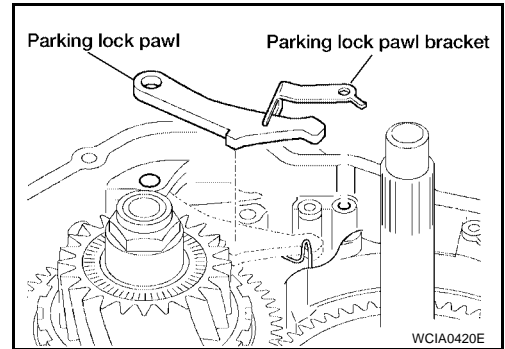
7. Install spring guide sleeve and torsion spring No.2 in transaxle case.
8. Tighten spring guide sleeve and torsion spring No.2 torx bolt to specified torque. Refer to [AT-626, "Components"](#) .



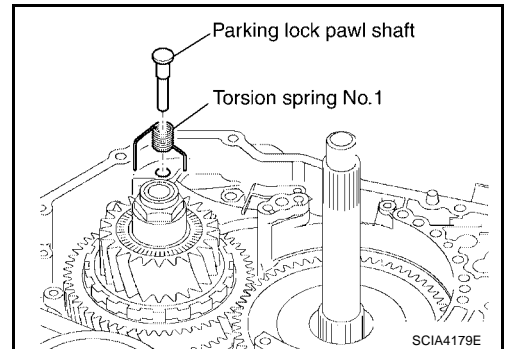
9. Install parking lockpin sub assembly.



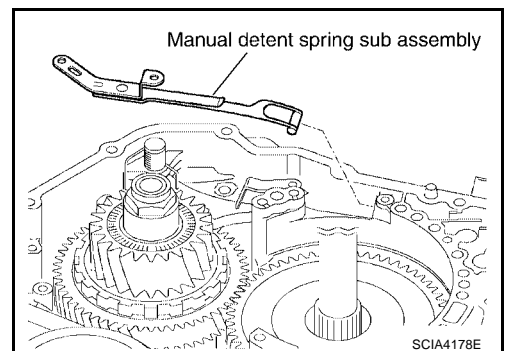
10. Install parking lock pawl bracket and parking lock pawl.



11. Install parking lock pawl shaft and torsion spring No.1.

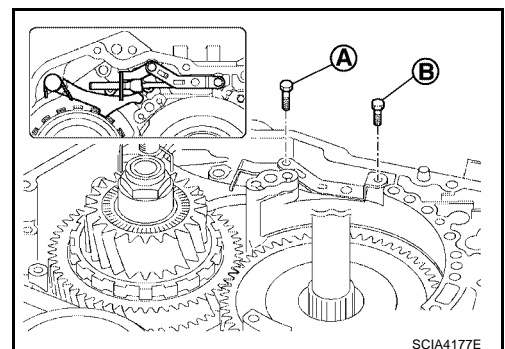


12. Install manual detent spring sub assembly.



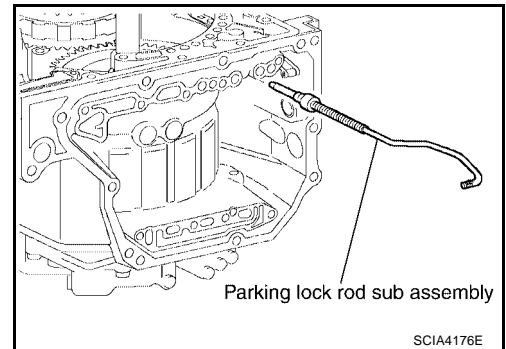
13. Temporary tightening the bolts.

| Bolt symbol | Length mm (in) | Number of bolts |
|-------------|----------------|-----------------|
| A | 16.7 (0.657) | 1 |
| B | 14.0 (0.551) | 1 |

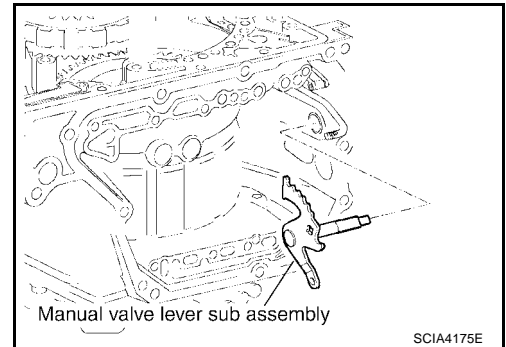


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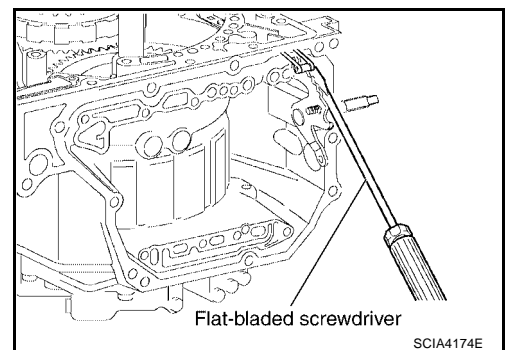
14. Install parking lock rod sub assembly.



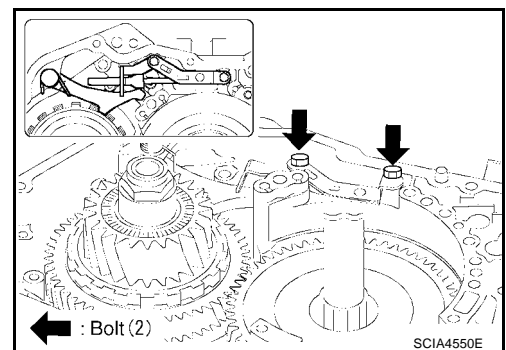
15. Install manual valve lever sub assembly connect parking lock rod sub assembly to it.



16. Connect manual detent spring sub assembly to manual valve lever sub assembly using a flat-bladed screwdriver and.



17. Tighten manual detent spring sub assembly bolts to specified torque. Refer to [AT-626, "Components"](#) .



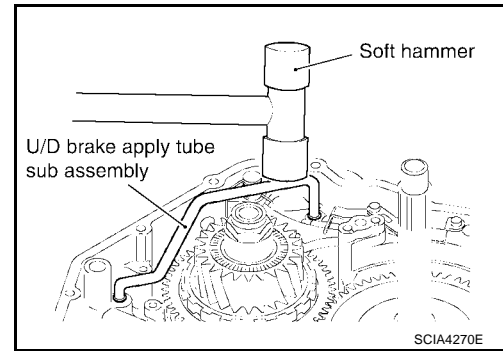
ASSEMBLY

[RE5F22A]

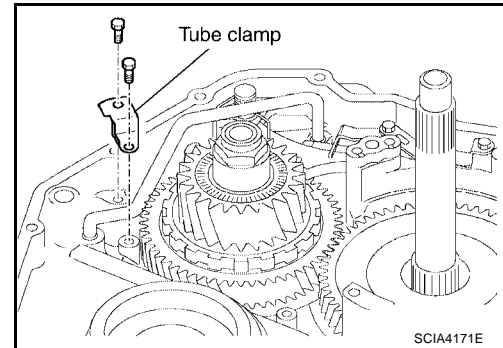
18. Install U/D brake apply tube sub assembly using a soft hammer.

CAUTION:

Be careful not to damage U/D brake apply tube sub assembly.

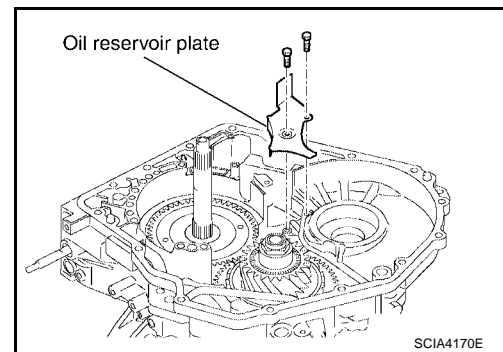


19. Tighten tube clamp bolts to specified torque. Refer to [AT-626, "Components"](#).



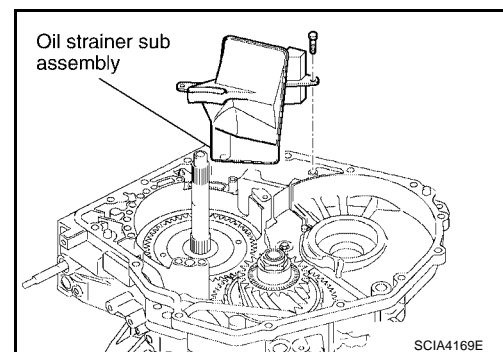
20. Install oil reservoir plate in transaxle case.

21. Tighten oil reservoir plate bolts to specified torque. Refer to [AT-626, "Components"](#).

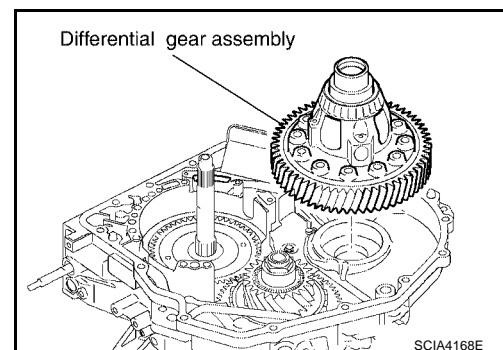


22. Install oil strainer sub assembly in transaxle case.

23. Tighten oil strainer sub assembly bolt to specified torque. Refer to [AT-626, "Components"](#).



24. Install differential gear assembly.



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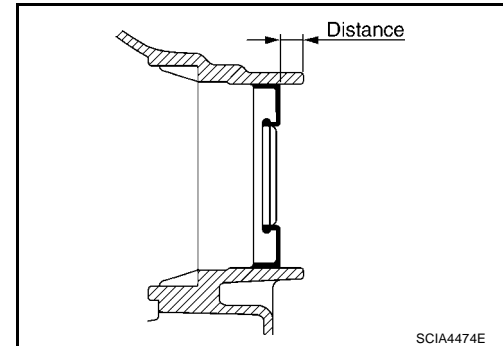
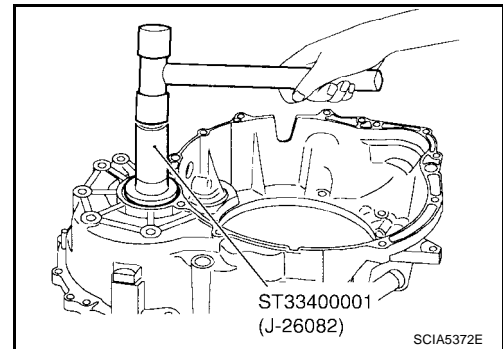
25. Install new differential side oil seal into transaxle housing as specified using Tool.

Tool number : ST33400001 (J-26082)

Distance : 14.8 - 15.8 mm (0.583 - 0.622 in)

NOTE:

- Do not reuse differential side oil seal.
- Apply ATF to differential side oil seal.

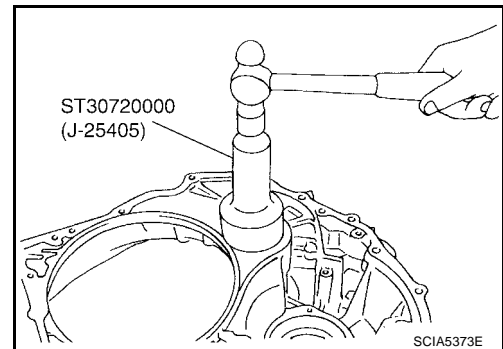


26. Install new thrust roller bearing in transaxle housing using Tool.

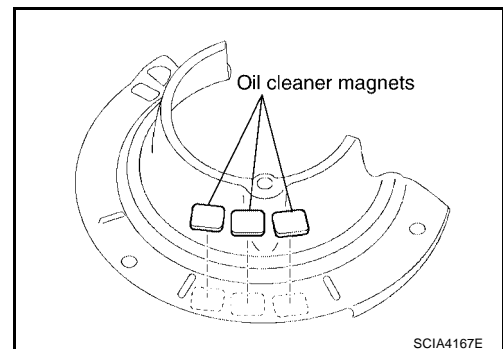
Tool number : ST30720000 (J-25405)

NOTE:

- Do not reuse thrust roller bearing.

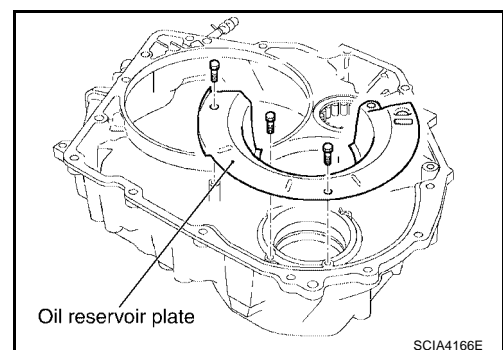


27. Install oil cleaner magnets on oil reservoir plate.



28. Install oil reservoir plate in transaxle housing.

29. Tighten oil reservoir plate bolts to specified torque. Refer to [AT-626](#), "Components".



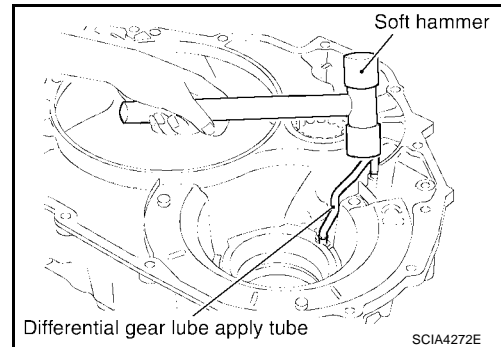
ASSEMBLY

[RE5F22A]

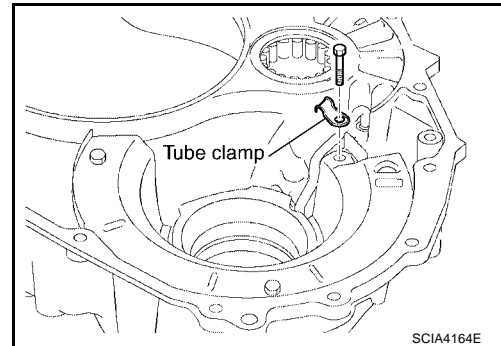
30. Install differential gear lube apply tube using a soft hammer.

CAUTION:

Be careful not to bend or damage differential gear lube apply tube.



31. Tighten tube clamp bolt to specified torque. Refer to [AT-626](#), "[Components](#)".



32. Install new governor apply gasket.

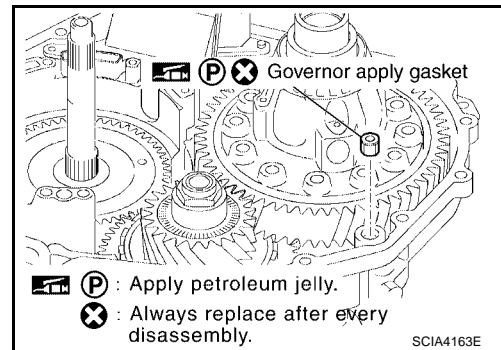
NOTE:

- Do not reuse governor apply gasket.
- Apply petroleum jelly to governor apply gasket.

33. Install new seal ring.

NOTE:

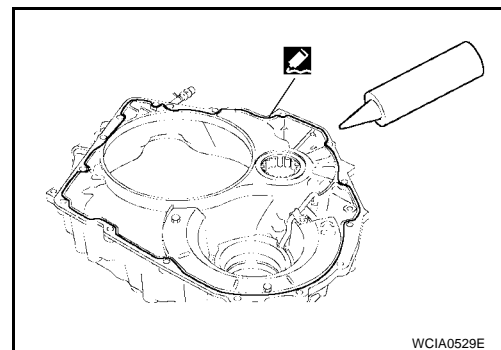
- Do not reuse seal ring.
- Apply ATF to seal ring.



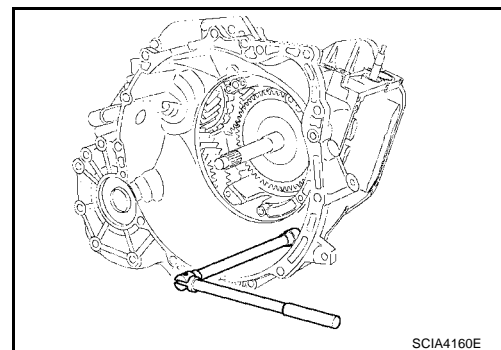
34. Apply Liquid Gasket (Three Bond 1281B) or equivalent to transaxle housing as shown. Refer to [GI-45](#), "[Recommended Chemical Products and Sealants](#)".

CAUTION:

Completely remove all moisture, oil and sealant from transaxle housing and transaxle case.



35. Install transaxle housing in transaxle case.



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ASSEMBLY

[RE5F22A]

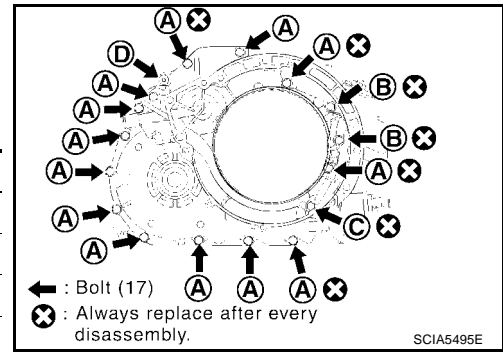
36. Tighten transaxle housing bolts to specified torque. Refer to [AT-626, "Components"](#).

NOTE:

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

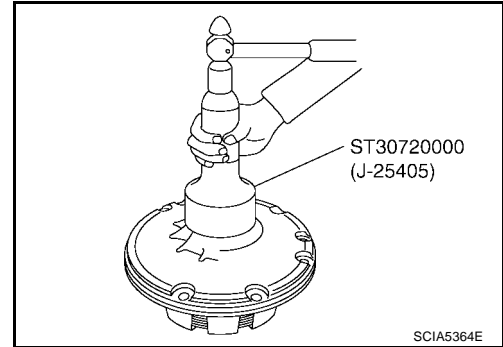


37. Install new oil seal into oil pump assembly until it is flush with oil pump face using Tool.

Tool number : ST30720000 (J-25405)

NOTE:

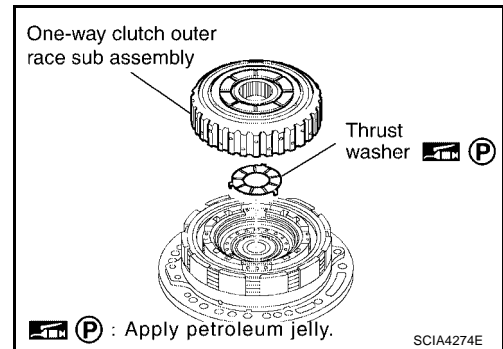
- Do not reuse oil seal.
- Apply ATF to oil seal.



38. Install thrust washer and one-way clutch outer race sub assembly in oil pump assembly.

NOTE:

Apply petroleum jelly to thrust washer.

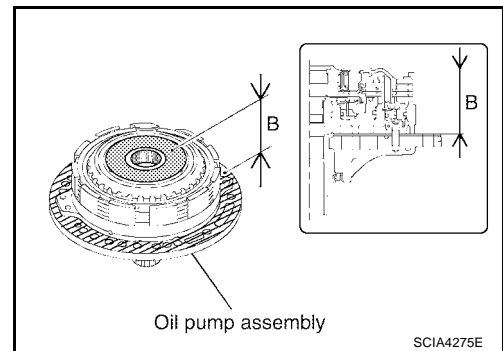


39. Check the distance of "B".

"B" : 51.09 - 51.71 mm (2.0114 - 2.0358 in)

CAUTION:

If the distance is out of standards, adjust within standards again.



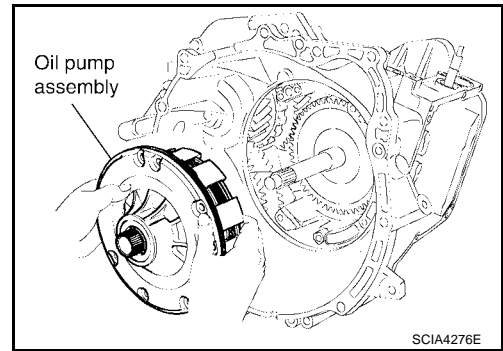
ASSEMBLY

[RE5F22A]

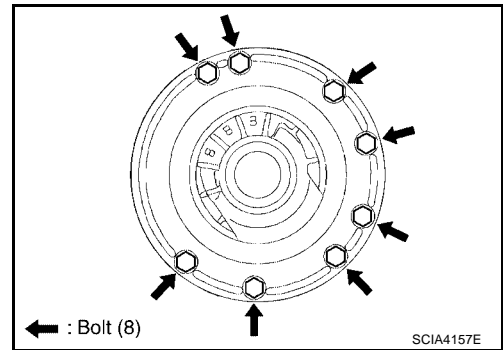
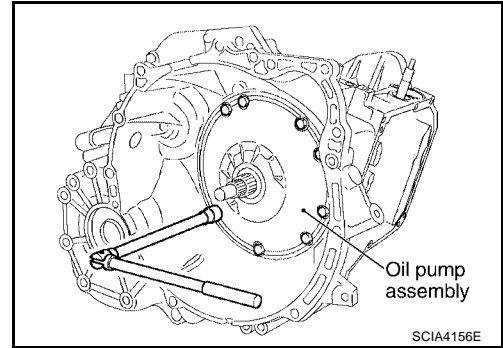
40. Place oil pump assembly through the input shaft in horizontal position, and align the bolt holes of the oil pump assembly with transaxle case. Lightly press oil pump assembly.

CAUTION:

Be careful not to drop one-way clutch outer race sub assembly.

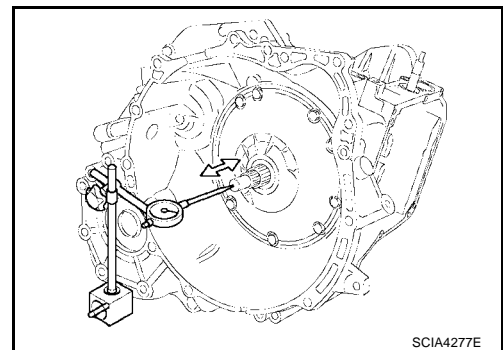


41. Tighten oil pump assembly bolts to specified torque. Refer to [AT-626, "Components"](#).

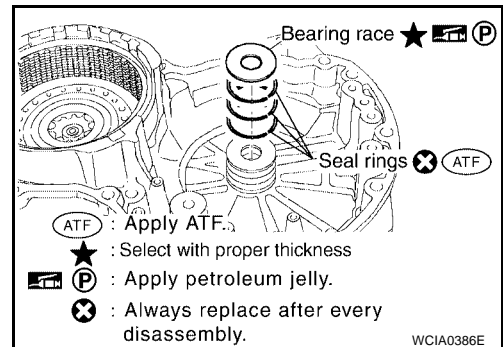


42. Set a dial indicator as shown, move the input shaft and measure the end play.

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-696, "FORWARD AND DIRECT CLUTCH ASSEMBLY"](#).

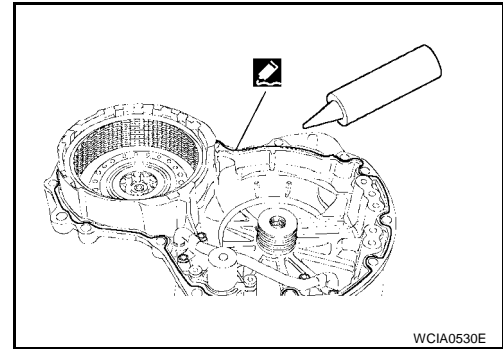


43. Remove transaxle case cover.

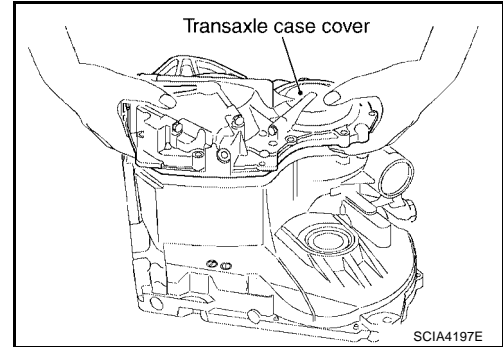
44. Apply Liquid Gasket (Three Bond 1281B) or equivalent to transaxle case cover as shown. Refer to [GI-45, "Recommended Chemical Products and Sealants"](#).

CAUTION:

Completely remove all moisture, oil and sealant from transaxle case cover and transaxle.



45. Install transaxle case cover in transaxle case.



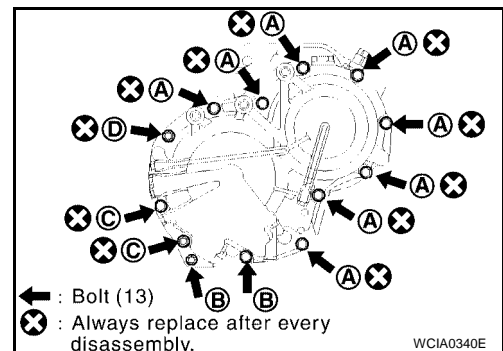
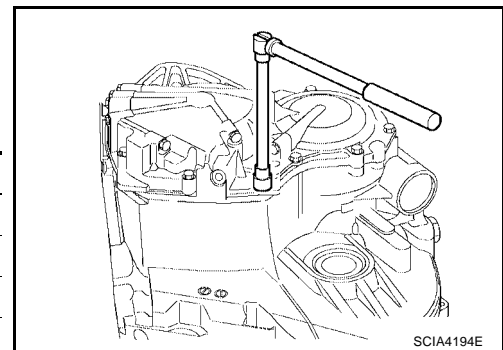
46. Tighten transaxle case cover bolts to specified torque. Refer to [AT-626, "Components"](#).

CAUTION:

Do not reuse seal bolts.

| Bolt symbol | Length mm (in) | Number of bolts |
|-------------|----------------|-----------------|
| A | 30 (1.18) | 8 |
| B | 45 (1.77) | 1 |
| C | 48 (1.89) | 2 |
| D* | — | 1 |

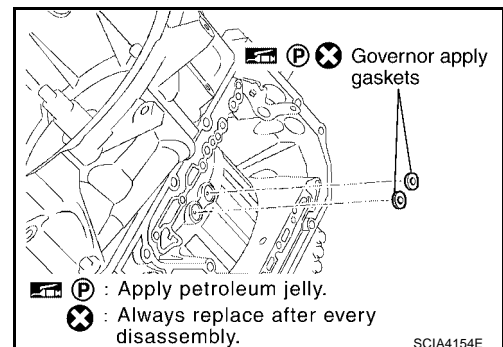
*:Stud bolt



47. Install new governor apply gasket.

NOTE:

- Do not reuse governor apply gaskets.
- Apply petroleum jelly to governor apply gaskets.



ASSEMBLY

[RE5F22A]

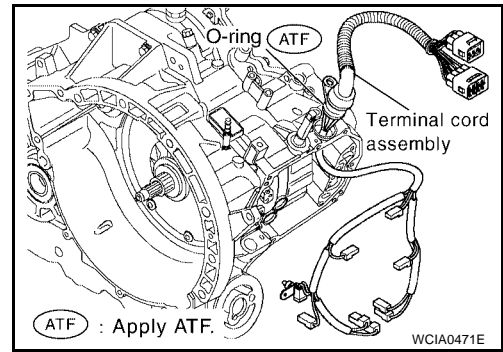
48. Install terminal cord assembly.

CAUTION:

- Be careful not to break the solenoid connector and A/T fluid temperature sensor.

NOTE:

Apply ATF to O-ring.

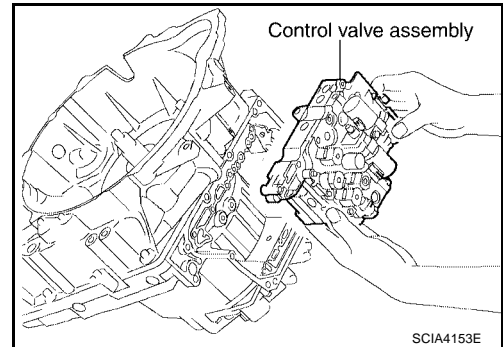


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49. While holding control valve assembly, connect the parking lock rod sub assembly to manual valve lever sub assembly.

NOTE:

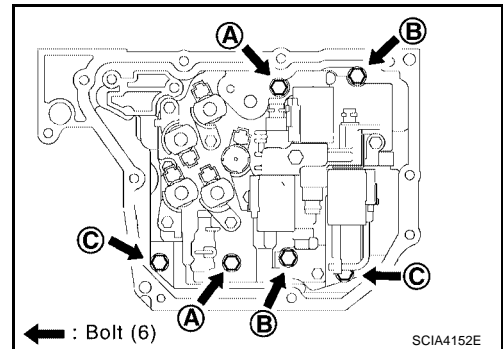
Shift position is "N".



D
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50. Tighten control valve assembly bolts to specified torque. Refer to [AT-626, "Components"](#).

| Bolt symbol | Length mm (in) | Number of bolts |
|-------------|----------------|-----------------|
| A | 55 (2.17) | 2 |
| B | 50 (1.97) | 2 |
| C | 16 (0.63) | 2 |

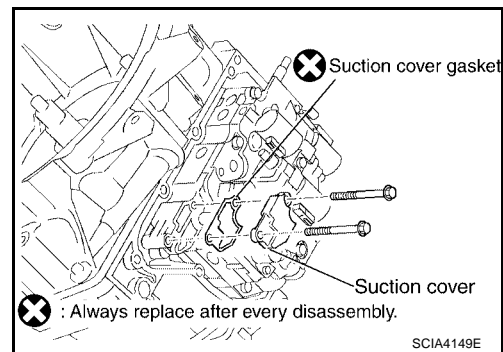


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51. Install suction cover and new suction cover gasket in control valve assembly.

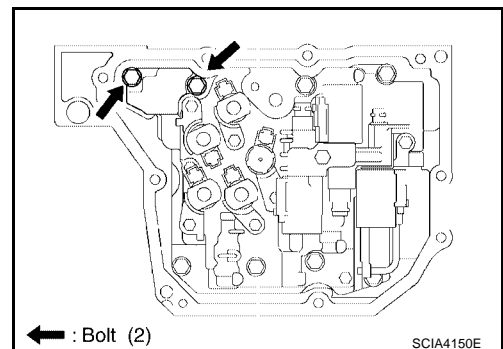
NOTE:

Do not reuse suction cover gasket.

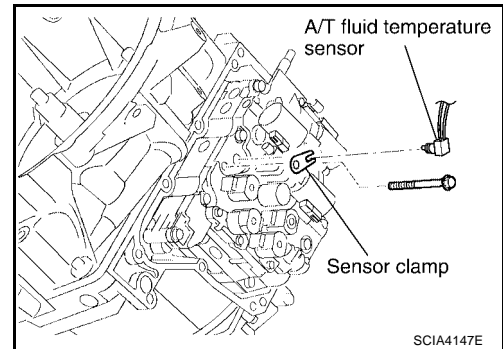


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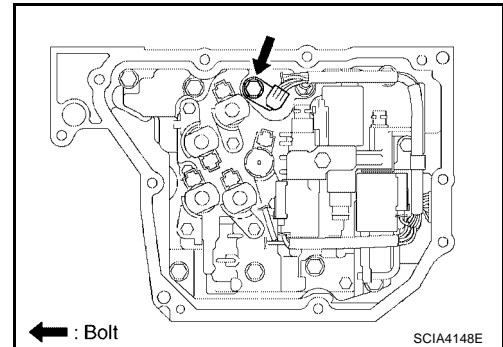
52. Tighten new suction cover gasket and suction cover bolts to specified torque. Refer to [AT-626, "Components"](#).



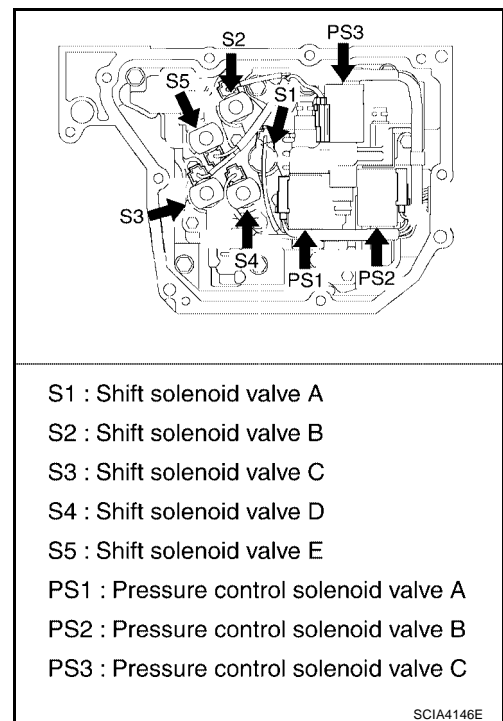
53. Install sensor clamp and A/T fluid temperature sensor in control valve assembly.



54. Tighten sensor clamp bolts to specified torque. Refer to [AT-626](#), "[Components](#)".



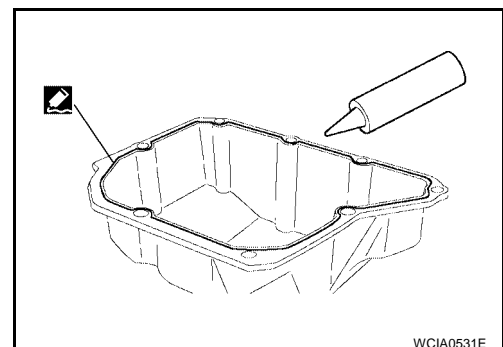
55. Connect the solenoid connectors.



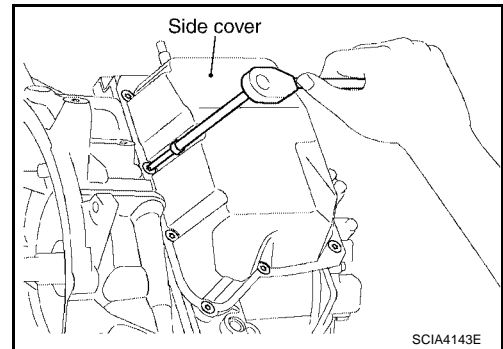
56. Apply Liquid Gasket (Three Bond 1281B) or equivalent to side cover as shown. Refer to [GI-45](#), "[Recommended Chemical Products and Sealants](#)".

CAUTION:

Completely remove all moisture, oil and sealant from side cover and transaxle case.



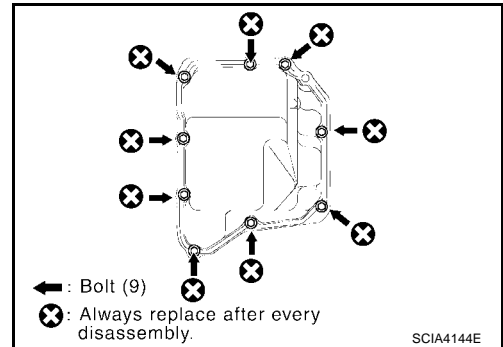
57. Install side cover in transaxle case.



58. Tighten side cover torx bolts to specified torque. Refer to [AT-626, "Components"](#).

NOTE:

Do not reuse seal bolt.



59. Install new O-rings in ATF cooler assembly.

NOTE:

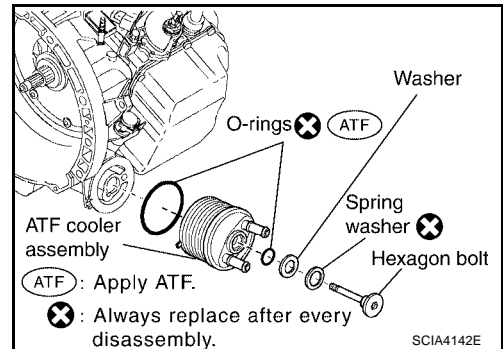
- Do not reuse O-rings.
- Apply ATF to O-rings.

60. Install ATF cooler assembly, washer and new spring washer.

CAUTION:

Do not reuse spring washer.

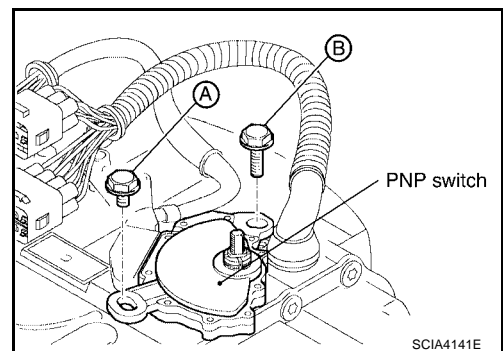
61. Tighten hexagon bolt specified torque. Refer to [AT-626, "Components"](#).



62. Install PNP switch to manual valve lever sub assembly.

63. Temporary tightening the bolts.

| Bolt symbol | Length mm (in) | Number of bolts |
|-------------|----------------|-----------------|
| A | 20 (0.79) | 1 |
| B | 33 (1.30) | 1 |

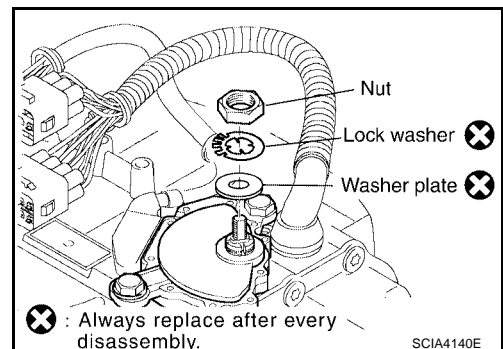


64. Install washer plate and lock washer.

NOTE:

Do not reuse washer plate and lock washer.

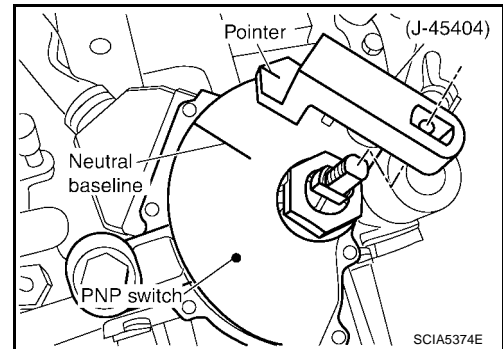
65. Tighten nut specified torque. Refer to [AT-626, "Components"](#).



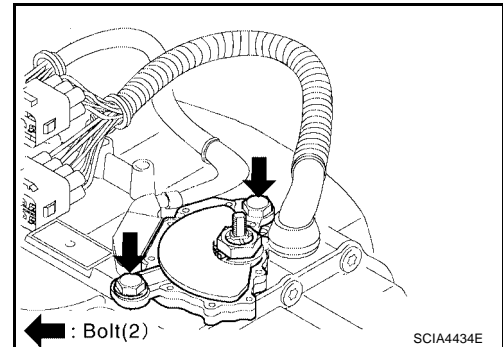
66. Install Tool.

Tool number : KV991J0060 (J-45404)

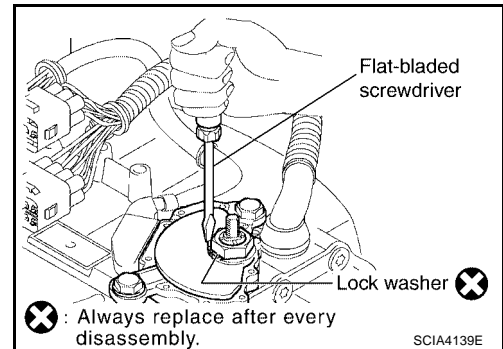
67. Adjust PNP switch so that Tool pointer aligns with neutral base line on PNP switch body.



68. Tighten PNP switch bolts to specified torque. Refer to [AT-626](#). "[Components](#)".

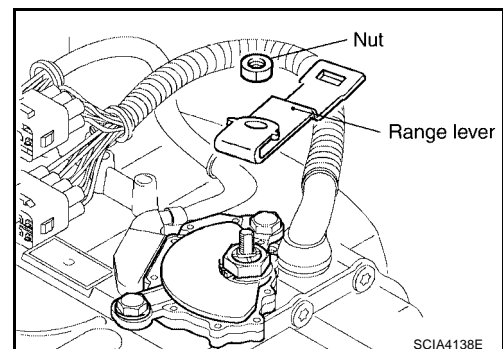


69. Bend the lock washer using a flat-bladed screwdriver.



70. Install range lever in manual valve lever sub assembly.

71. Tighten range lever nut to specified torque. Refer to [AT-626](#). "[Components](#)".

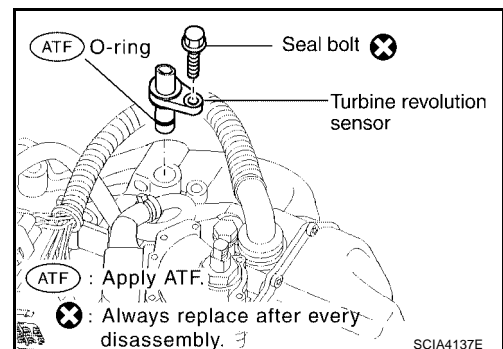


72. Install turbine revolution sensor in transaxle case.

73. Tighten turbine revolution sensor bolt to specified torque. Refer to [AT-626](#). "[Components](#)".

NOTE:

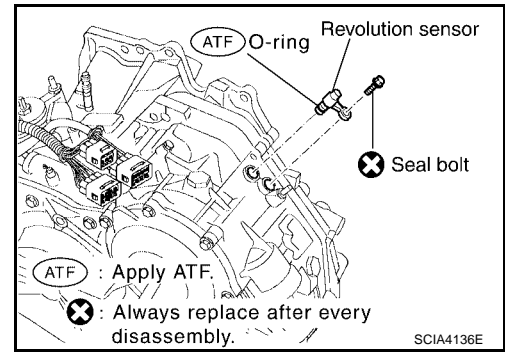
- Do not reuse seal bolt.
- Apply ATF to O-ring.



74. Install revolution sensor in transaxle case.
75. Tighten revolution sensor bolt to specified torque. Refer to [AT-626, "Components"](#).

NOTE:

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



76. Install new O-ring in A/T fluid charging pipe.

NOTE:

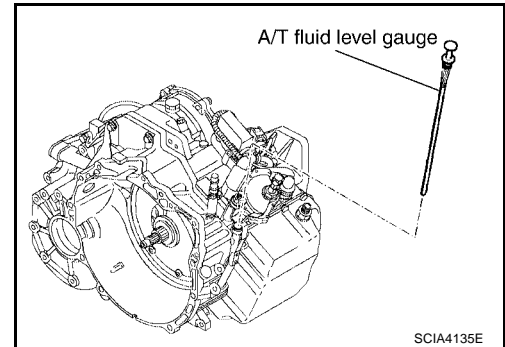
- Do not reuse O-ring.
- Apply petroleum jelly to O-ring.

77. Install A/T fluid charging pipe in transaxle housing.
78. Install A/T fluid cooler tube.

NOTE:

Do not reuse copper washer.

79. Tighten A/T fluid cooler tube union to specified torque. Refer to [AT-626, "Components"](#).
80. Install air breather hose.
81. Install A/T fluid level gauge.

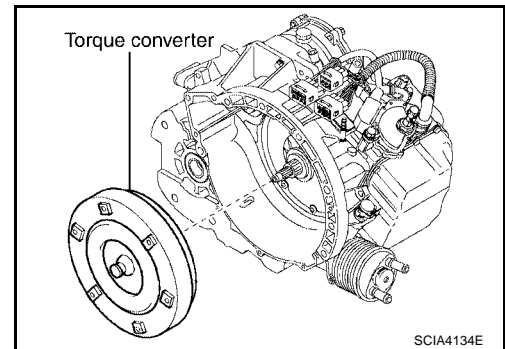


82. Install drain plug in transaxle housing.
83. Tighten drain plug to specified torque. Refer to [AT-626, "Components"](#).

NOTE:

Do not reuse drain plug gasket.

84. Install torque converter.

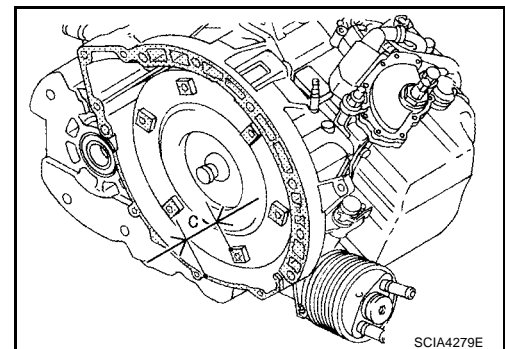


85. Check the dimension of "C".

Dimension "C" : 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

ECS009JV

| | | | |
|---------------------------------------|-------------|-----------------------------|-------|
| Engine | | VQ35DE | |
| Automatic transaxle model | | RE5F22A | |
| Automatic transaxle model code number | | 9J500 | 8Y100 |
| Stall torque ratio | | 1.8: 1 | |
| Transaxle gear ratio | 1st | 4.657 | |
| | 2nd | 3.033 | |
| | 3rd | 1.982 | |
| | 4th | 1.342 | |
| | 5th | 1.018 | |
| | Reverse | 5.114 | |
| | Final drive | 2.269 | 2.440 |
| Recommended fluid | | Genuine Nissan Matic K ATF* | |
| Fluid capacity ℓ (US qt, Imp qt) | | 7.3 (7-3/4, 6-3/8) | |

CAUTION:

- Use only Genuine Nissan Matic K ATF. Do not mix with other fluid.
- Using automatic transaxle fluid other than Genuine Nissan Matic K ATF will deteriorate driveability and automatic transaxle durability, and may damage the automatic transaxle, which is not covered by the warranty.

*: Refer to [MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS"](#).

Shift Schedule

ECS009JV

VEHICLE SPEED WHEN SHIFTING GEARS - 9J500 MODELS

| 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 % | 63 (39) | 100 (62) | 156 (97) | 230 (143) | 219 (136) | 150 (93) | 88 (55) | 43 (27) |
| 90 % | 63 (39) | 100 (62) | 156 (97) | 230 (143) | 219 (136) | 150 (93) | 88 (55) | 43 (27) |
| 80 % | 63 (39) | 100 (62) | 156 (97) | 230 (143) | 219 (136) | 150 (93) | 88 (55) | 43 (27) |
| 70 % | 63 (39) | 100 (62) | 156 (97) | 230 (143) | 208 (129) | 149 (93) | 86 (53) | 43 (27) |
| 60 % | 63 (39) | 100 (62) | 156 (97) | 230 (143) | 201 (125) | 143 (89) | 80 (50) | 43 (27) |
| 50 % | 63 (39) | 95 (59) | 145 (90) | 214 (133) | 187 (116) | 130 (81) | 73 (45) | 43 (27) |
| 40 % | 53 (33) | 87 (54) | 124 (77) | 182 (113) | 156 (97) | 97 (60) | 57 (35) | 34 (21) |
| 30 % | 39 (24) | 68 (42) | 95 (59) | 134 (83) | 112 (70) | 62 (39) | 37 (23) | 20 (12) |
| 20 % | 29 (18) | 49 (30) | 65 (40) | 92 (57) | 63 (39) | 42 (26) | 23 (14) | 8 (5) |
| 10 % | 20 (12) | 31 (19) | 41 (25) | 58 (36) | 47 (29) | 34 (21) | 23 (14) | 8 (5) |

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE5F22A]

VEHICLE SPEED WHEN SHIFTING GEARS - 8Y100 MODELS

| 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 % | 58 (36) | 93 (58) | 144 (89) | 213 (132) | 203 (126) | 139 (86) | 81 (50) | 40 (25) |
| 90 % | 58 (36) | 93 (58) | 144 (89) | 213 (132) | 203 (126) | 139 (86) | 81 (50) | 40 (25) |
| 80 % | 58 (36) | 93 (58) | 144 (89) | 213 (132) | 203 (126) | 139 (86) | 81 (50) | 40 (25) |
| 70 % | 58 (36) | 93 (58) | 144 (89) | 213 (132) | 193 (120) | 138 (86) | 80 (50) | 40 (25) |
| 60 % | 58 (36) | 93 (58) | 144 (89) | 213 (132) | 186 (116) | 133 (83) | 75 (47) | 40 (25) |
| 50 % | 58 (36) | 88 (55) | 135 (84) | 199 (124) | 173 (108) | 121 (75) | 68 (42) | 40 (25) |
| 40 % | 49 (30) | 80 (50) | 115 (71) | 169 (105) | 145 (90) | 90 (56) | 53 (33) | 31 (19) |
| 30 % | 36 (22) | 61 (38) | 85 (53) | 124 (77) | 103 (64) | 58 (36) | 34 (21) | 19 (12) |
| 20 % | 27 (17) | 43 (27) | 58 (36) | 86 (53) | 59 (37) | 39 (24) | 22 (14) | 8 (5) |
| 10 % | 19 (12) | 27 (17) | 35 (22) | 53 (33) | 44 (27) | 32 (20) | 22 (14) | 8 (5) |

VEHICLE SPEED WHEN PERFORMING AND RELEASING COMPLETE LOCK-UP- 9J500 MODELS

| Accelerator angle | Vehicle speed km/h (MPH) (Approx.) | |
|-------------------|------------------------------------|---------------|
| | Lock-up "ON" | Lock-up "OFF" |
| 50 % | 230 (143) | 207 (129) |
| 15% | 115 (71) | 74 (46) |
| 0 - 8 % | 70 (43) | 67 (42) |

- 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 COMPLETE LOCK-UP 8Y100 MODELS

| Accelerator angle | Vehicle speed km/h (MPH) (Approx.) | |
|-------------------|------------------------------------|---------------|
| | Lock-up "ON" | Lock-up "OFF" |
| 50 % | 213 (132) | 192 (119) |
| 15% | 106 (66) | 69 (43) |
| 0 - 8 % | 65 (40) | 62 (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.

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE5F22A]

VEHICLE SPEED WHEN PERFORMING AND RELEASING SLIP LOCK-UP - 9J500 MODEL

| Accelerator angle | Gear position | Vehicle speed km/h (MPH) (Approx.) | |
|-------------------|---------------|------------------------------------|--------------------|
| | | Slip lock-up "ON" | Slip lock-up "OFF" |
| 0 - 10 % | 4th | 43 (27) | 40 (25) |
| | 5th | 56 (35) | 53 (33) |

- 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.

VEHICLE SPEED WHEN PERFORMING AND RELEASING SLIP LOCK-UP - 8Y100 MODELS

| Accelerator angle | Gear position | Vehicle speed km/h (MPH) (Approx.) | |
|-------------------|---------------|------------------------------------|--------------------|
| | | Slip lock-up "ON" | Slip lock-up "OFF" |
| 0 - 10 % | 4th | 40 (25) | 37 (23) |
| | 5th | 52 (32) | 49 (30) |

- 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

ECS009JX

| | |
|-------------|-------------------|
| Stall speed | 2,430 - 2,730 rpm |
|-------------|-------------------|

Line Pressure

ECS009JY

| 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

ECS009JZ

| Selector lever | Time |
|-----------------|--------------------|
| N to D position | Less than 0.7 sec. |
| N to R position | Less than 1.2 sec. |

Shift Solenoid Valves

ECS009K0

| 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) | |
| | 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) | |
| M5 | 5th | OFF (Open) | ON (Open) | OFF (Closed) | ON (Closed) | OFF (Closed) | Locks in 5th gear* |

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE5F22A]

| Shift position | | Shift solenoid valve | | | | | Remarks |
|----------------|-----|----------------------|--------------|--------------|-------------|--------------|--------------------|
| | | A | B | C | D | E | |
| 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-418, "MANUAL MODE"](#).

Solenoid Valves

ECS009K1

| Solenoid valves | Resistance (Approx.) | Connector (Color) | Terminal |
|-----------------------------------|----------------------|-------------------|------------|
| Shift solenoid valve A | 11 - 16 Ω | (B) | 1 - Ground |
| Shift solenoid valve B | | (GY) | 1 - Ground |
| Shift solenoid valve C | | (GY) | 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

2ND BRAKE

ECS009K2

| | | |
|--------------------------------|-------------------------------|--------------|
| 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) |

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE5F22A]

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) | 31667-8Y016 |
| | 5.1 (0.202) | 31667-8Y017 |
| | 5.2 (0.205) | 31667-8Y018 |
| | 5.3 (0.209) | 31667-8Y019 |
| | 5.5 (0.217) | 31667-8Y020 |

*: 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* ² |
| | 0.81 (0.0319) | 31435 8Y060 |
| | 0.90 (0.0350) | 31435 8Y061 |
| | 1.00 (0.0400) | 31435 8Y062 |
| | 1.10 (0.0430) | 31435 8Y063 |
| | 1.20 (0.0470) | 31435 8Y064 |
| | 1.30 (0.0510) | 31435 8Y065 |
| | 1.40 (0.0550) | 31435 8Y066 |
| End play mm (in) | 0.188 - 0.570 mm (0.0074 - 0.0224) | |

*² : 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.

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE5F22A]

U/D RR PLANETARY RING GEAR SUB ASSEMBLY

| | Thickness mm (in) | Part number* ² |
|---------------------------|-------------------|---------------------------|
| Thickness of adjust shims | 0.81 (0.0319) | 31435 8Y0100 |
| | 0.90 (0.0350) | 31435 8Y0101 |
| | 1.00 (0.0400) | 31435 8Y0102 |
| | 1.10 (0.0430) | 31435 8Y0103 |
| | 1.20 (0.0470) | 31435 8Y0104 |
| | 1.30 (0.0510) | 31435 8Y0105 |
| | 1.40 (0.0550) | 31435 8Y0106 |
| | 1.50 (0.0590) | 31435 8Y0107 |
| | 1.60 (0.0630) | 31435 8Y0108 |

*² : Always check with the Parts Department for the latest parts information.

U/D GEAR ASSEMBLY

| | Thickness mm (in) | Part number* ² |
|-----------------------------|-------------------|---------------------------|
| Thickness of thrust washers | 0.80 (0.0310) | 31435 8Y021 |
| | 0.90 (0.0350) | 31435 8Y068 |
| | 1.00 (0.0400) | 31435 8Y069 |
| | 1.10 (0.0430) | 31435 8Y070 |
| | 1.20 (0.0470) | 31435 8Y071 |
| | 1.30 (0.0510) | 31435 8Y072 |
| | 1.40 (0.0550) | 31435 8Y073 |
| | 1.50 (0.0590) | 31435 8Y074 |

*² : Always check with the Parts Department for the latest parts information.

PLANETARY SUN GEAR SUB ASSEMBLY

| | Standard | 22.200 - 22.226 (0.8740 - 0.8750) |
|--|-----------------|-----------------------------------|
| Inner diameter of planetary sun gear sub assembly bushing mm (in). | Allowable limit | 22.276 (0.8770) |

PLANETARY GEAR ASSEMBLY

| | Standard | 30.056 - 30.082 (1.1833 - 1.1843) |
|--|-----------------|-----------------------------------|
| Inner diameter of planetary gear assembly bushing mm (in). | Allowable limit | 30.132 (1.1863) |

Final Drive DIFFERENTIAL SIDE BEARING ADJUSTING SHIMS

ECS009K3

| 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) |
|--|---|

SERVICE DATA AND SPECIFICATIONS (SDS)

[RE5F22A]

A/T Fluid Temperature Sensor

ECS009K4

| 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

ECS009K5

| 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

ECS009K6

| 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.