SECTION AT
AUTOMATIC TRANSMISSION

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NOTE:
If DTC “U1000” is displayed with other DTC, first perform the trouble diagnosis for “DTC U1000 CAN COMM CIRCUIT”. Refer to AT-102.

Items (CONSULT-III screen terms)	DTC*1		Reference
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1ST E/BRAKING	—	P1731	AT-149
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*1: These numbers are prescribed by SAE J2012.

*2: Refer to EC-121, "Diagnosis Description" (for VQ35HR engine), EC-734, "Introduction" (for VK45DE engine).

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NOTE:
If DTC “U1000” is displayed with other DTC, first perform the trouble diagnosis for “DTC U1000 CAN COMM CIRCUIT”. Refer to AT-102.

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MIL*2, “ENGINE” with CONSULT-III or GST	CONSULT-III only “TRANSMISSION”		
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P0735	P0735	5GR INCORRECT RATIO	AT-130
P0740	P0740	TORQUE CONVERTER	AT-132
P0744	P0744	TORQUE CONVERTER	AT-134
P0745	P0745	PC SOLENOID A	AT-136
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—	P1721	VEHICLE SPEED SIGNAL	AT-145
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*1: These numbers are prescribed by SAE J2012.

*2: Refer to EC-121, "Diagnosis Description" (for VQ35HR engine), EC-734, "Introduction" (for VK45DE engine).

PRECAUTIONS

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

INFOID:0000000005352393

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 “SUPPLEMENTAL RESTRAINT SYSTEM” and “SEAT BELTS” 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 “SUPPLEMENTAL RESTRAINT SYSTEM”.**
- **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 WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

Precaution for On Board Diagnosis (OBD) System of A/T and Engine

INFOID:0000000005352394

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

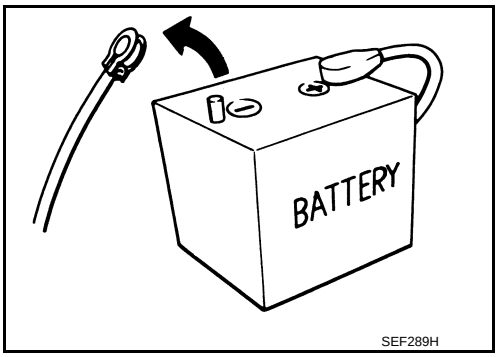
CAUTION:

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

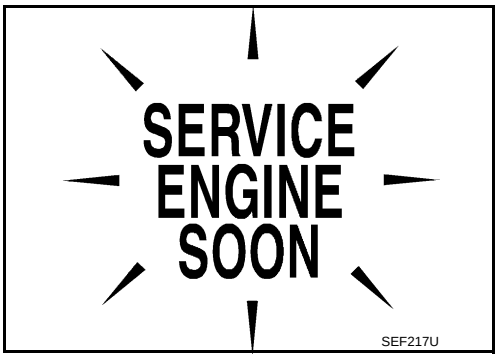
Precaution

INFOID:0000000005352395

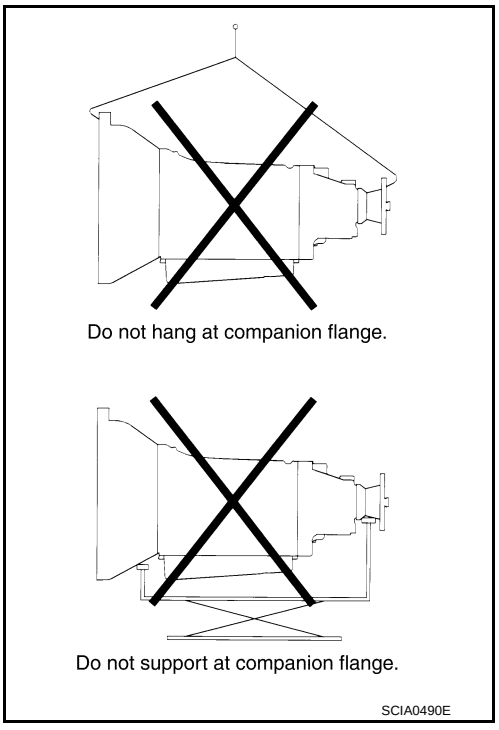
- **Before connecting or disconnecting the A/T assembly harness connector, turn ignition switch OFF and disconnect the battery cable from the negative terminal. Because battery voltage is applied to TCM even if ignition switch is turned OFF.**



- **After performing each TROUBLE DIAGNOSIS, perform "DTC (Diagnostic Trouble Code) Confirmation Procedure".**
  If the repair is completed the DTC should not be displayed in the "DTC Confirmation Procedure".



- When removing the transmission from a vehicle, do not use the companion flange section at the rear end of the transmission as a support point. (VK45DE models only)
- Always use the specified brand of ATF. Refer to MA-9, "Fluids and Lubricants".
- Use lint-free paper not cloth rags during work.
- After replacing the ATF, dispose of the waste oil using the methods prescribed by law, ordinance, etc.
- Before proceeding with disassembly, thoroughly clean the outside of the transmission. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Disassembly should be done in a clean work area.
- Use lint-free paper or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transmission.
- 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 transmission is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.



- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Do not use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- Clean or replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer. Refer to AT-12, "Service Notice or Precaution".
- After overhaul, refill the transmission with new ATF.

- When the A/T drain plug is removed, only some of the ATF is drained. Old ATF will remain in torque converter and ATF cooling system.
  Always follow the procedures under “Changing A/T Fluid” in the AT section when changing A/T fluid. Refer to AT-15, "VQ35HR : Changing A/T Fluid", AT-16, "VQ35HR : Adjusting A/T Fluid" (for VQ35HR engine) or AT-19, "VK45DE : Changing A/T Fluid", AT-20, "VK45DE : Checking A/T Fluid" (for VK45DE engine).

Service Notice or Precaution

INFOID:0000000005352396

ATF COOLER SERVICE

If ATF contains frictional material (clutches, bands, etc.), or if an A/T is repaired, overhauled, or replaced, inspect and clean the A/T fluid cooler mounted in the radiator or replace the radiator. Flush cooler lines using cleaning solvent and compressed air after repair. For A/T fluid cooler cleaning procedure, refer to AT-17, "VQ35HR : A/T Fluid Cooler Cleaning" (for VQ35HR engine) or AT-21, "VK45DE : A/T Fluid Cooler Cleaning" (for VK45DE engine). For radiator replacement, refer to CO-13 (for VQ35HR engine), CO-39 (for VK45DE engine).

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-92, "CONSULT-III Function (TRANSMISSION)" 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-47, "OBD-II Diagnostic Trouble Code (DTC)" to complete the repair and avoid unnecessary blinking of the MIL.

For details of OBD-II, refer to EC-121 (for VQ35HR engine), EC-734 (for VK45DE engine).

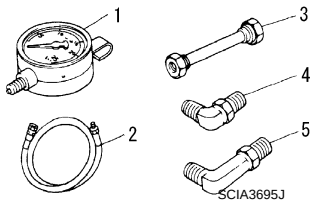
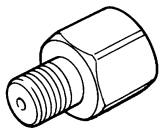
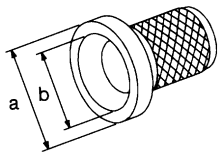
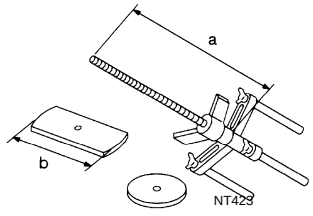
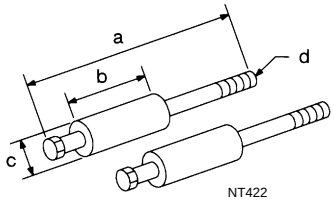
- **Certain systems and components, especially those related to OBD, may use the new style slide-locking type harness connector. For description and how to disconnect, refer to PG-74.**

PREPARATION

Special Service Tool

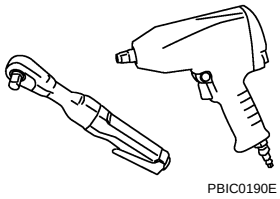
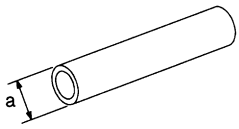
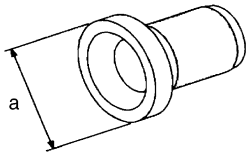
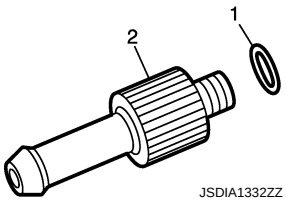
INFOID:0000000005352397

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

Tool number (Kent-Moore No.) Tool name	Description
ST2505S001 (J-34301-C) Oil pressure gauge set 1. ST25051001 (—) Oil pressure gauge 2. ST25052000 (—) Hose 3. ST25053000 (—) Joint pipe 4. ST25054000 (—) Adapter 5. ST25055000 (—) Adapter 	Measuring line pressure
KV31103600 (J-45674) Joint pipe adapter (With ST25054000) 	Measuring line pressure
ST33400001 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia. 	Installing oil pump housing oil seal
KV31102400 (J-34285 and J-34285-87) Clutch spring compressor a: 320 mm (12.60 in) b: 174 mm (6.85 in) 	Installing reverse brake return spring retainer
ST25850000 (J-25721-A) Sliding hammer a: 179 mm (7.05 in) b: 70 mm (2.76 in) c: 40 mm (1.57 in) d: M12X1.75P 	Remove oil pump assembly

Commercial Service Tool

INFOID:0000000005352398

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts
Drift a: 22 mm (0.87 in) dia.  NT083	Installing manual shaft oil seals
Drift a: 64 mm (2.52 in) dia.  SCIA5338E	Installing rear oil seal (AWD models)
1. 315268E000* O-ring 2. 310811EA5A* Charging pipe  JSDIA1332ZZ	A/T fluid changing and adjustment

*: Always check with the Parts Department for the latest parts information.

A/T FLUID

VQ35HR

VQ35HR : Changing A/T Fluid

INFOID:0000000005352399

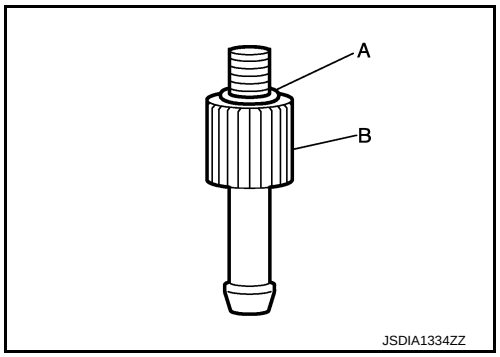
ATF	: Refer to AT-332, "General Specification".
Fluid capacity	: Refer to AT-332, "General Specification".

CAUTION:

- **If Genuine NISSAN Matic S ATF is not available, Genuine NISSAN Matic J ATF may also be used.**
- **Using ATF other than Genuine NISSAN Matic S ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**
- **When filling ATF, be careful not to scatter heat generating parts such as exhaust.**

1. Step 1

a. Install the O-ring (315268E000) (A) to the charging pipe (310811EA5A) (B).



2. Step 2

a. Use CONSULT-III to check that the ATF temperature is 40°C (104°F) or less.

b. Lift up the vehicle.

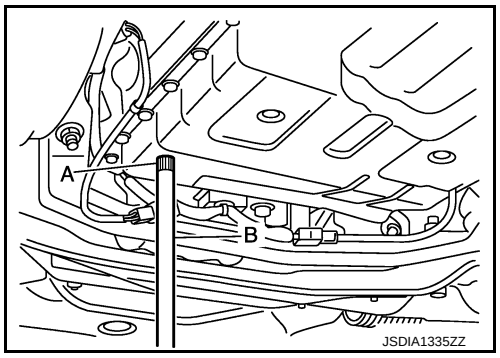
c. Remove the drain plug from the oil pan, and then drain the ATF.

d. When the ATF starts to drip, temporarily tighten the drain plug to the oil pan.
NOTE:
Never replace drain plug and drain plug gasket with new ones yet.

e. Remove overflow plug from oil pan.

f. Install the charging pipe (A) to the overflow plug hole.
CAUTION:
Tighten the charging pipe by hand.

g. Install the bucket pump hose (B) to the charging pipe.
CAUTION:
Insert the bucket pump hose all the way to the end of the charging pipe.



h. Fill approximately 3 liters (3-1/8 US qt, 2-5/8 lmp qt) of the ATF.

i. Remove the bucket pump hose to remove the charging pipe, and then temporarily tighten the overflow plug to the oil pan.
CAUTION:
Quickly perform the procedure to avoid ATF leakage from the oil pan.

j. Lift down the vehicle.

k. Start the engine and wait for approximately 3 minutes.

l. Stop the engine.

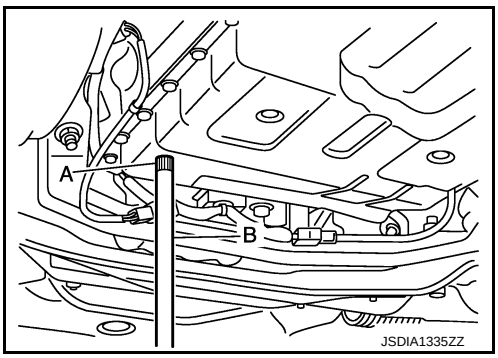
3. Step 3

a. Repeat “Step 2”.

4. Final Step

a. Use CONSULT-III to check that the ATF temperature is 40°C (104°F) or less.

b. Lift up the vehicle.
c. Remove the drain plug from the oil pan, and then drain the ATF.
d. When the ATF starts to drop, tighten the drain plug to the oil pan to the specified torque. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
CAUTION:
Never reuse drain plug and drain plug gasket.
e. Remove overflow plug from oil pan.
f. Install the charging pipe (A) to the overflow plug hole.
CAUTION:
Tighten the charging pipe by hand.
g. Install the bucket pump hose (B) to the charging pipe.
CAUTION:
Insert the bucket pump hose all the way to the end of the charging pipe.
h. Fill approximately 3 liters (3-1/8 US qt, 2-5/8 lmp qt) of the ATF.
i. Remove the bucket pump hose to remove the charging pipe, and then temporarily tighten the overflow plug to the oil pan.
CAUTION:
Quickly perform the procedure to avoid ATF leakage from the oil pan.



j. Lift down the vehicle.
k. Start the engine.
l. Make the ATF temperature approximately 40°C (104°F).
NOTE:
The ATF level is greatly affected by the temperature. Always check the ATF temperature on “ATF TEMP 1” of “Data Monitor” using CONSULT-III.
m. Park vehicle on level surface and set parking brake.
n. Shift the selector lever through each gear position. Leave selector lever in “P” position.
o. Lift up the vehicle when the ATF temperature reaches 40°C (104°F), and then remove the overflow plug from the oil pan.
p. When the ATF starts to drop, tighten the overflow plug to the oil pan to the specified torque. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
CAUTION:
Never reuse overflow plug.

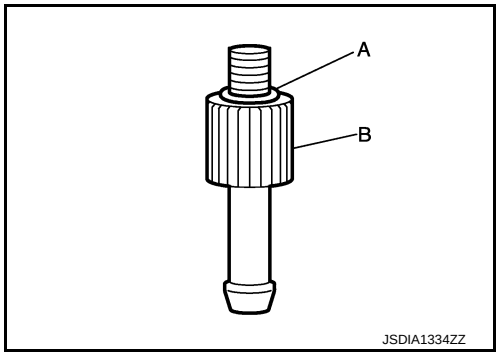
VQ35HR : Adjusting A/T Fluid

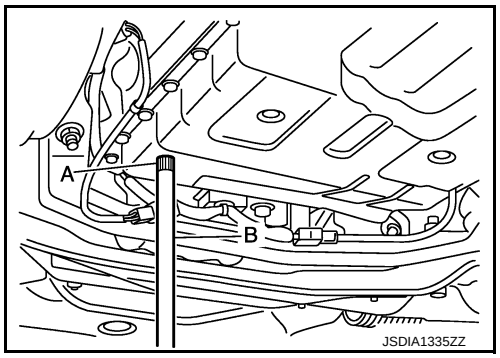
INFOID:0000000005352400

ATF	: Refer to AT-332, "General Specification".
Fluid capacity	: Refer to AT-332, "General Specification".

CAUTION:
- **If Genuine NISSAN Matic S ATF is not available, Genuine NISSAN Matic J ATF may also be used.**
- **Using ATF other than Genuine NISSAN Matic S ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**
- **When filling ATF, be careful not to scatter heat generating parts such as exhaust.**
- **Always maintain the ATF temperature within between 35°C (95°F) and 45°C (113°F) while checking with CONSULT-III when the ATF level adjustment is performed.**

1. Install the O-ring (315268E000) (A) to the charging pipe (310811EA5A) (B).
2. Start the engine.
3. Make the ATF temperature approximately 40°C (104°F).
   NOTE:
   The ATF level is greatly affected by the temperature. Always check the ATF temperature on “ATF TEMP 1” of “Data Monitor” using CONSULT-III.
4. Park vehicle on level surface and set parking brake.
5. Shift the selector lever through each gear position. Leave selector lever in “P” position.
6. Lift up the vehicle.
7. Check the ATF leakage from transmission.
8. Remove overflow plug from oil pan.
9. Install the charging pipe (A) to the overflow plug hole.
   CAUTION:
   Tighten the charging pipe by hand.
10. Install the bucket pump hose (B) to the charging pipe.
    CAUTION:
    Insert the bucket pump hose all the way to the end of the charging pipe.
11. Fill approximately 0.5 liters (1/2 US qt, 1/2 lmp qt) of the ATF.
12. Check that the ATF leaks when removing the charging pipe and the bucket pump hose. If the ATF does not leak, refill the ATF.
13. When the ATF starts to drop, tighten the overflow plug to the oil pan to the specified torque. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
    CAUTION:
    Never reuse overflow plug.





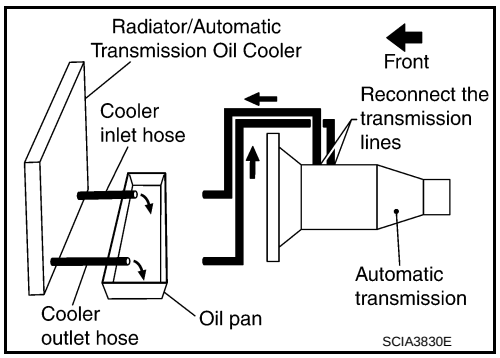
VQ35HR : A/T Fluid Cooler Cleaning

INFOID:0000000005352401

Whenever an A/T is replaced, the A/T fluid cooler mounted in the radiator must be inspected and cleaned.
Metal debris and friction material, if present, can become trapped in the A/T fluid cooler. This debris can contaminate the newly serviced A/T or, in severe cases, can block or restrict the flow of ATF. In either case, malfunction of the newly serviced A/T may result.
Debris, if present, may build up as ATF enters the cooler inlet. It will be necessary to back flush the cooler through the cooler outlet in order to flush out any built up debris.

A/T FLUID COOLER CLEANING PROCEDURE

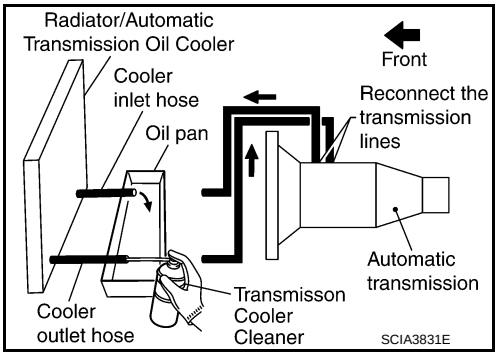
1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Identify the inlet and outlet fluid cooler hoses.
3. Disconnect the A/T fluid cooler inlet and outlet rubber hoses from the steel cooler tubes or bypass valve.
   NOTE:
   Replace the cooler hoses if rubber material from the hose remains on the tube fitting.
4. Allow any ATF that remains in the cooler hoses to drain into the oil pan.



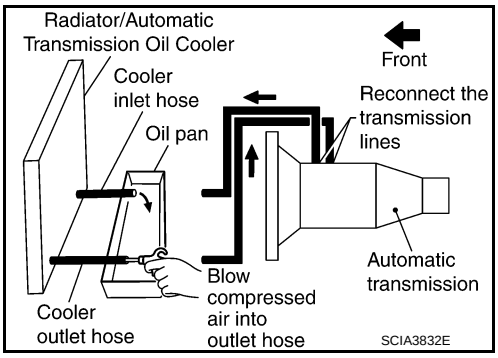
5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

CAUTION:
- **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
- **Spray Transmission Cooler Cleaner only with adequate ventilation.**
- **Avoid contact with eyes and skin.**
- **Never breathe vapors or spray mist.**

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



7. Insert the tip of an air gun into the end of the cooler outlet hose.
8. Wrap a shop rag around the air gun tip and of the cooler outlet hose.
9. Blow compressed air regulated to 5 to 9 kg/cm^2 (71 to 128 psi) through the cooler outlet hose for 10 seconds to force out any remaining ATF.
10. Repeat steps 5 through 9 three additional times.
11. Position an oil pan under the banjo bolts that connect the A/T fluid cooler steel lines to the A/T.
12. Remove the banjo bolts.
13. Flush each steel line from the cooler side back toward the A/T by spraying Transmission Cooler Cleaner in a continuous stream for 5 seconds.



14. Blow compressed air regulated to 5 to 9 kg/cm^2 (71 to 128 psi) through each steel line from the cooler side back toward the A/T for 10 seconds to force out any remaining ATF.
15. Ensure all debris is removed from the steel cooler lines.
16. Ensure all debris is removed from the banjo bolts and fittings.
17. Perform "A/T FLUID COOLER DIAGNOSIS PROCEDURE".

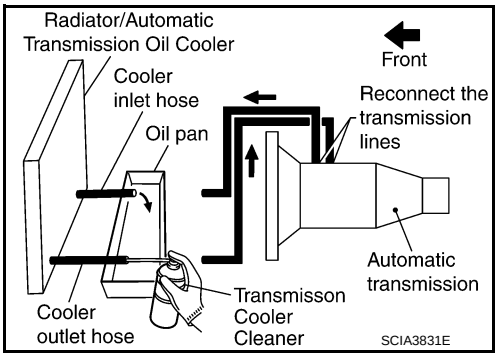
A/T FLUID COOLER DIAGNOSIS PROCEDURE

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

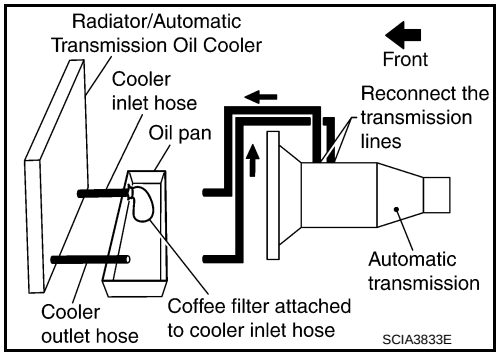
1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Clean the exterior and tip of the cooler inlet hose.
3. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

CAUTION:
- **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
- **Spray Transmission Cooler Cleaner only with adequate ventilation.**
- **Avoid contact with eyes and skin.**
- **Never breathe vapors or spray mist.**

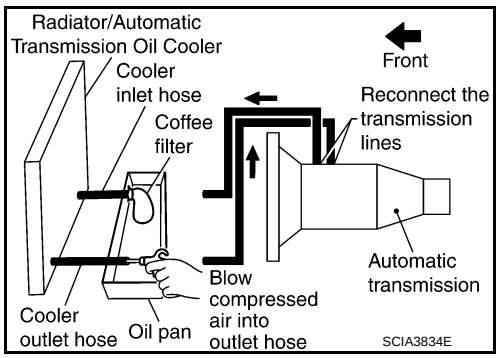
4. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.



5. Tie a common white, basket-type coffee filter to the end of the cooler inlet hose.



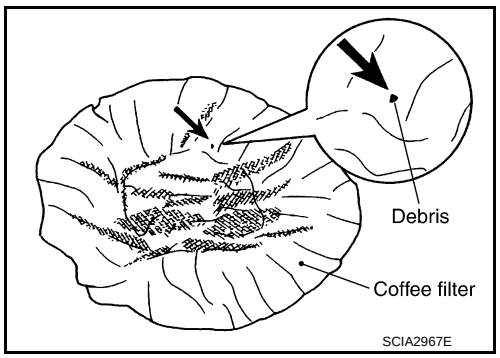
6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 to 9 kg/cm^2 (71 to 128 psi) through the cooler outlet hose to force any remaining ATF into the coffee filter.
9. Remove the coffee filter from the end of the cooler inlet hose.
10. Perform "A/T FLUID COOLER INSPECTION PROCEDURE".



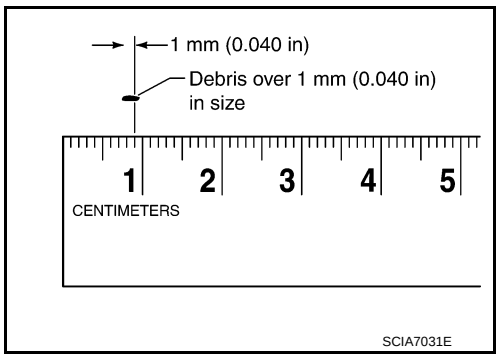
A/T FLUID COOLER INSPECTION PROCEDURE

1. Inspect the coffee filter for debris.

a. If small metal debris less than 1 mm (0.040 in) in size or metal powder is found in the coffee filter, this is normal. If normal debris is found, the A/T fluid cooler/radiator can be re-used and the procedure is ended.



b. If one or more pieces of debris are found that are over 1 mm (0.040 in) in size and/or peeled clutch facing material is found in the coffee filter, the A/T fluid cooler is not serviceable. The A/T fluid cooler/radiator must be replaced and the inspection procedure is ended. Refer to CO-13, "Component".



A/T FLUID COOLER FINAL INSPECTION

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

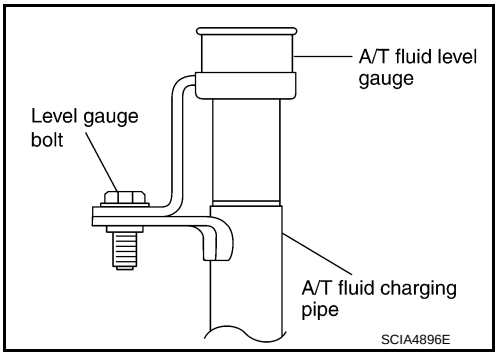
VK45DE

VK45DE : Changing A/T Fluid

INFOID:0000000005352402

1. Warm up ATF.
2. Stop engine.

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



ATF: **Genuine NISSAN Matic S ATF**

Fluid capacity: **10.3 ℓ (10-7/8 US qt, 9-1/8 Imp qt)**

CAUTION:
- **If Genuine NISSAN Matic S ATF is not available, Genuine NISSAN Matic J ATF may also be used.**
- **Using ATF other than Genuine NISSAN Matic S ATF or Matic J ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**
- **When filling ATF, take care not to scatter heat generating parts such as exhaust.**
- **Never reuse drain plug gasket.**

Drain plug

: 34 N·m (3.5 kg-m, 25 ft-lb)

5. Run engine at idle speed for 5 minutes.
6. Check A/T fluid level and condition. Refer to AT-20, "VK45DE : Checking A/T Fluid". If ATF is still dirty, repeat step 2. through 5.
7. Install the removed A/T fluid level gauge into A/T fluid charging pipe.
8. Tighten the level gauge bolt.

Level gauge bolt

: 5.1 N·m (0.52 kg-m, 45 in-lb)

VK45DE : Checking A/T Fluid

INFOID:0000000005352403

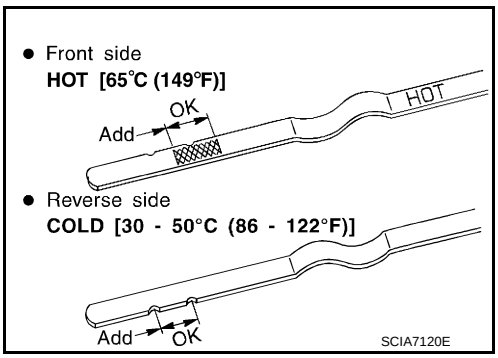
1. Warm up engine.
2. Check for A/T fluid leakage.
3. Loosen the level gauge bolt.
4. Before driving, A/T fluid level can be checked at A/T fluid temperatures of 30 to 50°C (86 to 122°F) using “COLD” range on A/T fluid level gauge as follows.

a. Park vehicle on level surface and set parking brake.

b. Start engine and move selector lever through each gear position. Leave selector lever in “P” position.

c. Check A/T fluid level with engine idling.

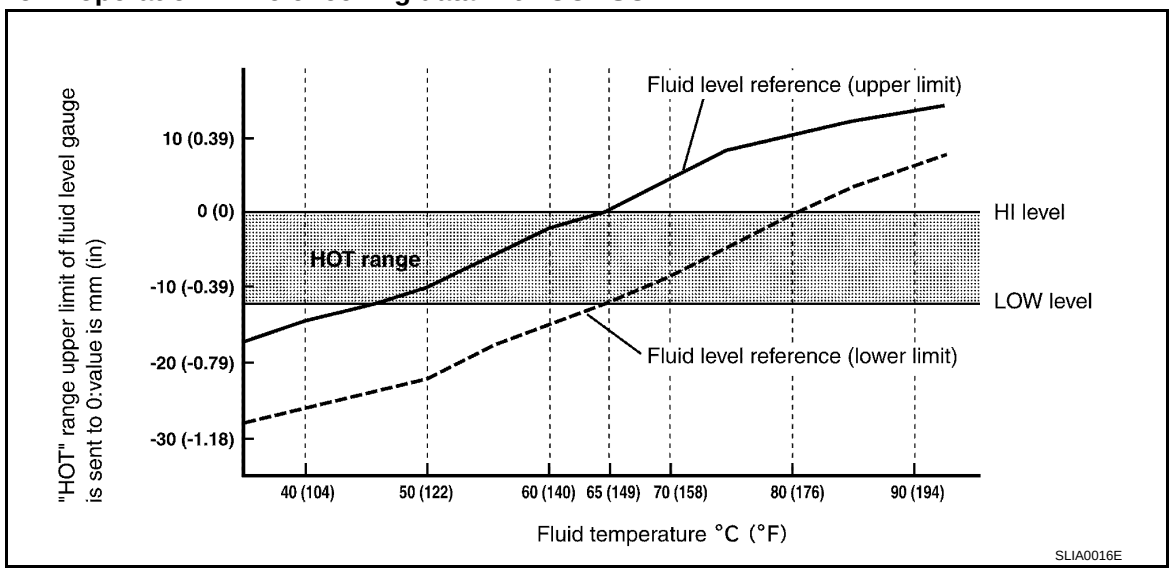
d. Remove A/T fluid level gauge and wipe clean with lint-free paper.
CAUTION:
When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.



e. Re-insert A/T fluid level gauge into A/T fluid charging pipe as far as it will go.
CAUTION:
To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge reversed from the normal attachment conditions.

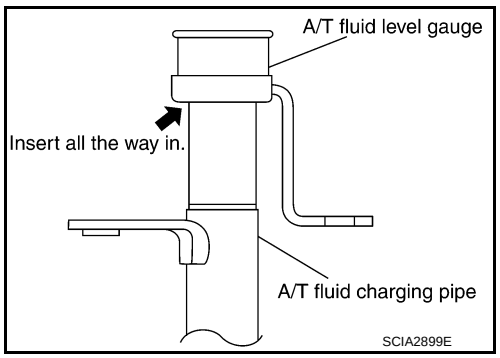
f. Remove A/T fluid level gauge and note reading. If reading is at low side of range, add ATF to the A/T fluid charging pipe.
CAUTION:
Never overfill.

5. Drive vehicle for approximately 5 minutes in urban areas.
6. Make the A/T fluid temperature approximately 65°C (149°F).
NOTE:
A/T fluid level will be greatly affected by temperature as shown in figure. Therefore, be certain to perform operation while checking data with CONSULT-III.



a. Select “DATA MONITOR”.
b. Read out the value of “ATF TEMP 1”.

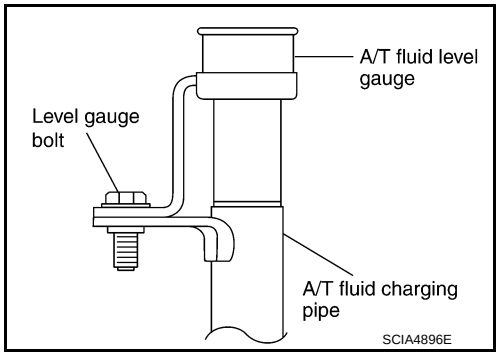
7. Re-check A/T fluid level at A/T fluid temperatures of approximately 65°C (149°F) using “HOT” range on A/T fluid level gauge.
CAUTION:
- **When wiping away the A/T fluid level gauge, always use lint-free paper, not a cloth one.**
- **To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the end of the A/T fluid charging pipe, with the A/T fluid level gauge reversed from the normal attachment conditions as shown.**



8. Check A/T fluid condition.
- If ATF is very dark or smells burned, check operation of A/T. Flush cooling system after repair of A/T.
- If 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-39, "Component" and AT-21, "VK45DE : A/T Fluid Cooler Cleaning".

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

Level gauge bolt
: 5.1 N·m (0.52 kg-m, 45 in-lb)



VK45DE : A/T Fluid Cooler Cleaning

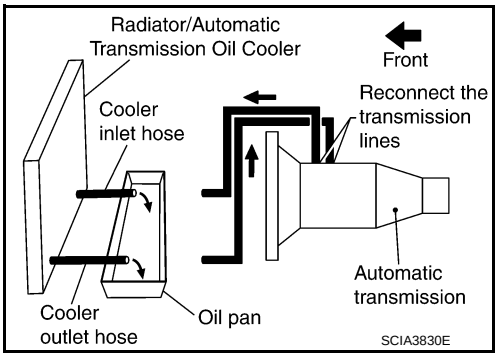
INFOID:0000000005352404

Whenever an A/T is replaced, the A/T fluid cooler mounted in the radiator must be inspected and cleaned.

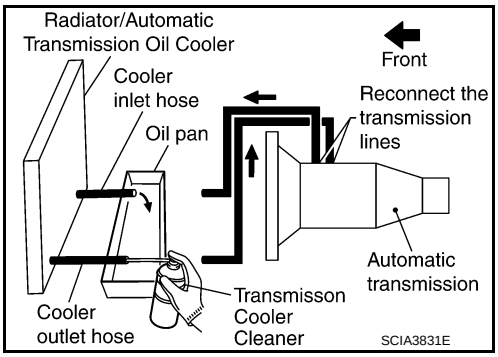
Metal debris and friction material, if present, can become trapped in the A/T fluid cooler. This debris can contaminate the newly serviced A/T or, in severe cases, can block or restrict the flow of ATF. In either case, malfunction of the newly serviced A/T may result.
Debris, if present, may build up as ATF enters the cooler inlet. It will be necessary to back flush the cooler through the cooler outlet in order to flush out any built up debris.

A/T FLUID COOLER CLEANING PROCEDURE

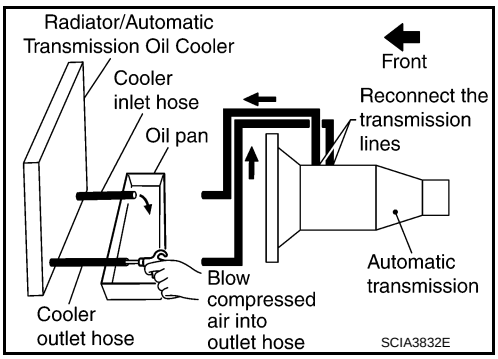
1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Identify the inlet and outlet fluid cooler hoses.
3. Disconnect the A/T fluid cooler inlet and outlet rubber hoses from the steel cooler tubes or bypass valve.
   NOTE:
   Replace the cooler hoses if rubber material from the hose remains on the tube fitting.
4. Allow any ATF that remains in the cooler hoses to drain into the oil pan.



5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.
   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray Transmission Cooler Cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Never breathe vapors or spray mist.**
6. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.



7. Insert the tip of an air gun into the end of the cooler outlet hose.
8. Wrap a shop rag around the air gun tip and of the cooler outlet hose.
9. Blow compressed air regulated to 5 to 9 kg/cm^2 (71 to 128 psi) through the cooler outlet hose for 10 seconds to force out any remaining ATF.
10. Repeat steps 5 through 9 three additional times.
11. Position an oil pan under the banjo bolts that connect the A/T fluid cooler steel lines to the A/T.
12. Remove the banjo bolts.
13. Flush each steel line from the cooler side back toward the A/T by spraying Transmission Cooler Cleaner in a continuous stream for 5 seconds.



14. Blow compressed air regulated to 5 to 9 kg/cm^2 (71 to 128 psi) through each steel line from the cooler side back toward the A/T for 10 seconds to force out any remaining ATF.
15. Ensure all debris is removed from the steel cooler lines.
16. Ensure all debris is removed from the banjo bolts and fittings.
17. Perform "A/T FLUID COOLER DIAGNOSIS PROCEDURE".

A/T FLUID COOLER DIAGNOSIS PROCEDURE

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

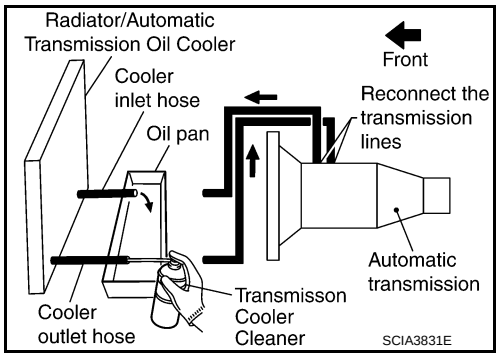
1. Position an oil pan under the A/T inlet and outlet cooler hoses.

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

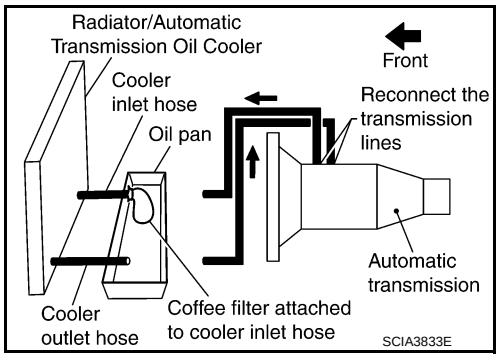
CAUTION:

- **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
- **Spray Transmission Cooler Cleaner only with adequate ventilation.**
- **Avoid contact with eyes and skin.**
- **Never breathe vapors or spray mist.**

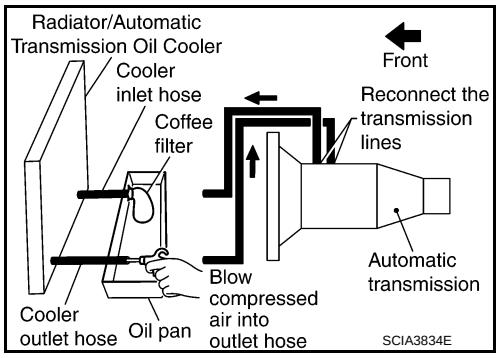
4. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.



5. Tie a common white, basket-type coffee filter to the end of the cooler inlet hose.



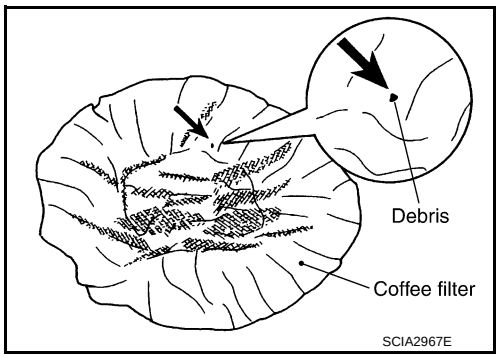
6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 to 9 kg/cm^2 (71 to 128 psi) through the cooler outlet hose to force any remaining ATF into the coffee filter.
9. Remove the coffee filter from the end of the cooler inlet hose.
10. Perform "A/T FLUID COOLER INSPECTION PROCEDURE".



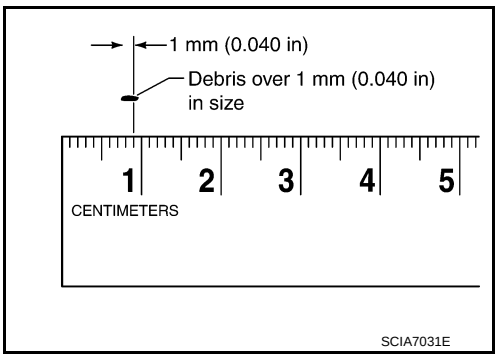
A/T FLUID COOLER INSPECTION PROCEDURE

1. Inspect the coffee filter for debris.

a. If small metal debris less than 1 mm (0.040 in) in size or metal powder is found in the coffee filter, this is normal. If normal debris is found, the A/T fluid cooler/radiator can be re-used and the procedure is ended.



b. If one or more pieces of debris are found that are over 1 mm (0.040 in) in size and/or peeled clutch facing material is found in the coffee filter, the A/T fluid cooler is not serviceable. The A/T fluid cooler/radiator must be replaced and the inspection procedure is ended. Refer to CO-39, "Component".



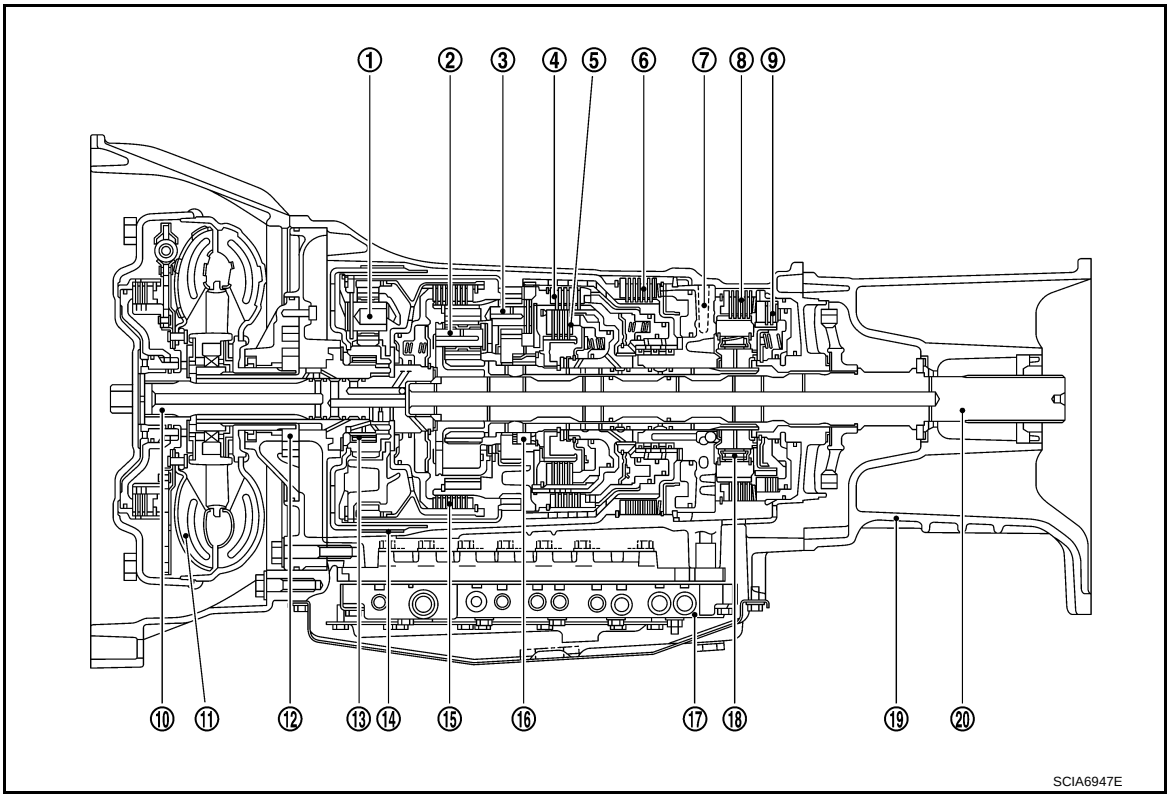
A/T FLUID COOLER FINAL INSPECTION

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

A/T CONTROL SYSTEM

Cross-Sectional View (VQ35HR Models)

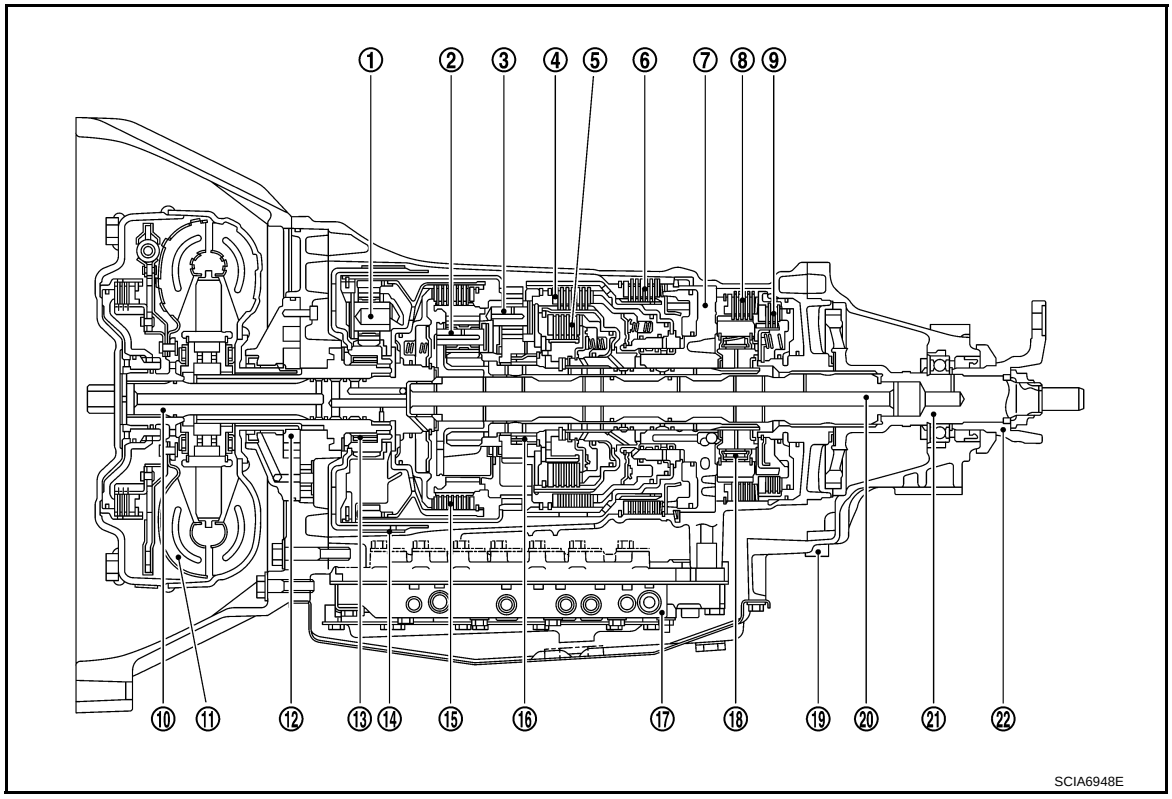
INFOID:0000000005352405



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

Cross-Sectional View (VK45DE Models for 2WD)

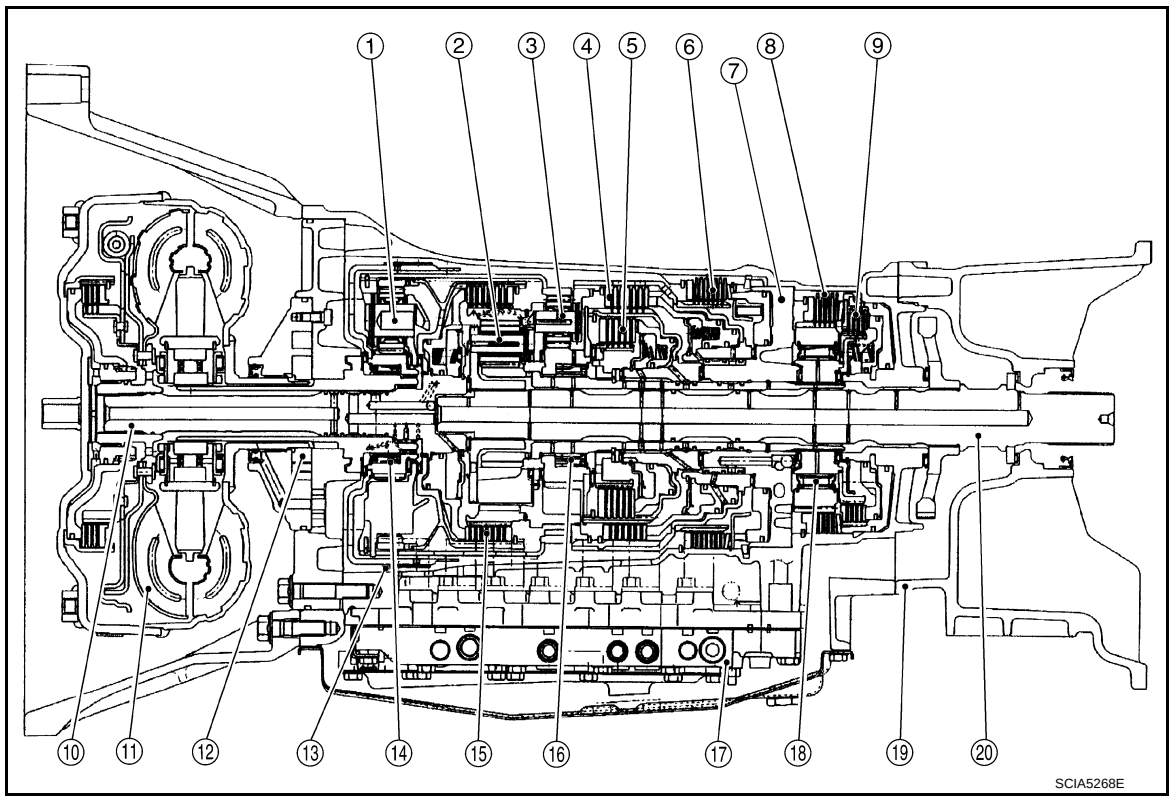
INFOID:0000000005352406



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

Cross-Sectional View (VK45DE Models for AWD)

INFOID:0000000005352407



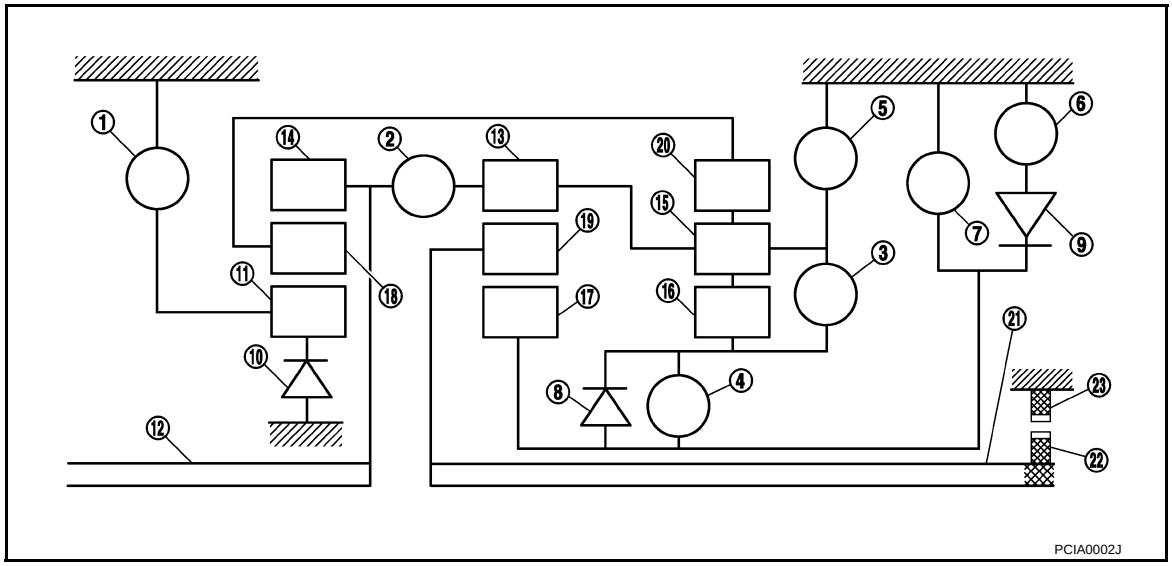
1. Front planetary gear
2. Mid planetary gear
3. Rear planetary gear
4. Direct clutch
5. High and low reverse clutch
6. Reverse brake
7. Drum support
8. Forward brake
9. Low coast brake
10. Input shaft
11. Torque converter
12. Oil pump
13. Front brake
14. 3rd one-way clutch
15. Input clutch
16. 1st one-way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

Shift Mechanism

INFOID:0000000005352408

The A/T uses compact triple planetary gear systems to improve power transmission efficiency, simplify construction and reduce weight.
It also employs an optimum shift control and super wide gear ratios. They improve starting performance and acceleration during medium and high-speed operation.

CONSTRUCTION



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

FUNCTION OF CLUTCH AND BRAKE

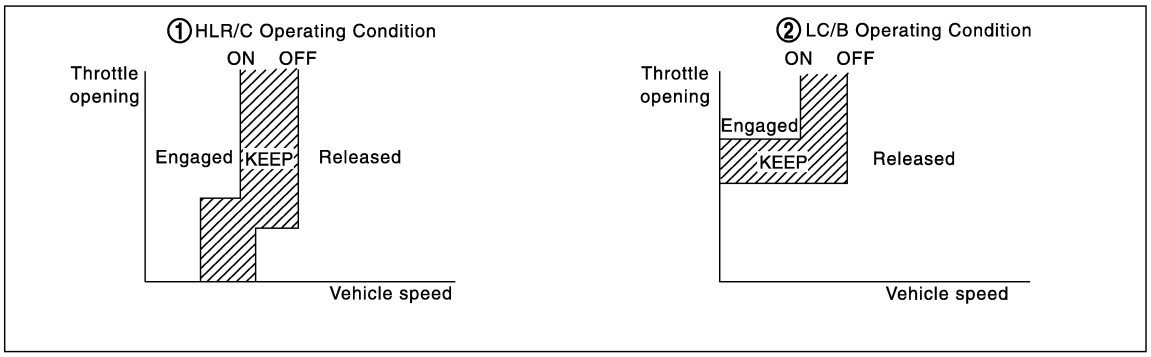
Name of the Part	Abbreviation	Function
Front brake (1)	FR/B	Fastens the front sun gear (11).
Input clutch (2)	I/C	Connects the input shaft (12), the front internal gear (14) and the mid internal gear (13).
Direct clutch (3)	D/C	Connects the rear carrier (15) and the rear sun gear (16).
High and low reverse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

CLUTCH AND BAND CHART

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

* : Down shift automatically according to the vehicle speed.

○ — Operates
◎ — Operates during “progressive” acceleration.
◇ — Operates and affects power transmission while coasting.
△ — Line pressure is applied but does not affect power transmission.
△ * — Operates under conditions shown in illustration ①.
△ ** — Operates under conditions shown in illustration ②. Delay control is applied during D(4,3,2,1) → N shift



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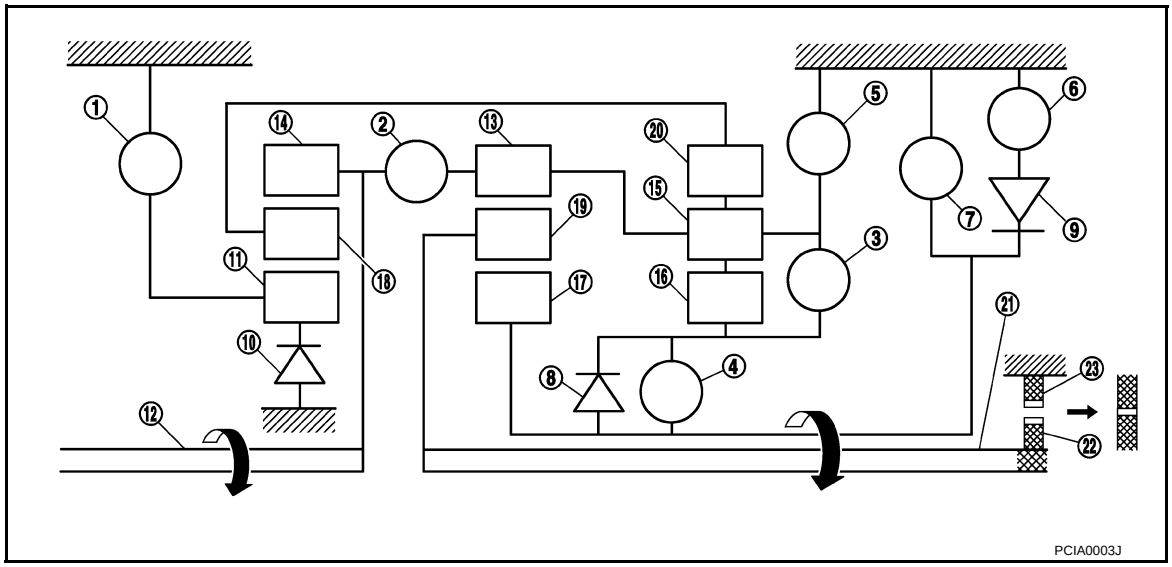
POWER TRANSMISSION

“N” Position

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

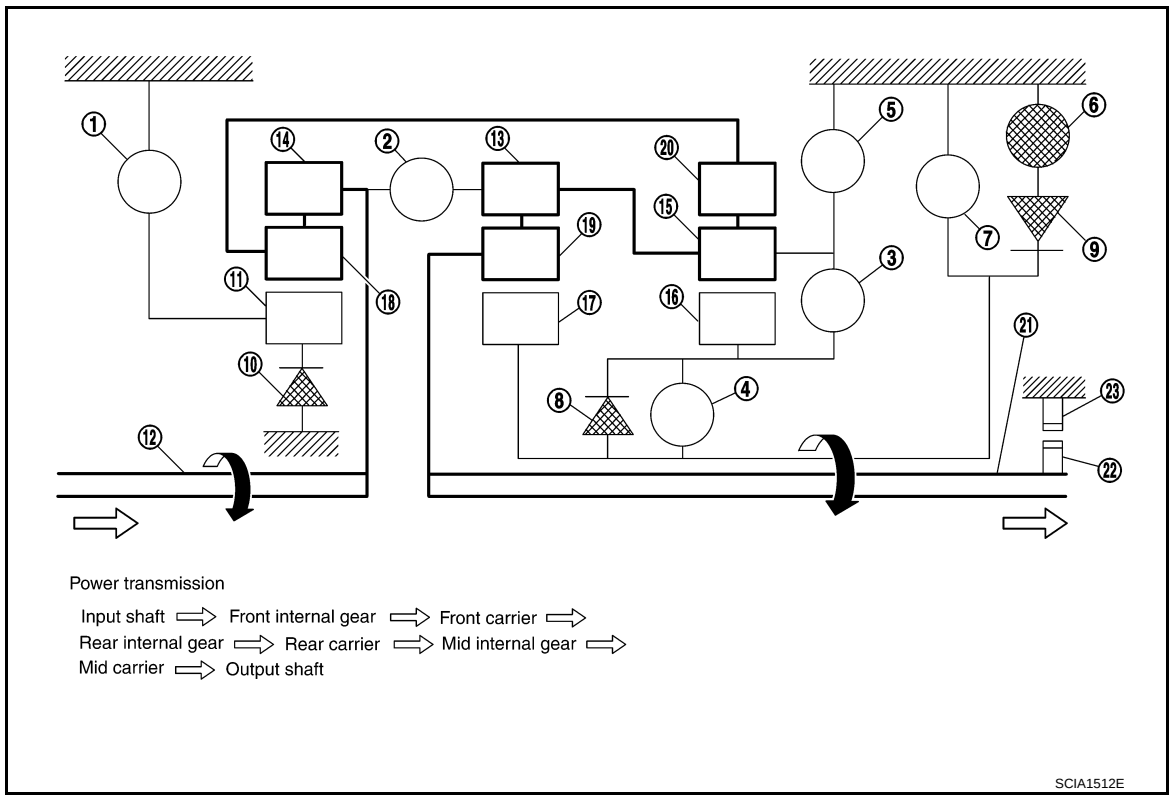
“P” Position

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



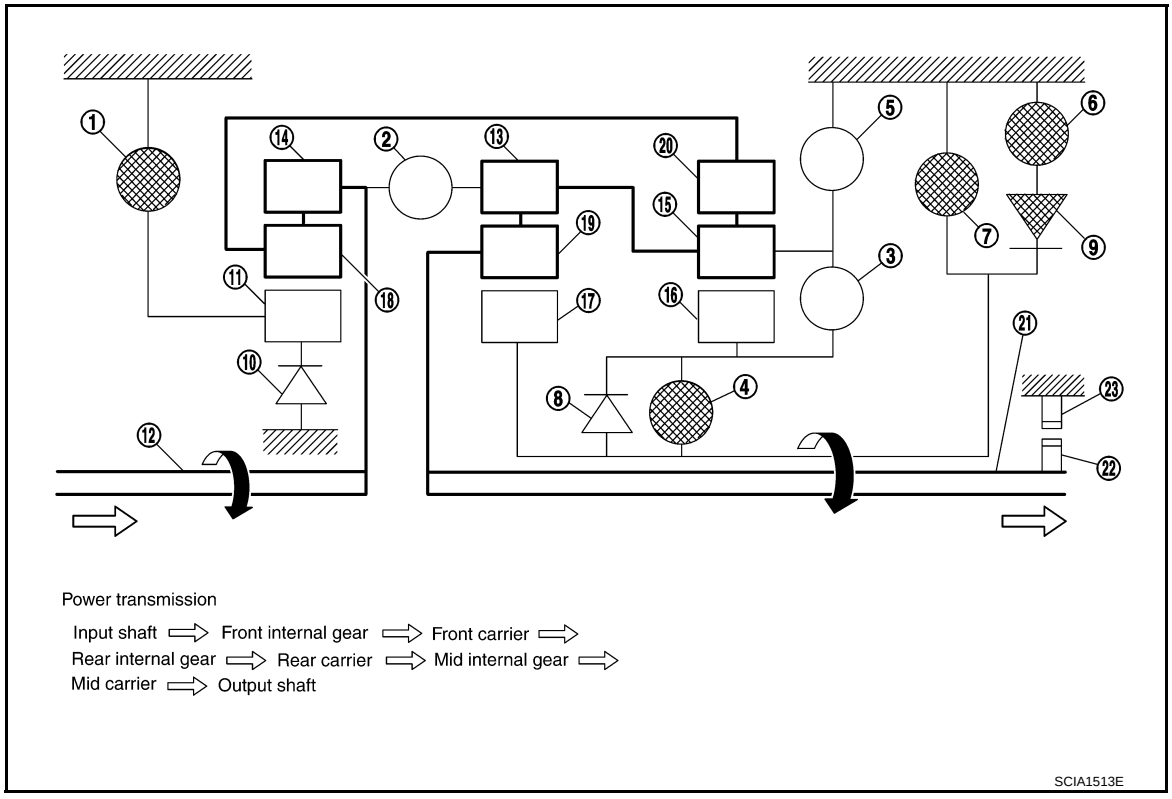
1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier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

“D_1” Position
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The 1st one-way clutch regulates reverse rotation of the rear sun gear.
- The 3rd one-way clutch regulates reverse rotation of the front sun gear.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and the engine brake is not activated.



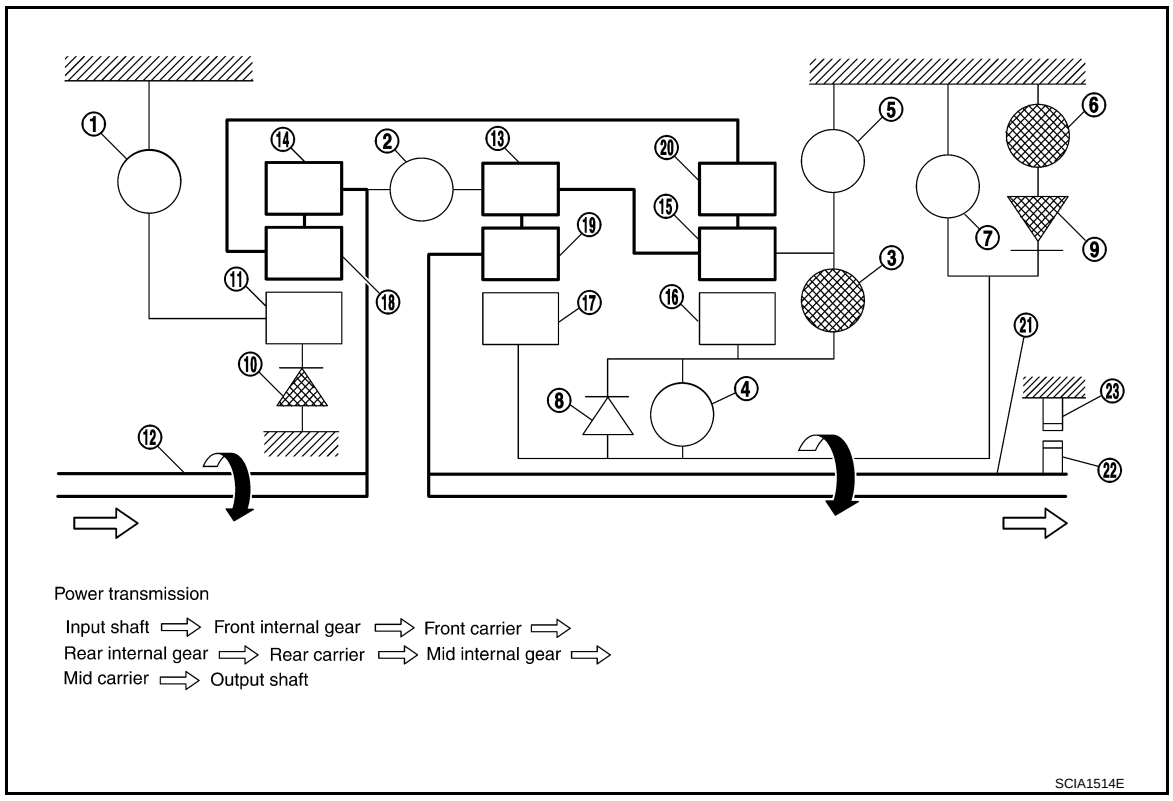
1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier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

“M1” Position
- The front brake fastens the front sun gear.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- High and low reverse clutch connects the rear sun gear and the mid sun gear.
- The low coast brake fastens the mid sun gear.
- During deceleration, the low coast brake regulates forward rotation of the mid sun gear and the engine brake functions.



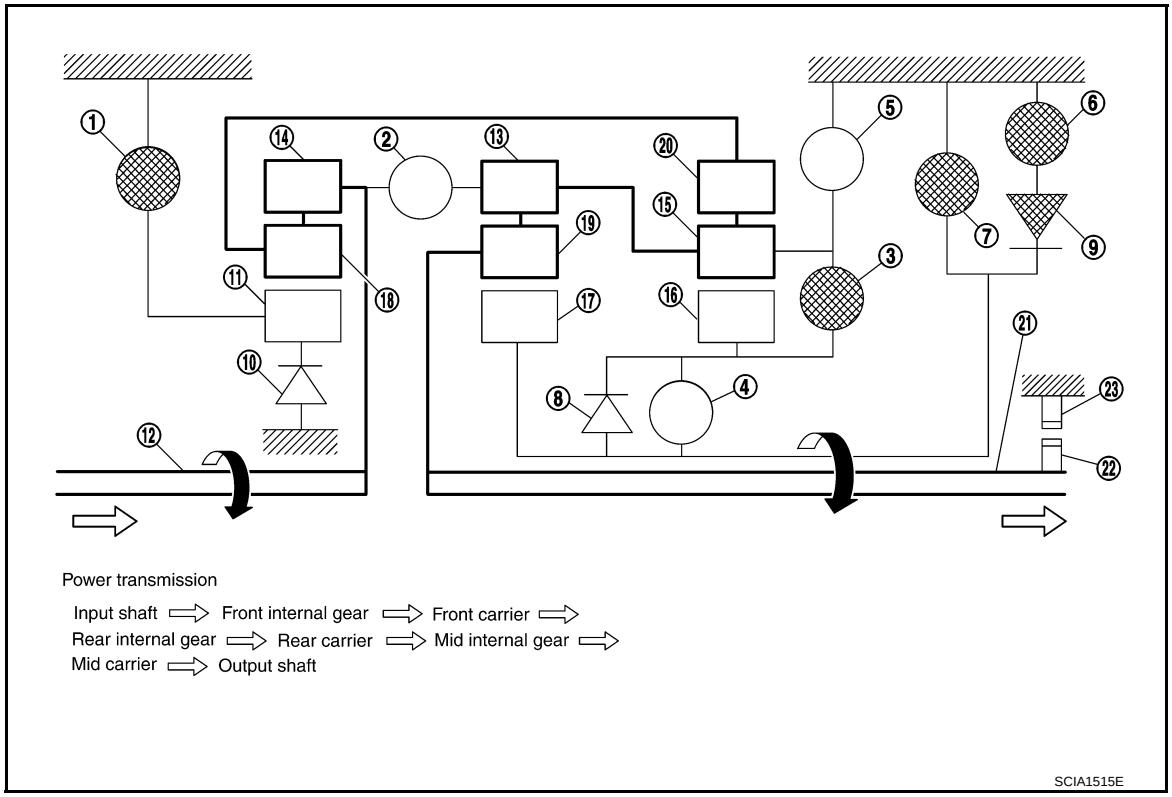
1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier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

"D_2" Position
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The 3rd one-way clutch regulates reverse rotation of the front sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and engine brake is not activated.



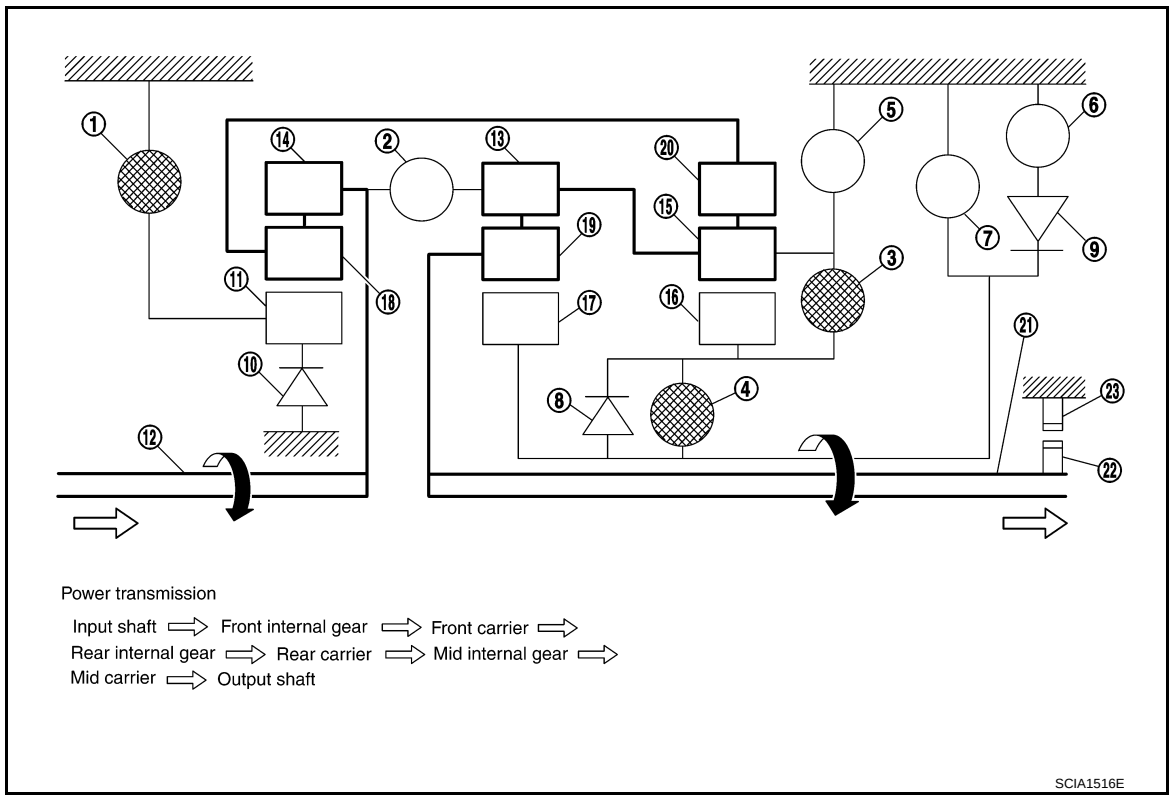
1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier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

“M2” Position
- The front brake fastens the front sun gear.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The low coast brake fastens the mid sun gear.
- During deceleration, the low coast brake regulates forward rotation of the mid sun gear and the engine brake functions.



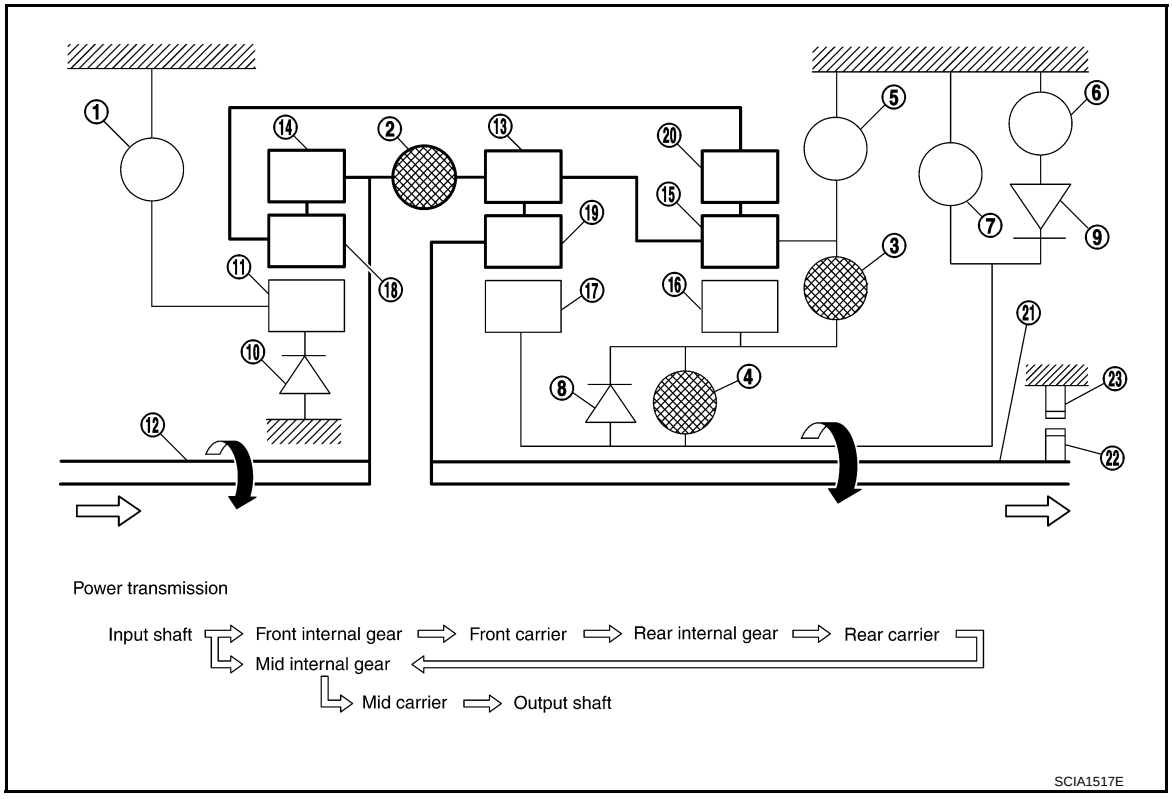
1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier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

"D3" and "M3" Positions
- The front brake fastens the front sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.



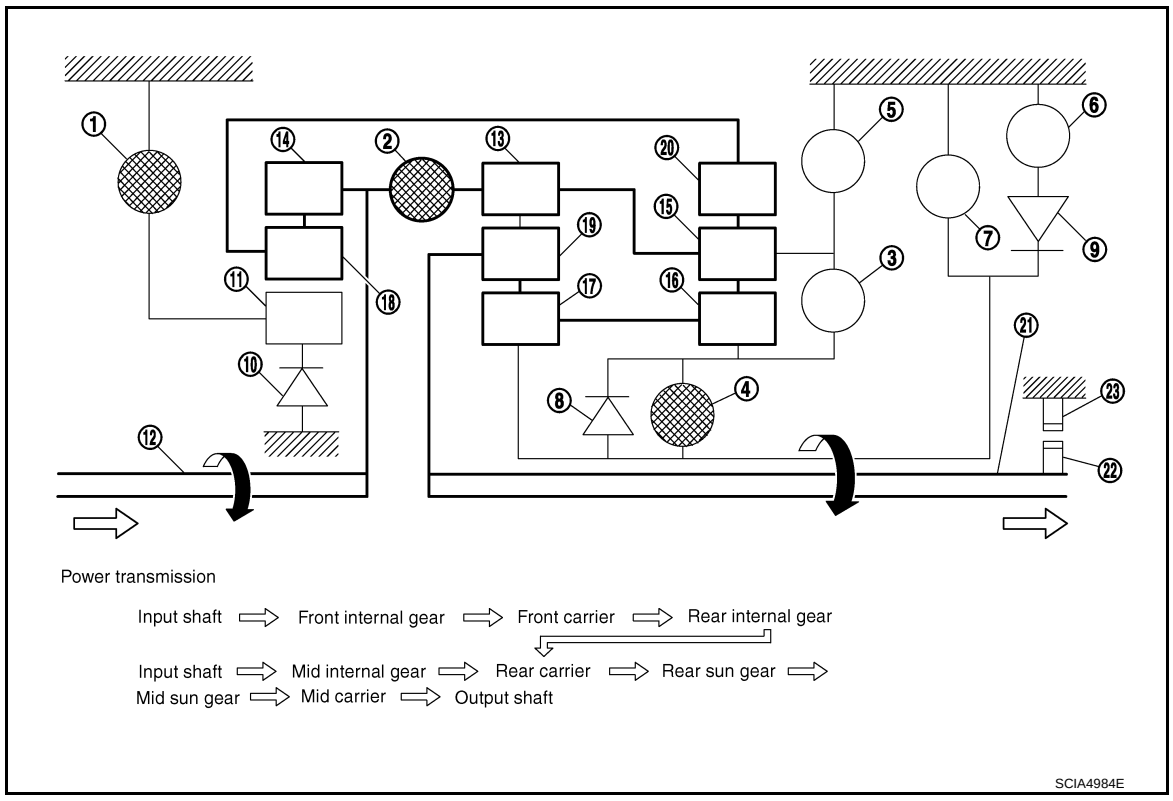
1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier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

"D4" and "M4" Positions
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.
- The input clutch is coupled, and the front internal gear and mid internal gear are connected.
- The drive power is conveyed to the front internal gear, mid internal gear, and rear carrier and the three planetary gears rotate forward as one unit.



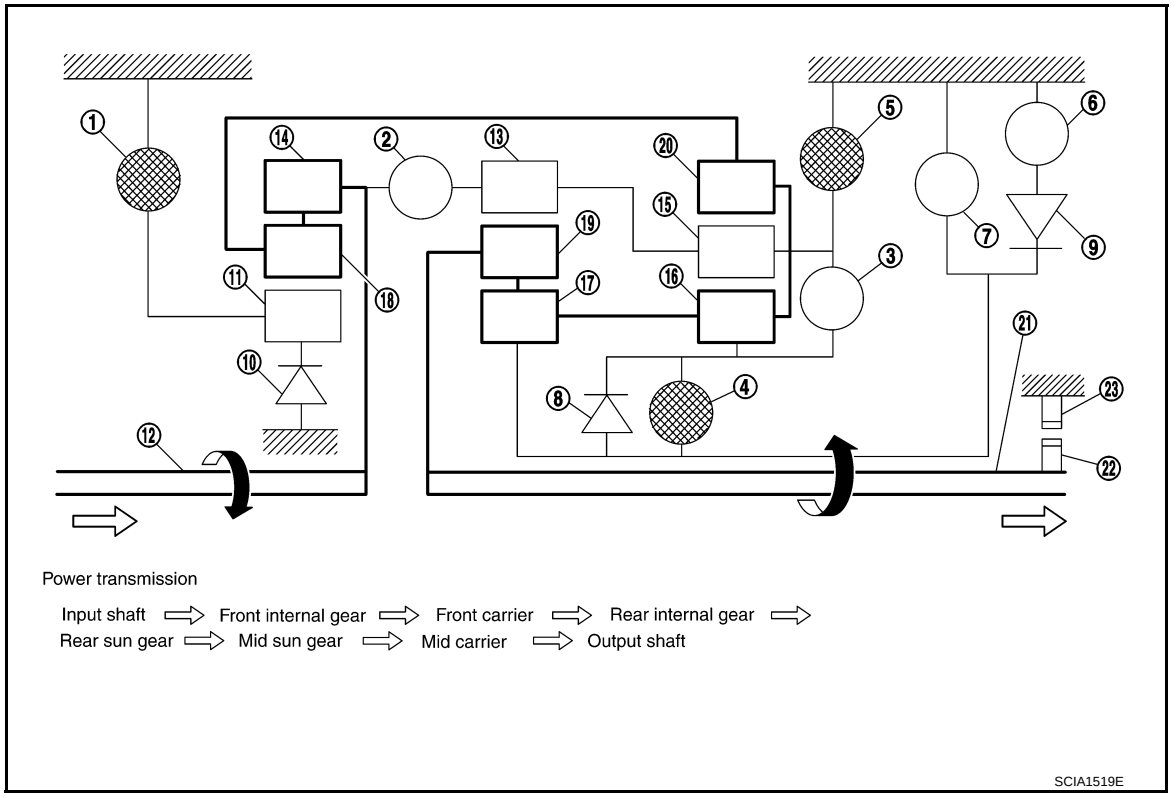
1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier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

"D5" and "M5" Positions
- The front brake fastens the front sun gear.
- The input clutch is coupled, and the front internal gear and mid internal gear are connected.
- The high and low reverse clutch is coupled, and the mid sun gear and rear sun gear are connected.



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

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



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

TCM Function

INFOID:0000000005352409

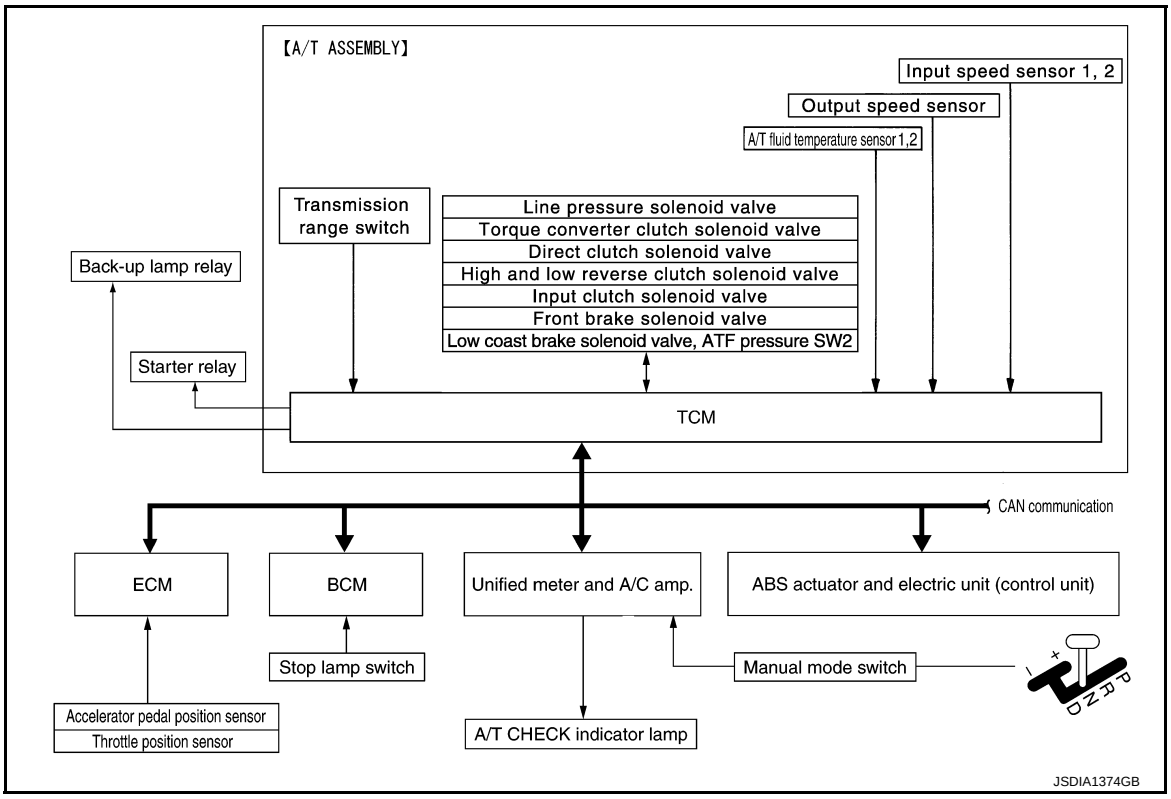
The function of the TCM is to:
- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids.

CONTROL SYSTEM OUTLINE

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

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

CONTROL SYSTEM DIAGRAM



CAN Communication

INFOID:0000000005352410

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. Refer to LAN-29, "CAN Communication Signal Chart".

Input/Output Signal of TCM

INFOID:0000000005352411

Control item			Line pressure control	Vehicle speed control	Shift control	Lock-up control	Engine brake control	Fail-safe function (*3)	Self-diag-nostics function
Input	Accelerator pedal position signal (*5)		X	X	X	X	X	X	X
	Output speed sensor		X	X	X	X	X	X	X
	Vehicle speed signal(*1) (*5)							X	
	Closed throttle position signal(*5)			X(*2)	X	X		X	X(*4)
	Wide open throttle position signal(*5)							X	X(*4)
	Input speed sensor 1			X		X	X	X	X
	Input speed sensor 2 (for 4th speed only)			X		X	X	X	X
	Engine speed signal(*5)		X	X	X	X	X	X	X
	Stop lamp switch signal(*5)			X	X	X			X(*4)
	A/T fluid temperature sensors 1, 2		X	X	X	X		X	X
	ASCD or ICC sensor inte-grated unit	Operation signal(*5)		X	X	X			
		Overdrive cancel signal(*5)		X					
Out-put	Direct clutch solenoid			X	X			X	X
	Input clutch solenoid			X	X			X	X
	High and low reverse clutch solenoid			X	X			X	X
	Front brake solenoid			X	X			X	X
	Low coast brake solenoid (ATF pressure switch 2)			X	X		X	X	X
	Line pressure solenoid		X	X	X	X	X	X	X
	TCC solenoid					X		X	X
	A/T CHECK indicator lamp(*6)								X(*4)
	Starter relay							X	X

*1: Spare for output speed sensor

*2: Spare for accelerator pedal position signal

*3: If these input and output signals are different, the TCM triggers the fail-safe function.

*4: Used as a condition for starting self-diagnostics; if self-diagnostics are not started, it is judged that there is some kind of error.

*5: Input by CAN communications.

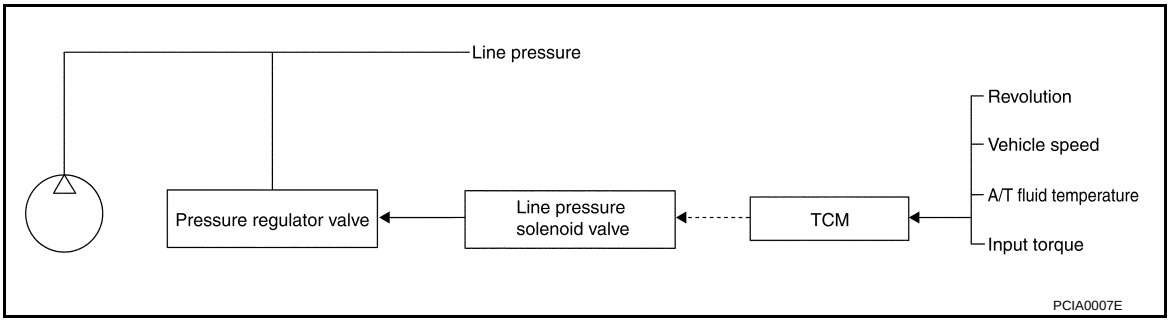
*6: Output by CAN communications.

Line Pressure Control

INFOID:0000000005352412

- When an input torque signal equivalent to the engine drive force is sent from the ECM to the TCM, the TCM controls the line pressure solenoid.

- This line pressure solenoid controls the pressure regulator valve as the signal pressure and adjusts the pressure of the operating oil discharged from the oil pump to the line pressure most appropriate to the driving state.

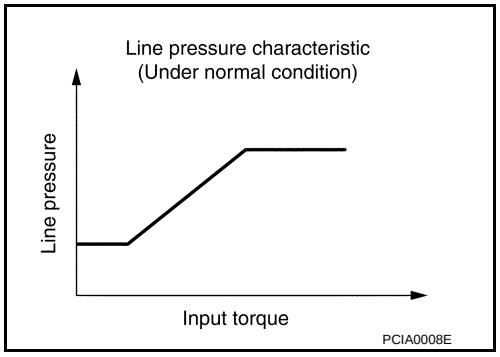


LINE PRESSURE CONTROL IS BASED ON THE TCM LINE PRESSURE CHARACTERISTIC PATTERN

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

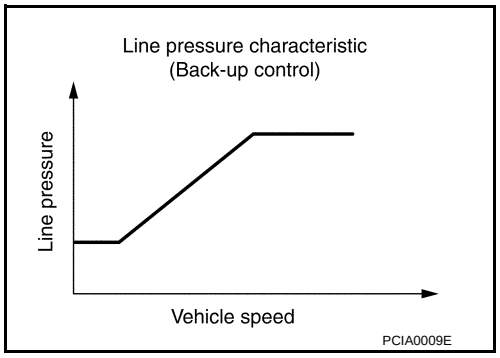
Normal Control

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



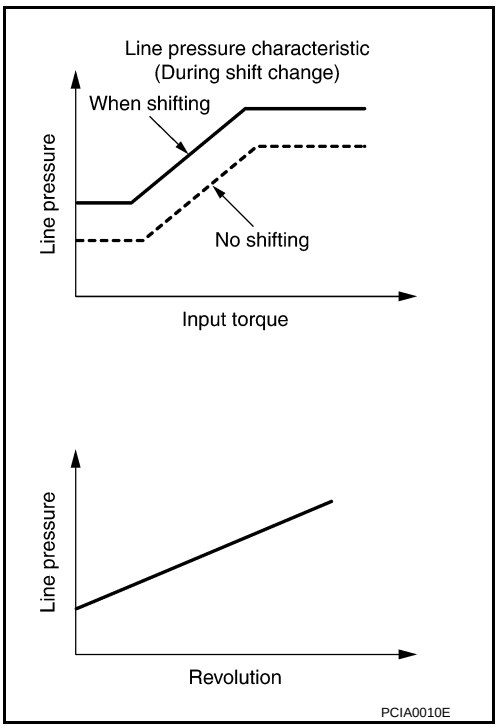
Back-up Control (Engine Brake)

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



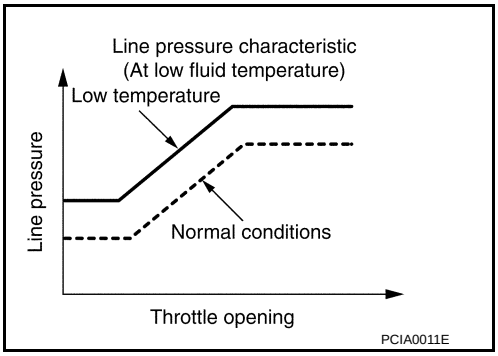
During Shift Change

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



At Low Fluid Temperature

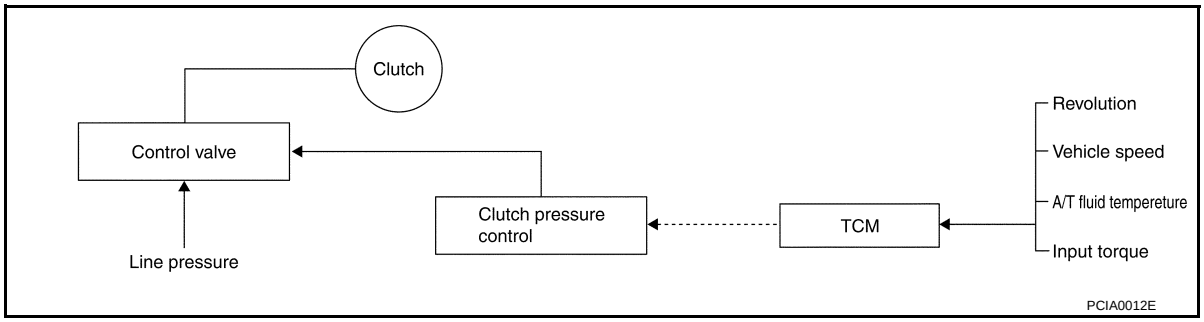
When the A/T fluid temperature drops below the prescribed temperature, in order to speed up the action of each friction element, the line pressure is set higher than the normal line pressure characteristic.



Shift Control

INFOID:0000000005352413

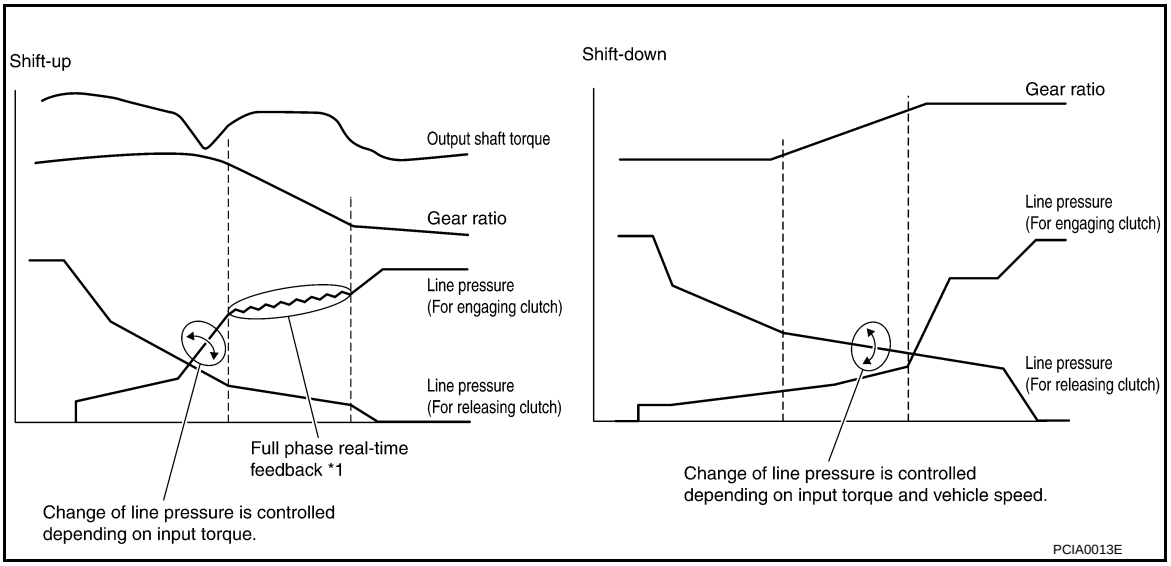
The clutch pressure control solenoid is controlled by the signals from the switches and sensors. Thus, the clutch pressure is adjusted to be appropriate to the engine load state and vehicle driving state. It becomes possible to finely control the clutch hydraulic pressure with high precision and a smoother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



SHIFT CHANGE

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

Shift Change System Diagram



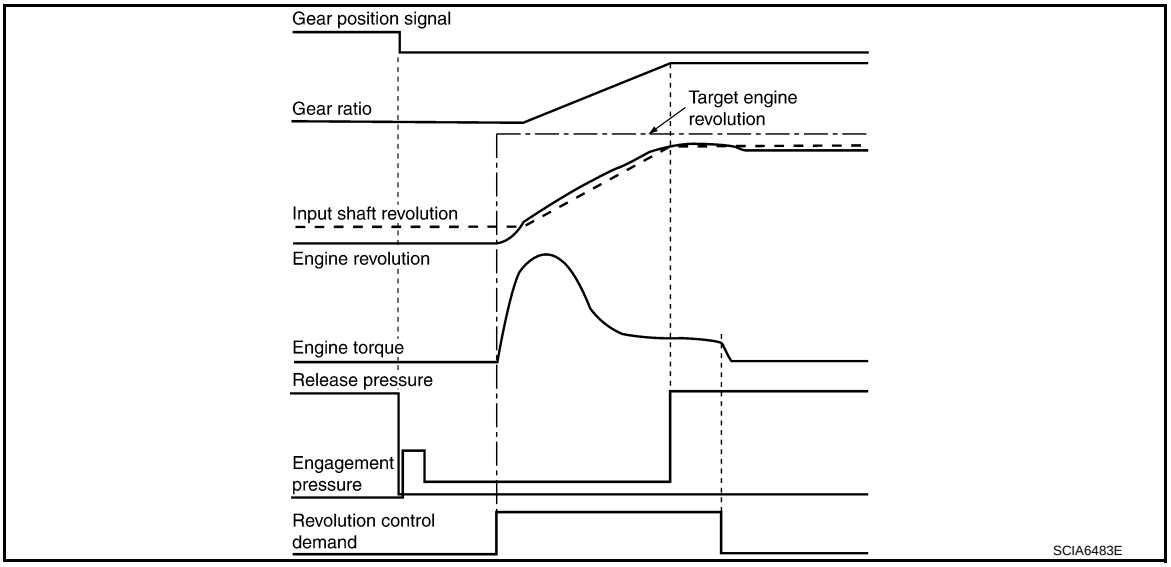
*1: Full phase real-time feedback control monitors movement of gear ratio at gear change, and controls oil pressure at real-time to achieve the best gear ratio.

BLIPPING CONTROL

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

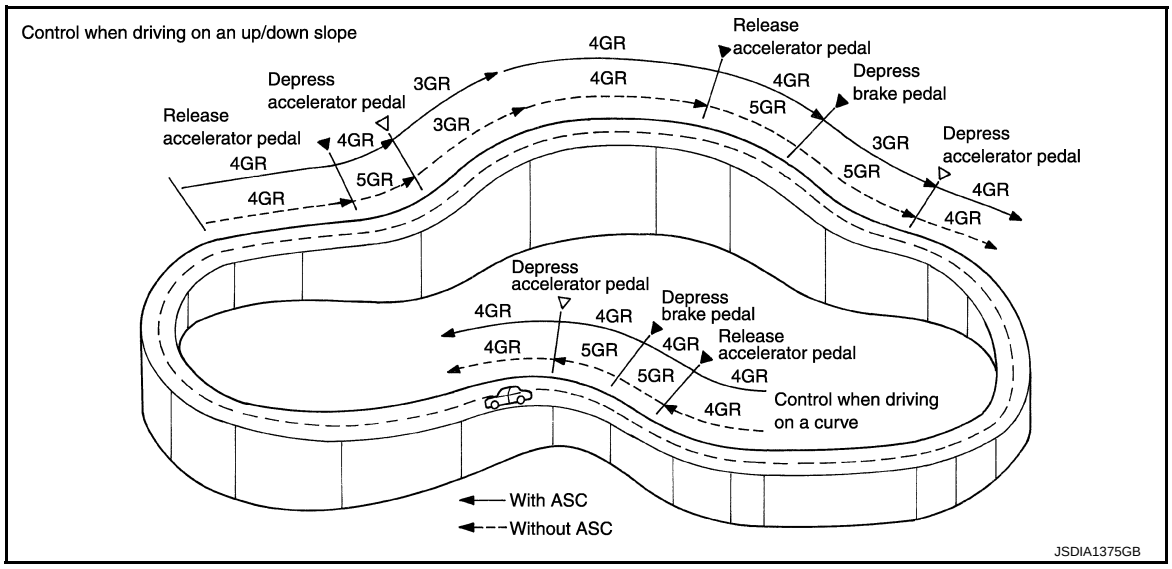
- "BLIPPING CONTROL" functions.
- When downshifting by accelerator pedal depression at "D" position.
- When downshifting under the manual mode.
- TCM selects "BLIPPING CONTROL" or "NORMAL SHIFT CONTROL" according to the gear position, the select lever position, the engine torque and the speed when accelerating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

Shift Change System Diagram



ASC (ADOPTIVE SHIFT CONTROL)

ASC automatically shifts or hold at 3GR or 4GR on certain roads (up/down slope and curve) and driving condition.



When Driving on an Up/Down Slope

ASC judges up/down slope according to the angle of accelerator pedal and vehicle speed. Fixing at 3GR or 4GR on an up-slope prevents shift hunting and controls the vehicle to gain maximum driving force. On a down-slope, automatic shift-down to 3GR or 4GR controls to gain maximum engine brake.

When Driving on a Curve

TCM receives side G sensor signal from ABS actuator and electric unit (control unit). Fixing at 3GR or 4GR based on the signal prevents shift-up and kick-down and controls to drive smoothly.

Lock-up Control

INFOID:0000000005352414

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

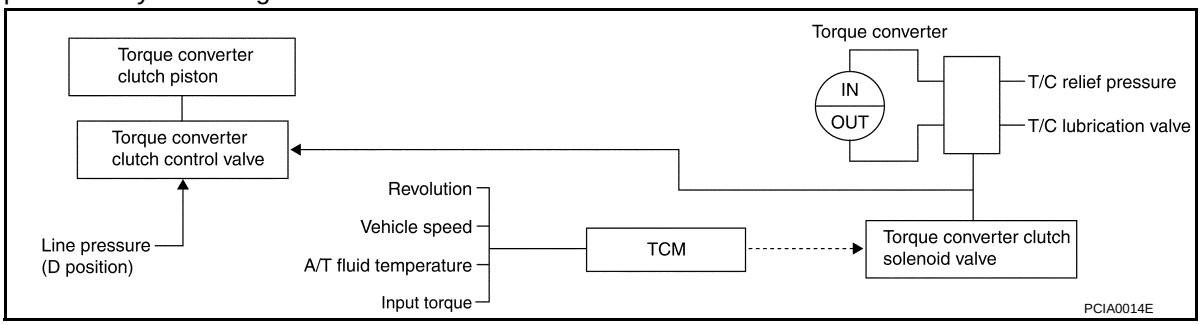
The torque converter clutch control valve operation is controlled by the torque converter clutch solenoid valve, which is controlled by a signal from TCM, and the torque converter clutch control valve engages or releases the torque converter clutch piston.

Lock-up operation condition table

Selector lever	"D" position			"M" position	
Gear position	5	4	3	5	4
Lock-up	×	–	–	×	×
Slip lock-up	×	×	×	–	–

TORQUE CONVERTER CLUTCH CONTROL VALVE CONTROL

Lock-up Control System Diagram



Lock-up Released

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

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

Lock-up Applied

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

SMOOTH LOCK-UP CONTROL

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

Half-clutched State

The current output from the TCM to the torque converter clutch solenoid is varied to steadily increase the torque converter clutch solenoid pressure.
In this way, the lock-up apply pressure gradually rises and while the torque converter clutch piston is put into half-clutched status, the torque converter clutch piston operating pressure is increased and the coupling is completed smoothly.

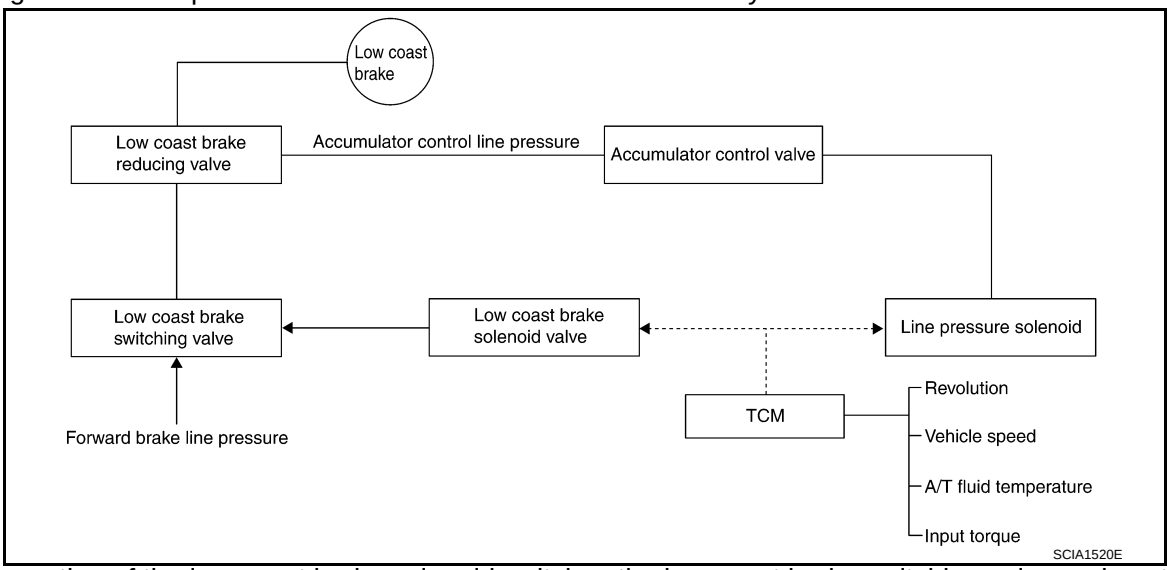
Slip Lock-up Control

In the slip region, the torque converter clutch solenoid current is controlled with the TCM to put it into the half-clutched state. This absorbs the engine torque fluctuation and lock-up operates from low speed.
This raises the fuel efficiency for 3GR, 4GR and 5GR at both low speed and when the accelerator has a low degree of opening.

Engine Brake Control

INFOID:0000000005352415

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



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

Control Valve

INFOID:0000000005352416

FUNCTION OF CONTROL VALVE

Name	Function
Torque converter regulator valve	In order to prevent the pressure supplied to the torque converter from being excessive, the line pressure is adjusted to the optimum pressure (torque converter operating pressure).
Pressure regulator valve Pressure regulator plug Pressure regulator sleeve	Adjusts the oil discharged from the oil pump to the optimum pressure (line pressure) for the driving state.

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

FUNCTION OF PRESSURE SWITCH

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

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Introduction

INFOID:0000000005352417

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-92, "CONSULT-III Function (TRANSMISSION)".

OBD-II Function for A/T System

INFOID:0000000005352418

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

INFOID:0000000005352419

ONE TRIP DETECTION LOGIC

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

TWO TRIP DETECTION LOGIC

When a malfunction is sensed during the first test drive, it is stored in the ECM memory as a 1st trip DTC (diagnostic trouble code) or 1st trip freeze frame data. At this point, the MIL will not illuminate. — 1st trip
If the same malfunction as that experienced during the first test drive is sensed during the second test drive, the MIL will illuminate. — 2nd trip
The “Trip” in the “One or Two Trip Detection Logic” means a driving mode in which self-diagnosis is performed during vehicle operation.

OBD-II Diagnostic Trouble Code (DTC)

INFOID:0000000005352420

HOW TO READ DTC AND 1ST TRIP DTC

DTC and 1st trip DTC can be read by the following methods.
(with CONSULT-III or GST) GST) CONSULT-III or GST (Generic Scan Tool) Examples: P0705, P0720 etc.
These DTC are prescribed by SAE J2012.
(CONSULT-III also displays the malfunctioning component or system.)

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

A sample of CONSULT-III 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-III. 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-III or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-III screen, not on the GST. For

detail, refer to EC-134, "CONSULT-III Function" (for VQ35HR engine), EC-799, "CONSULT-III Function" (for VK45DE engine).
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*1 or P0300 - P0308*2 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	

*1: For VQ35HR engine.

*2: For VK45DE engine.

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

HOW TO ERASE DTC

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

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

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to EC-667, "DTC Index" (for VQ35HR engine), EC-735, "Emission-Related Diagnostic Information" (for VK45DE engine).

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

HOW TO ERASE DTC (WITH CONSULT-III)

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

HOW TO ERASE DTC (WITH GST)

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-99, "Diagnosis Procedure without CONSULT-III". (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Select Mode 4 with GST (Generic Scan Tool). For details, refer to EC-144, "Diagnosis Tool Function" (for VQ35HR engine), EC-808, "Generic Scan Tool (GST) Function" (for VK45DE engine).

HOW TO ERASE DTC (NO TOOLS)

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

1. If the ignition switch stays ON after repair work, be sure to turn ignition switch OFF once. Wait at least 10 seconds and then turn it ON (engine stopped) again.
2. Perform AT-99, "Diagnosis Procedure without CONSULT-III". (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Perform “OBD-II SELF-DIAGNOSTIC PROCEDURE (No tools)”. Refer to EC-121, "Diagnosis Description" (for VQ35HR engine), EC-735, "Emission-Related Diagnostic Information" (for VK45DE engine).

Malfunction Indicator Lamp (MIL)

INFOID:0000000005352421

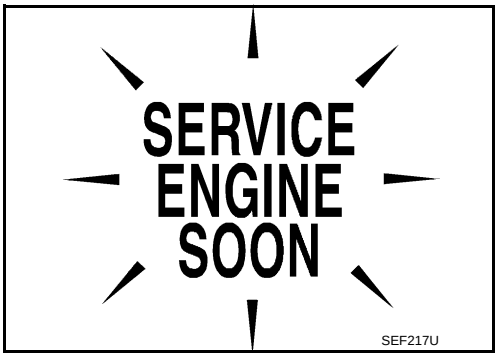
DESCRIPTION

The MIL is located on the combination meters.

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-35, or see EC-626 (for VQ35HR engine), EC-1335 (for VK45DE engine).

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

DTC Inspection Priority Chart

INFOID:0000000005352422

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 DTC, first perform the trouble diagnosis for "DTC U1000 CAN COMM CIRCUIT". Refer to AT-102.

Priority	Detected items (DTC)
1	U1000 CAN COMM CIRCUIT
2	Except above

Fail-Safe

INFOID:0000000005352423

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

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

Even when the electronic circuits are normal, under special conditions (for example, when slamming on the brake with the wheels spinning drastically and stopping the tire rotation), the A/T can go into fail-safe mode. If this happens, switch OFF the ignition switch for 10 seconds, then switch it ON again to return to the normal shift pattern. Therefore, the customer's vehicle has returned to normal, so handle according to the "WORK FLOW" (Refer to AT-51).

FAIL-SAFE FUNCTION

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

Output Speed Sensor

Signals are input from two systems - from output speed sensor installed on the A/T and from unified meter and A/C amp. so normal driving is possible even if there is a malfunction in one of the systems. And if output speed sensor has unusual cases, 5GR and manual mode are prohibited.

Accelerator Pedal Position Sensor

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

Throttle Position Sensor

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

Transmission Range Switch

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

Starter Relay

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

Interlock

- If there is an interlock judgment malfunction, the A/T is fixed in 2GR to make driving possible.
  NOTE:
  When the vehicle is driven fixed in 2GR, an input speed sensor malfunction is displayed, but this is not an input speed sensor malfunction.
- When the coupling pattern below is detected, the fail-safe action corresponding to the pattern is performed.

1st Engine Braking

When there is an 1st engine brake judgment malfunction, the low coast brake solenoid is switched OFF to avoid the engine brake operation.

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

Torque Converter Clutch Solenoid
The solenoid is switched OFF to release the lock-up.

Low Coast Brake Solenoid
When a malfunction (electrical or functional) occurs, in order to make driving possible. If the solenoid is ON, the A/T is held in 2GR. If the solenoid is OFF, the A/T is held in 4GR. (Engine brake is not applied in 1GR and 2GR.)

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

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

Front Brake Solenoid
If a malfunction (electrical or functional) occurs with the solenoid ON, in order to make driving possible. The A/T is held in 5GR. If the solenoid is OFF, the A/T is 4GR.

High and Low Reverse Clutch Solenoid
If a (electrical or functional) malfunction occurs with the solenoid either ON or OFF, the A/T is held in 4GR to make driving possible.

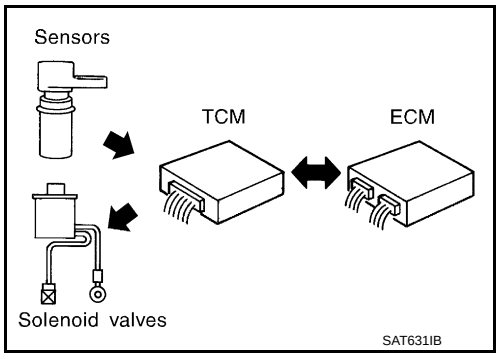
Input Speed Sensor 1 or 2
The control is the same as if there were no input speed sensors, 5GR and manual mode are prohibited.

How to Perform Trouble Diagnosis for Quick and Accurate Repair

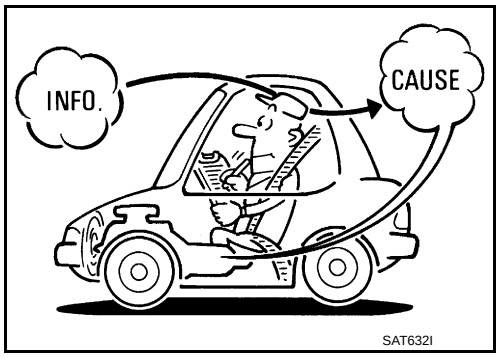
INFOID:0000000005352424

INTRODUCTION

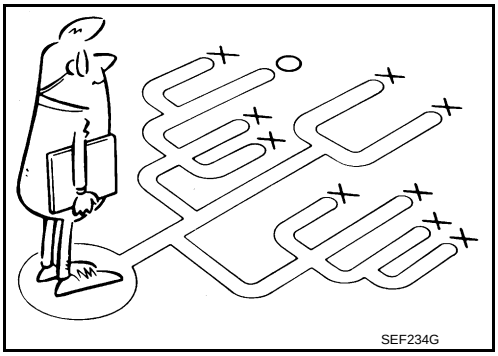
The TCM receives a signal from the output speed sensor, accelerator pedal position sensor (throttle position sensor) or transmission range switch and provides shift control or lock-up control via A/T solenoid valves.
The TCM also communicates with the ECM by means of a signal sent from sensing elements 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-III (or GST) or a circuit tester connected should be performed. Follow the "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 "Diagnostic Worksheet Chart") 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.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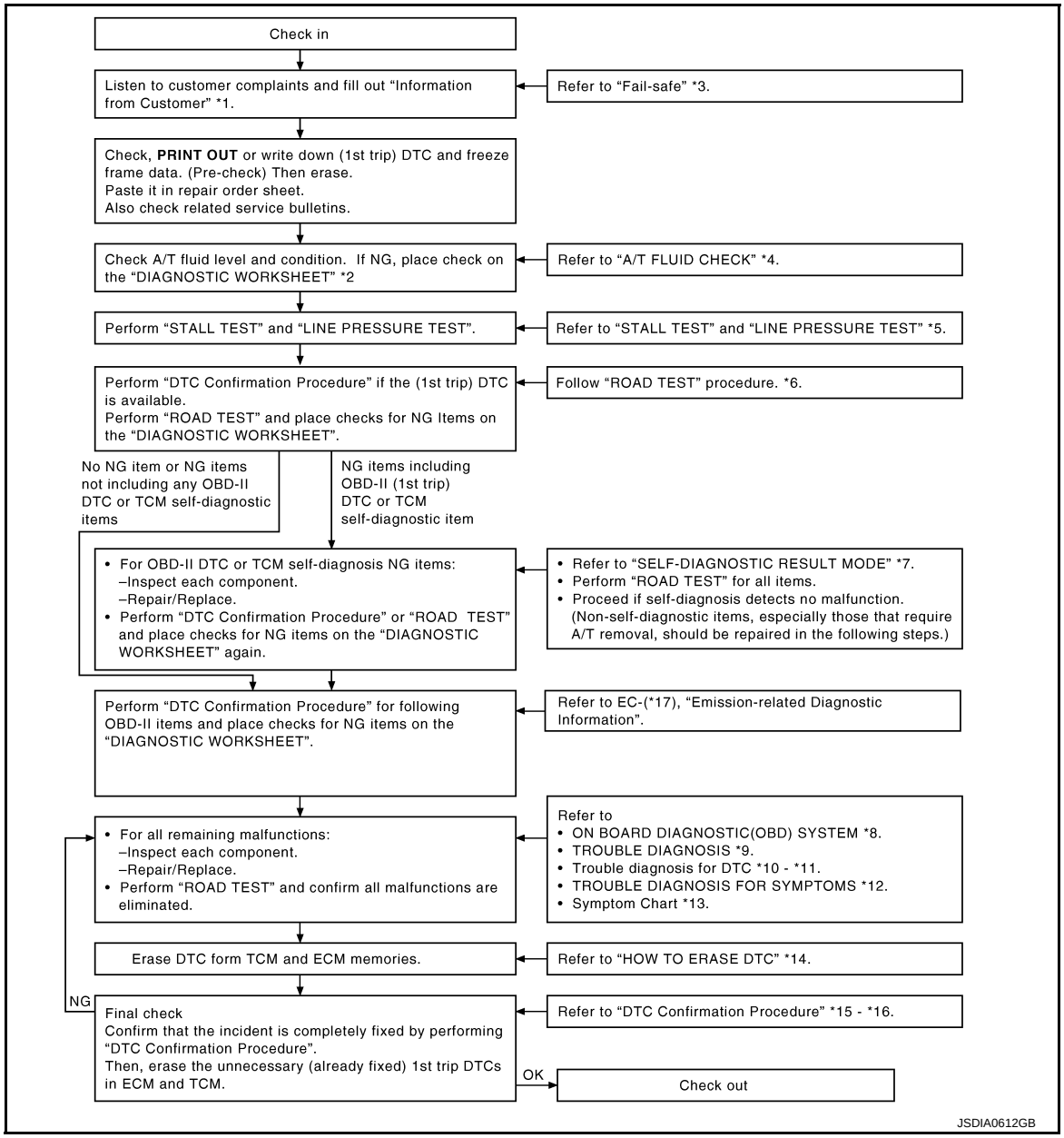
WORK FLOW

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's complaint.
Make good use of the two sheets provided, "Information From Customer" and "Diagnostic Worksheet Chart", to perform the best troubleshooting possible.

Work Flow Chart



*1. "Information From Customer" *2. "Diagnostic Worksheet Chart" *3. AT-50
*4. AT-57 *5. AT-51 *6. AT-61
*7. AT-92 *8. AT-47 *9. AT-50
*10. AT-102 *11. AT-163 *12. AT-175
*13. AT-67 *14. AT-47 *15. AT-102
*16. AT-163 *17. EC-667 (for VQ35HR engine), EC-735 (for VK45DE engine)

DIAGNOSTIC WORKSHEET

Information from Customer

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

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

Diagnostic Worksheet Chart

1	☐ Read the item on cautions concerning fail-safe and understand the customer's complaint.			AT-50
2	☐ A/T fluid inspection			AT-57
		☐ Leak (Repair leak location.) ☐ State ☐ Amount		
3	☐ Stall test and line pressure test			AT-57
		☐ Stall test		
			☐ Torque converter one-way clutch ☐ Front brake ☐ High and low reverse clutch ☐ Low coast brake ☐ Forward brake ☐ Reverse brake ☐ Forward one-way clutch	☐ 1st one-way clutch ☐ 3rd one-way clutch ☐ Engine ☐ Line pressure low ☐ Except for input clutch and direct clutch, clutches and brakes OK
		☐ Line pressure inspection - Suspected part:		

4	☐ Perform all road tests and enter checks in required inspection items.			AT-57
	4-1.	Check before engine is started		AT-61
		☐ AT-178, "A/T Check Indicator Lamp Does Not Come On" ☐ Perform self-diagnostics. Enter checks for detected items. AT-92,AT-99		
			☐ DTC U1000 CAN COMM CIRCUIT AT-102 ☐ DTC P0615 STARTER RELAY AT-105 ☐ DTC P0700 TRANSMISSION CONTROL AT-109 ☐ DTC P0705 TRANSMISSION RANGE SWITCH A AT-110 ☐ DTC P0717 INPUT SPEED SENSOR A AT-113 ☐ DTC P0720 OUTPUT SPEED SENSOR AT-115 ☐ DTC P0725 ENGINE SPEED AT-120 ☐ DTC P0731 1GR INCORRECT RATIO AT-122 ☐ DTC P0732 2GR INCORRECT RATIO AT-124 ☐ DTC P0733 3GR INCORRECT RATIO AT-126 ☐ DTC P0734 4GR INCORRECT RATIO AT-128 ☐ DTC P0735 5GR INCORRECT RATIO AT-130 ☐ DTC P0740 TORQUE CONVERTER AT-132 ☐ DTC P0744 TORQUE CONVERTER AT-134 ☐ DTC P0745 PRESSURE CONTROL SOLENOID A AT-136 ☐ DTC P1705 TP SENSOR AT-138 ☐ DTC P1710 TRANSMISSION FLUID TEMPERATURE SENSOR AT-140 ☐ DTC P1721 VEHICLE SPEED SIGNAL AT-145 ☐ DTC P1730 INTERLOCK AT-147 ☐ DTC P1731 1ST ENGINE BRAKING AT-149 ☐ DTC P1752 INPUT CLUTCH SOLENOID AT-151 ☐ DTC P1757 FRONT BRAKE SOLENOID AT-153 ☐ DTC P1762 DIRECT CLUTCH SOLENOID AT-155 ☐ DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID AT-157 ☐ DTC P1772 LOW COAST BRAKE SOLENOID AT-159 ☐ DTC P1774 LOW COAST BRAKE SOLENOID AT-161 ☐ DTC P1815 M-MODE SWITCH AT-163	
	4-2.	Check at Idle		AT-61
		☐ AT-178, "Engine Cannot Be Started in "P" or "N" Position" ☐ AT-179, "In "P" Position, Vehicle Moves When Pushed" ☐ AT-179, "In "N" Position, Vehicle Moves" ☐ AT-180, "Large Shock ("N" to "D" Position)" ☐ AT-182, "Vehicle Does Not Creep Backward in "R" Position" ☐ AT-184, "Vehicle Does Not Creep Forward in "D" Position"		
	4-3.	Cruise Test		AT-61
		Part 1		
		☐ AT-185, "Vehicle Cannot Be Started from D_1" ☐ AT-187, "A/T Does Not Shift: $D_1 \rightarrow D_2$" ☐ AT-189, "A/T Does Not Shift: $D_2 \rightarrow D_3$" ☐ AT-190, "A/T Does Not Shift: $D_3 \rightarrow D_4$" ☐ AT-192, "A/T Does Not Shift: $D_4 \rightarrow D_5$" ☐ AT-194, "A/T Does Not Lock-up" ☐ AT-195, "A/T Does Not Hold Lock-up Condition" ☐ AT-196, "Lock-up Is Not Released" ☐ AT-197, "Engine Speed Does Not Return to Idle"		

		Part 2		AT-61
		☐ AT-185, "Vehicle Cannot Be Started from D1" ☐ AT-187, "A/T Does Not Shift: D1→ D2" ☐ AT-189, "A/T Does Not Shift: D2→ D3" ☐ AT-190, "A/T Does Not Shift: D3→ D4"		
		Part 3		AT-61
		☐ AT-198, "Cannot Be Changed to Manual Mode" ☐ AT-198, "A/T Does Not Shift: 5GR → 4GR" ☐ AT-199, "A/T Does Not Shift: 4GR → 3GR" ☐ AT-201, "A/T Does Not Shift: 3GR → 2GR" ☐ AT-202, "A/T Does Not Shift: 2GR → 1GR" ☐ AT-203, "Vehicle Does Not Decelerate by Engine Brake" ☐ Perform self-diagnostics. Enter checks for detected items. AT-92, AT-99		
4	4-3		☐ DTC U1000 CAN COMM CIRCUIT AT-102 ☐ DTC P0615 STARTER RELAY AT-105 ☐ DTC P0700 TRANSMISSION CONTROL AT-109 ☐ DTC P0705 TRANSMISSION RANGE SWITCH A AT-110 ☐ DTC P0717 INPUT SPEED SENSOR A AT-113 ☐ DTC P0720 OUTPUT SPEED SENSOR AT-115 ☐ DTC P0725 ENGINE SPEED AT-120 ☐ DTC P0731 1GR INCORRECT RATIO AT-122 ☐ DTC P0732 2GR INCORRECT RATIO AT-124 ☐ DTC P0733 3GR INCORRECT RATIO AT-126 ☐ DTC P0734 4GR INCORRECT RATIO AT-128 ☐ DTC P0735 5GR INCORRECT RATIO AT-130 ☐ DTC P0740 TORQUE CONVERTER AT-132 ☐ DTC P0744 TORQUE CONVERTER AT-134 ☐ DTC P0745 PRESSURE CONTROL SOLENOID A AT-136 ☐ DTC P1705 TP SENSOR AT-138 ☐ DTC P1710 TRANSMISSION FLUID TEMPERATURE SENSOR AT-140 ☐ DTC P1721 VEHICLE SPEED SIGNAL AT-145 ☐ DTC P1730 INTERLOCK AT-147 ☐ DTC P1731 1ST ENGINE BRAKING AT-149 ☐ DTC P1752 INPUT CLUTCH SOLENOID AT-151 ☐ DTC P1757 FRONT BRAKE SOLENOID AT-153 ☐ DTC P1762 DIRECT CLUTCH SOLENOID AT-155 ☐ DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID AT-157 ☐ DTC P1772 LOW COAST BRAKE SOLENOID AT-159 ☐ DTC P1774 LOW COAST BRAKE SOLENOID AT-161 ☐ DTC P1815 M-MODE SWITCH AT-163	
5	☐ Inspect each system for items found to be NG in the self-diagnostics and repair or replace the malfunctioning parts.			
6	☐ Perform all road tests and enter the checks again for the required items.			AT-57
7	☐ For any remaining NG items, perform the “Diagnostics Procedure” and repair or replace the malfunctioning parts. See the chart for diagnostics by symptoms. (This chart also contains other symptoms and inspection procedures.)			AT-67
8	☐ Erase the results of the self-diagnostics from the TCM.			AT-92, AT-99

A/T Electrical Parts Location

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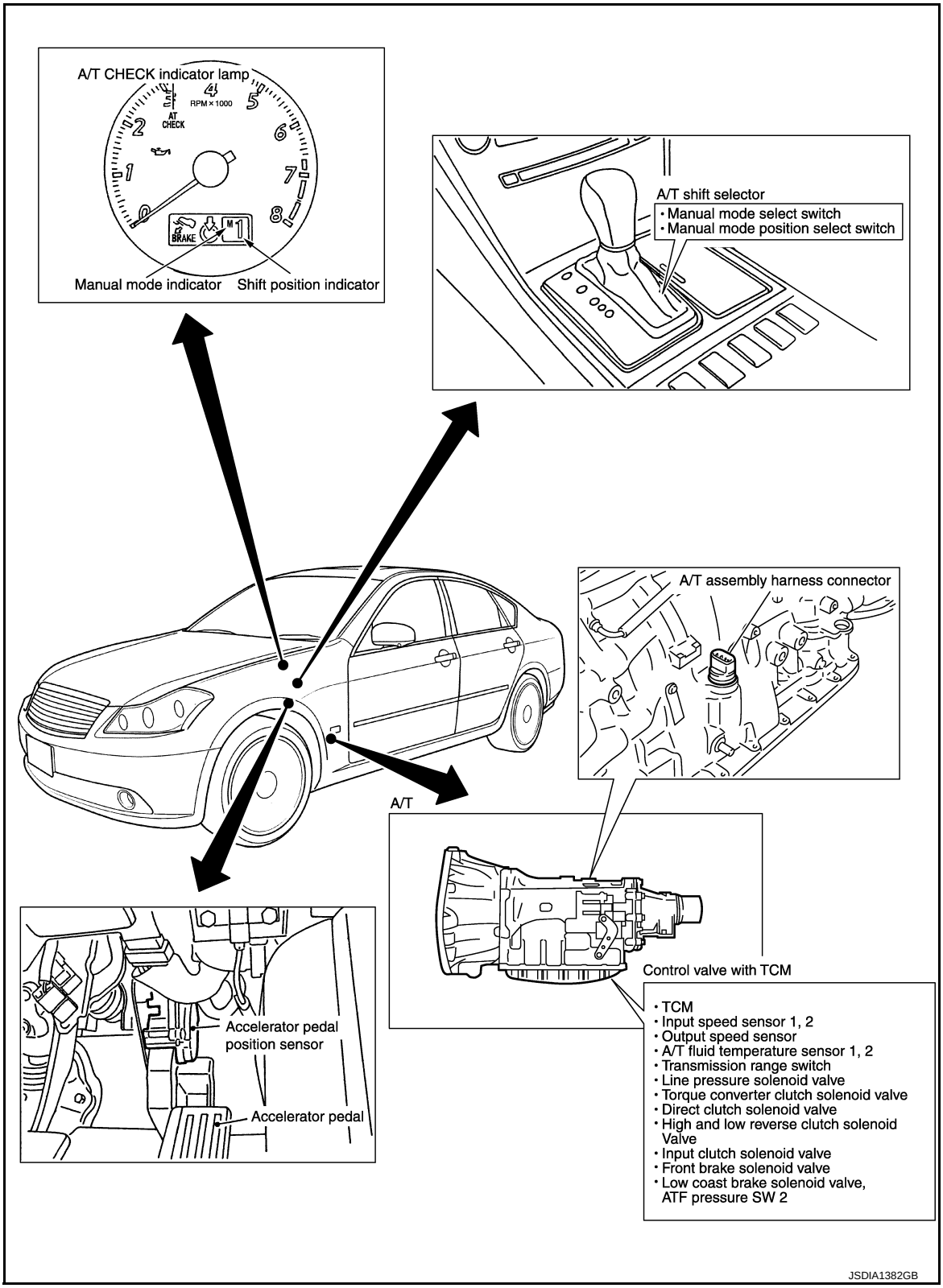

Circuit Diagram

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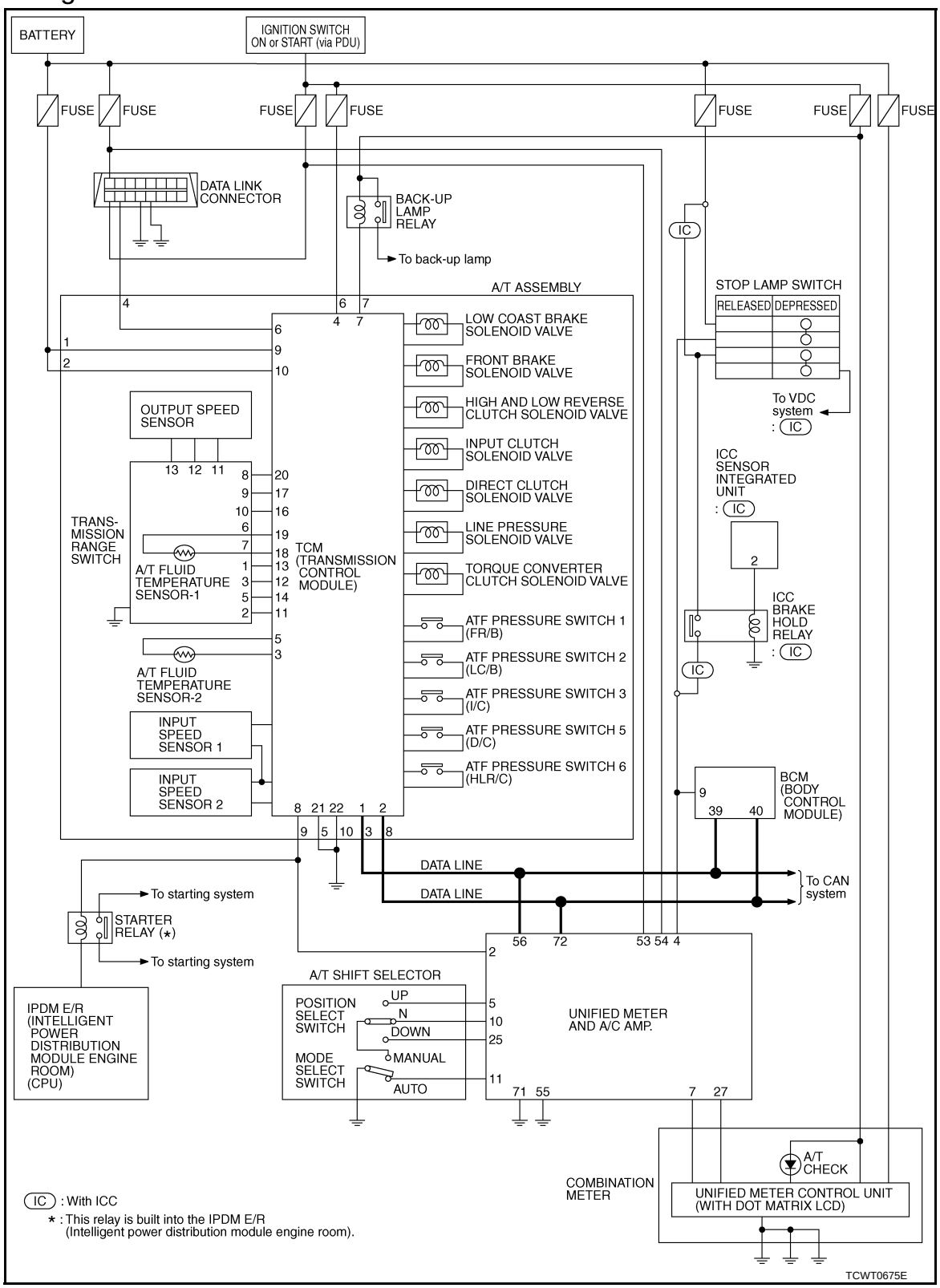

Inspections Before Trouble Diagnosis

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A/T FLUID CHECK (VK45DE MODELS ONLY)

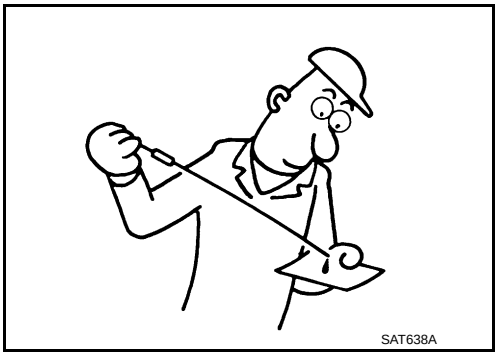
A/T Fluid Leakage and A/T Fluid Level Check

Inspect for A/T fluid leakage and check the A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

A/T Fluid Condition Check

Inspect the A/T fluid condition.

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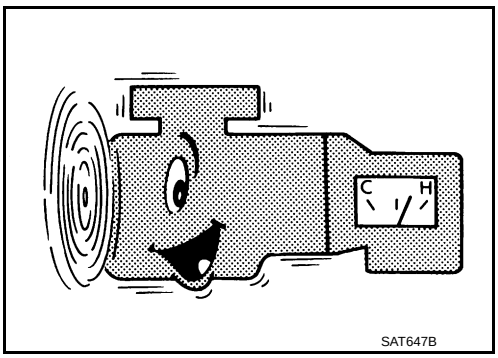
STALL TEST

Stall Test Procedure

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



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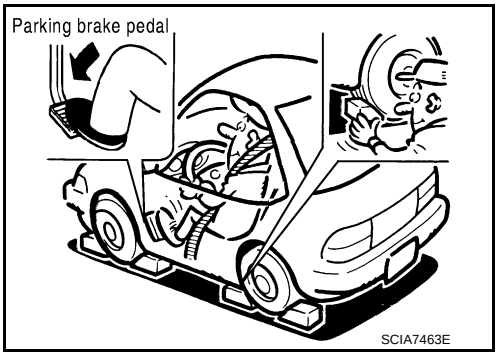
3. Securely engage the parking brake so that the tires do not turn.



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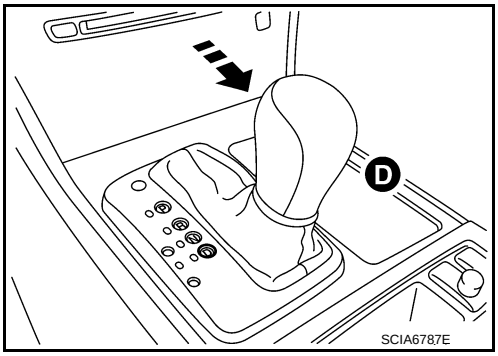
4. Engine start, apply foot brake, and place selector lever in “D” position.



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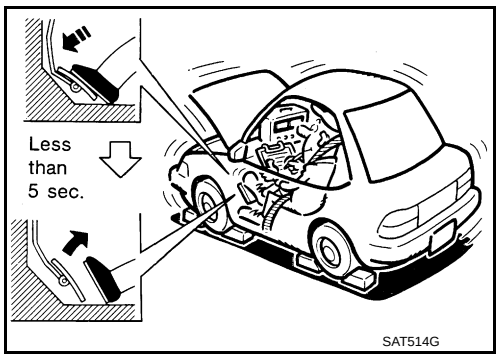
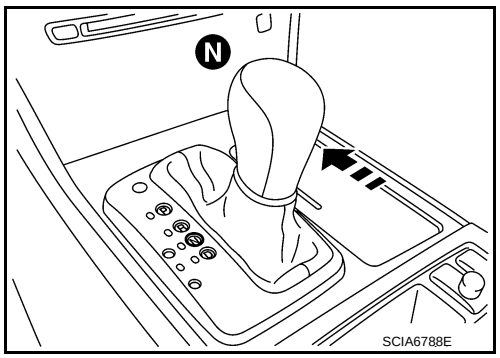
5. While holding down the foot brake, gradually press down the accelerator pedal.
6. Quickly read off the stall speed, then quickly remove your foot from the accelerator pedal.
   CAUTION:
   Never hold down the accelerator pedal for more than 5 seconds during this test.



Stall speed

VQ35HR models:	**2,700 - 3,000 rpm**
VK45DE models:	**2,260 - 2,560 rpm**

7. Move the selector lever to the “N” position.
8. Cool down the ATF.
   CAUTION:
   Run the engine at idle for at least 1 minute.
9. Repeat steps 5 through 8 with selector lever in “R” position.



Judgment of Stall Test

	Selector lever position		Possible location of malfunction
	“D”, “M”	“R”	
Stall speed	H	O	• Forward brake • Forward one-way clutch • 1st one-way clutch • 3rd one-way clutch
	O	H	• Reverse brake
	L	L	• Engine and torque converter one-way clutch
	H	H	• Line pressure low

O: Stall speed within standard value position

H: Stall speed higher than standard value

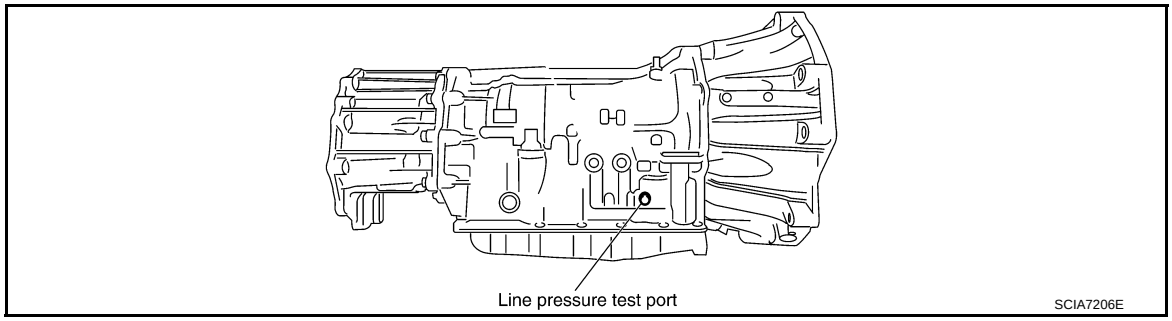
L: Stall speed lower than standard value

Stall test standard value position

Does not shift-up “D” or “M” position 1 → 2	Slipping in 2GR, 3GR or 4GR	Direct clutch slippage
Does not shift-up “D” or “M” position 2 → 3	Slipping in 3GR, 4GR or 5GR	High and low reverse clutch slippage
Does not shift-up “D” or “M” position 3 → 4	Slipping in 4GR or 5GR	Input clutch slippage
Does not shift-up “D” or “M” position 4 → 5	Slipping in 5GR	Front brake slippage

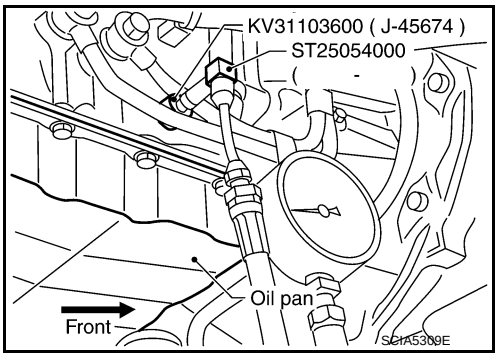
LINE PRESSURE TEST

Line Pressure Test Port

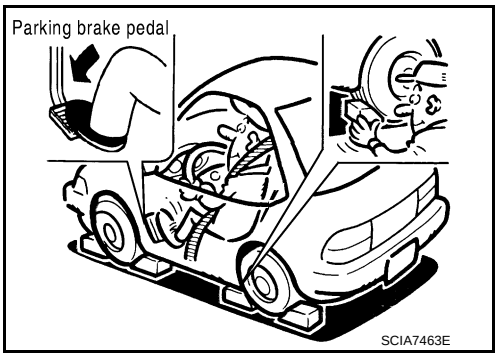


Line Pressure Test Procedure

1. Inspect the amount of engine oil and replenish if necessary.
2. Drive the car for about 10 minutes to warm it up so that the ATF reaches in range of 50 to 80°C (122 to 176°F), then inspect the amount of ATF and replenish if necessary.
   NOTE:
   The A/T fluid temperature rises in range of 50 to 80°C (122 to 176°F) during 10 minutes of driving.
3. Remove the front propeller shaft from vehicle (with AWD models). Refer to PR-5, "Removal and Installation".
4. After warming up remove the oil pressure detection plug and install the oil pressure gauge [ST2505S001(J-34301-C)].
   CAUTION:
   When using the oil pressure gauge, be sure to use the O-ring attached to the oil pressure detection plug.



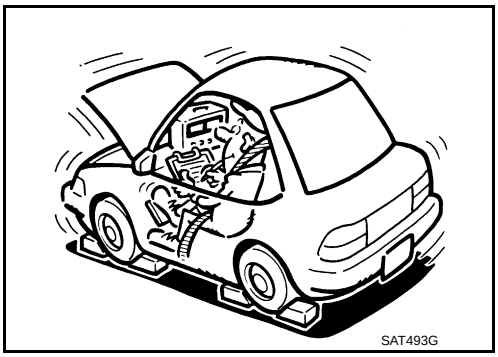
5. Securely engage the parking brake so that the tires do not turn.



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

   : 7.3 N·m (0.74 kg-m, 65 in-lb)

   CAUTION:
   - **Never reuse O-ring.**



- **Apply ATF to O-ring.**

Line Pressure

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

Judgment of Line Pressure Test

Judgment		Possible cause
Idle speed	Low for all positions ("P", "R", "N", "D", "M")	Possible causes include malfunctions in the pressure supply system and low oil pump output. For example • Oil pump wear • Pressure regulator valve or plug sticking or spring fatigue • Oil strainer ⇒ oil pump ⇒ pressure regulator valve passage oil leak • Engine idle speed too low
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.
	High	Possible causes include a sensor malfunction or malfunction in the line pressure adjustment function. For example • Accelerator pedal position signal malfunction • A/T fluid temperature sensor malfunction • Line pressure solenoid malfunction (sticking in OFF state, filter clog, cut line) • Pressure regulator valve or plug sticking
Stall speed	Oil pressure does not rise higher than the oil pressure for idle.	Possible causes include a sensor malfunction or malfunction in the pressure adjustment function. For example • Accelerator pedal position signal malfunction • TCM breakdown • Line pressure solenoid malfunction (shorting, sticking in ON state) • Pressure regulator valve or plug sticking • Pilot valve sticking or pilot filter clogged
	The pressure rises, but does not enter the standard position.	Possible causes include malfunctions in the pressure supply system and malfunction in the pressure adjustment function. For example • Accelerator pedal position signal malfunction • Line pressure solenoid malfunction (sticking, filter clog) • Pressure regulator valve or plug sticking • Pilot valve sticking or pilot filter clogged
	Only low for a specific position	Possible causes include an oil pressure leak in a passage or device related to the position after the pressure is distributed by the manual valve.

Road Test

INFOID:0000000005352428

DESCRIPTION

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

1. Check before engine is started.
2. Check at idle.
3. Cruise test
   - Inspect all the items Part 1 to Part 3.

- Before beginning the road test, check the procedure and inspection items.
- Test all inspection items until the symptom is uncovered. Include NG items in "Diagnostic Worksheet Chart" (Refer to AT-51). Perform a diagnosis of the NG items after the completion of all the road test.

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.

Does A/T CHECK indicator lamp light up for about 2 seconds?

YES - 1>> **With CONSULT-III**
1. Select “SELF-DIAG RESULTS” in “TRANSMISSION” with CONSULT-III and record all NG items on the “Diagnostic Worksheet Chart”.
2. Go to “CHECK AT IDLE”.

YES - 2>> **Without CONSULT-III**
1. Perform self-diagnostics and record all NG items on the “Diagnostic Worksheet Chart”. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".
2. Go to “CHECK AT IDLE”.

NO >> Stop the road test and go to AT-178, "A/T Check Indicator Lamp Does Not Come On".

CHECK AT IDLE

1.CHECK STARTING THE ENGINE

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

Does the engine start?

YES >> GO TO 2.
NO >> Stop the road test and go to AT-178, "Engine Cannot Be Started in "P" or "N" Position".

2.CHECK STARTING THE ENGINE

1. Turn ignition switch ON.
2. Move selector lever to “D”, “M” or “R” position.
3. Start engine.

Does the engine start in any positions?

YES >> Stop the road test and go to AT-178, "Engine Cannot Be Started in "P" or "N" Position".
NO >> GO TO 3.

3.CHECK “P” POSITION FUNCTIONS

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

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

YES >> Enter a check mark at AT-179, "In "P" Position, Vehicle Moves When Pushed" on the “Diagnostic Worksheet Chart”, GO TO 4.
NO >> GO TO 4.

4.CHECK “N” POSITION FUNCTIONS

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

Does vehicle move forward or backward?

YES >> Enter a check mark at AT-179, "In "N" Position, Vehicle Moves" on the “Diagnostic Worksheet Chart”, GO TO 5.
NO >> GO TO 5.

5.CHECK SHIFT SHOCK

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

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

YES >> Enter a check mark at AT-180, "Large Shock ("N" to "D" Position)" on the “Diagnostic Worksheet Chart”, GO TO 6.
NO >> GO TO 6.

6. CHECK “R” POSITION FUNCTIONS

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

Does the vehicle creep backward?

YES >> GO TO 7.
NO >> Enter a check mark at AT-182, "Vehicle Does Not Creep Backward in "R" Position" on the “Diagnostic Worksheet Chart”, GO TO 7.

7. CHECK “D” POSITION FUNCTIONS

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

Does the vehicle creep forward in the “D” position?

YES >> Go to “CRUISE TEST - PART 1”.
NO >> Enter a check mark at AT-184, "Vehicle Does Not Creep Forward in "D" Position" on the “Diagnostic Worksheet Chart”, then continue the road test. Go to “CRUISE TEST - PART 1”.

CRUISE TEST - PART 1

1. CHECK STARTING OUT FROM D1

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

With CONSULT-III

Read the value of “GEAR”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

Starts from D1?

YES >> GO TO 2.
NO >> Enter a check mark at AT-185, "Vehicle Cannot Be Started from D1" on the “Diagnostic Worksheet Chart”, GO TO 2.

2. CHECK SHIFT-UP D1 → D2

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up (D1 → D2) at the appropriate speed. Refer to AT-66, "Vehicle Speed at Which Gear Shifting Occurs".

With CONSULT-III

Read the value of “GEAR”, “ACCELE POSI” and “VEHCLE SPEED” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

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

YES >> GO TO 3.
NO >> Enter a check mark at AT-187, "A/T Does Not Shift: D1→ D2" on the “Diagnostic Worksheet Chart”, GO TO 3.

3. CHECK SHIFT-UP D2 → D3

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up (D2 → D3) at the appropriate speed. Refer to AT-66, "Vehicle Speed at Which Gear Shifting Occurs".

With CONSULT-III

Read the value of “GEAR”, “ACCELE POSI” and “VEHCLE SPEED” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

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

YES >> GO TO 4.

NO >> Enter a check mark at AT-189, "A/T Does Not Shift: D2→ D3" on the “Diagnostic Worksheet Chart”, GO TO 4.

4.CHECK SHIFT-UP D3 → D4

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up (D3 → D4) at the appropriate speed. Refer to AT-66, "Vehicle Speed at Which Gear Shifting Occurs".

With CONSULT-III

Read the value of “GEAR”, “ACCELE POSI” and “VEHCLE SPEED” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

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

YES >> GO TO 5.
NO >> Enter a check mark at AT-190, "A/T Does Not Shift: D3→ D4" on the “Diagnostic Worksheet Chart”, GO TO 5.

5.CHECK SHIFT-UP D4 → D5

Press down the accelerator pedal about half-way and inspect if the vehicle shifts up (D4 → D5) at the appropriate speed. Refer to AT-66, "Vehicle Speed at Which Gear Shifting Occurs".

With CONSULT-III

Read the value of “GEAR”, “ACCELE POSI” and “VEHCLE SPEED” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

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

YES >> GO TO 6.
NO >> Enter a check mark at AT-192, "A/T Does Not Shift: D4→ D5" on the “Diagnostic Worksheet Chart”, GO TO 6.

6.CHECK LOCK-UP

When releasing accelerator pedal (closed throttle position signal: OFF) from D5, check lock-up from D5 to L/U. Refer to AT-66, "Vehicle Speed at Which Gear Shifting Occurs".

With CONSULT-III

Select “TCC SOLENOID” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

Does it lock-up?

YES >> GO TO 7.
NO >> Enter a check mark at AT-194, "A/T Does Not Lock-up" on the “Diagnostic Worksheet Chart”, GO TO 7.

7.CHECK LOCK-UP HOLD

Check hold lock-up.

With CONSULT-III

Select “TCC SOLENOID” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

Does it maintain lock-up status?

YES >> GO TO 8.
NO >> Enter a check mark at AT-195, "A/T Does Not Hold Lock-up Condition" on the “Diagnostic Worksheet Chart”, then continue the road test.

8.CHECK LOCK-UP RELEASE

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

With CONSULT-III

Select “TCC SOLENOID” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

Does lock-up cancel?

YES >> GO TO 9.
NO >> Enter a check mark at AT-196, "Lock-up Is Not Released" on the “Diagnostic Worksheet Chart”, GO TO 9.

9.CHECK SHIFT-DOWN D5 → D4

Decelerate by pressing lightly on the brake pedal.

With CONSULT-III

Read the value of “GEAR” and “ENGINE SPEED” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

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

YES >> 1. Stop the vehicle.
2. Go to “CRUISE TEST - PART 2”.

NO >> Enter a check mark at AT-197, "Engine Speed Does Not Return to Idle" on the “Diagnostic Worksheet Chart”, then continue the road test. Go to “CRUISE TEST - PART 2”.

CRUISE TEST - PART 2

1. CHECK STARTING FROM D1

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

With CONSULT-III

Read the value of “GEAR” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

Does it start from D1?

YES >> GO TO 2.

NO >> Enter a check mark at AT-185, "Vehicle Cannot Be Started from D1" on the “Diagnostic Worksheet Chart”, GO TO 2.

2. CHECK SHIFT-UP D1 → D2

Press the accelerator pedal down all the way and inspect whether or not the A/T shifts up (D1 → D2) at the correct speed. Refer to AT-66, "Vehicle Speed at Which Gear Shifting Occurs".

With CONSULT-III

Read the value of “GEAR”, “ACCELE POSI” and “VEHCLE SPEED” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

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

YES >> GO TO 3.

NO >> Enter a check mark at AT-187, "A/T Does Not Shift: D1→ D2" on the “Diagnostic Worksheet Chart”, GO TO 3.

3. CHECK SHIFT-UP D2 → D3

Press the accelerator pedal down all the way and inspect whether or not the A/T shifts up (D2 → D3) at the correct speed. Refer to AT-66, "Vehicle Speed at Which Gear Shifting Occurs".

With CONSULT-III

Read the value of “GEAR”, “ACCELE POSI” and “VEHCLE SPEED” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

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

YES >> GO TO 4.

NO >> Enter a check mark at AT-189, "A/T Does Not Shift: D2→ D3" on the “Diagnostic Worksheet Chart”, GO TO 4.

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

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

With CONSULT-III

Read the value of “GEAR” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

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”.

NO >> Enter a check mark at AT-190, "A/T Does Not Shift: D3→ D4" on the “Diagnostic Worksheet Chart”, then continue the road test. Go to “CRUISE TEST - PART 3”.

CRUISE TEST - PART 3

1.MANUAL MODE FUNCTION

Move to manual mode from “D” position.

Does it switch to manual mode?

YES >> GO TO 2.
NO >> Continue road test and add check mark to AT-198, "Cannot Be Changed to Manual Mode" on the “Diagnostic Worksheet Chart”, GO TO 2.

2.CHECK SHIFT-DOWN

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

With CONSULT-III
Read the value of “GEAR” in “DATA MONITOR” in “TRANSMISSION”. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

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 “Diagnostic Worksheet Chart”, GO TO 3.

3.CHECK ENGINE BRAKE

Check engine brake.

Does engine braking effectively reduce speed in M1 position?

YES - 1>> **With CONSULT-III**
1. Stop the vehicle.
2. Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

YES - 2>> **Without CONSULT-III**
1. Stop the vehicle.
2. Perform self-diagnostics. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

NO - 1 >> **With CONSULT-III**
1. Enter a check mark at AT-203, "Vehicle Does Not Decelerate by Engine Brake" on the “Diagnostic Worksheet Chart”.
2. Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

NO - 2 >> **Without CONSULT-III**
1. Enter a check mark at AT-203, "Vehicle Does Not Decelerate by Engine Brake" on the “Diagnostic Worksheet Chart”.
2. Perform self-diagnostics. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Vehicle Speed at Which Gear Shifting Occurs

INFOID:0000000005352429

2WD MODELS

Engine model	Throttle position	Vehicle speed km/h (MPH)							
		D1→D2	D2→D3	D3→D4	D4→D5	D5→D4	D4→D3	D3→D2	D2→D1
VK45DE	Full throttle	56 - 60 (35 - 37)	89 - 97 (55 - 60)	138 - 148 (86 - 92)	206 - 216 (128 - 134)	202 - 212 (126 - 132)	121 - 131 (75 - 81)	73 - 81 (45 - 50)	30 - 34 (19 - 21)
	Half throttle	50 - 54 (31 - 34)	82 - 88 (51 - 55)	126 - 134 (78 - 83)	155 - 163 (96 - 101)	128 - 136 (80 - 85)	70 - 78 (43 - 48)	29 - 35 (18 - 22)	9 - 13 (6 - 8)

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

AWD MODELS

Engine model	Throttle position	Vehicle speed km/h (MPH)							
		D1→D2	D2→D3	D3→D4	D4→D5	D5→D4	D4→D3	D3→D2	D2→D1
VQ35HR	Full throttle	57 - 61 (36 - 37)	93 - 101 (58 - 62)	140 - 150 (87 - 93)	202 - 212 (126 - 131)	183 - 193 (114 - 119)	108 - 118 (68 - 73)	66 - 74 (42 - 45)	27 - 31 (17 - 19)
	Half throttle	48 - 52 (30 - 32)	79 - 85 (50 - 52)	111 - 119 (69 - 73)	139 - 147 (87 - 91)	106 - 114 (66 - 70)	64 - 72 (40 - 44)	33 - 39 (21 - 24)	9 - 13 (6 - 8)

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

Engine model	Throttle position	Vehicle speed km/h (MPH)							
		$D_1 \rightarrow D_2$	$D_2 \rightarrow D_3$	$D_3 \rightarrow D_4$	$D_4 \rightarrow D_5$	$D_5 \rightarrow D_4$	$D_4 \rightarrow D_3$	$D_3 \rightarrow D_2$	$D_2 \rightarrow D_1$
VK45DE	Full throttle	56 - 60 (35 - 37)	89 - 97 (55 - 60)	138 - 148 (86 - 92)	206 - 216 (128 - 134)	202 - 212 (126 - 132)	121 - 131 (75 - 81)	73 - 81 (45 - 50)	30 - 34 (19 - 21)
	Half throttle	50 - 54 (31 - 34)	82 - 88 (51 - 55)	126 - 134 (78 - 83)	155 - 163 (96 - 101)	128 - 136 (80 - 85)	70 - 78 (43 - 48)	29 - 35 (18 - 22)	9 - 13 (6 - 8)

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

Vehicle Speed at Which Lock-Up Occurs/Releases

INFOID:0000000005352430

2WD MODELS

Engine model	Throttle position	Vehicle speed km/h (MPH)	
		Lock-up ON	Lock-up OFF
VK45DE	Closed throttle	53 - 61 (33 - 38)	50 - 58 (31 - 36)
	Half throttle	196 - 204 (122 - 127)	138 - 146 (86 - 91)

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

AWD MODELS

Engine model	Throttle position	Vehicle speed km/h (MPH)	
		Lock-up ON	Lock-up OFF
VQ35HR	Closed throttle	51 - 59 (32 - 36)	48 - 56 (30 - 34)
	Half throttle	203 - 211 (127 - 131)	139 - 147 (87 - 91)

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

Engine model	Throttle position	Vehicle speed km/h (MPH)	
		Lock-up ON	Lock-up OFF
VK45DE	Closed throttle	53 - 61 (33 - 38)	50 - 58 (31 - 36)
	Half throttle	196 - 204 (122 - 127)	138 - 146 (86 - 91)

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

Symptom Chart

INFOID:0000000005352431

- The diagnostics item numbers show the sequence for inspection. Inspect in order from item 1.
- Overhaul and inspection inside the A/T only if A/T fluid condition is NG. Refer to AT-57, "Inspections Before Trouble Diagnosis".

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
1	Shift Shock	Large shock. (“N” → “D” position) Refer to AT-180, "Large Shock ("N" to "D" Position)".	ON vehicle	1. Engine idle speed	EC-26 (for VQ35HR engine), EC-763 (for VK45DE engine)
				2. Engine speed signal	AT-120
				3. Accelerator pedal position sensor	AT-138
				4. A/T position	AT-209
				5. A/T fluid temperature sensor	AT-140
				6. Front brake solenoid valve	AT-153
				7. CAN communication line	AT-102
				8. A/T fluid level and state (VK45DE)	AT-57
				9. Line pressure test	AT-57
				10. Control valve with TCM	AT-217
			OFF vehicle	11. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
2		Shock is too large when changing $D_1 \rightarrow D_2$ or $M_1 \rightarrow M_2$.	ON vehicle	1. Accelerator pedal position sensor	AT-138
				2. A/T position	AT-209
				3. Direct clutch solenoid valve	AT-155
				4. CAN communication line	AT-102
				5. Engine speed signal	AT-120
				6. Input speed sensor	AT-113
				7. Output speed sensor and vehicle speed signal	AT-115, AT-145
				8. A/T fluid level and state (VK45DE)	AT-57
				9. Control valve with TCM	AT-217
			OFF vehicle	10. Direct clutch	AT-305

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
3	Shift Shock	Shock is too large when changing $D_2 \rightarrow D_3$ or $M_2 \rightarrow M_3$.	ON vehicle	1. Accelerator pedal position sensor	AT-138
				2. A/T position	AT-209
				3. High and low reverse clutch solenoid valve	AT-157
				4. CAN communication line	AT-102
				5. Engine speed signal	AT-120
				6. Input speed sensor	AT-113
				7. Output speed sensor and vehicle speed signal	AT-115, AT-145
				8. A/T fluid level and state (VK45DE)	AT-57
				9. Control valve with TCM	AT-217
			OFF vehicle	10. High and low reverse clutch	AT-303
4		Shock is too large when changing $D_3 \rightarrow D_4$ or $M_3 \rightarrow M_4$.	ON vehicle	1. Accelerator pedal position sensor	AT-138
				2. A/T position	AT-209
				3. Input clutch solenoid valve	AT-151
				4. CAN communication line	AT-102
				5. Engine speed signal	AT-120
				6. Input speed sensor	AT-113
				7. Output speed sensor and vehicle speed signal	AT-115, AT-145
				8. A/T fluid level and state (VK45DE)	AT-57
				9. Control valve with TCM	AT-217
			OFF vehicle	10. Input clutch	AT-291
5		Shock is too large when changing $D_4 \rightarrow D_5$ or $M_4 \rightarrow M_5$.	ON vehicle	1. Accelerator pedal position sensor	AT-138
				2. A/T position	AT-209
				3. Front brake solenoid valve	AT-153
				4. CAN communication line	AT-102
				5. Engine speed signal	AT-120
				6. Input speed sensor	AT-113
				7. Output speed sensor and vehicle speed signal	AT-115, AT-145
				8. A/T fluid level and state (VK45DE)	AT-57
				9. Control valve with TCM	AT-217
			OFF vehicle	10. Front brake (brake band)	AT-268
				11. Input clutch	AT-291

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
6	Shift Shock	Shock is too large for downshift when accelerator pedal is pressed.	ON vehicle	1. Accelerator pedal position sensor	AT-138
				2. A/T position	AT-209
				3. CAN communication line	AT-102
				4. Engine speed signal	AT-120
				5. Input speed sensor	AT-113
				6. Output speed sensor and vehicle speed signal	AT-115, AT-145
				7. A/T fluid level and state (VK45DE)	AT-57
				8. Control valve with TCM	AT-217
			OFF vehicle	9. Front brake (brake band)	AT-268
				10. Input clutch	AT-291
				11. High and low reverse clutch	AT-303
				12. Direct clutch	AT-305
7		Shock is too large for upshift when accelerator pedal is released.	ON vehicle	1. Accelerator pedal position sensor	AT-138
				2. A/T position	AT-209
				3. Engine speed signal	AT-120
				4. CAN communication line	AT-102
				5. Input speed sensor	AT-113
				6. Output speed sensor and vehicle speed signal	AT-115, AT-145
				7. A/T fluid level and state (VK45DE)	AT-57
				8. Control valve with TCM	AT-217
			OFF vehicle	9. Front brake (brake band)	AT-268
				10. Input clutch	AT-291
				11. High and low reverse clutch	AT-303
				12. Direct clutch	AT-305
8		Shock is too large for lock-up.	ON vehicle	1. Accelerator pedal position sensor	AT-138
				2. A/T position	AT-209
				3. Engine speed signal	AT-120
				4. CAN communication line	AT-102
				5. Input speed sensor	AT-113
				6. Output speed sensor and vehicle speed signal	AT-115, AT-145
				7. Torque converter clutch solenoid valve	AT-132
				8. A/T fluid level and state (VK45DE)	AT-57
				9. Control valve with TCM	AT-217
			OFF vehicle	10. Torque converter	AT-268

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
9	Shift Shock	Shock is too large during engine brake.	ON vehicle	1. Accelerator pedal position sensor	AT-138
				2. A/T position	AT-209
				3. CAN communication line	AT-102
				4. A/T fluid level and state (VK45DE)	AT-57
				5. Control valve with TCM	AT-217
			OFF vehicle	6. Front brake (brake band)	AT-268
				7. Input clutch	AT-291
				8. High and low reverse clutch	AT-303
				9. Direct clutch	AT-305
10	No Up Shift	Gear does not change from $D_1 \rightarrow D_2$ or from $M_1 \rightarrow M_2$. Refer to AT-187, "A/T Does Not Shift: $D_1 \rightarrow D_2$".	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Direct clutch solenoid valve	AT-155
				4. Line pressure test	AT-57
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Direct clutch	AT-305
11		Gear does not change from $D_2 \rightarrow D_3$ or from $M_2 \rightarrow M_3$. Refer to AT-189, "A/T Does Not Shift: $D_2 \rightarrow D_3$".	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. High and low reverse clutch solenoid valve	AT-157
				4. Line pressure test	AT-57
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. High and low reverse clutch	AT-303
12		Gear does not change from $D_3 \rightarrow D_4$ or from $M_3 \rightarrow M_4$. Refer to AT-190, "A/T Does Not Shift: $D_3 \rightarrow D_4$".	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Input clutch solenoid valve	AT-151
				4. Front brake solenoid valve	AT-153
				5. Line pressure test	AT-57
				6. CAN communication line	AT-102
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Input clutch	AT-291
13		Gear does not change from $D_4 \rightarrow D_5$ or from $M_4 \rightarrow M_5$. Refer to AT-192, "A/T Does Not Shift: $D_4 \rightarrow D_5$".	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Front brake solenoid valve	AT-153
				4. Direct clutch solenoid valve	AT-155
				5. Input speed sensor	AT-113
				6. Line pressure test	AT-57
				7. CAN communication line	AT-102
				8. Control valve with TCM	AT-217
			OFF vehicle	9. Front brake (brake band)	AT-268
				10. Input clutch	AT-291

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
14	No Down Shift	In “D” or “M” position, does not downshift to 4GR.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Front brake solenoid valve	AT-153
				4. Direct clutch solenoid valve	AT-155
				5. CAN communication line	AT-102
				6. Line pressure test	AT-57
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Front brake (brake band)	AT-268
				9. Input clutch	AT-291
15		In “D” or “M” position, does not downshift to 3GR.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Input clutch solenoid valve	AT-151
				4. Front brake solenoid valve	AT-153
				5. CAN communication line	AT-102
				6. Line pressure test	AT-57
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Input clutch	AT-291
16		In “D” or “M” position, does not downshift to 2GR.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. High and low reverse clutch solenoid valve	AT-157
				4. CAN communication line	AT-102
				5. Line pressure test	AT-57
				6. Control valve with TCM	AT-217
			OFF vehicle	7. High and low reverse clutch	AT-303
17		In “D” or “M” position, does not downshift to 1GR.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Direct clutch solenoid valve	AT-155
				4. CAN communication line	AT-102
				5. Line pressure test	AT-57
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Direct clutch	AT-305

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
18	Slips/Will Not Engage	When “D” or “M” position, remains in 1GR.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Direct clutch solenoid valve	AT-155
				4. Line pressure test	AT-57
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. 3rd one-way clutch	AT-289
				8. 1st one-way clutch	AT-297
				9. Gear system	AT-251
				10. Reverse brake	AT-268
				11. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
19		When “D” or “M” position, remains in 2GR.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Low coast brake solenoid valve	AT-159
				4. Line pressure test	AT-57
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. 3rd one-way clutch	AT-289
				8. Gear system	AT-251
				9. Direct clutch	AT-305
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
20	Slips/Will Not Engage	When “D” or “M” position, remains in 3GR.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Line pressure test	AT-57
				4. CAN communication line	AT-102
				5. Control valve with TCM	AT-217
			OFF vehicle	6. 3rd one-way clutch	AT-289
				7. Gear system	AT-251
				8. High and low reverse clutch	AT-303
				9. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
21		When “D” or “M” position, remains in 4GR.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Input clutch solenoid valve	AT-151
				4. Direct clutch solenoid valve	AT-155
				5. High and low reverse clutch solenoid valve	AT-157
				6. Low coast brake solenoid valve	AT-159
				7. Front brake solenoid valve	AT-153
				8. Line pressure test	AT-57
				9. CAN communication line	AT-102
				10. Control valve with TCM	AT-217
			OFF vehicle	11. Input clutch	AT-291
				12. Gear system	AT-251
				13. High and low reverse clutch	AT-303
				14. Direct clutch	AT-305

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
22	Slips/Will Not Engage	When “D” or “M” position, remains in 5GR.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Front brake solenoid valve	AT-153
				4. Line pressure test	AT-57
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Front brake (brake band)	AT-268
				8. Input clutch	AT-291
				9. Gear system	AT-251
				10. High and low reverse clutch	AT-303
23		Vehicle cannot be started from D1. Refer to AT-185, "Vehicle Cannot Be Started from D1".	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Accelerator pedal position sensor	AT-138
				3. Line pressure test	AT-57
				4. CAN communication line	AT-102
				5. Control valve with TCM	AT-217
			OFF vehicle	6. Torque converter	AT-268
				7. Oil pump assembly	AT-287
				8. 3rd one-way clutch	AT-289
				9. 1st one-way clutch	AT-297
				10. Gear system	AT-251
				11. Reverse brake	AT-268
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
24		Does not lock-up. Refer to AT-194, "A/T Does Not Lock-up".	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Engine speed signal	AT-120
				4. Input speed sensor	AT-113
				5. Torque converter clutch solenoid valve	AT-132
				6. CAN communication line	AT-102
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Torque converter	AT-268
				9. Oil pump assembly	AT-287

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
25	Slips/Will Not Engage	Does not hold lock-up condition. Refer to AT-195, "A/T Does Not Hold Lock-up Condition".	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Engine speed signal	AT-120
				4. Input speed sensor	AT-113
				5. Torque converter clutch solenoid valve	AT-132
				6. CAN communication line	AT-102
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Torque converter	AT-268
				9. Oil pump assembly	AT-287
26		Lock-up is not released. Refer to AT-196, "Lock-up Is Not Released".	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Engine speed signal	AT-120
				4. Input speed sensor	AT-113
				5. Torque converter clutch solenoid valve	AT-132
				6. CAN communication line	AT-102
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Torque converter	AT-268
				9. Oil pump assembly	AT-287
27		No shock at all or the clutch slips when vehicle changes speed $D_1 \rightarrow D_2$ or $M_1 \rightarrow M_2$.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Direct clutch solenoid valve	AT-155
				4. CAN communication line	AT-102
				5. Line pressure test	AT-57
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Torque converter	AT-268
				8. Oil pump assembly	AT-287
				9. 3rd one-way clutch	AT-289
				10. Gear system	AT-251
				11. Direct clutch	AT-305
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
28	Slips/Will Not Engage	No shock at all or the clutch slips when vehicle changes speed $D_2 \rightarrow D_3$ or $M_2 \rightarrow M_3$.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. High and low reverse clutch solenoid valve	AT-157
				4. CAN communication line	AT-102
				5. Line pressure test	AT-57
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Torque converter	AT-268
				8. Oil pump assembly	AT-287
				9. 3rd one-way clutch	AT-289
				10. Gear system	AT-251
				11. High and low reverse clutch	AT-303
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)" AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
29		No shock at all or the clutch slips when vehicle changes speed $D_3 \rightarrow D_4$ or $M_3 \rightarrow M_4$.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Input clutch solenoid valve	AT-151
				4. Front brake solenoid valve	AT-153
				5. CAN communication line	AT-102
				6. Line pressure test	AT-57
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Torque converter	AT-268
				9. Oil pump assembly	AT-287
				10. Input clutch	AT-291
				11. Gear system	AT-251
				12. High and low reverse clutch	AT-303
				13. Direct clutch	AT-305

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
30	Slips/Will Not Engage	No shock at all or the clutch slips when vehicle changes speed $D_4 \rightarrow D_5$ or $M_4 \rightarrow M_5$.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Front brake solenoid valve	AT-153
				4. Direct clutch solenoid valve	AT-155
				5. CAN communication line	AT-102
				6. Line pressure test	AT-57
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Torque converter	AT-268
				9. Oil pump assembly	AT-287
				10. Front brake (brake band)	AT-268
				11. Input clutch	AT-291
				12. Gear system	AT-251
				13. High and low reverse clutch	AT-303
31		When you press the accelerator pedal and shift speed $D_5 \rightarrow D_4$ or $M_5 \rightarrow M_4$ the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Front brake solenoid valve	AT-153
				4. Direct clutch solenoid valve	AT-155
				5. CAN communication line	AT-102
				6. Line pressure test	AT-57
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Torque converter	AT-268
				9. Oil pump assembly	AT-287
				10. Input clutch	AT-291
				11. Gear system	AT-251
				12. High and low reverse clutch	AT-303
				13. Direct clutch	AT-305

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
32	Slips/Will Not Engage	When you press the accelerator pedal and shift speed $D_4 \rightarrow D_3$ or $M_4 \rightarrow M_3$ the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Input clutch solenoid valve	AT-151
				4. Front brake solenoid valve	AT-153
				5. CAN communication line	AT-102
				6. Line pressure test	AT-57
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Torque converter	AT-268
				9. Oil pump assembly	AT-287
				10. 3rd one-way clutch	AT-289
				11. Gear system	AT-251
				12. High and low reverse clutch	AT-303
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
33		When you press the accelerator pedal and shift speed $D_3 \rightarrow D_2$ or $M_3 \rightarrow M_2$ the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. High and low reverse clutch solenoid valve	AT-157
				4. Direct clutch solenoid valve	AT-155
				5. CAN communication line	AT-102
				6. Line pressure test	AT-57
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Torque converter	AT-268
				9. Oil pump assembly	AT-287
				10. 3rd one-way clutch	AT-289
				11. Gear system	
				12. Direct clutch	AT-305
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
34	Slips/Will Not Engage	When you press the accelerator pedal and shift speed $D_2 \rightarrow D_1$ or $M_2 \rightarrow M_1$ the engine idles or the A/T slips.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Output speed sensor and vehicle speed signal	AT-115, AT-145
				3. Direct clutch solenoid valve	AT-155
				4. CAN communication line	AT-102
				5. Line pressure test	AT-57
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Torque converter	AT-268
				8. Oil pump assembly	AT-287
				9. 3rd one-way clutch	AT-289
				10. 1st one-way clutch	AT-297
				11. Gear system	AT-251
				12. Reverse brake	AT-268
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
35		With selector lever in “D” position, acceleration is extremely poor.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Accelerator pedal position sensor	AT-138
				4. CAN communication line	AT-102
				5. Transmission range switch	AT-110
				6. A/T position	AT-209
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Torque converter	AT-268
				9. Oil pump assembly	AT-287
				10. 1st one-way clutch	AT-297
				11. Gear system	AT-251
				12. Reverse brake	AT-268
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
36	Slips/Will Not Engage	With selector lever in “R” position, acceleration is extremely poor.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Accelerator pedal position sensor	AT-138
				4. High and low reverse clutch solenoid valve	AT-157
				5. CAN communication line	AT-102
				6. Transmission range switch	AT-110
				7. A/T position	AT-209
				8. Control valve with TCM	AT-217
			OFF vehicle	9. Gear system	AT-251
				10. Output shaft	AT-268
				11. Reverse brake	AT-268
37		While starting off by accelerating in 1GR, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Accelerator pedal position sensor	AT-138
				4. CAN communication line	AT-102
				5. Control valve with TCM	AT-217
			OFF vehicle	6. Torque converter	AT-268
				7. Oil pump assembly	AT-287
				8. 3rd one-way clutch	AT-289
				9. 1st one-way clutch	AT-297
				10. Gear system	AT-251
				11. Reverse brake	AT-268
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
38	Slips/Will Not Engage	While accelerating in 2GR, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Accelerator pedal position sensor	AT-138
				4. CAN communication line	AT-102
				5. Direct clutch solenoid valve	AT-155
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Torque converter	AT-268
				8. Oil pump assembly	AT-287
				9. 3rd one-way clutch	AT-289
				10. Gear system	AT-251
				11. Direct clutch	AT-305
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
39		While accelerating in 3rd, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Accelerator pedal position sensor	AT-138
				4. CAN communication line	AT-102
				5. High and low reverse clutch solenoid valve	AT-157
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Torque converter	AT-268
				8. Oil pump assembly	AT-287
				9. 3rd one-way clutch	AT-289
				10. Gear system	AT-251
				11. High and low reverse clutch	AT-303
				12. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				13. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
40	Slips/Will Not Engage	While accelerating in 4GR, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Accelerator pedal position sensor	AT-138
				4. CAN communication line	AT-102
				5. Input clutch solenoid valve	AT-151
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Torque converter	AT-268
				8. Oil pump assembly	AT-287
				9. Input clutch	AT-291
				10. Gear system	AT-251
				11. High and low reverse clutch	AT-303
				12. Direct clutch	AT-305
41		While accelerating in 5GR, engine races or slippage occurs.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Accelerator pedal position sensor	AT-138
				4. CAN communication line	AT-102
				5. Front brake solenoid valve	AT-153
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Torque converter	AT-268
				8. Oil pump assembly	AT-287
				9. Front brake (brake band)	AT-268
				10. Input clutch	AT-291
				11. Gear system	AT-251
				12. High and low reverse clutch	AT-303
42		Slips at lock-up.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Engine speed signal	AT-120
				4. Input speed sensor	AT-113
				5. Torque converter clutch solenoid valve	AT-132
				6. CAN communication line	AT-102
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Torque converter	AT-268
				9. Oil pump assembly	AT-287

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
43	Slips/Will Not Engage	No creep at all. Refer to AT-182, "Vehicle Does Not Creep Backward in "R" Position", AT-184, "Vehicle Does Not Creep Forward in "D" Position".	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Accelerator pedal position sensor	AT-138
				4. Direct clutch solenoid valve	AT-155
				5. Transmission range switch	AT-110
				6. CAN communication line	AT-102
				7. A/T position	AT-209
				8. Control valve with TCM	AT-217
			OFF vehicle	9. Torque converter	AT-268
				10. Oil pump assembly	AT-287
				11. 1st one-way clutch	AT-297
				12. Gear system	AT-251
				13. Reverse brake	AT-268
				14. Direct clutch	AT-305
				15. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				16. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
44		Vehicle cannot run in all positions.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Transmission range switch	AT-110
				4. A/T position	AT-209
				5. Control valve with TCM	AT-217
			OFF vehicle	6. Oil pump assembly	AT-287
				7. Gear system	AT-251
				8. Output shaft	AT-268

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
45	Slips/Will Not Engage	With selector lever in “D” position, driving is not possible.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Transmission range switch	AT-110
				4. A/T position	AT-209
				5. Control valve with TCM	AT-217
			OFF vehicle	6. Torque converter	AT-268
				7. Oil pump assembly	AT-287
				8. 1st one-way clutch	AT-297
				9. Gear system	AT-251
				10. Reverse brake	AT-268
				11. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				12. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
46		With selector lever in “R” position, driving is not possible.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Transmission range switch	AT-110
				4. A/T position	AT-209
				5. Control valve with TCM	AT-217
			OFF vehicle	6. Gear system	AT-251
				7. Output shaft	AT-268
				8. Reverse brake	AT-268
47	Does Not Change	Does not change M5 → M4. Refer to AT-198, "A/T Does Not Shift: 5GR → 4GR".	ON vehicle	1. Transmission range switch	AT-110
				2. A/T fluid level and state (VK45DE)	AT-57
				3. A/T position	AT-209
				4. Manual mode switch	AT-163
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Front brake (brake band)	AT-268

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
48	Does Not Change	Does not change M4 → M3. Refer to AT-199, "A/T Does Not Shift: 4GR → 3GR".	ON vehicle	1. Transmission range switch	AT-110
				2. A/T fluid level and state (VK45DE)	AT-57
				3. A/T position	AT-209
				4. Manual mode switch	AT-163
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Front brake (brake band)	AT-268
				8. Input clutch	AT-291
49		Does not change M3 → M2. Refer to AT-201, "A/T Does Not Shift: 3GR → 2GR".	ON vehicle	1. Transmission range switch	AT-110
				2. A/T fluid level and state (VK45DE)	AT-57
				3. A/T position	AT-209
				4. Manual mode switch	AT-163
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Front brake (brake band)	AT-268
				8. Input clutch	AT-291
				9. High and low reverse clutch	AT-303
50		Does not change M2 → M1. Refer to AT-202, "A/T Does Not Shift: 2GR → 1GR".	ON vehicle	1. Transmission range switch	AT-110
				2. A/T fluid level and state (VK45DE)	AT-57
				3. A/T position	AT-209
				4. Manual mode switch	AT-163
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Input clutch	AT-291
				8. High and low reverse clutch	AT-303
				9. Direct clutch	AT-305
51		Cannot be changed to manual mode. Refer to AT-198, "Cannot Be Changed to Manual Mode".	ON vehicle	1. Manual mode switch	AT-163
				2. Input speed sensor	AT-113
				3. CAN communication line	AT-102
52	Others	Shift point is high in “D” position.	ON vehicle	1. Output speed sensor and vehicle speed signal	AT-115, AT-145
				2. Accelerator pedal position sensor	AT-138
				3. CAN communication line	AT-102
				4. A/T fluid temperature sensor	AT-140
				5. Control valve with TCM	AT-217

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
53	Others	Shift point is low in “D” position.	ON vehicle	1. Output speed sensor and vehicle speed signal	AT-115, AT-145
				2. Accelerator pedal position sensor	AT-138
				3. CAN communication line	AT-102
				4. Control valve with TCM	AT-217
54		Judder occurs during lock-up.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Engine speed signal	AT-120
				3. Input speed sensor	AT-113
				4. Output speed sensor and vehicle speed signal	AT-115, AT-145
				5. Accelerator pedal position sensor	AT-138
				6. CAN communication line	AT-102
				7. Torque converter clutch solenoid valve	AT-132
				8. Control valve with TCM	AT-217
			OFF vehicle	9. Torque converter	AT-268
55		Strange noise in “R” position.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Engine speed signal	AT-120
				3. CAN communication line	AT-102
				4. Control valve with TCM	AT-217
			OFF vehicle	5. Torque converter	AT-268
				6. Oil pump assembly	AT-287
				7. Gear system	AT-251
				8. High and low reverse clutch	AT-303
				9. Reverse brake	AT-268
56		Strange noise in “N” position.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Engine speed signal	AT-120
				3. CAN communication line	AT-102
				4. Control valve with TCM	AT-217
			OFF vehicle	5. Torque converter	AT-268
				6. Oil pump assembly	AT-287
				7. Gear system	AT-251
57		Strange noise in “D” position.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Engine speed signal	AT-120
				3. CAN communication line	AT-102
				4. Control valve with TCM	AT-217
			OFF vehicle	5. Torque converter	AT-268
				6. Oil pump assembly	AT-287
				7. Gear system	AT-251
				8. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
58	Others	Vehicle dose not decelerate by engine brake. Refer to AT-203, "Vehicle Does Not Decelerate by Engine Brake".	ON vehicle	1. Transmission range switch	AT-110
				2. A/T fluid level and state (VK45DE)	AT-57
				3. A/T position	AT-209
				4. Manual mode switch	AT-163
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Input clutch	AT-291
				8. High and low reverse clutch	AT-303
				9. Direct clutch	AT-305
59		Engine brake does not work M5 → M4.	ON vehicle	1. Transmission range switch	AT-110
				2. A/T fluid level and state (VK45DE)	AT-57
				3. A/T position	AT-209
				4. Manual mode switch	AT-163
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Front brake (brake band)	AT-268
60		Engine brake does not work M4 → M3.	ON vehicle	1. Transmission range switch	AT-110
				2. A/T fluid level and state (VK45DE)	AT-57
				3. A/T position	AT-209
				4. Manual mode switch	AT-163
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Front brake (brake band)	AT-268
				8. Input clutch	AT-291
61		Engine brake does not work M3 → M2.	ON vehicle	1. Transmission range switch	AT-110
				2. A/T fluid level and state (VK45DE)	AT-57
				3. A/T position	AT-209
				4. Manual mode switch	AT-163
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Front brake (brake band)	AT-268
				8. Input clutch	AT-291
				9. High and low reverse clutch	AT-303

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
62	Others	Engine brake does not work M2 → M1.	ON vehicle	1. Transmission range switch	AT-110
				2. A/T fluid level and state (VK45DE)	AT-57
				3. A/T position	AT-209
				4. Manual mode switch	AT-163
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Input clutch	AT-291
				8. High and low reverse clutch	AT-303
				9. Direct clutch	AT-305
63		Maximum speed low.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Line pressure test	AT-57
				3. Accelerator pedal position sensor	AT-138
				4. CAN communication line	AT-102
				5. Direct clutch solenoid valve	AT-155
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Torque converter	AT-268
				8. Oil pump assembly	AT-287
				9. Input clutch	AT-291
				10. Gear system	AT-251
				11. High and low reverse clutch	AT-303
				12. Direct clutch	AT-305
				13. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				14. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
64		Extremely large creep.	ON vehicle	1. Engine idle speed	EC-26 (for VQ35HR engine), EC-763 (for VK45DE engine)
				2. CAN communication line	AT-102
			OFF vehicle	3. Torque converter	AT-268

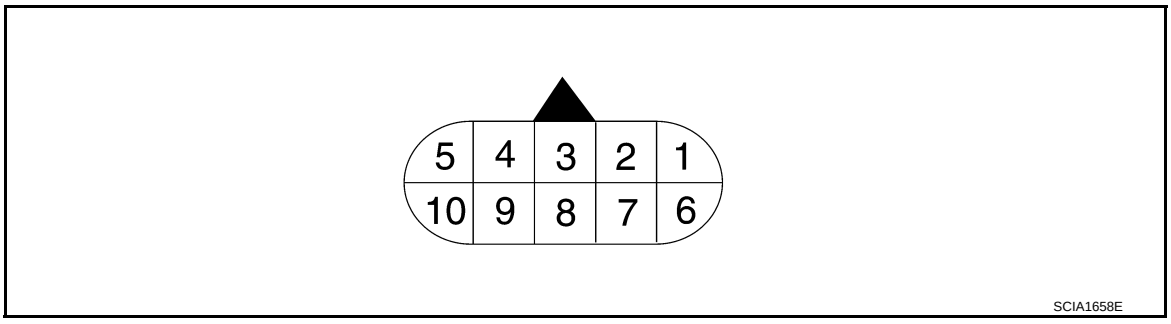
No.	Item	Symptom	Condition	Diagnostic Item	Reference page
65	Others	With selector lever in “P” position, vehicle does not enter parking condition or, with selector lever in another position, parking condition is not cancelled. Refer to AT-179, "In "P" Position, Vehicle Moves When Pushed".	ON vehicle	1. Transmission range switch	AT-110
				2. A/T position	AT-209
			OFF vehicle	3. Parking components	AT-231 (2WD models) or AT-268 (AWD models)
66		Vehicle runs with A/T in “P” position.	ON vehicle	1. Transmission range switch	AT-110
				2. A/T fluid level and state (VK45DE)	AT-57
				3. A/T position	AT-209
				4. Control valve with TCM	AT-217
			OFF vehicle	5. Parking components	AT-231 (2WD models) or AT-268 (AWD models)
				6. Gear system	AT-251
67		Vehicle runs with A/T in “N” position. Refer to AT-179, "In "N" Position, Vehicle Moves".	ON vehicle	1. Transmission range switch	AT-110
				2. A/T fluid level and state (VK45DE)	AT-57
				3. A/T position	AT-209
				4. Control valve with TCM	AT-217
			OFF vehicle	5. Input clutch	AT-291
				6. Gear system	AT-251
				7. Direct clutch	AT-305
				8. Reverse brake	AT-268
				9. Forward one-way clutch (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
				10. Forward brake (Parts behind drum support is impossible to perform inspection by disassembly. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)" or AT-27, "Cross-Sectional View (VK45DE Models for AWD)".)	AT-268
68		Engine does not start in “N” or “P” position. Refer to AT-178, "Engine Cannot Be Started in "P" or "N" Position".	ON vehicle	1. Push-button ignition switch and starter	PG-4, SC-8
				2. A/T position	AT-209
				3. Transmission range switch	AT-110
69		Engine starts in positions other than “N” or “P”.	ON vehicle	1. Push-button ignition switch and starter	PG-4, SC-8
				2. A/T position	AT-209
				3. Transmission range switch	AT-110

No.	Item	Symptom	Condition	Diagnostic Item	Reference page
70	Others	Engine stall.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Engine speed signal	AT-120
				3. Input speed sensor	AT-113
				4. Torque converter clutch solenoid valve	AT-132
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Torque converter	AT-268
71		Engine stalls when selector lever shifted “N” → “D”or “R”.	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Engine speed signal	AT-120
				3. Input speed sensor	AT-113
				4. Torque converter clutch solenoid valve	AT-132
				5. CAN communication line	AT-102
				6. Control valve with TCM	AT-217
			OFF vehicle	7. Torque converter	AT-268
72		Engine speed does not return to idle. Refer to AT-197, "Engine Speed Does Not Return to Idle".	ON vehicle	1. A/T fluid level and state (VK45DE)	AT-57
				2. Direct clutch solenoid valve	AT-155
				3. Front brake solenoid valve	AT-153
				4. Accelerator pedal position sensor	AT-138
				5. Output speed sensor and vehicle speed signal	AT-115, AT-145
				6. CAN communication line	AT-102
				7. Control valve with TCM	AT-217
			OFF vehicle	8. Front brake (brake band)	AT-268
				9. Direct clutch	AT-305

TCM Input/Output Signal Reference Value

INFOID:0000000005352432

A/T ASSEMBLY HARNESS CONNECTOR TERMINAL LAYOUT



TCM INSPECTION TABLE

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

Terminal	Wire color	Item	Condition	Data (Approx.)
1	R/W	Power supply (Memory back-up)	Always	Battery voltage
2	R/W	Power supply (Memory back-up)	Always	Battery voltage
3	L	CAN-H	—	—
4	V	K-line (CONSULT-III signal)	The terminal is connected to the data link connector for CONSULT-III.	—

Terminal	Wire color	Item	Condition		Data (Approx.)
5	B	Ground	Always		0 V
6	Y/R	Power supply		—	Battery voltage
				—	0 V
7	R/L	Back-up lamp relay		Selector lever in “R” position.	0 V
				Selector lever in other positions.	Battery voltage
8	P	CAN-L	—		—
9	GR/R	Starter relay		Selector lever in “N”, “P” positions.	Battery voltage
				Selector lever in “R”, “D” positions.	0 V
10	B	Ground	Always		0 V

CONSULT-III Function (TRANSMISSION)

INFOID:0000000005352433

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

FUNCTION

Diagnostic test mode	Function
Work Support	This mode enables a technician to adjust some devices faster and more accurately.
Self Diagnostic Results	Retrieve DTC from ECU and display diagnostic items.
Data Monitor	Monitor the input/output signal of the control unit in real time.
CAN Diagnosis	This mode displays a network diagnosis result in real time.
CAN Diagnosis Support Monitor	It monitors the status of CAN communication.
DTC & SRT confirmation	The status of system monitoring tests and the self-diagnosis status/result can be confirmed.
ECU Identification	Display the ECU identification number (part number etc.) of the selected system.

CONSULT-III REFERENCE VALUE

NOTICE:

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

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

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

Item name	Condition	Display value (Approx.)
VHCL/S SE-A/T	During driving	Approximately matches the speed meter reading.
VHCL/S SE-MTR	During driving	Approximately matches the speed meter reading.
ACCELE POSI	Released accelerator pedal.	0.0/8
	Fully depressed accelerator pedal.	8.0/8

Item name	Condition	Display value (Approx.)
CLSD THL POS	Released accelerator pedal.	ON
	Fully depressed accelerator pedal.	OFF
W/O THL POS	Fully depressed accelerator pedal.	ON
	Released accelerator pedal.	OFF
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF
ENGINE SPEED	Engine running	Closely matches the tachometer reading.
INPUT SPEED	During driving (lock-up ON)	Approximately matches the engine speed.
ATF TEMP SE 1	0°C (32° F) - 20°C (68°F) - 80°C (176°F)	3.3 - 2.7 - 0.9 V
ATF TEMP SE 2	0°C (32° F) - 20°C (68°F) - 80°C (176°F)	3.3 - 2.5 - 0.7 V
ATF TEMP 1	Ignition switch ON	Temperature of ATF in the oil pan is indicated.
TCC SOLENOID	Lock-up is active	0.4 - 0.6 A
LINE PRES SOL	During driving	0.2 - 0.6 A
FR/B SOLENOID	Front brake engaged. Refer to AT-27.	0.6 - 0.8 A
	Front brake disengaged. Refer to AT-27.	0 - 0.05 A
I/C SOLENOID	Input clutch disengaged. Refer to AT-27.	0.6 - 0.8 A
	Input clutch engaged. Refer to AT-27.	0 - 0.05 A
D/C SOLENOID	Direct clutch disengaged. Refer to AT-27.	0.6 - 0.8 A
	Direct clutch engaged. Refer to AT-27.	0 - 0.05 A
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-27.	0.6 - 0.8 A
	High and low reverse clutch engaged. Refer to AT-27.	0 - 0.05 A
STARTER RELAY	Selector lever in “N”, “P” positions.	ON
	Selector lever in “R”, “D” positions.	OFF
SLCT LVR POSI	Selector lever in “N”, “P” positions.	N/P
	Selector lever in “R” position.	R
	Selector lever in “D” position.	D
ON OFF SOL	Low coast brake engaged. Refer to AT-27.	ON
	Low coast brake disengaged. Refer to AT-27.	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-27.	ON
	Low coast brake disengaged. Refer to AT-27.	OFF
MANU MODE SW	Selector lever is shifted to manual shift gate.	ON
	Other than the above	OFF
NON M-MODE SW	Selector lever is shifted to manual shift gate.	OFF
	Other than the above	ON
UP SW LEVER	Selector lever is shifted to + side.	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever is shifted to – side.	ON
	Other than the above	OFF
GEAR	During driving	1, 2, 3, 4, 5

SELF-DIAGNOSTIC RESULT MODE

Display Items List

X: Applicable, —: Not applicable

Items (CONSULT-III screen terms)	Malfunction is detected when...	DTC		Reference
		"TRANSMISSION" with CONSULT-III	MIL[*1], "ENGINE" with CONSULT-III or GST	
CAN COMM CIRCUIT	When TCM is not transmitting or receiving CAN communication signal for 2 seconds or more.	U1000	U1000	AT-102
STARTER RELAY	If this signal is ON other than in "P" or "N" position, this is judged to be a malfunction. (And if it is OFF in "P" or "N" position, this too is judged to be a malfunction.)	P0615	—	AT-105
TRANSMISSION CONTROL	TCM is malfunctioning	P0700	P0700	AT-109
T/M RANGE SWITCH A	• Transmission range switch 1-4 signals input with impossible pattern. • "P" position is detected from "N" position without any other position being detected in between.	P0705	P0705	AT-110
INPUT SPEED SENSOR A	• TCM does not receive the proper voltage signal from the sensor. • TCM detects an irregularity only at position of 4GR for input speed sensor 2.	P0717	P0717	AT-113
OUTPUT SPEED SENSOR	• Signal from output speed sensor not input due to cut line or the like. • Unexpected signal input during running. • After ignition switch is turned ON, unexpected signal input from vehicle speed signal before the vehicle starts moving.	P0720	P0720	AT-115
ENGINE SPEED	TCM does not receive the CAN communication signal from the ECM.	P0725	P0725	AT-120
1GR INCORRECT RATIO	A/T cannot shift to 1GR.	P0731	P0731	AT-122
2GR INCORRECT RATIO	A/T cannot shift to 2GR.	P0732	P0732	AT-124
3GR INCORRECT RATIO	A/T cannot shift to 3GR.	P0733	P0733	AT-126
4GR INCORRECT RATIO	A/T cannot shift to 4GR.	P0734	P0734	AT-128
5GR INCORRECT RATIO	A/T cannot shift to 5GR.	P0735	P0735	AT-130
TORQUE CONVERTER	Normal voltage not applied to solenoid due to cut line, short, or the like.	P0740	P0740	AT-132
TORQUE CONVERTER	• A/T cannot perform lock-up even if electrical circuit is good. • TCM detects as irregular by comparing difference value with slip rotation.	P0744	P0744[*2]	AT-134
PC SOLENOID A	• Normal voltage not applied to solenoid due to cut line, short, or the like. • TCM detects as irregular by comparing target value with monitor value.	P0745	P0745	AT-136
TP SENSOR	TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM.	P1705	P1705	AT-138
FLUID TEMP SENSOR	During running, the A/T fluid temperature sensor signal voltage is excessively high or low.	P1710	P0710	AT-140
VEHICLE SPEED SIGNAL	• Signal (CAN communication) from vehicle speed signal not input due to cut line or the like. • Unexpected signal input during running.	P1721	—	AT-145

Items (CONSULT-III screen terms)	Malfunction is detected when...	DTC		Reference
		"TRANSMISSION" with CONSULT-III	MIL*1, "ENGINE" with CONSULT-III or GST	
INTERLOCK	Except during shift change, the gear position and ATF pressure switch states are monitored and comparative judgement made.	P1730	P1730	AT-147
1ST E/BRAKING	Each ATF pressure switch and solenoid current is monitored and if a pattern is detected having engine braking 1GR other than in the M1 position, a malfunction is detected.	P1731	—	AT-149
INPUT CLUTCH SOLENOID	• Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like. • TCM detects as irregular by comparing target value with monitor value.	P1752	P1752	AT-151
FR BRAKE SOLENOID	• Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like. • TCM detects as irregular by comparing target value with monitor value.	P1757	P1757	AT-153
DRCT CLUTCH SOLENOID	• Normal voltage not applied to solenoid due to cut line, short, or the like. • TCM detects as irregular by comparing target value with monitor value.	P1762	P1762	AT-155
HLR CLUTCH SOLENOID	• Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like. • TCM detects as irregular by comparing target value with monitor value.	P1767	P1767	AT-157
L C BRAKE SOLENOID	Normal voltage not applied to solenoid due to functional malfunction, cut line, short, or the like.	P1772	P1772	AT-159
L C BRAKE SOLENOID	• TCM detects an improper voltage drop when it tries to operate the solenoid valve. • Condition of ATF pressure switch 2 is different from monitor value, and relation between gear position and actual gear ratio is irregular.	P1774	P1774*2	AT-161
M-MODE SWITCH	When an impossible pattern of switch signals is detected, a malfunction is detected.	P1815	—	AT-163
NO DTC IS DETECTED FURTHER TESTING MAY BE REQUIRED	No NG item has been detected.	X	X	—

*1: Refer to EC-121, "Diagnosis Description" (for VQ35HR engine), EC-751, "Malfunction Indicator Lamp (MIL)" (for VK45DE engine).

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

DATA MONITOR MODE

Display Items List

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

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
VHCL/S SE-A/T (km/h)	X	X	▼	Output speed sensor
VHCL/S SE-MTR (km/h)	X	—	▼	—
ACCELE POSI (0.0/8)	X	—	▼	Accelerator pedal position signal

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
THROTTLE POSI (0.0/8)	X	X	▼	Degree of opening for accelerator recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
CLSD THL POS (ON/OFF)	X	—	▼	Signal input with CAN communications.
W/O THL POS (ON/OFF)	X	—	▼	
BRAKE SW (ON/OFF)	X	—	▼	Stop lamp switch
GEAR	—	X	▼	Gear position recognized by the TCM updated after gear-shifting.
ENGINE SPEED (rpm)	X	X	▼	—
INPUT SPEED (rpm)	X	X	▼	—
OUTPUT REV (rpm)	X	X	▼	—
GEAR RATIO	—	X	▼	—
TC SLIP SPEED (rpm)	—	X	▼	Difference between engine speed and torque converter input shaft speed.
F SUN GR REV (rpm)	—	—	▼	—
F CARR GR REV (rpm)	—	—	▼	—
ATF TEMP SE 1 (V)	X	—	▼	—
ATF TEMP SE 2 (V)	X	—	▼	—
ATF TEMP 1 (°C)	—	X	▼	Temperature of ATF in the oil pan.
ATF TEMP 2 (°C)	—	X	▼	Temperature of ATF at the exit of torque converter.
BATTERY VOLT (V)	X	—	▼	—
ATF PRES SW 1 (ON/OFF)	X	X	▼	—
ATF PRES SW 2 (ON/OFF)	X	X	▼	for LC/B solenoid
ATF PRES SW 3 (ON/OFF)	X	X	▼	—
ATF PRES SW 5 (ON/OFF)	X	X	▼	—
ATF PRES SW 6 (ON/OFF)	X	X	▼	—
RANGE SW 1 (ON/OFF)	X	—	▼	—
RANGE SW 2 (ON/OFF)	X	—	▼	—
RANGE SW 3 (ON/OFF)	X	—	▼	—
RANGE SW 4 (ON/OFF)	X	—	▼	—
1 POSITION SW (ON/OFF)	X	—	▼	—
SLCT LVR POSI	—	X	▼	Selector lever position is recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
OD CONT SW (ON/OFF)	X	—	▼	Not mounted but displayed.
POWERSHIFT SW (ON/OFF)	X	—	▼	
HOLD SW (ON/OFF)	X	—	▼	

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
MANU MODE SW (ON/OFF)	X	—	▼	—
NON M-MODE SW (ON/OFF)	X	—	▼	—
UP SW LEVER (ON/OFF)	X	—	▼	—
DOWN SW LEVER (ON/OFF)	X	—	▼	—
SFT UP ST SW (ON/OFF)	—	—	▼	Not mounted but displayed.
SFT DWN ST SW (ON/OFF)	—	—	▼	
ASCD·OD CUT (ON/OFF)	—	—	▼	—
ASCD·CRUISE (ON/OFF)	—	—	▼	—
ABS SIGNAL (ON/OFF)	—	—	▼	—
ACC OD CUT (ON/OFF)	—	—	▼	Intelligent cruise control (ICC) system
ACC SIGNAL (ON/OFF)	—	—	▼	
TCS GR/P KEEP (ON/OFF)	—	—	▼	—
TCS SIGNAL 2 (ON/OFF)	—	—	▼	—
TCS SIGNAL 1 (ON/OFF)	—	—	▼	—
TCC SOLENOID (A)	—	X	▼	—
LINE PRES SOL (A)	—	X	▼	—
I/C SOLENOID (A)	—	X	▼	—
FR/B SOLENOID (A)	—	X	▼	—
D/C SOLENOID (A)	—	X	▼	—
HLR/C SOL (A)	—	X	▼	—
ON OFF SOL (ON/OFF)	—	—	▼	LC/B solenoid
TCC SOL MON (A)	—	—	▼	—
L/P SOL MON (A)	—	—	▼	—
I/C SL MON (A)	—	—	▼	—
FR/B SOL MON (A)	—	—	▼	—
D/C SOL MON (A)	—	—	▼	—
HLR/C SOL MON (A)	—	—	▼	—
ON OFF SOL MON (ON/OFF)	—	—	▼	LC/B solenoid
P POSI IND (ON/OFF)	—	—	▼	—
R POSI IND (ON/OFF)	—	—	▼	—
N POSI IND (ON/OFF)	—	—	▼	—
D POSI IND (ON/OFF)	—	—	▼	—
4TH POSI IND (ON/OFF)	—	—	▼	—
3RD POSI IND (ON/OFF)	—	—	▼	—
2ND POSI IND (ON/OFF)	—	—	▼	—

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

DTC WORK SUPPORT MODE

Display Items List

DTC work support item	Description	Check item
1ST GR FNCTN P0731	Following items for “1GR function ratio” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	• Input clutch solenoid valve • Front brake solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Each clutch and brake • Hydraulic control circuit
2ND GR FNCTN P0732	Following items for “2GR function ratio” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
3RD GR FNCTN P0733	Following items for “3GR function ratio” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
4TH GR FNCTN P0734	Following items for “4GR function ratio” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
5TH GR FNCTN P0735	Following items for “5GR function ratio” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	

Diagnosis Procedure without CONSULT-III

INFOID:0000000005352434

OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)

Refer to EC-144, "Diagnosis Tool Function" (for VQ35HR engine), EC-808, "Generic Scan Tool (GST) Function" (for VK45DE engine).

OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer to EC-121, "Diagnosis Description" (for VQ35HR engine), EC-751, "Malfunction Indicator Lamp (MIL)" (for VK45DE engine).

TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Description

As a method for locating the suspect circuit, when the self-diagnostics start signal is input, the memory for the malfunction location is output and the A/T CHECK indicator lamp flashes to display the corresponding DTC.

Operation Procedure

1. CHECK A/T CHECK INDICATOR LAMP

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

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

YES >> GO TO 2.
NO >> GO TO AT-178, "A/T Check Indicator Lamp Does Not Come On".

2. JUDGMENT PROCEDURE

1. Turn ignition switch OFF.
2. Keep pressing shift lock release button.
3. Move selector lever from “P” to “D” position.
4. Release accelerator pedal. (Set the closed throttle position signal ON.)
5. Depress brake pedal. (Stop lamp switch signal ON.)
6. Turn ignition switch ON.
7. Wait 3 seconds.
8. Move the selector lever to the manual shift gate side. (Manual mode signal ON.)
9. Release brake pedal. (Stop lamp switch signal OFF.)
10. Move the selector lever to “D” position. (Manual mode signal OFF.)

11. Depress brake pedal. (Stop lamp switch signal ON.)
12. Release brake pedal. (Stop lamp switch signal OFF.)
13. Depress accelerator pedal fully and release it.

>> GO TO 3.

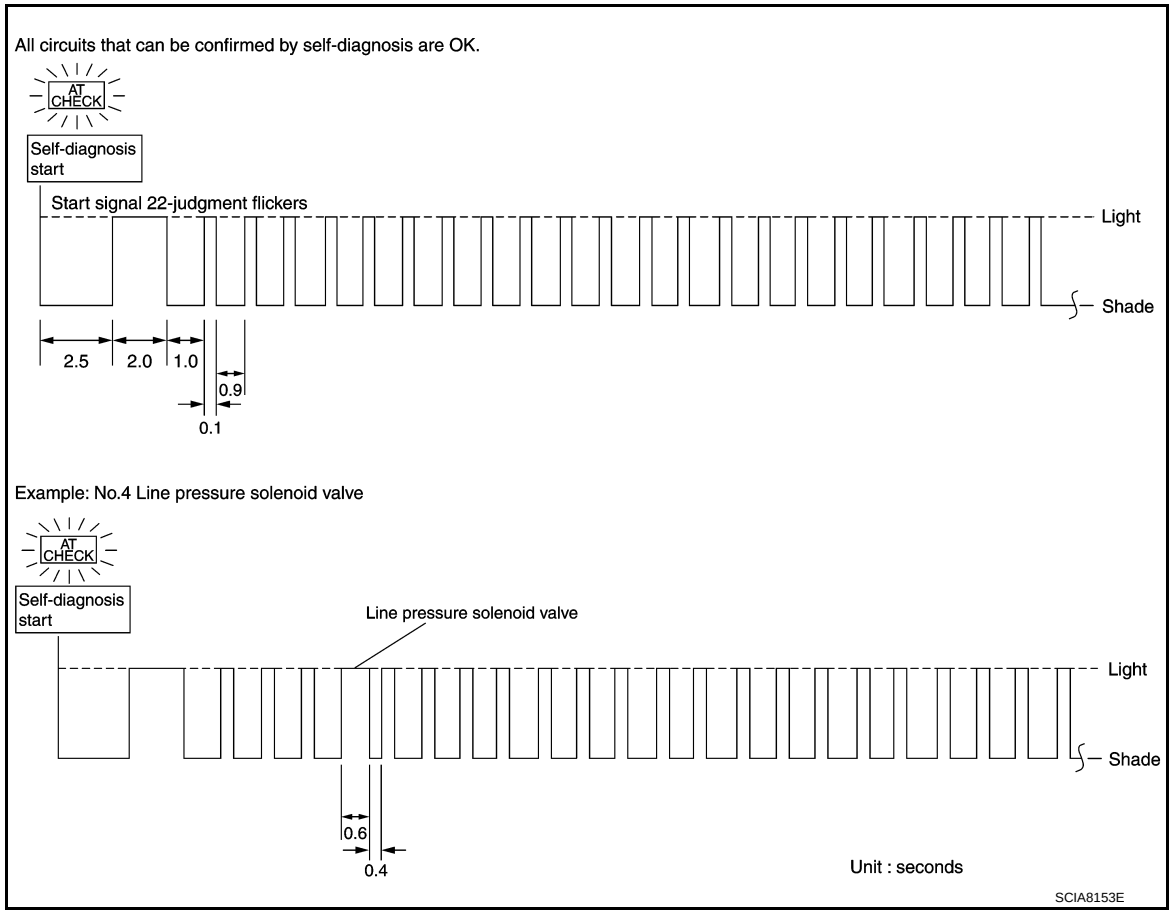
3. CHECK SELF-DIAGNOSIS CODE

Check A/T CHECK indicator lamp.
Refer to "Judgment Self-diagnosis Code".
If the system does not go into self-diagnostics. Refer to AT-110, AT-172, AT-163, AT-173.

>> **DIAGNOSIS END**

Judgment Self-diagnosis Code
If there is a malfunction, the lamp lights up for the time corresponding to the suspect circuit.

No.	Malfunctioning item	No.	Malfunctioning item
1	Output speed sensor AT-115	12	Interlock AT-147
2	Direct clutch solenoid AT-155	13	1st engine braking AT-149
3	Torque converter AT-132, AT-134	14	Starter relay AT-105
4	Line pressure solenoid AT-136	15	Accelerator pedal position sensor AT-138
5	Input clutch solenoid AT-151	16	Engine speed AT-120
6	Front brake solenoid AT-153	17	CAN communication line AT-102
7	Low coast brake solenoid AT-159, AT-161	18	1GR incorrect ratio AT-122
8	High and low reverse clutch solenoid AT-157	19	2GR incorrect ratio AT-124
9	Transmission range switch AT-110	20	3GR incorrect ratio AT-126
10	A/T fluid temperature sensor AT-140	21	4GR incorrect ratio AT-128
11	Input speed sensor AT-113	22	5GR incorrect ratio AT-130



Erase Self-diagnosis

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

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000005352435

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

INFOID:0000000005352436

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

Possible Cause

INFOID:0000000005352437

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

DTC Confirmation Procedure

INFOID:0000000005352438

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

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
3. Touch “START”
4. Start engine and wait for at least 6 seconds.
5. If DTC is detected, go to AT-104, "Diagnosis Procedure".

WITH GST

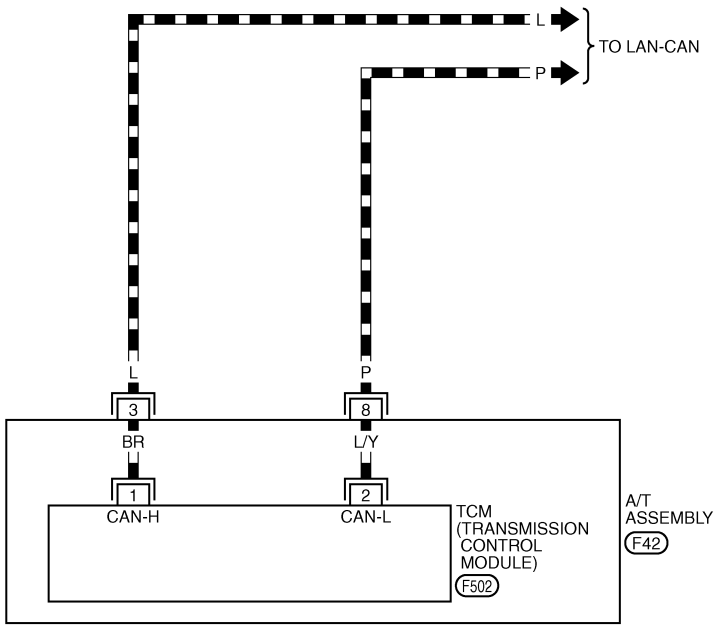
Follow the procedure “WITH CONSULT-III”.

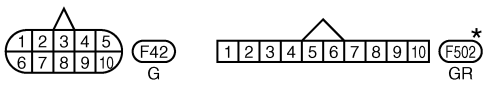
Wiring Diagram - AT - CAN

INFOID:0000000005352439

AT-CAN-01

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





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

TCWT0342E

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

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

Diagnosis Procedure

INFOID:0000000005352440

1. CHECK CAN COMMUNICATION CIRCUIT

With CONSULT-III
1. Turn ignition switch ON and start engine.
2. Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Is the “U1000” indicated?

YES >> GO TO LAN section. Refer to LAN-29, "CAN System Specification Chart".
NO >> **INSPECTION END**

P0615 STARTER RELAY

Description

INFOID:0000000005352441

TCM prohibits cranking other than at “P” or “N” position.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352442

Item name	Condition	Display value
STARTER RELAY	Selector lever in “N”, “P” positions.	ON
	Selector lever in “R”, “D” positions.	OFF

On Board Diagnosis Logic

INFOID:0000000005352443

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

Possible Cause

INFOID:0000000005352444

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

DTC Confirmation Procedure

INFOID:0000000005352445

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

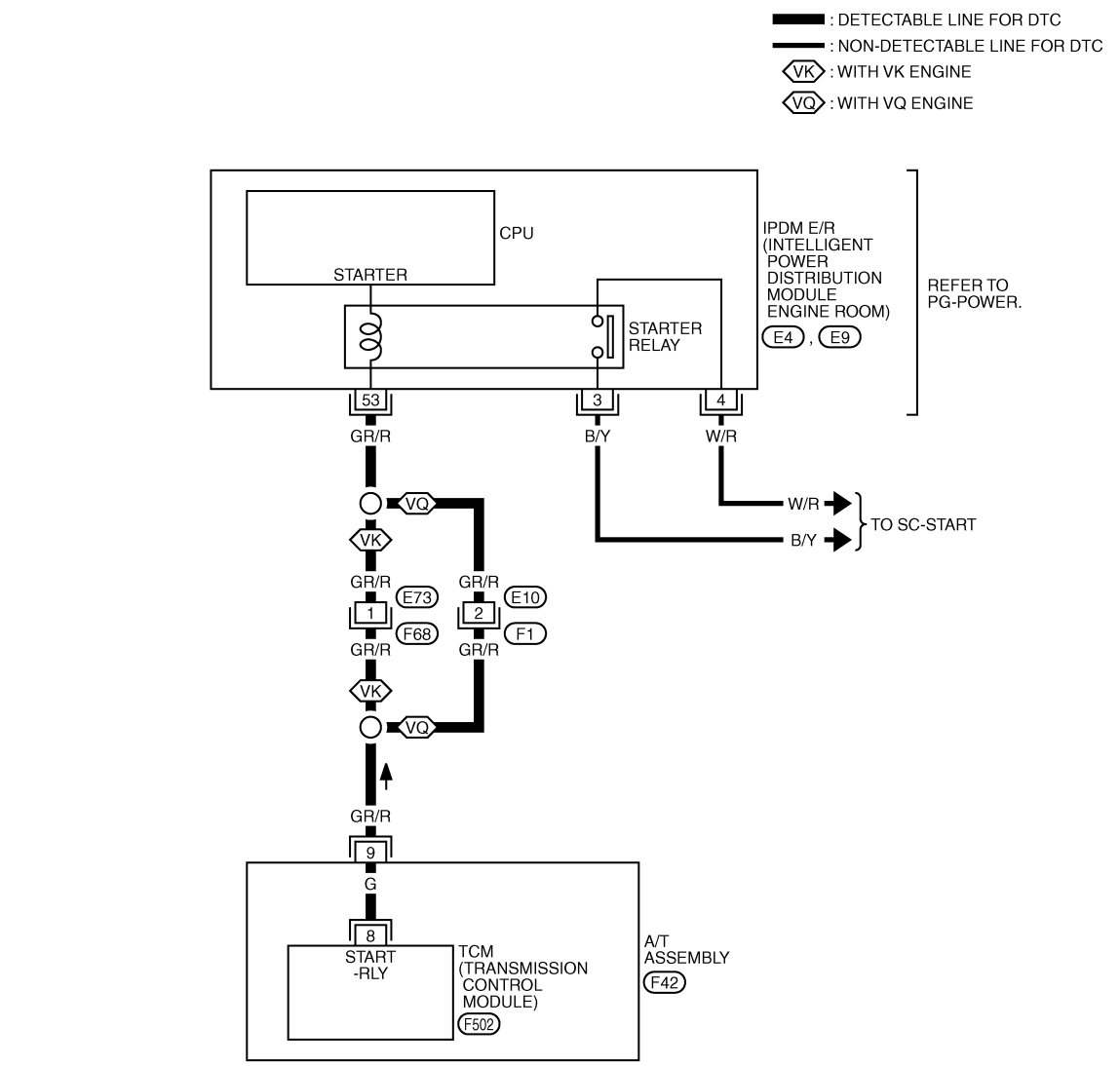
WITH CONSULT-III

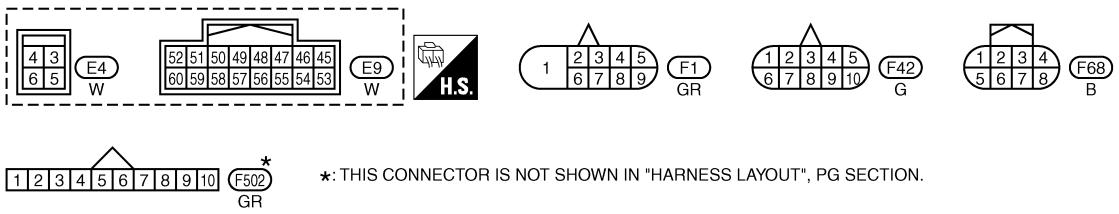
1. Shift the selector lever to “P” or “N” position.
2. Turn ignition switch ON and wait for at least 2 consecutive seconds.
3. Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
4. If DTC is detected, go to AT-107, "Diagnosis Procedure".

Wiring Diagram - AT - STSIG

INFOID:0000000005352446

AT-STSIG-01





TCWT0343E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
9	GR/R	Starter relay	ON	Selector lever in “N”, “P” positions.	Battery voltage
				Selector lever in “R”, “D” positions.	0 V

Diagnosis Procedure

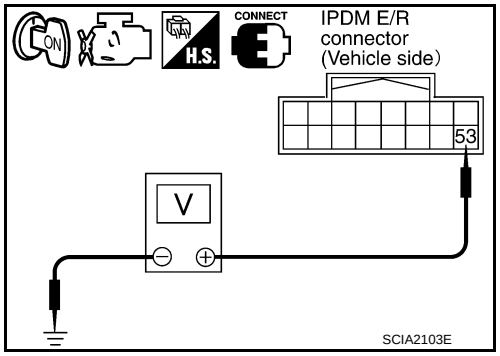
INFOID:0000000005352447

1. CHECK STARTER RELAY

With CONSULT-III
1. Turn ignition switch ON.
2. Select “SELECTION FROM MENU” in “DATA MONITOR” in “TRANSMISSION” and check monitor “STARTER RELAY” ON/OFF. Refer to AT-105, "CONSULT-III Reference Value in Data Monitor Mode".

Without CONSULT-III
1. Turn ignition switch ON.
2. Check voltage between the IPDM E/R connector and ground.

Item	Connector	Terminal		Shift position	Voltage (Approx.)
Starter relay	E9	53	Ground	“N”, “P”	Battery voltage
				“R”, “D”	0 V



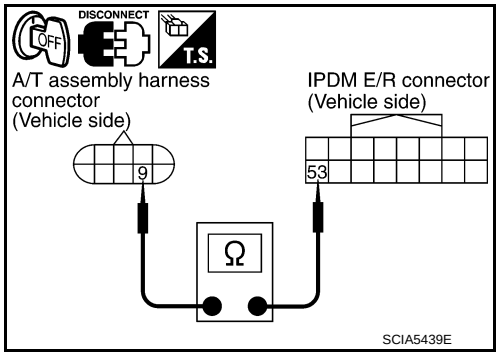
OK or NG

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

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

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

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F42	9	Yes
IPDM E/R connector	E9	53	



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

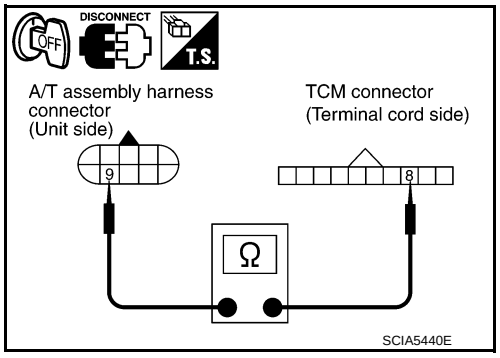
OK or NG

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK TERMINAL CORD ASSEMBLY

1. Remove control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disconnect A/T assembly harness connector and TCM connector.
3. Check continuity between A/T assembly harness connector terminal and TCM connector terminal.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F42	9	Yes
TCM connector	F502	8	



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

OK or NG

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

4. DETECT MALFUNCTIONING ITEM

Check the following.

- Starter relay, Refer to SC-8.
- IPDM E/R, Refer to PG-19.

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

5.CHECK DTC

Perform AT-105, "DTC Confirmation Procedure".

OK or NG

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

P0700 TRANSMISSION CONTROL

Description

INFOID:0000000005352448

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

On Board Diagnosis Logic

INFOID:0000000005352449

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

Possible Cause

INFOID:0000000005352450

TCM.

DTC Confirmation Procedure

INFOID:0000000005352451

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

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
3. Touch “START”.
4. Start engine.
5. Run engine for at least 2 consecutive seconds at idle speed.
6. If DTC is detected, go to AT-109, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352452

1.CHECK DTC

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
3. Touch “ERASE”.
4. Turn ignition switch OFF and wait for at least 10 seconds.
5. Perform AT-109, "DTC Confirmation Procedure".

Is the “P0700” displayed again?

YES >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NO >> **INSPECTION END**

P0705 TRANSMISSION RANGE SWITCH A

Description

INFOID:0000000005352453

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352454

Item name	Condition	Display value
SLCT LVR POSI	Selector lever in “N”, “P” positions.	N/P
	Selector lever in “R” position.	R
	Selector lever in “D” position.	D

On Board Diagnosis Logic

INFOID:0000000005352455

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0705” with CONSULT-III or 9th judgment flicker without CONSULT-III is detected under the following conditions.

- When TCM does not receive the correct voltage signal from the transmission range switches 1, 2, 3 and 4 based on the gear position.
- When no other position but “P” position is detected from “N” position.

Possible Cause

INFOID:0000000005352456

- Harness or connectors
  Transmission range switches 1, 2, 3, 4 and TCM circuit is open or shorted.
- Transmission range switches 1, 2, 3 and 4

DTC Confirmation Procedure

INFOID:0000000005352457

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.

   ACCELE POSI : More than 1.0/8

4. If DTC is detected, go to AT-111, "Diagnosis Procedure".

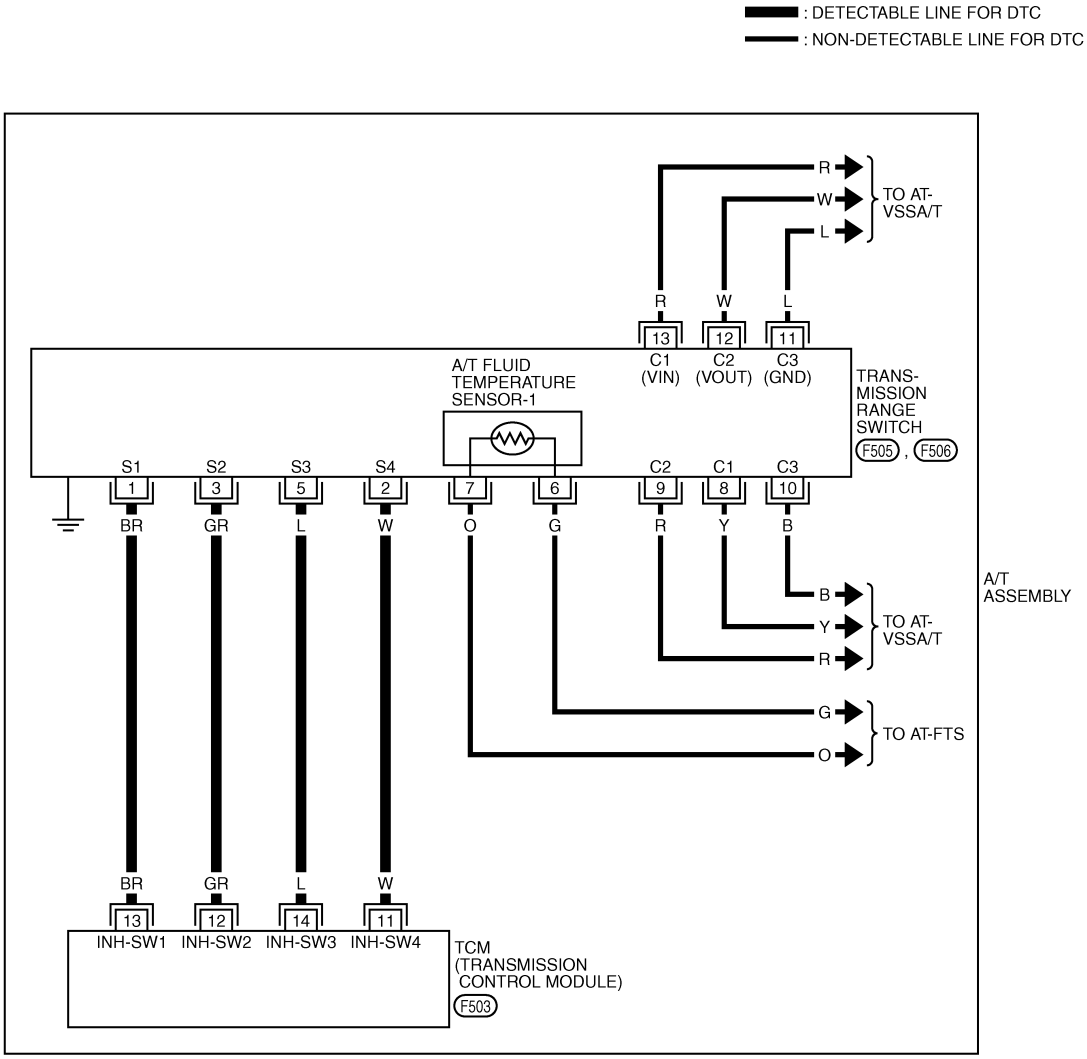
WITH GST

Follow the procedure “WITH CONSULT-III”.

Wiring Diagram - AT - TR/SW

INFOID:0000000005352458

AT-TR/SW-01



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

TCWT0344E

Diagnosis Procedure

INFOID:0000000005352459

1. CHECK TRANSMISSION RANGE SWITCH CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.

2. Select “DATA MONITOR” in “TRANSMISSION” and read out the value of “SLCT LVR POSI”.
3. Check if correct selector lever position (N/P, R or D) is displayed as selector lever is moved into each position. Refer to AT-110, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

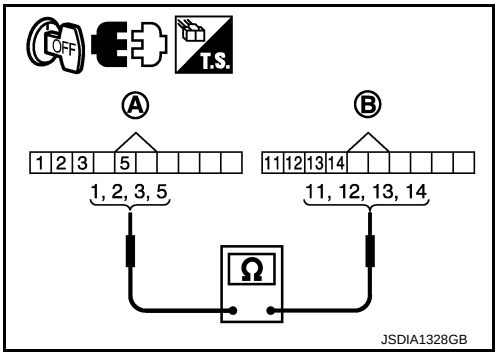
Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

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

4.CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disconnect transmission range switch connector and TCM connector.
3. Check continuity between transmission range switch switch connector (A) terminals and TCM connector (B) terminals.



Item	Connector	Terminal	Continuity
Transmission range switch connector	F505	1	Yes
TCM connector	F503	13	
Transmission range switch connector	F505	2	Yes
TCM connector	F503	11	
Transmission range switch connector	F505	3	Yes
TCM connector	F503	12	
Transmission range switch connector	F505	5	Yes
TCM connector	F503	14	

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Replace open circuit or short to ground and short to power in harness or connectors.

5.CHECK DTC

Perform AT-110, "DTC Confirmation Procedure".

OK or NG

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

P0717 INPUT SPEED SENSOR A

Description

INFOID:0000000005352460

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352461

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

On Board Diagnosis Logic

INFOID:0000000005352462

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0717” with CONSULT-III or 11th judgment flicker without CONSULT-III is detected under the following conditions.

- When TCM does not receive the proper voltage signal from the sensor.
- When TCM detects an irregularity only at position of 4GR for input speed sensor 2.

Possible Cause

INFOID:0000000005352463

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

DTC Confirmation Procedure

INFOID:0000000005352464

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

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

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

VHCL/S SE-A/T	: 40 km/h (25 MPH) or more
ACCELE POSI	: More than 0.5/8
ENGINE SPEED	: 1,500 rpm or more
SLCT LVR POSI	: “D” position
GEAR (Input speed sensor 1)	: “4” or “5” position
GEAR (Input speed sensor 2)	: All positions
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-113, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352465

1.CHECK INPUT SIGNAL

With CONSULT-III
1. Start engine.

2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Vehicle start and read out the value of “INPUT SPEED”. Refer to AT-113, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform AT-113, "DTC Confirmation Procedure".

OK or NG

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

P0720 OUTPUT SPEED SENSOR

Description

INFOID:0000000005352466

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352467

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

On Board Diagnosis Logic

INFOID:0000000005352468

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0720” with CONSULT-III or 1st judgment flicker without CONSULT-III is detected under the following conditions.

- When TCM does not receive the proper voltage signal from the sensor.
- After ignition switch is turned ON, irregular signal input from vehicle speed signal before the vehicle starts moving.

Possible Cause

INFOID:0000000005352469

- Harness or connectors
  (Sensor circuit is open or shorted.)
- Output speed sensor
- Vehicle speed signal

DTC Confirmation Procedure

INFOID:0000000005352470

CAUTION:

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

NOTE:

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

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

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. 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-117, "Diagnosis Procedure".
   If the check result is OK, go to following step.
4. Select “DATA MONITOR” in “TRANSMISSION”.
5. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

VHCL/S SE-A/T	: 30 km/h (19 MPH) or more
ACCELE POSI	: More than 1.0/8
SLCT LVR POSI	: “D” position
Driving location	: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

   If the check result is NG, go to AT-117, "Diagnosis Procedure".
   If the check result is OK, go to following step.
6. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

ENGINE SPEED	: 3,500 rpm or more
ACCELE POSI	: More than 1.0/8

SLCT LVR POSI	: “D” position
Driving location	: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

7. If DTC is detected, go to AT-117, "Diagnosis Procedure".

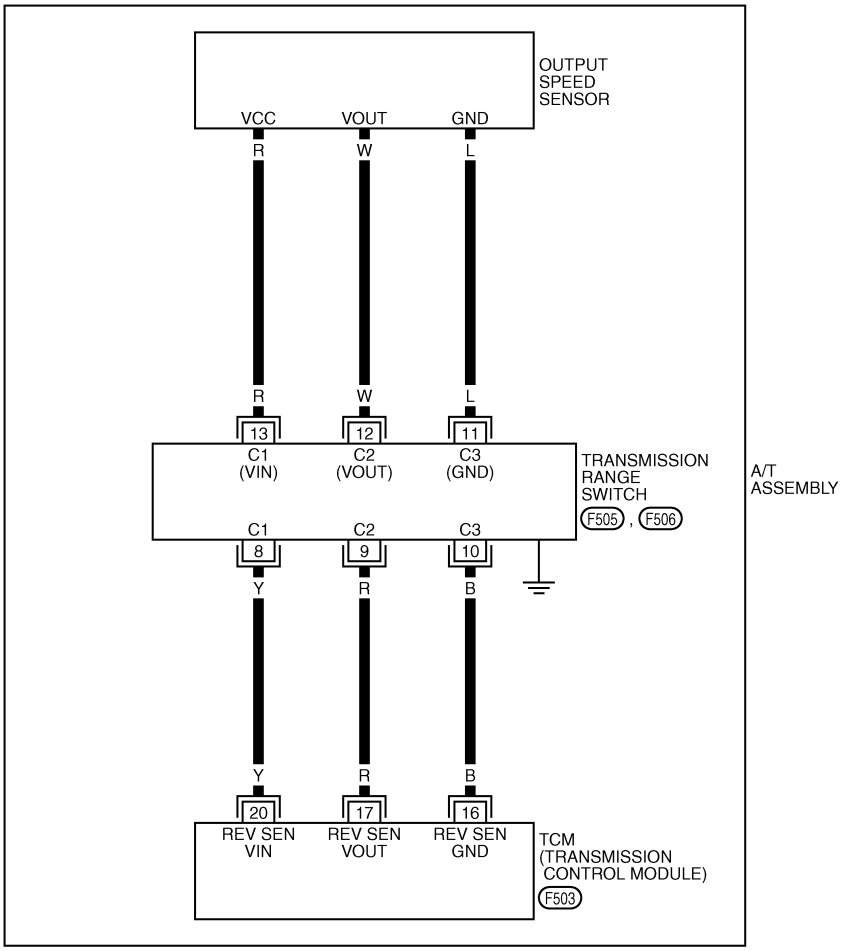
WITH GST
Follow the procedure “WITH CONSULT-III”.

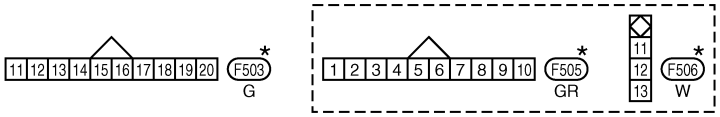
Wiring Diagram - AT - VSSA/T

INFOID:0000000005352471

AT-VSSA/T-01

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





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

TCWT0345E

Diagnosis Procedure

INFOID:0000000005352472

1. CHECK INPUT SIGNAL

With CONSULT-III
1. Turn ignition switch ON.

2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Start engine.
4. Read out the value of “VHCL/S SE-A/T” while driving. Check the value changes according to driving speed. Refer to AT-115, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

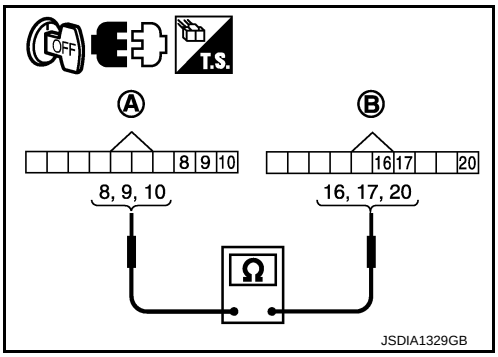
Check A/T assembly harness connector pin terminals for damage or loose connection with harness connector.

OK or NG

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

4.CHECK SUB-HARNESS

1. Remove control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disconnect transmission range switch connector and TCM connector.
3. Check continuity between transmission range switch connector (A) terminals and TCM connector (B) terminals.



Item	Connector	Terminal	Continuity
Transmission range switch connector	F505	8	Yes
TCM connector	F503	20	
Transmission range switch connector	F505	9	Yes
TCM connector	F503	17	
Transmission range switch connector	F505	10	Yes
TCM connector	F503	16	

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

OK or NG

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

5.REPLACE THE OUTPUT SPEED SENSOR AND CHECK DTC

1. Replace the output speed sensor. Refer to AT-236, "Output Speed Sensor Component (2WD Models Only)" (2WD models) or AT-268, AT-251, "Component" (AWD models).
2. Perform AT-115, "DTC Confirmation Procedure".

OK or NG

OK >> **INSPECTION END**
NG >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".

6.CHECK DTC

Perform AT-115, "DTC Confirmation Procedure".

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

P0725 ENGINE SPEED

Description

INFOID:0000000005352473

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352474

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

On Board Diagnosis Logic

INFOID:0000000005352475

Diagnostic trouble code “P0725” with CONSULT-III or 16th judgment flicker without CONSULT-III is detected when TCM does not receive the ignition signal from ECM during engine cranking or running.

Possible Cause

INFOID:0000000005352476

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

DTC Confirmation Procedure

INFOID:0000000005352477

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
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 POSI	: More than 1.0/8
SLCT LVR POSI	: “D” position

4. If DTC is detected, go to AT-120, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352478

1.CHECK CAN COMMUNICATION LINE

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

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

YES >> Check CAN communication line. Refer to AT-102.
NO >> GO TO 2.

2.CHECK INPUT SIGNAL

With CONSULT-III
1. Start engine.
2. Select “DATA MONITOR” in “TRANSMISSION” and read out the value of “ENGINE SPEED”.

3. While monitoring engine speed, check for engine speed change corresponding to wide-open throttle position signal. Refer to AT-120, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

OK >> GO TO 3.
NG >> Check the ignition signal circuit. Refer to EC-617, "Description" (for VQ35HR engine), EC-1307 (for VK45DE engine).

3.CHECK DTC

Perform AT-120, "DTC Confirmation Procedure".

OK or NG

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

4.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

5.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

P0731 1GR INCORRECT RATIO

Description

INFOID:0000000005352479

This malfunction is detected when the A/T does not shift into 1GR position as instructed by TCM. This is not only 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

INFOID:0000000005352480

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0731” with CONSULT-III or 18th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

INFOID:0000000005352481

- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch and brake
- Hydraulic control circuit

DTC Confirmation Procedure

INFOID:0000000005352482

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” in “TRANSMISSION”.
2. Make sure that “ATF TEMP 1” is within the following range.

ATF TEMP 1	: 20°C (68°F) – 140°C (284°F)

   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “1ST GR FNCTN P0731” in “DTC & SRT CONFIRMATION” in “TRANSMISSION”.
4. Drive vehicle and maintain the following conditions.

MANU MODE SW	: ON
GEAR	: “1” position
ACCELE POSI	: 0.6/8 or more
VEHICLE SPEED	: 10 km/h (6 MPH) or more
ENGINE SPEED	: INPUT SPEED – 50 rpm or more
INPUT SPEED	: 300 rpm or more

5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than “P0731” is shown, refer to “AT-92, "CONSULT-III Function (TRANSMISSION)"”.
   If “COMPLETED RESULT NG” is detected, go to AT-123, "Diagnosis Procedure".
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1GR to 5GR and check shift timing and shift shock.

- Touch “OK” to complete the inspection when normally shifted from the 1GR to 5GR.
- Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1GR to 5GR. Go to AT-61, "Road Test".

- Perform AT-92, "CONSULT-III Function (TRANSMISSION)" when not shifted from the 1GR to 5GR. (Neither “OK” nor “NG” are indicated.)

WITH GST
1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

Manual mode switch	: ON
Gear position	: “1” position
Accelerator opening	: 0.6/8 or more
Vehicle speed	: 10 km/h (6 MPH) or more

4. Check DTC. If DTC is detected, go to AT-123, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000005352483

1.CHECK CAN COMMUNICATION LINE

With CONSULT-III
• Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
Without CONSULT-III
• Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

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

YES >> Check CAN communication line. Refer to AT-104.
NO >> GO TO 2.

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-169.

OK or NG

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

3.DETECT MALFUNCTION ITEM

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

OK or NG

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

4.REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Perform AT-122, "DTC Confirmation Procedure".

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-61, "Road Test".

P0732 2GR INCORRECT RATIO

Description

INFOID:0000000005352484

This malfunction is detected when the A/T does not shift into 2GR position as instructed by TCM. This is not only 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

INFOID:0000000005352485

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0732” with CONSULT-III or 19th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

INFOID:0000000005352486

- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch and brake
- Hydraulic control circuit

DTC Confirmation Procedure

INFOID:0000000005352487

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” in “TRANSMISSION”.
2. Make sure that “ATF TEMP 1” is within the following range.

ATF TEMP 1	: 20°C (68°F) – 140°C (284°F)

   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “2ND GR FNCTN P0732” in “DTC & CONFIRMATION” in “TRANSMISSION”.
4. Drive vehicle and maintain the following conditions.

MANU MODE SW	: ON
GEAR	: “2” position
ACCELE POSI	: 0.6/8 or more
VEHICLE SPEED	: 10 km/h (6 MPH) or more
ENGINE SPEED	: INPUT SPEED – 50 rpm or more
INPUT SPEED	: 300 rpm or more

5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than “P0732” is shown, refer to “AT-92, "CONSULT-III Function (TRANSMISSION)"”.
   If “COMPLETED RESULT NG” is detected, go to AT-125, "Diagnosis Procedure".
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1GR to 5GR and check shift timing and shift shock.

- Touch “OK” to complete the inspection when normally shifted from the 1GR to 5GR.
- Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1GR to 5GR Go to AT-61, "Road Test".

- Perform AT-92, "CONSULT-III Function (TRANSMISSION)" when not shifted from the 1GR to 5GR. (Neither “OK” nor “NG” are indicated.)

WITH GST
1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

Manual mode switch	: ON
Gear position	: “2” position
Accelerator opening	: 0.6/8 or more
Vehicle speed	: 10 km/h (6 MPH) or more

4. Check DTC. If DTC is detected, go to AT-125, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000005352488

1.CHECK CAN COMMUNICATION LINE

With CONSULT-III
• Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
Without CONSULT-III
• Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

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

YES >> Check CAN communication line. Refer to AT-104.
NO >> GO TO 2.

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-169.

OK or NG

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

3.DETECT MALFUNCTION ITEM

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

OK or NG

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

4.REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Perform AT-124, "DTC Confirmation Procedure".

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-61, "Road Test".

P0733 3GR INCORRECT RATIO

Description

INFOID:0000000005352489

This malfunction is detected when the A/T does not shift into 3GR position as instructed by TCM. This is not only 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

INFOID:0000000005352490

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0733” with CONSULT-III or 20th judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

INFOID:0000000005352491

- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch and brake
- Hydraulic control circuit

DTC Confirmation Procedure

INFOID:0000000005352492

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” in “TRANSMISSION”.
2. Make sure that “ATF TEMP 1” is within the following range.

ATF TEMP 1	: 20°C (68°F) – 140°C (284°F)

   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “3RD GR FNCTN P0733” in “DTC & SRT CONFIRMATION” in “TRANSMISSION”.
4. Drive vehicle and maintain the following conditions.

MANU MODE SW	: ON
GEAR	: “3” position
ACCELE POSI	: 0.6/8 or more
VEHICLE SPEED	: 10 km/h (6 MPH) or more
ENGINE SPEED	: INPUT SPEED – 50 rpm or more
INPUT SPEED	: 300 rpm or more

5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than “P0733” is shown, refer to “AT-92, "CONSULT-III Function (TRANSMISSION)"”.
   If “COMPLETED RESULT NG” is detected, go to AT-127, "Diagnosis Procedure".
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1GR to 5GR and check shift timing and shift shock.

- Touch “OK” to complete the inspection when normally shifted from the 1GR to 5GR.
- Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1GR to 5GR. Go to AT-61, "Road Test".

- Perform AT-92, "CONSULT-III Function (TRANSMISSION)" when not shifted from the 1GR to 5GR. (Neither “OK” nor “NG” are indicated.)

WITH GST
1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

Manual mode switch	: ON
Gear position	: “3” position
Accelerator opening	: 0.6/8 or more
Vehicle speed	: 10 km/h (6 MPH) or more

4. Check DTC. If DTC is detected, go to AT-127, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000005352493

1.CHECK CAN COMMUNICATION LINE

With CONSULT-III
• Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
Without CONSULT-III
• Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

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

YES >> Check CAN communication line. Refer to AT-104.
NO >> GO TO 2.

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-169.

OK or NG

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

3.DETECT MALFUNCTION ITEM

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

OK or NG

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

4.REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Perform AT-126, "DTC Confirmation Procedure".

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-61, "Road Test".

P0734 4GR INCORRECT RATIO

Description

INFOID:0000000005352494

This malfunction is detected when the A/T does not shift into 4GR position as instructed by TCM. This is not only 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

INFOID:0000000005352495

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0734” with CONSULT-III or 21st judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

INFOID:0000000005352496

- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch and brake
- Hydraulic control circuit

DTC Confirmation Procedure

INFOID:0000000005352497

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” in “TRANSMISSION”.
2. Make sure that “ATF TEMP 1” is within the following range.

ATF TEMP 1	: 20°C (68°F) – 140°C (284°F)

   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “4TH GR FNCTN P0734” in “DTC & SRT CONFIRMATION” in “TRANSMISSION”.
4. Drive vehicle and maintain the following conditions.

MANU MODE SW	: ON
GEAR	: “4” position
ACCELE POSI	: 0.6/8 or more
VEHICLE SPEED	: 10 km/h (6 MPH) or more
ENGINE SPEED	: INPUT SPEED – 50 rpm or more
INPUT SPEED	: 300 rpm or more

5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than “P0734” is shown, refer to “AT-92, "CONSULT-III Function (TRANSMISSION)"”.
   If “COMPLETED RESULT NG” is detected, go to AT-129, "Diagnosis Procedure".
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1GR to 5GR and check shift timing and shift shock.

- Touch “OK” to complete the inspection when normally shifted from the 1GR to 5GR.
- Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1GR to 5GR. Go to AT-61, "Road Test".

- Perform AT-92, "CONSULT-III Function (TRANSMISSION)" when not shifted from the 1GR to 5GR. (Neither “OK” nor “NG” are indicated.)

WITH GST
1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

Manual mode switch	: ON
Gear position	: “4” position
Accelerator opening	: 0.6/8 or more
Vehicle speed	: 10 km/h (6 MPH) or more

4. Check DTC. If DTC is detected, go to AT-129, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000005352498

1.CHECK CAN COMMUNICATION LINE

With CONSULT-III
• Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
Without CONSULT-III
• Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

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

YES >> Check CAN communication line. Refer to AT-104.
NO >> GO TO 2.

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-169.

OK or NG

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

3.DETECT MALFUNCTION ITEM

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

OK or NG

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

4.REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Perform AT-128, "DTC Confirmation Procedure".

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-61, "Road Test".

P0735 5GR INCORRECT RATIO

Description

INFOID:0000000005352499

This malfunction is detected when the A/T does not shift into 5GR position as instructed by TCM. This is not only 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

INFOID:0000000005352500

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0735” with CONSULT-III or 22nd judgment flicker without CONSULT-III is detected when TCM detects any inconsistency in the actual gear ratio.

Possible Cause

INFOID:0000000005352501

- Input clutch solenoid valve
- Front brake solenoid valve
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Each clutch and brake
- Hydraulic control circuit

DTC Confirmation Procedure

INFOID:0000000005352502

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine and select “DATA MONITOR” in “TRANSMISSION”.
2. Make sure that “ATF TEMP 1” is within the following range.

ATF TEMP 1	: 20°C (68°F) – 140°C (284°F)

   If out of range, drive vehicle to warm ATF or stop engine to cool ATF.
3. Select “5TH GR FNCTN P0735” in “DTC & SRT CONFIRMATION” in “TRANSMISSION”.
4. Drive vehicle and maintain the following conditions.

MANU MODE SW	: ON
GEAR	: “5” position
ACCELE POSI	: 0.6/8 or more
VEHICLE SPEED	: 10 km/h (6 MPH) or more
ENGINE SPEED	: INPUT SPEED – 50 rpm or more
INPUT SPEED	: 300 rpm or more

5. Keep the current driving status for at least 5 consecutive seconds if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
   CAUTION:
   If “TESTING” does not appear on CONSULT-III for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than “P0735” is shown, refer to “AT-92, "CONSULT-III Function (TRANSMISSION)"”.
   If “COMPLETED RESULT NG” is detected, go to AT-131, "Diagnosis Procedure".
   If “STOP VEHICLE” is detected, go to the following step.
6. Stop vehicle.
7. Drive vehicle in “D” position allowing it to shift from 1GR to 5GR and check shift timing and shift shock.

- Touch “OK” to complete the inspection when normally shifted from the 1GR to 5GR.
- Touch “NG” when an unusual shift shock, etc. occurs in spite of shifting from the 1GR to 5GR. Go to AT-61, "Road Test".

- Perform AT-92, "CONSULT-III Function (TRANSMISSION)" when not shifted from the 1GR to 5GR. (Neither “OK” nor “NG” are indicated.)

WITH GST
1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

Manual mode switch	: ON
Gear position	: “5” position
Accelerator opening	: 0.6/8 or more
Vehicle speed	: 10 km/h (6 MPH) or more

4. Check DTC. If DTC is detected, go to AT-131, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000005352503

1.CHECK CAN COMMUNICATION LINE

With CONSULT-III
• Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
Without CONSULT-III
• Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

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

YES >> Check CAN communication line. Refer to AT-104.
NO >> GO TO 2.

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-169.

OK or NG

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

3.DETECT MALFUNCTION ITEM

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

OK or NG

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

4.REPLACE CONTROL VALVE WITH TCM

1. Replace control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Perform AT-130, "DTC Confirmation Procedure".

OK or NG

OK >> **INSPECTION END**
NG >> Confirm malfunction phenomena by “ROAD TEST” to repair malfunctioning part. Refer to AT-61, "Road Test".

P0740 TORQUE CONVERTER

Description

INFOID:0000000005352504

- The torque converter clutch solenoid valve is activated, with the gear in D_3, D_4, D_5, M4 and M5 by the TCM in response to signals sent from the output speed sensor and accelerator pedal position sensor (throttle position sensor). Torque converter clutch piston operation will then be controlled.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- When the accelerator pedal is depressed (less than 1/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352505

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

On Board Diagnosis Logic

INFOID:0000000005352506

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0740” with CONSULT-III or 3rd judgment flicker without CONSULT-III is detected under the following conditions.

- When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

INFOID:0000000005352507

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

DTC Confirmation Procedure

INFOID:0000000005352508

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

VHCL/S SE-A/T	: 80 km/h (50 MPH) or more
ACCELE POSI	: 0.5/8 – 1.0/8
SLCT LVR POSI	: “D” position
Driving location	: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

4. If DTC is detected, go to AT-132, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352509

1.CHECK INPUT SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “DATA MONITOR” in “TRANSMISSION”.

3. Start engine.
4. Read out the value of “TCC SOLENOID” while driving. Refer to AT-132, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform AT-132, "DTC Confirmation Procedure".

OK or NG

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

P0744 TORQUE CONVERTER

Description

INFOID:0000000005352510

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352511

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

On Board Diagnosis Logic

INFOID:0000000005352512

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0744” with CONSULT-III or 3rd judgment flicker without CONSULT-III is detected under the following conditions.

- When A/T cannot perform lock-up even if electrical circuit is good.
- When TCM detects as irregular by comparing difference value with slip rotation.

Possible Cause

INFOID:0000000005352513

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

DTC Confirmation Procedure

INFOID:0000000005352514

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 30 consecutive seconds.

ACCELE POSI	: More than 1.0/8
SLCT LVR POSI	: “D” position
TCC SOLENOID	: 0.4 – 0.6 A
VEHICLE SPEED	: 80 km/h (50 MPH) or more
Driving location	: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

4. If DTC is detected, go to AT-134, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352515

1.CHECK INPUT SIGNAL

With CONSULT-III
1. Turn ignition switch ON.

2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Start engine.
4. Read out the value of “TCC SOLENOID” while driving. Refer to AT-134, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform AT-134, "DTC Confirmation Procedure".

OK or NG

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

P0745 PRESSURE CONTROL SOLENOID A

Description

INFOID:0000000005352516

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-III Reference Value in Data Monitor Mode

INFOID:0000000005352517

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

On Board Diagnosis Logic

INFOID:0000000005352518

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

Possible Cause

INFOID:0000000005352519

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

DTC Confirmation Procedure

INFOID:0000000005352520

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

WITH CONSULT-III

1. Turn ignition switch ON.
2. Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
3. Touch “START”.
4. Engine start and wait for at least 5 seconds.
5. If DTC is detected, go to AT-136, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352521

1.CHECK INPUT SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Start engine.
4. Read out the value of “LINE PRES SOL” during driving. Refer to AT-136, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

3. DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".

NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform AT-136, "DTC Confirmation Procedure".

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 2.

P1705 TP SENSOR

Description

INFOID:0000000005352522

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352523

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

On Board Diagnosis Logic

INFOID:0000000005352524

Diagnostic trouble code “P1705” with CONSULT-III or 15th judgment flicker without CONSULT-III is detected when TCM does not receive the proper accelerator pedal position signals (input by CAN communication) from ECM.

Possible Cause

INFOID:0000000005352525

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

DTC Confirmation Procedure

INFOID:0000000005352526

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

WITH CONSULT-III
1. Turn ignition switch ON.
2. Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
3. Touch “START”.
4. Start engine and let it idle for 1 second.
5. If DTC is detected, go to AT-138, "Diagnosis Procedure".

WITH GST
Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352527

1.CHECK CAN COMMUNICATION LINE

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

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

YES >> Check CAN communication line. Refer to AT-102.
NO >> GO TO 2.

2.CHECK DTC WITH TCM

With CONSULT-III
1. Turn ignition switch ON.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Depress accelerator pedal and read out the value of “ACCELE POSI”. Refer to AT-138, "CONSULT-III Reference Value in Data Monitor Mode".

4. Select “SELF-DIAG RESULTS” mode for “TRANSMISSION” with CONSULT-III. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)"

OK or NG

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

3.CHECK DTC WITH ECM

With CONSULT-III
1. Turn ignition switch ON.
2. Select “SELF-DIAG RESULTS” in “ENGINE”. Refer to EC-134, "CONSULT-III Function" (for VQ35HR engine), EC-799, "CONSULT-III Function" (for VK45DE engine).

OK or NG

OK >> GO TO 4.
NG >> Check the DTC detected item. Refer to EC-134, "CONSULT-III Function" (for VQ35HR engine), EC-799, "CONSULT-III Function" (for VK45DE engine).
- If CAN communication line is detected, go to AT-102.

4.CHECK DTC

Perform AT-138, "DTC Confirmation Procedure".

OK or NG

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

5.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

6.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

P1710 TRANSMISSION FLUID TEMPERATURE SENSOR

Description

INFOID:0000000005352528

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352529

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

On Board Diagnosis Logic

INFOID:0000000005352530

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

Possible Cause

INFOID:0000000005352531

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

DTC Confirmation Procedure

INFOID:0000000005352532

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)

VHCL/S SE-A/T	: 10 km/h (6 MPH) or more
ACCELE POSI	: More than 1.0/8
SLCT LVR POSI	: “D” position

4. If DTC is detected, go to AT-141, "Diagnosis Procedure".

WITH GST

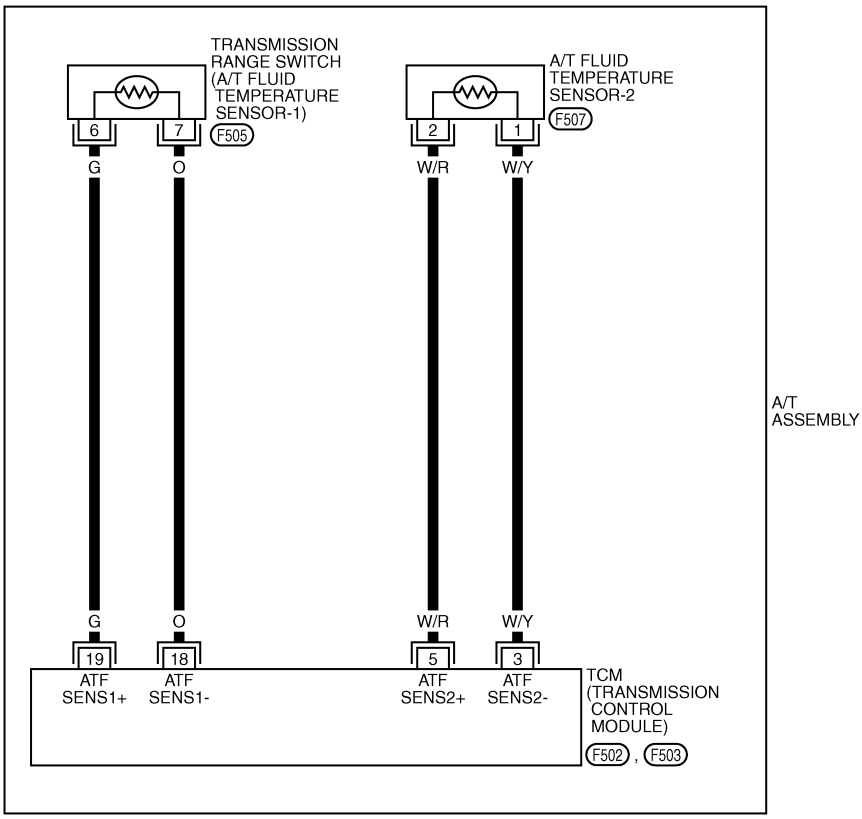
Follow the procedure “WITH CONSULT-III”.

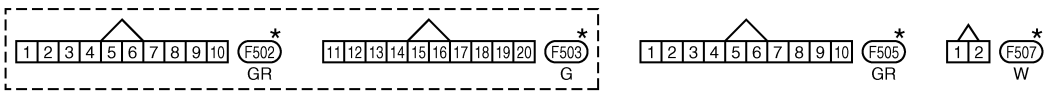
Wiring Diagram - AT - FTS

INFOID:0000000005352533

AT-FTS-01

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





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

TCWT0346E

Diagnosis Procedure

INFOID:0000000005352534

1. CHECK A/T FLUID TEMPERATURE SENSOR 1 SIGNAL

With CONSULT-III
1. Start engine.

2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Read out the value of “ATF TEMP SE 1”. Refer to AT-140, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK A/T FLUID TEMPERATURE SENSOR 2 SIGNAL

With CONSULT-III
1. Start engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Read out the value of “ATF TEMP SE 2”. Refer to AT-140, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

3.CHECK A/T FLUID TEMPERATURE SENSOR 1

Check A/T fluid temperature sensor 1. Refer to AT-143, "Component Inspection".

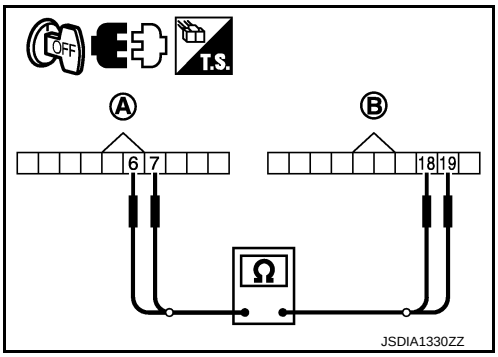
OK or NG

OK >> GO TO 4.
NG >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".

4.CHECK SUB-HARNESS

1. Disconnect transmission range switch connector and TCM connector.
2. Check continuity between transmission range switch connector (A) terminals and TCM connector (B) terminals.

Item	Connector	Terminal	Continuity
Transmission range switch connector	F505	6	Yes
TCM connector	F503	19	
Transmission range switch connector	F505	7	Yes
TCM connector	F503	18	



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

OK or NG

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

5.CHECK A/T FLUID TEMPERATURE SENSOR 2

Check A/T fluid temperature sensor 2. Refer to AT-143, "Component Inspection".

OK or NG

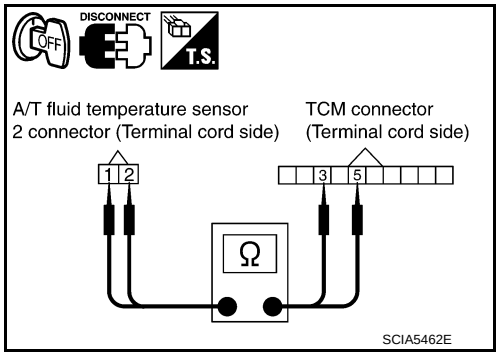
OK >> GO TO 6.
NG >> Replace the A/T fluid temperature sensor 2. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".

6.CHECK TERMINAL CORD ASSEMBLY

1. Disconnect A/T fluid temperature sensor 2 connector and TCM connector.

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

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



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

OK or NG

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

7. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

1. Check TCM power supply and ground circuit. Refer to AT-168.
2. Reinstall any part removed.

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

8. CHECK DTC

Perform AT-140, "DTC Confirmation Procedure".

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 1.

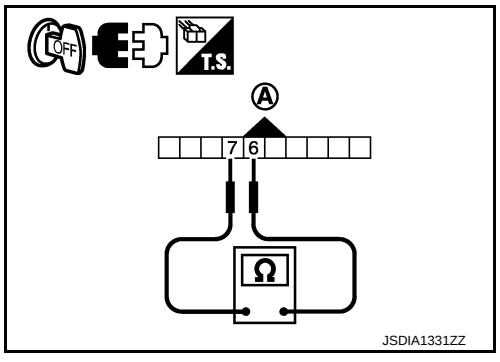
Component Inspection

INFOID:0000000005352535

A/T FLUID TEMPERATURE SENSOR 1

1. Remove control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check resistance between transmission range switch connector (A) terminals.

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



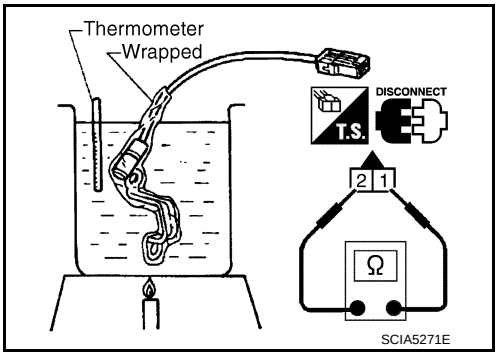
3. If NG, replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".

A/T FLUID TEMPERATURE SENSOR 2

1. Remove A/T fluid temperature sensor 2. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".

2. Check resistance between terminals.

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



3. If NG, replace the A/T fluid temperature sensor 2. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".

P1721 VEHICLE SPEED SIGNAL

Description

INFOID:0000000005352536

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352537

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

On Board Diagnosis Logic

INFOID:0000000005352538

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

Possible Cause

INFOID:0000000005352539

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

DTC Confirmation Procedure

INFOID:0000000005352540

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

VHCL/S SE-MTR	: 30 km/h (19 MPH) or more
ACCELE POSI	: 1.0/8 or less

4. If DTC is detected, go to AT-145, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000005352541

1.CHECK CAN COMMUNICATION LINE

With CONSULT-III
- Select “SELF-DIAG RESULTS” mode for “TRANSMISSION” with CONSULT-III.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is malfunction in the CAN communication indicated in the result?

YES >> Check CAN communication line. Refer to AT-102.
NO >> GO TO 2.

2.CHECK INPUT SIGNAL

With CONSULT-III
1. Start engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and read out the value of “VHCL/S SE-MTR”. Refer to AT-145, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

3. CHECK UNIFIED METER AND A/C AMP

Check unified meter and A/C amp. Refer to DI-26.

OK or NG

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

4. CHECK DTC

Perform AT-145, "DTC Confirmation Procedure".

OK or NG

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

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

6. DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

P1730 INTERLOCK

Description

INFOID:0000000005352542

Fail-safe function to detect interlock conditions.

On Board Diagnosis Logic

INFOID:0000000005352543

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

Possible Cause

INFOID:0000000005352544

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

DTC Confirmation Procedure

INFOID:0000000005352545

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

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.

SLCT LVR POSI	: “D” position

4. If DTC is detected, go to AT-147, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Judgment of Interlock

INFOID:0000000005352546

When interlock is judged to be malfunctioning, the vehicle should be fixed in 2GR, and should be set in a condition in which it can travel.
NOTE:
When the vehicle is driven fixed in 2GR, a input speed sensor malfunction is displayed, but this is not a input speed sensor malfunction.
When interlock is detected at the 3GR or more, it is locked at the 2GR.

Diagnosis Procedure

INFOID:0000000005352547

1. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON.
4. Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III

1. Drive vehicle.
2. Stop vehicle and turn ignition switch OFF.
3. Turn ignition switch ON.
4. Perform self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

OK or NG

OK >> GO TO 2.
NG >> Check low coast brake solenoid valve circuit and function. Refer to AT-159, AT-161.

2.CHECK DTC

Perform AT-147, "DTC Confirmation Procedure".

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

4.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

P1731 1ST ENGINE BRAKING

Description

INFOID:0000000005352548

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352549

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-27.	ON
	Low coast brake disengaged. Refer to AT-27.	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-27.	ON
	Low coast brake disengaged. Refer to AT-27.	OFF

On Board Diagnosis Logic

INFOID:0000000005352550

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1731” with CONSULT-III or 13th judgment flicker without CONSULT-III is detected under the following conditions.

- When TCM does not receive the proper voltage signal from the sensor.
- When TCM monitors each ATF pressure switch and solenoid monitor value, and detects as irregular when engine brake of 1GR acts other than at M1 position.

Possible Cause

INFOID:0000000005352551

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

DTC Confirmation Procedure

INFOID:0000000005352552

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 preformed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.

ENGINE SPEED	: 1,200 rpm
MANU MODE SW	: ON
GEAR	: “1” position

4. If DTC is detected, go to AT-149, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000005352553

1.CHECK INPUT SIGNALS

With CONSULT-III

1. Start engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle in the “M” position (1GR), and confirm the ON/OFF actuation of “ATF PRES SW 2” and “ON OFF SOL”. Refer to AT-149, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform AT-149, "DTC Confirmation Procedure".

OK or NG

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

P1752 INPUT CLUTCH SOLENOID

Description

INFOID:0000000005352554

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352555

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-27.	0.6 - 0.8 A
	Input clutch engaged. Refer to AT-27.	0 - 0.05 A

On Board Diagnosis Logic

INFOID:0000000005352556

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1752” with CONSULT-III or 5th judgment flicker without CONSULT-III is detected under the following conditions.

- When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

INFOID:0000000005352557

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

DTC Confirmation Procedure

INFOID:0000000005352558

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

ACCELE POSI	: 1.5/8 – 2.0/8
SLCT LVR POSI	: “D” position
GEAR	: “3” ⇒ “4” (I/C ON/OFF)
Driving location	: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

4. If DTC is detected, go to AT-151, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352559

1. CHECK INPUT SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Start engine.

4. Read out the value of “I/C SOLENOID” while driving. Refer to AT-151, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform AT-151, "DTC Confirmation Procedure".

OK or NG

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

P1757 FRONT BRAKE SOLENOID

Description

INFOID:0000000005352560

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352561

Item name	Condition	Display value (Approx.)
FR/B SOLENOID	Front brake engaged. Refer to AT-27.	0.6 - 0.8 A
	Front brake disengaged. Refer to AT-27.	0 - 0.05 A

On Board Diagnosis Logic

INFOID:0000000005352562

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1757” with CONSULT-III or 6th judgment flicker without CONSULT-III is detected under the following conditions.

- When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

INFOID:0000000005352563

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

DTC Confirmation Procedure

INFOID:0000000005352564

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

ACCELE POSI	: 1.5/8 – 2.0/8
SLCT LVR POSI	: “D” position
GEAR	: “3” ⇒ “4” (FR/B ON/OFF)
Driving location	: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

4. If DTC is detected, go to AT-153, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352565

1.CHECK INPUT SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Start engine.

4. Read out the value of “FR/B SOLENOID” while driving. Refer to AT-153, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform AT-153, "DTC Confirmation Procedure".

OK or NG

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

P1762 DIRECT CLUTCH SOLENOID

Description

INFOID:0000000005352566

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

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352567

Item name	Condition	Display value (Approx.)
D/C SOLENOID	Direct clutch disengaged. Refer to AT-27.	0.6 - 0.8 A
	Direct clutch engaged. Refer to AT-27.	0 - 0.05 A

On Board Diagnosis Logic

INFOID:0000000005352568

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1762” with CONSULT-III or 2nd judgment flicker without CONSULT-III is detected under the following conditions.

- When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

INFOID:0000000005352569

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

DTC Confirmation Procedure

INFOID:0000000005352570

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

ACCELE POSI	: 1.5/8 – 2.0/8
SLCT LVR POSI	: “D” position
GEAR	: “1” ⇒ “2” (D/C ON/OFF)
Driving location	: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

4. If DTC is detected, go to AT-155, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352571

1. CHECK INPUT SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Start engine.

4. Read out the value of “D/C SOLENOID” while driving. Refer to AT-155, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform AT-155, "DTC Confirmation Procedure".

OK or NG

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

P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID

Description

INFOID:0000000005352572

High and low reverse clutch solenoid valve is controlled by the TCM in response to signals sent from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352573

Item name	Condition	Display value (Approx.)
HLR/C SOL	High and low reverse clutch disengaged. Refer to AT-27.	0.6 - 0.8 A
	High and low reverse clutch engaged. Refer to AT-27.	0 - 0.05 A

On Board Diagnosis Logic

INFOID:0000000005352574

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1767” with CONSULT-III or 8th judgment flicker without CONSULT-III is detected under the following conditions.

- When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

INFOID:0000000005352575

- Harness or connectors
  (Solenoid circuit is open or shorted.)
- High and low reverse clutch solenoid valve

DTC Confirmation Procedure

INFOID:0000000005352576

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

ACCELE POSI	: 1.5/8 – 2.0/8
SLCT LVR POSI	: “D” position
GEAR	: “2” ⇒ “3” (HLR/C ON/OFF)
Driving location	: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

4. If DTC is detected, go to AT-157, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352577

1. CHECK INPUT SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Start engine.

4. Read out the value of “HLR/C SOL” while driving. Refer to AT-157, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform AT-157, "DTC Confirmation Procedure".

OK or NG

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

P1772 LOW COAST BRAKE SOLENOID

Description

INFOID:0000000005352578

Low coast brake solenoid valve is turned ON or OFF by the TCM in response to signals sent from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352579

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-27.	ON
	Low coast brake disengaged. Refer to AT-27.	OFF

On Board Diagnosis Logic

INFOID:0000000005352580

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1772” with CONSULT-III or 7th judgment flicker without CONSULT-III is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

INFOID:0000000005352581

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

DTC Confirmation Procedure

INFOID:0000000005352582

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Touch “START”.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.

MANU MODE SW	: ON
GEAR	: “1” or “2” (LC/B ON/OFF)

5. If DTC is detected, go to AT-159, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352583

1.CHECK INPUT SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Start engine.
4. Read out the value of “ON OFF SOL” while driving. Refer to AT-159, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

OK >> GO TO 4.

NG >> GO TO 2.

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform AT-159, "DTC Confirmation Procedure".

OK or NG

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

P1774 LOW COAST BRAKE SOLENOID

Description

INFOID:0000000005352584

- Low coast brake solenoid valve is turned ON or OFF by the TCM in response to signals sent from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352585

Item name	Condition	Display value
ON OFF SOL	Low coast brake engaged. Refer to AT-27.	ON
	Low coast brake disengaged. Refer to AT-27.	OFF
ATF PRES SW 2	Low coast brake engaged. Refer to AT-27.	ON
	Low coast brake disengaged. Refer to AT-27.	OFF

On Board Diagnosis Logic

INFOID:0000000005352586

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1774” with CONSULT-III or 7th judgment flicker without CONSULT-III is detected under the following conditions.

- When TCM detects that actual gear ratio is irregular, and relation between gear position and condition of ATF pressure switch 2 is irregular during depressing accelerator pedal. (Other than during shift change.)
- When TCM detects that relation between gear position and condition of ATF pressure switch 2 is irregular during releasing accelerator pedal. (Other than during shift change.)

Possible Cause

INFOID:0000000005352587

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

DTC Confirmation Procedure

INFOID:0000000005352588

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Accelerate vehicle to maintain the following conditions.

MANU MODE SW	: ON
GEAR	: “1” or “2” (LC/B ON/OFF)

4. Perform step 3 again.
5. Turn ignition switch OFF, then perform step 1 to 4 again.
6. Check “SELF-DIAG RESULTS” in “TRANSMISSION”.
   If DTC (P1774) is detected, go to AT-162, "Diagnosis Procedure".
   If DTC (P1772) is detected, go to AT-159, "Diagnosis Procedure".

WITH GST

Follow the procedure “WITH CONSULT-III”.

Diagnosis Procedure

INFOID:0000000005352589

1.CHECK INPUT SIGNALS

With CONSULT-III
1. Start engine.
2. Select in “DATA MONITOR” in “TRANSMISSION”.
3. Drive vehicle in the manual mode (1GR or 2GR), and confirm the ON/OFF actuation of the “ATF PRES SW 2” and “ON OFF SOL”. Refer to AT-161, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

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

2.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

3.DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

4.CHECK DTC

Perform AT-161, "DTC Confirmation Procedure".

OK or NG

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

P1815 M-MODE SWITCH

Description

INFOID:0000000005352590

Manual mode switch is installed in A/T shift selector. It sends manual mode switch, shift up and shift down switch signals to TCM.
TCM sends the switch signals to unified meter and A/C amp. by CAN communication line. Then manual mode switch position is indicated on the A/T indicator. For inspection, refer to AT-174.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352591

Item name	Condition	Display Value
MANU MODE SW	Selector lever is shifted to manual shift gate side.	ON
	Other than the above	OFF
NON M-MODE SW	Selector lever is shifted to manual shift gate side.	OFF
	Other than the above	ON
UP SW LEVER	Selector lever is shifted to + side.	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever is shifted to – side.	ON
	Other than the above	OFF

On Board Diagnosis Logic

INFOID:0000000005352592

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1815” with CONSULT-III is detected when TCM monitors Manual mode, Non manual mode, Up or Down switch signal, and detects as irregular when impossible input pattern occurs 1 second or more.

Possible Cause

INFOID:0000000005352593

- Harness or connectors
  (These switches circuit is open or shorted.)
- Manual mode select switch (Into A/T shift selector)
- Manual mode position select switch (Into A/T shift selector)

DTC Confirmation Procedure

INFOID:0000000005352594

CAUTION:
Always drive vehicle at a safe speed.
NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-III

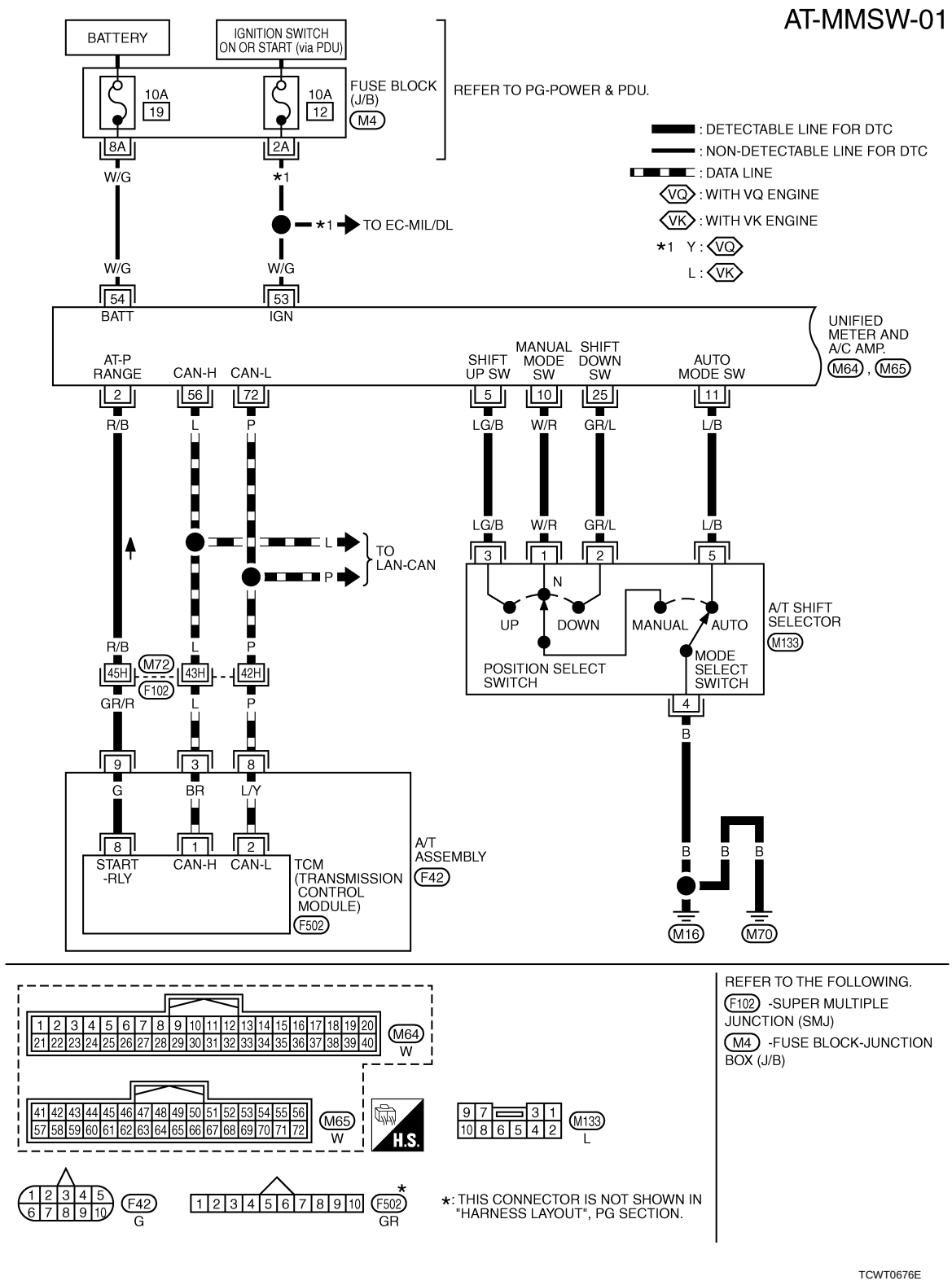
1. Start the engine.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Move selector lever to “M” position.
4. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.

   MANU MODE SW : ON

5. If DTC is detected, go to AT-166, "Diagnosis Procedure".

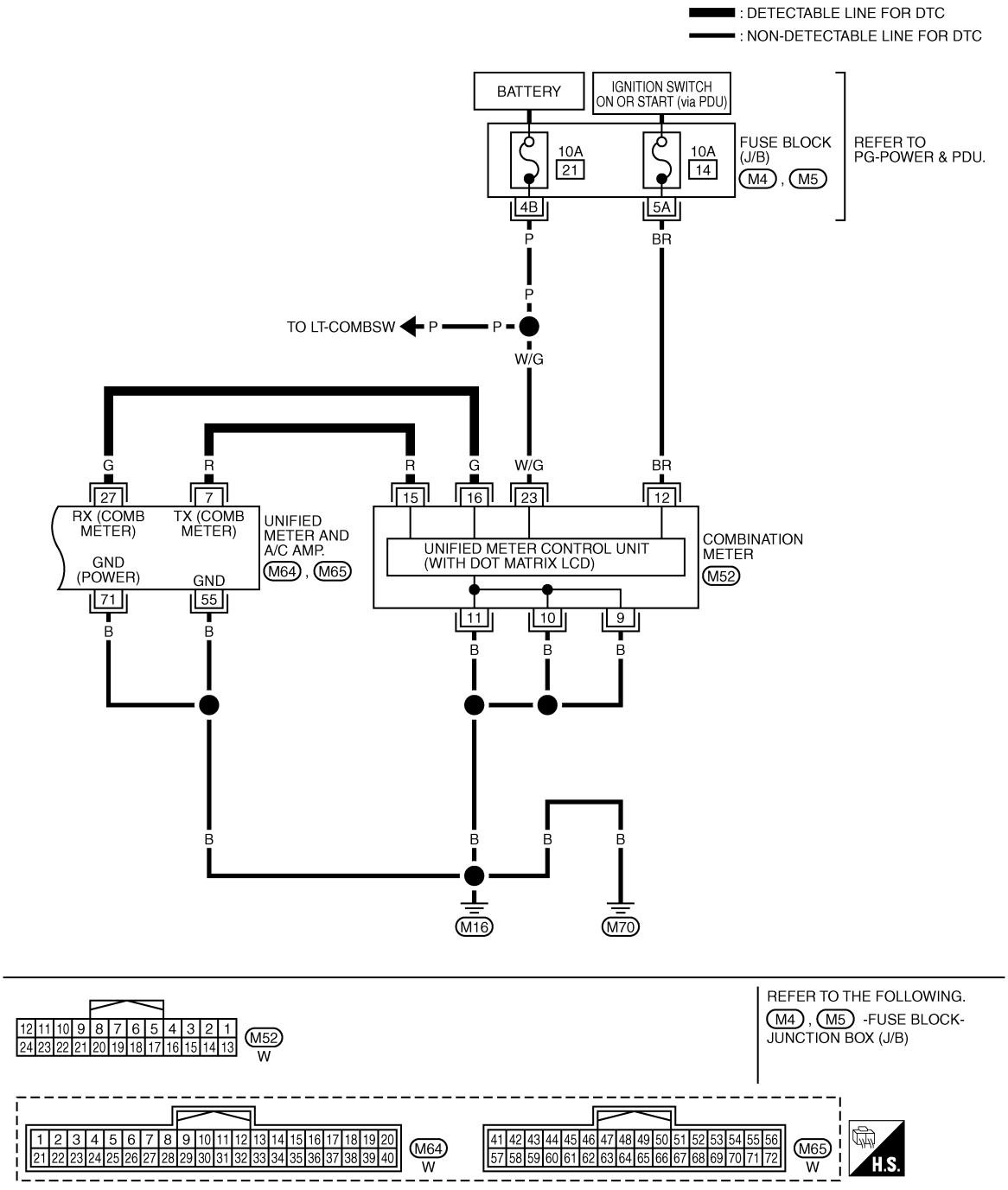
Wiring Diagram - AT - MMSW

INFOID:0000000005352595



TCWT0676E

AT-MMSW-02



TCWT0677E

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

Terminal	Wire color	Item	Condition		Data (Approx.)
3	L	CAN-H	—		—
8	P	CAN-L	—		—
9	GR/R	Starter relay	ON	Selector lever in “N”, “P” positions.	Battery voltage
				Selector lever in “R”, “D” positions.	0 V

Diagnosis Procedure

INFOID:0000000005352596

1. CHECK CAN COMMUNICATION LINE

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

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

YES >> Check CAN communication line. Refer to AT-102.
NO >> GO TO 2.

2. CHECK MANUAL MODE SWITCH CIRCUIT

With CONSULT-III
1. Turn ignition switch ON.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Read out ON/OFF switching action of “MANU MODE SW”, “NON M-MODE SW”, “UP SW LEVER”, “DOWN SW LEVER”. Refer to AT-163, "CONSULT-III Reference Value in Data Monitor Mode".

Without CONSULT-III
Drive vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the “+ (up)” or “- (down)” side (1GR ⇔ 5GR).

OK or NG

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

3. DETECT MALFUNCTIONING ITEM

Check the following.
- Manual mode switch. Refer to AT-167, "Component Inspection".
- Pin terminals for damage or loose connection with harness connector.
- Open circuit or short to ground or short to power in harness or connector for A/T shift selector (manual mode switch).
- Harness for short or open between unified meter and A/C amp. and A/T shift selector.
- Unified meter and A/C amp. Refer to DI-6.

OK or NG

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

4. CHECK DTC

Perform AT-163, "DTC Confirmation Procedure".

OK or NG

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

5. CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

6. DETECT MALFUNCTIONING ITEM

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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
NG >> Repair or replace damaged parts.

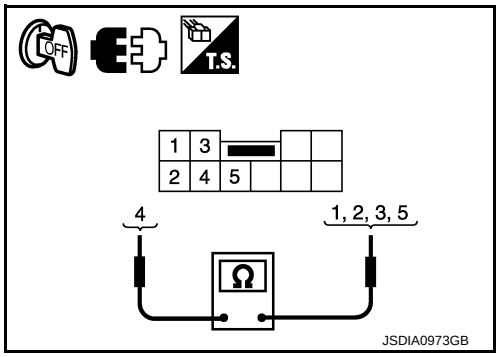
Component Inspection

INFOID:0000000005352597

MANUAL MODE SWITCH

Check continuity between A/T shift selector connector terminals.

Item	Position	Connector	Terminal	Continuity
Manual mode select switch	Auto	M133	4 - 5	Yes
	Manual		1 - 4	
Manual mode position select switch	+ side		3 - 4	
	– side		2 - 4	

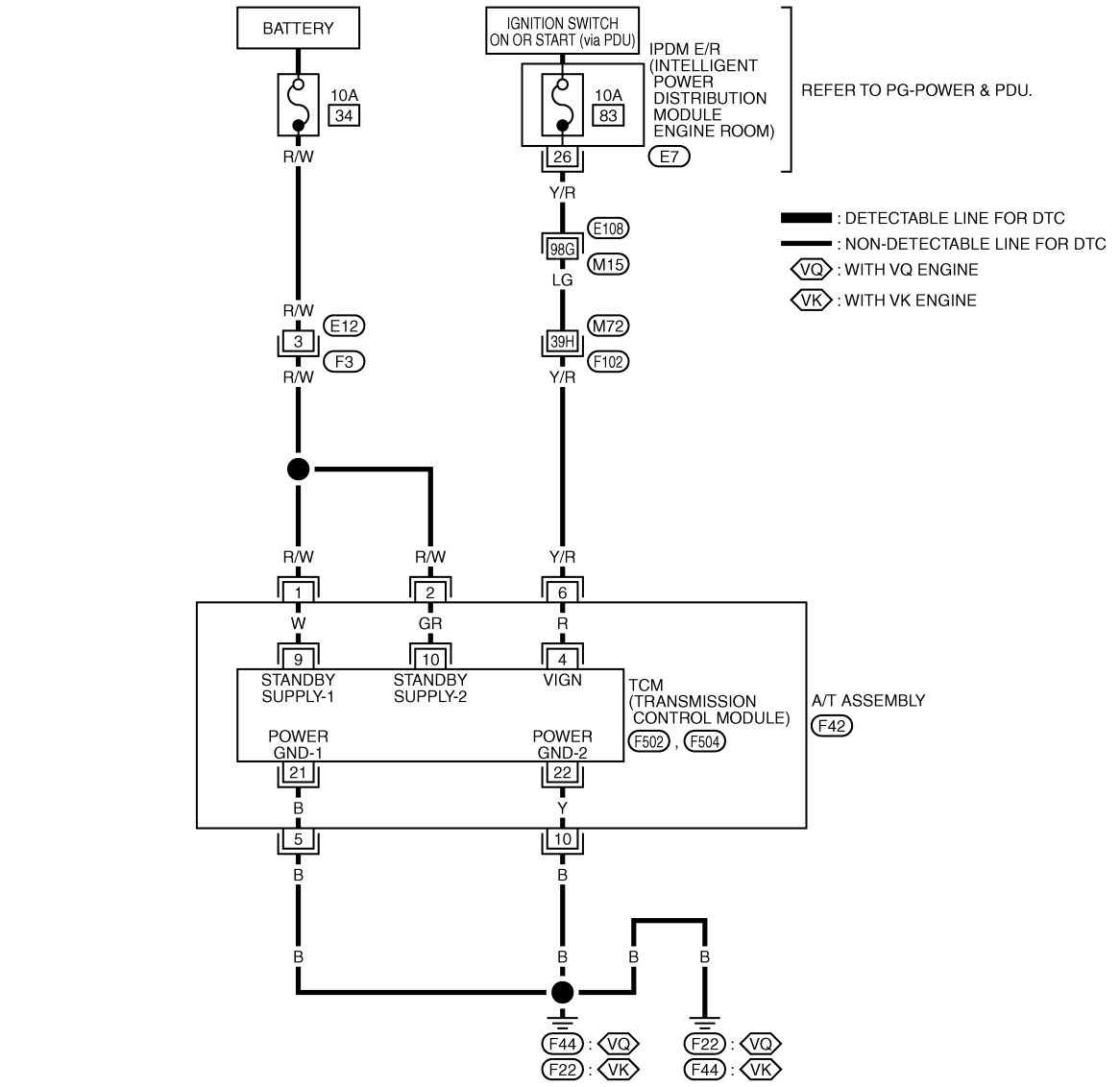


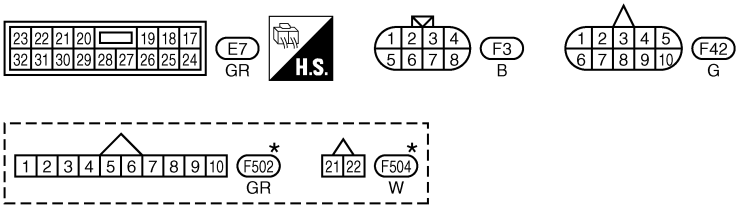
MAIN POWER SUPPLY AND GROUND CIRCUIT

Wiring Diagram - AT - MAIN

INFOID:0000000005352598

AT-MAIN-01





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

REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)

TCWT0678E

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

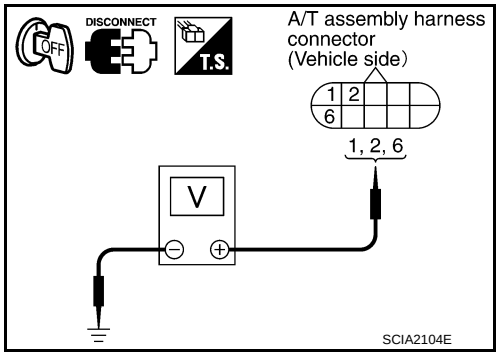
Terminal	Wire color	Item	Condition		Data (Approx.)
1	R/W	Power supply (Memory back-up)	Always		Battery voltage
2	R/W	Power supply (Memory back-up)	Always		Battery voltage
5	B	Ground	Always		0 V
6	Y/R	Power supply		—	Battery voltage
				—	0 V
10	B	Ground	Always		0 V

Diagnosis Procedure

INFOID:0000000005352599

1. CHECK TCM POWER SOURCE STEP 1

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Check voltage between A/T assembly harness connector terminals and ground.



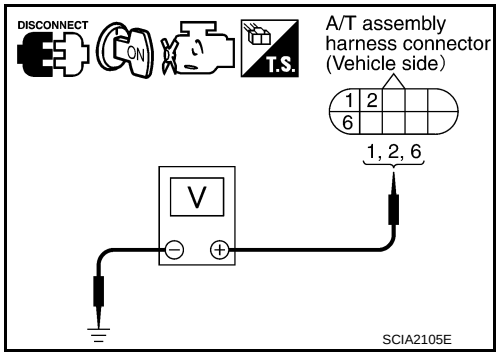
Item	Connector	Terminal	Voltage
TCM	F42	1 - Ground	Battery voltage
		2 - Ground	
		6 - Ground	0 V

OK or NG

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

2. CHECK TCM POWER SOURCE STEP 2

1. Disconnect A/T assembly harness connector.
2. Turn ignition switch ON.
3. Check voltage between A/T assembly harness connector terminals and ground.



Item	Connector	Terminal	Voltage
TCM	F42	1 - Ground	Battery voltage
		2 - Ground	
		6 - Ground	

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 A/T assembly harness connector terminals 1, 2
- Harness for short or open between push-button ignition switch and A/T assembly harness connector terminal 6
- 10A fuse (No. 34, located in the fuse and fusible link block) and 10A fuse (No. 83, located in the IPDM E/R)
- Push-button ignition switch (Refer to PG-4)

OK or NG

OK >> GO TO 4.

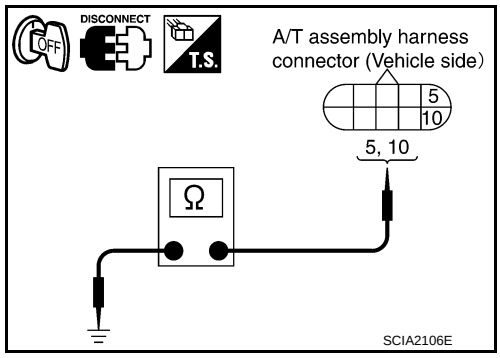
NG >> Repair or replace damaged parts.

4. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T assembly harness connector.
3. Check continuity between A/T assembly harness connector terminals and ground.

Continuity should exist.

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



OK or NG

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

5. DETECT MALFUNCTIONING ITEM

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

OK or NG

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

6. PERFORM SELF-DIAGNOSIS

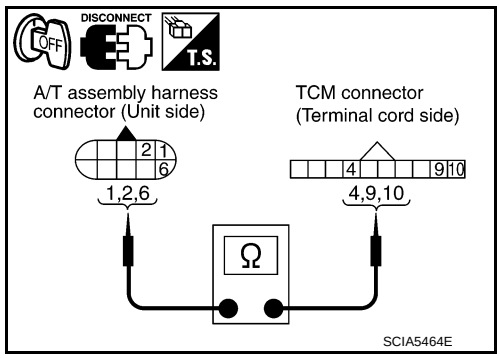
Perform self-diagnosis. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

OK or NG

OK >> **INSPECTION END**
NG-1 >> Self-diagnosis does not activate: GO TO 7.
NG-2 >> DTC is displayed: Check the malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".

7. CHECK TERMINAL CORD ASSEMBLY

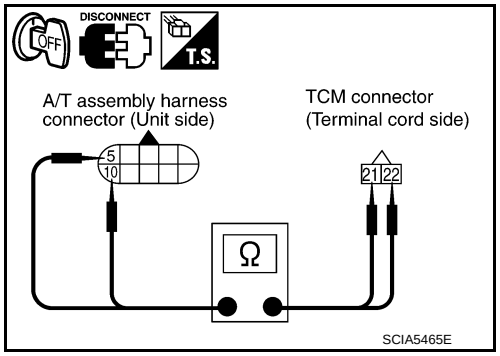
1. Remove control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disconnect A/T assembly harness connector and TCM connector.
3. Check continuity between A/T assembly harness connector terminals and TCM connector terminals.



Item	Connector	Terminal	Continuity
A/T assembly harness connector	F42	1	Yes
TCM connector	F502	9	
A/T assembly harness connector	F42	2	Yes
TCM connector	F502	10	
A/T assembly harness connector	F42	6	Yes
TCM connector	F502	4	

4. Check continuity between A/T assembly harness connector terminals and TCM connector terminals.

Item	Connector	Terminal	Continuity
A/T assembly harness connector	F42	5	Yes
TCM connector	F504	21	
A/T assembly harness connector	F42	10	Yes
TCM connector	F504	22	



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

OK or NG

OK >> Replace the control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".

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

CLOSED THROTTLE POSITION AND WIDE OPEN THROTTLE POSITION CIRCUIT

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352600

Item name	Condition	Display value
CLSD THL POS	Released accelerator pedal.	ON
	Fully depressed accelerator pedal.	OFF
W/O THL POS	Fully depressed accelerator pedal.	ON
	Released accelerator pedal.	OFF

Diagnosis Procedure

INFOID:0000000005352601

1.CHECK CAN COMMUNICATION LINE

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

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

YES >> Check CAN communication line. Refer to AT-102.
NO >> GO TO 2.

2.CHECK THROTTLE POSITION SIGNAL CIRCUIT

With CONSULT-III
1. Turn ignition switch ON.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Depress accelerator pedal and read out the value of “CLSD THL POS” and “W/O THL POS”. Refer to AT-172, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

OK >> **INSPECTION END**
NG >> Check the following. If NG, repair or replace damaged parts.
- Perform “SELF-DIAG RESULTS” in “ENGINE”. Refer to EC-134, "CONSULT-III Function" (for VQ35HR engine), EC-799, "CONSULT-III Function" (for VK45DE engine).
- Open circuit or short to ground or short to power in harness or connectors.
- Pin terminals for damage or loose connection with harness connector.

BRAKE SIGNAL CIRCUIT

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352602

Item name	Condition	Display value
BRAKE SW	Depressed brake pedal.	ON
	Released brake pedal.	OFF

Diagnosis Procedure

INFOID:0000000005352603

1.CHECK CAN COMMUNICATION LINE

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

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

YES >> Check CAN communication line. Refer to AT-102.
NO >> GO TO 2.

2.CHECK STOP LAMP SWITCH CIRCUIT

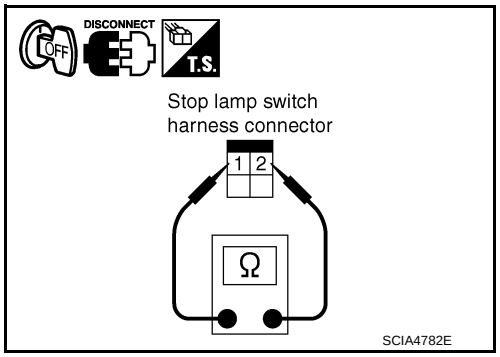
With CONSULT-III
1. Turn ignition switch ON.
2. Select “DATA MONITOR” in “TRANSMISSION”.
3. Read out ON/OFF switching action of the “BRAKE SW”. Refer to AT-173, "CONSULT-III Reference Value in Data Monitor Mode".

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 3.

3.CHECK STOP LAMP SWITCH

Check continuity between stop lamp switch harness connector terminals. Refer to AT-175, "Wiring Diagram - AT - NONDTC".



Condition	Continuity
When brake pedal is depressed	Yes
When brake pedal is released	No

Check stop lamp switch after adjusting brake pedal — refer to BR-6.

OK or NG

OK >> Check the following. If NG, repair or replace damaged parts.
- Harness for short or open between battery and stop lamp switch.
- Harness for short or open between stop lamp switch and unified meter and A/C amp.
- 10A fuse (No.20, located in fuse block).

NG >> Repair or replace the stop lamp switch.

A/T INDICATOR CIRCUIT

Description

INFOID:0000000005352604

TCM sends the switch signals to unified meter and A/C amp. by CAN communication line. Then manual mode switch position is indicated on the A/T indicator.

CONSULT-III Reference Value in Data Monitor Mode

INFOID:0000000005352605

Item name	Condition	Display value
GEAR	During driving	1, 2, 3, 4, 5

Diagnosis Procedure

INFOID:0000000005352606

1.CHECK INPUT SIGNALS

With CONSULT-III
1. Start engine.
2. Select “DATA MONITOR” in “TRANSMISSION” and read out the value of “GEAR”. Refer to AT-174, "CONSULT-III Reference Value in Data Monitor Mode".
3. Drive vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the “+ (up)” or “- (down)” side (1GR ⇔ 5GR.

OK or NG

OK >> **INSPECTION END**
NG >> Check the following.

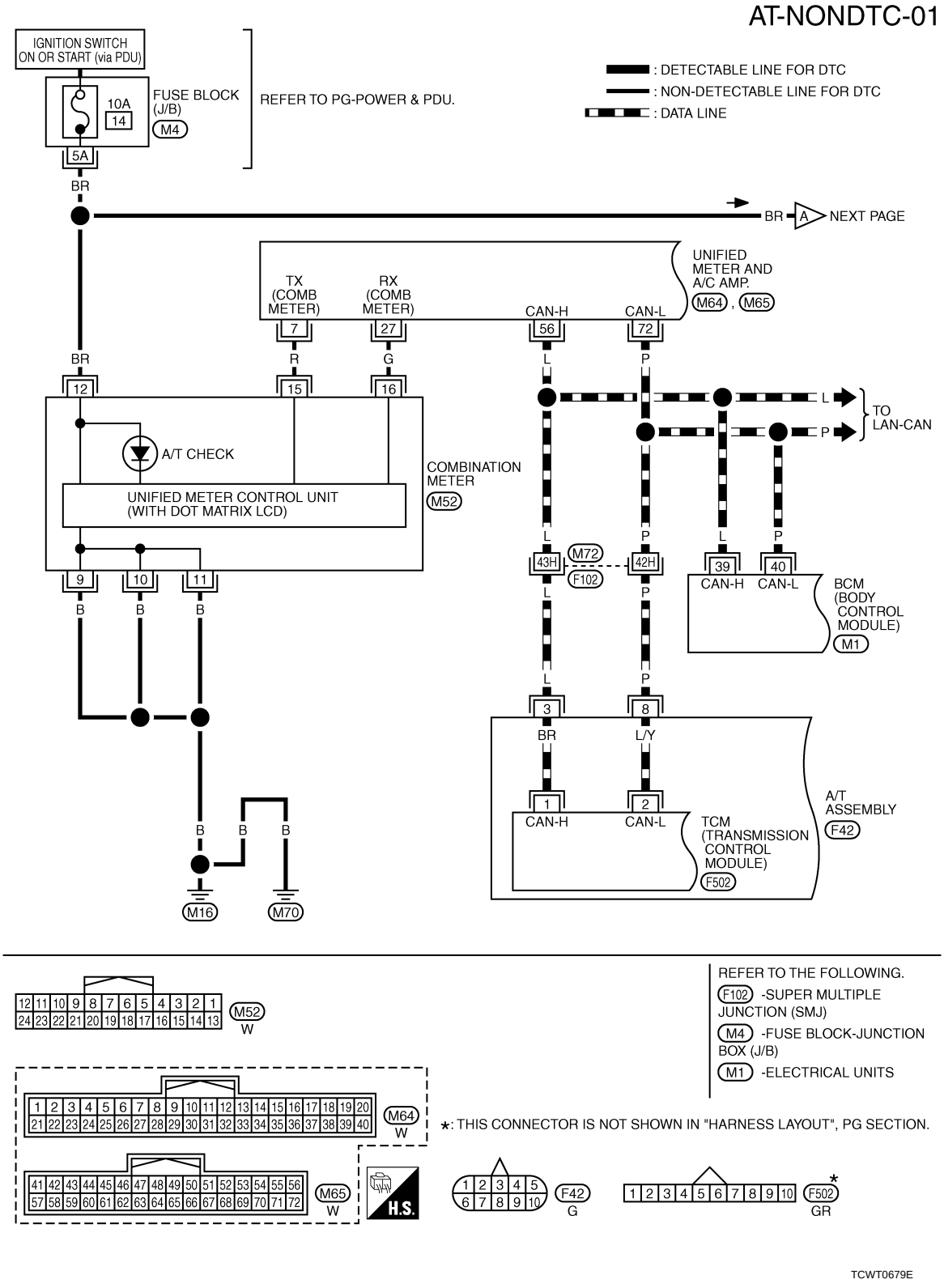
A/T INDICATOR SYMPTOM CHART

Items	Possible location of malfunction
The actual gear position does not change, or shifting into the manual mode is not possible (no gear shifting in the manual mode possible). The A/T indicator is not indicated.	Manual mode switch Refer to AT-163. A/T main system (Fail-safe function actuated) • Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".
The actual gear position changes, but the A/T indicator is not indicated.	Perform the self-diagnosis function. • Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".
The actual gear position and the indication on the A/T indicator do not coincide.	Perform the self-diagnosis function. • Refer to AT-92, "CONSULT-III Function (TRANSMISSION)".
Only a specific position or positions is/are not indicated on the A/T indicator.	Check the unified meter and A/C amp. Refer to DI-6.

TROUBLE DIAGNOSIS FOR SYMPTOMS

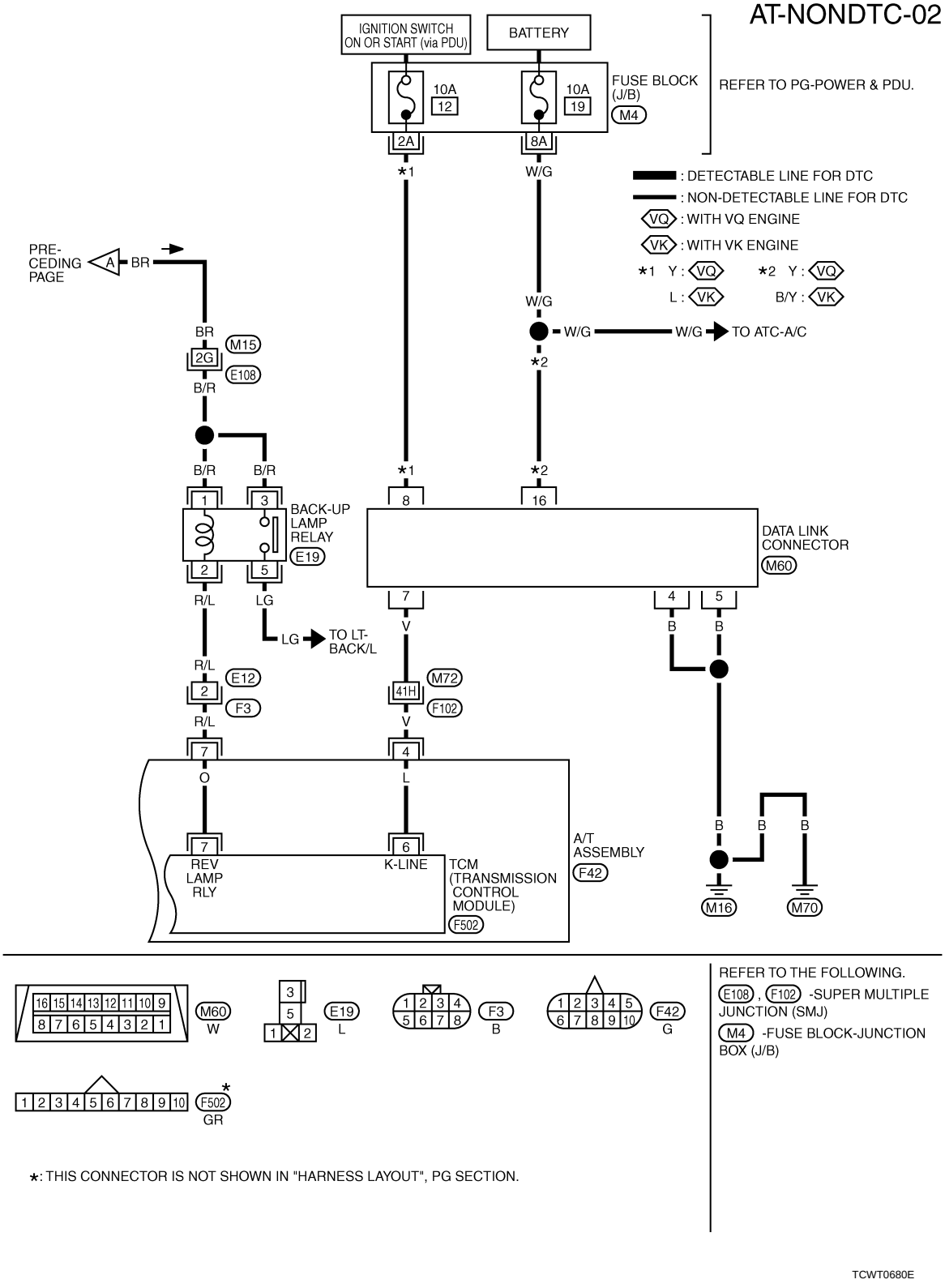
Wiring Diagram - AT - NONDTC

INFOID:0000000005352607



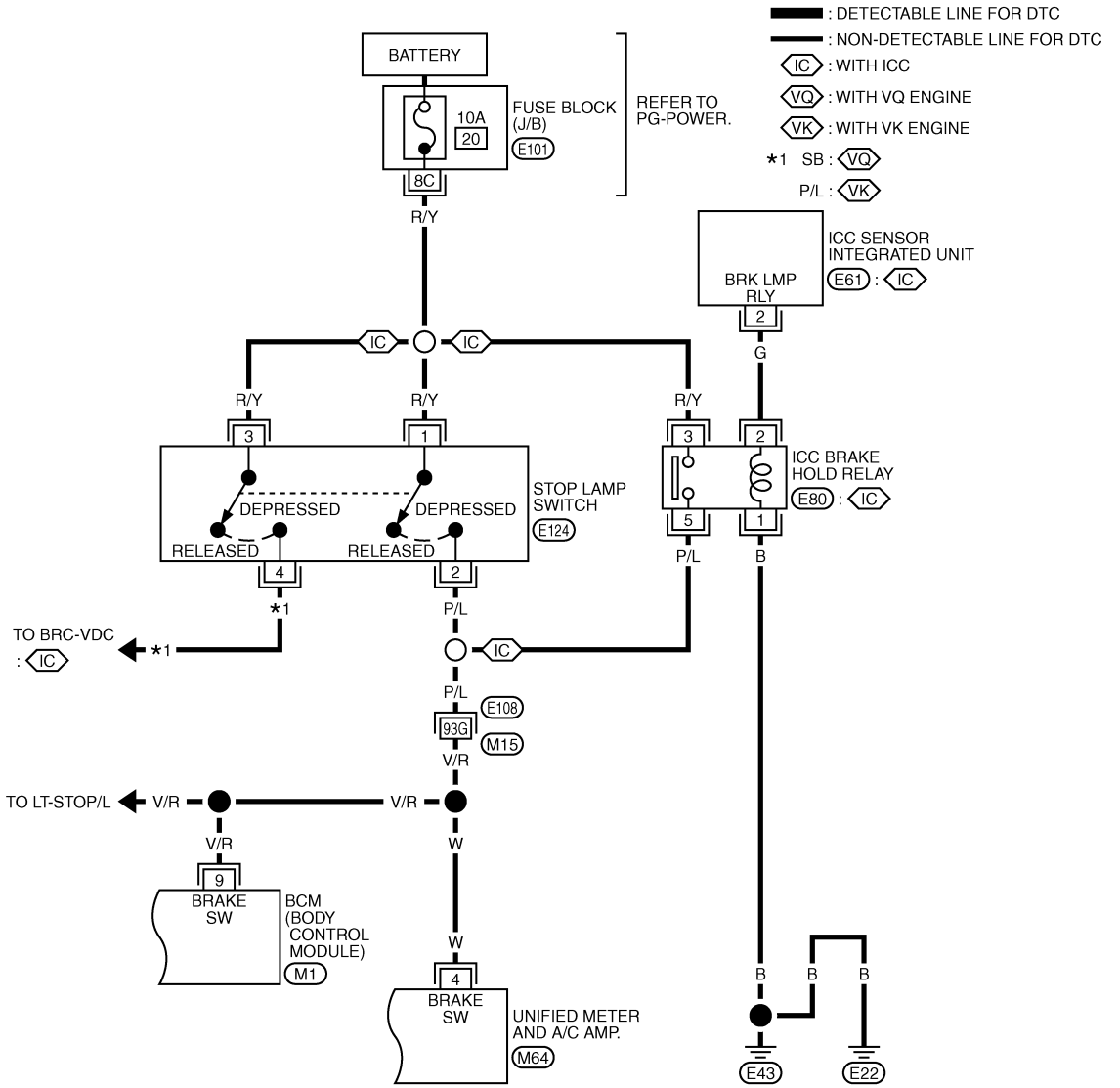
TCWT0679E

AT-NONDTC-02



TCWT0680E

AT-NONDTC-03



TCWT0681E

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

Terminal	Wire color	Item	Condition	Data (Approx.)
3	L	CAN-H	—	—
4	V	K-line (CONSULT-III signal)	The terminal is connected to the data link connector for CONSULT-III.	—

Terminal	Wire color	Item	Condition		Data (Approx.)
7	R/L	Back-up lamp relay		Selector lever in “R” position.	0 V
				Selector lever in other positions.	Battery voltage
8	P	CAN-L	—		—

A/T Check Indicator Lamp Does Not Come On

INFOID:0000000005352608

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

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

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

YES >> Check CAN communication line. Refer to AT-102.
NO >> GO TO 2.

2.CHECK A/T CHECK INDICATOR LAMP CIRCUIT

Check combination meters. Refer to DI-6.

OK or NG

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

3.CHECK TCM POWER SUPPLY AND GROUND CIRCUIT

Check TCM power supply and ground circuit. Refer to AT-168.

OK or NG

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

Engine Cannot Be Started in "P" or "N" Position

INFOID:0000000005352609

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 TRANSMISSION RANGE SWITCH CIRCUIT

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Do the self-diagnostic results indicate transmission range switch?

YES >> Check malfunctioning system. Refer to AT-110.
NO >> GO TO 2.

2.CHECK A/T POSITION

Check A/T position. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 3.
NG >> Adjust A/T position. Refer to AT-209, "Adjustment of A/T Position".

3.CHECK STARTING SYSTEM

Check starting system. Refer to SC-8.

OK or NG

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

In "P" Position, Vehicle Moves When Pushed

INFOID:0000000005352610

SYMPTOM:

Even though the selector lever is set in “P” position, the parking mechanism is not actuated, allowing the vehicle to be moved when it is pushed.

DIAGNOSTIC PROCEDURE

1.CHECK TRANSMISSION RANGE SWITCH CIRCUIT

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Do the self-diagnostic results indicate transmission range switch?

YES >> Check malfunctioning system. Refer to AT-110.
NO >> GO TO 2.

2.CHECK A/T POSITION

Check A/T position. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 3.
NG >> Adjust A/T position. Refer to AT-209, "Adjustment of A/T Position".

3.CHECK PARKING COMPONENTS

Check parking components. Refer to AT-268, "Disassembly" (VQ35HR models), AT-231, "Parking Component (2WD Models Only)" (VK45DE models).

OK or NG

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

4.CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> **INSPECTION END**
NG >> Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.65).

In "N" Position, Vehicle Moves

INFOID:0000000005352611

SYMPTOM:

Vehicle moves forward or backward when selecting “N” position.

DIAGNOSTIC PROCEDURE

1.CHECK TRANSMISSION RANGE SWITCH CIRCUIT

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Do the self-diagnostic results indicate transmission range switch?

YES >> Check malfunctioning system. Refer to AT-110.
NO >> GO TO 2.

2.CHECK A/T POSITION

Check A/T position. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 3.
NG >> Adjust A/T position. Refer to AT-209, "Adjustment of A/T Position".

3.CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4.CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 5.
NG >> Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.67).

5.CHECK SYMPTOM

Check again. Refer to “CHECK AT IDLE”.

OK or NG

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

6.CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

Large Shock ("N" to "D" Position)

INFOID:0000000005352612

SYMPTOM:

A noticeable shock occurs when the selector lever is shifted from “N” to “D” position.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 2.

2.ENGINE IDLE SPEED

Check engine idle speed. Refer to EC-26, "IDLE SPEED : Description" (for VQ35HR engine), EC-763, "Idle Speed and Ignition Timing Check" (for VK45DE engine).

OK or NG

OK >> GO TO 3.
NG >> Adjust engine idle speed. Refer to EC-26, "IDLE SPEED : Description" (for VQ35HR engine), EC-763, "Idle Speed and Ignition Timing Check" (for VK45DE engine).

3. CHECK A/T POSITION

Check A/T position. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 4.
NG >> Adjust A/T position. Refer to AT-209, "Adjustment of A/T Position".

4. CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 5.
NG >> Refill ATF.

5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in “D” position. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 8.
NG - 1 >> Line pressure high: GO TO 6.
NG - 2 >> Line pressure low: GO TO 7.

6. DETECT MALFUNCTIONING

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".

OK or NG

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

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287.
- Power train system. Refer to AT-268.
- Transmission case. Refer to AT-268.

OK or NG

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

8. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.1).

OK or NG

OK >> GO TO 10.

NG >> Repair or replace damaged parts.

10.CHECK SYMPTOM

Check again. Refer to “CHECK AT IDLE”.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11.CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

Vehicle Does Not Creep Backward in "R" Position

INFOID:0000000005352613

SYMPTOM:

The vehicle does not creep in “R” position. Or an extreme lack of acceleration is observed.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnosis results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 2.

2.CHECK A/T POSITION

Check A/T position. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 3.
NG >> Adjust A/T position. Refer to AT-209, "Adjustment of A/T Position".

3.CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4.CHECK STALL TEST

Check stall revolution with selector lever in “M” and “R” positions. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 6.
OK in “M” position, NG in “R” position>>GO TO 5
NG in both “M” and “R” positions>>GO TO 8.

5.DETECT MALFUNCTIONING ITEM

1. Disassemble A/T. Refer to AT-268.
2. Check the following.

- Reverse brake. Refer to AT-268.

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

6. CHECK LINE PRESSURE

Check line pressure with the engine idling. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 9.
NG - 1 >> Line pressure high: GO TO 7.
NG - 2 >> Line pressure low: GO TO 8.

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

8. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".
- Power train system. Refer to AT-268.
- Transmission case. Refer to AT-268.

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 10.
NG >> GO TO 13.

10. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.43).

OK or NG

OK >> GO TO 11.
NG >> Repair or replace damaged parts.

11. CHECK SYMPTOM

Check again. Refer to “CHECK AT IDLE”.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 12.

12. CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

13. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.43).

OK or NG

OK >> GO TO 11.
NG >> Repair or replace damaged parts.

Vehicle Does Not Creep Forward in "D" Position

INFOID:0000000005352614

SYMPTOM:

Vehicle does not creep forward when selecting “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 2.

2. CHECK A/T POSITION

Check A/T position. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 3.
NG >> Adjust A/T position. Refer to AT-209, "Adjustment of A/T Position".

3. CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK STALL TEST

Check stall revolution with selector lever in “D” position. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

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

5. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in “D” position. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 8.
NG - 1 >> Line pressure high: GO TO 6.
NG - 2 >> Line pressure low: GO TO 7.

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".

OK or NG

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

7. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".
- Power train system. Refer to AT-268.
- Transmission case. Refer to AT-268.

OK or NG

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

8. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 9.
NG >> GO TO 12.

9. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.43).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to “CHECK AT IDLE”.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

12. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.43).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

Vehicle Cannot Be Started from D1

INFOID:0000000005352615

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-182, "Vehicle Does Not Creep Backward in "R" Position".

2.CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
• Select “SELF-DIAG RESULTS” in “TRANSMISSION”.
Without CONSULT-III
• Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 3.

3.CHECK ACCELERATOR PEDAL POSITION (APP) SENSOR

Check accelerator pedal position (APP) sensor. Refer to AT-110

OK or NG

OK >> GO TO 4.
NG >> Repair or replace accelerator pedal position (APP) sensor.

4.CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 5.
NG >> Refill ATF.

5.CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 8.
NG - 1 >> Line pressure high: GO TO 6.
NG - 2 >> Line pressure low: GO TO 7.

6.DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".

OK or NG

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

7.DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".
- Power train system. Refer to AT-268.
- Transmission case. Refer to AT-268.

OK or NG

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

8. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 9.
NG >> GO TO 12.

9. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.23).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

12. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.23).

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_1 \rightarrow D_2$

INFOID:0000000005352616

SYMPTOM:

The vehicle does not shift-up from the D_1 to D_2 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creep forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-184, "Vehicle Does Not Creep Forward in "D" Position", AT-185, "Vehicle Cannot Be Started from D_1".

2. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".

NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high: GO TO 5.
NG - 2 >> Line pressure low: GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".

OK or NG

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

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".
- Power train system. Refer to AT-268.
- Transmission case. Refer to AT-268.

OK or NG

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

7. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.10).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

11. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.10).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: D2→ D3

INFOID:0000000005352617

SYMPTOM:

The vehicle does not shift-up from D2 to D3 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creep forward in “D” position and vehicle can be started from D1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-184, "Vehicle Does Not Creep Forward in "D" Position", AT-185, "Vehicle Cannot Be Started from D1".

2. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high: GO TO 5.
NG - 2 >> Line pressure low: GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".

OK or NG

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

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".
- Power train system. Refer to AT-268.
- Transmission case. Refer to AT-268.

OK or NG

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

7. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.11).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

11. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.11).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_3 \rightarrow D_4$

INFOID:0000000005352618

SYMPTOM:

The vehicle does not shift-up from the D_3 to D_4 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creep forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-184, "Vehicle Does Not Creep Forward in "D" Position", AT-185, "Vehicle Cannot Be Started from D_1".

2. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 3.

3. CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 4.
NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high: GO TO 5.
NG - 2 >> Line pressure low: GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".

OK or NG

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

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".
- Power train system. Refer to AT-268.
- Transmission case. Refer to AT-268.

OK or NG

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

7. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8.DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.12).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9.CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10.CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

11.DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.12).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Shift: $D_4 \rightarrow D_5$

INFOID:0000000005352619

SYMPTOM:

- **The vehicle does not shift-up from the D_4 to D_5 gear at the specified speed.**
- **The vehicle does not shift-up from the D_4 to D_5 gear unless A/T is warmed up.**

DIAGNOSTIC PROCEDURE

1.CONFIRM THE SYMPTOM

Check if vehicle creep forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-184, "Vehicle Does Not Creep Forward in "D" Position", AT-185, "Vehicle Cannot Be Started from D_1".

2.CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 3.

3.CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 4.

NG >> Refill ATF.

4. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 7.
NG - 1 >> Line pressure high: GO TO 5.
NG - 2 >> Line pressure low: GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".

OK or NG

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

6. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".
- Power train system. Refer to AT-268.
- Transmission case. Refer to AT-268.

OK or NG

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

7. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 8.
NG >> GO TO 11.

8. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.13).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

9. CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

10. CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

11. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.13).

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

A/T Does Not Lock-up

INFOID:0000000005352620

SYMPTOM:
A/T does not lock-up at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK LINE PRESSURE

Check line pressure at the engine stall point. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 6.
NG - 1 >> Line pressure high: GO TO 4.
NG - 2 >> Line pressure low: GO TO 5.

4. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".

OK or NG

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

5. DETECT MALFUNCTIONING ITEM

1. Check control valve with TCM. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Disassemble A/T. Refer to AT-268.
3. Check the following.

- Oil pump assembly. Refer to AT-287, "Oil Pump".
- Power train system. Refer to AT-268.
- Transmission case. Refer to AT-268.

OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.

6. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 7.
NG >> GO TO 10.

7. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.24).

OK or NG

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

8. CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 9.

9. CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

10. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.24).

OK or NG

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

A/T Does Not Hold Lock-up Condition

INFOID:0000000005352621

SYMPTOM:

The lock-up condition cannot be maintained for more than 30 seconds.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.

3.CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 4.
NG >> GO TO 7.

4.DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.25).

OK or NG

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

5.CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

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

6.CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

7.DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.25).

OK or NG

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

Lock-up Is Not Released

INFOID:0000000005352622

SYMPTOM:

The lock-up condition cannot be cancelled even after releasing the accelerator pedal.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 2.

2.CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 3.

3.CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

Engine Speed Does Not Return to Idle

INFOID:0000000005352623

SYMPTOM:
When a shift-down is performed, the engine speed does not smoothly return to the idling speed.

DIAGNOSTIC PROCEDURE

1.CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

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

2.CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 3.

3.CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 4.
NG >> GO TO 7.

4.DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.72).

OK or NG

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

5.CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

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

6.CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

7.DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.72).

OK or NG

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

Cannot Be Changed to Manual Mode

INFOID:0000000005352624

SYMPTOM:
Does not change to manual mode when manual shift gate is used.

DIAGNOSTIC PROCEDURE

1.CHECK MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-163.

OK or NG

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

2.CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> **INSPECTION END**

A/T Does Not Shift: 5GR → 4GR

INFOID:0000000005352625

SYMPTOM:
When shifted from M5 to M4 position in manual mode, does not downshift from 5GR to 4GR.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 2.

2.CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3.CHECK A/T POSITION

Check A/T position. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 4.
NG >> Adjust A/T position. Refer to AT-209, "Adjustment of A/T Position".

4. CHECK MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-163.

OK or NG

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

5. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.47).

OK or NG

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

7. CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

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

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

9. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.47).

OK or NG

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

A/T Does Not Shift: 4GR → 3GR

INFOID:0000000005352626

SYMPTOM:

When shifted from M4 to M3 position in manual mode, does not downshift from 4GR to 3GR.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 4.
NG >> Adjust A/T position. Refer to AT-209, "Adjustment of A/T Position".

4. CHECK MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-163.

OK or NG

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

5. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.48).

OK or NG

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

7. CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

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

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

9. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.48).

OK or NG

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

A/T Does Not Shift: 3GR → 2GR

INFOID:0000000005352627

SYMPTOM:

When shifted from M3 to M2 position in manual mode, does not downshift from 3GR to 2GR.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".

NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 3.

NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 4.

NG >> Adjust A/T position. Refer to AT-209, "Adjustment of A/T Position".

4. CHECK MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-163.

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

5. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 6.

NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.49).

OK or NG

OK >> GO TO 7.

NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

OK >> **INSPECTION END**

NG >> GO TO 8.

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".

2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

9. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.49).

OK or NG

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

A/T Does Not Shift: 2GR → 1GR

INFOID:0000000005352628

SYMPTOM:

When shifted from M2 to M1 position in manual mode, does not downshift from 2GR to 1GR.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 2.

2. CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK A/T POSITION

Check A/T position. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 4.
NG >> Adjust A/T position. Refer to AT-209, "Adjustment of A/T Position".

4. CHECK MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-163.

OK or NG

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

5. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.50).

OK or NG

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

7.CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

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

8.CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

9.DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.50).

OK or NG

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

Vehicle Does Not Decelerate by Engine Brake

INFOID:0000000005352629

SYMPTOM:

No engine brake is applied when the gear is shifted from the 2GR to 1GR.

DIAGNOSTIC PROCEDURE

1.CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-III
- Select “SELF-DIAG RESULTS” in “TRANSMISSION”.

Without CONSULT-III
- Perform the self-diagnosis. Refer to AT-99, "Diagnosis Procedure without CONSULT-III".

Is any malfunction detected by self-diagnostic results?

YES >> Check malfunctioning system. Refer to AT-92, "CONSULT-III Function (TRANSMISSION)", AT-99, "Diagnosis Procedure without CONSULT-III".
NO >> GO TO 2.

2.CHECK A/T FLUID LEVEL (VK45DE)

Check A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3.CHECK A/T POSITION

Check A/T position. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 4.
NG >> Adjust A/T position. Refer to AT-209, "Adjustment of A/T Position".

4.CHECK MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-163.

OK or NG

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

5. CHECK A/T FLUID CONDITION (VK45DE)

1. Remove oil pan. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
2. Check A/T fluid condition. Refer to AT-57, "Inspections Before Trouble Diagnosis".

OK or NG

OK >> GO TO 6.
NG >> GO TO 9.

6. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.58).

OK or NG

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

7. CHECK SYMPTOM

Check again. Refer to AT-61, "Road Test".

OK or NG

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

8. CHECK TCM

1. Check TCM input/output signals. Refer to AT-91, "TCM Input/Output Signal Reference Value".
2. If NG, recheck A/T assembly harness connector terminals for damage or loose connection with harness connector.

OK or NG

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

9. DETECT MALFUNCTIONING ITEM

Check malfunction items. If any items are damaged, repair or replace damaged parts. Refer to AT-67, "Symptom Chart" (Symptom No.58).

OK or NG

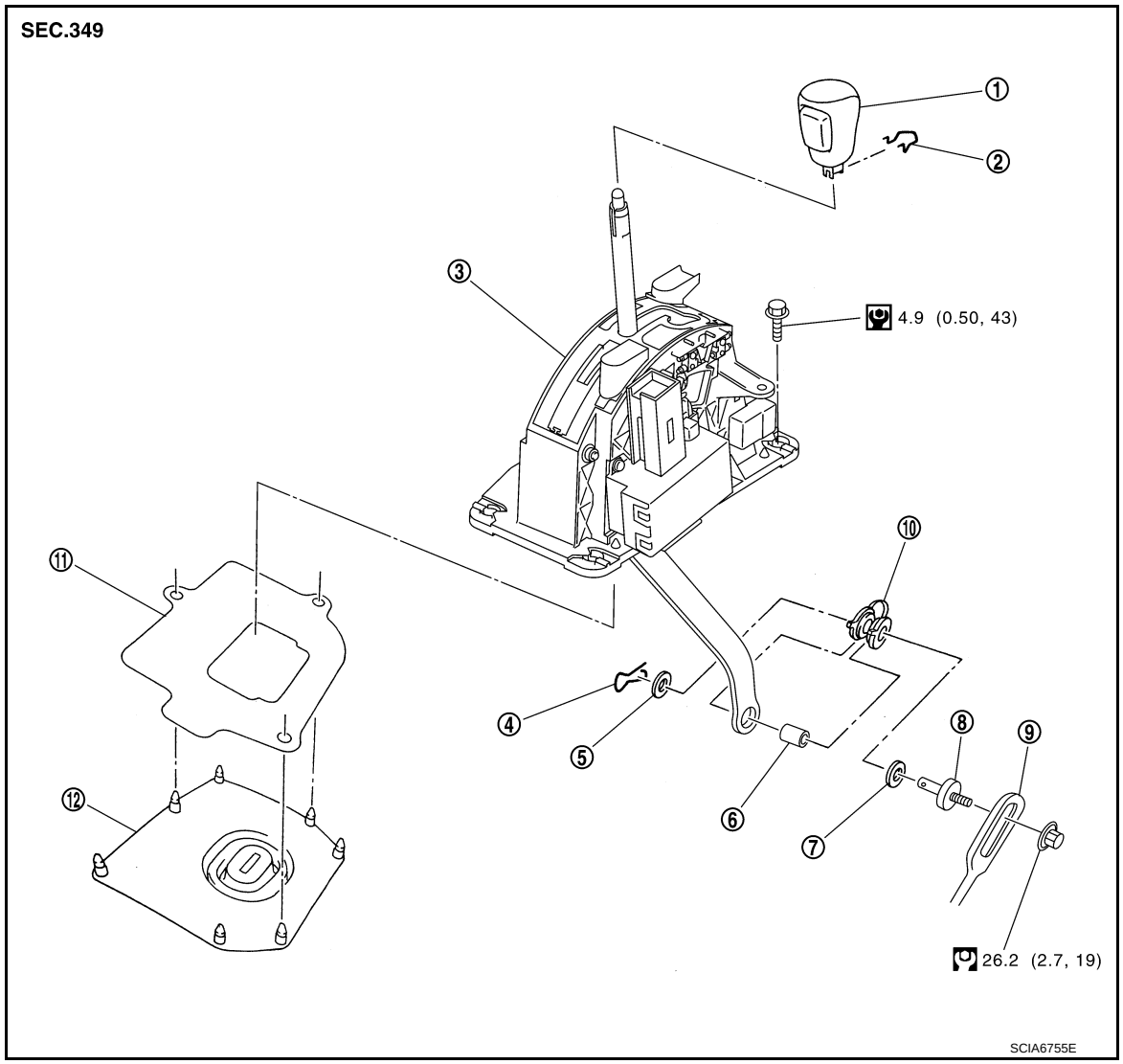
OK >> GO TO 7.
NG >> Repair or replace damaged parts.

SHIFT CONTROL SYSTEM

A/T Shift Selector Removal and Installation

INFOID:0000000005352630

A/T SHIFT SELECTOR COMPONENTS (2WD MODELS)



1.	Selector lever knob	2.	Lock pin	3.	A/T shift selector assembly
4.	Snap pin	5.	Plain washer	6.	Color
7.	Plain washer	8.	Pivot pin	9.	Control rod
10.	Insulator	11.	Dust cover plate	12.	Dust cover

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

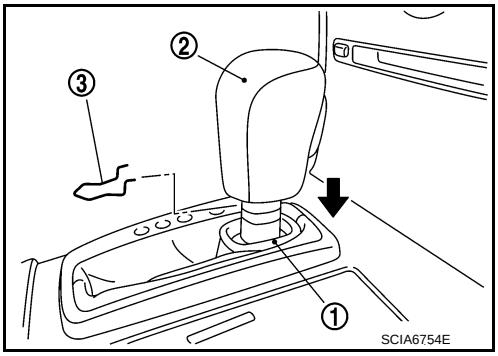
REMOVAL

CAUTION:

Make sure that parking brake is applied before removal/installation.

1. Move selector lever to “N” position.

2. Remove knob cover (1) below selector lever downward.
3. Pull lock pin (3) out of selector lever knob (2).
4. Remove selector lever knob.
5. Remove cup holder, switch finisher, cluster lid C and A/T console finisher. Refer to IP-11
6. Remove center console. Refer to IP-11.
7. Disconnect A/T shift selector connector.
8. Remove A/T shift selector assembly.

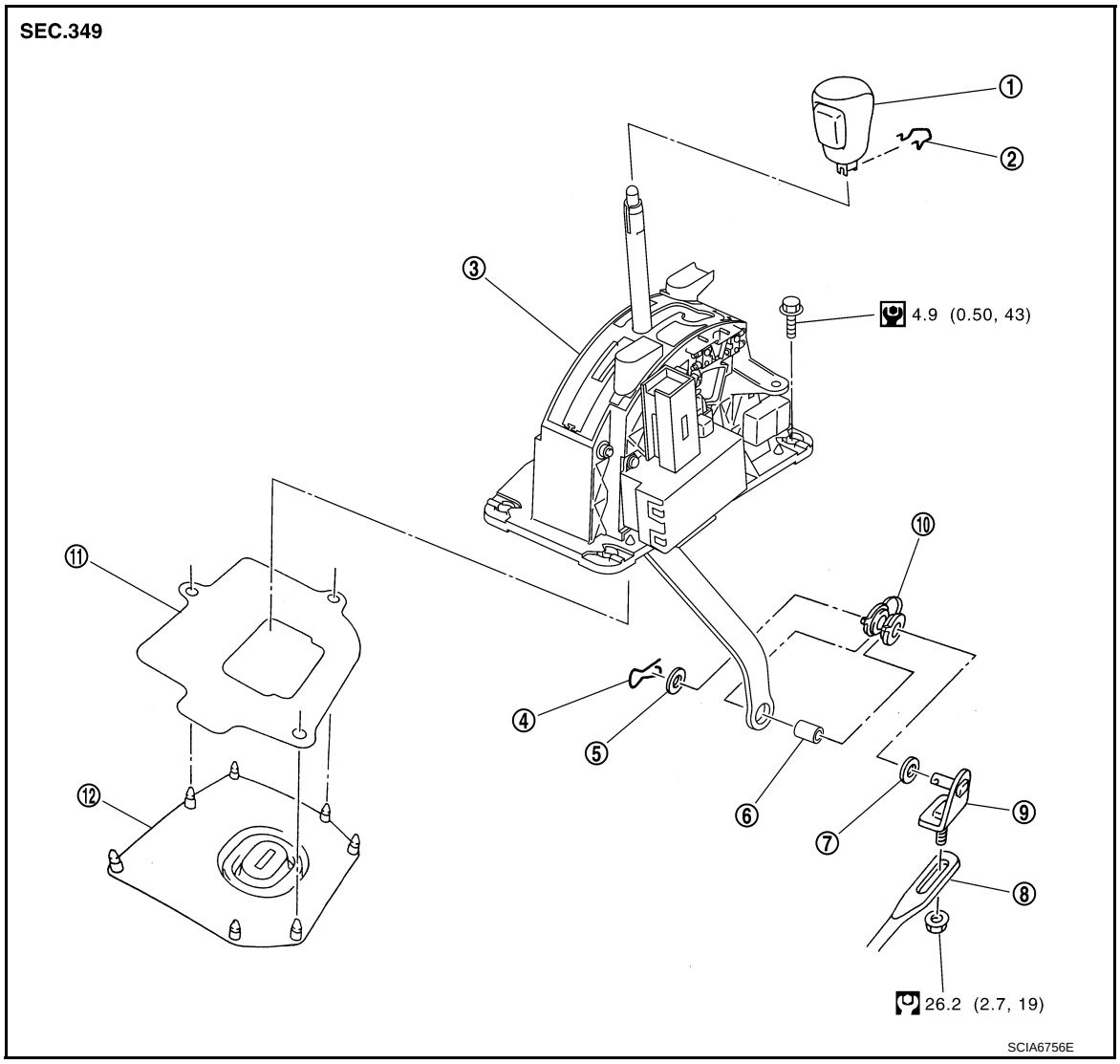


INSTALLATION

Note the following, and install in the reverse order of removal.

- After installation is completed, adjust and check A/T position. Refer to AT-209, "Adjustment of A/T Position" and AT-209, "Checking of A/T Position".

A/T SHIFT SELECTOR COMPONENTS (AWD MODELS)



1. Selector lever knob	2. Lock pin	3. A/T shift selector assembly
4. Snap pin	5. Plain washer	6. Color
7. Plain washer	8. Control rod	9. Bracket
10. Insulator	11. Dust cover plate	12. Dust cover

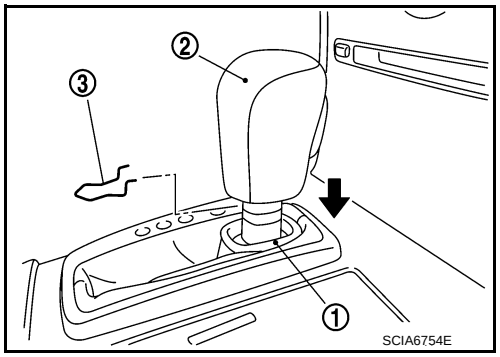
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

REMOVAL

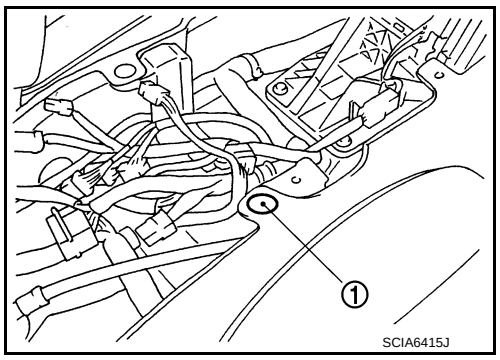
CAUTION:

Make sure that parking brake is applied before removal/installation.

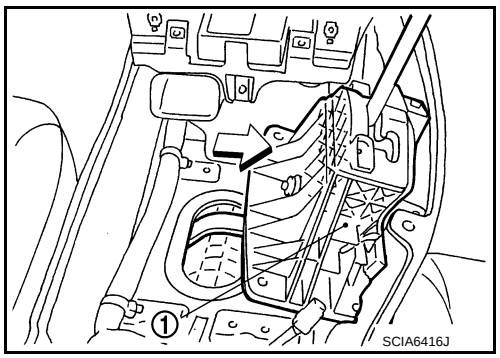
1. Disconnect lower lever of A/T shift selector and control rod.
2. Move selector lever to “N” position.
3. Remove knob cover (1) below selector lever downward.
4. Pull lock pin (3) out of selector lever knob (2).
5. Remove selector lever knob.
6. Remove cup holder, switch finisher, cluster lid C and A/T console finisher. Refer to IP-11.
7. Remove center console. Refer to IP-11.
8. Disconnect A/T shift selector connector.
9. Move selector lever to “P” position.
10. Move driver side seat to the end.



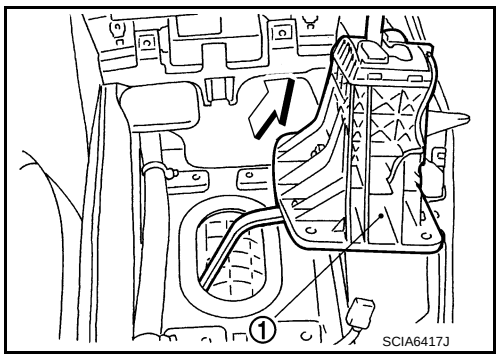
11. Remove one of floor carpet attachment clips (1).
12. Remove A/T shift selector assembly mounting dolts.



13. Lift A/T shift selector assembly (1). Then slide to the right till touching floor carpet.



14. Pull A/T shift selector assembly (1) out in the right-slanting direction while pressing to the right.



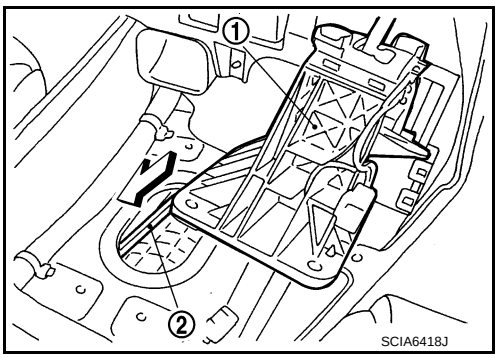
INSTALLATION

Note the following, and install in the reverse order of removal.

NOTE:

Bend A/T shift selector assembly (1) to vehicle, then insert lower lever (2) to the rear of vehicle.

- After installation is completed, adjust and check A/T position. Refer to AT-209, "Adjustment of A/T Position" and AT-209, "Checking of A/T Position".

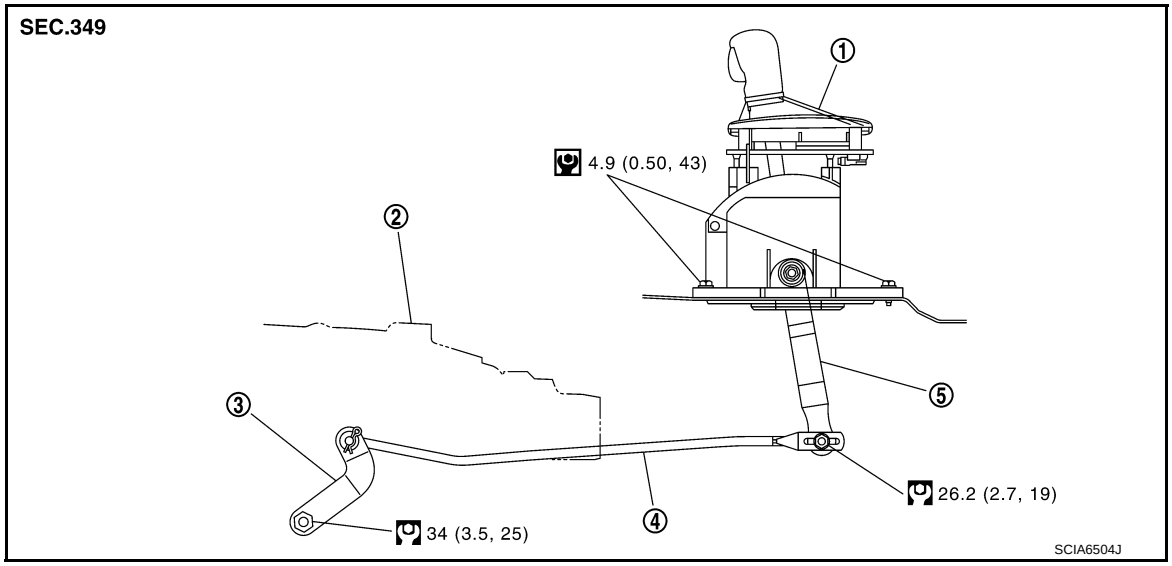


Control Rod Removal and Installation

INFOID:0000000005352631

CONTROL ROD COMPONENTS (2WD MODELS)

Refer to the figure below for control rod removal and installation procedure.

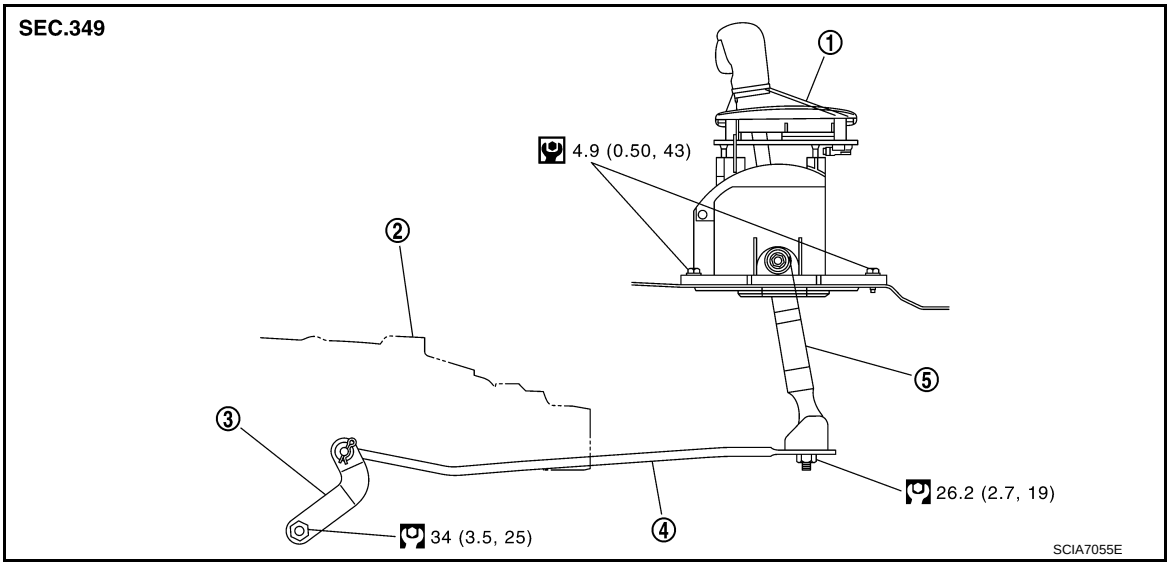


1. A/T shift selector assembly
2. A/T assembly
3. Manual lever
4. Control rod
5. Lower lever

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

CONTROL ROD COMPONENTS (AWD MODELS)

Refer to the figure below for control rod removal and installation procedure.



1. A/T shift selector assembly
2. A/T assembly
3. Manual lever
4. Control rod
5. Lower lever

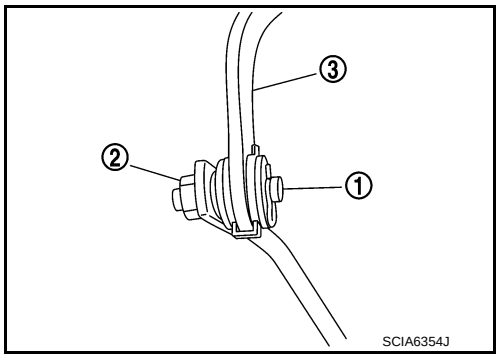
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

Adjustment of A/T Position

INFOID:0000000005352632

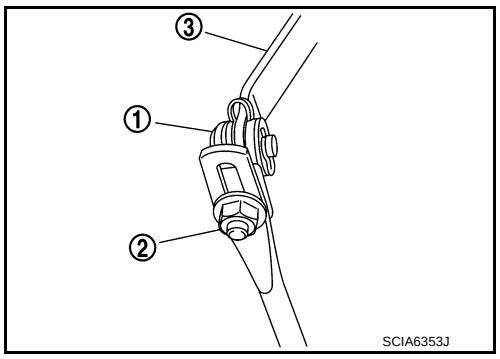
2WD MODELS

1. Loosen nut (2) of pivot pin (1).
2. Place transmission range switch and selector lever in “P” position.
3. While pressing lower lever (3) toward rear of vehicle (in “P” position direction), tighten nut to specified torque.
   Refer to AT-208, "Control Rod Removal and Installation".



AWD MODELS

1. Loosen nut (2) of bracket (1).
2. Place transmission range switch and selector lever in “P” position.
3. While pressing lower lever (3) toward rear of vehicle (in “P” position direction), tighten nut to specified torque.
   Refer to AT-208, "Control Rod Removal and Installation".

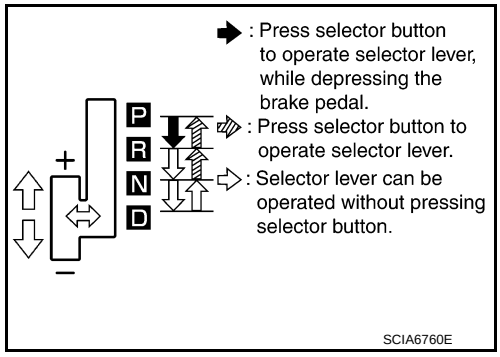


Checking of A/T Position

INFOID:0000000005352633

1. Place selector lever in “P” position, and turn ignition switch ON (engine stop).
2. Make sure that selector lever can be shifted to other than “P” position when brake pedal is depressed. Also make sure that selector lever can be shifted from “P” position only when brake pedal is depressed.
3. Move the selector lever and check for excessive effort, sticking, noise or rattle.

4. Confirm the selector lever stops at each position with the feel of engagement when it is moved through all the positions. Check whether or not the actual position the selector lever is in matches the position shown by the shift position indicator and the A/T body.
5. The method of operating the lever to individual positions correctly should be as shown in the figure.
6. When selector button is pressed in “P”, “R”, or “N” position without applying forward/backward force to selector lever, check button operation for sticking.
7. Confirm the back-up lamps illuminate only when lever is placed in the “R” position. Confirm the back-up lamps does not illuminate when selector lever is pushed against “R” position in the “P” or “N” position.
8. Confirm the engine can only be started with the selector lever in the “P” and “N” positions. (With selector lever in the “P” position, engine can be started even when selector lever is moved forward and backward.)



9. Make sure that A/T is locked completely in “P” position.
10. When selector lever is set to manual shift gate, make sure that manual mode is displayed on combination meter.
    Shift selector lever to “+” and “-” sides, and check that set shift position changes.

A/T SHIFT LOCK SYSTEM

Description

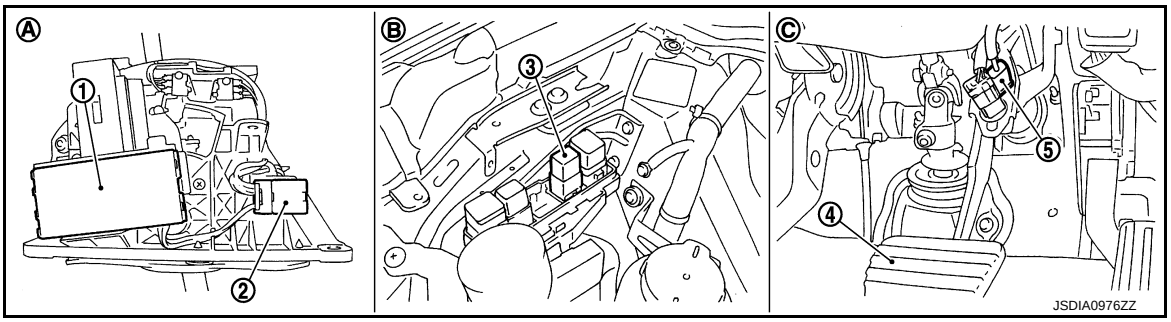
INFOID:0000000005352634

The mechanical key interlock mechanism also operates as a shift lock:
With the ignition switch turned to ON, the selector lever cannot be shifted from “P” position to any other positions unless the brake pedal is depressed.

Shift Lock System Electrical Parts Location

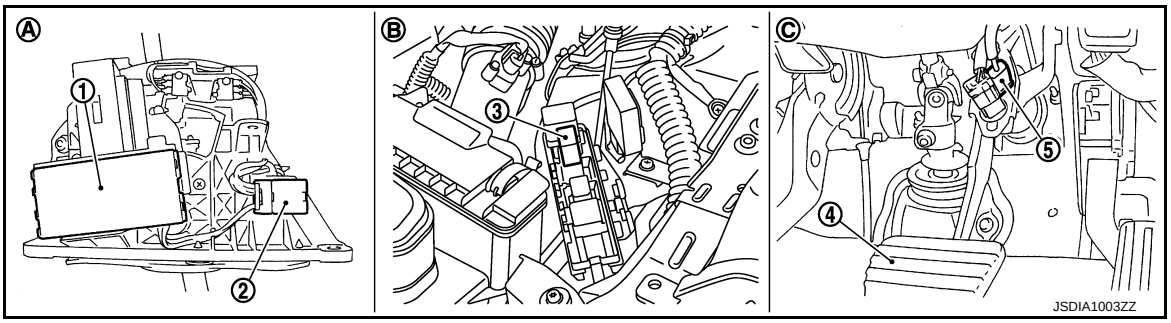
INFOID:0000000005352635

VQ35HR MODELS



A. A/T shift selector assembly
B. Engine room, right side
C. Brake pedal, upper
1. Shift lock unit (Shift lock solenoid installed)
2. A/T shift selector connector
3. Shift lock relay
4. Brake pedal
5. Stop lamp switch

VK45DE MODELS

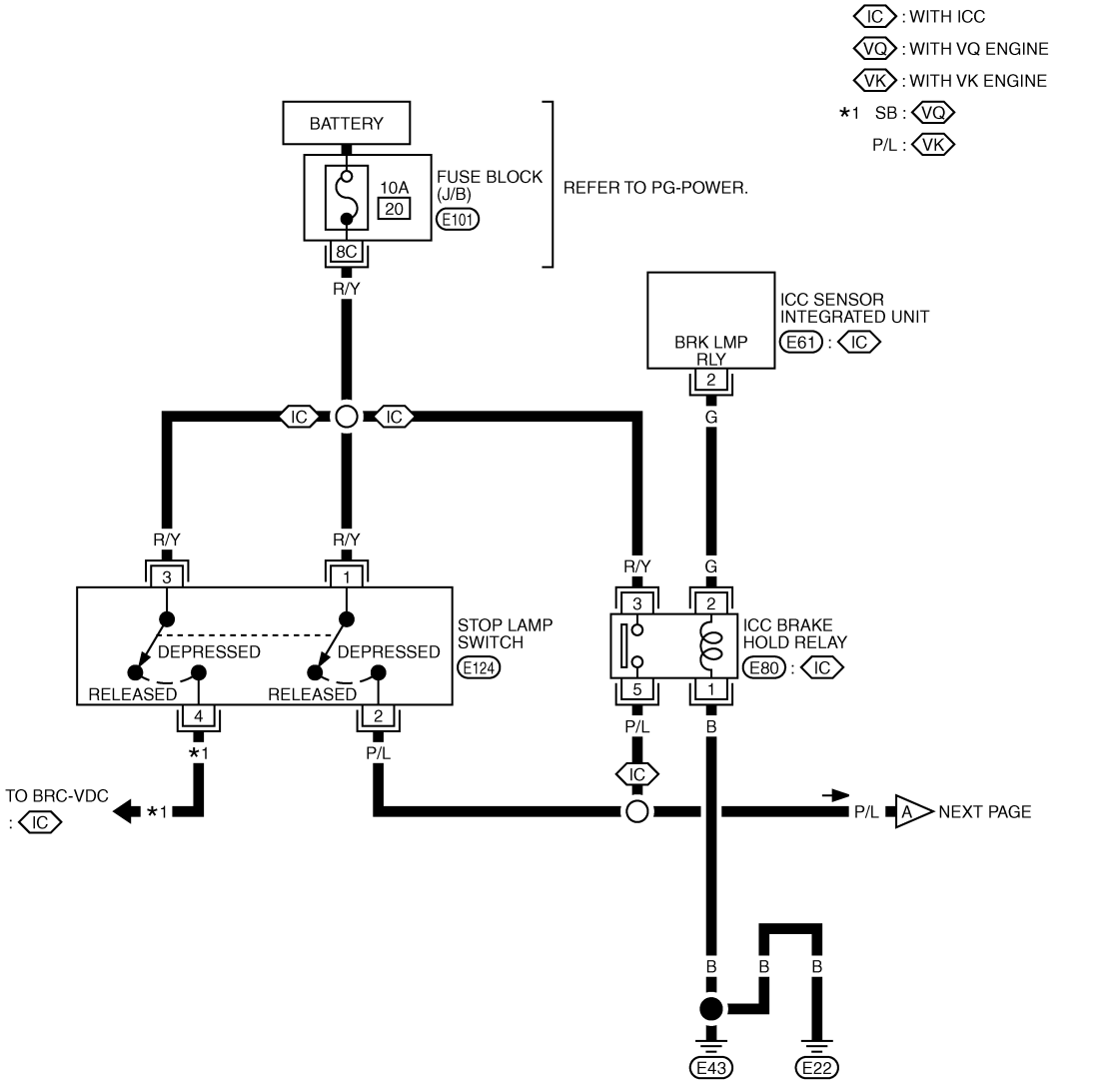


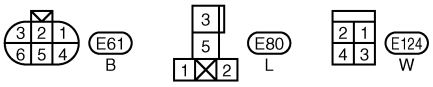
A. A/T shift selector assembly
B. Engine room, left side
C. Brake pedal, upper
1. Shift lock unit (Shift lock solenoid installed)
2. A/T shift selector connector
3. Shift lock relay
4. Brake pedal
5. Stop lamp switch

Wiring Diagram - AT - SHIFT

INFOID:0000000005352636

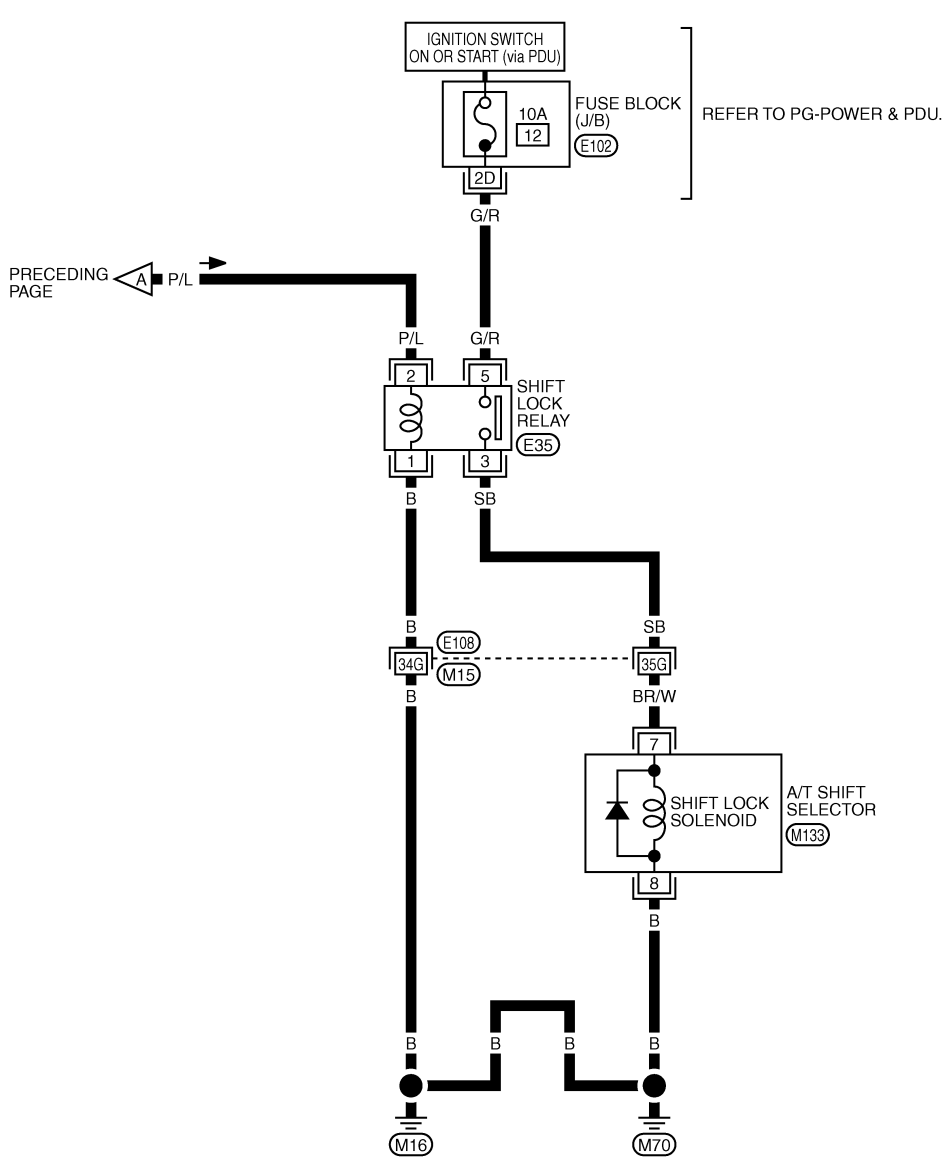
AT-SHIFT-01





REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0682E



TCWT0683E

Diagnosis Procedure

INFOID:0000000005352637

SYMPTOM:

- **Selector lever cannot be moved from “P” position with key in ON position and brake pedal applied.**
- **Selector lever can be moved from “P” position with key in ON position and brake pedal released.**

1. CHECK SELECTOR LEVER POSITION

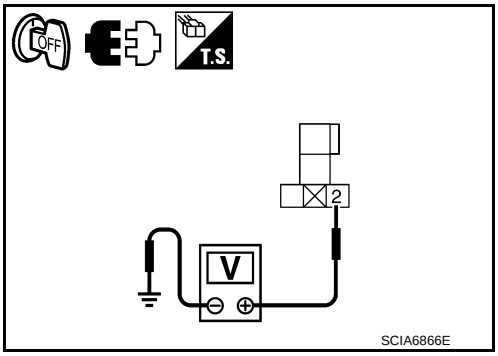
Check the selector lever position for damage. Refer to AT-209, "Checking of A/T Position".

OK or NG

OK >> GO TO 2.
NG >> Adjust control linkage. Refer to AT-209, "Adjustment of A/T Position".

2.CHECK POWER SOURCE

1. Turn ignition switch OFF.
2. Disconnect shift lock relay.
3. Check voltage between shift lock relay E35 terminal 2 and ground.



Voltage

Brake pedal depressed:	**Battery voltage**
Brake pedal released:	**0 V**

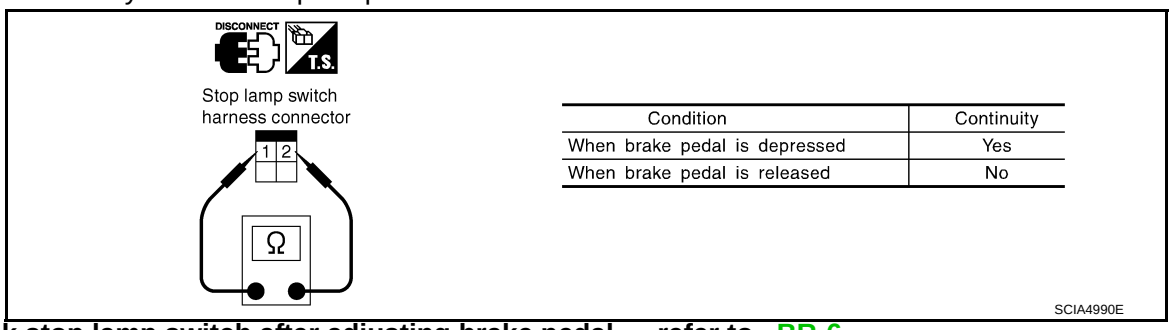
OK or NG

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

3.DETECT MALFUNCTIONING ITEM

Check the following.
- Harness for short or open between battery and stop lamp switch harness connector E124 terminal 1
- Harness for short or open between stop lamp switch harness connector E124 terminal 2 and shift lock relay E35 terminal 2
- 10A fuse [No.20, located in the fuse block (J/B)]
- Stop lamp switch

- Check continuity between stop lamp switch harness connector E124 terminals 1 and 2



Condition	Continuity
When brake pedal is depressed	Yes
When brake pedal is released	No

Check stop lamp switch after adjusting brake pedal — refer to BR-6.

- ICC brake hold relay. Refer to ACS-68, "ICC Brake Hold Relay". (With ICC only)
- Harness for short or open between battery and ICC brake hold relay E80 terminal 3. Refer to ACS-49, "C1A13 STOP LAMP RLY FIX". (With ICC only)
- Harness for short or open between ICC brake hold relay E80 terminal 5 and shift lock relay E35 terminal 2. (With ICC only)
- Harness for short or open between ICC sensor integrated unit harness connector E61 terminal 2 and ICC brake hold relay E80 terminal 2. Refer to ACS-49, "C1A13 STOP LAMP RLY FIX". (With ICC only)
- Harness for short or open between ICC brake hold relay E80 terminal 1 and ground. Refer to ACS-49, "C1A13 STOP LAMP RLY FIX". (With ICC only)

OK or NG

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

4.CHECK GROUND CIRCUIT

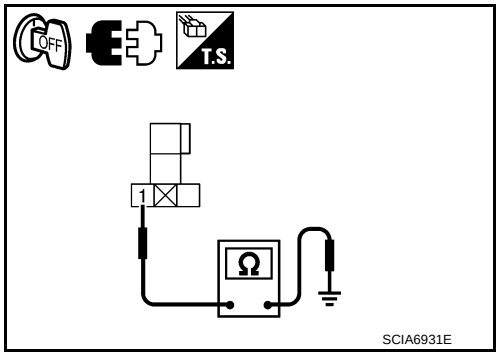
1. Turn ignition switch OFF.
2. Disconnect shift lock relay.
3. Check continuity between shift lock relay E35 terminal 1 and ground.

Continuity should exist.

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

OK or NG

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



5. CHECK INPUT SIGNAL A/T SHIFT SELECTOR

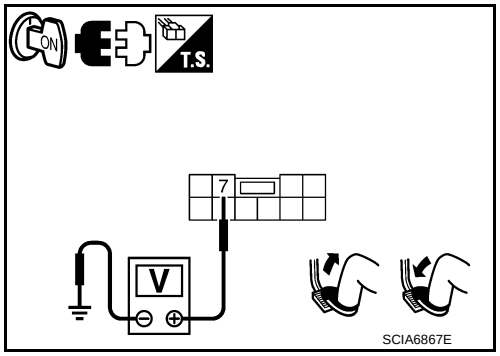
1. Turn ignition switch OFF.
2. Disconnect A/T shift selector connector.
3. Turn ignition switch ON.
4. Check voltage between A/T shift selector connector M133 terminal 7 and ground.

Voltage

Brake pedal depressed:	**Battery voltage**
Brake pedal released:	**0 V**

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.



6. DETECT MALFUNCTIONING ITEM

Check the following.

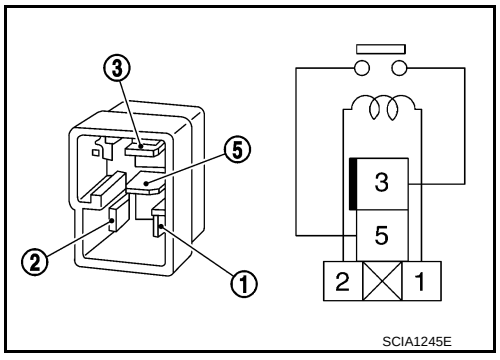
- Harness for short or open between push-button ignition switch and shift lock relay E35 terminal 5
- Harness for short or open between shift lock relay E35 terminal 3 and A/T shift selector connector M133 terminal 7
- 10A fuse [No.12, located in the fuse block (J/B)]
- Push-button ignition switch (Refer to PG-4.)
- Shift lock relay

- Check continuity between shift lock relay E35 terminal 3 and 5

Condition	Continuity
12 V direct current supply between terminal 1 and 2	Yes
OFF	No

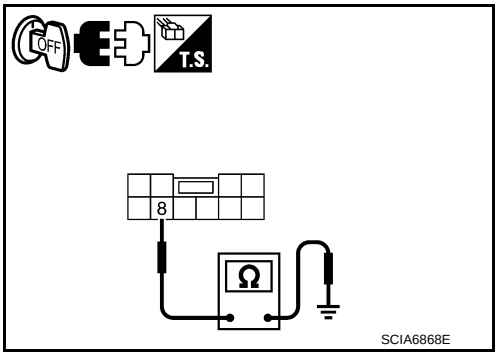
OK or NG

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



7. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T shift selector connector.
3. Check continuity between A/T shift selector connector M133 terminal 8 and ground.



Continuity should exist.

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

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK SHIFT LOCK SOLENOID

1. Connect A/T shift selector connector.
2. Turn ignition switch ON.
3. Check shift lock solenoid operation.

Condition	Brake pedal	Operation
When ignition switch is turned to ON position and selector lever is set in “P” position.	Depressed	Yes
	Released	No

OK or NG

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

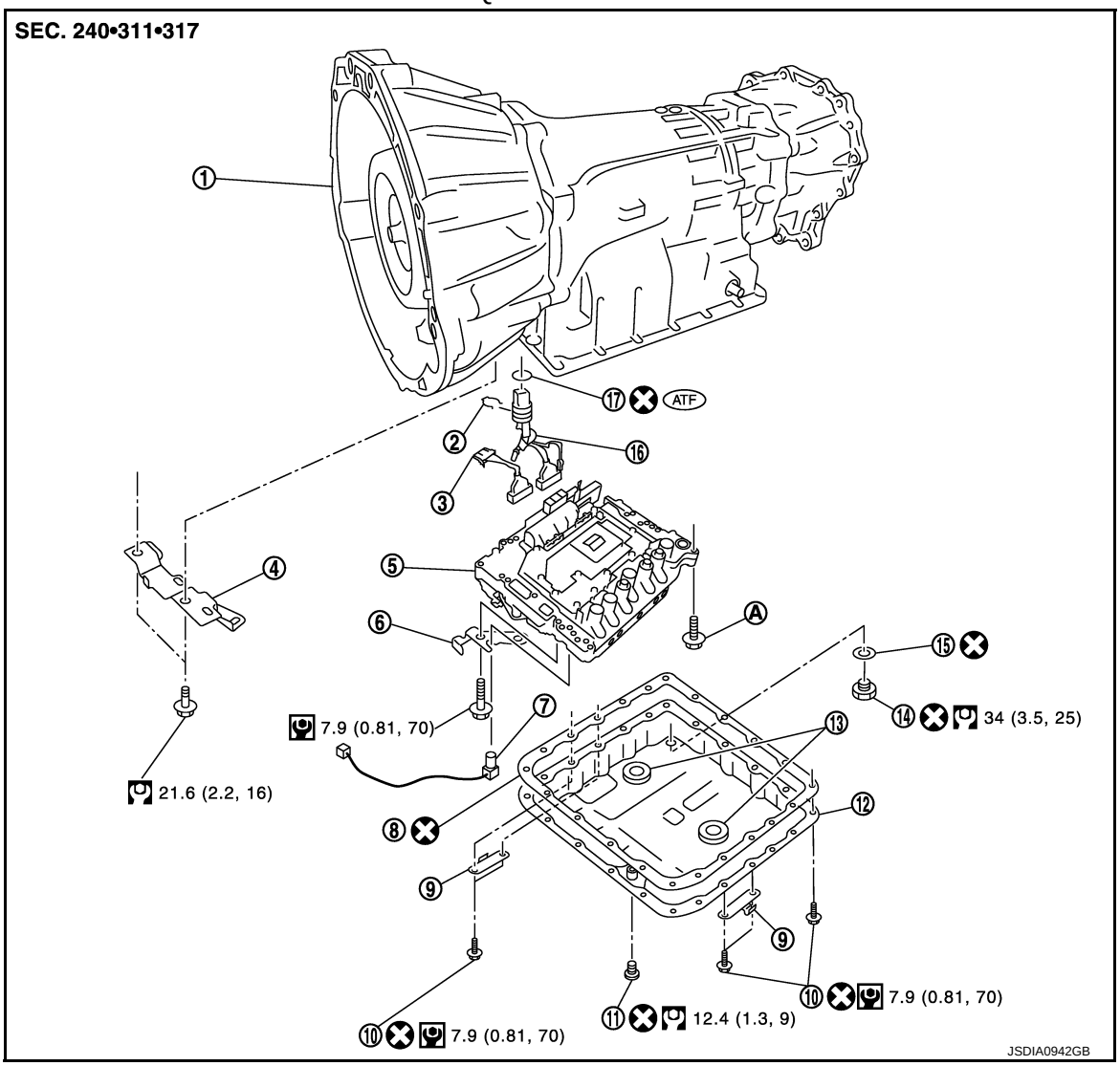
ON-VEHICLE SERVICE

Control Valve with TCM and A/T Fluid Temperature Sensor 2

INFOID:0000000005352638

COMPONENTS

VQ35HR models

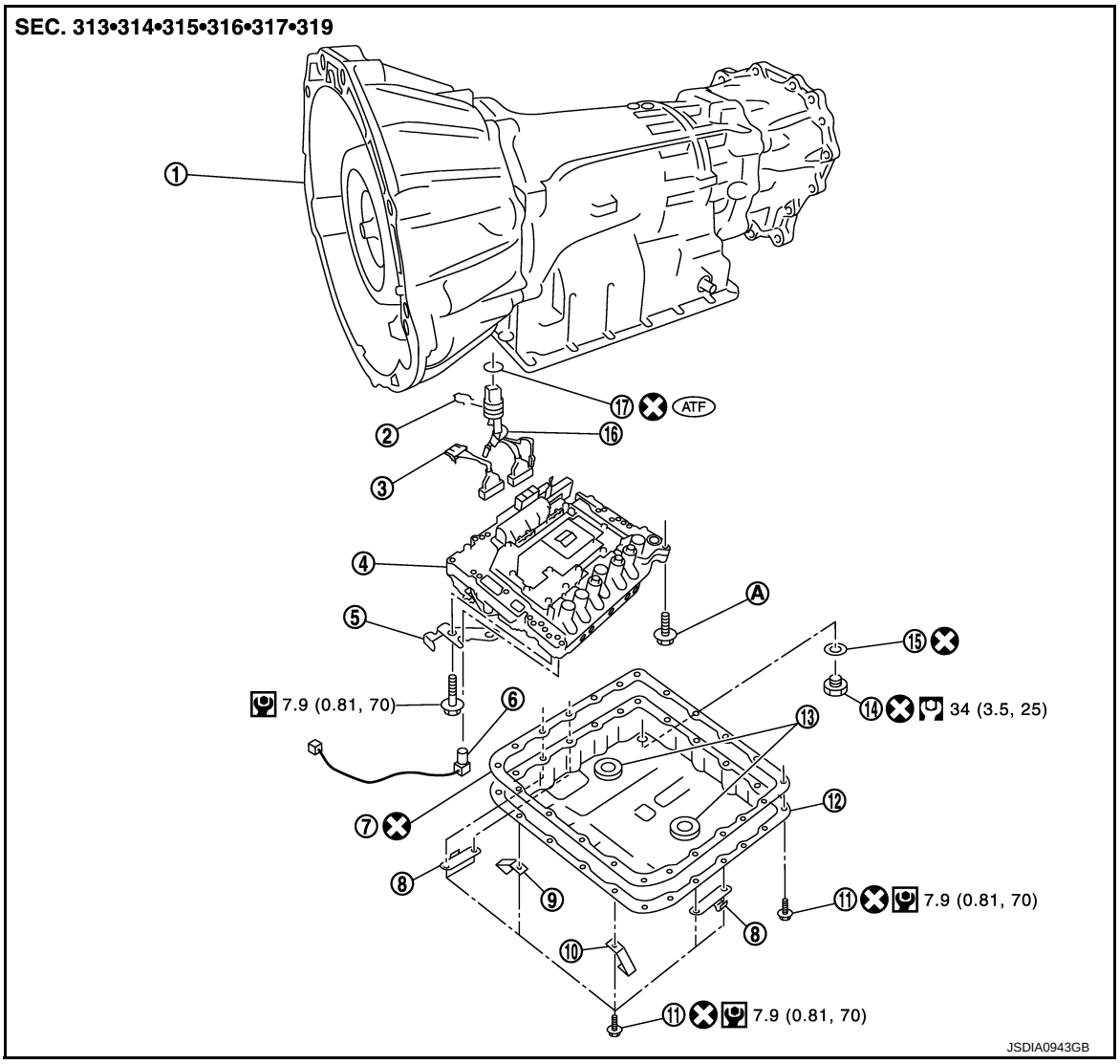


1. A/T
2. Snap ring
3. Sub-harness
4. Bracket
5. Control valve with TCM
6. Bracket
7. A/T fluid temperature sensor 2
8. Oil pan gasket
9. Clip
10. Oil pan mounting bolt
11. Overflow plug
12. Oil pan
13. Magnet
14. Drain plug
15. Drain plug gasket
16. Terminal cord assembly
17. O-ring

A. For tightening torque, refer to “Installation”.

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

VK45DE models



1. A/T
2. Snap ring
3. Sub-harness
4. Control valve with TCM
5. Bracket
6. A/T fluid temperature sensor 2
7. Oil pan gasket
8. Clip
9. Bracket
10. Bracket
11. Oil pan mounting bolt
12. Oil pan
13. Magnet
14. Drain plug
15. Drain plug gasket
16. Terminal cord assembly
17. O-ring

A. For tightening torque, refer to “Installation”.

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

CONTROL VALVE WITH TCM REMOVAL AND INSTALLATION

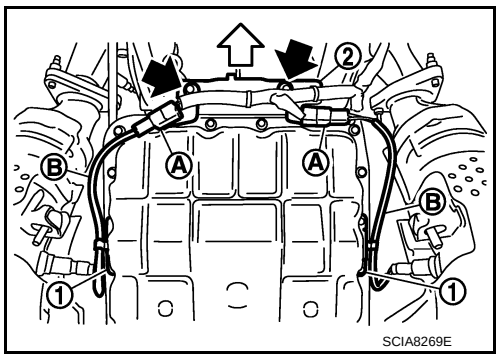
Removal

1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain plug.

3. Disconnect heated oxygen sensor 2 connectors (A).

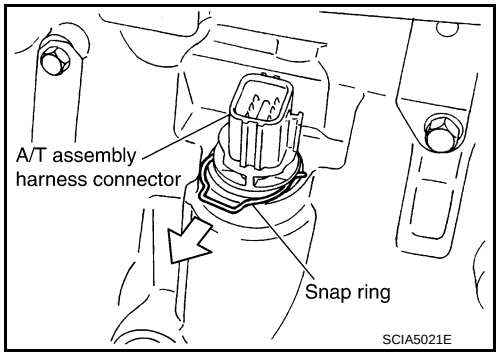
⇦ : Vehicle front

⬅ : Bolt

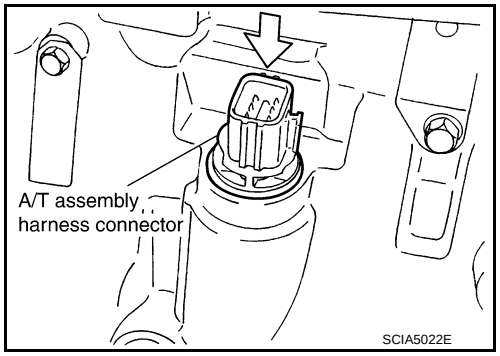


4. Remove heated oxygen sensor 2 harness (B) from clips (1).
5. Remove bracket (2) from transmission assembly. (for VQ35HR models)
6. Disconnect A/T assembly harness connector.

7. Remove snap ring from A/T assembly harness connector.



8. Push A/T assembly harness connector.
CAUTION:
Be careful not to damage connector.



9. Remove oil pan according to the following procedures.

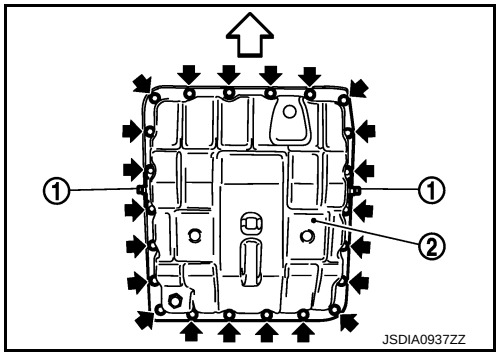
a. VQ35HR models

i. Remove clips (1).

ii. Remove oil pan (2) and oil pan gasket.

⇦ : Vehicle front

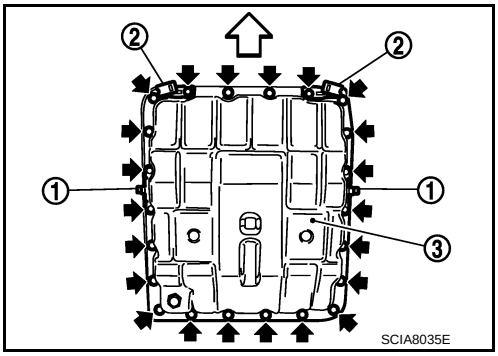
⬅ : Oil pan mounting bolt



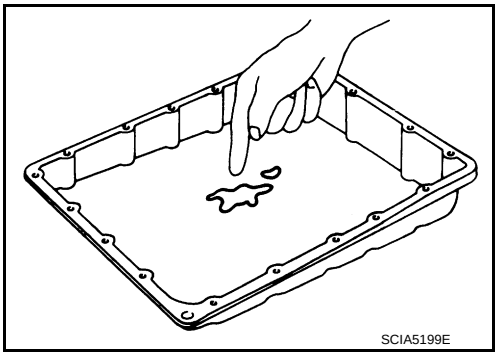
b. VK45DE models

i. Remove clips (1) and brackets (2).
ii. Remove oil pan (3) and oil pan gasket.

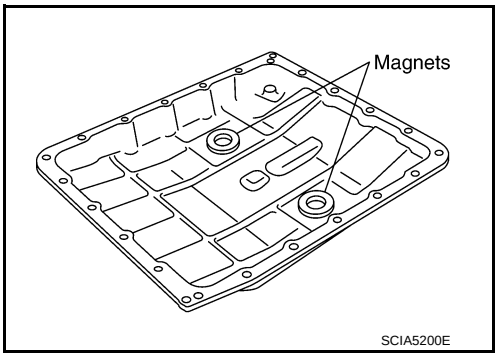
⇦ : Vehicle front
⬅ : Oil pan mounting bolt



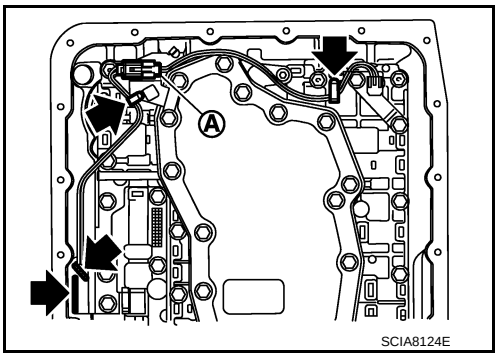
10. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
    - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-17, "VQ35HR : A/T Fluid Cooler Cleaning" (VQ35HR) or AT-21, "VK45DE : A/T Fluid Cooler Cleaning" (VK45DE).**



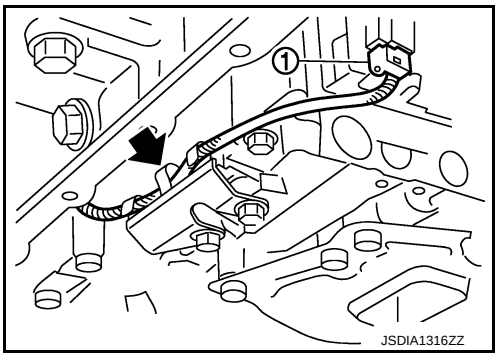
11. Remove magnets from oil pan.



12. Disconnect A/T fluid temperature sensor 2 connector (A).
    CAUTION:
    Be careful not to damage connector.
13. Straighten terminal clips (⬅) to free terminal cord assembly A/T fluid temperature sensor 2 harness.



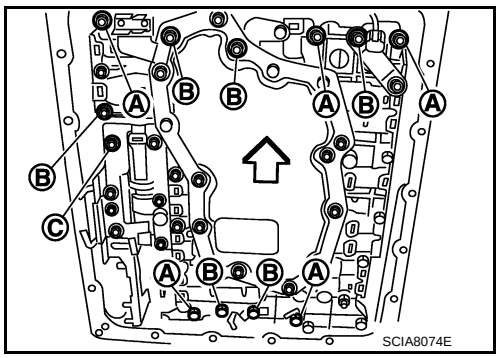
14. Straighten terminal clip (⬅) to free output speed sensor harness.
15. Disconnect output speed sensor connector (1).
    CAUTION:
    Be careful not to damage connector.



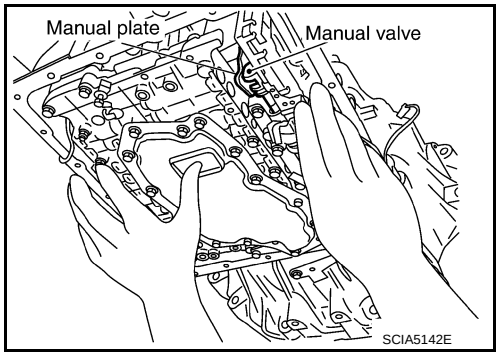
16. Remove bolts (A), (B) and (C) from control valve with TCM.

⇦ : Vehicle front

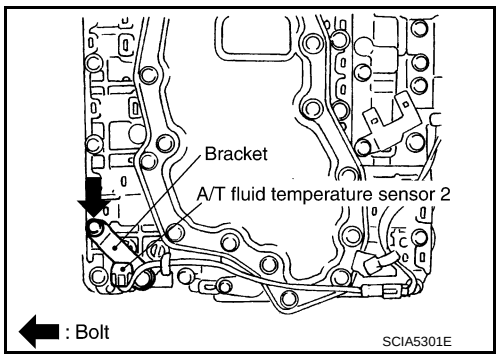
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



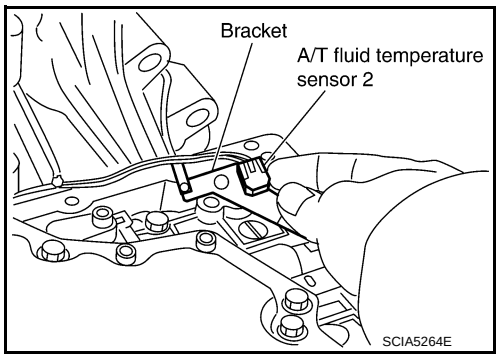
17. Remove control valve with TCM from transmission case.
CAUTION:
When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



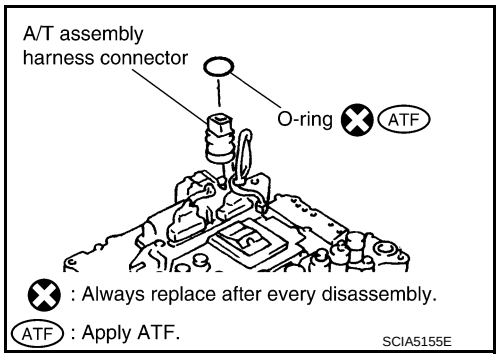
18. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



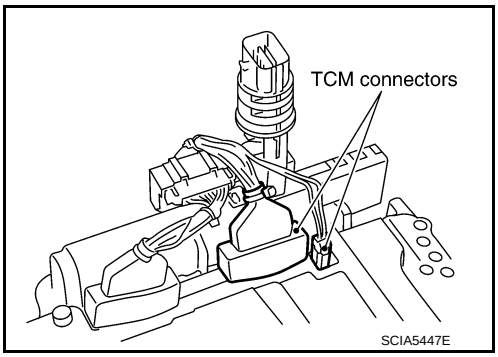
19. Remove bracket from A/T fluid temperature sensor 2.



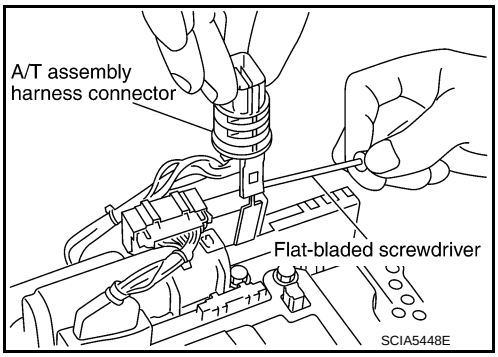
20. Remove O-ring from A/T assembly harness connector.



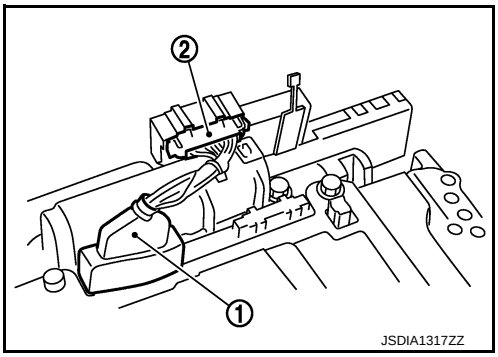
21. Disconnect TCM connectors.
CAUTION:
Be careful not to damage connectors.



22. Remove A/T assembly harness connector from control valve with TCM using flat-blade screwdriver.

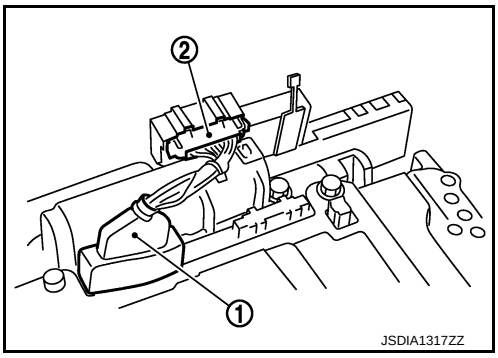


23. Disconnect TCM connector (1) and transmission range switch connector (2).
CAUTION:
Be careful not to damage connectors.

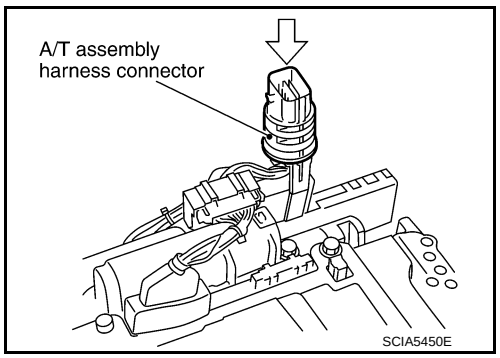


Installation
CAUTION:
After completing installation, check A/T fluid leakage and A/T fluid level. Refer to AT-16, "VQ35HR : Adjusting A/T Fluid" (VQ35HR) or AT-20, "VK45DE : Checking A/T Fluid" (VK45DE).

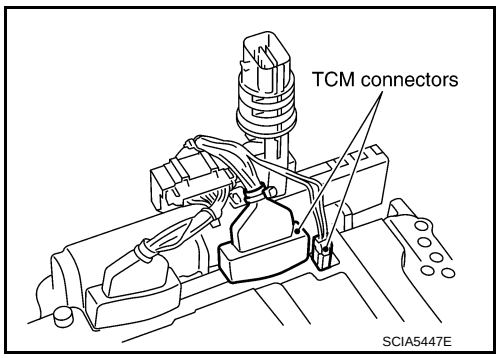
1. Connect TCM connector (1) and transmission range switch connector (2).



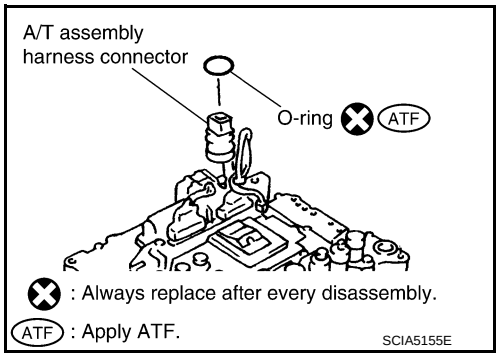
2. Install A/T assembly harness connector to control valve with TCM.



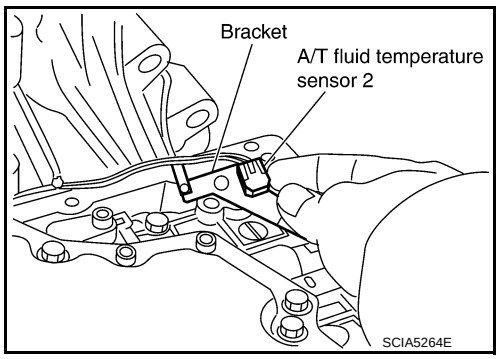
3. Connect TCM connectors.



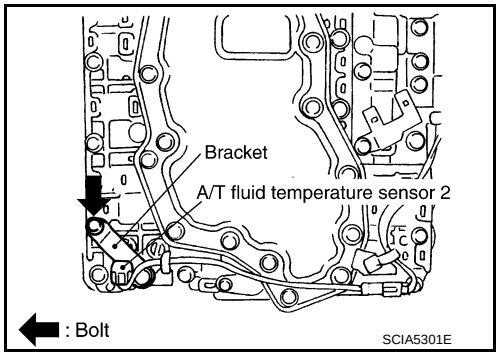
4. Install new O-ring in A/T assembly harness connector.
CAUTION:
- **Never reuse O-ring.**
- **Apply ATF to O-ring.**



5. Install A/T fluid temperature sensor 2 to bracket.



6. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM. Tighten A/T fluid temperature sensor 2 bolt to the specified torque. Refer to "COMPONENTS".
CAUTION:
Adjust bolt hole of bracket to bolt hole of control valve with TCM.

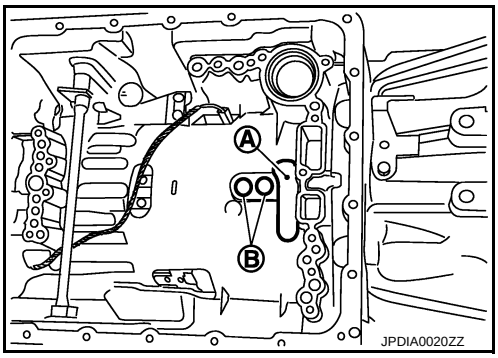


7. Install control valve with TCM in transmission case.

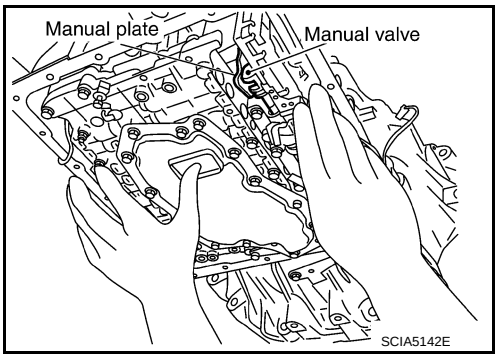
CAUTION:

- **Make sure that input speed sensor securely installs input speed sensor holes (B).**

A : Brake band

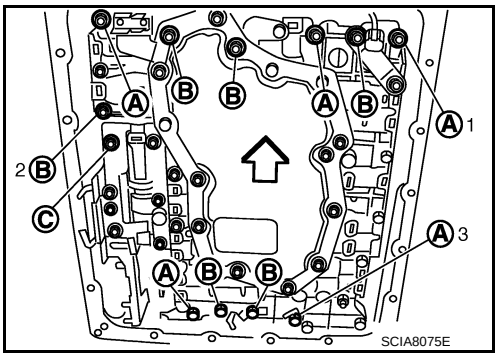


- **Hang down output speed sensor harness toward outside so as not to disturb installation of control valve with TCM.**
- **Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.**
- **Assemble it so that manual valve cutout is engaged with manual plate projection.**



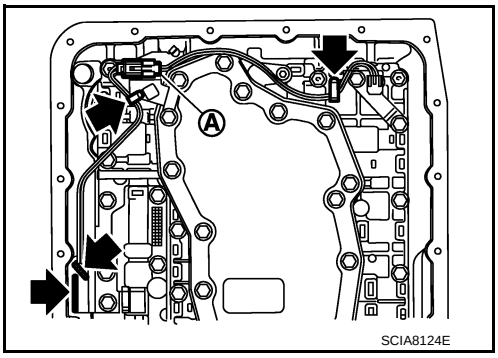
8. Install bolts (A), (B) and (C) in control valve with TCM. Tighten bolt 1, 2 and 3 temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts. Tighten control valve with TCM bolts to the specified torque.

⇦ : Vehicle front

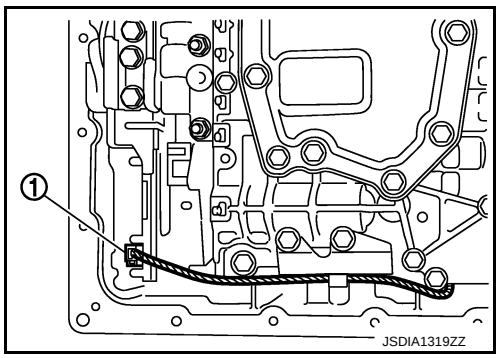


Bolt symbol	A	B	C
Number of bolts	5	6	1
Length mm (in)	42 (1.65)	55 (2.17)	40 (1.57)
Tightening torque N·m (km-g, in-lb)	7.9 (0.81, 70)		With ATF applied
			7.9 (0.81, 70)

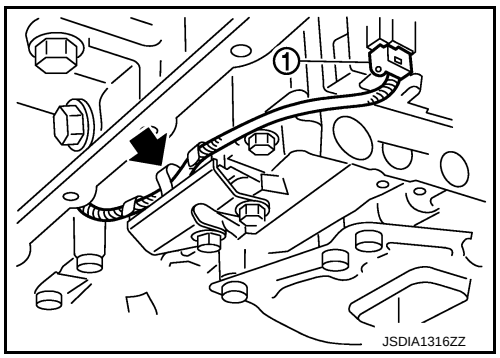
9. Connect A/T fluid temperature sensor 2 connector (A).
10. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips (⬅).



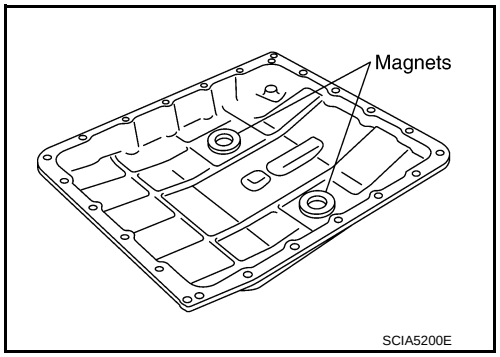
11. Connect output speed sensor connector (1).



12. Securely fasten output speed sensor (1) harness with terminal clip (⬅).



13. Install magnets in oil pan.



14. Install oil pan according to the following procedures.

a. VQ35HR models

i. Install oil pan gasket to oil pan.

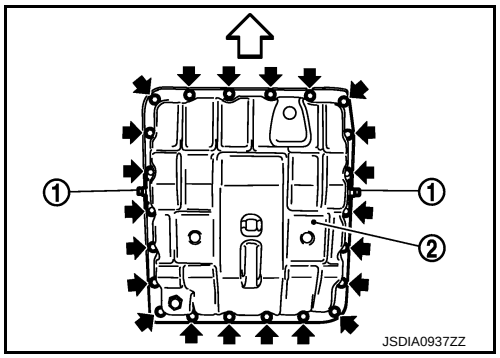
CAUTION:

- **Never reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

ii. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

⇦ : Vehicle front

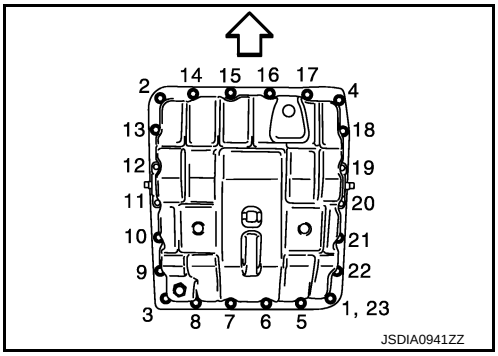
⬅ : Oil pan mounting bolt



CAUTION:

- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**

iii. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Tighten oil pan mounting bolts to the specified torque. Refer to "COMPONENTS".
CAUTION:
Never reuse oil pan mounting bolts.



b. VK45DE models

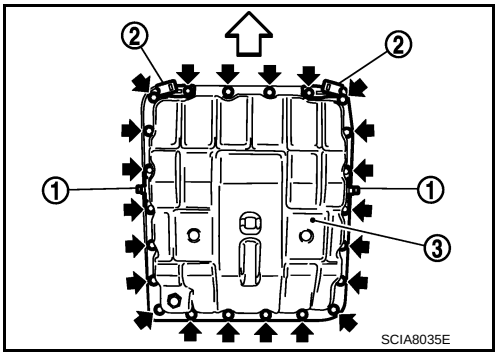
i. Install oil pan gasket to oil pan.
CAUTION:
- **Never reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

ii. Install oil pan (3) (with oil pan gasket), clips (1) and brackets (2) to transmission case.

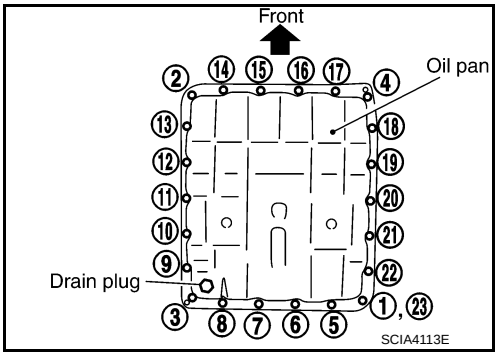
⇦ : Vehicle front

⬅ : Oil pan mounting bolt

CAUTION:
- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**
- **Be careful with installation direction of brackets (2).**

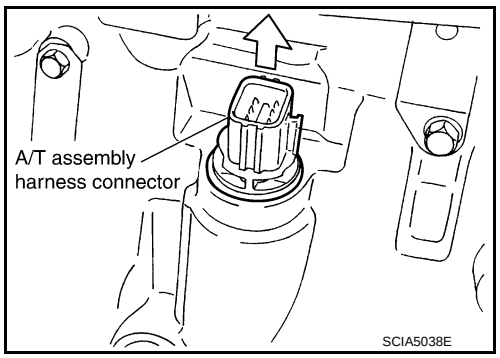


iii. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Tighten oil pan mounting bolts to the specified torque. Refer to "COMPONENTS".
CAUTION:
Never reuse oil pan mounting bolts.

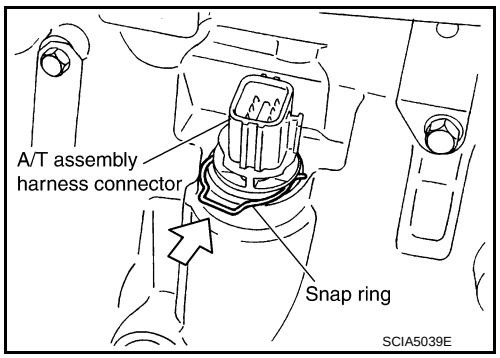


15. Install drain plug to oil pan. Tighten drain plug to the specified torque. Refer to "COMPONENTS".
CAUTION:
Never reuse drain plug and drain plug gasket.

16. Pull up A/T assembly harness connector.
CAUTION:
Be careful not to damage connector.

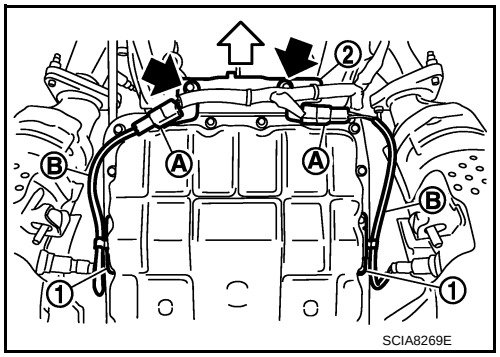


17. Install snap ring to A/T assembly harness connector.
18. Connect A/T assembly harness connector.



19. Connect heated oxygen sensor 2 harness connectors (A).

⇦ : Vehicle front
⬅ : Bolt



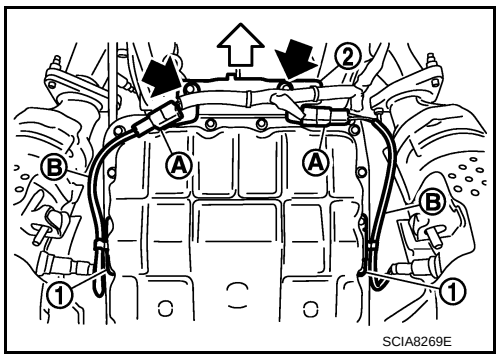
20. Install heated oxygen sensor 2 harness (B) to clips (1).
21. Install bracket (2) to transmission assembly. (for VQ35HR models)
22. Pour ATF into A/T assembly. Refer to AT-15, "VQ35HR : Changing A/T Fluid" (VQ35HR) or AT-19, "VK45DE : Changing A/T Fluid" (VK45DE).
23. Connect the battery cable to the negative terminal.

A/T FLUID TEMPERATURE SENSOR 2 REMOVAL AND INSTALLATION

Removal

1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain plug.
3. Disconnect heated oxygen sensor 2 harness connectors (A).

⇦ : Vehicle front
⬅ : Bolt

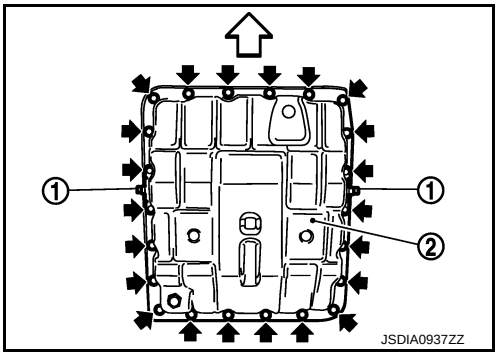


4. Remove heated oxygen sensor 2 harness (B) from clips (1).
5. Remove bracket (2) from transmission assembly. (for VQ35HR models)
6. Remove oil pan according to the following procedures.

a. VQ35HR models

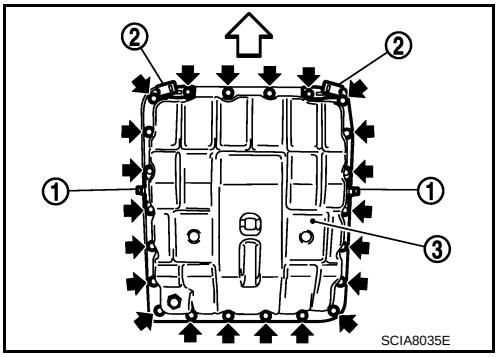
i. Remove clips (1).
ii. Remove oil pan (2) and oil pan gasket.

⇦ : Vehicle front
⬅ : Bolt

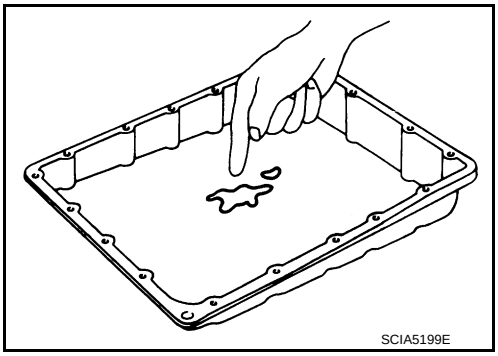


b. VK45DE models
i. Remove clips (1) and brackets (2).
ii. Remove oil pan (3) and oil pan gasket.

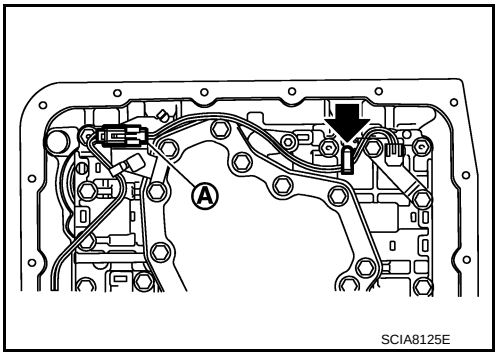
⇦ : Vehicle front
⬅ : Bolt



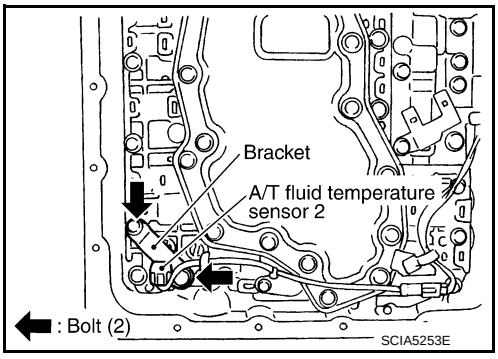
7. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
   - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-17, "VQ35HR : A/T Fluid Cooler Cleaning" (VQ35HR) or AT-21, "VK45DE : A/T Fluid Cooler Cleaning" (VK45DE).**



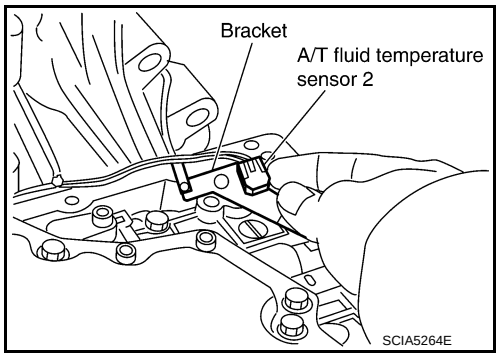
8. Disconnect A/T fluid temperature sensor 2 connector (A).
   CAUTION:
   Be careful not to damage connector.
9. Straighten terminal clip (⬅) to free A/T fluid temperature sensor 2 harness.



10. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



11. Remove bracket from A/T fluid temperature sensor 2.

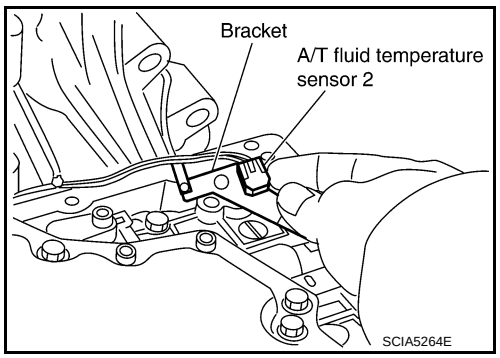


Installation

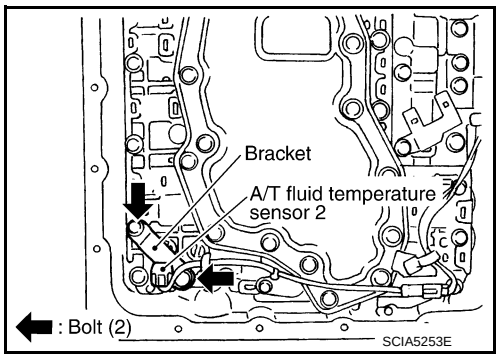
CAUTION:

After completing installation, check for A/T fluid leakage and A/T fluid level. Refer to AT-16, "VQ35HR : Adjusting A/T Fluid" (VQ35HR) or AT-20, "VK45DE : Checking A/T Fluid" (VK45DE).

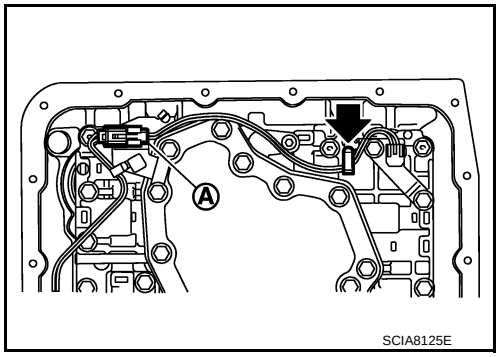
1. Install A/T fluid temperature sensor 2 to bracket.



2. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM. Tighten A/T fluid temperature sensor 2 bolts to the specified torque. Refer to "COMPONENTS".



3. Connect A/T fluid temperature sensor 2 connector (A).
4. Securely fasten A/T fluid temperature sensor 2 harness with terminal clip (⬅).



5. Install oil pan according to the following procedures.

a. VQ35HR models

i. Install oil pan gasket to oil pan.

CAUTION:

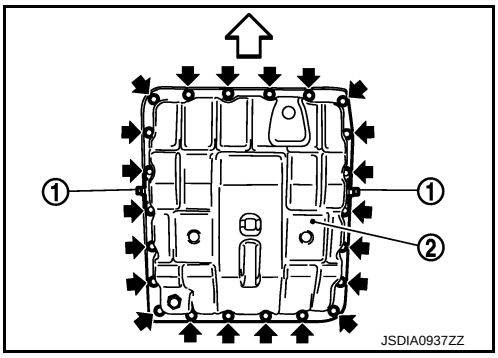
- **Never reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**

- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

ii. Install oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

⇦ : Vehicle front

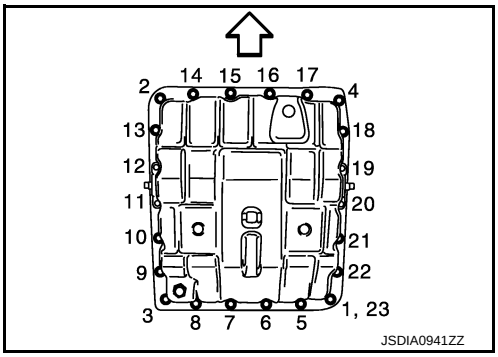
⬅ : Bolt



CAUTION:
- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**

iii. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them.
Tighten oil pan mounting bolts to the specified torque. Refer to "COMPONENTS".

CAUTION:
Never reuse oil pan mounting bolts.



b. VK45DE models

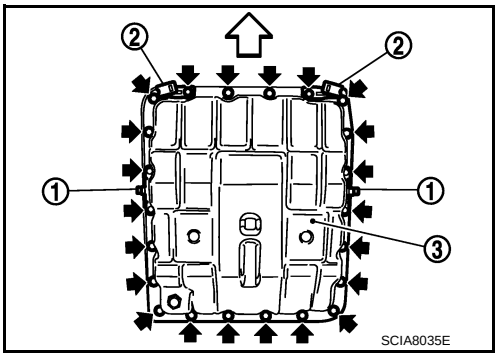
i. Install oil pan gasket to oil pan.

CAUTION:
- **Never reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

ii. Install oil pan (3) (with oil pan gasket), clips (1) and brackets (2) to transmission case.

⇦ : Vehicle front

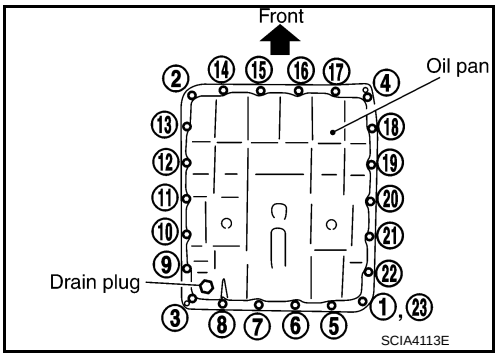
⬅ : Bolt



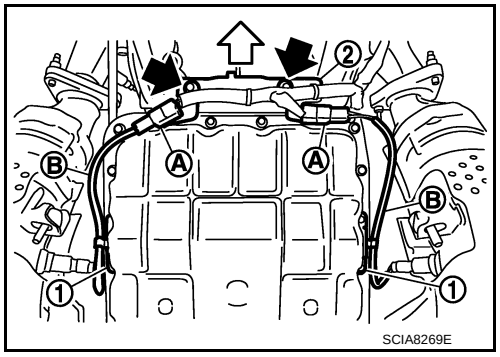
CAUTION:
- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**
- **Be careful with installation direction of brackets (2).**

iii. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them.
Tighten oil pan mounting bolts to the specified torque. Refer to "COMPONENTS".

CAUTION:
Never reuse oil pan mounting bolts.



6. Install drain plug to oil pan. Tighten drain plug to the specified torque. Refer to "COMPONENTS".
   CAUTION:
   Never reuse drain plug and drain plug gasket.
7. Connect heated oxygen sensor 2 harness connectors (A).



⇦ : Vehicle front

⬅ : Bolt

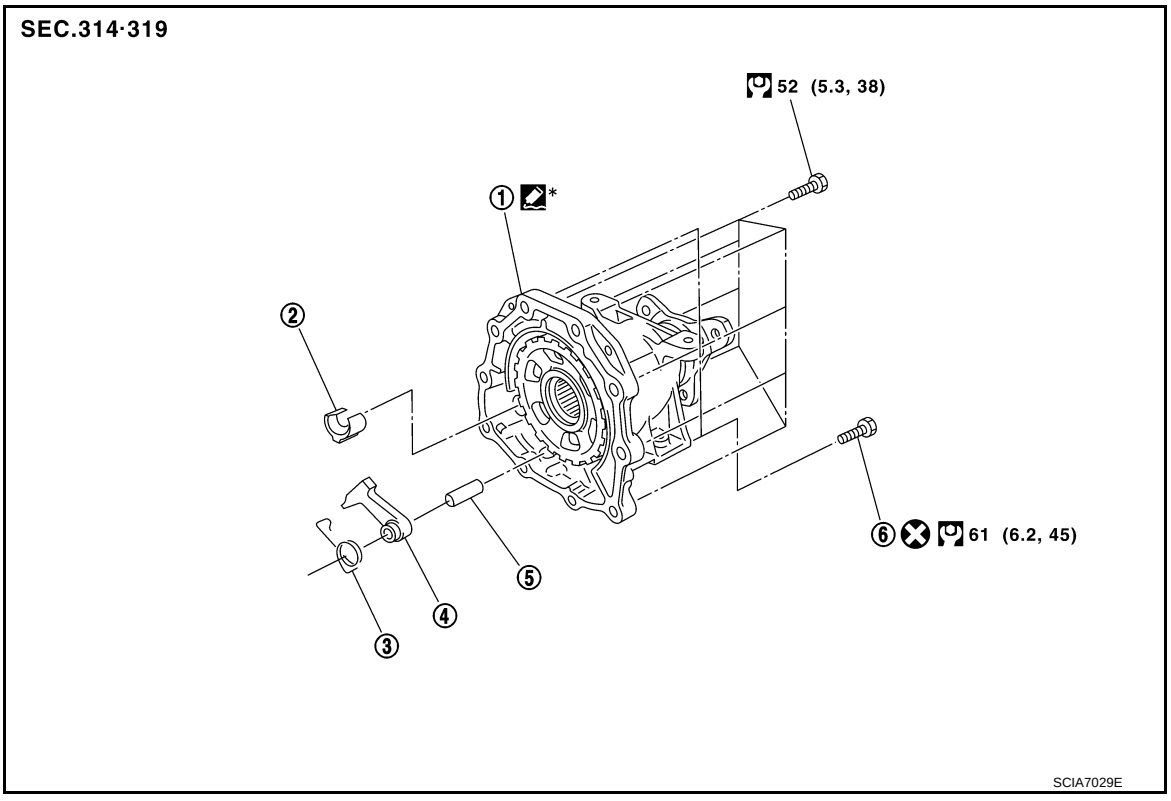
8. Install heated oxygen sensor 2 harness (B) to clips (1).
9. Install bracket (2) to transmission assembly. (for VQ35HR models)
10. Pour ATF into A/T assembly. Refer to AT-15, "VQ35HR : Changing A/T Fluid" (VQ35HR) or AT-19, "VK45DE : Changing A/T Fluid" (VK45DE).
11. Connect the battery cable to the negative terminal.

Parking Component (2WD Models Only)

INFOID:0000000005352639

REMOVAL AND INSTALLATION

Components



1.	Output shaft & companion flange complement	2.	Parking actuator support	3.	Return spring
4.	Parking pawl	5.	Pawl shaft	6.	Self-sealing bolt

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".
However, refer to the following symbols for others.

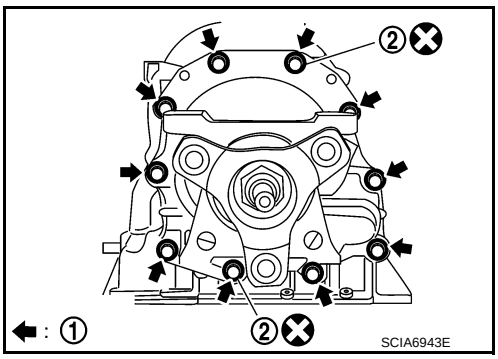
*: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-46, "Recommended Chemical Product and Sealant".

Removal

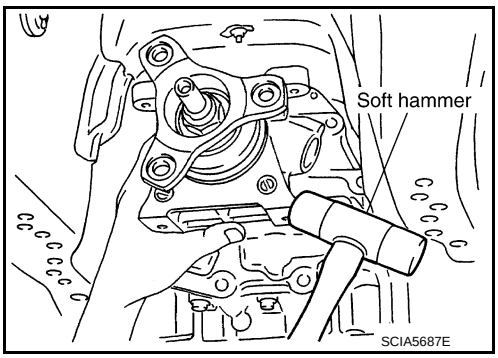
1. Drain ATF through drain plug.
2. Remove exhaust front tube and center muffler with a power tool. Refer to EX-6, "Removal and Installation".

3. Remove rear propeller shaft. Refer to PR-9, "Removal and Installation".
4. Remove control rod. Refer to AT-208, "Control Rod Removal and Installation".
5. Support A/T assembly with a transmission jack.
   CAUTION:
   When setting transmission jack, be careful not to allow it to collide against the drain plug.
6. Remove rear engine mounting member with a power tool. Refer to AT-243, "Removal and Installation (2WD Models)".
7. Remove engine mounting insulator (rear). Refer to AT-243, "Removal and Installation (2WD Models)".
8. Remove tightening bolts (1) for output shaft & companion flange complement and transmission case.

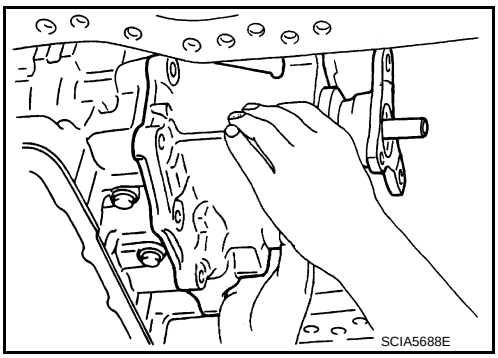
   2 : Self-sealing bolt
   ⬅ : Bolt



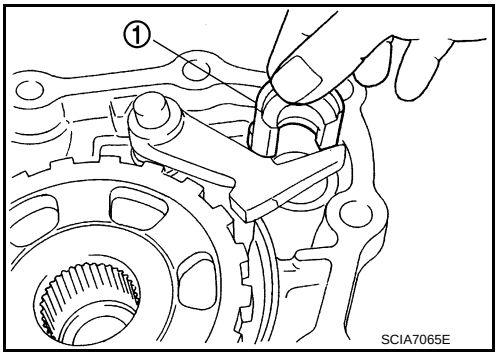
9. Tap output shaft & companion flange complement with a soft hammer.



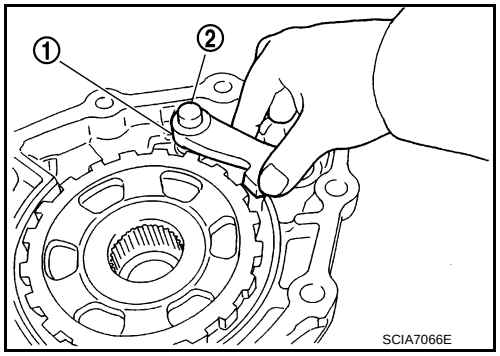
10. Remove output shaft & companion flange complement from transmission case.



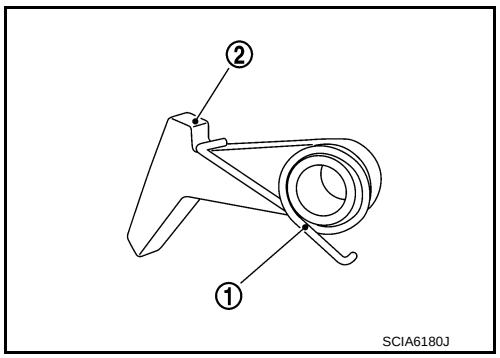
11. Remove parking actuator support (1) from output shaft & companion flange complement.



12. Remove parking pawl (with return spring) (1) and pawl shaft (2) from output shaft & companion flange complement.

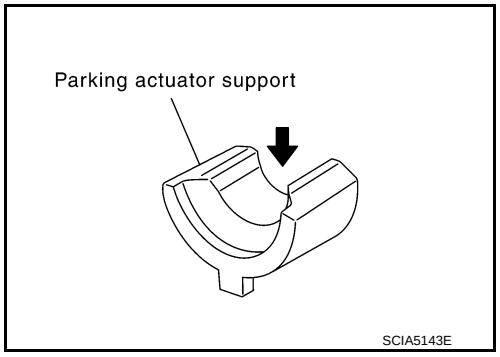


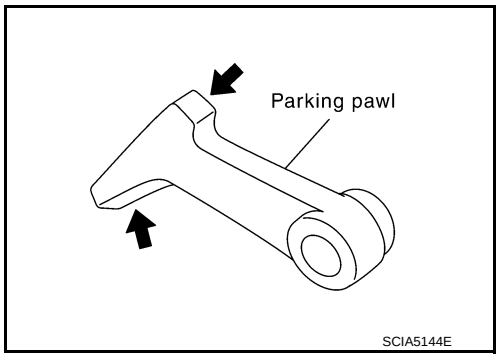
13. Remove return spring (1) from parking pawl (2).



Inspection

- If the contact surface on parking actuator support, parking pawl, etc. has excessive wear, abrasion, bend, or any other damage, replace the components.



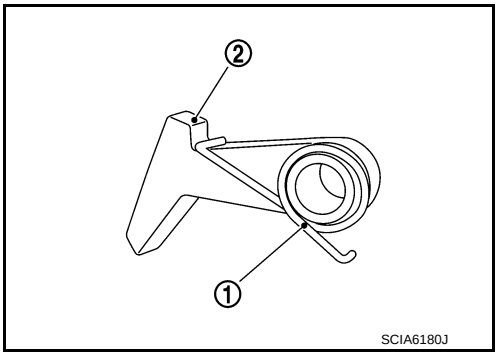


Installation

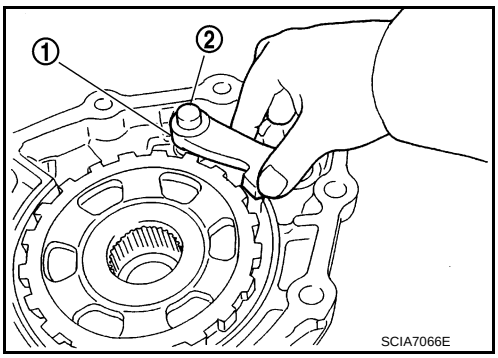
CAUTION:

After completing installation, check A/T fluid leakage, A/T fluid level and A/T position. Refer to AT-20, "VK45DE : Checking A/T Fluid", AT-209, "Checking of A/T Position".

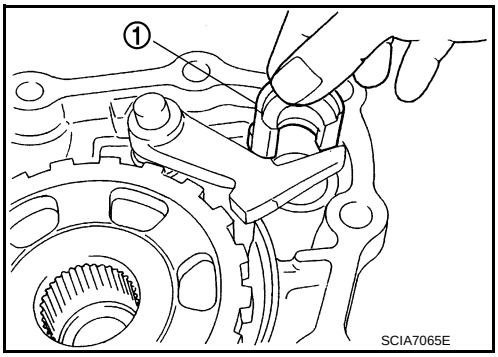
1. Install return spring (1) to parking pawl (2).



2. Install parking pawl (with return spring) (1) and pawl shaft (2) in output shaft & companion flange complement.



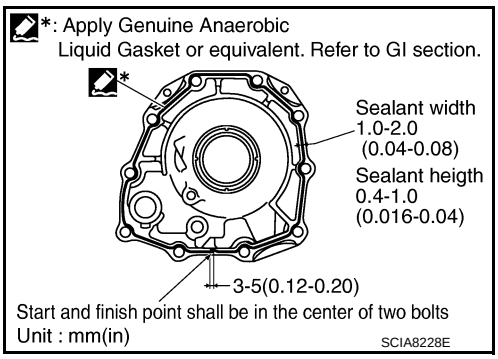
3. Install parking actuator support (1) in output shaft & companion flange complement.



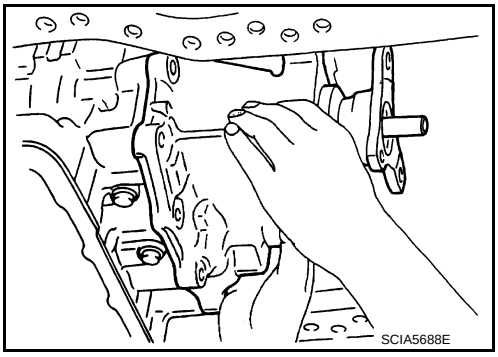
4. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-46, "Recommended Chemical Product and Sealant".) to output shaft & companion flange complement as shown in the figure.

CAUTION:

Completely remove all moisture, oil and old sealant, etc. from the transmission case and output shaft & companion flange complement mounting surfaces.



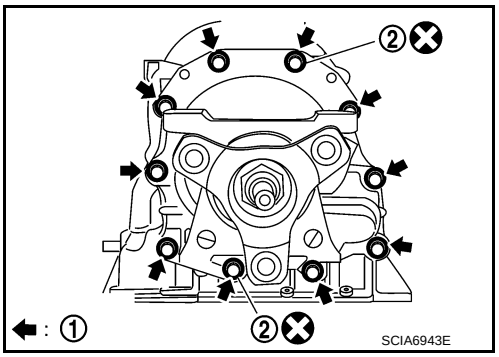
5. Install output shaft & companion flange complement to transmission case.



6. Tighten output shaft & companion flange complement bolts (1) to the specified torque. Refer to "Components".

⬅ : Bolt

CAUTION:
Never reuse self-sealing bolts (2).
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".



7. Install engine mounting insulator (rear). Refer to AT-243, "Removal and Installation (2WD Models)".
8. Install rear engine mounting member. Refer to AT-243, "Removal and Installation (2WD Models)".
9. Install control rod. Refer to AT-208, "Control Rod Removal and Installation".
10. Install rear propeller shaft. Refer to PR-9, "Removal and Installation".
11. Install exhaust front tube and center muffler. Refer to EX-6, "Removal and Installation".
12. Install drain plug to oil pan. Tighten a necessary drain plug with specified torque. Refer to AT-217, "Control Valve with TCM and A/T Fluid Temperature Sensor 2".
    CAUTION:
    Never reuse drain plug and drain plug gasket.
13. Pour ATF into A/T assembly. Refer to AT-19, "VK45DE : Changing A/T Fluid".

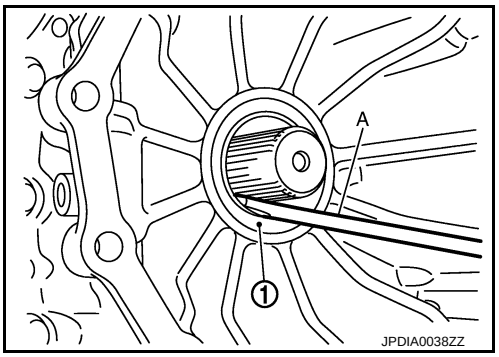
Rear Oil Seal (VQ35HR Models Only)

INFOID:0000000005352640

REMOVAL AND INSTALLATION

Removal

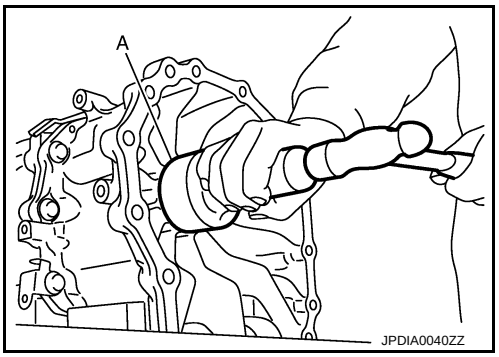
1. Remove rear propeller shaft. Refer to PR-9, "Removal and Installation".
2. Remove transfer assembly from A/T assembly. Refer to TF-44, "Removal and Installation".
3. Remove rear oil seal (1) using a flat-bladed screwdriver (A).
   CAUTION:
   Be careful not to scratch adapter case assembly.



Installation

CAUTION:
After completing installation, check for A/T fluid leakage and A/T fluid level. Refer to AT-20, "VK45DE : Checking A/T Fluid".

1. As shown in the figure, use the drift [64 mm (2.52 in) dia. commercial service tool] (A) to drive rear oil seal into adapter case assembly until it is flush.
   CAUTION:
   - **Never reuse rear oil seal.**
   - **Apply ATF to rear oil seal.**
2. Install transfer assembly to A/T assembly. Refer to TF-44, "Removal and Installation".
3. Install rear propeller shaft. Refer to PR-9, "Removal and Installation".

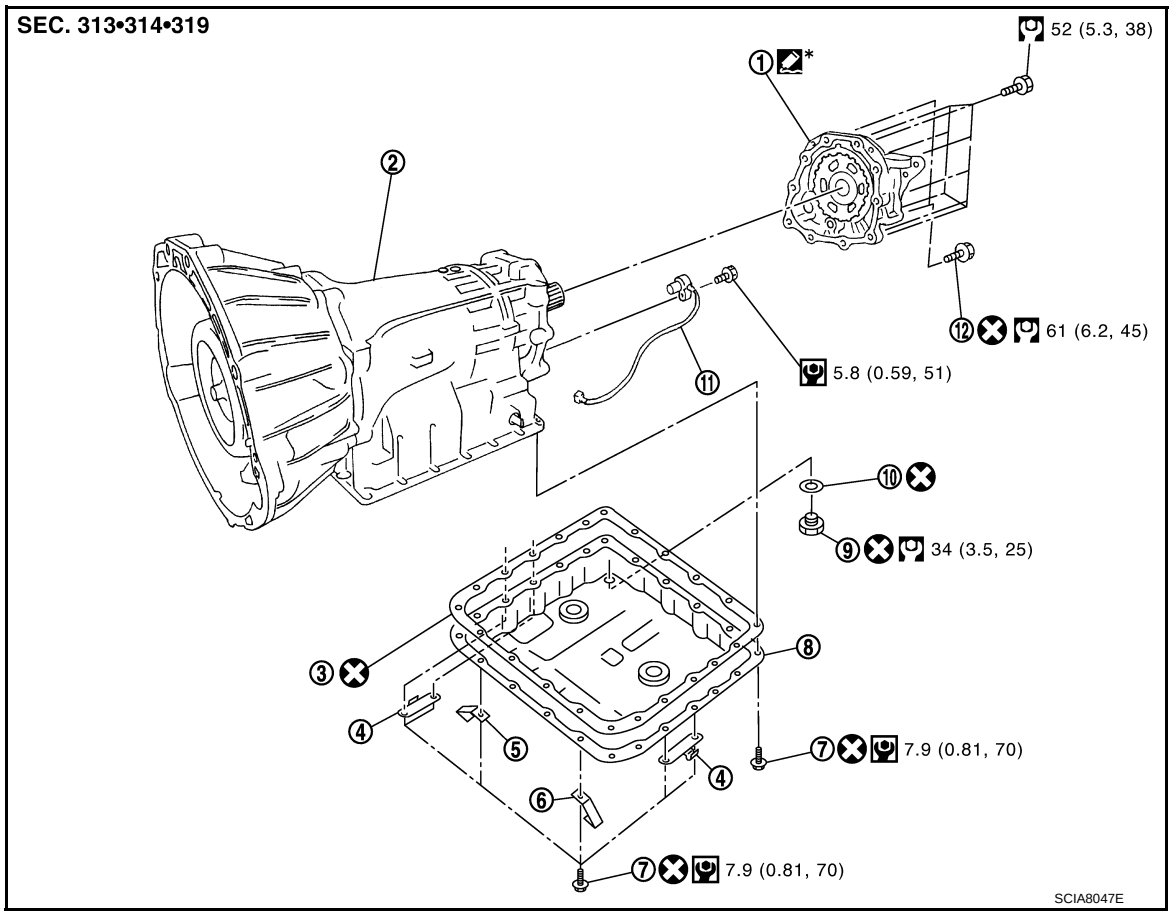


Output Speed Sensor Component (2WD Models Only)

INFOID:0000000005352641

REMOVAL AND INSTALLATION

Components



1.	Output shaft & companion flange complement	2.	A/T	3.	Oil pan gasket
4.	Clip	5.	Bracket	6.	Bracket
7.	Oil pan mounting bolt	8.	Oil pan	9.	Drain plug
10.	Drain plug gasket	11.	Output speed sensor	12.	Self-sealing bolt

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

However, refer to the following symbols for others.

*: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-46, "Recommended Chemical Product and Sealant".

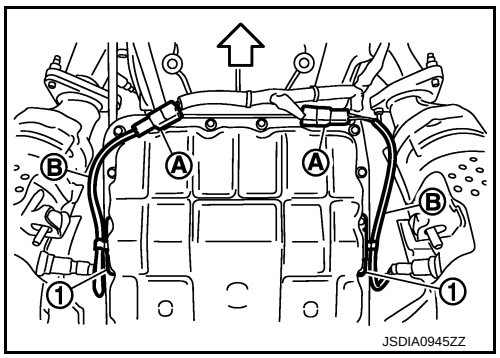
Removal

1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain plug.
3. Remove exhaust front tube and center muffler with power tool. Refer to EX-4, "Removal and Installation"
4. Remove rear propeller shaft. Refer to PR-9, "Removal and Installation".
5. Remove control rod. Refer to AT-208, "Control Rod Removal and Installation".

6. Disconnect heated oxygen sensor 2 harness connectors (A).

⇦ : Vehicle front

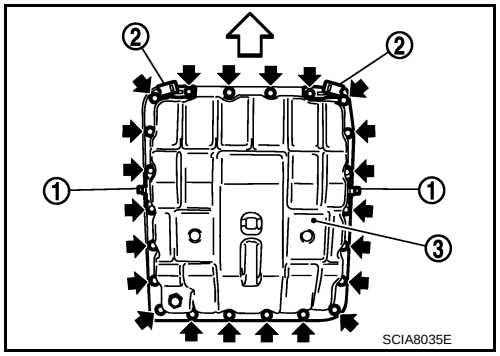
7. Remove heated oxygen sensor 2 harness (B) from clips (1).



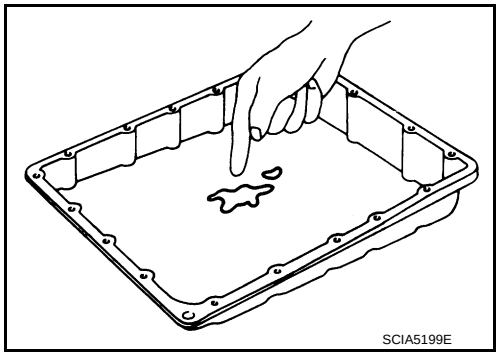
8. Remove clips (1) and brackets (2).
9. Remove oil pan (3) and oil pan gasket.

⇦ : Vehicle front

⬅ : Oil pan mounting bolt



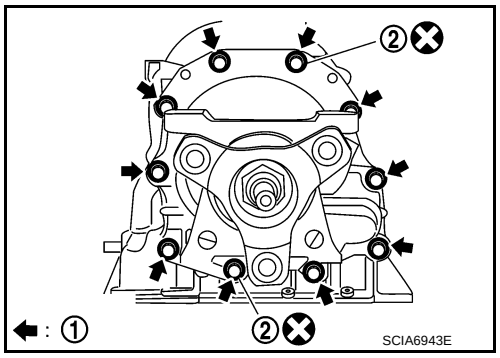
10. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
   - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to CO-39, "Component".**
11. Support A/T assembly with a transmission jack.
   CAUTION:
   When setting transmission jack, place wooden blocks to prevent from damaging control valve with TCM and transmission case.



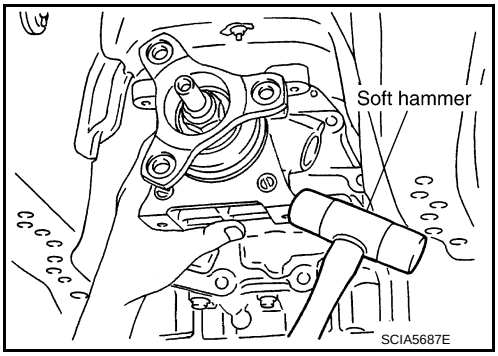
12. Remove rear engine mounting member with power tool. Refer to AT-243, "Removal and Installation (2WD Models)".
13. Remove tightening bolts (1) for output shaft & companion flange complement and transmission case.

2 : Self-sealing bolt

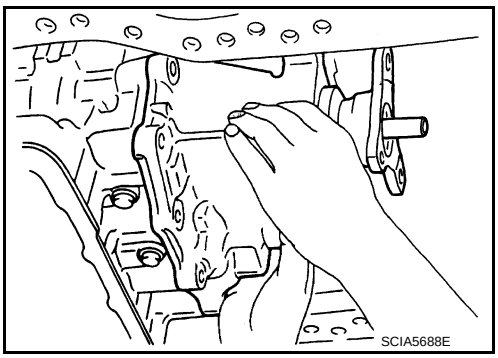
⬅ : Bolt



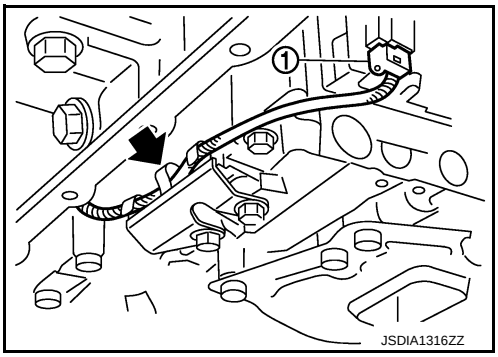
14. Tap output shaft & companion flange complement with a soft hammer.



15. Remove output shaft & companion flange complement from transmission case



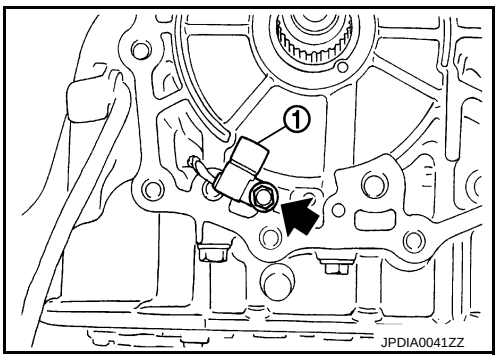
16. Straighten terminal clip (⬅) to free output speed sensor harness.
17. Disconnect output speed sensor connector (1).
CAUTION:
Be careful not to damage connector



18. Remove output speed sensor (1) from transmission case.

⬅ : Bolt

CAUTION:
- **Never subject it to impact by dropping or hitting it.**
- **Never disassemble.**
- **Never allow metal filings, etc., to get on the sensor's front edge magnetic area.**
- **Never place in an area affected by magnetism.**



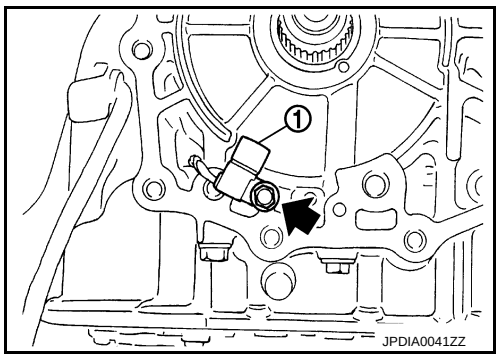
Installation

CAUTION:

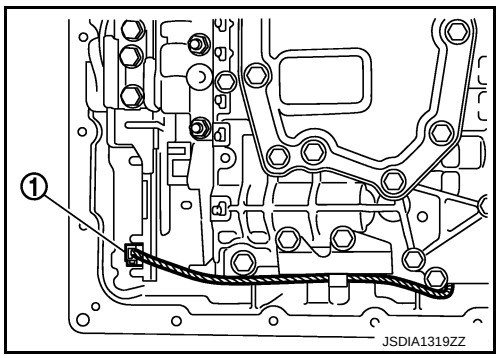
After completing installation, check A/T fluid leakage, A/T fluid level and A/T position. Refer to AT-20, "VK45DE : Checking A/T Fluid", AT-209, "Checking of A/T Position".

1. Install output speed sensor (1) in transmission case. Tighten a necessary bolt (⬅) for output speed sensor with specified torque. Refer to "Components".

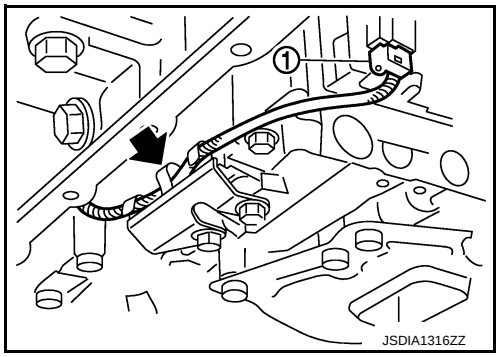
CAUTION:
- **Never subject it to impact by dropping or hitting it.**
- **Never disassemble.**
- **Never allow metal filings, etc., to get on the sensor's front edge magnetic area.**
- **Never place in an area affected by magnetism.**



2. Connect output speed sensor connector (1).

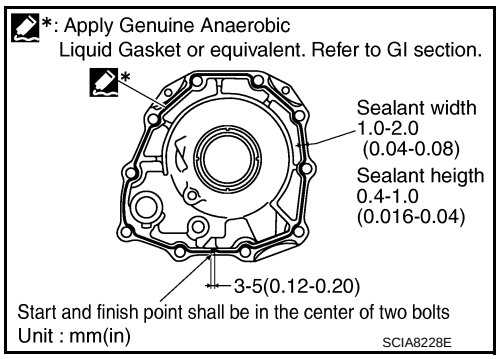


3. Securely fasten output speed sensor (1) harness with clip (⬅).

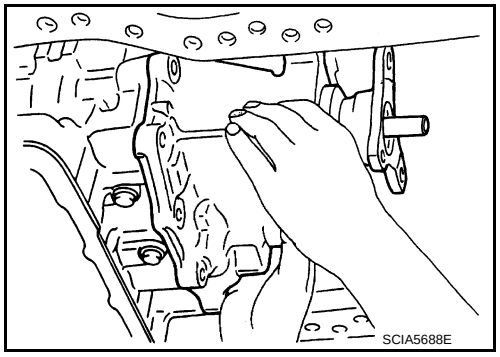


4. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-46, "Recommended Chemical Product and Sealant".) to output shaft & companion flange complement as shown in the figure.

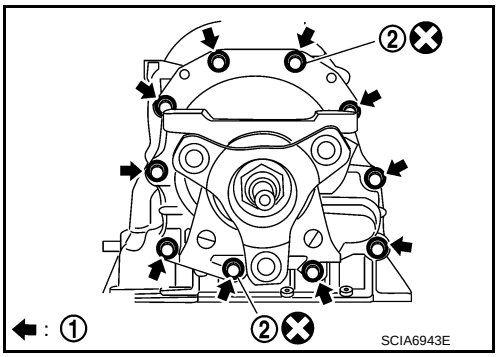
CAUTION:
Completely remove all moisture, oil and old sealant, etc. from the transmission case and output shaft & companion flange complement mounting surfaces.



5. Install output shaft & companion flange complement to transmission case.



6. Tighten output shaft & companion flange complement bolts (1) to the specified torque. Refer to "REMOVAL AND INSTALLATION".



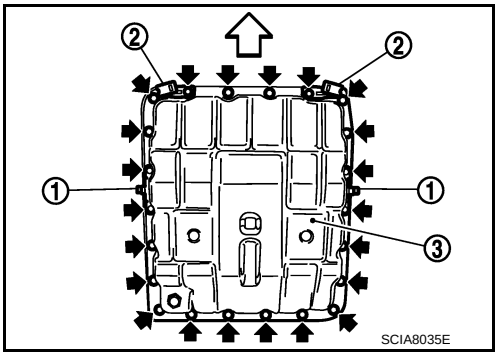
⬅ : Bolt

CAUTION:
Never reuse self-sealing bolts (2).
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

7. Install rear engine mounting member. Refer to AT-243, "Removal and Installation (2WD Models)".
8. Install oil pan gasket to oil pan.

CAUTION:
- **Never reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

9. Install oil pan (3) (with oil pan gasket), clips (1) and brackets (2) to transmission case.



⇦ : Vehicle front

⬅ : Oil pan mounting bolt

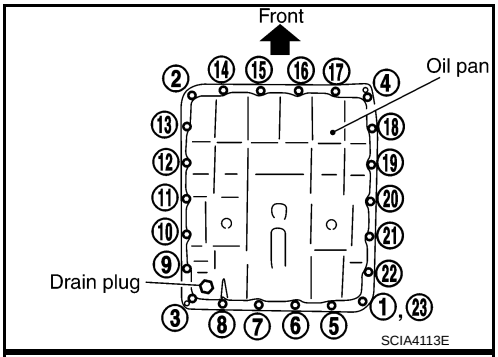
CAUTION:
- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**
- **Be careful with installation direction of brackets (2).**

10. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them.
Tighten oil pan mounting bolts to the specified torque. Refer to "Components".

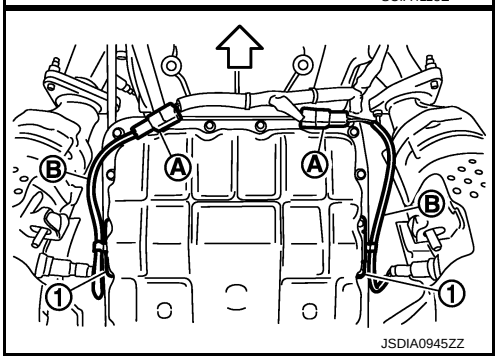
CAUTION:
Never reuse oil pan mounting bolts.

11. Install drain plug to oil pan. Tighten a necessary drain plug with specified torque. Refer to "Components".

CAUTION:
Never reuse drain plug and drain plug gasket.



12. Connect heated oxygen sensor 2 harness connectors (A).



⇦ : Vehicle front

13. Install heated oxygen sensor 2 harness (B) to clips (1).
14. Install control rod. Refer to AT-208, "Control Rod Removal and Installation".
15. Install rear propeller shaft. Refer to PR-9, "Removal and Installation".
16. Install exhaust front tube and center muffler. Refer to EX-4, "Removal and Installation".
17. Pour ATF into A/T assembly. Refer to AT-19, "VK45DE : Changing A/T Fluid".
18. Connect the battery cable to the negative terminal.

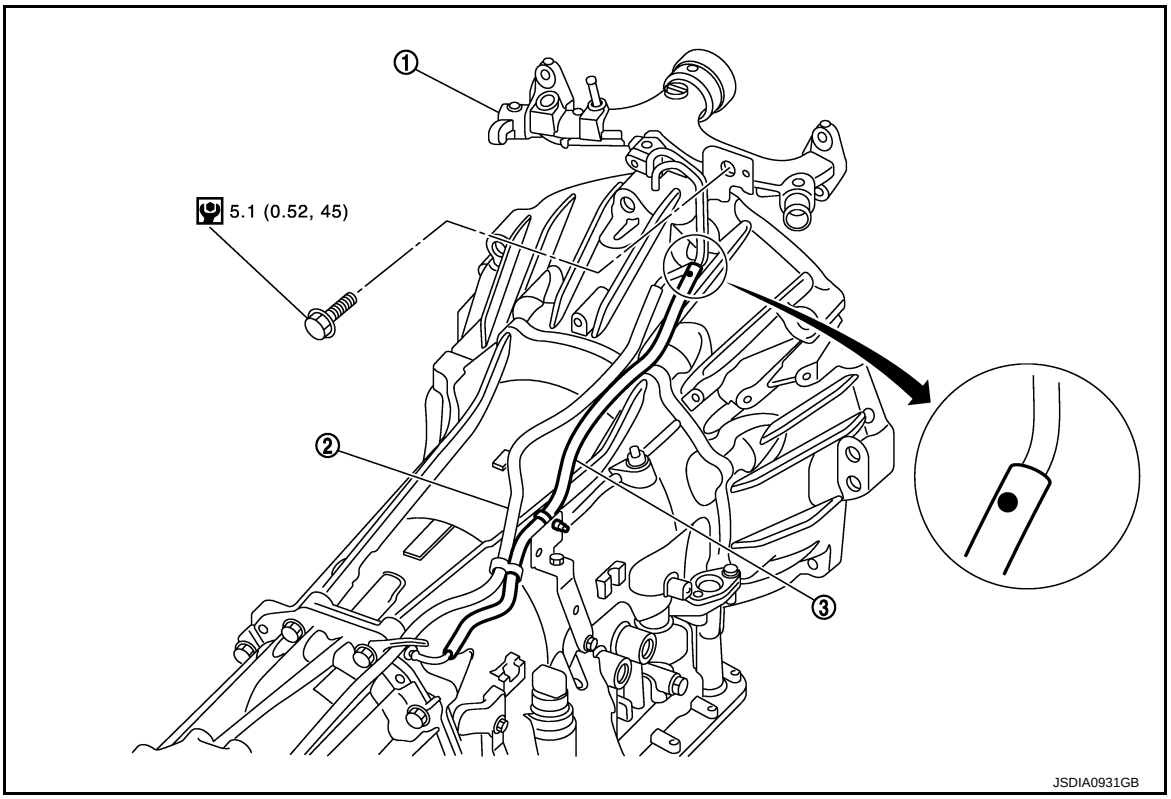
AIR BREATHER HOSE

Removal and Installation

INFOID:0000000005352642

VQ35HR ENGINE MODEL

Refer to the figure below for A/T air breather hose removal and installation procedure.



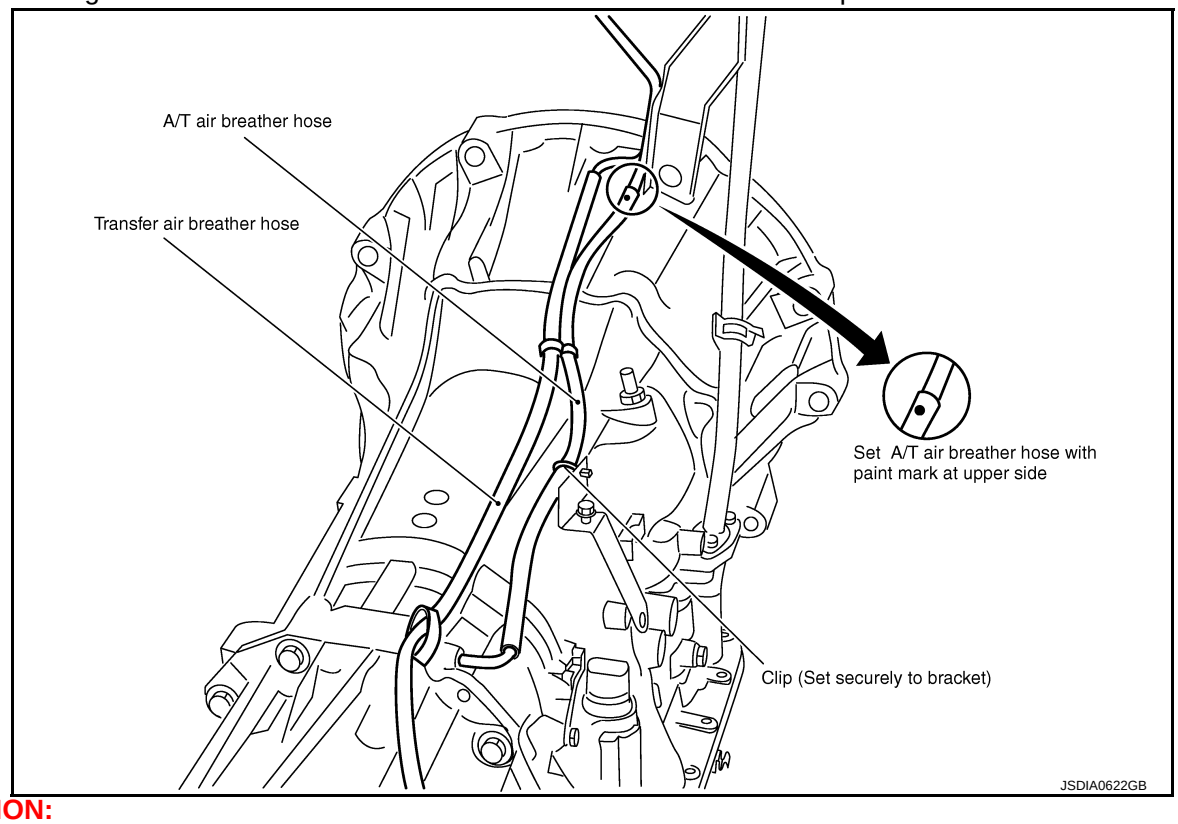
1. Water outlet (rear)
2. Transfer air breather hose
3. A/T air breather hose

CAUTION:

- **Set A/T air breather hose with paint mark at upper side.**
- **When installing an A/T air breather hose, be careful not to be crushed or blocked by folding or bending the hose.**
- **When inserting an A/T air breather hose to the transmission tube, be sure to insert it fully until its end reaches the tube bend “R” portion.**

VK45DE ENGINE MODEL

Refer to the figure below for A/T air breather hose removal and installation procedure.



CAUTION:

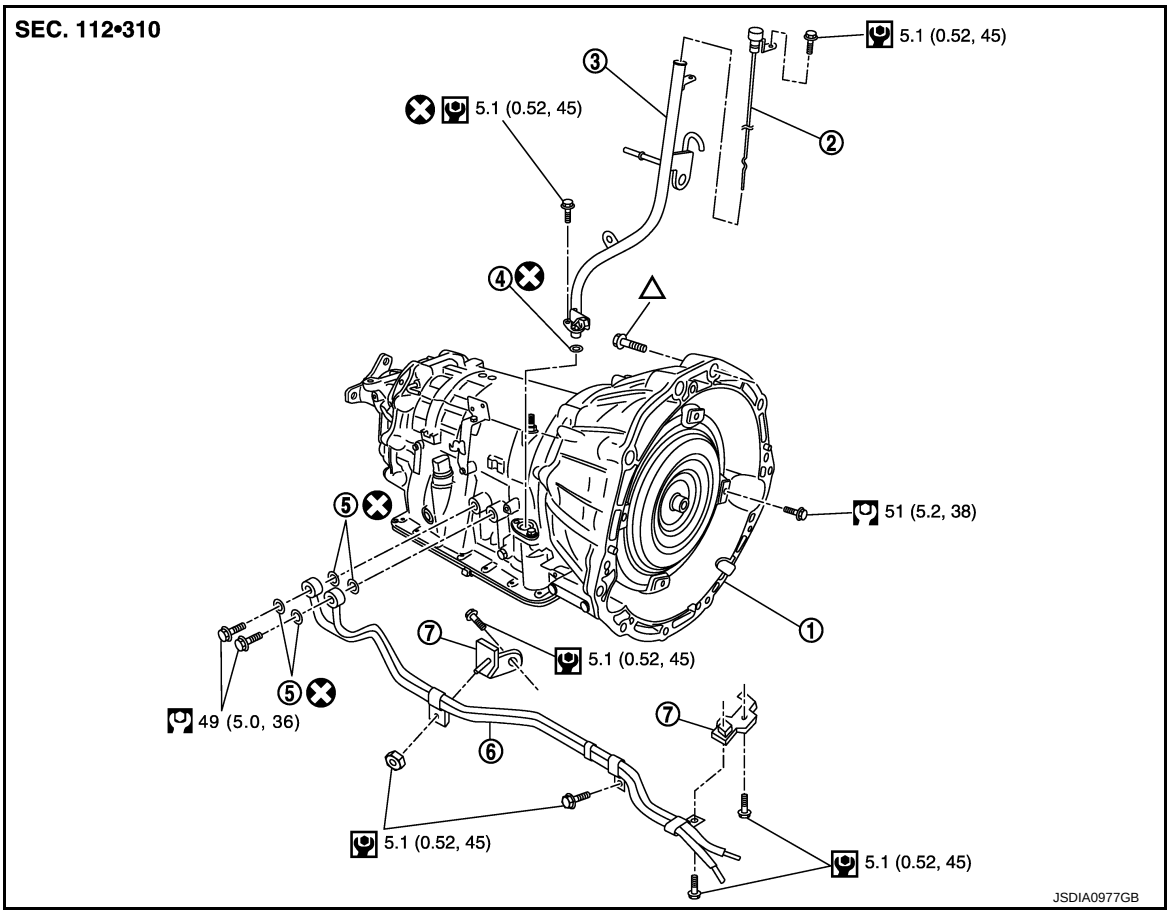
- **When installing an A/T air breather hose, be careful not to be crushed or blocked by folding or bending the hose.**
- **When inserting an A/T air breather hose to the transmission tube, be sure to insert it fully until its end reaches the tube bend “R” portion.**

TRANSMISSION ASSEMBLY

Removal and Installation (2WD Models)

INFOID:0000000005352643

COMPONENTS



1. A/T assembly
2. A/T fluid level gauge
3. A/T fluid charging pipe
4. O-ring
5. Copper washer
6. Fluid cooler tube
7. Bracket

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

However, refer to following symbols for others.

△: For tightening torque, refer to "INSTALLATION".

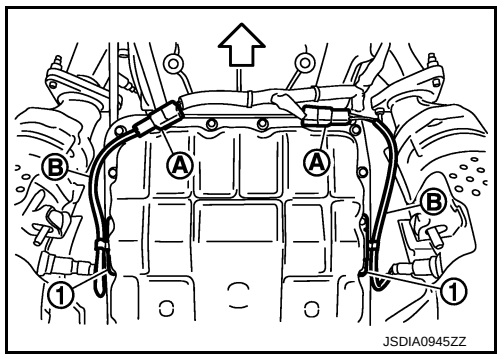
REMOVAL

CAUTION:

- **When removing the A/T assembly from engine, first remove the crankshaft position sensor (POS) from the A/T assembly.**
- **Be careful not to damage sensor edge.**

1. Disconnect the battery cable from the negative terminal.
2. Remove engine under cover with power tool.
3. Remove A/T fluid level gauge.
4. Remove exhaust front tube and center muffler with power tool. Refer to EX-6, "Removal and Installation".
5. Remove heat insulator.
6. Remove rear propeller shaft. Refer to PR-9, "Removal and Installation".
7. Remove rack stay. Refer to FSU-8, "Removal and Installation".
8. Remove exhaust mounting bracket. Refer to EX-6, "Removal and Installation".

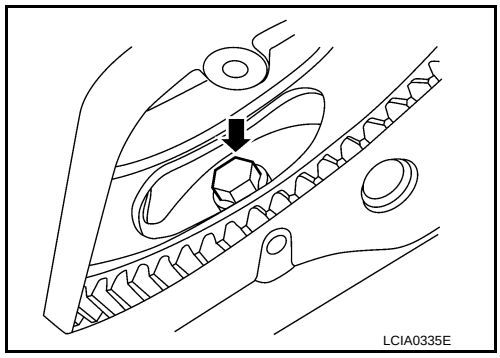
9. Disconnect heated oxygen sensor 2 harness connectors (A).



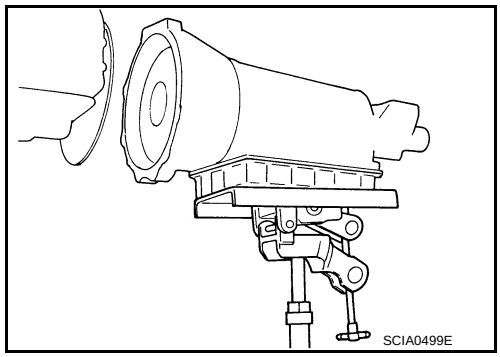
⇦ : Front

⬅ : Bolt

10. Remove heated oxygen sensor 2 harness (B) from clips (1).
11. Remove control rod. Refer to AT-208, "Control Rod Removal and Installation".
12. Remove crankshaft position sensor (POS) from A/T assembly.
    CAUTION:
    - **Never subject it to impact by dropping or hitting it.**
    - **Never disassemble.**
    - **Never allow metal filings, etc., to get on the sensor's front edge magnetic area.**
    - **Never place in an area affected by magnetism.**
13. Remove starter motor. Refer to SC-13, "Removal and Installation".
14. Remove rear plate cover. Refer to EM-183, "Removal and Installation".
15. Turn crankshaft, and remove the four tightening bolts for drive plate and torque converter.
    CAUTION:
    When turning the crankshaft, turn it clockwise as viewed from the front of the engine.



16. Support A/T assembly with a transmission jack.
    CAUTION:
    When setting the transmission jack, be careful not to allow it to collide against the drain plug.
17. Remove rear engine mounting member with power tool.
18. Remove engine mounting insulator (rear).
19. Disconnect A/T assembly harness connector.
20. Remove A/T air breather hose. Refer to AT-241, "Removal and Installation".
21. Remove A/T fluid charging pipe from A/T assembly.
22. Remove O-ring from A/T fluid charging pipe.
23. Disconnect fluid cooler tube from A/T assembly.
24. Plug up openings such as the A/T fluid charging pipe hole, etc.
25. Remove bolts fixing A/T assembly to engine assembly with power tool.
26. Remove A/T assembly from vehicle.
    CAUTION:
    - **Secure torque converter to prevent it from dropping.**
    - **Secure A/T assembly to a transmission jack.**

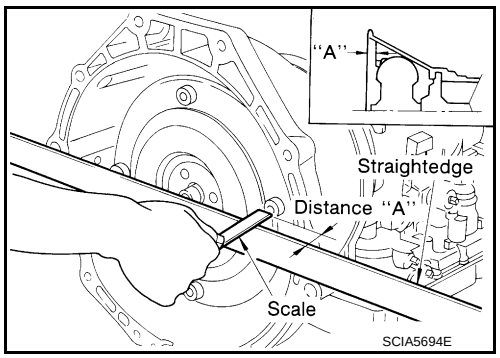


INSPECTION

Installation and Inspection of Torque Converter

- After inserting a torque converter to a A/T, be sure to check distance “A” to ensure it is within the reference value limit.

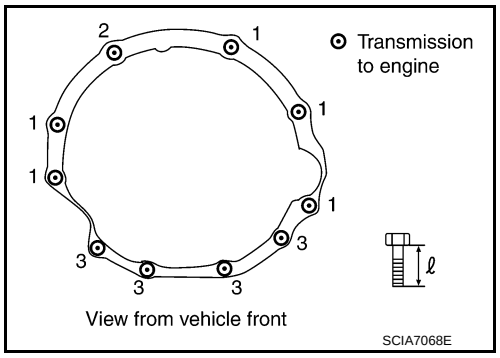
Distance “A”: 22.0 mm (0.87 in)



INSTALLATION

Install the removed parts in the reverse order of the removal, while paying attention to the following work.

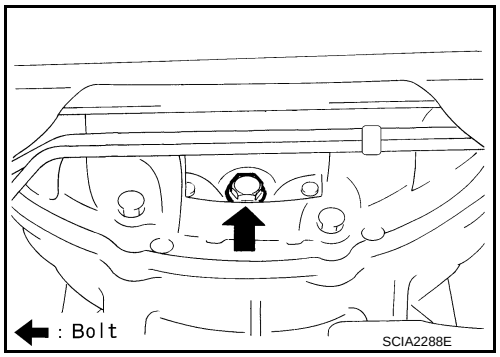
- When installing A/T assembly to the engine assembly, attach the fixing bolts in accordance with the following standard.



Bolt No.	1	2*	3
Number of bolts	5	1	4
Bolt length “ℓ”mm (in)	70 (2.76)	70 (2.76)	65 (2.56)
Tightening torque N·m (kg-m, ft-lb)	113 (12, 83)		74 (7.5, 55)

*: No.2 bolt also secures A/T fluid charging pipe.

- Align the positions of tightening bolts for drive plate with those of the torque converter, and temporarily tighten the bolts. Then, tighten the bolts with the specified torque. Refer to "COMPONENTS".



CAUTION:

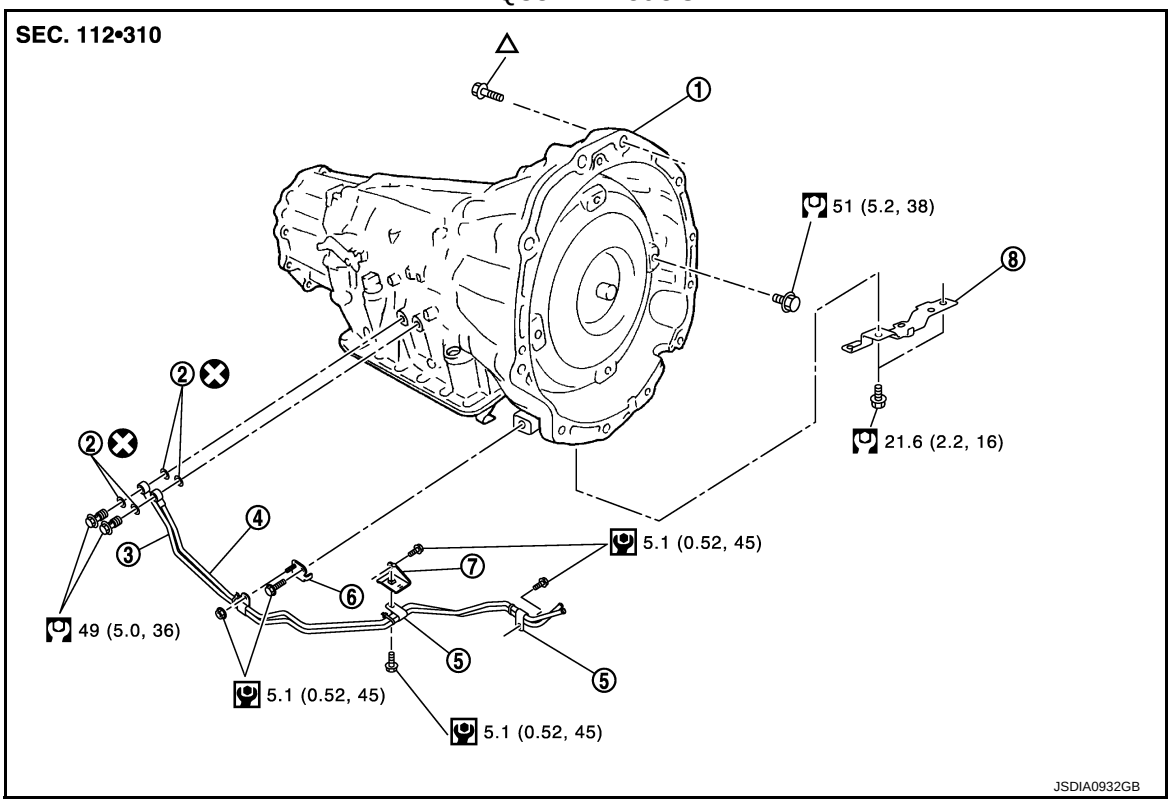
- **When turning crankshaft, turn it clockwise as viewed from the front of the engine.**
- **When tightening the tightening bolts for the torque converter after fixing the crankshaft pulley bolts, be sure to confirm the tightening torque of the crankshaft pulley mounting bolts. Refer to EM-200, "Removal and Installation".**
- **After converter is installed to drive plate, rotate crankshaft several turns and check to be sure that A/T rotates freely without binding.**
- Install crankshaft position sensor (POS). Refer to EM-183, "Removal and Installation".
- After completing installation, check A/T fluid leakage, A/T fluid level and A/T position. Refer to AT-20, "VK45DE : Checking A/T Fluid", AT-209, "Checking of A/T Position".

Removal and Installation (AWD Models)

INFOID:0000000005352644

COMPONENTS

VQ35HR models



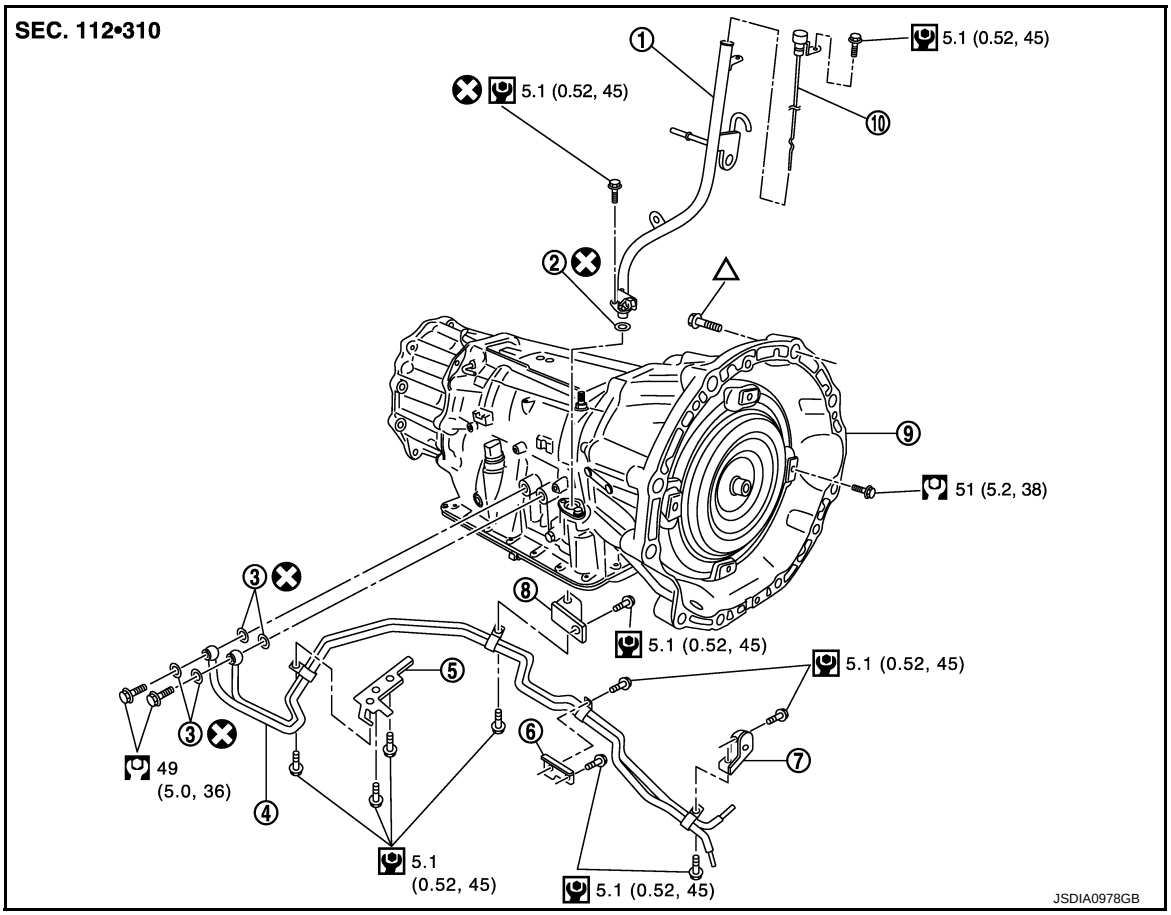
1. A/T assembly
2. Copper washer
3. Fluid cooler tube
4. Fluid cooler tube
5. Clip
6. Bracket
7. Bracket
8. Bracket

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

However, refer to the following symbols for others.

△: For tightening torque, refer to "INSTALLATION".

VK45DE models



1. A/T fluid charging pipe
2. O-ring
3. Copper washer
4. Fluid cooler tube
5. Bracket
6. Bracket
7. Bracket
8. Bracket
9. A/T assembly
10. A/T fluid level gauge

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

However, refer to the following symbols for others.

△: For tightening torque, refer to "INSTALLATION".

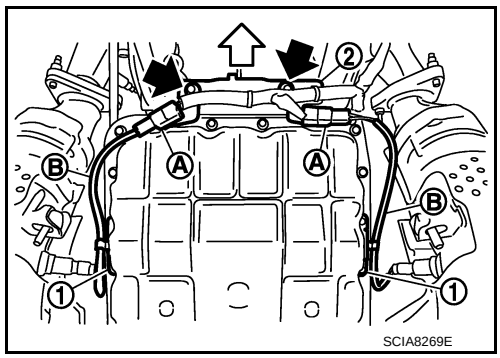
REMOVAL

CAUTION:

- **When removing the A/T assembly from engine, first remove the crankshaft position sensor (POS) from the A/T assembly.**
- **Be careful not to damage sensor edge.**

1. Disconnect the battery cable from the negative terminal.
2. Remove engine under cover with power tool.
3. Remove A/T fluid level gauge. (VK45DE)
4. Remove exhaust front tube and center muffler and with power tool. Refer to EX-4, "Removal and Installation".
5. Remove heat insulator.
6. Remove rear propeller shaft. Refer to PR-9, "Removal and Installation".
7. Remove front cross bar with power tool. Refer to FSU-25, "Removal and Installation".
8. Remove exhaust mounting bracket. Refer to EX-4, "Removal and Installation".
9. Remove three way catalyst. Refer to EX-4, "Removal and Installation".
10. Remove front propeller shaft. Refer to PR-5, "Removal and Installation".

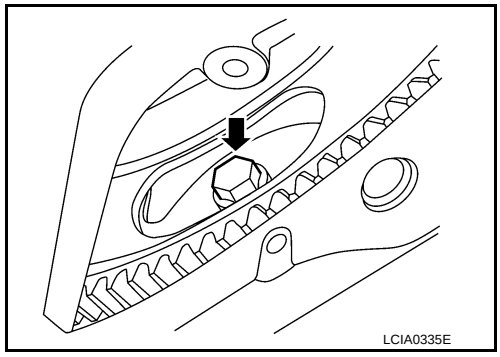
11. Disconnect heated oxygen sensor 2 harness connectors (A).



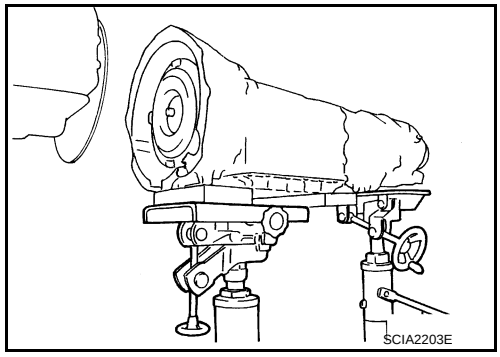
⇦ : Front

⬅ : Bolt

12. Remove heated oxygen sensor 2 harness (B) from clips (1).
13. Remove bracket (2) from transmission assembly. (VQ35HR)
14. Remove control rod. Refer to AT-208, "Control Rod Removal and Installation".
15. Remove crankshaft position sensor (POS) from A/T assembly.
    CAUTION:
    - **Never subject it to impact by dropping or hitting it.**
    - **Never disassemble.**
    - **Never allow metal filings, etc., to get on the sensor's front edge magnetic area.**
    - **Never place in an area affected by magnetism.**
16. Remove starter motor. Refer to SC-13, "Removal and Installation".
17. Remove rear plate cover. Refer to EM-32, "AWD : Component" (VQ35HR) or EM-182, "Component" (VK45DE).
18. Turn crankshaft, and remove the four tightening bolts for drive plate and torque converter.
    CAUTION:
    When turning the crankshaft, turn it clockwise as viewed from the front of the engine.



19. Support A/T assembly with a transmission jack.
    CAUTION:
    When setting the transmission jack, be careful not to allow it to collide against the drain plug.
20. Remove rear engine mounting member with power tool.
21. Remove engine mounting insulator (rear).
22. Disconnect A/T assembly harness connector.
23. Remove air breather hose. Refer to AT-241, "Removal and Installation".
24. Remove A/T fluid charging pipe from A/T assembly. (VK45DE)
25. Remove O-ring from A/T fluid charging pipe.
26. Disconnect fluid cooler tube from the A/T assembly.
27. Plug up openings such as the A/T fluid charging pipe hole, etc.
28. Remove bolts fixing A/T assembly to engine assembly with power tool.
29. Remove A/T assembly with transfer assembly from vehicle.
    CAUTION:
    - **Secure torque converter to prevent it from dropping.**
    - **Secure A/T assembly to a transmission jack.**



30. Remove transfer assembly from A/T assembly with power tool.

INSPECTION

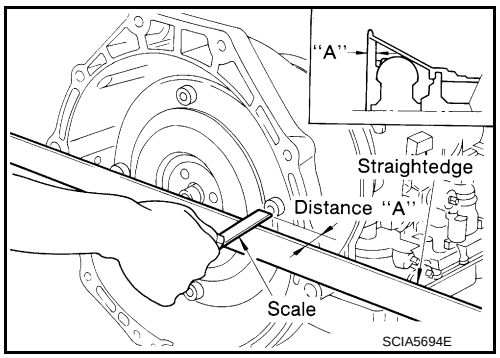
Installation and Inspection of Torque Converter

- After inserting a torque converter to a A/T, be sure to check distance “A” to ensure it is within the reference value limit.

Distance “A”

VQ35HR models : 25.0 mm (0.98 in)

VK45DE models : 22.0 mm (0.87 in)



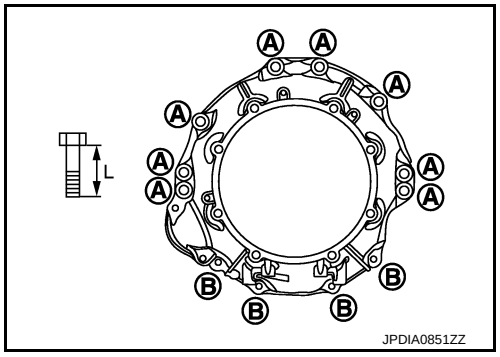
INSTALLATION

Install the removed parts in the reverse order of the removal, while paying attention to the following work.

- When installing A/T assembly to the engine assembly, attach the fixing bolts in accordance with the following standard.

VQ35HR models

Insertion direction	A/T assembly to engine assembly	Engine assembly to A/T assembly
Bolt position	A	B
Number of bolts	8	4
Bolt length “L” mm (in)	65 (2.56)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7, 55)	46.6 (4.8, 34)



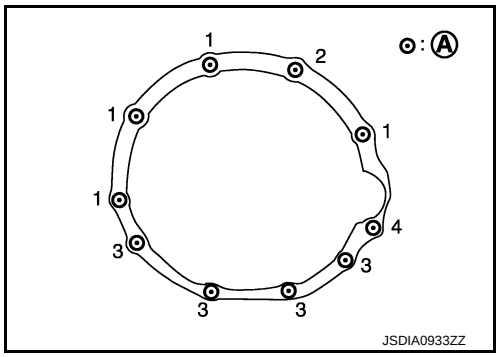
VK45DE models

Bolt No.	1	2*1	3	4*2
Number of bolts	4	1	4	1
Bolt length mm (in)	70 (2.76)		65 (2.56)	70 (2.76)
Tightening torque N·m (kg-m, ft-lb)	113 (12, 83)		74 (7.5, 55)	113 (12, 83)

*1: No.2 bolt also secures A/T fluid charging pipe.

*2: No.4 bolt also secures bracket.

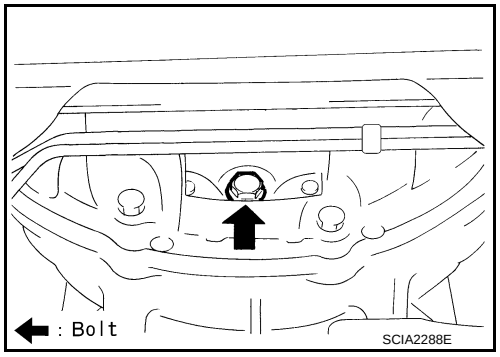
(A): A/T to engine



- Align the positions of tightening bolts for drive plate with those of the torque converter, and temporarily tighten the bolts. Then, tighten the bolts with the specified torque. Refer to "COMPONENTS".

CAUTION:

- **When turning crankshaft, turn it clockwise as viewed from the front of the engine.**
- **When tightening the tightening bolts for the torque converter after fixing the crankshaft pulley bolts, be sure to confirm the tightening torque of the crankshaft pulley mounting bolts. Refer to EM-59, "Component" (VQ35HR) or EM-199, "Component" (VK45DE).**
- **After converter is installed to drive plate, rotate crankshaft several turns and check to be sure that A/T rotates freely without binding.**
- Install crankshaft position sensor (POS). Refer to EM-119, "Component" (VQ35HR) or EM-246, "Component" (VK45DE).



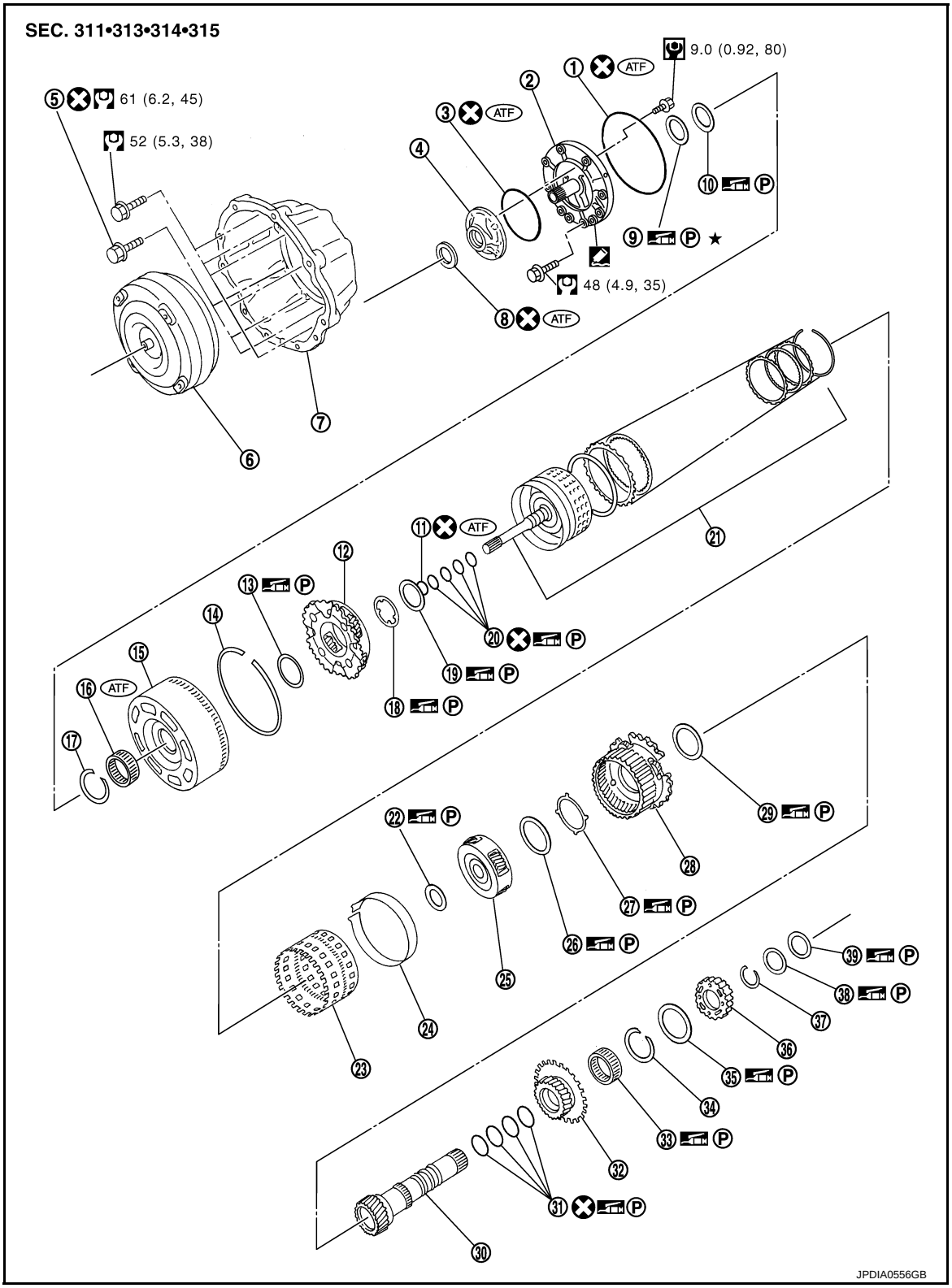
- After completing installation, check A/T fluid leakage, A/T fluid level and A/T position. Refer to AT-16, "VQ35HR : Adjusting A/T Fluid" (VQ35HR) or AT-20, "VK45DE : Checking A/T Fluid" (VK45DE), AT-209, "Checking of A/T Position".

OVERHAUL

Component

INFOID:0000000005352645

VQ35HR models



1. O-ring
2. Oil pump cover
3. O-ring
4. Oil pump housing
5. Self-sealing bolt
6. Torque converter
7. Converter housing
8. Oil pump housing oil seal
9. Bearing race

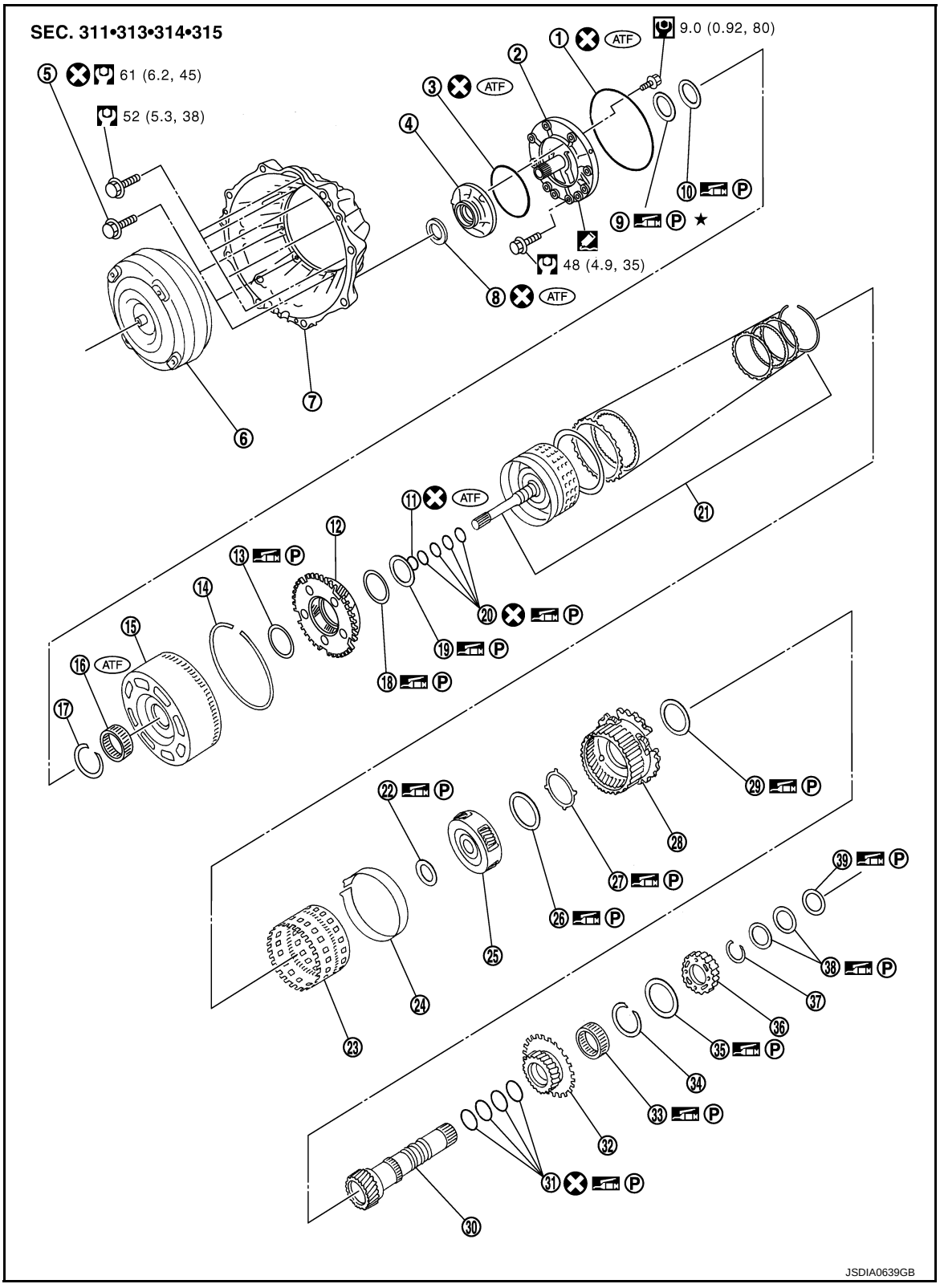
10. Needle bearing	11. O-ring	12. Front carrier assembly
13. Needle bearing	14. Snap ring	15. Front sun gear
16. 3rd one-way clutch	17. Snap ring	18. Bearing race
19. Needle bearing	20. Seal ring	21. Input clutch assembly
22. Needle bearing	23. Rear internal gear	24. Brake band
25. Mid carrier assembly	26. Needle bearing	27. Bearing race
28. Rear carrier assembly	29. Needle bearing	30. Mid sun gear
31. Seal ring	32. Rear sun gear	33. 1st one-way clutch
34. Snap ring	35. Needle bearing	36. High and low reverse clutch hub
37. Snap ring	38. Bearing race	39. Needle bearing

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

However, refer to the following symbols for others.

: Apply Genuine RTV silicone sealant or equivalent. Refer to GI-46, "Recommended Chemical Product and Sealant".

VK45DE models



1. O-ring
2. Oil pump cover
3. O-ring
4. Oil pump housing
5. Self-sealing bolt
6. Torque converter
7. Converter housing
8. Oil pump housing oil seal
9. Bearing race
10. Needle bearing
11. O-ring
12. Front carrier assembly
13. Needle bearing
14. Snap ring
15. Front sun gear
16. 3rd one-way clutch
17. Snap ring
18. Bearing race

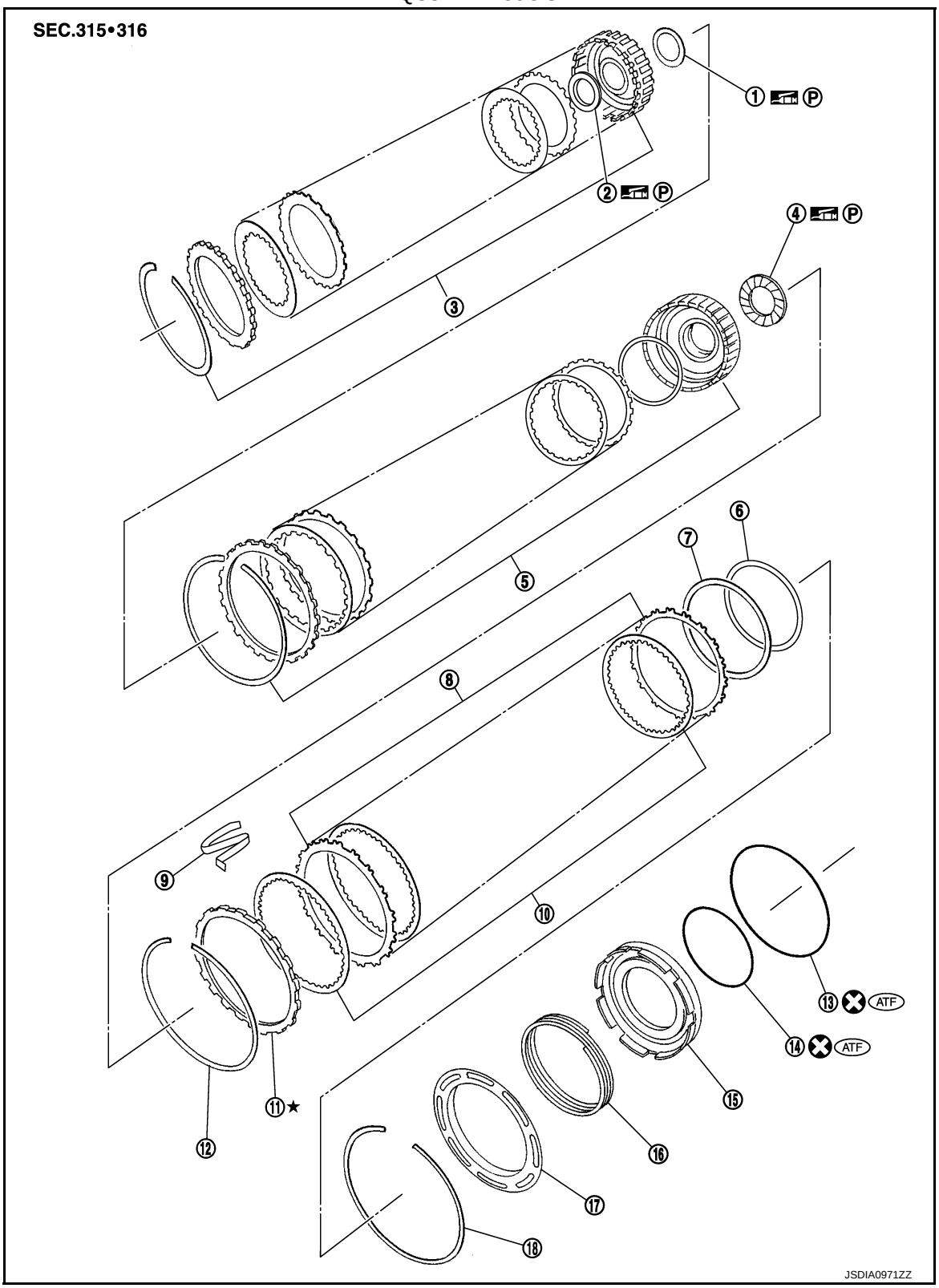
19. Needle bearing
20. Seal ring
21. Input clutch assembly
22. Needle bearing
23. Rear internal gear
24. Brake band
25. Mid carrier assembly
26. Needle bearing
27. Bearing race
28. Rear carrier assembly
29. Needle bearing
30. Mid sun gear
31. Seal ring
32. Rear sun gear
33. 1st one-way clutch
34. Snap ring
35. Needle bearing
36. High and low reverse clutch hub
37. Snap ring
38. Bearing race
39. Needle bearing

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

However, refer to the following symbols for others.

: Apply Genuine RTV silicone sealant or equivalent. Refer to GI-46, "Recommended Chemical Product and Sealant".

VQ35HR models

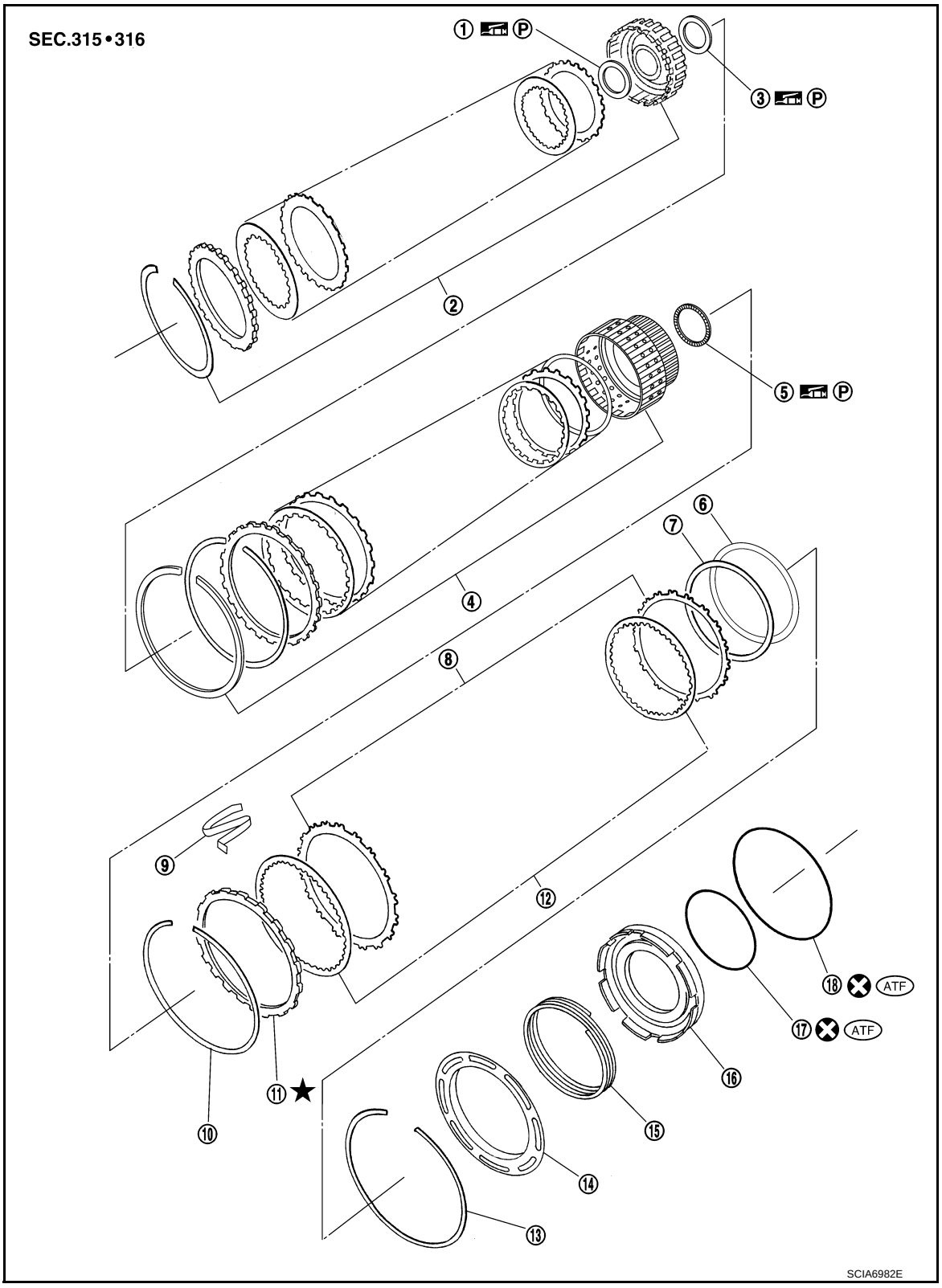


1. Needle bearing
2. Bearing race
3. High and low reverse clutch assembly
4. Needle bearing
5. Direct clutch assembly
6. Reverse brake dish plate
7. Reverse brake dish plate
8. Reverse brake driven plate
9. N-spring
10. Reverse brake drive plate
11. Reverse brake retaining plate
12. Snap ring
13. D-ring
14. D-ring
15. Reverse brake piston

16. Return spring
17. Spring retainer
18. Snap ring

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

VK45DE models

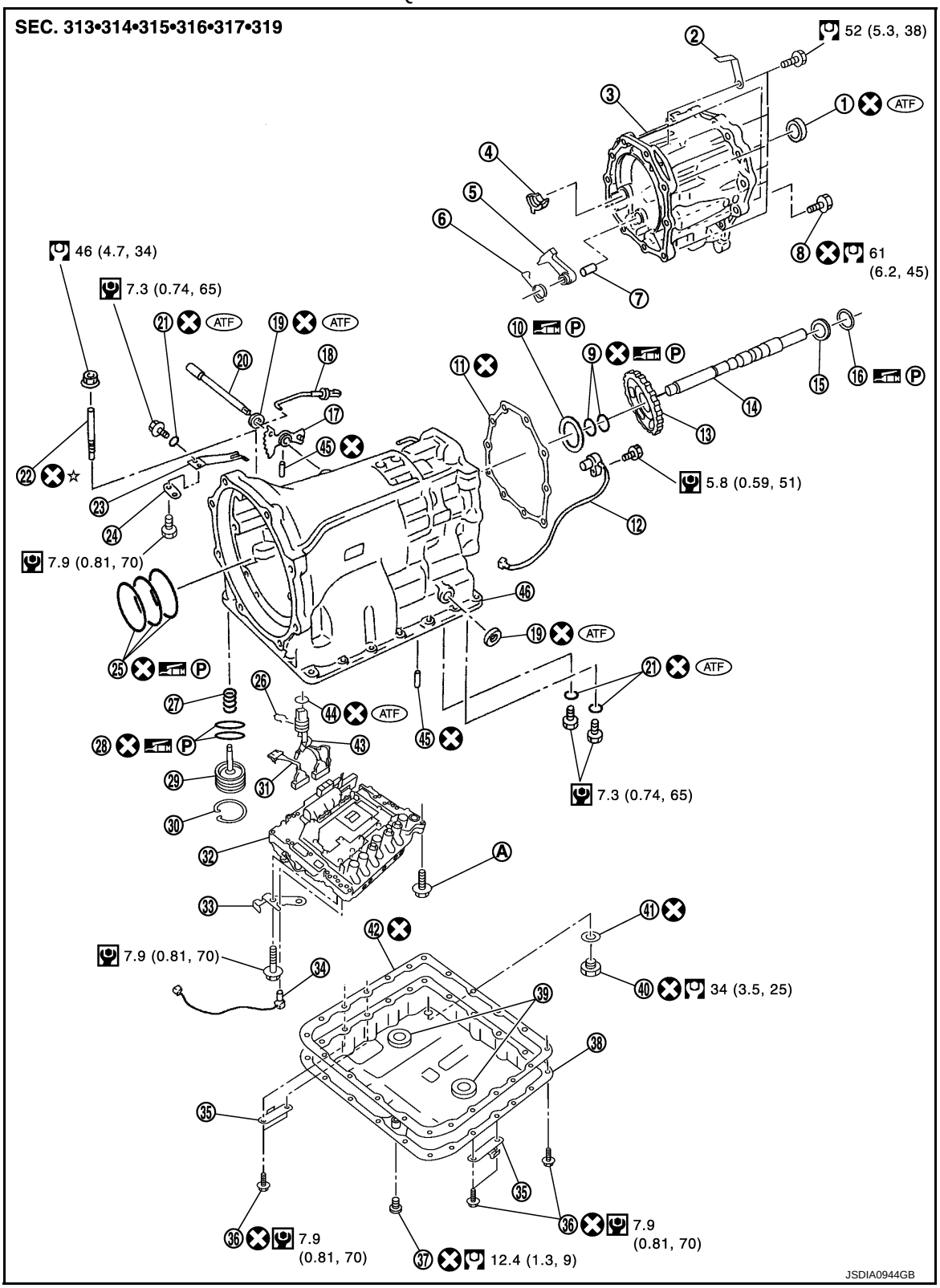


1. Bearing race
2. High and low reverse clutch assembly
3. Needle bearing
4. Direct clutch assembly
5. Needle bearing
6. Reverse brake dish plate
7. Reverse brake dish plate
8. Reverse brake driven plate
9. N-spring
10. Snap ring
11. Reverse brake retaining plate
12. Reverse brake drive plate

13. Snap ring
14. Spring retainer
15. Return spring
16. Reverse brake piston
17. D-ring
18. D-ring

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component"

VQ35HR models



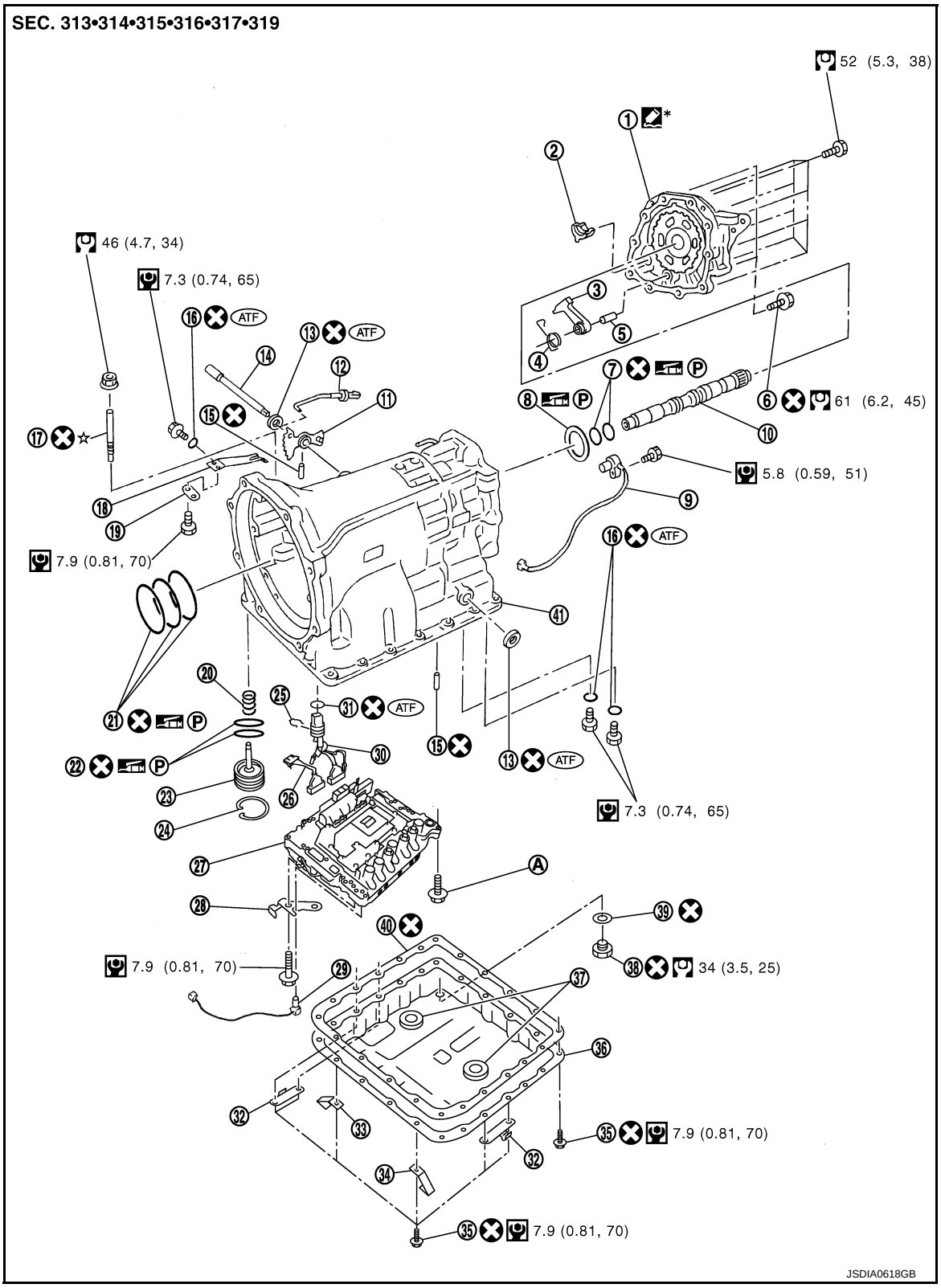
1. Rear oil seal
2. Bracket
3. Adapter case
4. Parking actuator support
5. Parking pawl
6. Return spring
7. Pawl shaft
8. Self-sealing bolt
9. Seal ring

10. Needle bearing	11. Gasket	12. Output speed sensor
13. Parking gear	14. Output shaft	15. Bearing race
16. Needle bearing	17. Manual plate	18. Parking rod
19. Manual shaft oil seal	20. Manual shaft	21. O-ring
22. Band servo anchor end pin	23. Detent spring	24. Spacer
25. Seal ring	26. Snap ring	27. Return spring
28. O-ring	29. Servo assembly	30. Snap ring
31. Sub-harness	32. Control valve with TCM	33. Bracket
34. A/T fluid temperature sensor 2	35. Clip	36. Oil pan mounting bolt
37. Overflow plug	38. Oil pan	39. Magnet
40. Drain plug	41. Drain plug gasket	42. Oil pan gasket
43. Terminal cord assembly	44. O-ring	45. Retaining pin
46. Transmission case		

A. For tightening torque, refer to AT-325, "Assembly (2)".

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

VK45DE models for 2WD



1.	Output shaft & companion flange complement	2.	Parking actuator support	3.	Parking pawl
4.	Return spring	5.	Pawl shaft	6.	Self-sealing bolt
7.	Seal ring	8.	Needle bearing	9.	Output speed sensor
10.	Intermediate shaft	11.	Manual plate	12.	Parking rod
13.	Manual shaft oil seal	14.	Manual shaft	15.	Retaining pin

16.	O-ring	17.	Band servo anchor end pin	18.	Detent spring
19.	Spacer	20.	Return spring	21.	Seal ring
22.	O-ring	23.	Servo assembly	24.	Snap ring
25.	Snap ring	26.	Sub-harness	27.	Control valve with TCM
28.	Bracket	29.	A/T fluid temperature sensor 2	30.	Terminal cord assembly
31.	O-ring	32.	Clip	33.	Bracket
34.	Bracket	35.	Oil pan mounting bolt	36.	Oil pan
37.	Magnet	38.	Drain plug	39.	Drain plug gasket
40.	Oil pan gasket	41.	Transmission case		

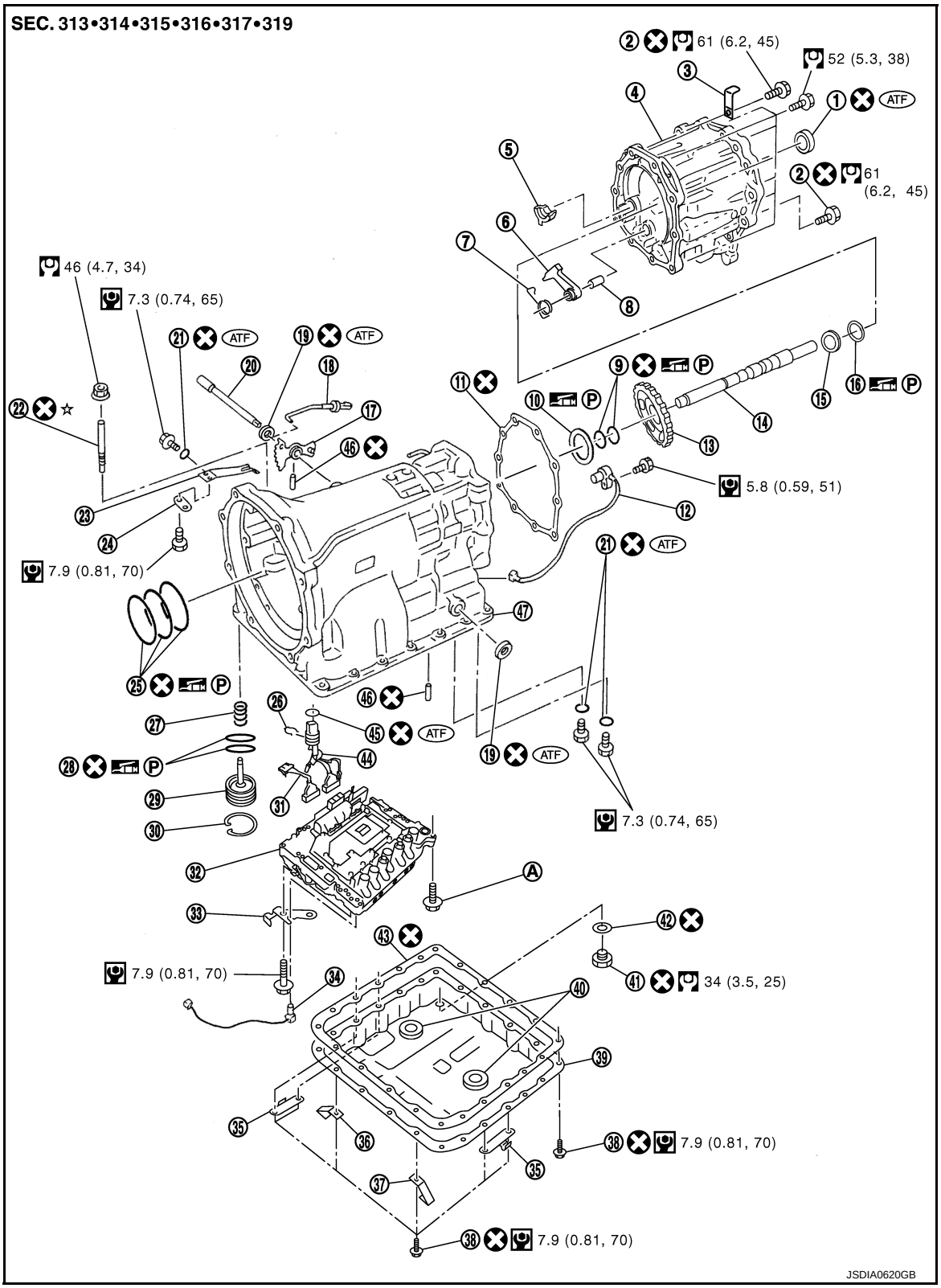
A. For tightening torque, refer to AT-325, "Assembly (2)".

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

However, refer to the following symbols for others.

*: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-46, "Recommended Chemical Product and Sealant".

VK45DE models for AWD



1.	Rear oil seal	2.	Self-sealing bolt	3.	Bracket
4.	Adapter case	5.	Parking actuator support	6.	Parking pawl
7.	Return spring	8.	Pawl shaft	9.	Seal ring
10.	Needle bearing	11.	Gasket	12.	Output speed sensor
13.	Parking gear	14.	Output shaft	15.	Bearing race
16.	Needle bearing	17.	Manual plate	18.	Parking rod

19. Manual shaft oil seal	20. Manual shaft	21. O-ring
22. Band servo anchor end pin	23. Detent spring	24. Spacer
25. Seal ring	26. Snap ring	27. Return spring
28. O-ring	29. Servo assembly	30. Snap ring
31. Sub-harness	32. Control valve with TCM	33. Bracket
34. A/T fluid temperature sensor 2	35. Clip	36. Bracket
37. Bracket	38. Oil pan mounting bolt	39. Oil pan
40. Magnet	41. Drain plug	42. Drain plug gasket
43. Oil pan gasket	44. Terminal cord assembly	45. O-ring
46. Retaining pin	47. Transmission case	

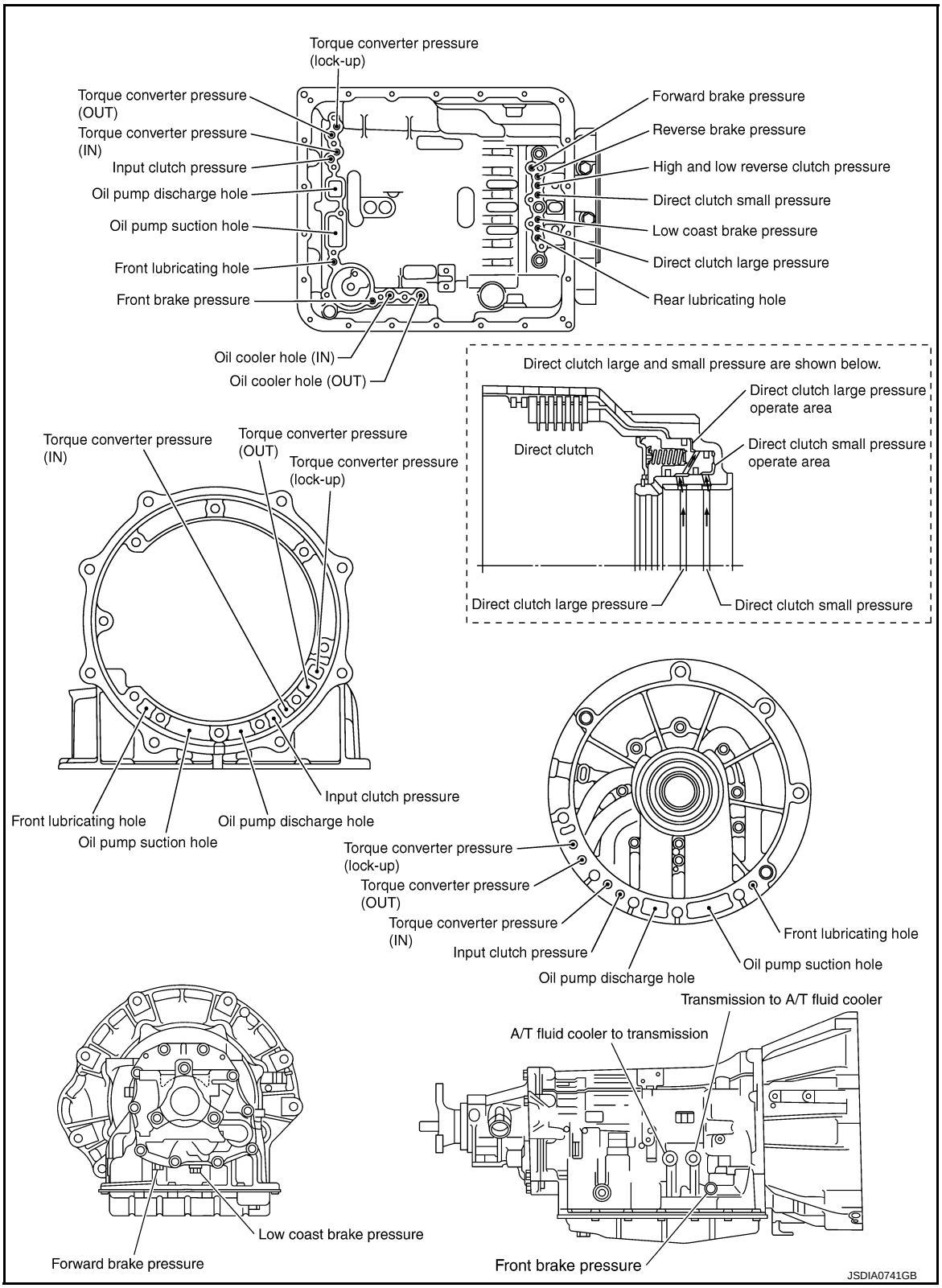
A. For tightening torque, refer to AT-325, "Assembly (2)".

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

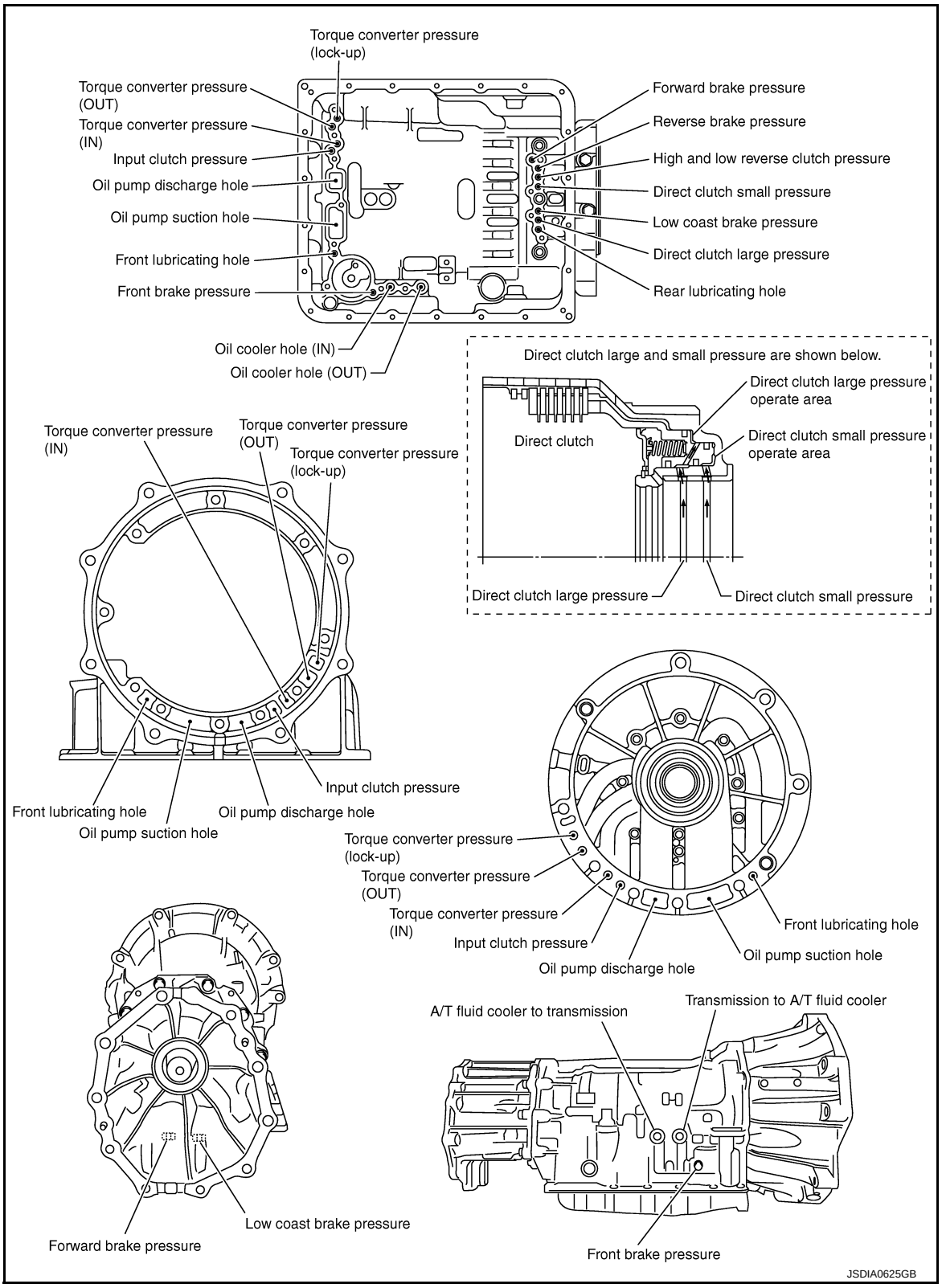
Oil Channel

INFOID:0000000005352646

2WD models



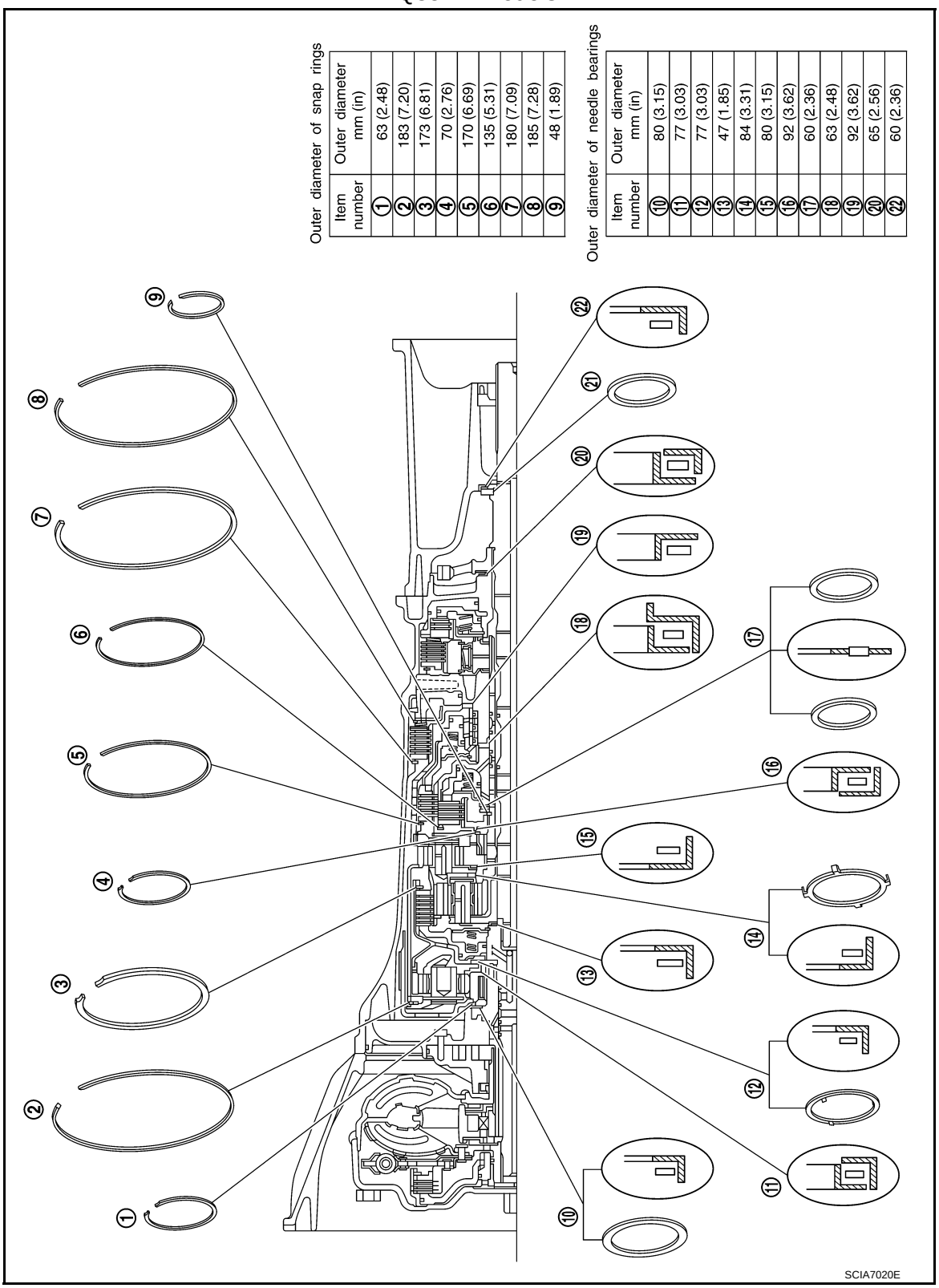
AWD models


Torque converter pressure (lock-up)
Torque converter pressure (OUT)
Torque converter pressure (IN)
Input clutch pressure
Oil pump discharge hole
Oil pump suction hole
Front lubricating hole
Front brake pressure
Oil cooler hole (IN)
Oil cooler hole (OUT)
Forward brake pressure
Reverse brake pressure
High and low reverse clutch pressure
Direct clutch small pressure
Low coast brake pressure
Direct clutch large pressure
Rear lubricating hole
Direct clutch large and small pressure are shown below.
Direct clutch large pressure operate area
Direct clutch
Direct clutch small pressure operate area
Direct clutch large pressure
Direct clutch small pressure
Torque converter pressure (IN)
Torque converter pressure (OUT)
Torque converter pressure (lock-up)
Input clutch pressure
Front lubricating hole
Oil pump discharge hole
Oil pump suction hole
Torque converter pressure (lock-up)
Torque converter pressure (OUT)
Torque converter pressure (IN)
Input clutch pressure
Oil pump discharge hole
Front lubricating hole
Oil pump suction hole
Low coast brake pressure
Forward brake pressure
A/T fluid cooler to transmission
Transmission to A/T fluid cooler
Front brake pressure
JSDIA0625GB

Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

INFOID:0000000005352647

VQ35HR models



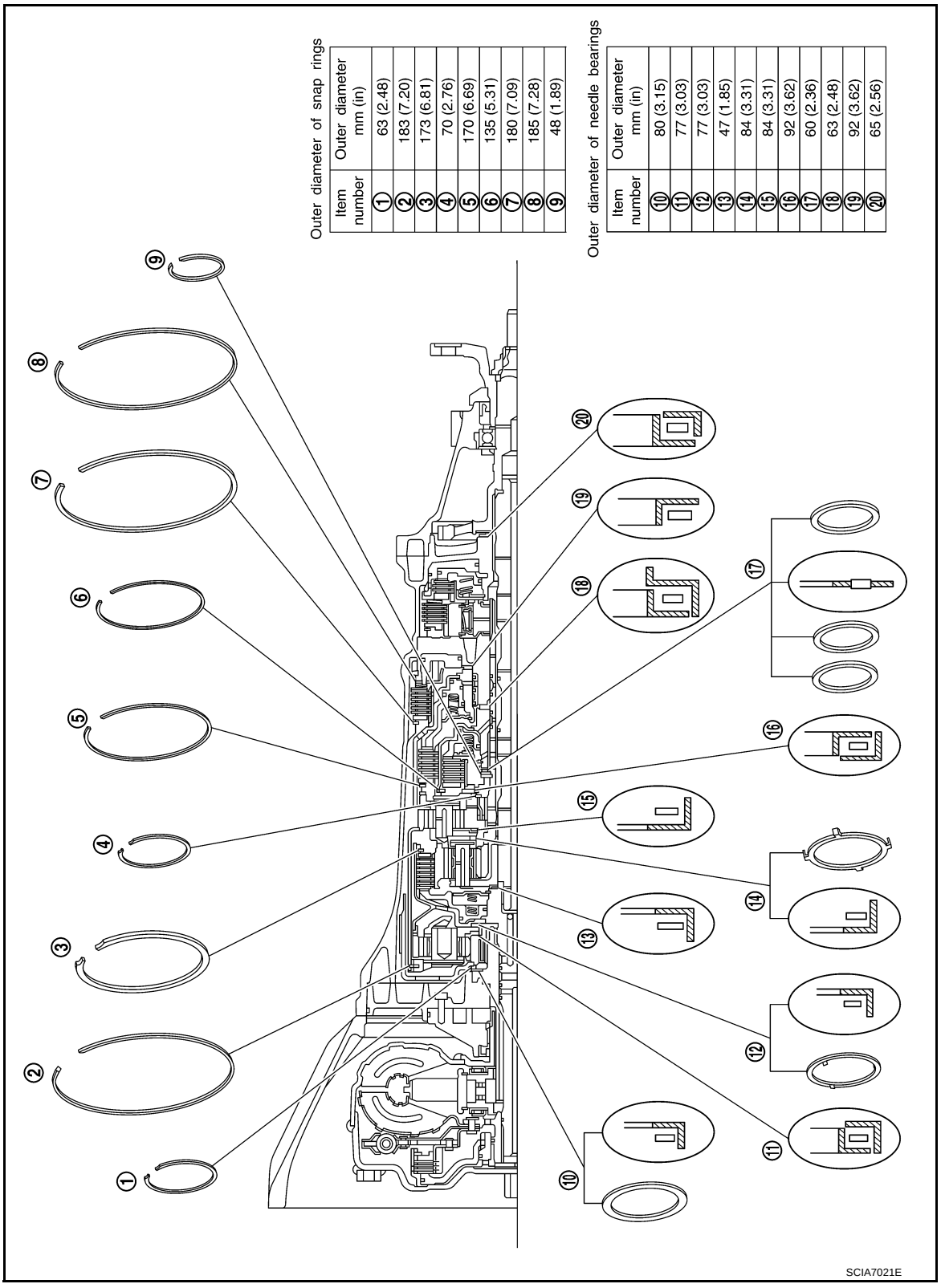
VK45DE models for 2WD

Outer diameter of snap rings

Item number	Outer diameter mm (in)
①	63 (2.48)
②	183 (7.20)
③	173 (6.81)
④	70 (2.76)
⑤	170 (6.69)
⑥	135 (5.31)
⑦	180 (7.09)
⑧	185 (7.28)
⑨	48 (1.89)

Outer diameter of needle bearings

Item number	Outer diameter mm (in)
⑩	80 (3.15)
⑪	77 (3.03)
⑫	77 (3.03)
⑬	47 (1.85)
⑭	84 (3.31)
⑮	84 (3.31)
⑯	92 (3.62)
⑰	60 (2.36)
⑱	63 (2.48)
⑲	92 (3.62)
⑳	65 (2.56)



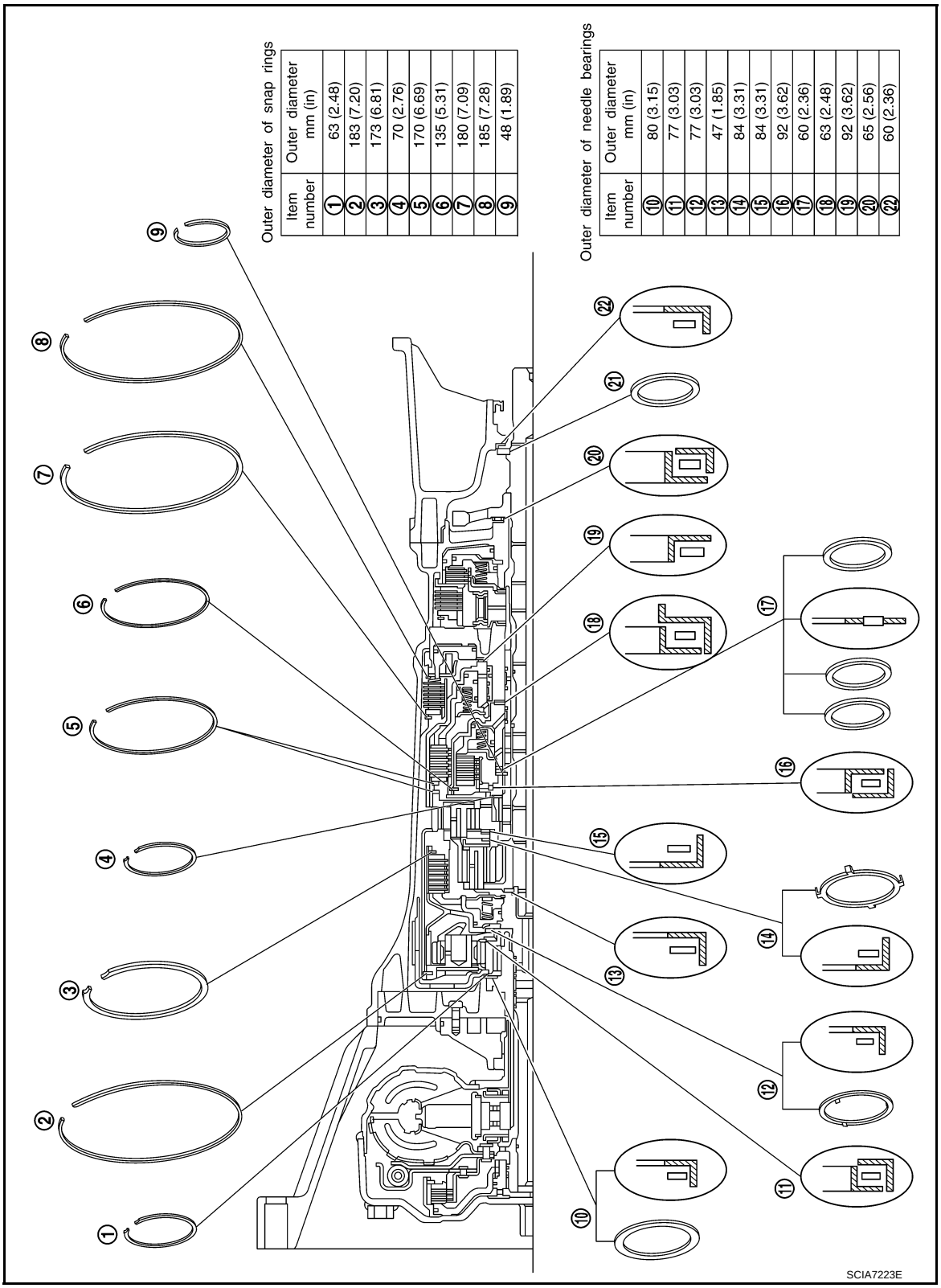
VK45DE models for AWD

Outer diameter of snap rings

Item number	Outer diameter mm (in)
1	63 (2.48)
2	183 (7.20)
3	173 (6.81)
4	70 (2.76)
5	170 (6.69)
6	135 (5.31)
7	180 (7.09)
8	185 (7.28)
9	48 (1.89)

Outer diameter of needle bearings

Item number	Outer diameter mm (in)
10	80 (3.15)
11	77 (3.03)
12	77 (3.03)
13	47 (1.85)
14	84 (3.31)
15	84 (3.31)
16	92 (3.62)
17	60 (2.36)
18	63 (2.48)
19	92 (3.62)
20	65 (2.56)
22	60 (2.36)



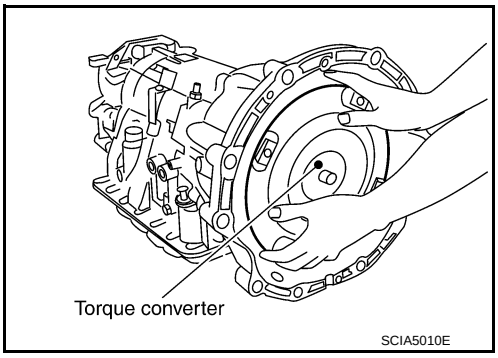
DISASSEMBLY

Disassembly

INFOID:0000000005352648

CAUTION:
Never disassemble parts behind Drum Support. Refer to AT-26, "Cross-Sectional View (VK45DE Models for 2WD)", AT-25, "Cross-Sectional View (VQ35HR Models)", AT-27, "Cross-Sectional View (VK45DE Models for AWD)".

1. Drain ATF through drain plug.
2. Remove torque converter by holding it firmly and turning while pulling straight out.

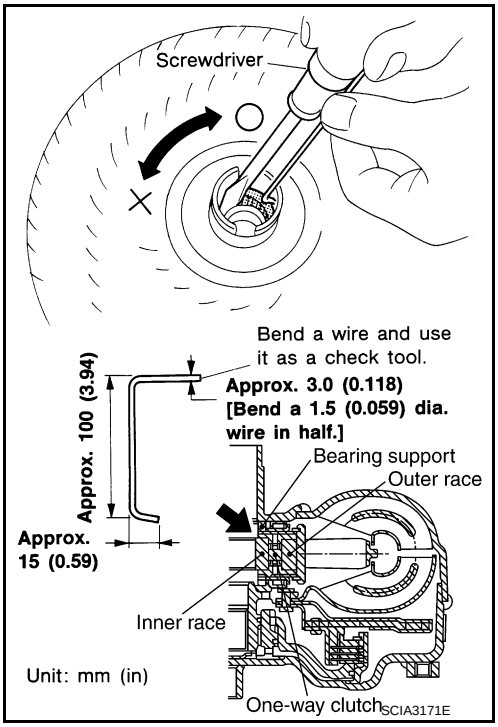


3. Check torque converter one-way clutch using a check tool as shown at figure.

a. Insert a check tool into the groove of bearing support built into one-way clutch outer race.

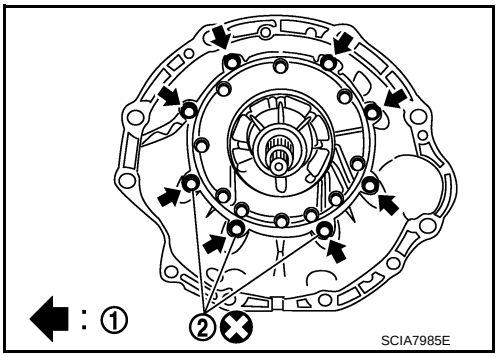
b. When fixing bearing support with a check tool, rotate one-way clutch spline using a screwdriver.

c. Make sure that inner race rotates clockwise only. If not, replace torque converter assembly.



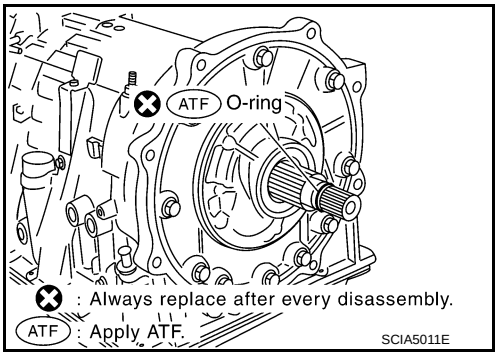
4. Remove tightening bolts (1) for converter housing and transmission case.

⬅	: Bolt
2	: Self-sealing bolt

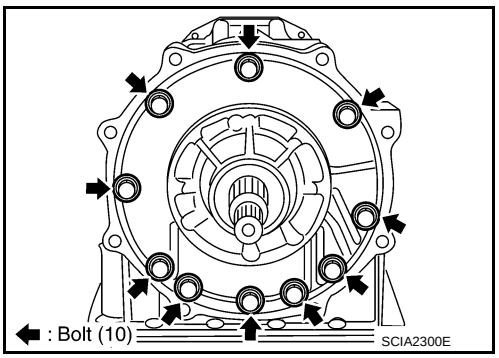


5. Remove converter housing from transmission case.
CAUTION:
Be careful not to scratch converter housing.

6. Remove O-ring from input clutch assembly.



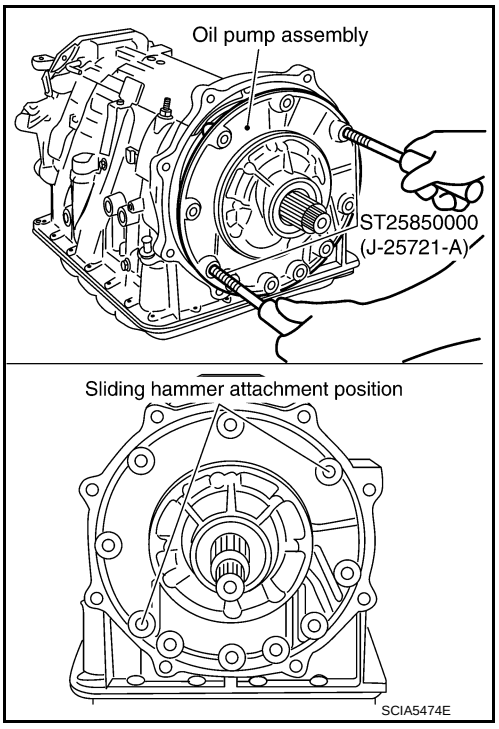
7. Remove tightening bolts for oil pump assembly and transmission case.



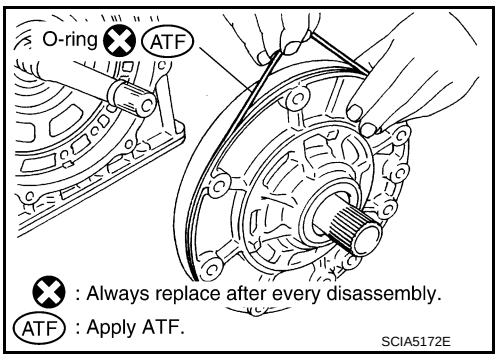
8. Attach the sliding hammers to oil pump assembly and extract it evenly from transmission case.

CAUTION:

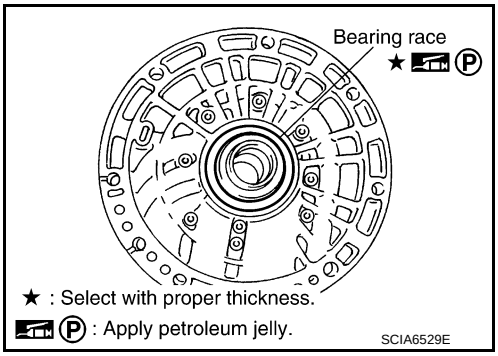
- **Fully tighten the sliding hammer screws.**
- **Make sure that bearing race is installed to the oil pump assembly edge surface.**



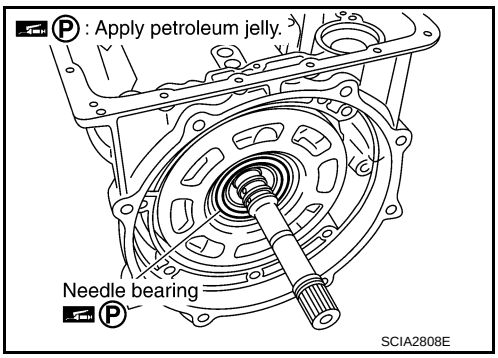
9. Remove O-ring from oil pump assembly.



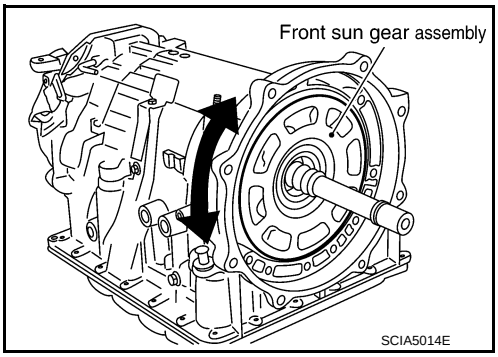
10. Remove bearing race from oil pump assembly.



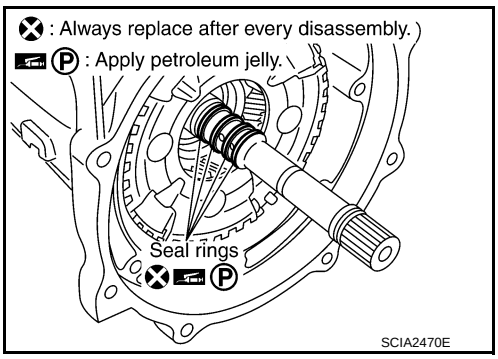
11. Remove needle bearing from front sun gear.



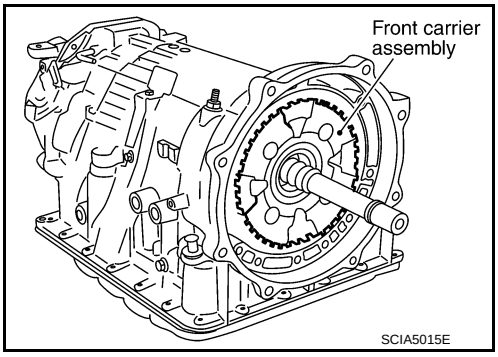
12. Remove front sun gear assembly from front carrier assembly.
NOTE:
Remove front sun gear by rotating left/right.



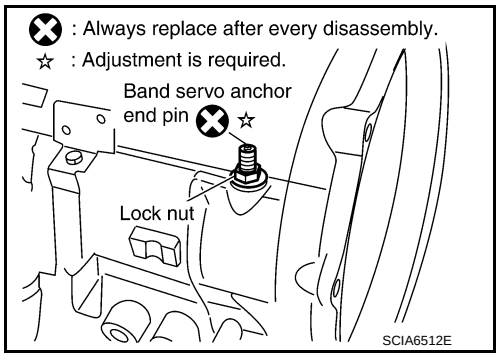
13. Remove seal rings from input clutch assembly.



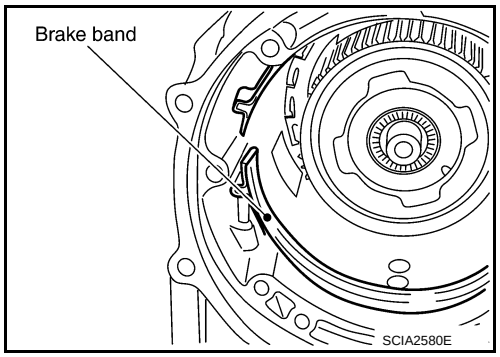
14. Remove front carrier assembly from rear carrier assembly. (With input clutch assembly and rear internal gear.)
CAUTION:
Be careful to remove it with needle bearing.



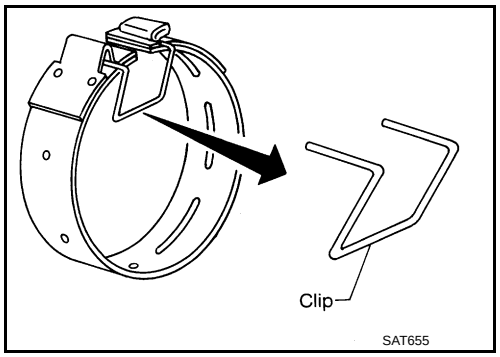
15. Loosen lock nut and remove band servo anchor end pin from transmission case.



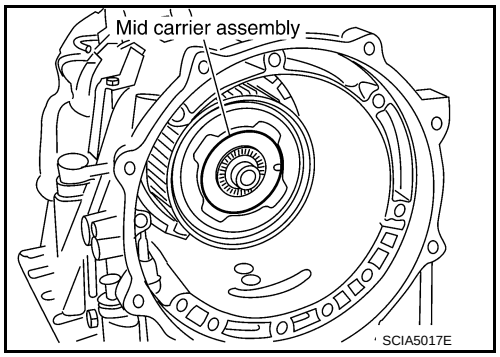
16. Remove brake band from transmission case.



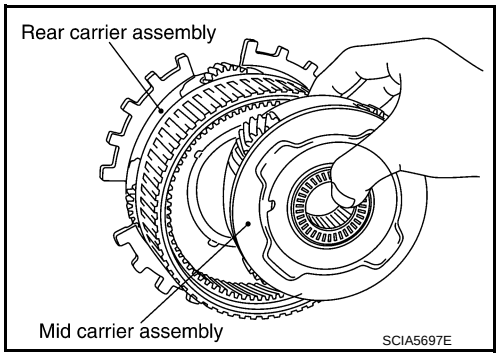
- **To prevent brake linings from cracking or peeling, never stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown in the figure at right.**
  Leave the clip in position after removing the brake band.
- **Check brake band facing for damage, cracks, wear or burns.**



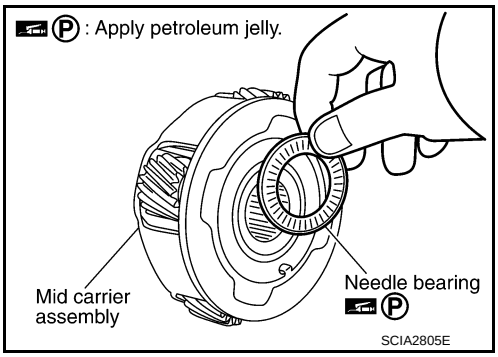
17. Remove mid carrier assembly and rear carrier assembly as a unit.



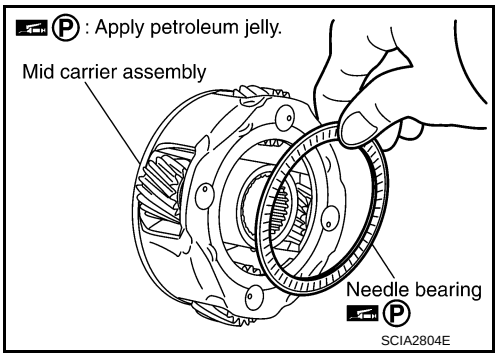
18. Remove mid carrier assembly from rear carrier assembly.



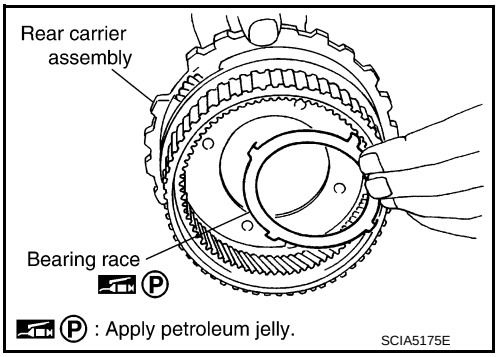
19. Remove needle bearing (front side) from mid carrier assembly.



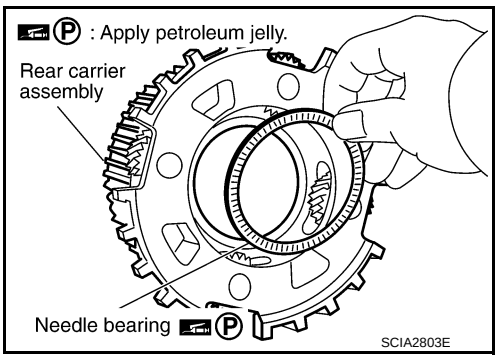
20. Remove needle bearing (rear side) from mid carrier assembly.



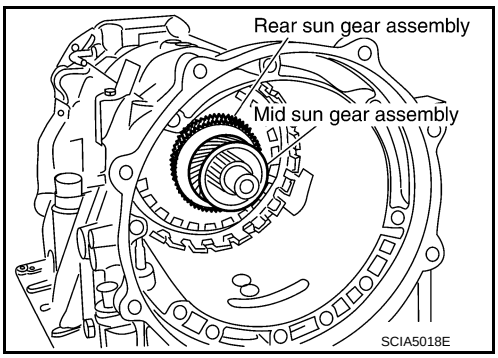
21. Remove bearing race from rear carrier assembly.



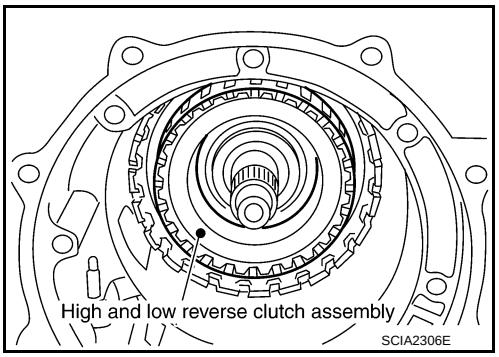
22. Remove needle bearing from rear carrier assembly.



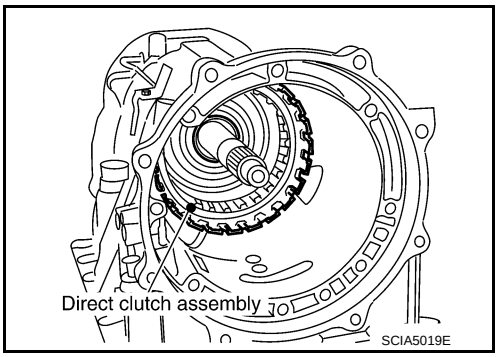
23. Remove mid sun gear assembly, rear sun gear assembly and high and low reverse clutch hub as a unit.
CAUTION:
Be careful to remove then with bearing race and needle bearing.



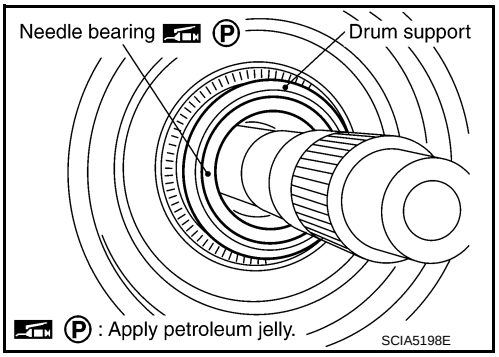
24. Remove high and low reverse clutch assembly from direct clutch assembly.
CAUTION:
Make sure that needle bearing is installed to the high and low reverse clutch assembly edge surface.



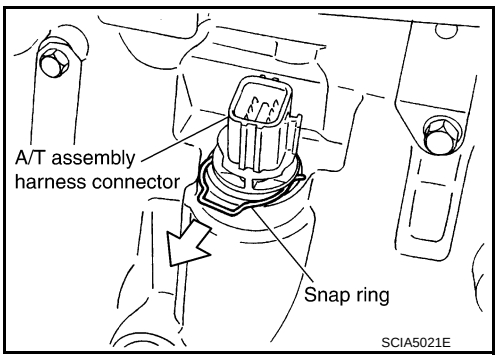
25. Remove direct clutch assembly from reverse brake.



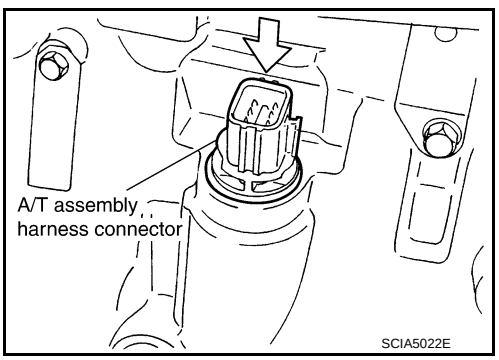
26. Remove needle bearing from drum support.



27. Remove snap ring from A/T assembly harness connector.



28. Push A/T assembly harness connector.
CAUTION:
Be careful not to damage connector.



29. Remove oil pan according to the following procedures.

a. VQ35HR models

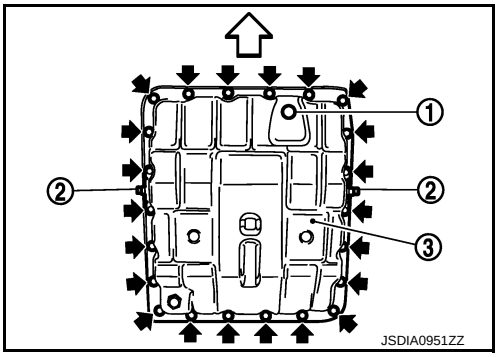
i. Remove overflow plug (1).

ii. Remove clips (2).

iii. Remove oil pan (3) and oil pan gasket.

⇦ : Front

⬅ : Oil pan mounting bolt



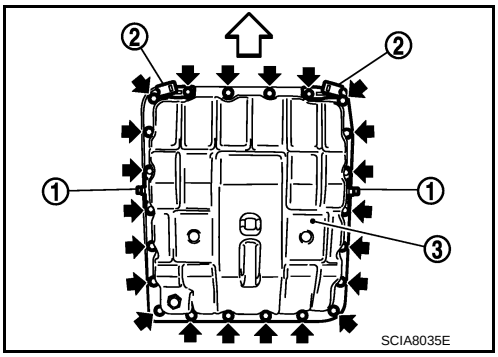
b. VK45DE models

i. Remove clips (1) and brackets (2).

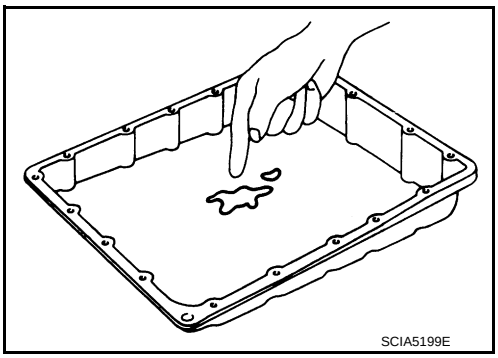
ii. Remove oil pan (3) and oil pan gasket.

⇦ : Front

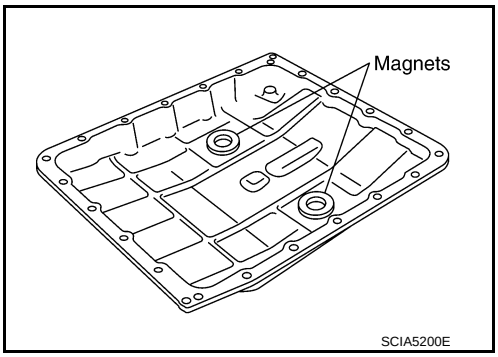
⬅ : Oil pan mounting bolt



30. Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
   - **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-17, "VQ35HR : A/T Fluid Cooler Cleaning" (VQ35HR) or AT-21, "VK45DE : A/T Fluid Cooler Cleaning" (VK45DE).**

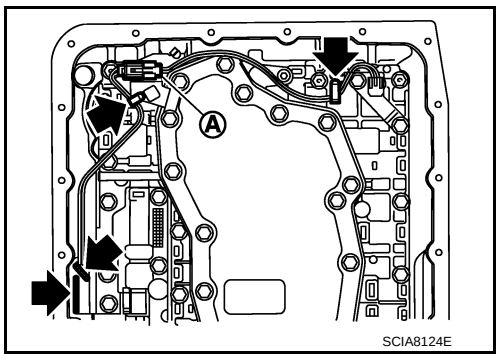


31. Remove magnets from oil pan.

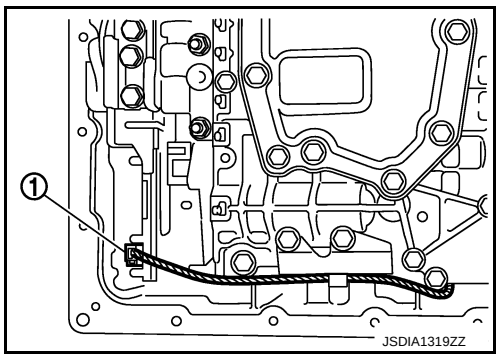


32. Disconnect A/T fluid temperature sensor 2 connector (A).
CAUTION:
Be careful not to damage connector.

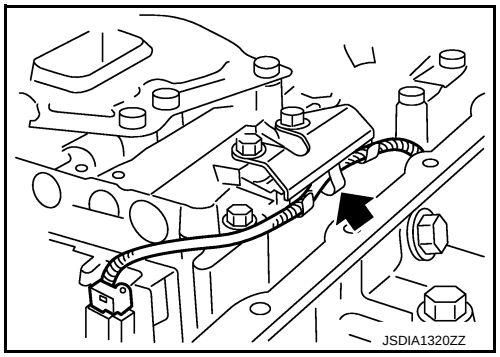
33. Straighten terminal clips (⬅) to free terminal cord assembly and A/T fluid temperature sensor 2 harness.



34. Disconnect output speed sensor connector (1).
CAUTION:
Be careful not to damage connector.



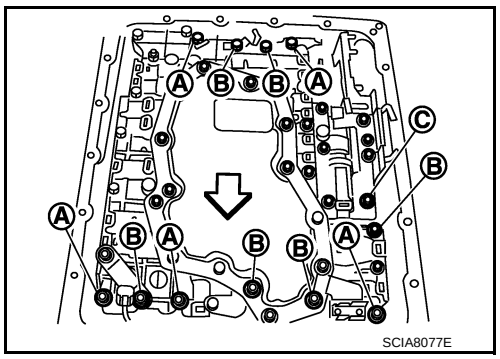
35. Straighten terminal clip (⬅) to free output speed sensor harness.



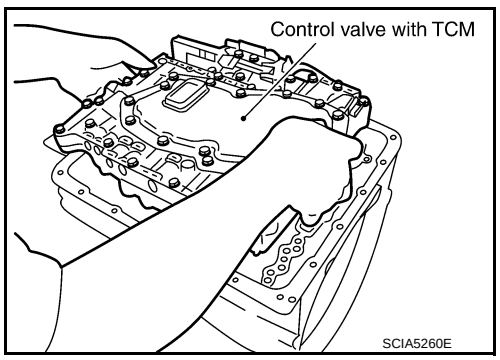
36. Remove bolts (A), (B) and (C) from control valve with TCM.

⇦ : Front

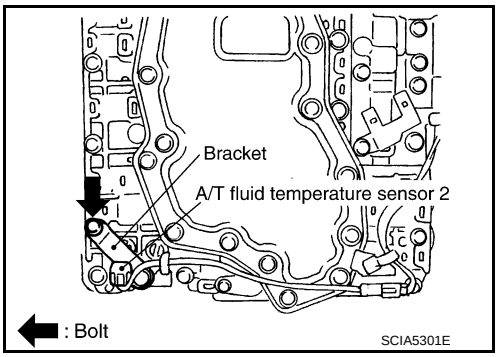
Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1



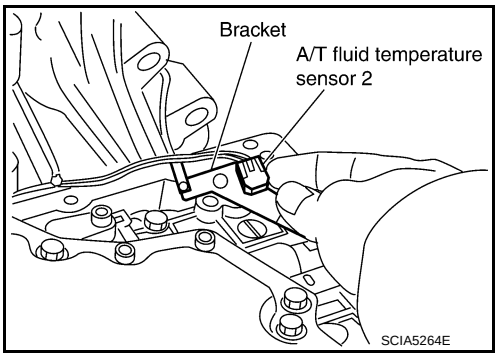
37. Remove control valve with TCM from transmission case.
CAUTION:
When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



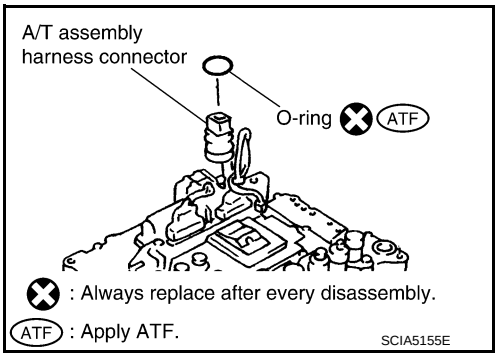
38. Remove A/T fluid temperature sensor 2 with bracket from control valve with TCM.



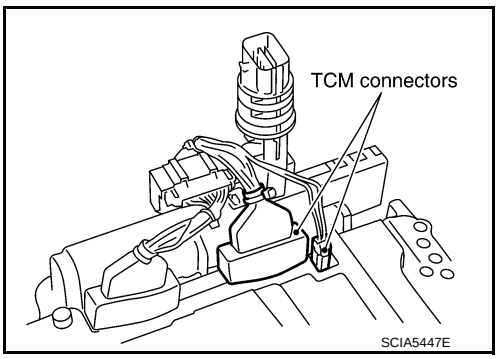
39. Remove bracket from A/T fluid temperature sensor 2.



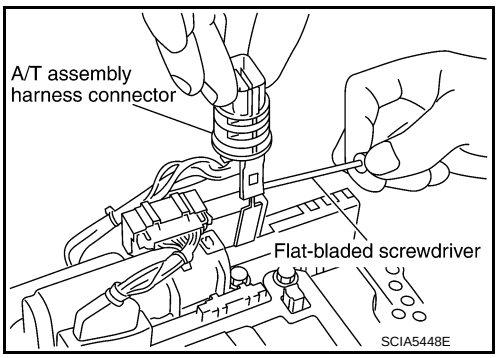
40. Remove O-ring from A/T assembly harness connector.



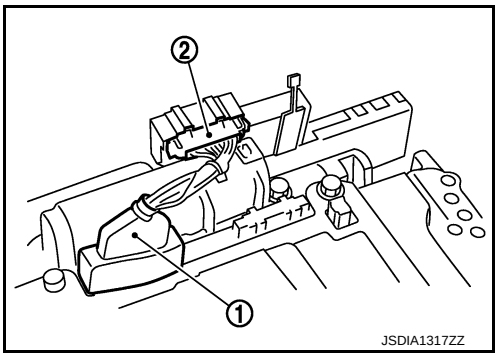
41. Disconnect TCM connectors.
CAUTION:
Be careful not to damage connectors.



42. Remove A/T assembly harness connector from control valve with TCM using a flat-bladed screwdriver.



43. Disconnect TCM connector (1) and transmission range switch connector (2).
CAUTION:
Be careful not to damage connectors.

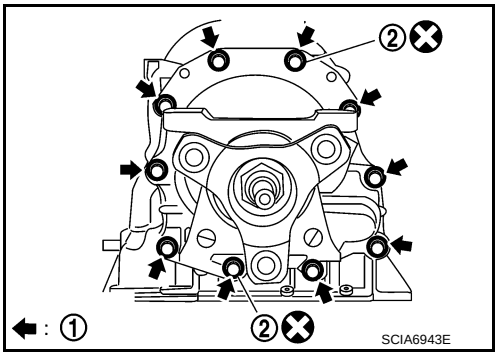


44. Remove output shaft & companion flange complement (2WD) or adapter case assembly (AWD) according to the following procedures.

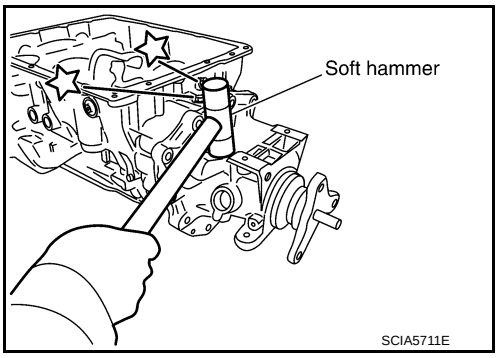
a. **2WD models**

i. Remove tightening bolts (1) for output shaft & companion flange complement and transmission case.

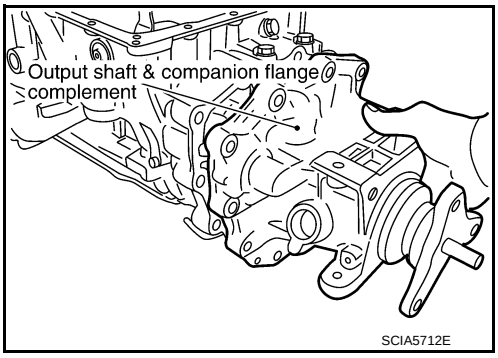
⬅	: Bolt
2	: Self-sealing bolt



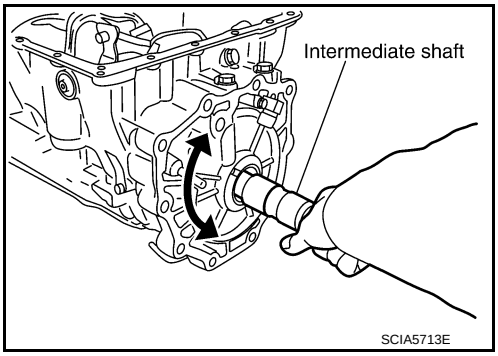
ii. Tap output shaft & companion flange complement with a soft hammer.



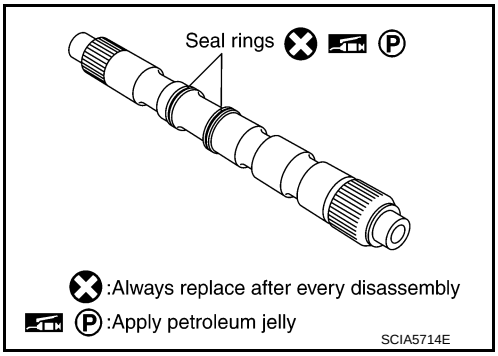
iii. Remove output shaft & companion flange complement from transmission case.



iv. Remove intermediate shaft from transmission case by rotating left/right.



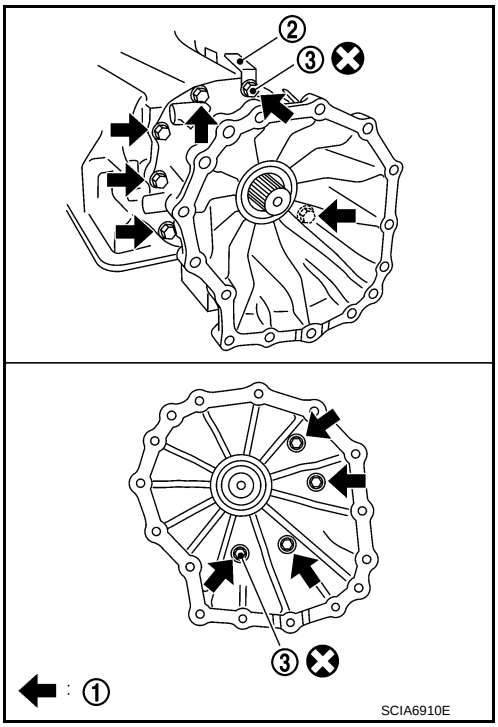
v. Remove seal rings from intermediate shaft.



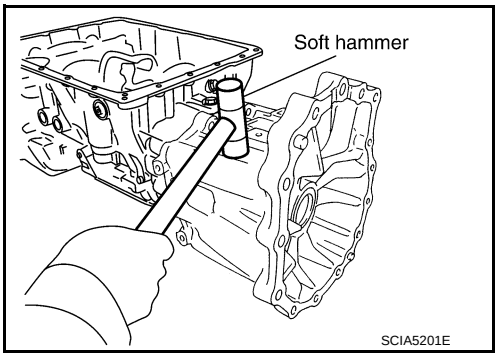
b. **AWD models**

i. Remove tightening bolts (1) for adapter case assembly and transmission case. [With bracket (2).]

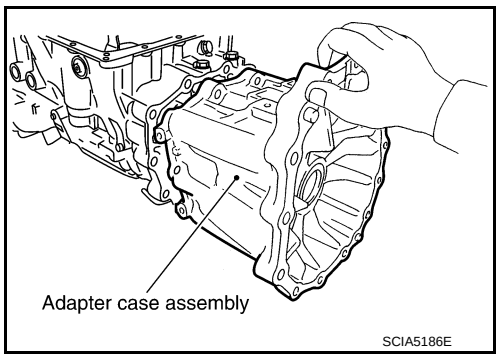
⬅	: Bolt
2	: Self-sealing bolt



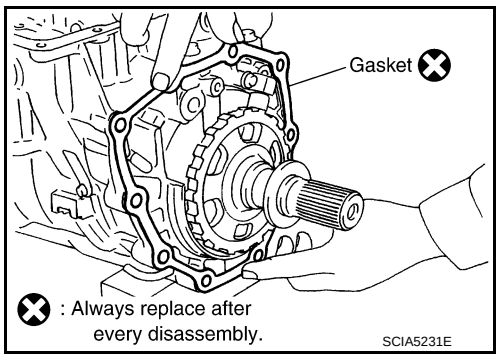
ii. Tap adapter case assembly with a soft hammer.



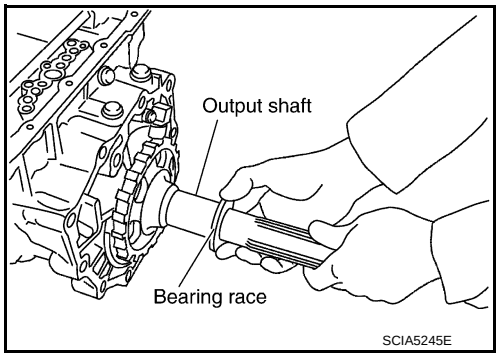
iii. Remove adapter case assembly from transmission case. (With needle bearing)



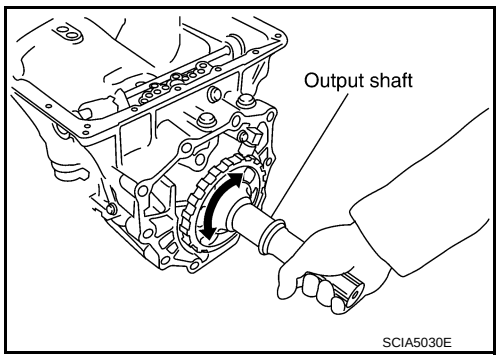
iv. Remove gasket from transmission case.



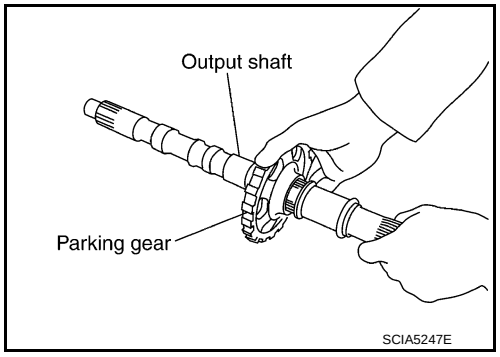
v. Remove bearing race from output shaft.



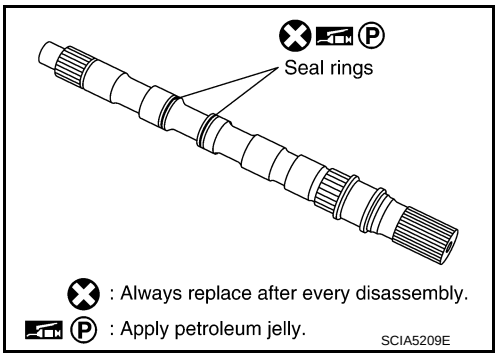
vi. Remove output shaft from transmission case by rotating left/right.



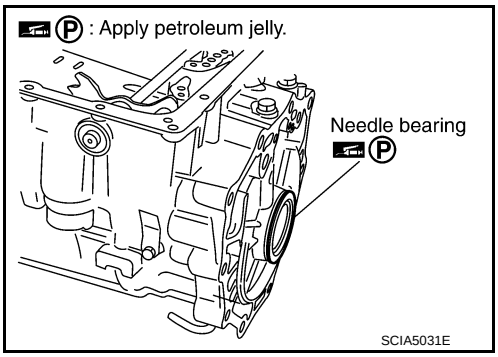
vii. Remove parking gear from output shaft.



viii. Remove seal rings from output shaft.



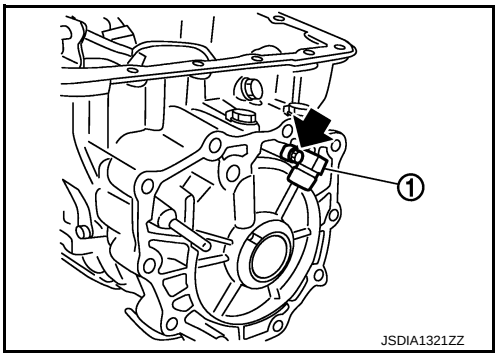
45. Remove needle bearing from transmission case.



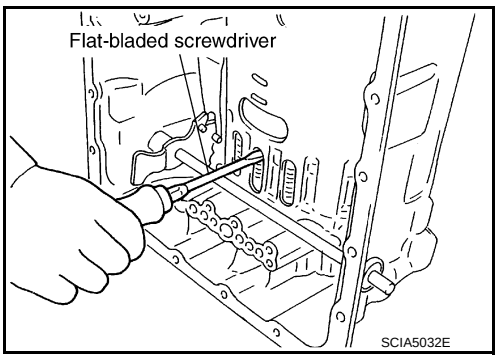
46. Remove output speed sensor (1) from transmission case.

: Bolt

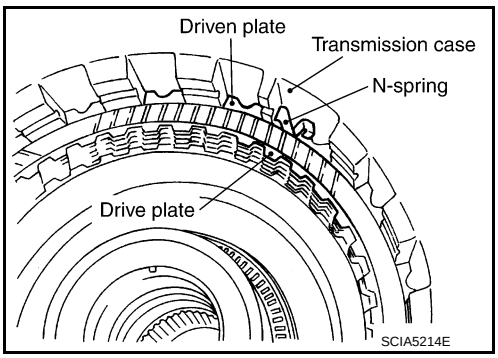
CAUTION:
- **Never subject it to impact by dropping or hitting it.**
- **Never disassemble.**
- **Never allow metal filings, etc., to get on the sensor's front edge magnetic area.**
- **Never place in an area affected by magnetism.**



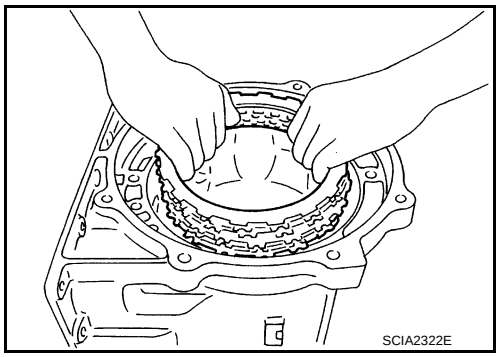
47. Remove reverse brake snap ring (fixing plate) using 2 flat-bladed screwdrivers.
NOTE:
Press out snap ring from the transmission case oil pan side gap using a flat-bladed screwdriver, and remove it using a another screwdriver.
48. Remove reverse brake retaining plate from transmission case.
- Check facing for burns, cracks or damage. If necessary, replace the plate.



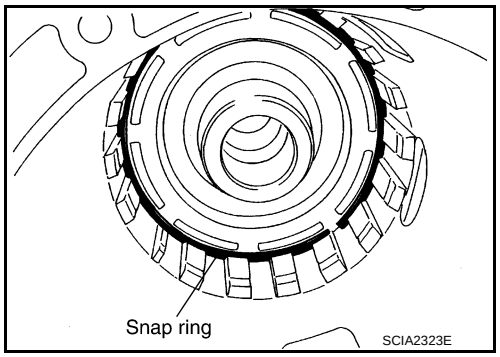
49. Remove N-spring from transmission case.



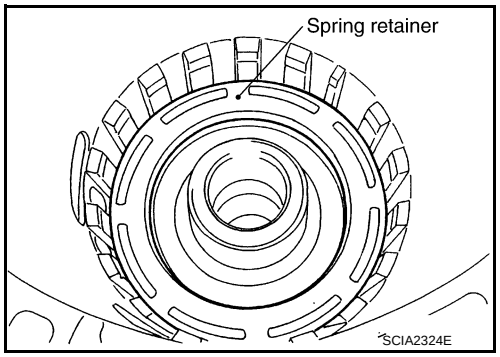
50. Remove reverse brake drive plates, driven plates and dish plates from transmission case.
    - **Check facing for burns, cracks or damage. If necessary, replace the plate.**



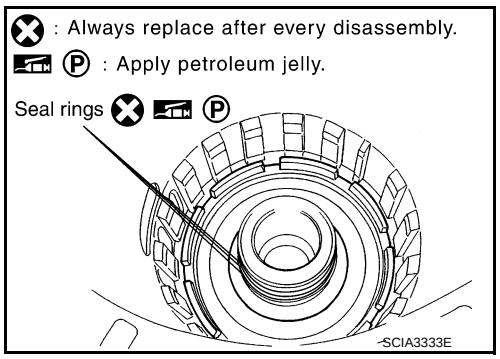
51. Remove snap ring (fixing spring retainer) using a flat-bladed screwdriver.



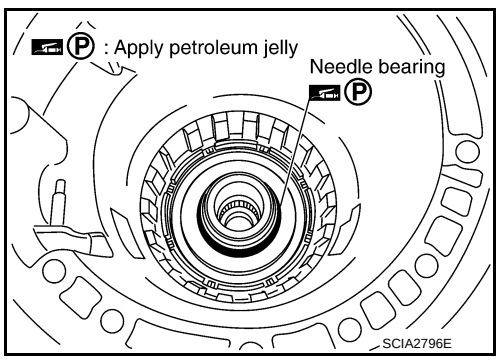
52. Remove spring retainer and return spring from transmission case.



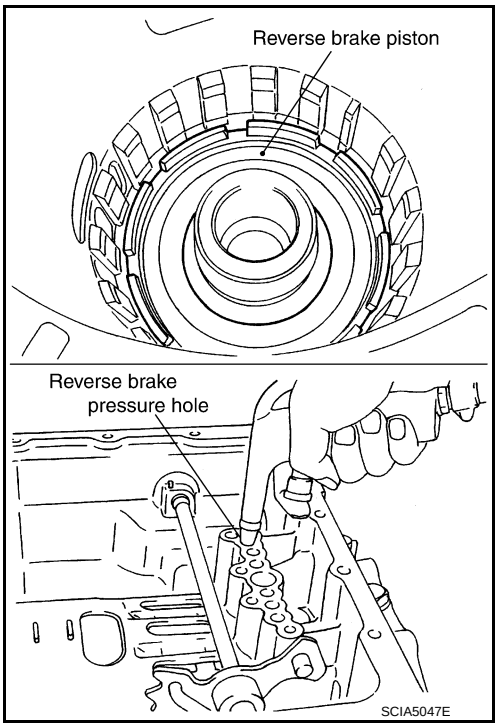
53. Remove seal rings from drum support.



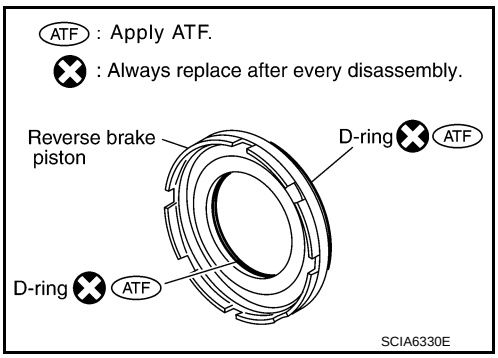
54. Remove needle bearing from drum support edge surface.



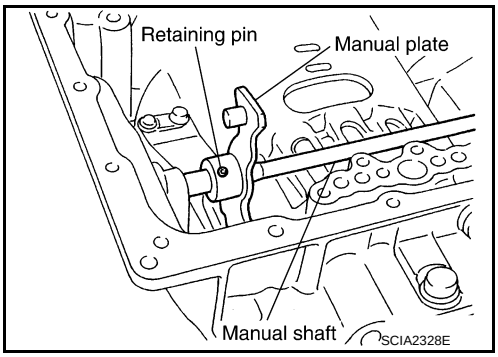
55. Remove reverse brake piston from transmission case with compressed air. Refer to AT-263, "Oil Channel".
CAUTION:
Care should be taken not to abruptly blow air. It makes pistons incline, as the result, it becomes hard to disassemble the pistons.



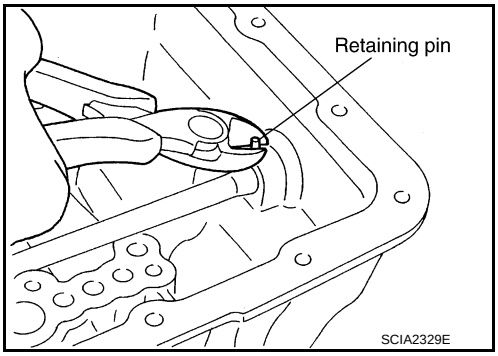
56. Remove D-rings from reverse brake piston.



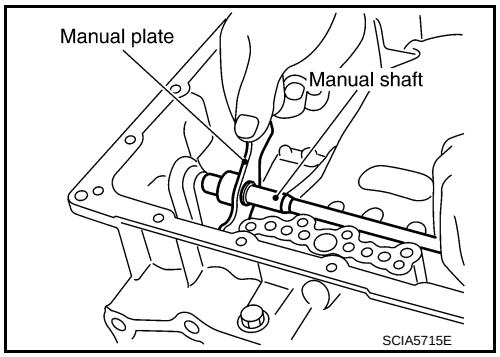
57. Use a pin punch [4 mm (0.16 in) dia. commercial service tool] to knock out retaining pin.



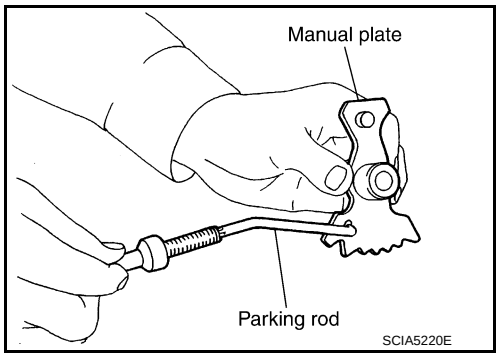
58. Remove manual shaft retaining pin with a pair of nippers.



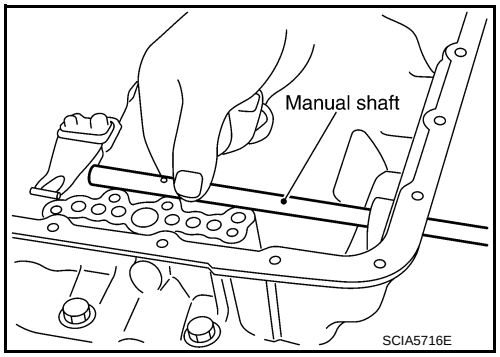
59. Remove manual plate (with parking rod) from manual shaft.



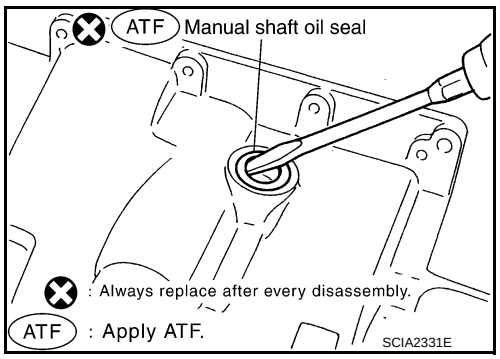
60. Remove parking rod from manual plate.



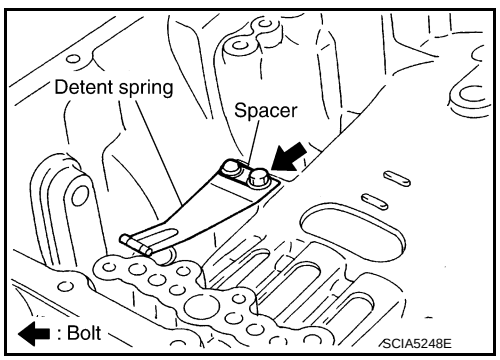
61. Remove manual shaft from transmission case.



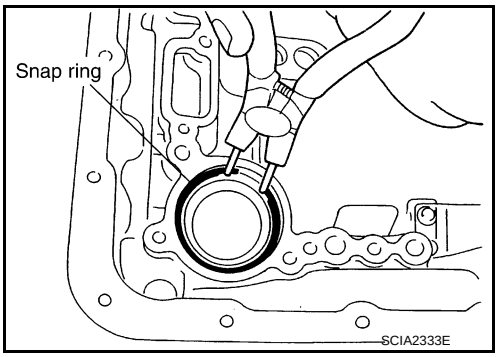
62. Remove manual shaft oil seals using a flat-bladed screwdriver.
CAUTION:
Be careful not to scratch transmission case.



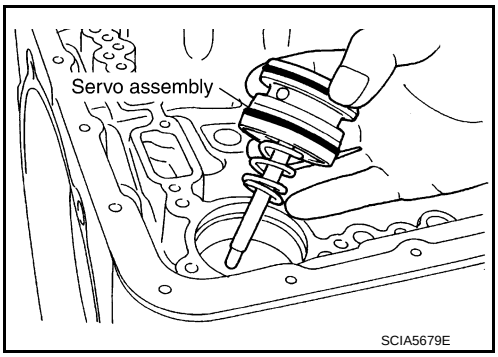
63. Remove detent spring and spacer from transmission case.



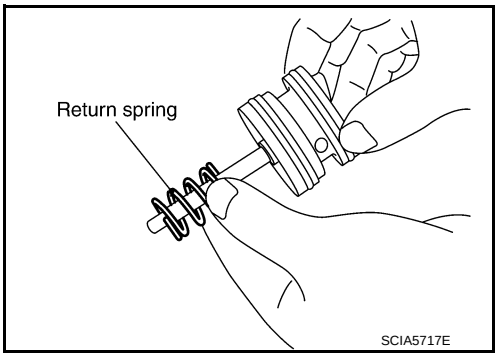
64. Using a pair of snap ring pliers, remove snap ring from transmission case.



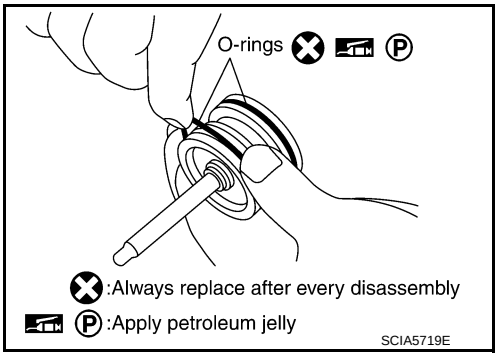
65. Remove servo assembly (with return spring) from transmission case.



66. Remove return spring from servo assembly.



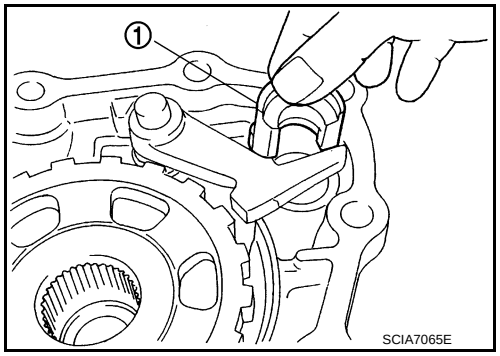
67. Remove O-rings from servo assembly.



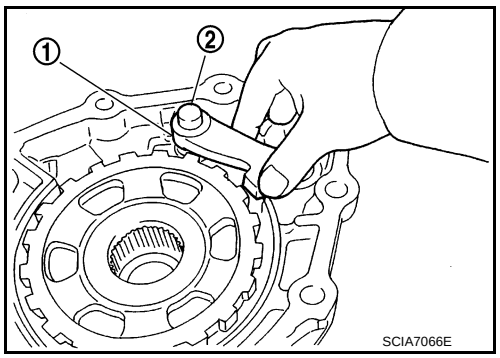
68. Remove each part according to the following procedures.

a. **2WD models**

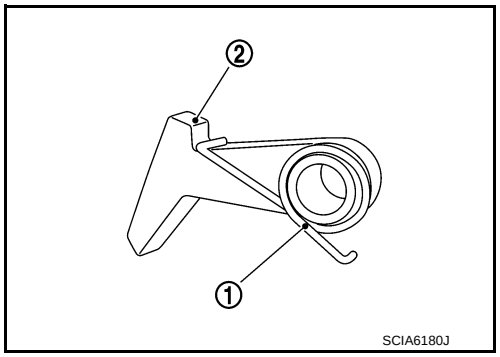
i. Remove parking actuator support (1) from output shaft & companion flange complement.



ii. Remove parking pawl (with return spring) (1) and pawl shaft (2) from output shaft & companion flange complement.

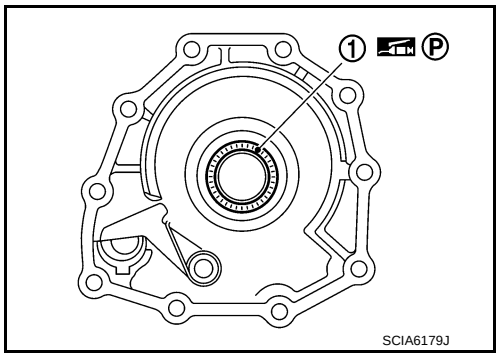


iii. Remove return spring (1) from parking pawl (2).

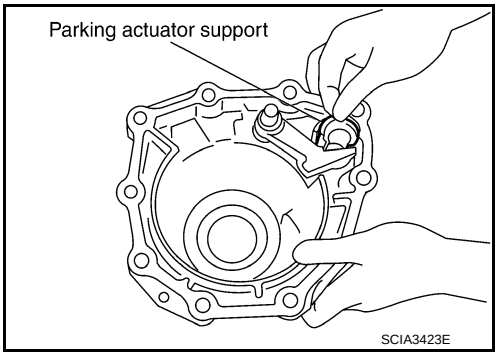


b. **AWD models**

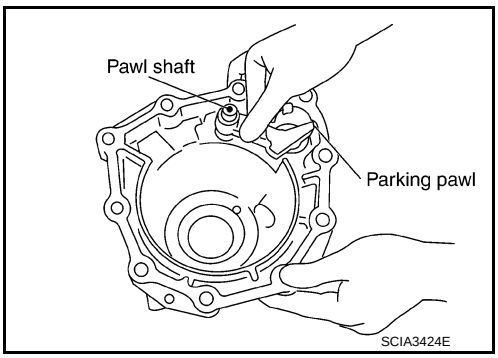
i. Remove needle bearing (1) from adapter case.



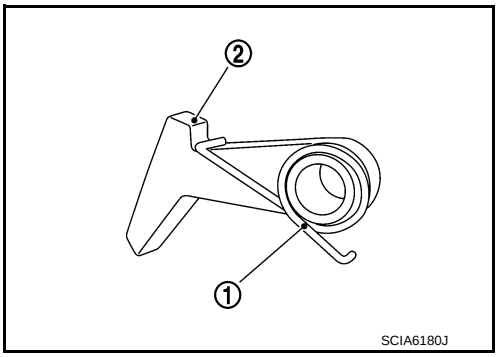
ii. Remove parking actuator support fromadapter case.



iii. Remove parking pawl (with return spring) and pawl shaft from adapter case.



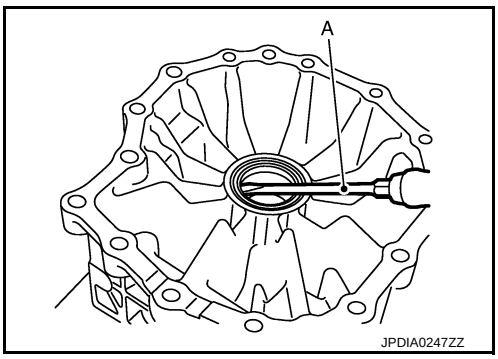
iv. Remove return spring (1) from parking pawl (2).



v. Remove rear oil seal from adapter case using flat-bladed screwdriver (A).

CAUTION:

Be careful not to scratch adapter case.

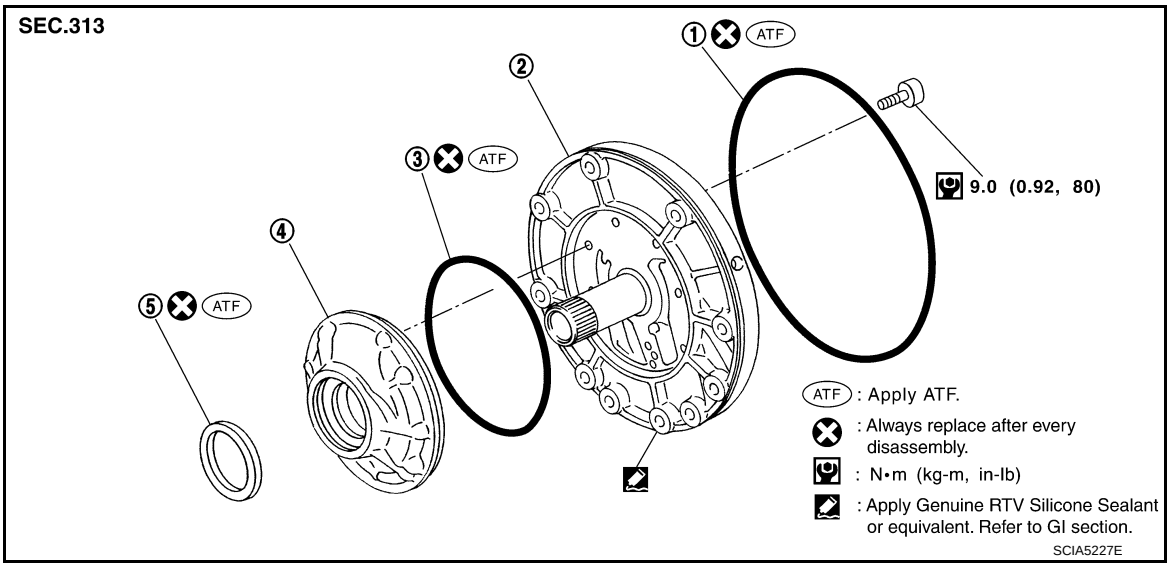


REPAIR FOR COMPONENT PARTS

Oil Pump

INFOID:0000000005352649

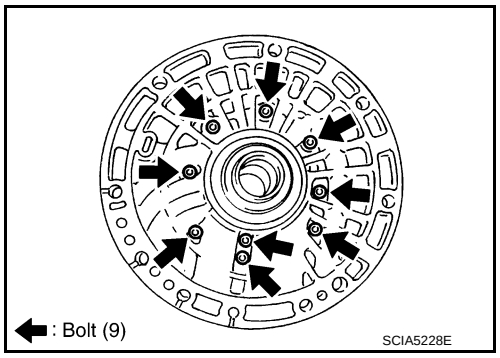
COMPONENTS



1. O-ring
2. Oil pump cover
3. O-ring
4. Oil pump housing
5. Oil pump housing oil seal

DISASSEMBLY

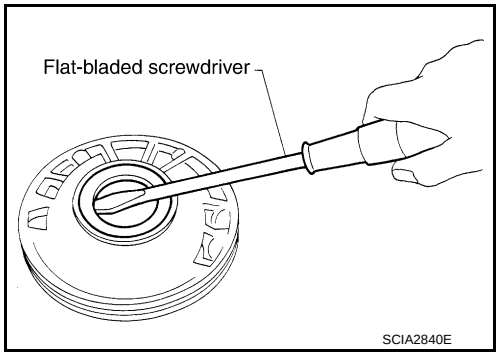
1. Remove oil pump housing from oil pump cover.



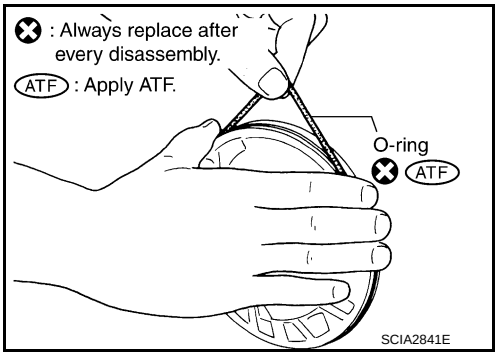
2. Remove oil pump housing oil seal using a flat-bladed screwdriver.

CAUTION:

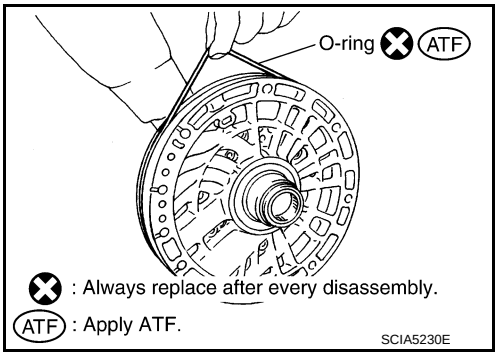
Be careful not to scratch oil pump housing.



3. Remove O-ring from oil pump housing.

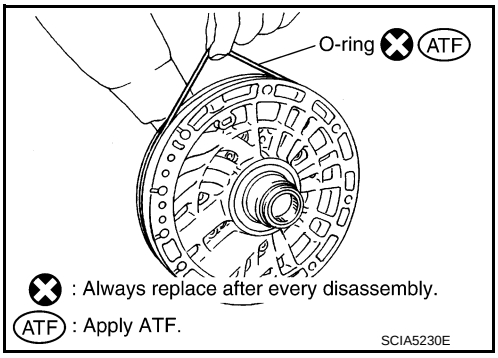


4. Remove O-ring from oil pump cover.

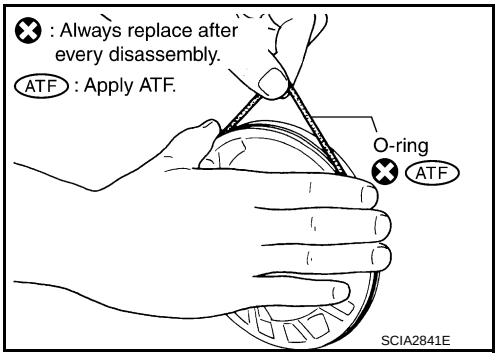


ASSEMBLY

1. Install O-ring to oil pump cover.
   CAUTION:
   - **Never reuse O-ring.**
   - **Apply ATF to O-ring.**

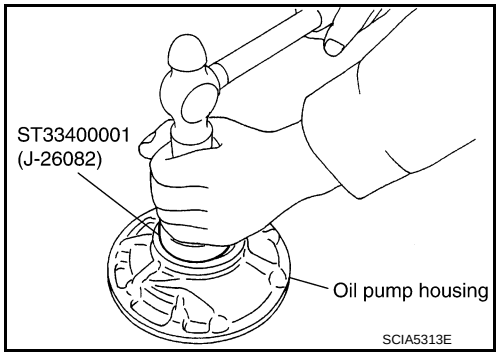


2. Install O-ring to oil pump housing.
   CAUTION:
   - **Never reuse O-ring.**
   - **Apply ATF to O-ring.**

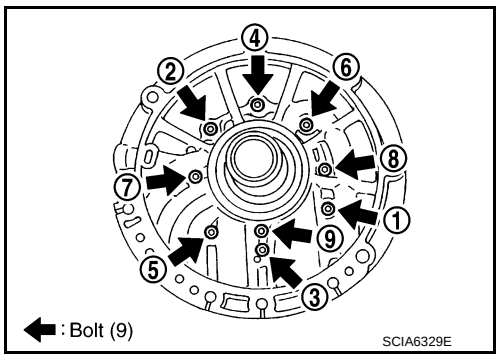


3. Using the drift, install oil pump housing oil seal to the oil pump housing until it is flush.

CAUTION:
- **Never reuse oil seal.**
- **Apply ATF to oil seal.**



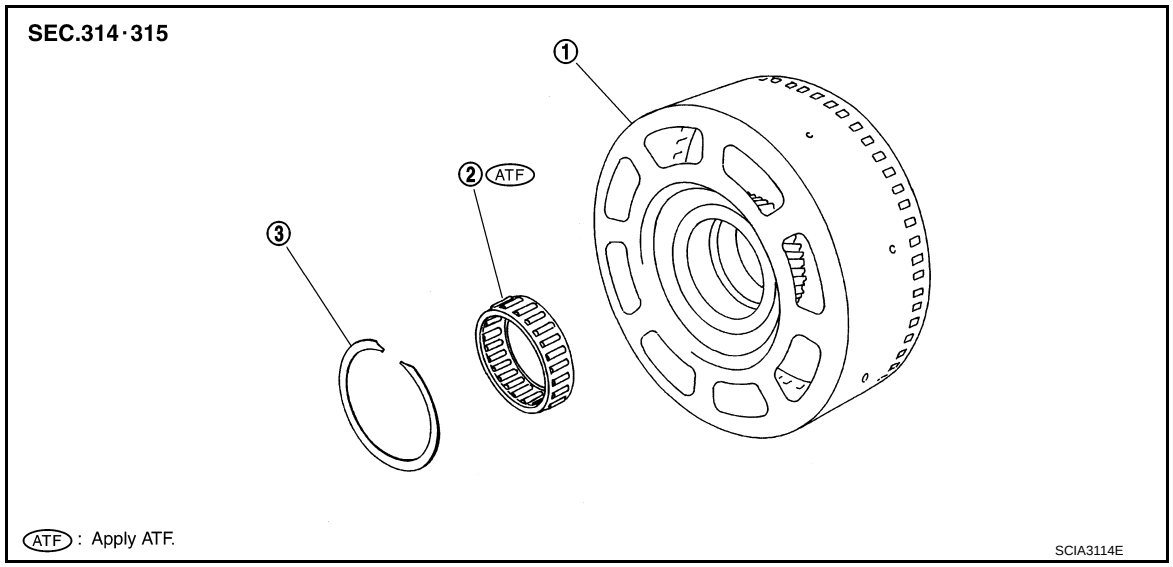
4. Install oil pump housing to oil pump cover.
5. Tighten bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Refer to "COMPONENTS".



Front Sun Gear, 3rd One-Way Clutch

INFOID:0000000005352650

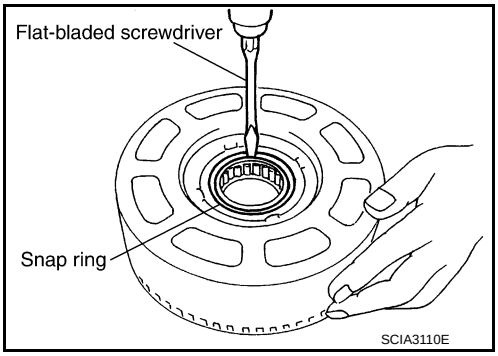
COMPONENTS



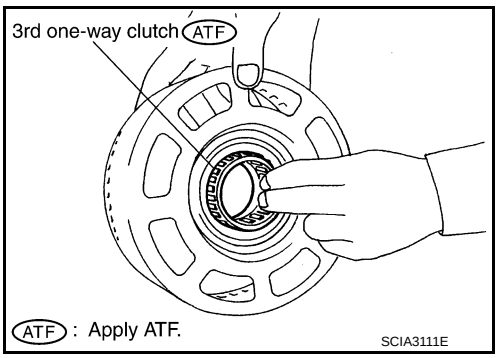
1. Front sun gear
2. 3rd one-way clutch
3. Snap ring

DISASSEMBLY

1. Using a flat-bladed screwdriver, remove snap ring from front sun gear.



2. Remove 3rd one-way clutch from front sun gear.



INSPECTION

3rd One-way Clutch

- Check frictional surface for wear or damage.
  CAUTION:
  If necessary, replace the 3rd one-way clutch.

Front Sun Gear Snap Ring

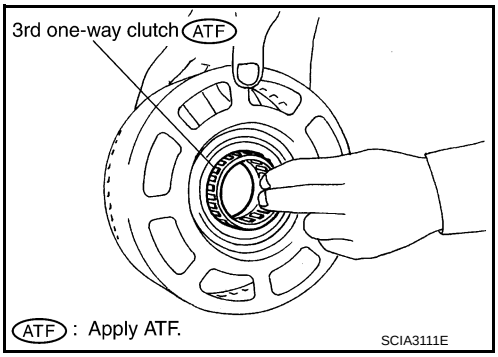
- Check for deformation, fatigue or damage.
  CAUTION:
  If necessary, replace the snap ring.

Front Sun Gear

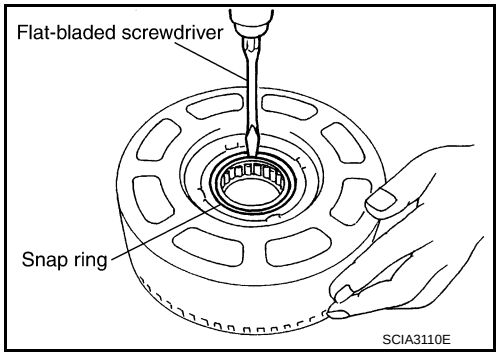
- Check for deformation, fatigue or damage.
  CAUTION:
  If necessary, replace the front sun gear.

ASSEMBLY

1. Install 3rd one-way clutch in front sun gear.
   CAUTION:
   Apply ATF to 3rd one-way clutch.



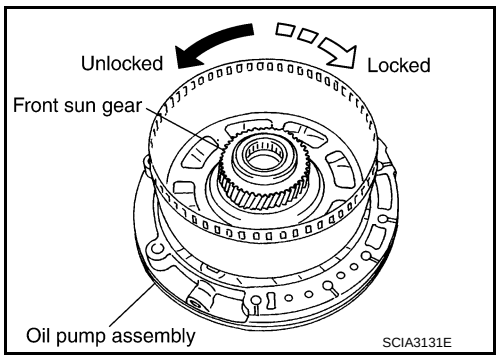
2. Using a flat-bladed screwdriver, install snap ring in front sun gear.



3. Check operation of 3rd one-way clutch.

a. Hold oil pump assembly and turn front sun gear.

b. Check 3rd one-way clutch for correct locking and unlocking directions.
CAUTION:
If not as shown in figure, check installation direction of 3rd one-way clutch.

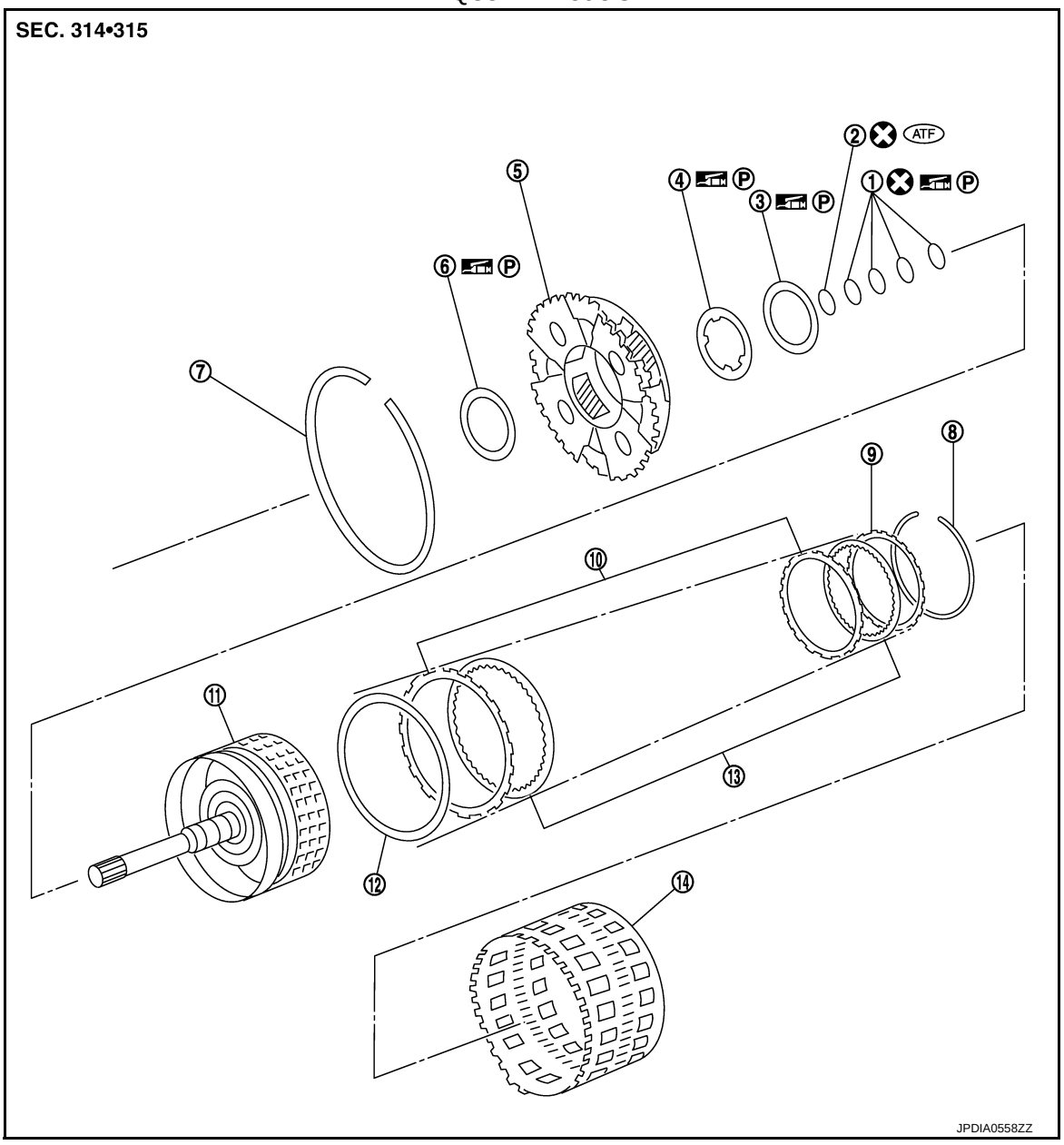


Front Carrier, Input Clutch, Rear Internal Gear

INFOID:0000000005352651

COMPONENTS

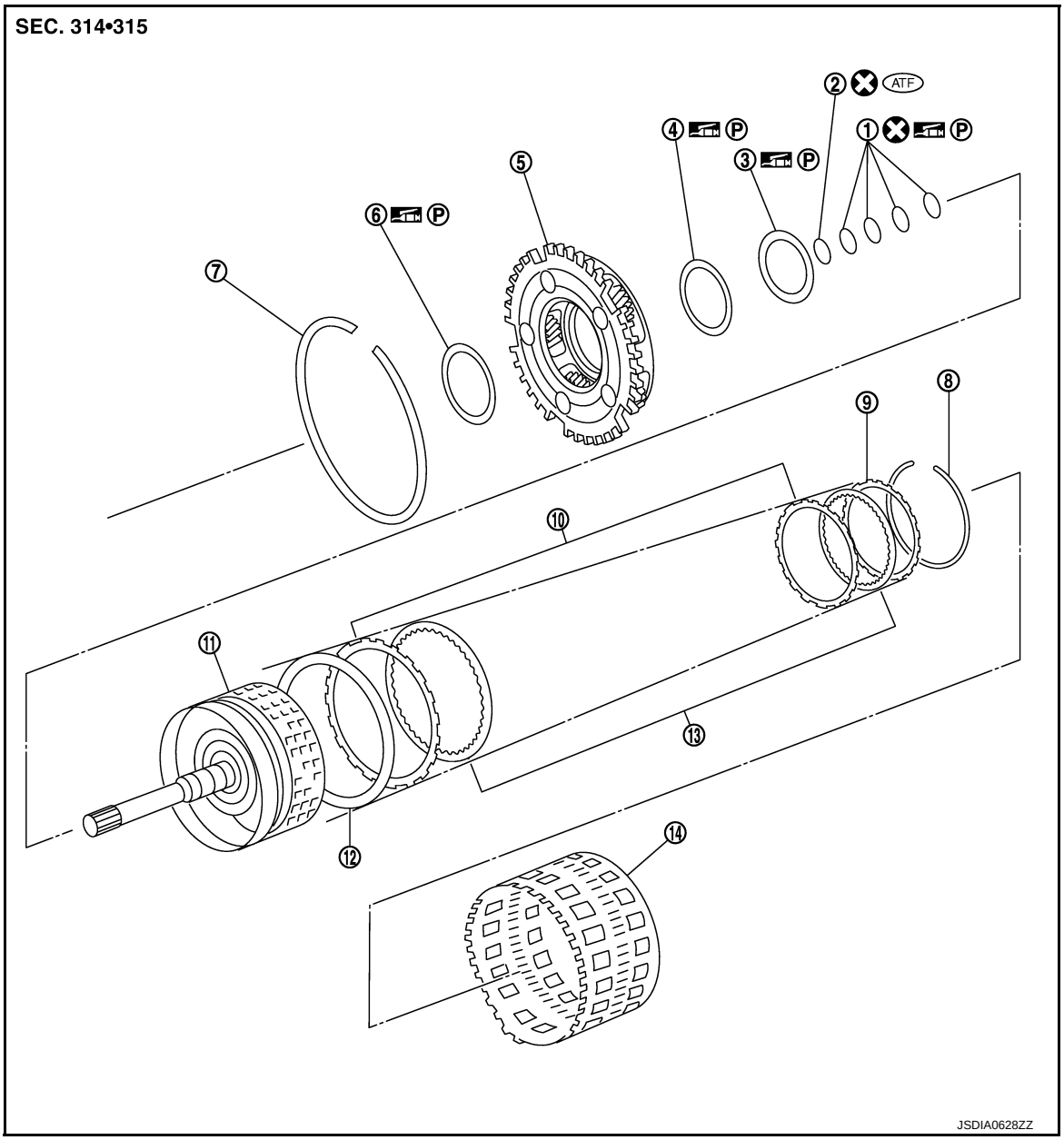
VQ35HR models



1.	Seal ring	2.	O-ring	3.	Needle bearing
4.	Bearing race	5.	Front carrier assembly	6.	Needle bearing
7.	Snap ring	8.	Snap ring	9.	Retaining plate
10.	Driven plate	11.	Input clutch drum	12.	Dish plate
13.	Drive plate	14.	Rear internal gear		

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

VK45DE models

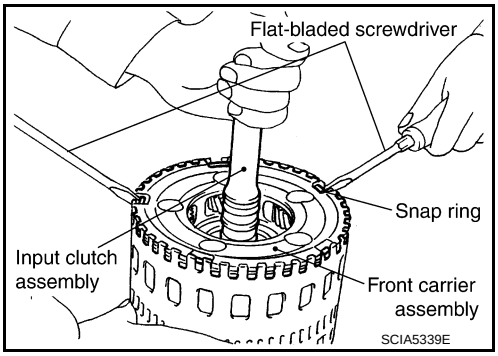


1. Seal ring	2. O-ring	3. Needle bearing
4. Bearing race	5. Front carrier assembly	6. Needle bearing
7. Snap ring	8. Snap ring	9. Retaining plate
10. Driven plate	11. Input clutch drum	12. Dish plate
13. Drive plate	14. Rear internal gear	

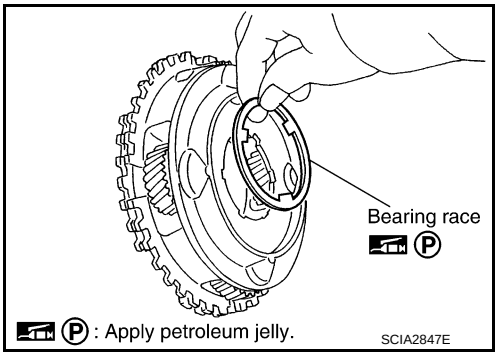
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

DISASSEMBLY

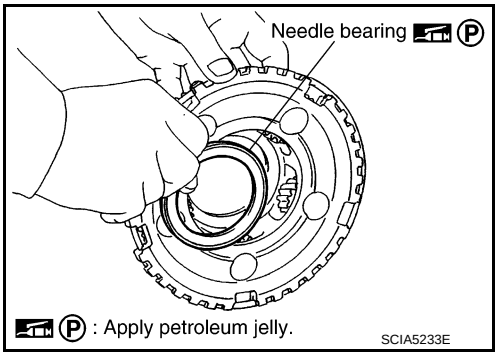
1. Compress snap ring using 2 flat-bladed screwdrivers.
2. Remove front carrier assembly and input clutch assembly from rear internal gear.
3. Remove front carrier assembly from input clutch assembly.



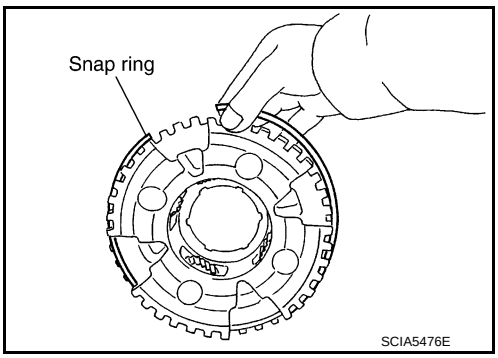
a. Remove bearing race from front carrier assembly.



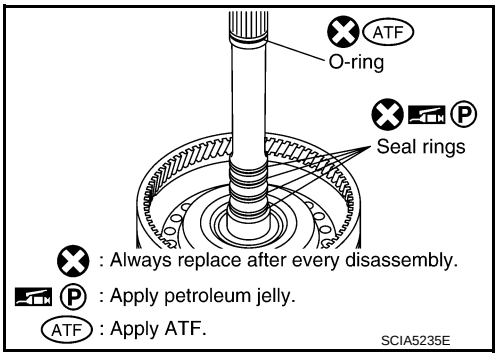
b. Remove needle bearing from front carrier assembly.



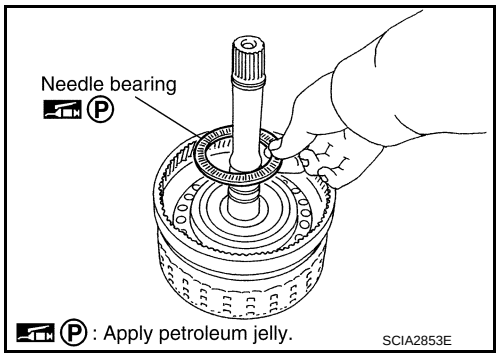
c. Remove snap ring from front carrier assembly.
CAUTION:
Never expand snap ring excessively.



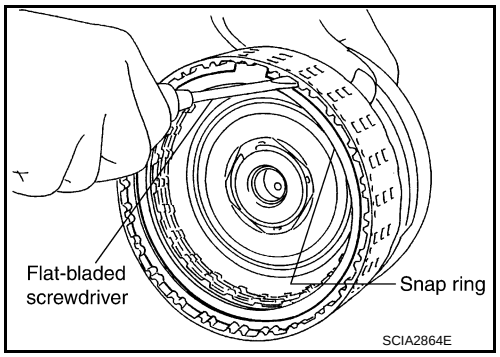
4. Disassemble input clutch assembly.
a. Remove O-ring and seal rings from input clutch assembly.



b. Remove needle bearing from input clutch assembly.



c. Using a flat-bladed screwdriver, remove snap ring from input clutch drum.
d. Remove drive plates, driven plates and retaining plate from input clutch drum.



INSPECTION

Front Carrier Snap Ring
- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace the snap ring.

Input Clutch Snap Ring
- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace the input clutch assembly.

Input Clutch Drum
- Check for deformation, fatigue or damage or burns.

CAUTION:
If necessary, replace the input clutch assembly.

Input Clutch Drive Plates
- Check facing for burns, cracks or damage.

CAUTION:
If necessary, replace the input clutch assembly.

Input Clutch Retaining Plate and Driven Plates
- Check facing for burns, cracks or damage.

CAUTION:
If necessary, replace the input clutch assembly.

Front Carrier
- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace the front carrier assembly.

Rear Internal Gear
- Check for deformation, fatigue or damage.

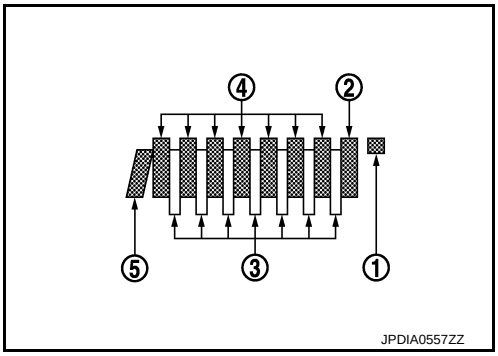
CAUTION:
If necessary, replace the rear internal gear.

ASSEMBLY

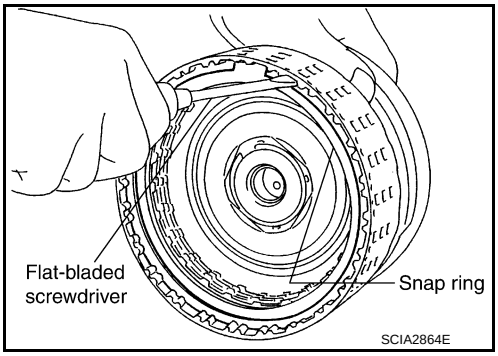
1. Install input clutch.

a. Install drive plates, driven plates, dish plate and retaining plate in input clutch drum.
- Snap ring (1)
- Retaining plate (2)
- Drive plate (3)
- Driven plate (4)
- Dish plate (5)
- Drive plate/Driven plate: 7/7

CAUTION:
Take care with order of plates.

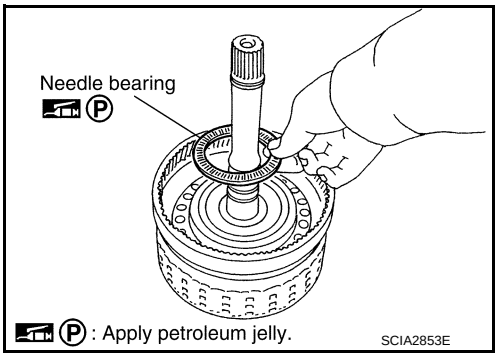


b. Using a flat-bladed screwdriver, install snap ring in input clutch drum.



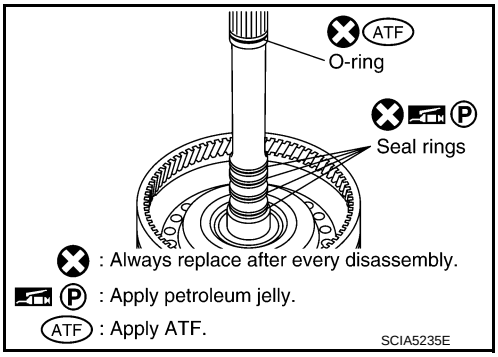
c. Install needle bearing in input clutch assembly.

CAUTION:
- **Take care with the direction of needle bearing. Refer to AT-265, "Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings".**
- **Apply petroleum jelly to needle bearing.**



d. Install O-ring and seal rings in input clutch assembly.

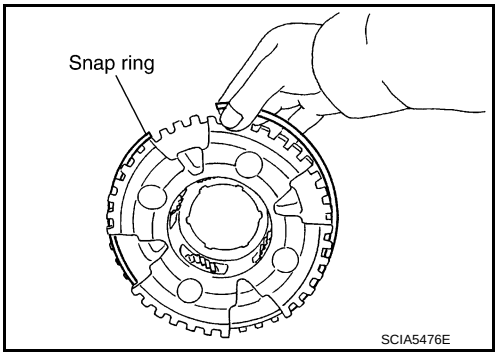
CAUTION:
- **Never reuse O-ring and seal rings.**
- **Apply ATF to O-ring.**
- **Apply petroleum jelly to seal rings.**



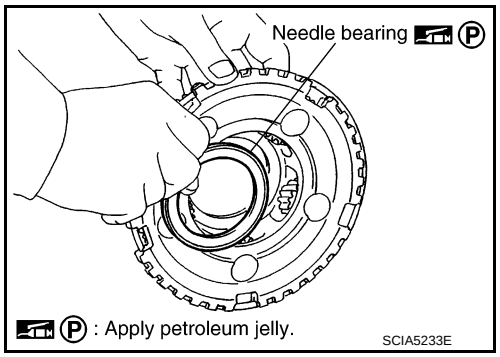
2. Install front carrier assembly.

a. Install snap ring to front carrier assembly.

CAUTION:
Never expand snap ring excessively.

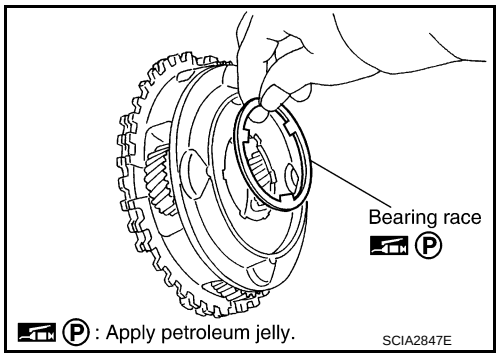


b. Install needle bearing in front carrier assembly.
CAUTION:
- **Take care with the direction of needle bearing. Refer to AT-265, "Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings".**
- **Apply petroleum jelly to needle bearing.**

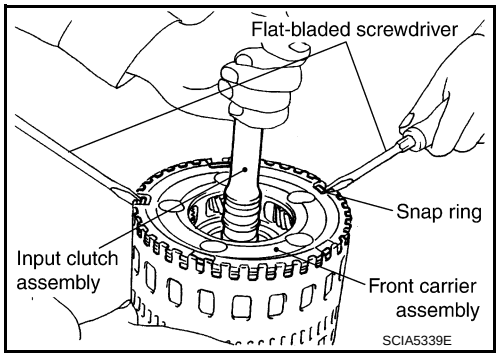


c. Install bearing race in front carrier assembly.
CAUTION:
Apply petroleum jelly to bearing race.

d. Install front carrier assembly to input clutch assembly.



3. Compress snap ring using 2 flat-bladed screwdrivers.
4. Install front carrier assembly and input clutch assembly to rear internal gear.

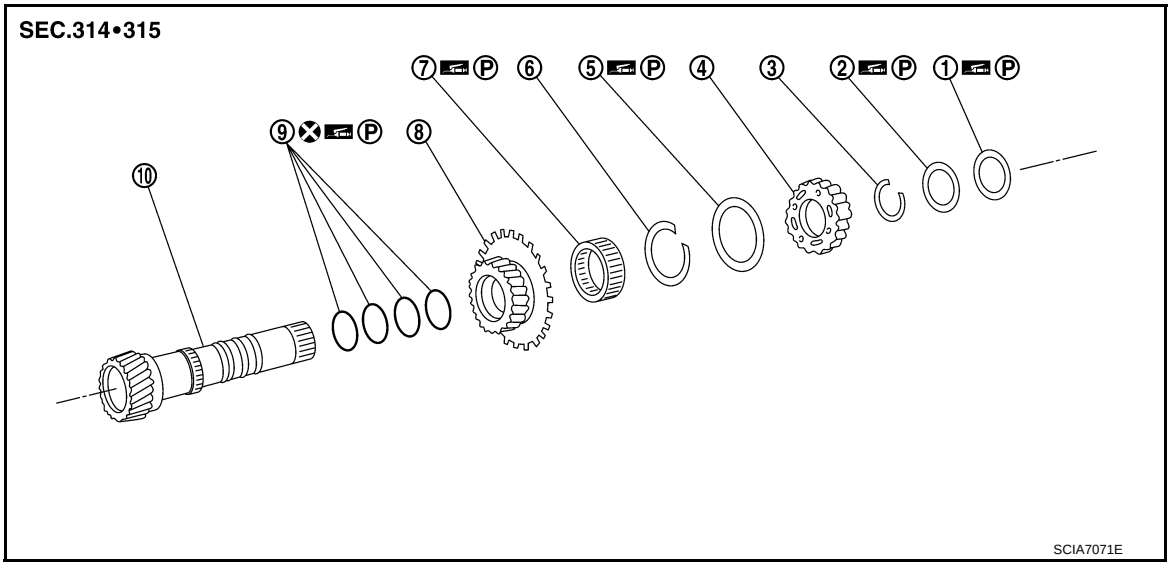


Mid Sun Gear, Rear Sun Gear, High and Low Reverse Clutch Hub

INFOID:0000000005352652

COMPONENTS

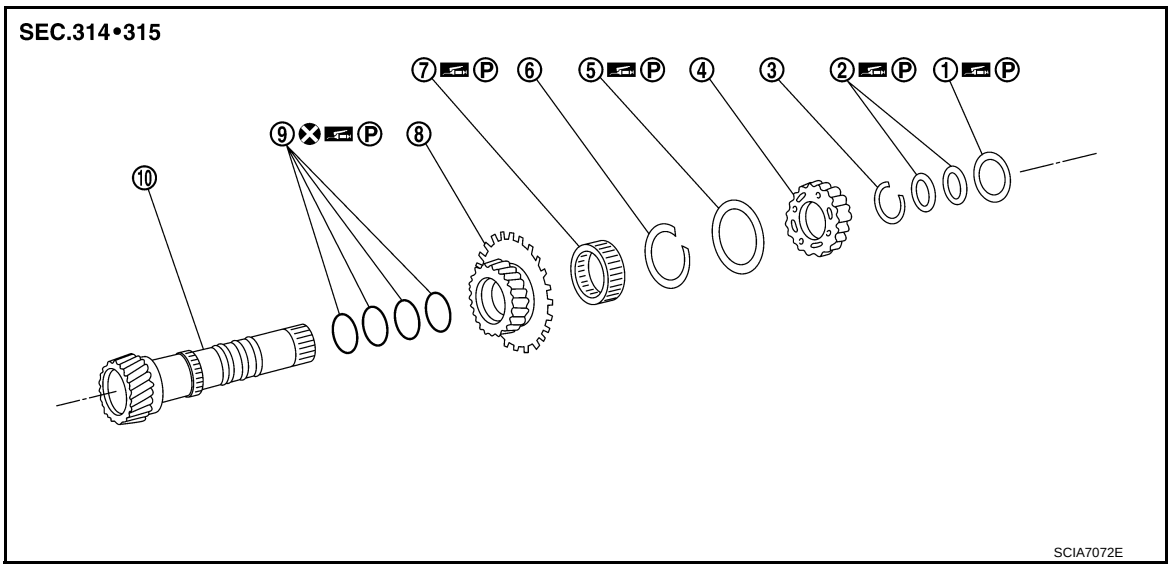
VQ35HR models



1. Needle bearing
2. Bearing race
3. Snap ring
4. High and low reverse clutch hub
5. Needle bearing
6. Snap ring
7. 1st one-way clutch
8. Rear sun gear
9. Seal ring
10. Mid sun gear

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

VK45DE models

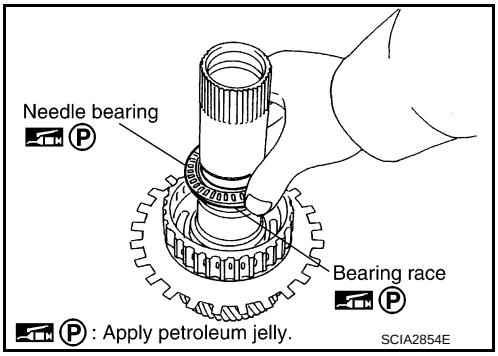


1. Needle bearing
2. Bearing race
3. Snap ring
4. High and low reverse clutch hub
5. Needle bearing
6. Snap ring
7. 1st one-way clutch
8. Rear sun gear
9. Seal ring
10. Mid sun gear

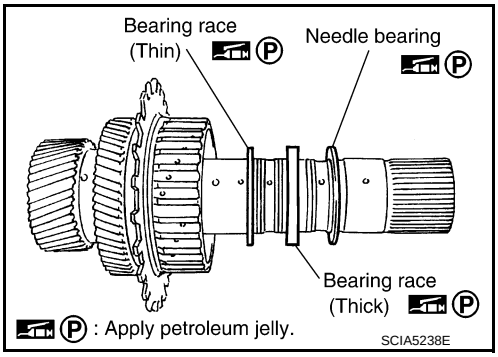
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

DISASSEMBLY

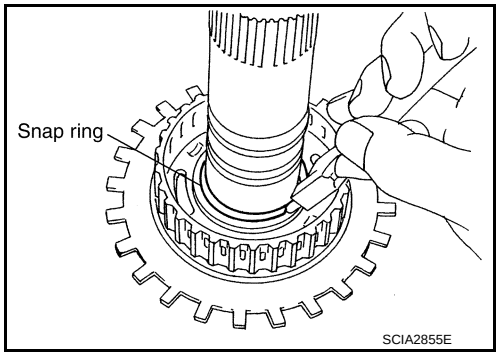
1. Remove needle bearing and bearing races from high and low reverse clutch hub.
   - VQ35HR models



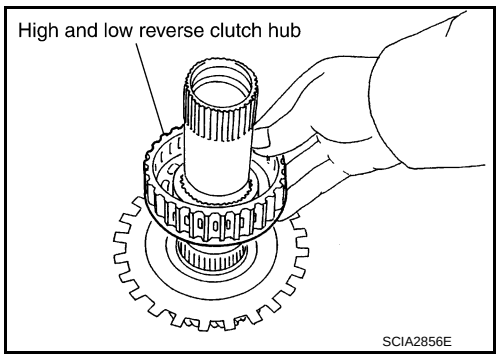
   - VK45DE models



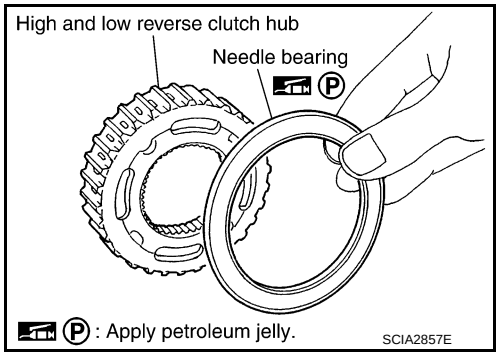
2. Using a pair of snap ring pliers, remove snap ring from mid sun gear assembly.
CAUTION:
Never expand snap ring excessively.



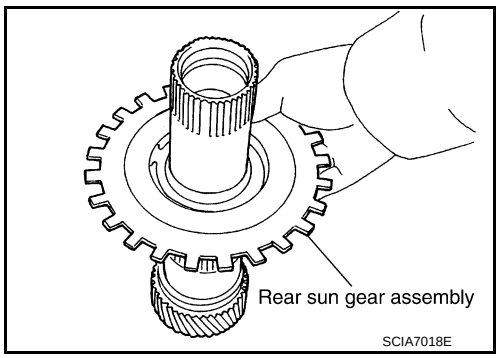
3. Remove high and low reverse clutch hub from mid sun gear assembly.



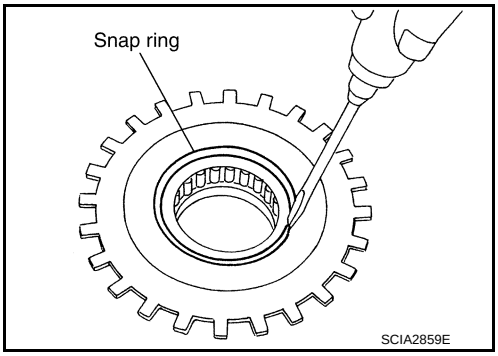
a. Remove needle bearing from high and low reverse clutch hub.



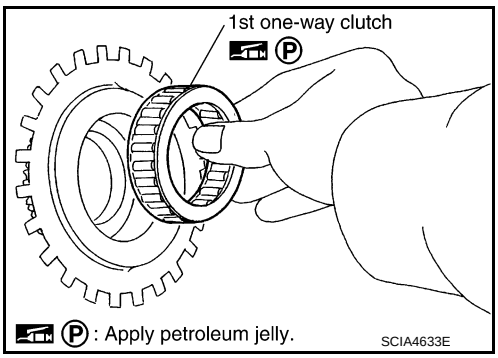
4. Remove rear sun gear assembly from mid sun gear assembly.



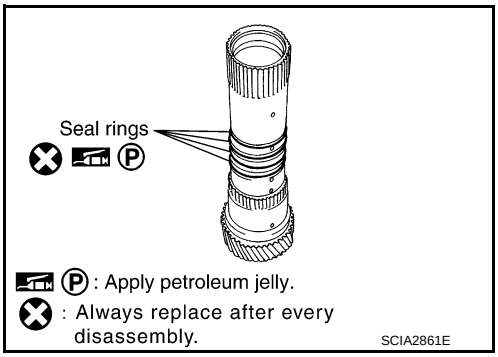
a. Using a flat-bladed screwdriver, remove snap ring from rear sun gear.



b. Remove 1st one-way clutch from rear sun gear.



5. Remove seal rings from mid sun gear.



INSPECTION

High and Low Reverse Clutch Hub Snap Ring, Rear Sun Gear Snap Ring
- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace the snap ring.

1st One-way Clutch
- Check frictional surface for wear or damage.

CAUTION:
If necessary, replace the 1st one-way clutch.

Mid Sun Gear
- Check for deformation, fatigue or damage.

CAUTION:
If necessary, replace the mid sun gear.

Rear Sun Gear
- Check for deformation, fatigue or damage.

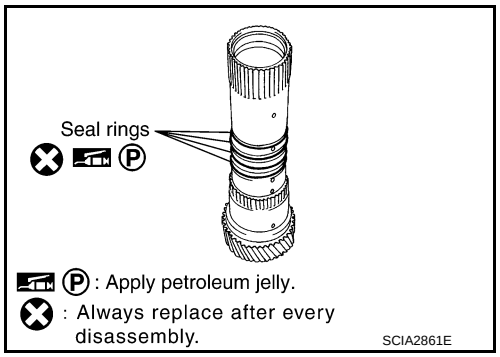
CAUTION:
If necessary, replace the rear sun gear.

High and Low Reverse Clutch Hub
- Check for deformation, fatigue or damage.

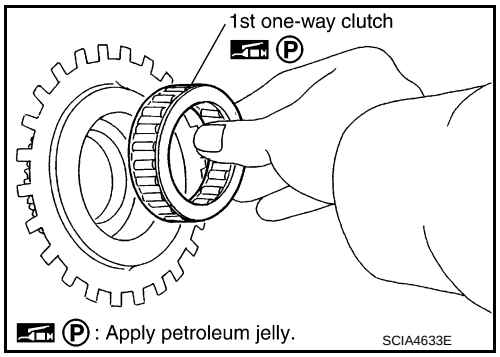
CAUTION:
If necessary, replace the high and low reverse clutch hub.

ASSEMBLY

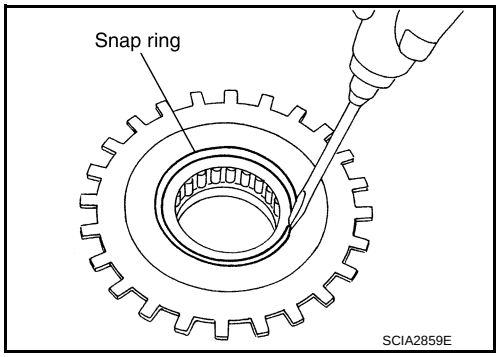
1. Install seal rings to mid sun gear.
   CAUTION:
   - **Never reuse seal rings.**
   - **Apply petroleum jelly to seal rings.**



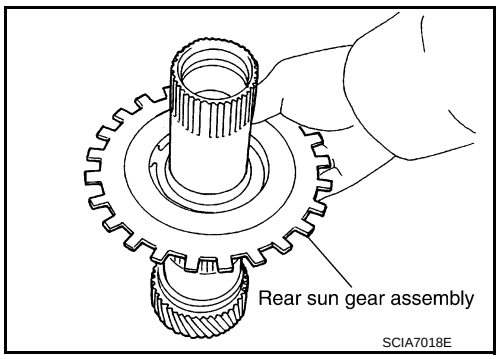
2. Install 1st one-way clutch to rear sun gear.
   CAUTION:
   Apply petroleum jelly to 1st one-way clutch.



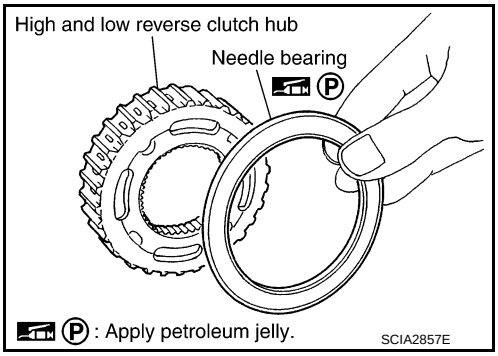
3. Using a flat-bladed screwdriver, install snap ring to rear sun gear.



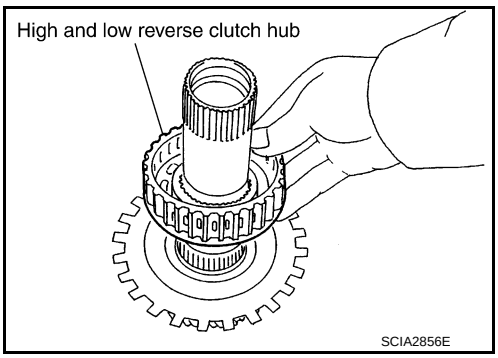
4. Install rear sun gear assembly to mid sun gear assembly.



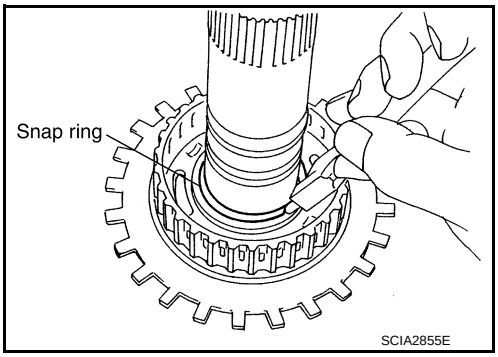
5. Install needle bearing to high and low reverse clutch hub.
CAUTION:
- **Take care with the direction of needle bearing. Refer to AT-265, "Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings".**
- **Apply petroleum jelly to needle bearing.**



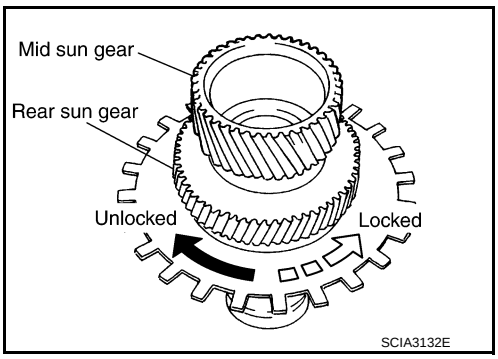
6. Install high and low reverse clutch hub to mid sun gear assembly.



7. Using a pair of snap ring pliers, install snap ring to mid sun gear assembly.
CAUTION:
Never expand snap ring excessively.

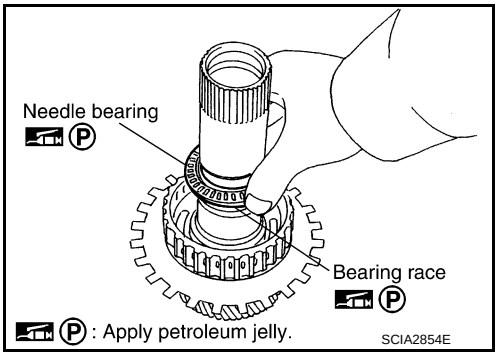


8. Check operation of 1st one-way clutch.
a. Hold mid sun gear and turn rear sun gear.
b. Check 1st one-way clutch for correct locking and unlocking directions.
CAUTION:
If not as shown in the figure, check installation direction of 1st one-way clutch.

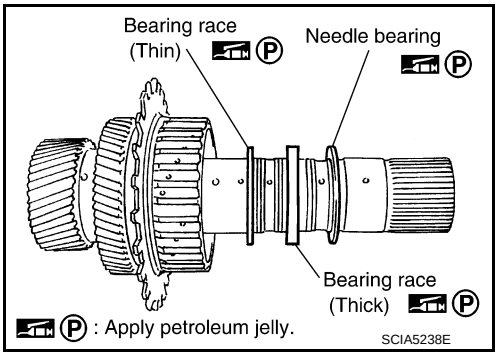


9. Install needle bearing and bearing races to high and low reverse clutch hub.
CAUTION:
Apply petroleum jelly to needle bearing and bearing races.

- VQ35HR models



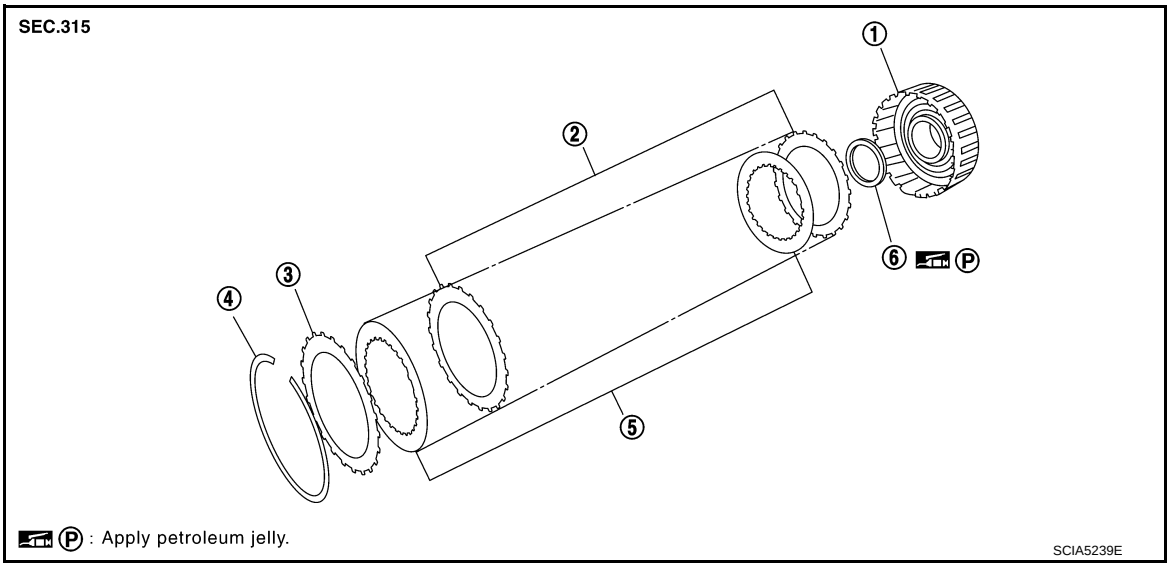
- VK45DE models



High and Low Reverse Clutch

INFOID:0000000005352653

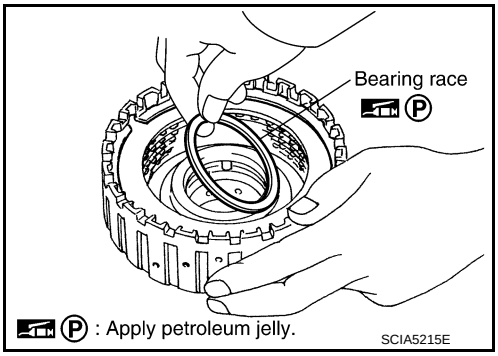
COMPONENTS



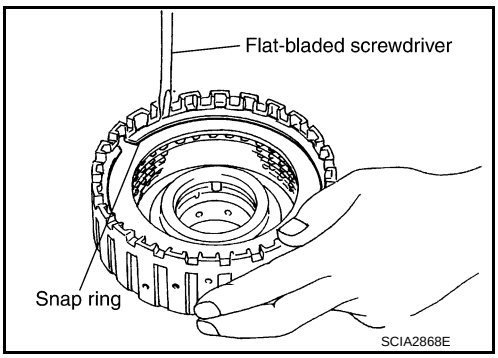
1. High and low reverse clutch drum
2. Driven plate
3. Retaining plate
4. Snap ring
5. Drive plate
6. Bearing race

DISASSEMBLY

1. Remove bearing race from high and low reverse clutch drum.



2. Using a flat-bladed screwdriver, remove snap ring from high and low reverse clutch drum.
3. Remove drive plates, driven plates and retaining plate from high and low reverse clutch drum.



INSPECTION

- **Check the following, and replace high and low reverse clutch assembly if necessary.**

High and Low Reverse Clutch Snap Ring
- Check for deformation, fatigue or damage.

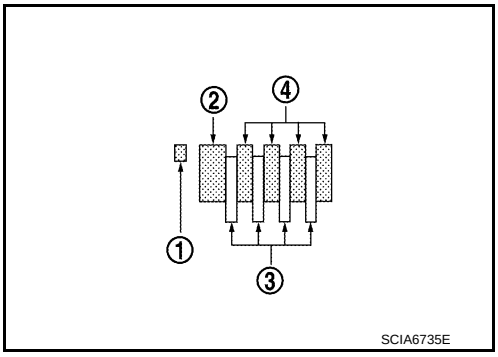
High and Low Reverse Clutch Drive Plates
- Check facing for burns, cracks or damage.

High and Low Reverse Clutch Retaining Plate and Driven Plates
- Check facing for burns, cracks or damage.

ASSEMBLY

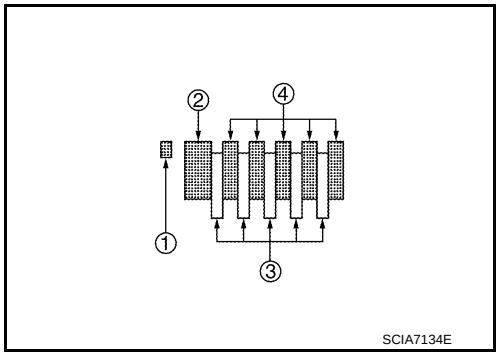
1. Install drive plates, driven plates and retaining plate in high and low reverse clutch drum.
   CAUTION:
   Take care with the order of plates.
   - VQ35HR models

1	: Snap ring
2	: Retaining plate
3	: Drive plate
4	: Driven plate
4/4	: Drive plate/Driven plate

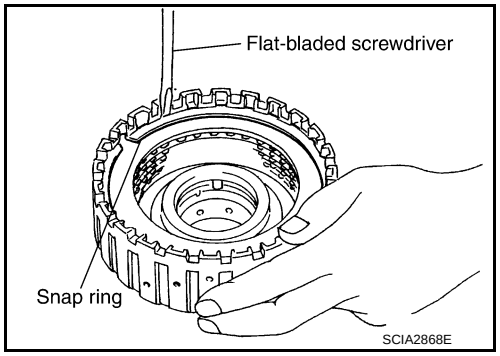


- VK45DE models

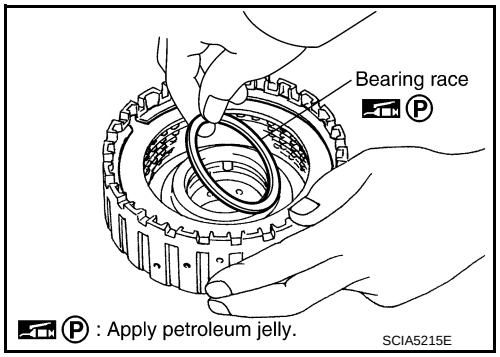
1	: Snap ring
2	: Retaining plate
3	: Drive plate
4	: Driven plate
5/5	: Drive plate/Driven plate



2. Using a flat-bladed screwdriver, install snap ring in high and low reverse clutch drum.



3. Install bearing race to high and low reverse clutch drum.
CAUTION:
Apply petroleum jelly to bearing race.

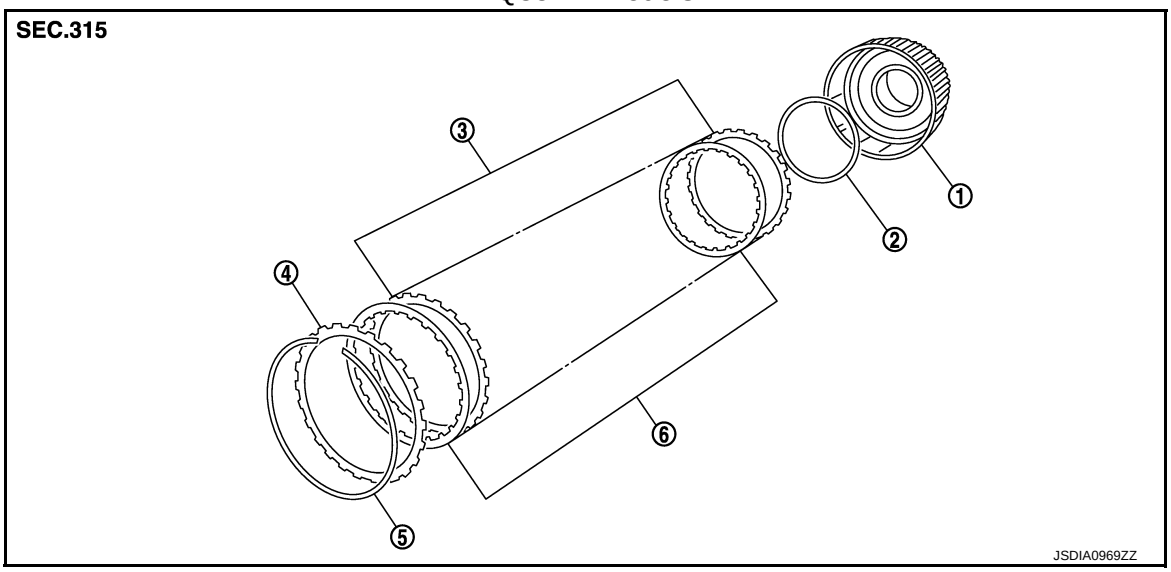


Direct Clutch

INFOID:0000000005352654

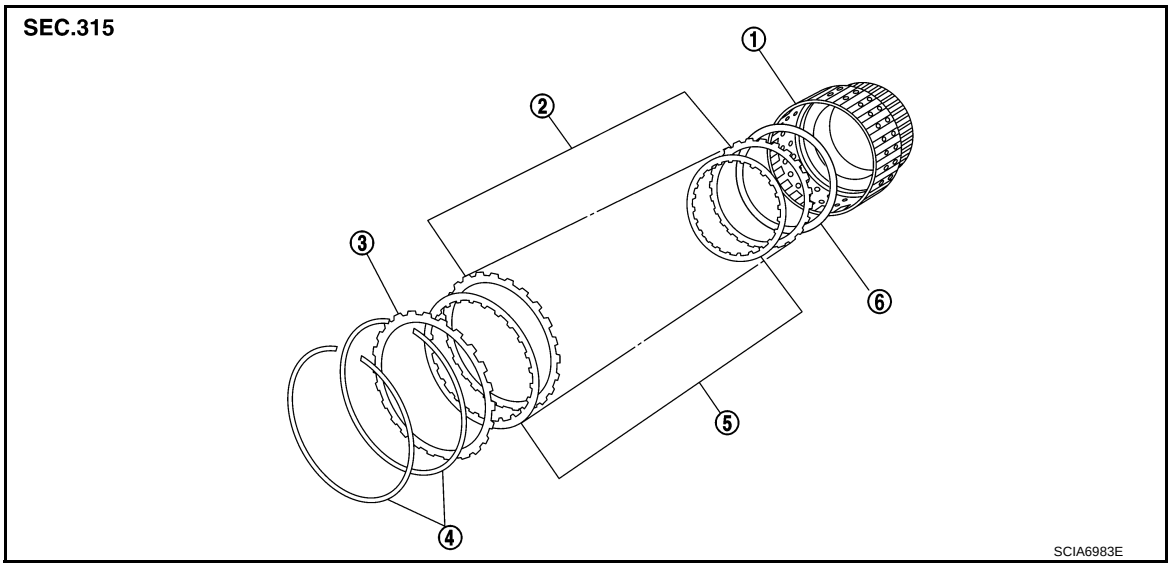
COMPONENTS

VQ35HR models



1. Direct clutch drum
2. Dish plate
3. Driven plate
4. Retaining plate
5. Snap ring
6. Drive plate

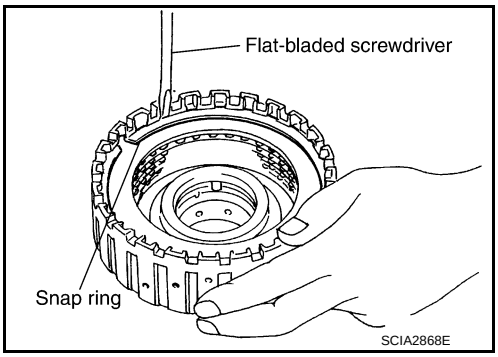
VK45DE models



1. Direct clutch drum
2. Driven plate
3. Retaining plate
4. Snap ring
5. Drive plate
6. Dish plate

DISASSEMBLY

1. Using a flat-bladed screwdriver, remove snap ring from direct clutch drum.
2. Remove drive plates, driven plates, dish plate and retaining plates from direct clutch drum.



INSPECTION

- **Check the following, and replace direct clutch assembly if necessary.**

Direct Clutch Snap Ring
- Check for deformation, fatigue or damage.

Direct Clutch Drive Plates and Driven Plates
- Check facing for burns, cracks or damage.

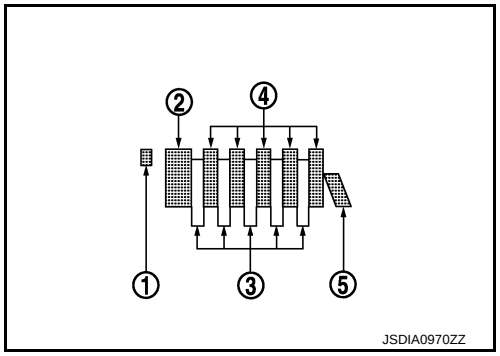
Direct Clutch Dish Plate and Retaining Plates
- Check facing for burns, cracks or damage.

ASSEMBLY

1. Install drive plates, driven plates, dish plate and retaining plates in direct clutch drum.
   CAUTION:
   Take care with the order of plates.

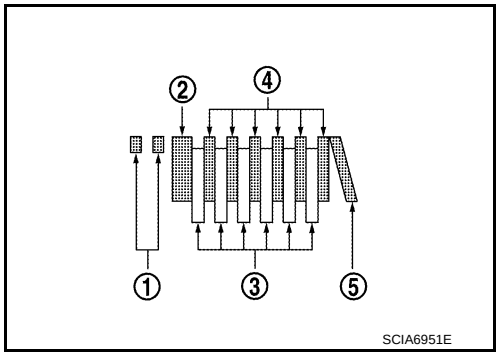
- VQ35HR models

1	: Snap ring
2	: Retaining plate
3	: Drive plate
4	: Driven plate
5	: Dish plate
5/5	: Drive plate/Driven plate

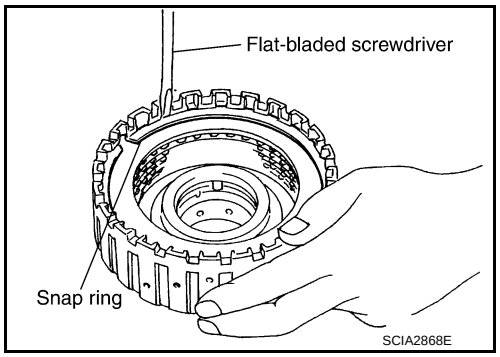


- VK45DE models

1	: Snap ring
2	: Retaining plate
3	: Drive plate
4	: Driven plate
5	: Dish plate
6/6	: Drive plate/Driven plate



2. Using a flat-bladed screwdriver, install snap ring in direct clutch drum.

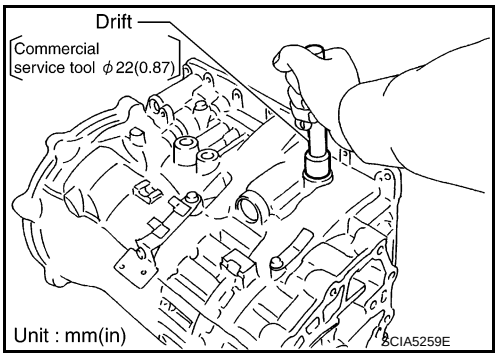


ASSEMBLY

Assembly (1)

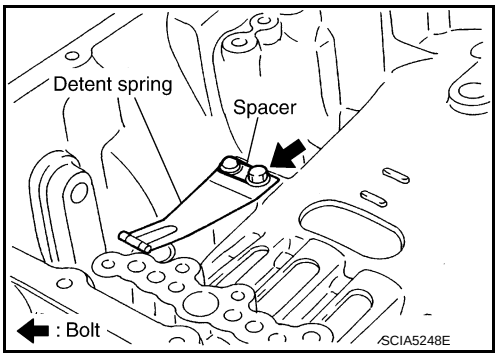
INFOID:0000000005352655

1. As shown in the figure, use a drift [22 mm (0.87 in) dia. commercial service tool] to drive manual shaft oil seals into the transmission case until it is flush.

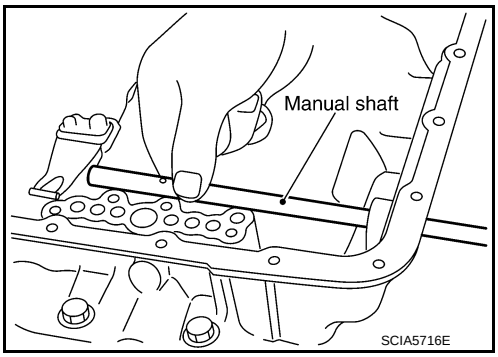


CAUTION:
- **Never reuse manual shaft oil seals.**
- **Apply ATF to manual shaft oil seals.**

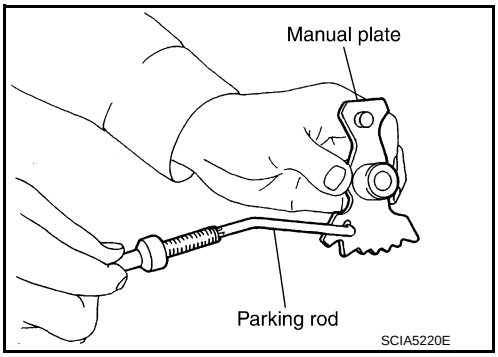
2. Install detent spring and spacer in transmission case. Tighten detent spring and spacer bolts to the specified torque. Refer to AT-251, "Component".



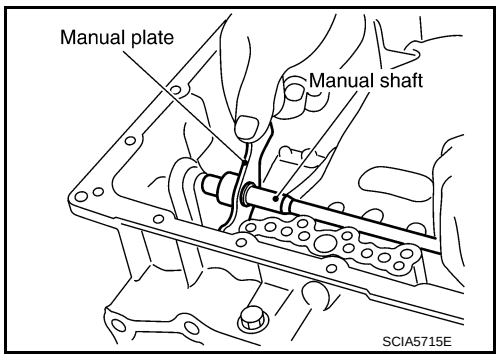
3. Install manual shaft to transmission case.



4. Install parking rod to manual plate.



5. Install manual plate (with parking rod) to manual shaft.



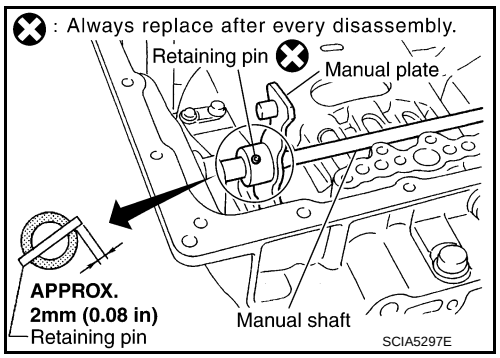
6. Install retaining pin into the manual plate and manual shaft.

a. Fit pinhole of the manual plate to pinhole of the manual shaft with a pin punch.

b. Use a hammer to tap the retaining pin into the manual plate.

CAUTION:

- **Never reuse retaining pin.**
- **Drive retaining pin to 2±0.5 mm (0.08±0.020 in) over the manual plate.**



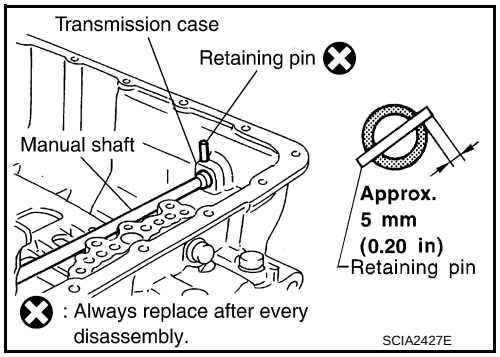
7. Install retaining pin into the transmission case and manual shaft.

a. Fit pinhole of the transmission case to pinhole of the manual shaft with a pin punch.

b. Use a hammer to tap the retaining pin into the transmission case.

CAUTION:

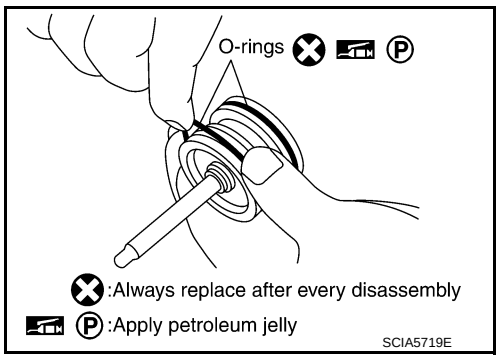
- **Never reuse retaining pin.**
- **Drive retaining pin to 5±1 mm (0.20±0.04 in) over the transmission case.**



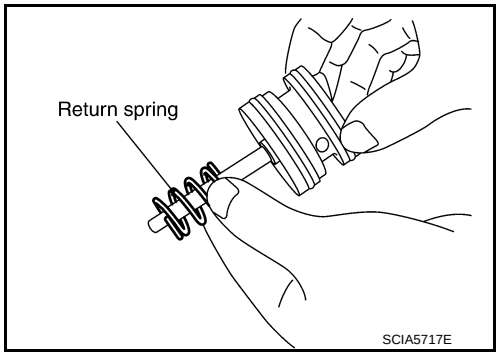
8. Install O-rings to servo assembly.

CAUTION:

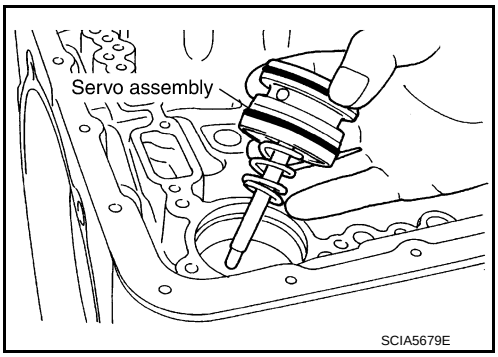
- **Never reuse O-rings.**
- **Apply petroleum jelly to O-rings.**



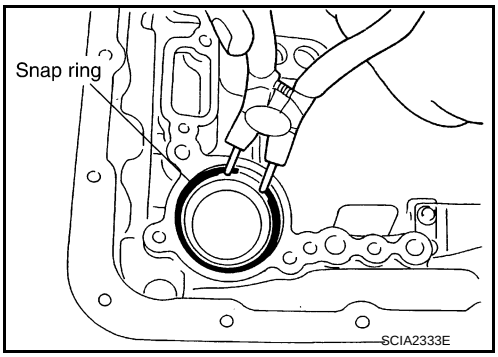
9. Install return spring to servo assembly.



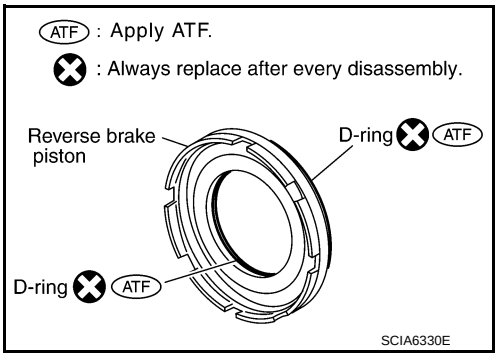
10. Install servo assembly in transmission case.



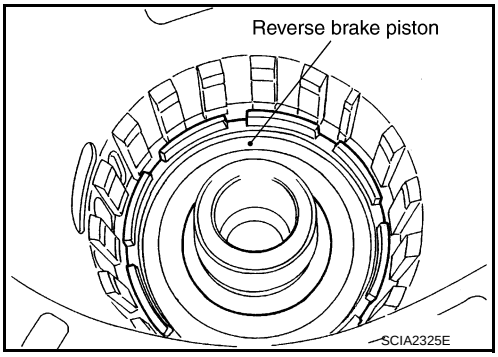
11. Using a pair of snap ring pliers, install snap ring to transmission case.



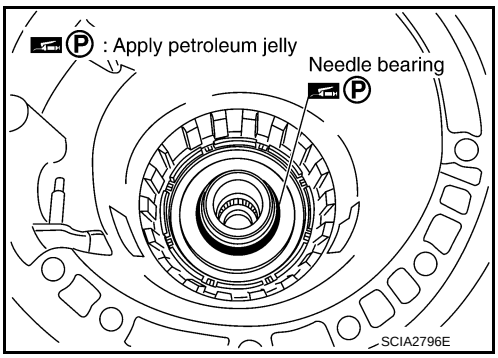
12. Install D-rings in reverse brake piston.
CAUTION:
- **Never reuse D-rings.**
- **Apply ATF to D-rings.**



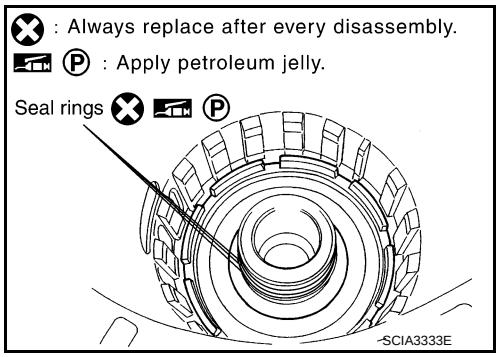
13. Install reverse brake piston in transmission case.



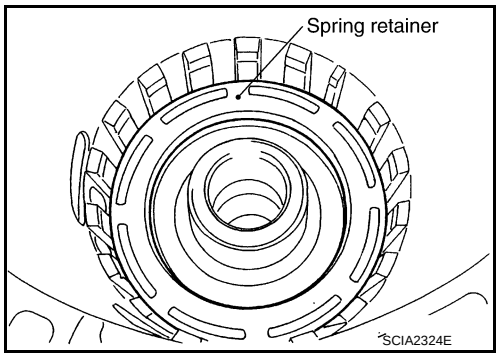
14. Install needle bearing to drum support edge surface.
CAUTION:
Apply petroleum jelly to needle bearing.



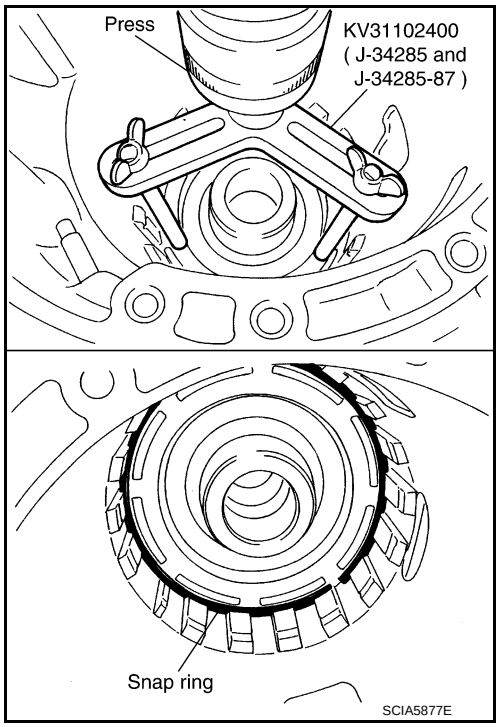
15. Install seal rings to drum support.
CAUTION:
- **Never reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



16. Install spring retainer and return spring in transmission case.



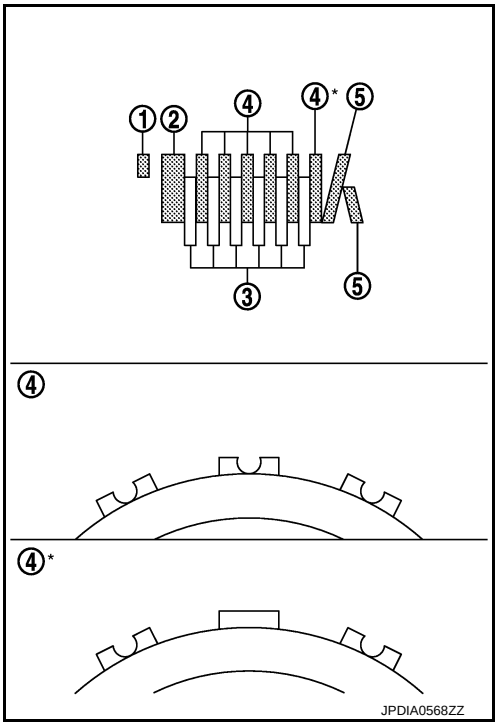
17. Set the SST on spring retainer and install snap ring (fixing spring retainer) in transmission case while compressing return spring.
CAUTION:
Securely assemble them using a flat-bladed screwdriver so that snap ring tension is slightly weak.



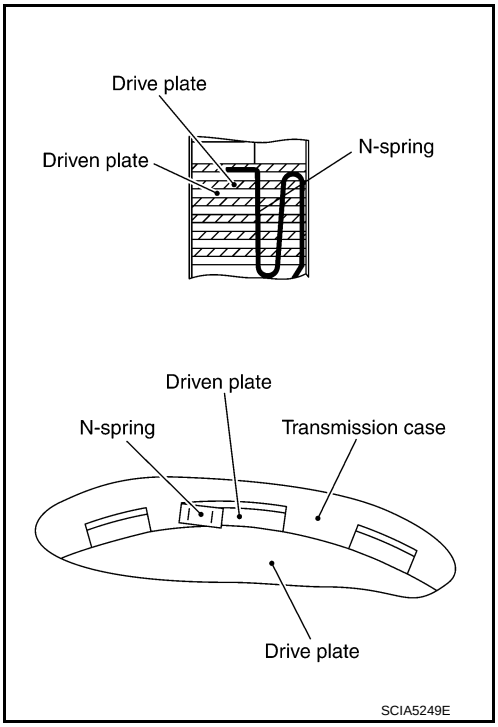
18. Install reverse brake drive plates, driven plates and dish plates in transmission case.

CAUTION:
Take care with order of plates.

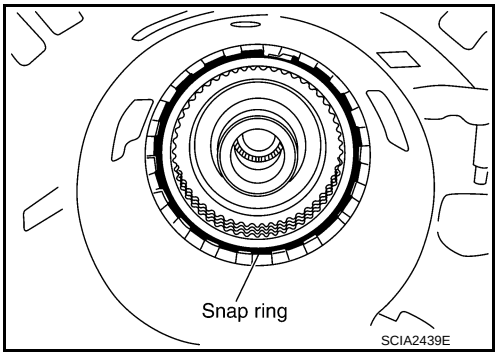
1	: Snap ring
2	: Retaining plate
3	: Drive plate
4	: Driven plate
5	: Dish plate
6/6	: Drive plate/Driven plate



19. Assemble N-spring.
20. Install reverse brake retaining plate in transmission case.



21. Install snap ring in transmission case.



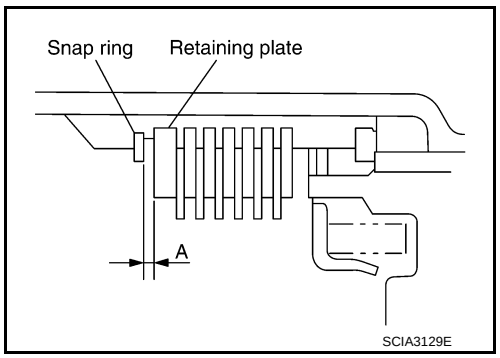
22. Measure clearance between retaining plate and snap ring. If not within specified clearance, select proper retaining plate.

Specified clearance A

Standard: 0.7 - 1.1 mm (0.028 - 0.043 in)

Retaining plate

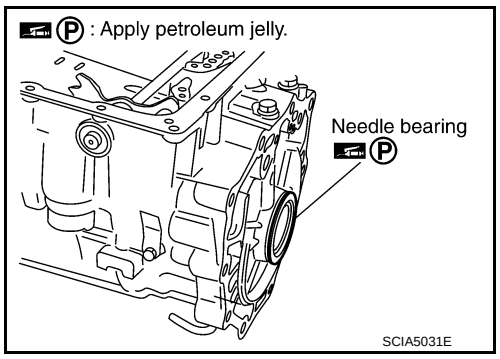
Refer to AT-334, "Reverse Brake".



23. Install needle bearing to transmission case.

CAUTION:

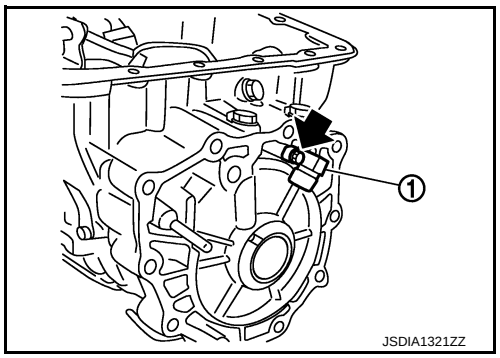
- **Take care with the direction of needle bearing. Refer to AT-265, "Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings".**
- **Apply petroleum jelly to needle bearing.**



24. Install output speed sensor (1) to transmission case. Tighten bolt (⬅) to the specified torque. Refer to AT-251, "Component".

CAUTION:

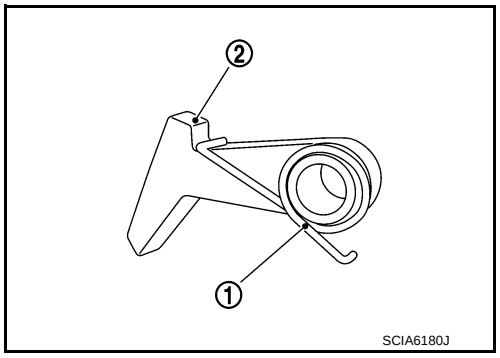
- **Never subject it to impact by dropping or hitting it.**
- **Never disassemble.**
- **Never allow metal filings, etc., to get on the sensor's front edge magnetic area.**
- **Never place in an area affected by magnetism.**



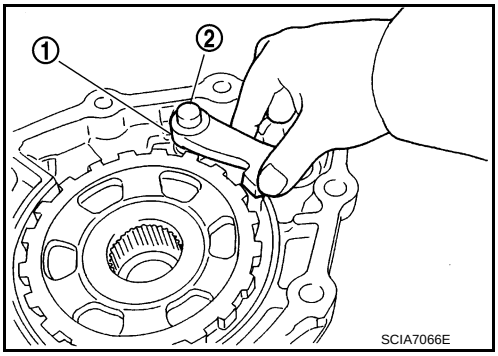
25. Assemble each part according to the following procedures.

a. **2WD models**

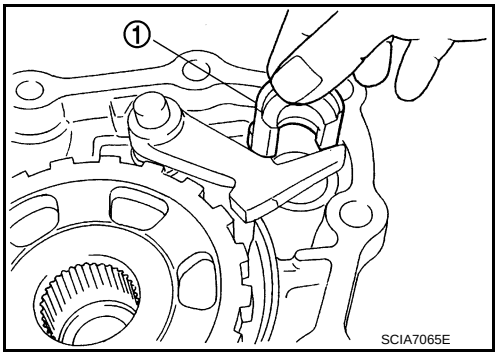
i. Install return spring (1) to parking pawl (2).



ii. Install parking pawl (with return spring) (1) and pawl shaft (2) to output shaft & companion flange complement.



iii. Install parking actuator support (1) from output shaft & companion flange complement.

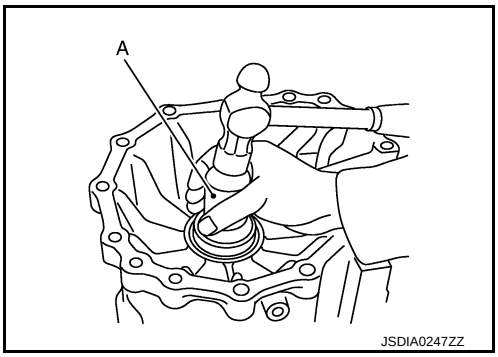


b. **AWD models**

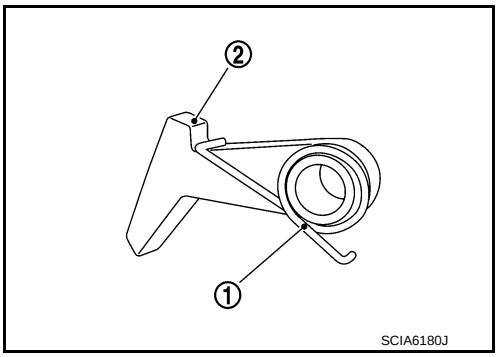
i. As shown in the figure, use the drift [64 mm (2.52 in) dia. commercial service tool] (A) to drive rear oil seal into the adapter case until it is flush.

CAUTION:

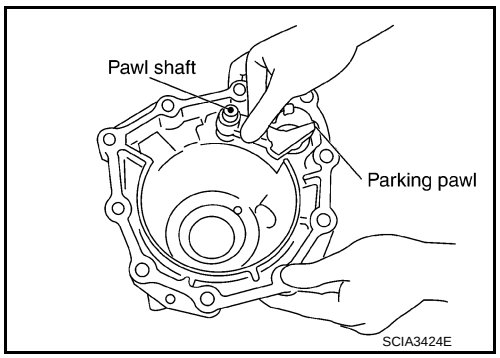
- **Apply ATF to rear oil seal.**
- **Never reuse rear oil seal.**



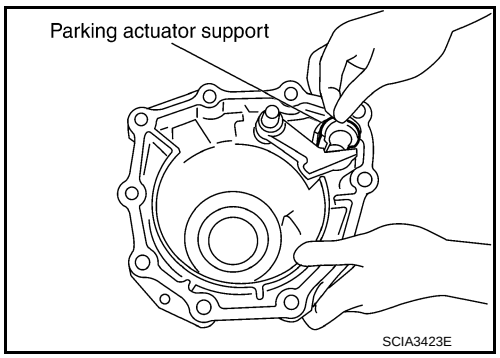
ii. Install return spring (1) to parking pawl (2).



iii. Install parking pawl (with return spring) and pawl shaft to adapter case.



iv. Install parking actuator support from adapter case.

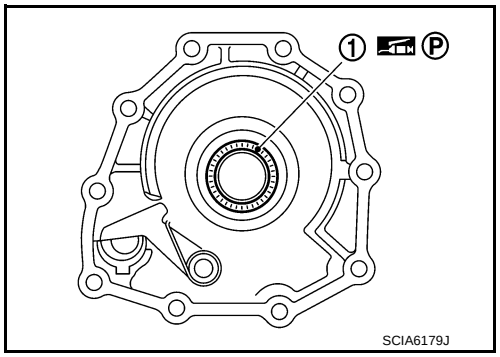


v. Install needle bearing (1) to adapter case.

CAUTION:

- **Take care with the direction of needle bearing. Refer to AT-265, "Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings".**
- **Apply petroleum jelly to needle bearing.**

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".



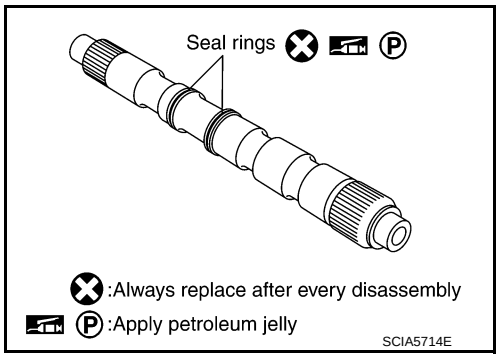
26. Assemble output shaft & companion flange complement (2WD) or adapter case assembly (AWD) according to the following procedures.

a. **2WD models**

i. Install seal rings to intermediate shaft.

CAUTION:

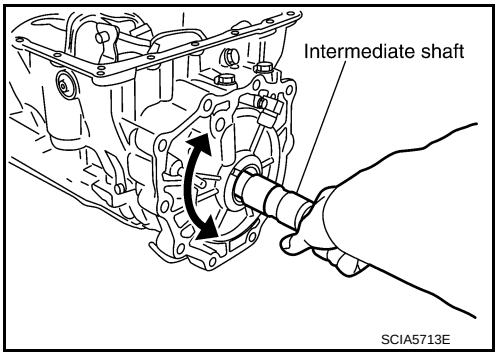
- **Never reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



ii. Install intermediate shaft in transmission case.

CAUTION:

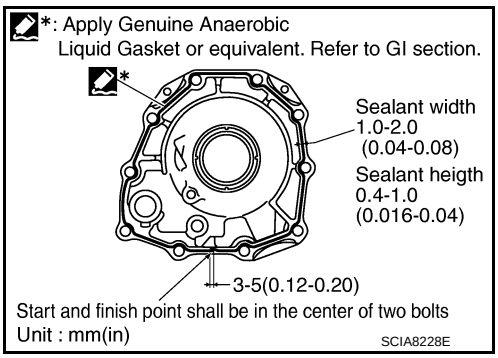
Be careful not to mistake front for rear because both sides looks similar. (Thinner end is front side.)



iii. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to GI-46, "Recommended Chemical Product and Sealant".) to output shaft & companion flange complement as shown in the figure.

CAUTION:

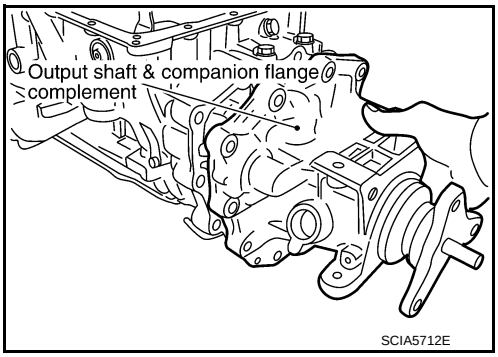
Completely remove all moisture, oil and old sealant, etc. from the transmission case and output shaft & companion flange complement mounting surfaces.



iv. Install output shaft & companion flange complement in transmission case.

CAUTION:

Insert the tip of parking rod between the parking pawl and the parking actuator support when assembling the output shaft & companion flange complement.



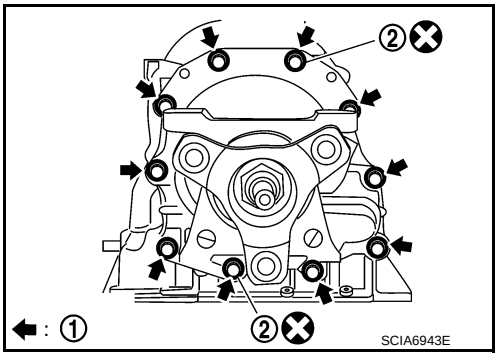
v. Tighten output shaft & companion flange complement bolts (1) to the specified torque. Refer to AT-251, "Component".

⬅ : Bolt

CAUTION:

Never reuse self-sealing bolts (2).

Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".

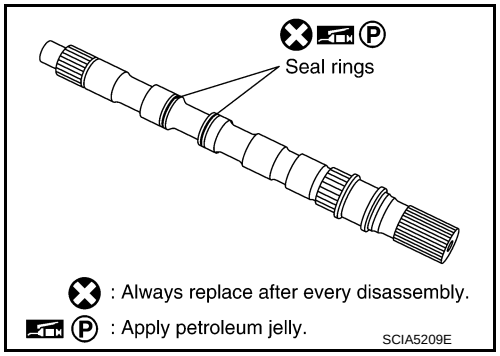


b. **AWD models**

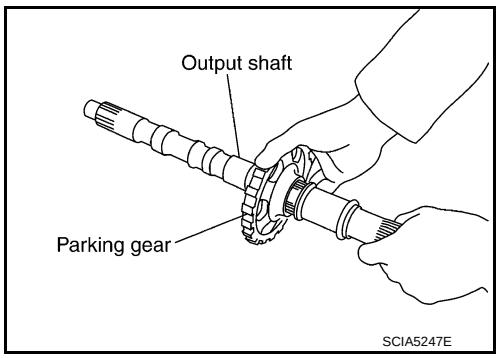
i. Install seal rings to output shaft.

CAUTION:

- **Never reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



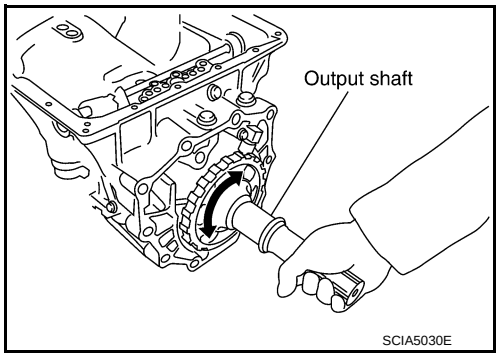
ii. Install parking gear to output shaft.



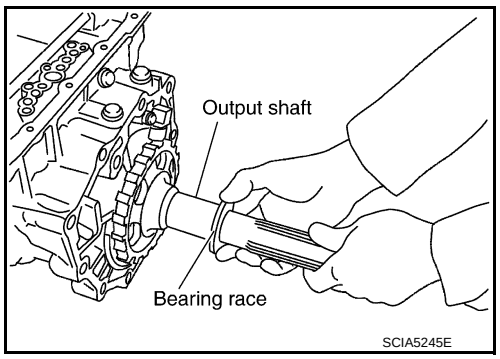
iii. Install output shaft in transmission case.

CAUTION:

Be careful not to mistake front for rear because both sides looks similar. (Thinner end is front side.)



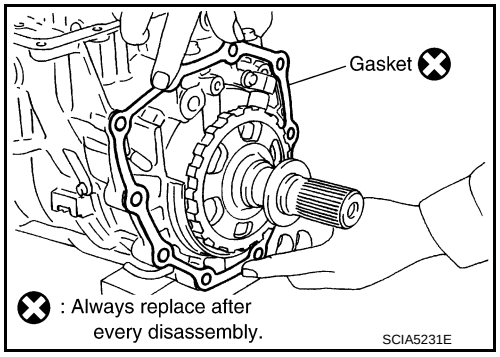
iv. Install bearing race to output shaft.



v. Install gasket onto transmission case.

CAUTION:

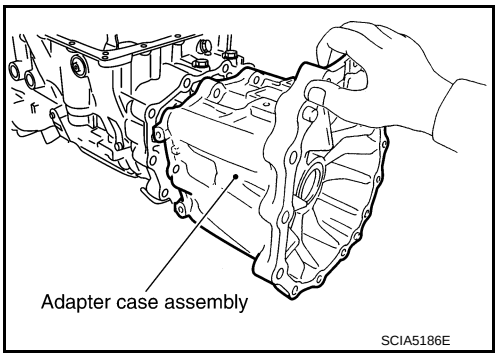
- **Completely remove all moisture, oil and old gasket, etc. from the transmission case and adapter case assembly mounting surfaces.**
- **Never reuse gasket.**



vi. Install adapter case assembly to transmission case.

CAUTION:

Insert the tip of parking rod between the parking pawl and the parking actuator support when assembling the adapter case assembly.



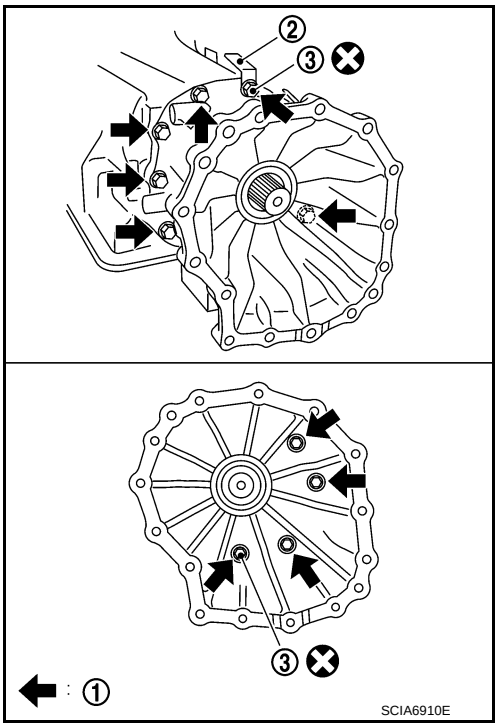
vii. Tighten adapter case assembly bolts (1) to the specified torque. [With bracket (2).] Refer to AT-251, "Component".

⬅ : Bolt

CAUTION:

Never reuse self-sealing bolts (3).

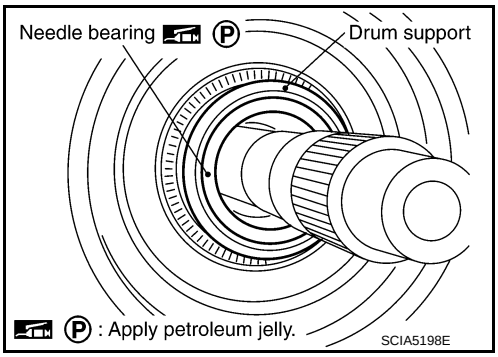
Refer to GI section to make sure icons (symbol marks) in the figure. Refer to GI-9, "Component".



27. Install needle bearing in drum support.

CAUTION:

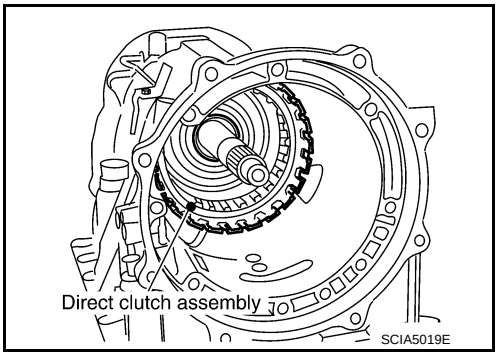
- **Take care with the direction of needle bearing. Refer to AT-265, "Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings".**
- **Apply petroleum jelly to needle bearing.**



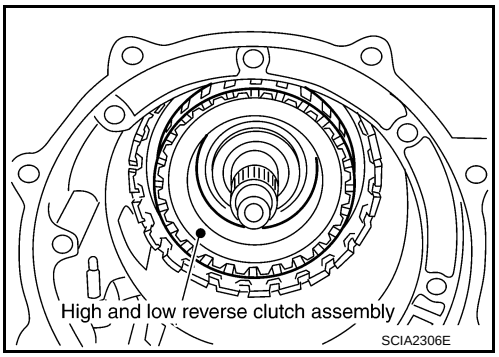
28. Install direct clutch assembly in reverse brake.

CAUTION:

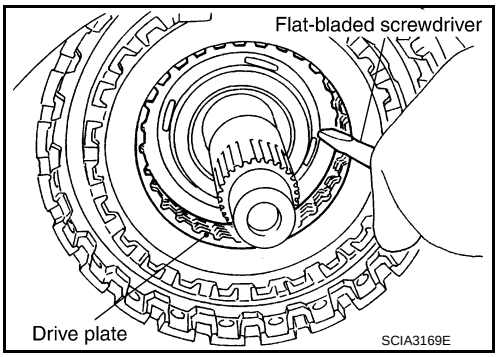
Make sure that drum support edge surface and direct clutch inner boss edge surface come to almost same place.



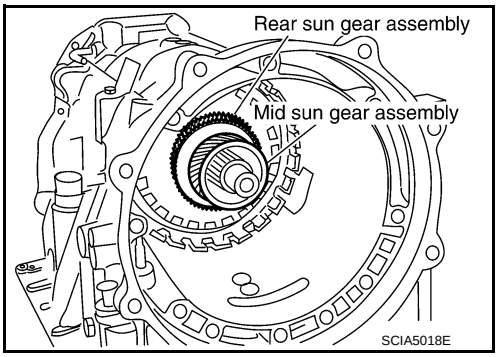
29. Install high and low reverse clutch assembly in direct clutch.



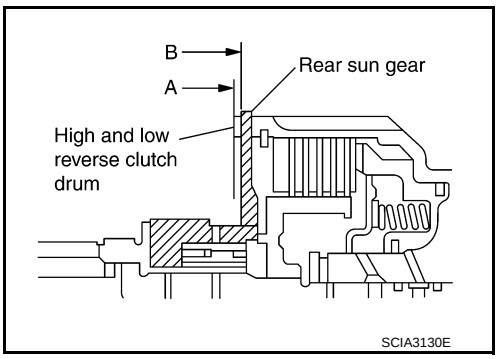
30. Using a flat-bladed screwdriver, align the drive plate.



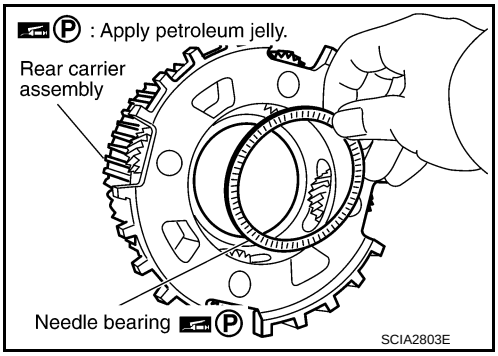
31. Install high and low reverse clutch hub, mid sun gear assembly and rear sun gear assembly as a unit.



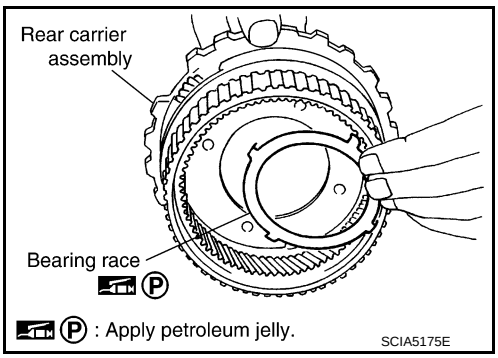
CAUTION:
Make sure that portion “A” of high and low reverse clutch drum protrudes approximately 2 mm (0.08 in) beyond portion “B” of rear sun gear.



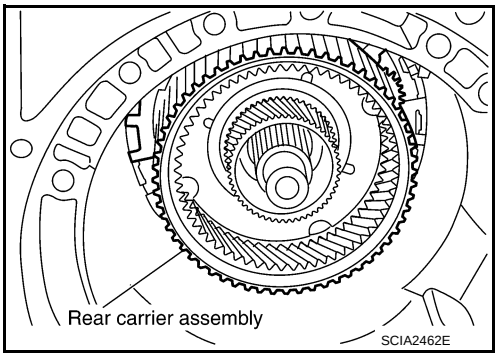
32. Install needle bearing in rear carrier assembly.
CAUTION:
- **Take care with the direction of needle bearing. Refer to AT-265, "Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings".**
- **Apply petroleum jelly to needle bearing.**



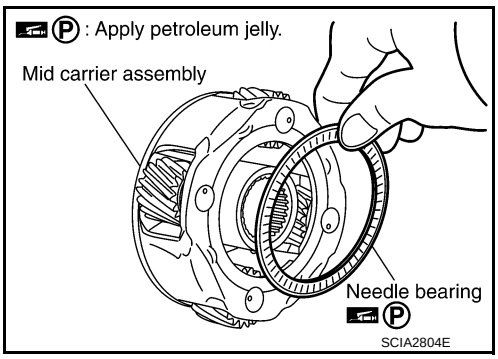
33. Install bearing race in rear carrier assembly.
CAUTION:
Apply petroleum jelly to bearing race.



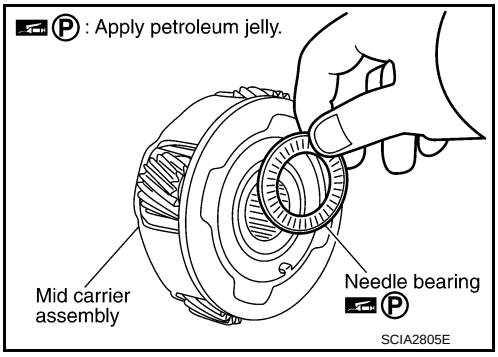
34. Install rear carrier assembly in direct clutch drum.



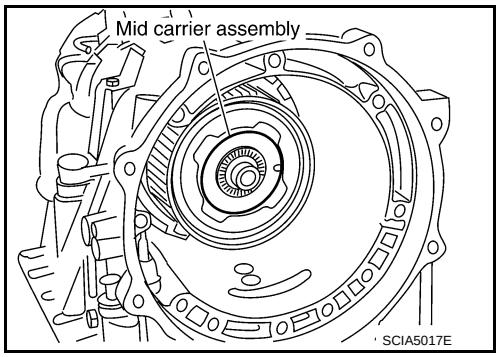
35. Install needle bearing (rear side) to mid carrier assembly.
CAUTION:
- **Take care with the direction of needle bearing. Refer to AT-265, "Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings".**
- **Apply petroleum jelly to needle bearing.**



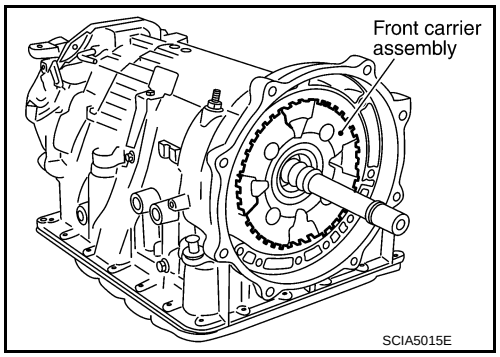
36. Install needle bearing (front side) to mid carrier assembly.
CAUTION:
- **Take care with the direction of needle bearing. Refer to AT-265, "Location of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings".**
- **Apply petroleum jelly to needle bearing.**



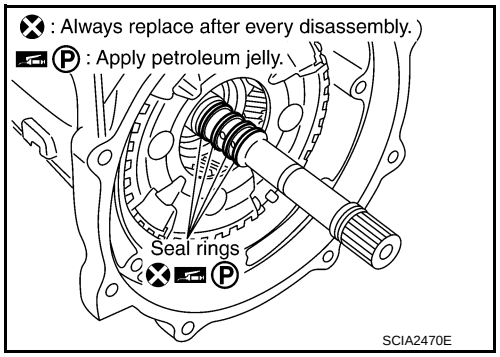
37. Install mid carrier assembly in rear carrier assembly.



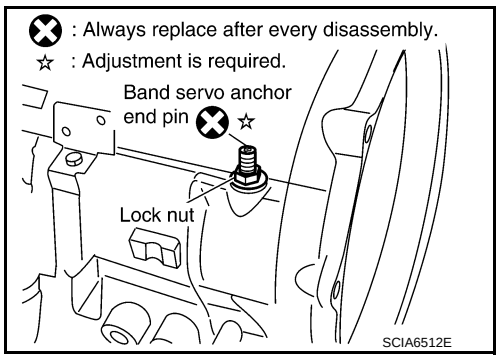
38. Install front carrier assembly, input clutch assembly and rear internal gear as a unit.



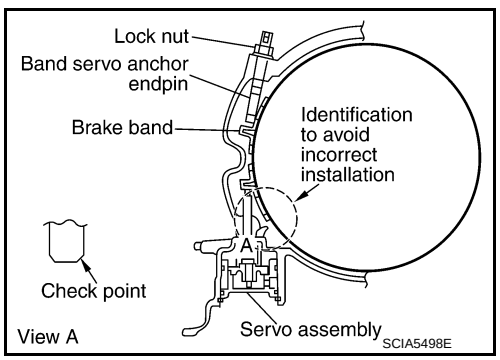
39. Install seal rings in input clutch assembly.
CAUTION:
- **Never reuse seal rings.**
- **Apply petroleum jelly to seal rings.**



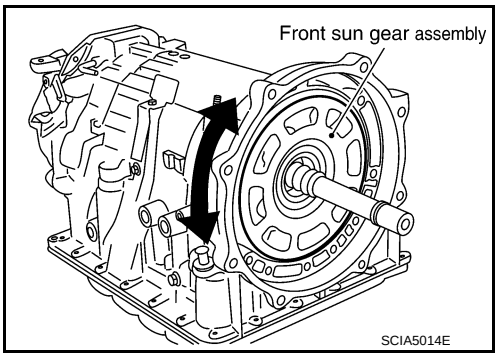
40. Install band servo anchor end pin and lock nut in transmission case.
CAUTION:
Never reuse band servo anchor end pin.



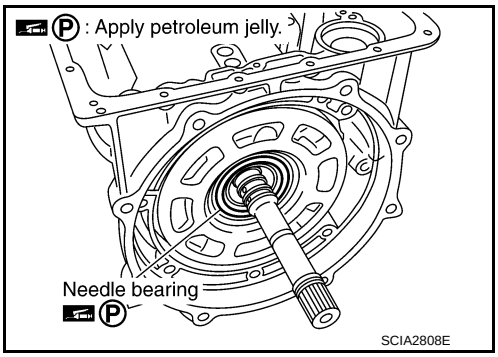
41. Install brake band in transmission case.
CAUTION:
Assemble it so that identification to avoid incorrect installation faces servo side.



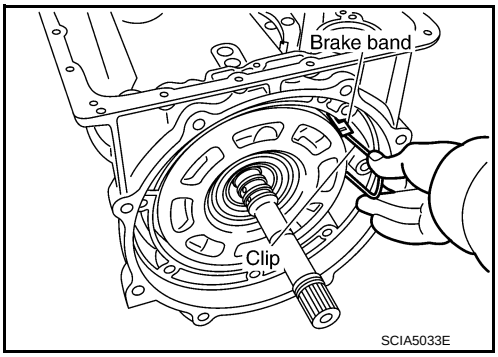
42. Install front sun gear to front carrier assembly.
CAUTION:
Apply ATF to front sun gear bearing and 3rd one-way clutch end bearing.



43. Install needle bearing to front sun gear.
CAUTION:
Apply petroleum jelly to needle bearing.



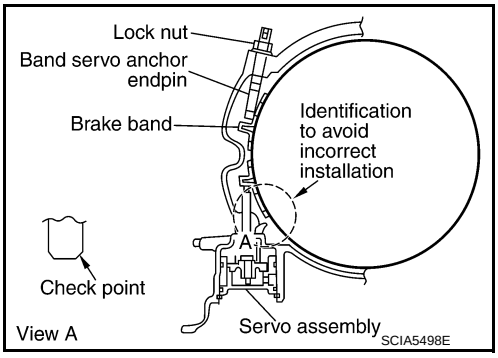
44. Adjust brake band tilting using a clip so that brake band contacts front sun gear drum evenly.



45. Adjust brake band.
a. Loosen lock nut.
b. Tighten band servo anchor end pin to specified torque.

: 5.0 N·m (0.51 kg-m, 44 in-lb)

c. Back of band servo anchor end pin three turns.
d. Holding band servo anchor end pin, tighten lock nut to the specified torque. Refer to AT-251, "Component".

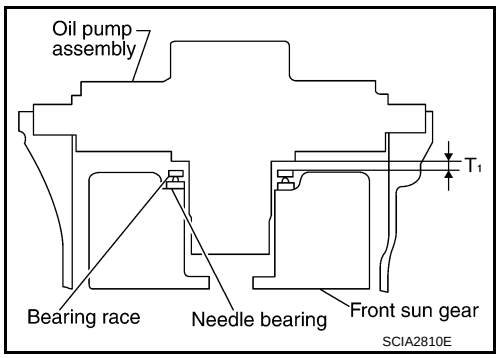


Adjustment

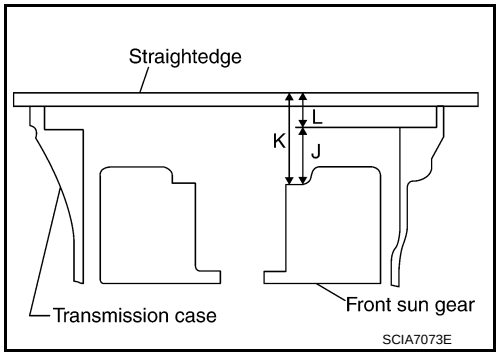
INFOID:0000000005352656

TOTAL END PLAY

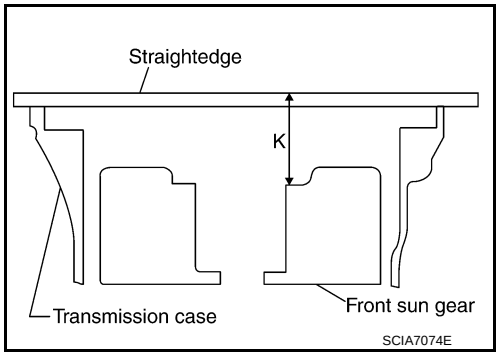
- Measure clearance between front sun gear and bearing race for oil pump cover.
- Select proper thickness of bearing race so that end play is within specifications.



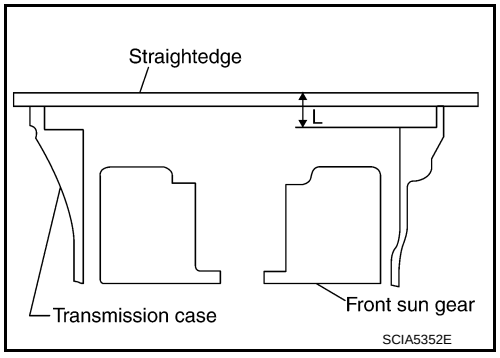
1. Measure dimensions “K” and “L” and then calculate dimension “J”.



a. Measure dimension “K”.



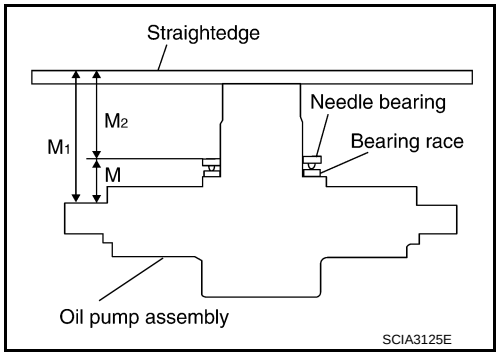
b. Measure dimension “L”.
c. Calculate dimension “J”.



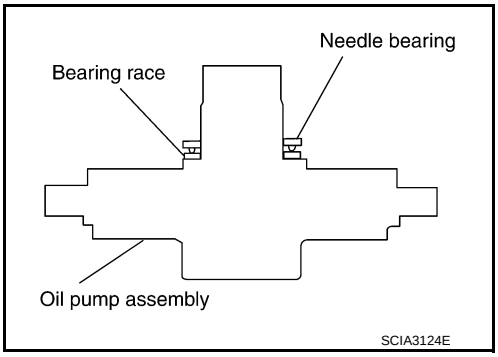
“J”: Distance between oil pump fitting surface of transmission case and needle bearing mating surface of front sun gear.

J = K – L

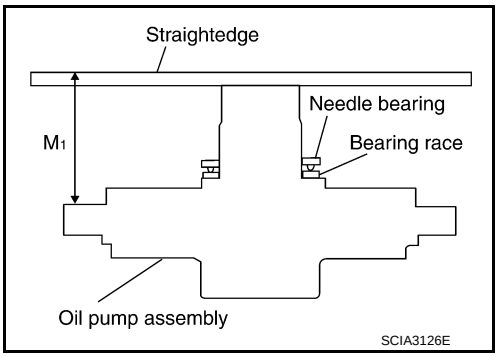
2. Measure dimensions “M1” and “M2” and then calculate dimension “M”.



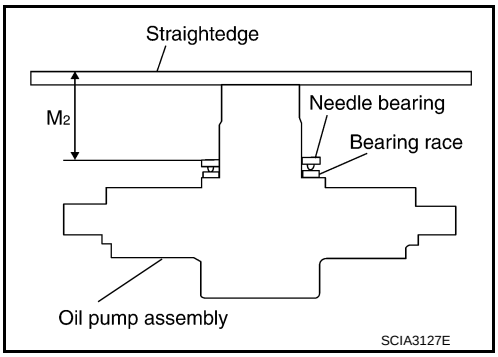
a. Place bearing race and needle bearing on oil pump assembly.



b. Measure dimension “M_1”.



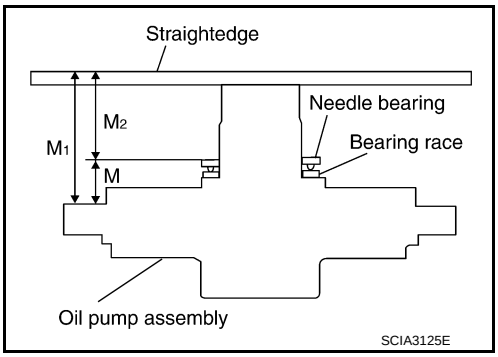
c. Measure dimension “M_2”.



d. Calculate dimension “M”.

“M”: Distance between transmission case fitting surface of oil pump and needle bearing on oil pump.

$M = M_1 – M_2$



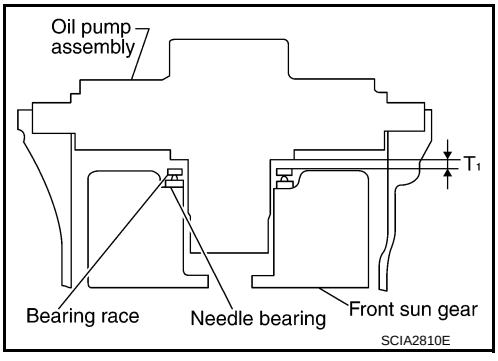
3. Adjust total end play “T_1”.

$T_1 = J – M$

Total end play “T_1”: 0.25 - 0.55 mm (0.0098 - 0.0217 in)

- Select proper thickness of bearing race so that total end play is within specifications.

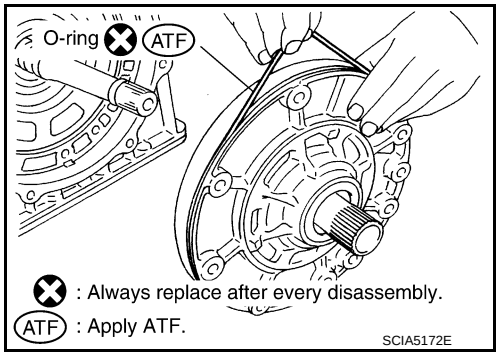
Bearing races: Refer to AT-334, "Total End Play".



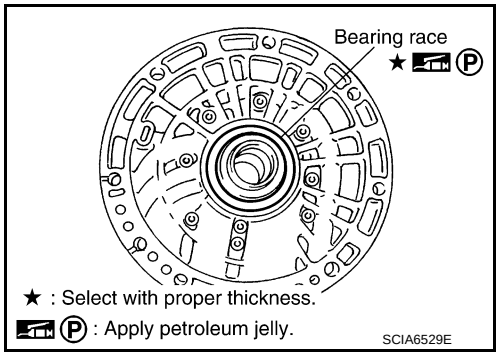
Assembly (2)

INFOID:0000000005352657

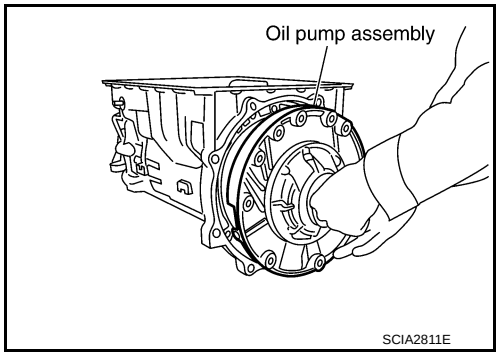
1. Install O-ring to oil pump assembly.
CAUTION:
- **Never reuse O-ring.**
- **Apply ATF to O-ring.**



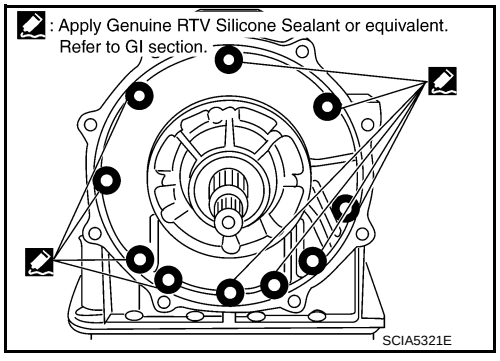
2. Install bearing race to oil pump assembly.
CAUTION:
Apply petroleum jelly to bearing race.



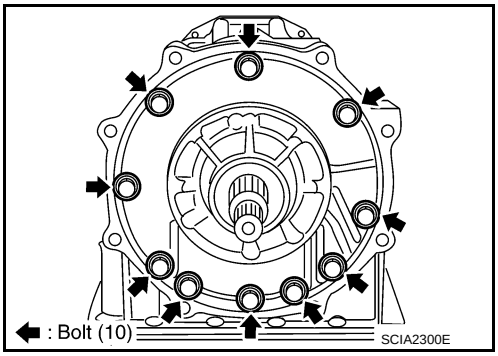
3. Install oil pump assembly in transmission case.
CAUTION:
Apply ATF to oil pump bearing.



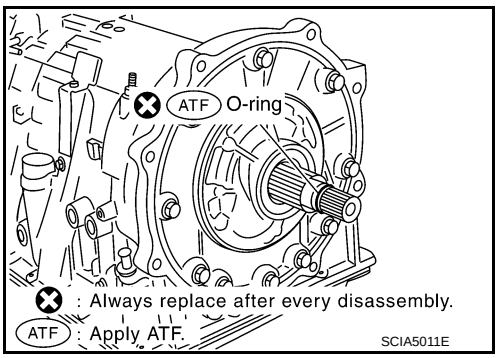
4. Apply recommended sealant (Genuine RTV Silicone Sealant or equivalent. Refer to GI-46, "Recommended Chemical Product and Sealant".) to oil pump assembly as shown in the figure.
CAUTION:
Completely remove all moisture, oil and old sealant, etc. from the oil pump mounting bolts and oil pump mounting bolt mounting surfaces.



5. Tighten oil pump bolts to the specified torque. Refer to AT-251, "Component".
CAUTION:
Apply ATF to oil pump bushing.



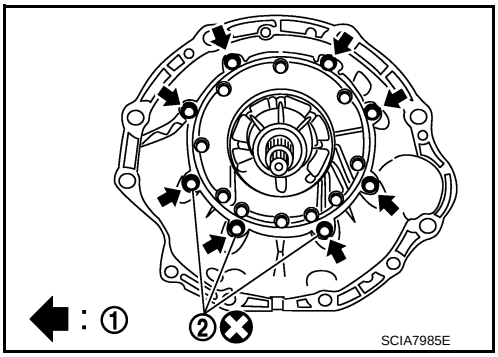
6. Install O-ring to input clutch assembly.
CAUTION:
- **Never reuse O-ring.**
- **Apply ATF to O-ring.**



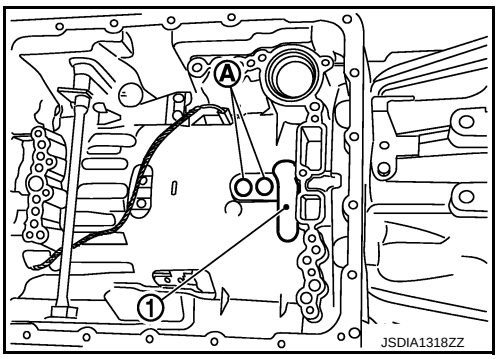
7. Install converter housing to transmission case. Tighten converter housing bolts (1) to the specified torque. Refer to AT-251, "Component".

: Bolt

CAUTION:
Never reuse self-sealing bolt (2).

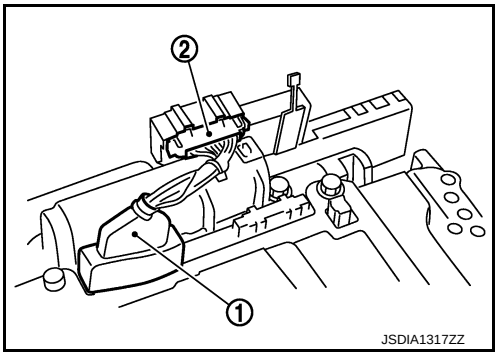


8. Make sure that brake band (1) does not close input speed sensor holes (A).

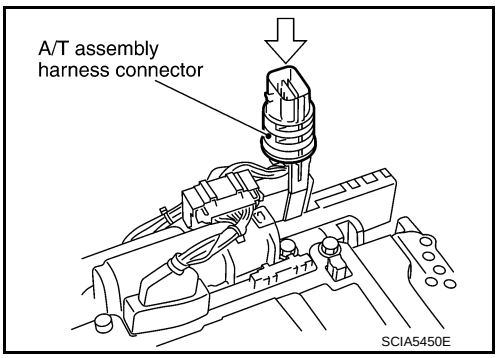


9. Install control valve with TCM.

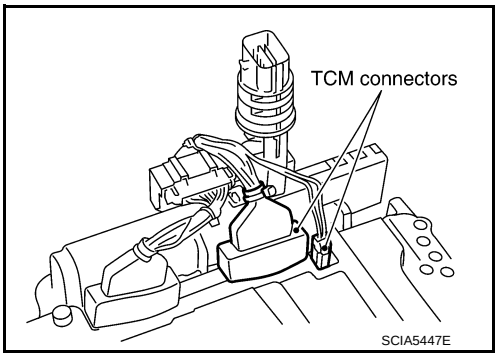
a. Connect TCM connector (1) and transmission range switch connector (2).



b. Install A/T assembly harness connector to control valve with TCM.



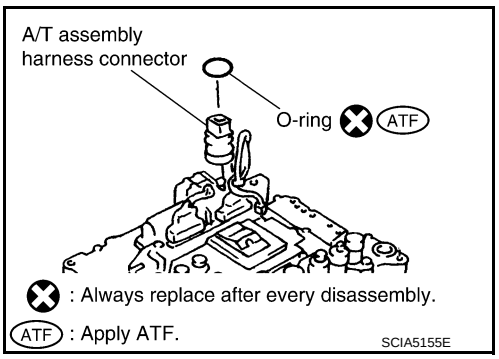
c. Connect TCM connectors.



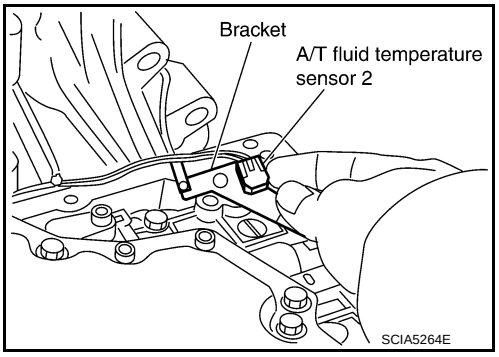
d. Install O-ring to A/T assembly harness connector.

CAUTION:

- **Never reuse O-ring.**
- **Apply ATF to O-ring.**



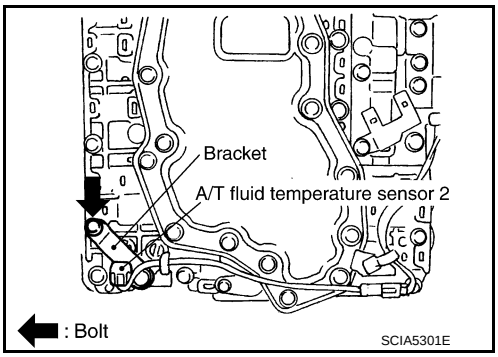
e. Install A/T fluid temperature sensor 2 to bracket.



f. Install A/T fluid temperature sensor 2 (with bracket) in control valve with TCM. Tighten A/T fluid temperature sensor 2 bolt to the specified torque. Refer to AT-251, "Component".

CAUTION:

Adjust bolt hole of bracket to bolt hole of control valve.

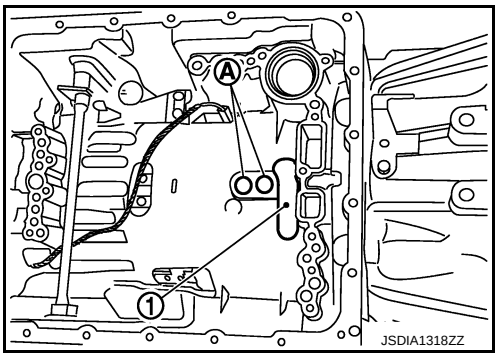


g. Install control valve with TCM in transmission case.

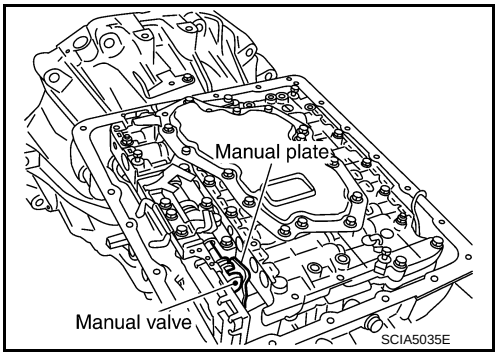
⬅ : Brake band

CAUTION:

- **Make sure that input speed sensor securely installs input speed sensor holes (A).**
- **Hang down output speed sensor harness toward outside so as not to disturb installation of control valve with TCM.**
- **Adjust A/T assembly harness connector of control valve with TCM to terminal hole of transmission case.**

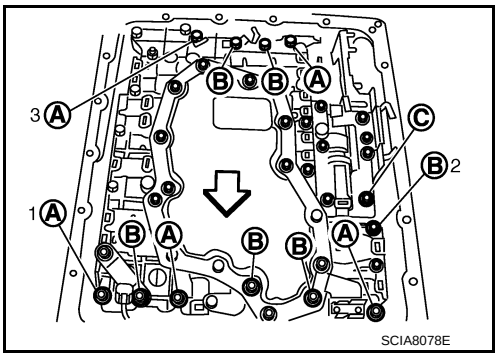


- **Assemble it so that manual valve cutout is engaged with manual plate projection.**



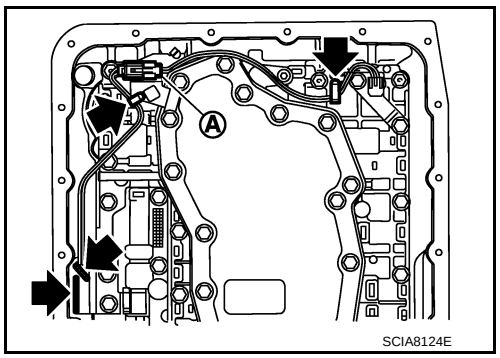
h. Install bolts (A), (B) and (C) to control valve with TCM. Tighten bolt 1, 2 and 3 temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts. Tighten control valve bolts to the TCM with specified torque.

⇦ : Front

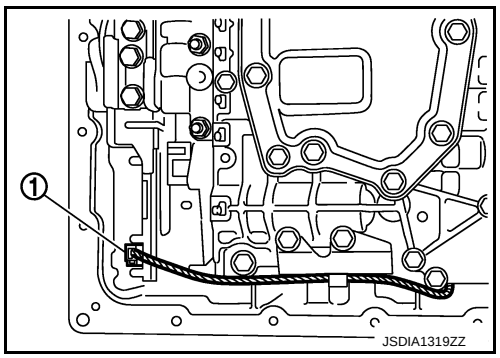


Bolt symbol	A	B	C
Number of bolts	5	6	1
Length mm (in)	42 (1.65)	55 (2.17)	40 (1.57)
Tightening torque N·m (km-g, in-lb)	7.9 (0.81, 70)		With ATF applied
			7.9 (0.81, 70)

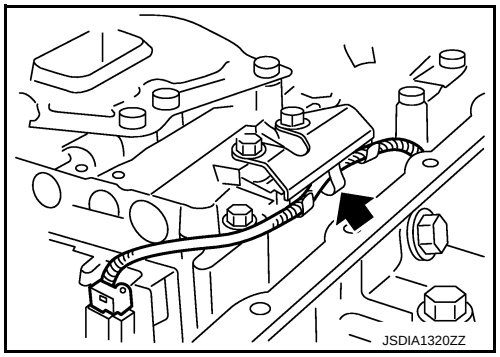
10. Connect A/T fluid temperature sensor 2 connector (A).
11. Securely fasten terminal cord assembly and A/T fluid temperature sensor 2 harness with terminal clips (⬅).



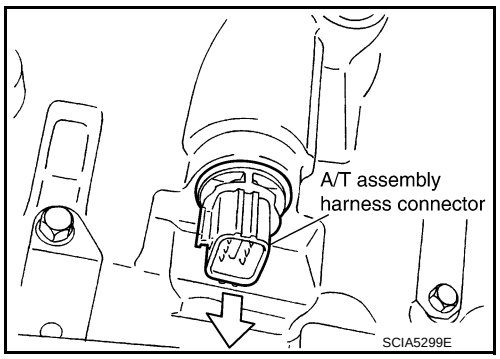
12. Connect output speed sensor connector (1).



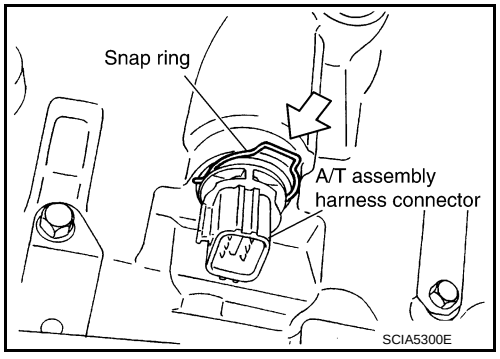
13. Securely fasten output speed sensor harness with terminal clip (⬅).



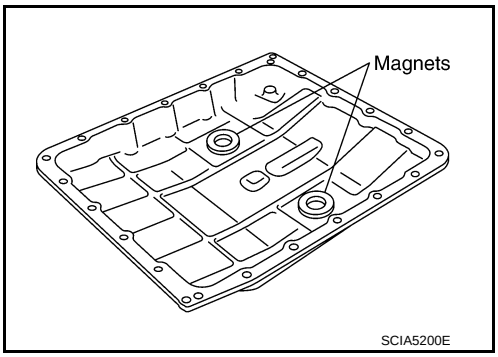
14. Pull down A/T assembly harness connector.
CAUTION:
Be careful not to damage connector.



15. Install snap ring to A/T assembly harness connector.



16. Install magnets in oil pan.



17. Install oil pan according to the following procedures.

a. VQ35HR models

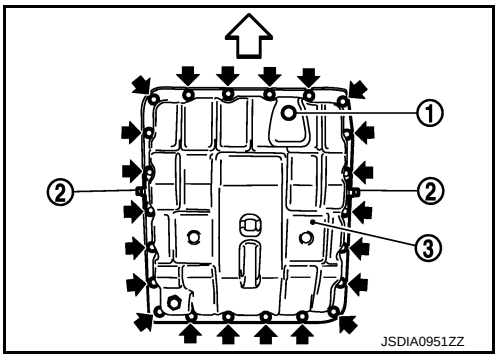
i. Install oil pan gasket to transmission case.

CAUTION:
- **Never reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

ii. Install oil pan (3), overflow plug (1) and clips (2) to transmission case.

⇦ : Front

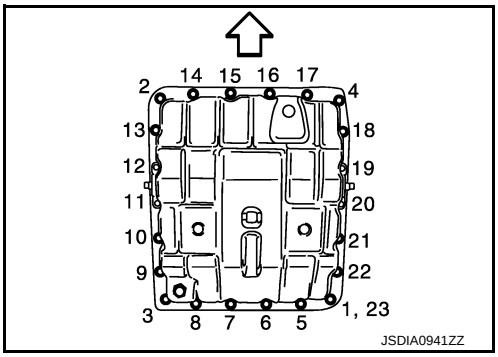
⬅ : Oil pan mounting bolt



CAUTION:
- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**

iii. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them.
Tighten oil pan mounting bolts to the specified torque. Refer to AT-251, "Component".

⇦ : Front



CAUTION:
Never reuse oil pan mounting bolts.

b. VK45DE models

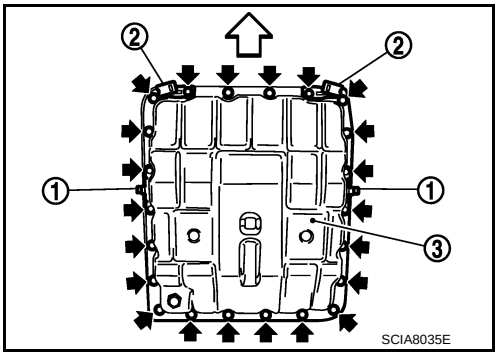
i. Install oil pan gasket to transmission case.

CAUTION:
- **Never reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**
- **Complete remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.**

ii. Install oil pan (3), clips (1) and brackets (2) to transmission case.

⇦ : Front

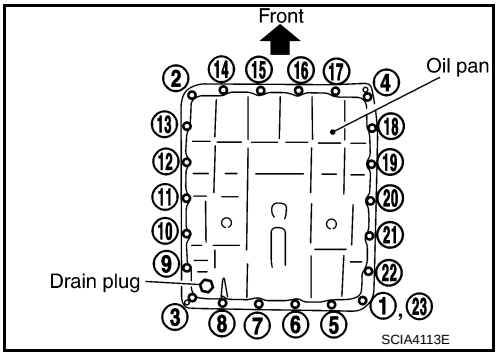
⬅ : Oil pan mounting bolt



CAUTION:
- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**
- **Be careful with installation direction of brackets.**

iii. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them.
Tighten oil pan mounting bolts to the specified torque. Refer to AT-251, "Component"

CAUTION:
Never reuse oil pan mounting bolts.

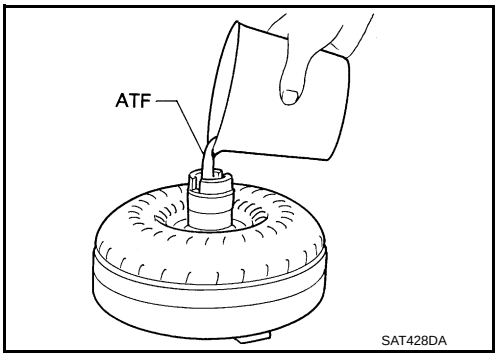


18. Install drain plug to oil pan. Tighten drain plug to the specified torque. Refer to AT-251, "Component".

CAUTION:
Never reuse drain plug and drain plug gasket.

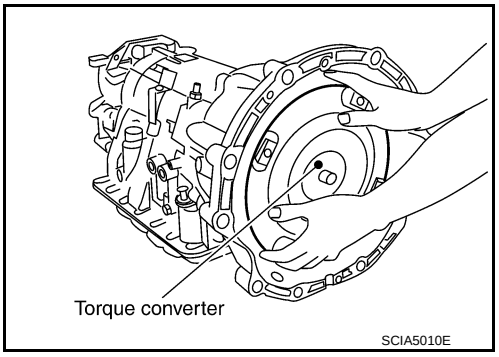
19. Install torque converter.

a. Pour ATF into torque converter.
- **Approximately 2 liter (2-1/8 US qt, 1-3/4 Imp qt) of ATF is required for a new torque converter.**
- **When reusing old torque converter, add the same amount of ATF as was drained.**



b. Install torque converter while aligning notches of torque converter with notches of oil pump.

CAUTION:
Install torque converter while rotating it.

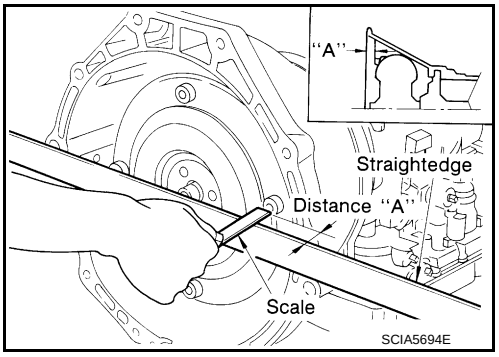


c. Measure distance “A” to make sure that torque converter is in proper position.

Distance “A”

VQ35HR models: 25.0 mm (0.98 in)

VK45DE models: 22.0 mm (0.87 in)



SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000005352658

Applied model		VQ35HR engine	VK45DE engine	
		AWD	2WD	AWD
Automatic transmission model		RE5R05A		
Transmission model code number		3EX1A	96X6A	96X6B
Stall torque ratio		1.74: 1	1.87: 1	
Transmission gear ratio	1st	3.842	3.827	
	2nd	2.353	2.368	
	3rd	1.529	1.519	
	4th	1.000	1.000	
	5th	0.839	0.834	
	Reverse	2.765	2.613	
Recommended fluid		Genuine NISSAN Matic S ATF*1		
Fluid capacity		10.3 liter (10-7/8 US qt, 9-1/8 Imp qt)		

CAUTION:
- **If Genuine NISSAN Matic S ATF is not available, Genuine NISSAN Matic J ATF may also be used.**
- **Using ATF other than Genuine NISSAN Matic S ATF or Matic J ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**

*1: Refer to MA-9, "Fluids and Lubricants".

Vehicle Speed at Which Gear Shifting Occurs

INFOID:0000000005352659

2WD MODELS

Engine model	Throttle position	Vehicle speed km/h (MPH)							
		D1→D2	D2→D3	D3→D4	D4→D5	D5→D4	D4→D3	D3→D2	D2→D1
VK45DE	Full throttle	56 - 60 (35 - 37)	89 - 97 (55 - 60)	138 - 148 (86 - 92)	206 - 216 (128 - 134)	202 - 212 (126 - 132)	121 - 131 (75 - 81)	73 - 81 (45 - 50)	30 - 34 (19 - 21)
	Half throttle	50 - 54 (31 - 34)	82 - 88 (51 - 55)	126 - 134 (78 - 83)	155 - 163 (96 - 101)	128 - 136 (80 - 85)	70 - 78 (43 - 48)	29 - 35 (18 - 22)	9 - 13 (6 - 8)

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

AWD MODELS

Engine model	Throttle position	Vehicle speed km/h (MPH)							
		D1→D2	D2→D3	D3→D4	D4→D5	D5→D4	D4→D3	D3→D2	D2→D1
VQ35HR	Full throttle	57 - 61 (36 - 37)	93 - 101 (58 - 62)	140 - 150 (87 - 93)	202 - 212 (126 - 131)	183 - 193 (114 - 119)	108 - 118 (68 - 73)	66 - 74 (42 - 45)	27 - 31 (17 - 19)
	Half throttle	48 - 52 (30 - 32)	79 - 85 (50 - 52)	111 - 119 (69 - 73)	139 - 147 (87 - 91)	106 - 114 (66 - 70)	64 - 72 (40 - 44)	33 - 39 (21 - 24)	9 - 13 (6 - 8)

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

Engine model	Throttle position	Vehicle speed km/h (MPH)							
		D1→D2	D2→D3	D3→D4	D4→D5	D5→D4	D4→D3	D3→D2	D2→D1
VK45DE	Full throttle	56 - 60 (35 - 37)	89 - 97 (55 - 60)	138 - 148 (86 - 92)	206 - 216 (128 - 134)	202 - 212 (126 - 132)	121 - 131 (75 - 81)	73 - 81 (45 - 50)	30 - 34 (19 - 21)
	Half throttle	50 - 54 (31 - 34)	82 - 88 (51 - 55)	126 - 134 (78 - 83)	155 - 163 (96 - 101)	128 - 136 (80 - 85)	70 - 78 (43 - 48)	29 - 35 (18 - 22)	9 - 13 (6 - 8)

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

Vehicle Speed at Which Lock-Up Occurs/Releases

INFOID:0000000005352660

2WD MODELS

Engine model	Throttle position	Vehicle speed km/h (MPH)	
		Lock-up ON	Lock-up OFF
VK45DE	Closed throttle	53 - 61 (33 - 38)	50 - 58 (31 - 36)
	Half throttle	196 - 204 (122 - 127)	138 - 146 (86 - 91)

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

AWD MODELS

Engine model	Throttle position	Vehicle speed km/h (MPH)	
		Lock-up ON	Lock-up OFF
VQ35HR	Closed throttle	51 - 59 (32 - 36)	48 - 56 (30 - 34)
	Half throttle	203 - 211 (127 - 131)	139 - 147 (87 - 91)

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

Engine model	Throttle position	Vehicle speed km/h (MPH)	
		Lock-up ON	Lock-up OFF
VK45DE	Closed throttle	53 - 61 (33 - 38)	50 - 58 (31 - 36)
	Half throttle	196 - 204 (122 - 127)	138 - 146 (86 - 91)

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

Stall Speed

INFOID:0000000005352661

Engine model	Stall speed
VQ35HR	2,700 - 3,000 rpm
VK45DE	2,260 - 2,560 rpm

Line Pressure

INFOID:0000000005352662

Engine speed	Line pressure [kPa (kg/cm^2, psi)]	
	“R” position	“D”, “M” positions
At idle speed	425 - 465 (4.3 - 4.7, 62 - 67)	379 - 428 (3.9 - 4.4, 55 - 62)
At stall speed	1,605 - 1,950 (16.4 - 19.9, 233 - 283)	1,310 - 1,500 (13.4 - 15.3, 190 - 218)

A/T Fluid Temperature Sensor

INFOID:0000000005352663

Name	Condition	CONSULT-III “DATA MONITOR” (Approx.)	Resistance (Approx.)
ATF TEMP SE 1	0°C (32°F)	3.3 V	15 kΩ
	20°C (68°F)	2.7 V	6.5 kΩ
	80°C (176°F)	0.9 V	0.9 kΩ

Name	Condition	CONSULT-III “DATA MONITOR” (Approx.)	Resistance (Approx.)
ATF TEMP SE 2	0°C (32°F)	3.3 V	10 kΩ
	20°C (68°F)	2.5 V	4 kΩ
	80°C (176°F)	0.7 V	0.5 kΩ

Input Speed Sensor

INFOID:0000000005352664

Name	Condition	Data (Approx.)
Input speed sensor 1	When running at 50 km/h (31 MPH) in 4th speed with the closed throttle position signal “OFF”.	1.3 kHz
Input speed sensor 2	When running at 20 km/h (12 MPH) in 1st speed with the closed throttle position signal “OFF”.	

Output Speed Sensor

INFOID:0000000005352665

Name	Condition	Data (Approx.)
Output speed sensor	When running at 20 km/h (12 MPH).	185 Hz

Reverse Brake

INFOID:0000000005352666

Model code number		3EX1A, 96X6A, 96X6B	
Number of drive plates		6	
Number of driven plates		6	
Clearance mm (in)	Standard	0.7 - 1.1 (0.028 - 0.043)	
Thickness of retaining plates		Thickness mm (in)	Part number*
		4.2 (0.165)	31667 90X14
		4.4 (0.173)	31667 90X15
		4.6 (0.181)	31667 90X16
		4.8 (0.189)	31667 90X17
		5.0 (0.197)	31667 90X18
		5.2 (0.205)	31667 90X19
		5.4 (0.213)	31667 90X0A

*: Always check with the Parts Department for the latest parts information.

Total End Play

INFOID:0000000005352667

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 95X00
1.0 (0.039)	31435 95X01
1.2 (0.047)	31435 95X02
1.4 (0.055)	31435 95X03
1.6 (0.063)	31435 95X04
1.8 (0.071)	31435 95X05

*: Always check with the Parts Department for the latest parts information.

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Diagnosis Flow

INFOID:0000000005352668

1.OBTAIN INFORMATION ABOUT SYMPTOM

1. Refer to AT-336, "Question sheet" and interview the customer to obtain the malfunction information (conditions and environment when the malfunction occurred) as much as possible when the customer brings in the vehicle.
2. Check the following:

- Service history
- Harnesses and connectors malfunction. Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

>> GO TO 2.

2.CHECK DTC

1. Before checking the malfunction, check whether any DTC exists.
2. If DTC exists, perform the following operations.

- Record the DTC and freeze frame data. (Print out the data using CONSULT-III and affix it to the Work Order Sheet.)
- Erase DTCs.
- Check the relationship between the cause that is clarified with DTC and the malfunction information described by the customer. AT-474, "Symptom Table" is effective.

3. Check the information of related service bulletins and others also.

Do malfunction information and DTC exist?

Malfunction information and DTC exists. >>GO TO 3.
Malfunction information exists, but no DTC. >>GO TO 4.
No malfunction information, but DTC exists. >>GO TO 5.

3.REPRODUCE MALFUNCTION SYMPTOM

Check any malfunction described by a customer, except those with DTC on the vehicle.
Also investigate whether the symptom is a fail-safe or normal operation. Refer to AT-466, "Fail-Safe".
When a malfunction symptom is reproduced, the question sheet is effective. Refer to AT-336, "Question sheet".
Verify the relationship between the symptom and the conditions in which the malfunction described by the customer occurs.

>> GO TO 5.

4.REPRODUCE MALFUNCTION SYMPTOM

Check the malfunction described by the customer on the vehicle.
Also investigate whether the symptom is a fail-safe or normal operation. Refer to AT-466, "Fail-Safe".
When a malfunction symptom is reproduced, the question sheet is effective. Refer to AT-336, "Question sheet".
Verify the relationship between the symptom and the conditions in which the malfunction described by the customer occurs.

>> GO TO 6.

5.PERFORM “DTC CONFIRMATION PROCEDURE”

Perform “DTC CONFIRMATION PROCEDURE” of the appropriate DTC to check if DTC is detected again.
Refer to AT-469, "DTC Inspection Priority Chart" when multiple DTCs are detected, and then determine the order for performing the diagnosis.

NOTE:
If no DTC is detected, refer to the freeze frame data.

Is any DTC detected?

YES >> GO TO 7.
NO >> Check according to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

6. IDENTIFY MALFUNCTIONING SYSTEM WITH “DIAGNOSIS CHART BY SYMPTOM”

Use AT-474, "Symptom Table" from the symptom inspection result in step 4. Then identify where to start performing the diagnosis based on possible causes and symptoms.

>> GO TO 8.

7. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the detected malfunctioning parts.
Reconnect parts or connector after repairing or replacing, and then erase DTC if necessary.

>> GO TO 8.

8. FINAL CHECK

Perform “DTC CONFIRMATION PROCEDURE” again to make sure that the repair is correctly performed.
Check that malfunctions are not reproduced when obtaining the malfunction information from the customer, referring to the symptom inspection result in step 3 or 4.

Is DTC or malfunction symptom reproduced?

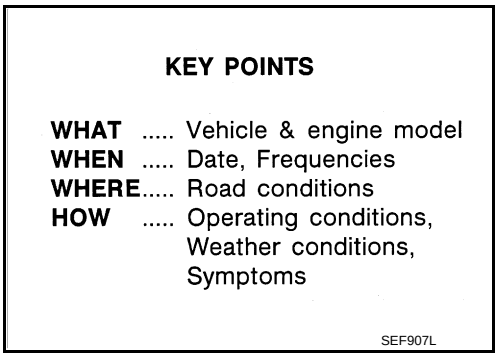
YES-1 >> DTC is reproduced: GO TO 5.
YES-2 >> Malfunction symptom is reproduced: GO TO 6.
NO >> Before delivering the vehicle to the customer, make sure that DTC is erased.

Question sheet

INFOID:0000000005352669

DESCRIPTION

There are many operating conditions that may cause a malfunction of the transmission parts. By understanding those conditions properly, a quick and exact diagnosis can be achieved.
In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about the concerns carefully. In order to systemize all the information for the diagnosis, prepare the question sheet referring to the question points.



WORKSHEET SAMPLE

Question Sheet					
Customer name MR/MS		Engine #		Manuf. Date	
		Incident Date		VIN	
		Model & Year		In Service Date	
		Trans.		Mileage	km / Mile

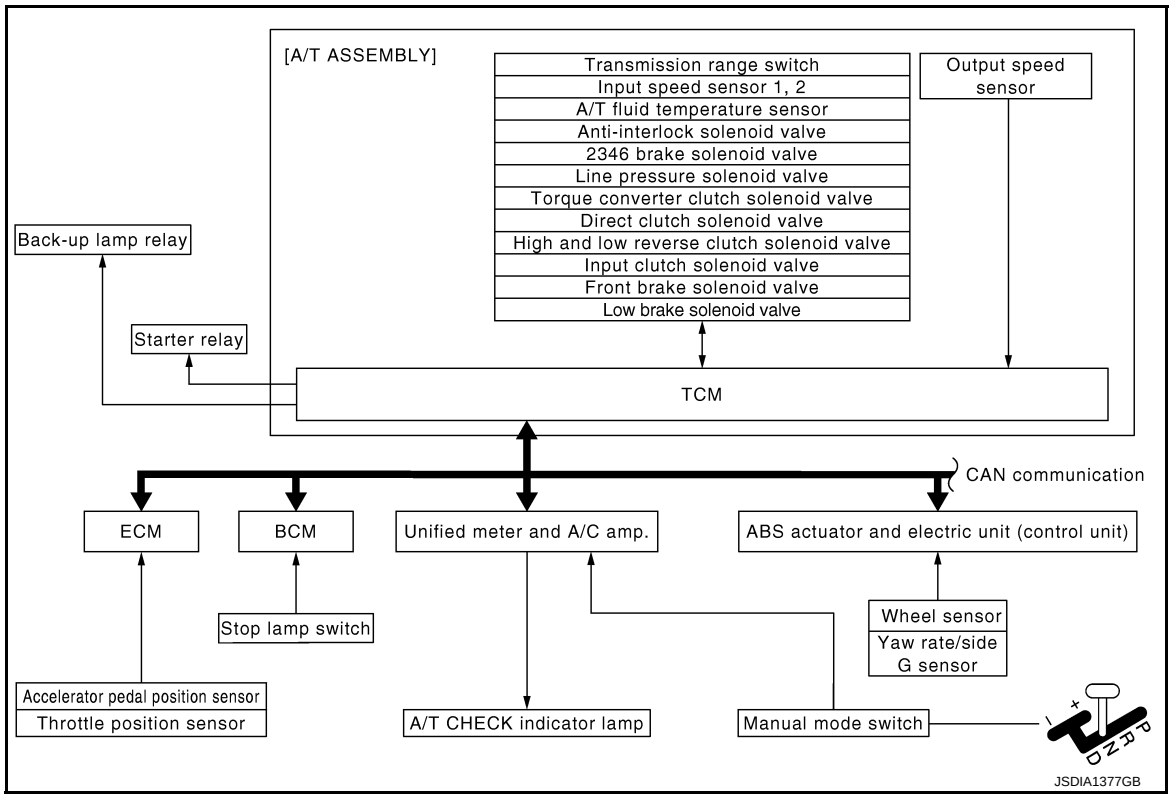
Question Sheet						
Symptoms		☐ Vehicle does not move (☐ Any position ☐ Particular position)				
		☐ No up-shift (☐ 1st → 2nd ☐ 2nd → 3rd ☐ 3rd → 4th ☐ 4th → 5th ☐ 5th → 6th ☐ 6th → 7th)				
		☐ No down-shift (☐ 7th → 6th ☐ 6th → 5th ☐ 5th → 4th ☐ 4th → 3rd ☐ 3rd → 2nd ☐ 2nd → 1st)				
		☐ Lock-up malfunction				
		☐ Shift point too high or too low				
		☐ Shift shock or slip				
		☐ Noise or vibration				
		☐ No kick down				
		☐ No pattern select				
		☐ Others				
Frequency		☐ All the time	☐ Under certain conditions	☐ Sometimes (times a day)		
Weather conditions		☐ Not affected				
	Weather	☐ Fine	☐ Clouding	☐ Raining	☐ Snowing	☐ Other ( )
	Temp.	☐ Hot	☐ Warm	☐ Cool	☐ Cold	☐ Temp. [Approx. °C (°F)]
	Humidity	☐ High	☐ Middle	☐ Low		
Transmission conditions		☐ Not affected				
		☐ Cold	☐ During warm-up	☐ After warm-up		
		☐ Engine speed (rpm)				
Road conditions		☐ Not affected				
		☐ In town	☐ In suburbs	☐ Freeway	☐ Off road (Up / Down)	
Driving conditions		☐ Not affected				
		☐ At starting	☐ While idling	☐ While engine racing	☐ At racing	☐ While cruising
		☐ While accelerating	☐ While decelerating	☐ While turning (Right / Left)		
		☐ Vehicle speed [km/h (MPH)]				
Other conditions						

FUNCTION DIAGNOSIS

A/T CONTROL SYSTEM

System Diagram

INFOID:0000000005352670



System Description

INFOID:0000000005352671

INPUT/OUTPUT SIGNAL CHART

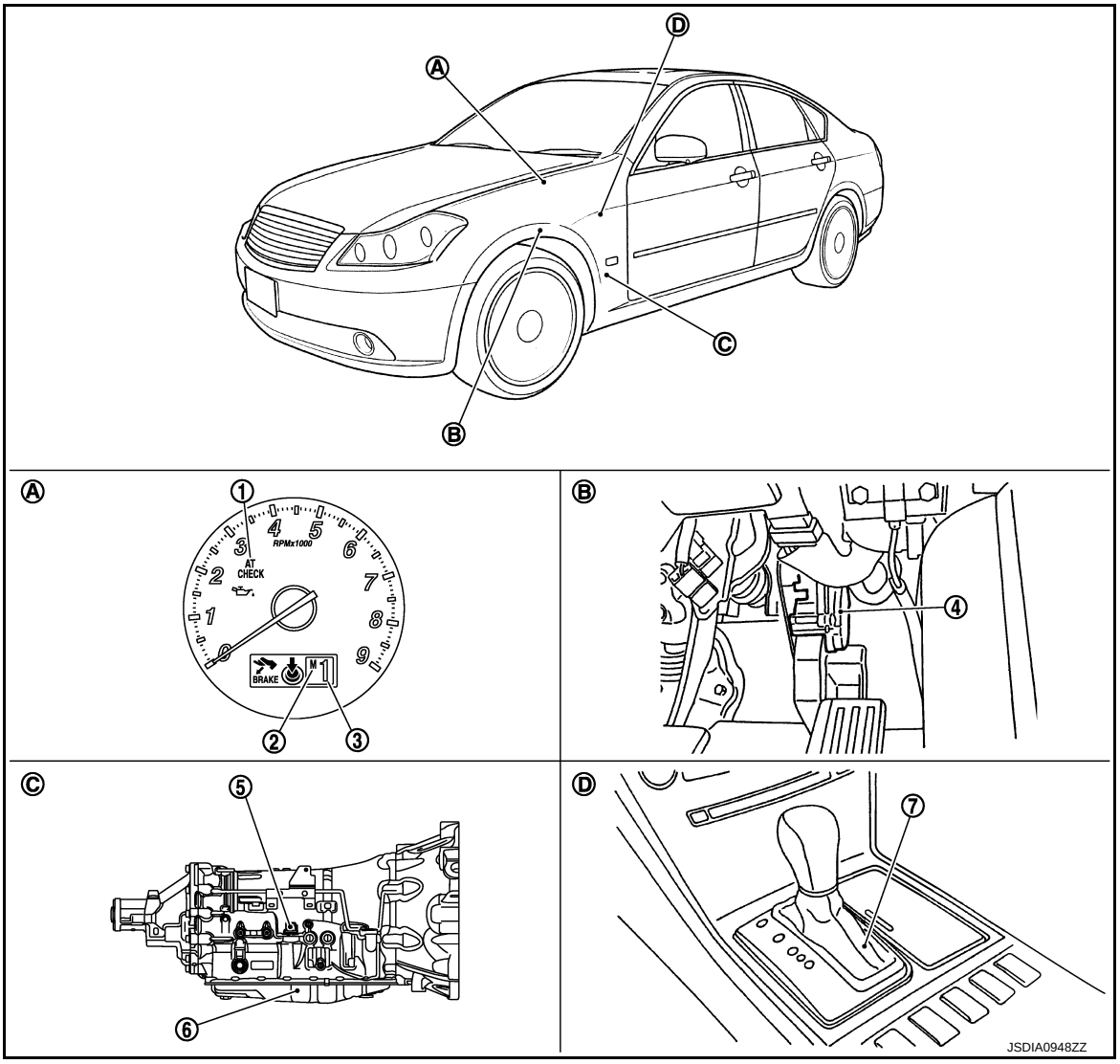
Sensor (or signal)		TCM function		Actuator
Transmission range switch Accelerator pedal position signal Closed throttle position signal Wide open throttle position signal Engine speed signal A/T fluid temperature sensor Output speed sensor Vehicle speed signal Manual mode switch signal Stop lamp switch signal Side G sensor signal Input speed sensor 1, 2	⇒	Line pressure control (AT-341) Shift change control (AT-345) Shift pattern control • ASC (Adaptive shift control) (AT-350) • Manual mode (AT-354) Lock-up control (AT-357) Fail-safe control (AT-466) Self-diagnosis (AT-391) CONSULT-III communication line (AT-391) CAN communication line (AT-397)	⇒	Input clutch solenoid valve Direct clutch solenoid valve Front brake solenoid valve High and low reverse clutch solenoid valve Low brake solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve Anti-interlock solenoid valve 2346 brake solenoid valve A/T CHECK indicator lamp Back-up lamp relay Starter relay

SYSTEM DESCRIPTION

- The A/T senses vehicle operating conditions through various sensors or signals. It always controls the optimum shift position and reduces shifting and lock-up shocks.
- Receive input signals transmitted from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, etc.
- Transmit required output signals to the respective solenoids.

Component Parts Location

INFOID:0000000005352672



1. A/T CHECK indicator lamp
2. A/T shift selector assembly
3. Shift position indicator
4. Accelerator pedal position sensor
5. A/T assembly connector
6. Control valve with TCM*
7. Control device assembly

A. Combination meter
B. Accelerator pedal
C. A/T assembly
D. Center console

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (7).
  - Manual mode select switch
  - Manual mode position select switch
- The following components are included in control valve with TCM (6).
  - TCM
  - Input speed sensor 1, 2
  - Output speed sensor
  - A/T fluid temperature sensor
  - Transmission range switch
  - Direct clutch solenoid valve
  - High and low reverse clutch solenoid valve

- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

Component Description

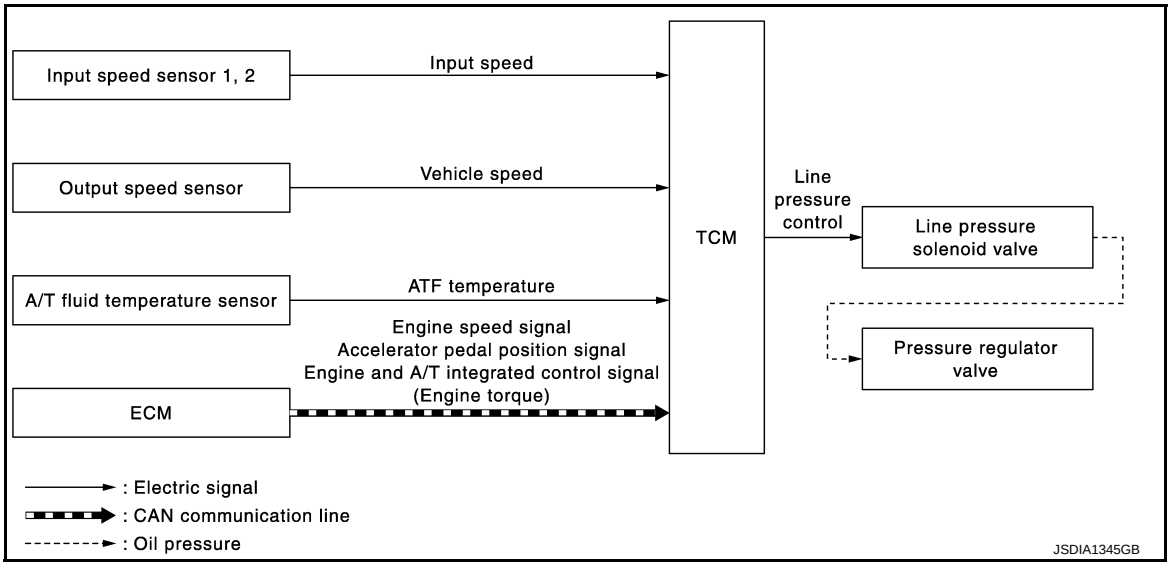
INFOID:0000000005352673

Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Transmission range switch	AT-402, "Description"
Output speed sensor	AT-407, "Description"
Input speed sensor 1	AT-405, "Description"
Input speed sensor 2	
A/T fluid temperature sensor	AT-403, "Description"
Input clutch solenoid valve	AT-429, "Description"
Front brake solenoid valve	AT-431, "Description"
Direct clutch solenoid valve	AT-448, "Description"
High and low reverse clutch solenoid valve	AT-445, "Description"
Low brake solenoid valve	AT-446, "Description"
Anti-interlock solenoid valve	AT-428, "Description"
2346 brake solenoid valve	AT-447, "Description"
Torque converter clutch solenoid valve	AT-424, "Description"
Line pressure solenoid valve	AT-427, "Description"
Accelerator pedal position sensor	AT-432, "Description"
Throttle position sensor	
Manual mode switch	AT-439, "Description"
Starter relay	AT-399, "Description"
A/T CHECK indicator lamp	When the ignition switch is pushed to the ON position, the light comes on for 2 seconds.
Stop lamp switch	AT-452, "Description"
ECM	EC-32, "System Description"
BCM	BCS-4, "System Description"
Unified meter and A/C amp.	DI-26, "System Description"
ABS actuator and electric unit (control unit)	BRC-9, "Schematic"
Wheel sensor	BRC-10, "Functions"
Yaw rate/side G sensor	BRC-10, "Functions"

LINE PRESSURE CONTROL

System Diagram

INFOID:0000000005352674



System Description

INFOID:0000000005352675

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to TCM	TCM function	Actuator
Input speed sensor 1, 2	Input speed	Line pressure control	Line pressure solenoid valve ↓ Pressure regulator valve
Output speed sensor	Vehicle speed		
A/T fluid temperature sensor	ATF temperature		
ECM	Engine speed signal*		
	Accelerator pedal position signal*		
	Engine and A/T integrated control signal (Engine torque)*		

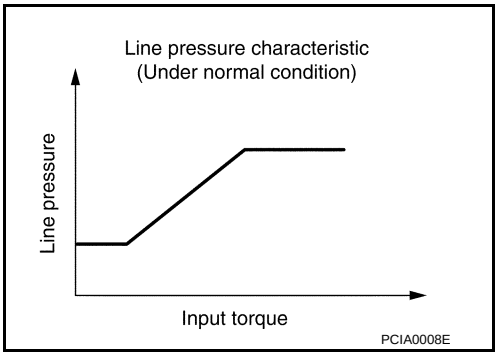
*: This signal is transmitted via CAN communication line.

SYSTEM DESCRIPTION

- When an engine and A/T integrated control signal (engine torque) equivalent to the engine drive force is transmitted from the ECM to the TCM, the TCM controls the line pressure solenoid valve.
  This line pressure solenoid controls the pressure regulator valve as the signal pressure and adjusts the pressure of the operating oil discharged from the oil pump to the line pressure most appropriate to the driving state.
- The TCM has stored in memory a number of patterns for the optimum line pressure characteristic for the driving state.
- In order to obtain the most appropriate line pressure characteristic to meet the current driving state, the TCM controls the line pressure solenoid current value and thus controls the line pressure.

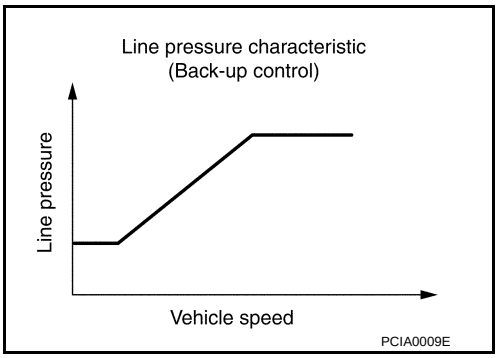
Normal Control

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



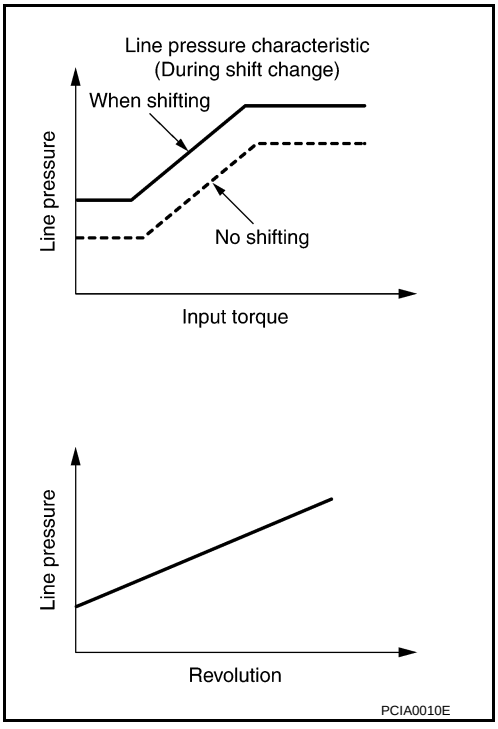
Back-up Control (Engine Brake)

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



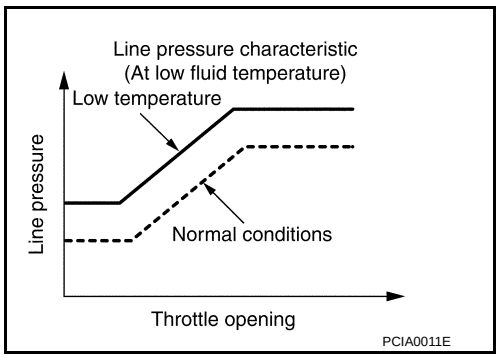
During Shift Change

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



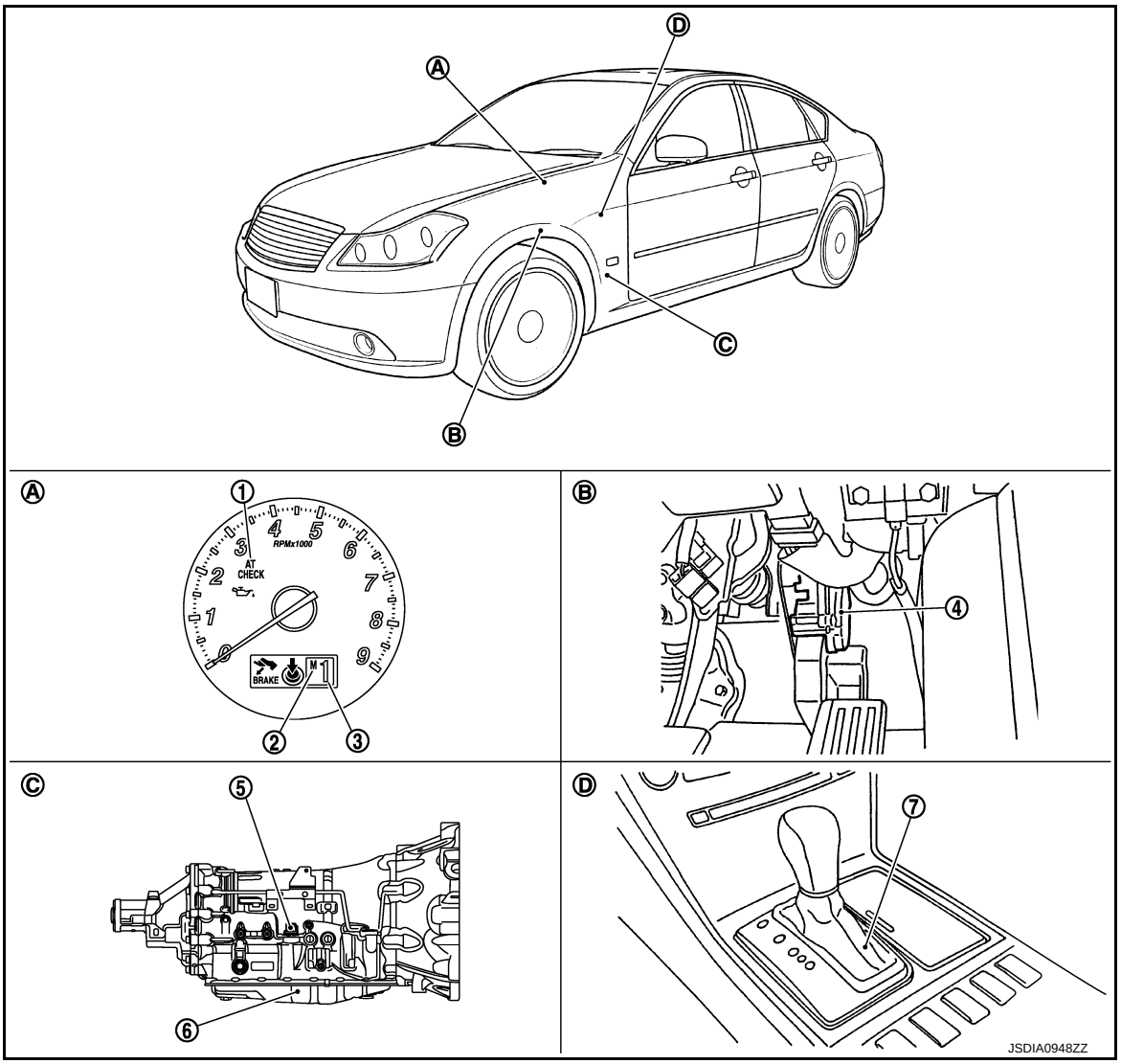
At Low Fluid Temperature

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



Component Parts Location

INFOID:0000000005352676



1. A/T CHECK indicator lamp
2. A/T shift selector assembly
3. Shift position indicator
4. Accelerator pedal position sensor
5. A/T assembly connector
6. Control valve with TCM*
7. Control device assembly
A. Combination meter
B. Accelerator pedal
C. A/T assembly
D. Center console

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (7).

- Manual mode select switch
- Manual mode position select switch

• The following components are included in control valve with TCM (6).

- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

Component Description

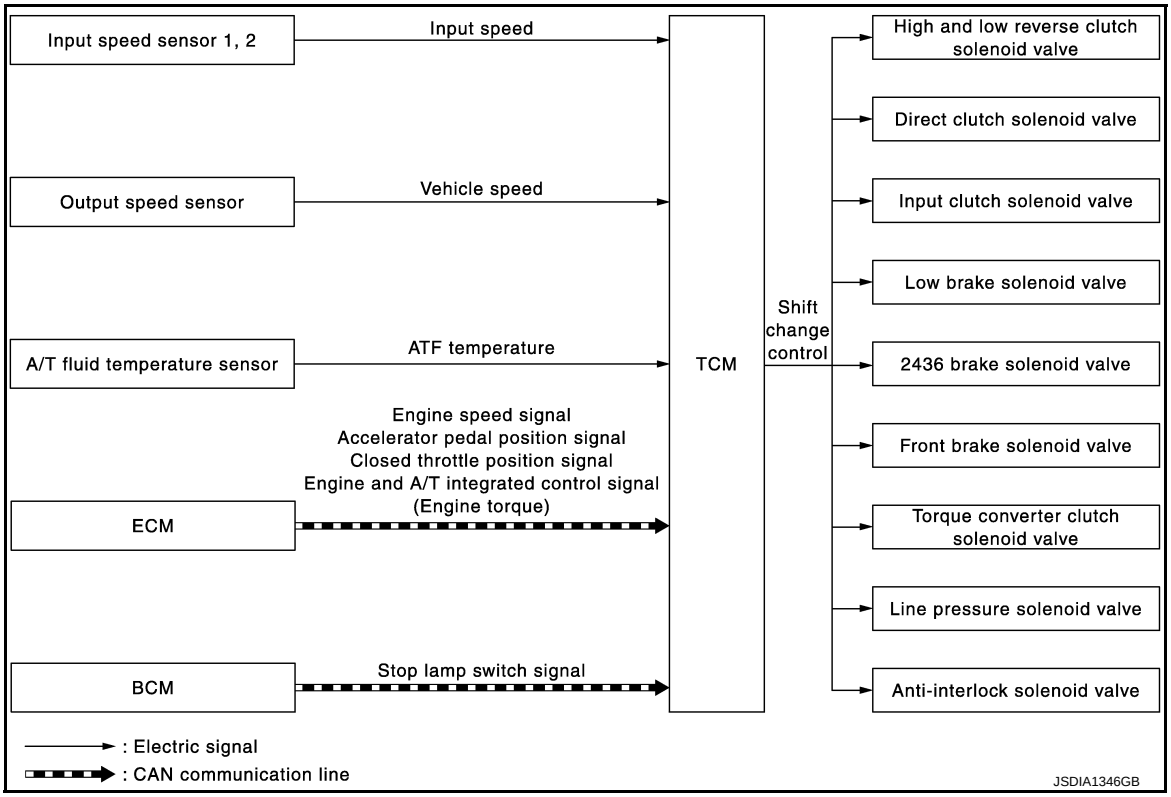
INFOID:0000000005352677

Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Output speed sensor	AT-407, "Description"
Input speed sensor 1	AT-405, "Description"
Input speed sensor 2	
A/T fluid temperature sensor	AT-403, "Description"
Line pressure solenoid valve	AT-427, "Description"
Pressure regulator valve	Adjusts the oil discharged from the oil pump to the optimum pressure (line pressure) for the driving state.
ECM	EC-32, "System Description"

SHIFT CHANGE CONTROL

System Diagram

INFOID:0000000005352678



System Description

INFOID:0000000005352679

INPUT/OUTPUT SIGNAL CHART

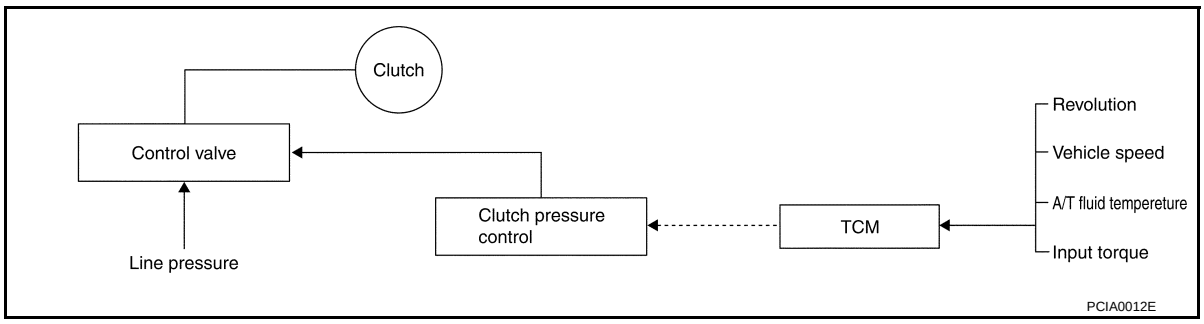
Sensor	Input signal to TCM	TCM function	Actuator
Input speed sensor 1, 2	Input speed	Shift change control	• High and low reverse clutch solenoid valve • Direct clutch solenoid valve • Input clutch solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Front brake solenoid valve • Torque converter clutch solenoid valve • Line pressure solenoid valve • Anti-interlock solenoid valve
Output speed sensor	Vehicle speed		
A/T fluid temperature sensor	ATF temperature		
ECM	Engine speed signal*		
	Accelerator pedal position signal*		
	Closed throttle position signal*		
	Engine and A/T integrated control signal (Engine torque)*		
BCM	Stop lamp switch signal*		

*: This signal is transmitted via communication line.

SYSTEM DESCRIPTION

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

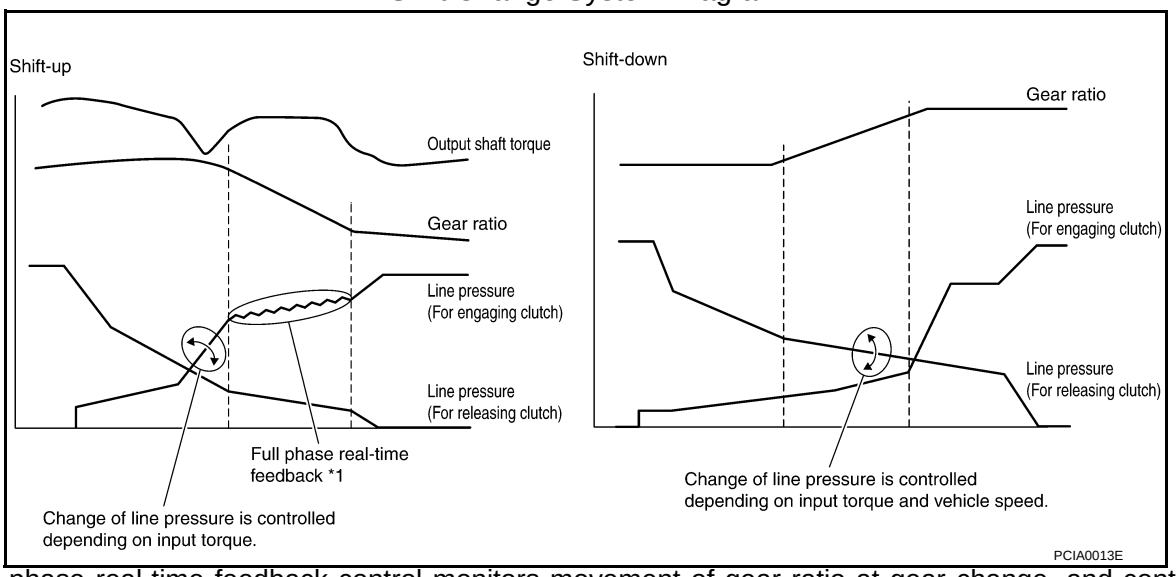
possible to finely control the clutch hydraulic pressure with high precision and a smoother shift change characteristic is attained.



Shift Change

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

Shift Change System Diagram

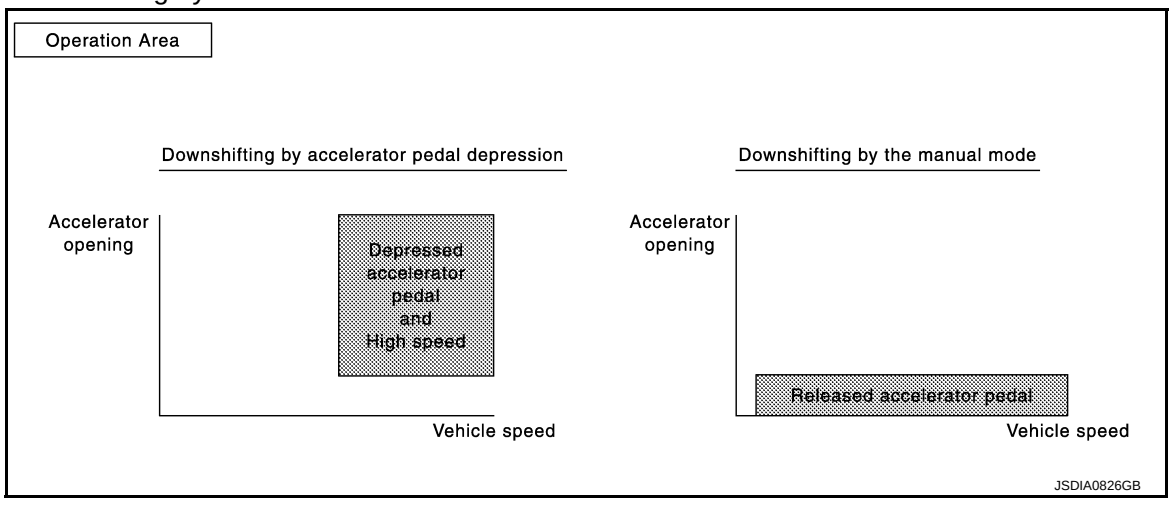


*1: Full phase real-time feedback control monitors movement of gear ratio at gear change, and controls oil pressure in real-time to achieve the best gear ratio.

Blipping Control

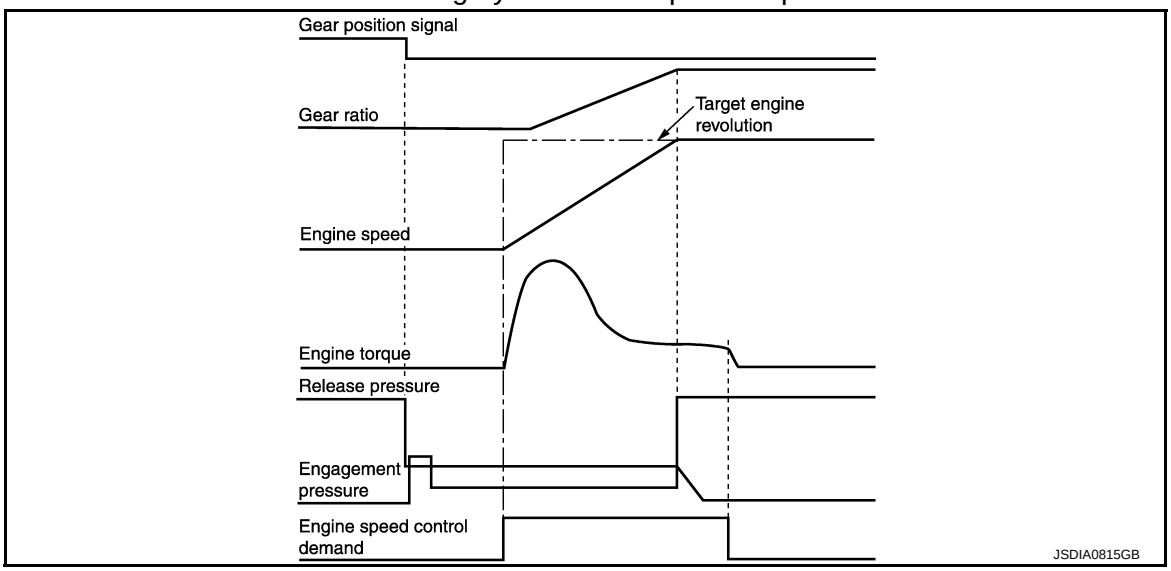
This system makes transmission clutch engage readily by controlling (synchronizing) engine revolution according to the (calculation of) engine revolution after shifting down.

• “BLIPPING CONTROL” functions.
- When downshifting by accelerator pedal depression.
- When downshifting by the manual mode.

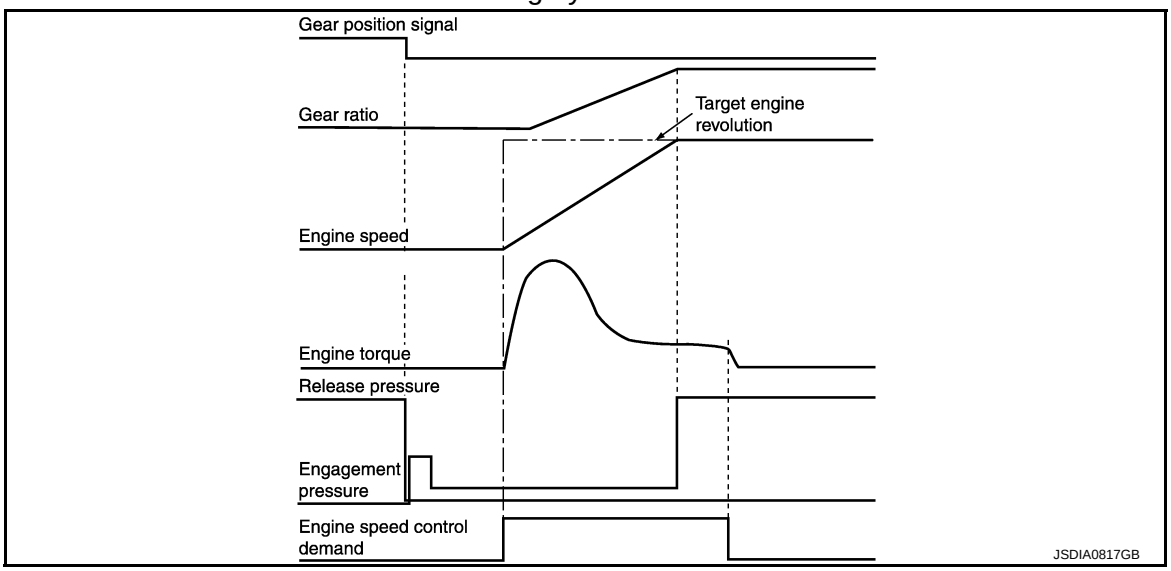


- TCM selects “BLIPPING CONTROL” or “NORMAL SHIFT CONTROL” according to the gear position, the selector lever position, the engine torque and the speed when accelerating by pedal depression.
- Engine speed control demand signal is transmitted from TCM to ECM under “BLIPPING CONTROL”.
- ECM synchronizes the engine speed according to the engine speed control demand signal.

Downshifting by accelerator pedal depression

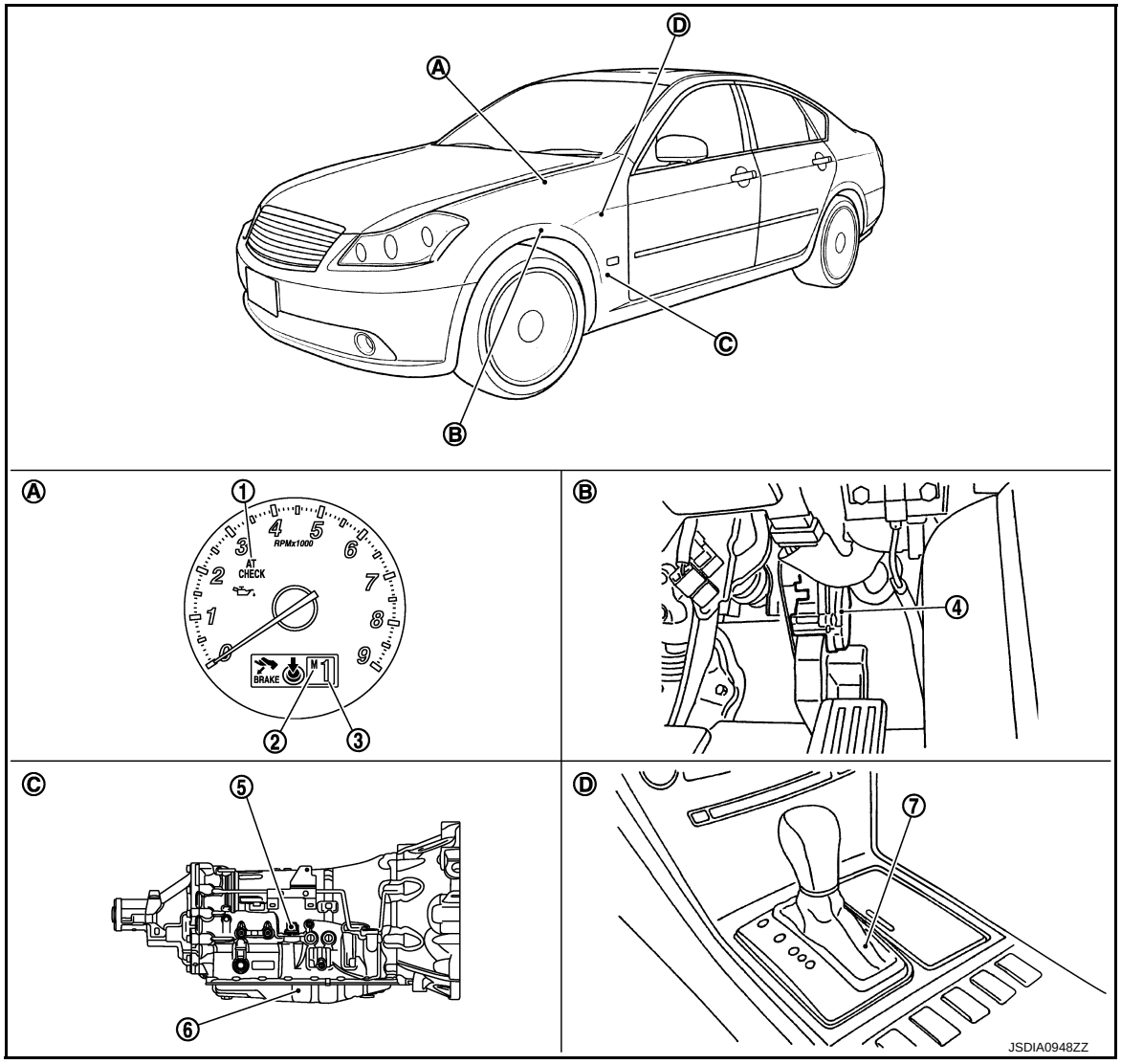


Downshifting by the manual mode



Component Parts Location

INFOID:0000000005352680



1. A/T CHECK indicator lamp
2. A/T shift selector assembly
3. Shift position indicator
4. Accelerator pedal position sensor
5. A/T assembly connector
6. Control valve with TCM*
7. Control device assembly

A. Combination meter
B. Accelerator pedal
C. A/T assembly
D. Center console

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (7).
- Manual mode select switch
- Manual mode position select switch
- The following components are included in control valve with TCM (6).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve

- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

Component Description

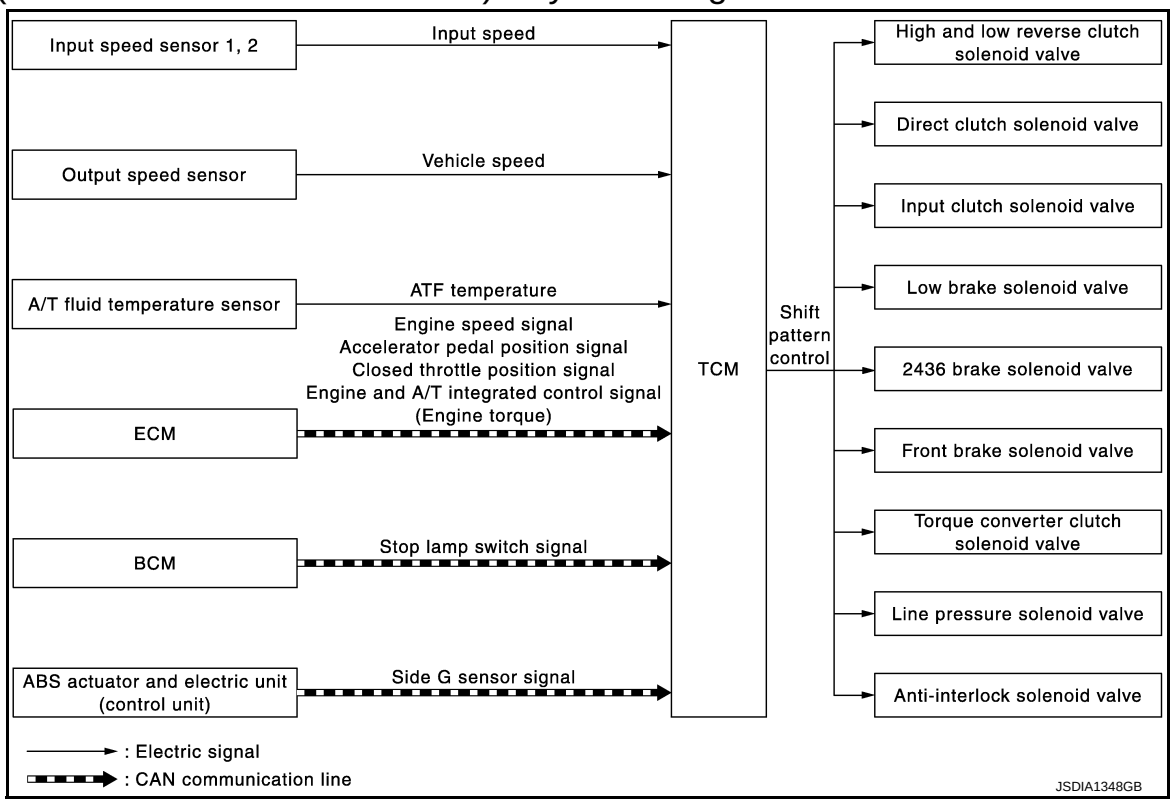
INFOID:0000000005352681

Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Output speed sensor	AT-407, "Description"
Input speed sensor 1	AT-405, "Description"
Input speed sensor 2	
A/T fluid temperature sensor	AT-403, "Description"
Input clutch solenoid valve	AT-429, "Description"
Front brake solenoid valve	AT-431, "Description"
Direct clutch solenoid valve	AT-448, "Description"
High and low reverse clutch solenoid valve	AT-445, "Description"
Low brake solenoid valve	AT-446, "Description"
Anti-interlock solenoid valve	AT-428, "Description"
2346 brake solenoid valve	AT-447, "Description"
Line pressure solenoid valve	AT-427, "Description"
Torque converter clutch solenoid valve	AT-424, "Description"
ECM	EC-32, "System Description"
BCM	BCS-4, "System Description"

SHIFT PATTERN CONTROL
ASC (ADAPTIVE SHIFT CONTROL)

ASC (ADAPTIVE SHIFT CONTROL) : System Diagram

INFOID:0000000005352682



ASC (ADAPTIVE SHIFT CONTROL) : System Description

INFOID:0000000005352683

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to TCM	TCM function	Actuator
Input speed sensor 1, 2	Input speed	Shift pattern control	• High and low reverse clutch solenoid valve • Direct clutch solenoid valve • Input clutch solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Front brake solenoid valve • Torque converter clutch solenoid valve • Line pressure solenoid valve • Anti-interlock solenoid valve
Output speed sensor	Vehicle speed		
A/T fluid temperature sensor	ATF temperature		
ECM	Engine speed signal*		
	Accelerator pedal position signal*		
	Closed throttle position signal*		
	Engine and A/T integrated control signal (engine torque)*		
ABS actuator and electric unit (control unit)	Side G sensor signal*		
BCM	Stop lamp switch signal*		

*: This signal is transmitted via CAN communication line.

SYSTEM DESCRIPTION

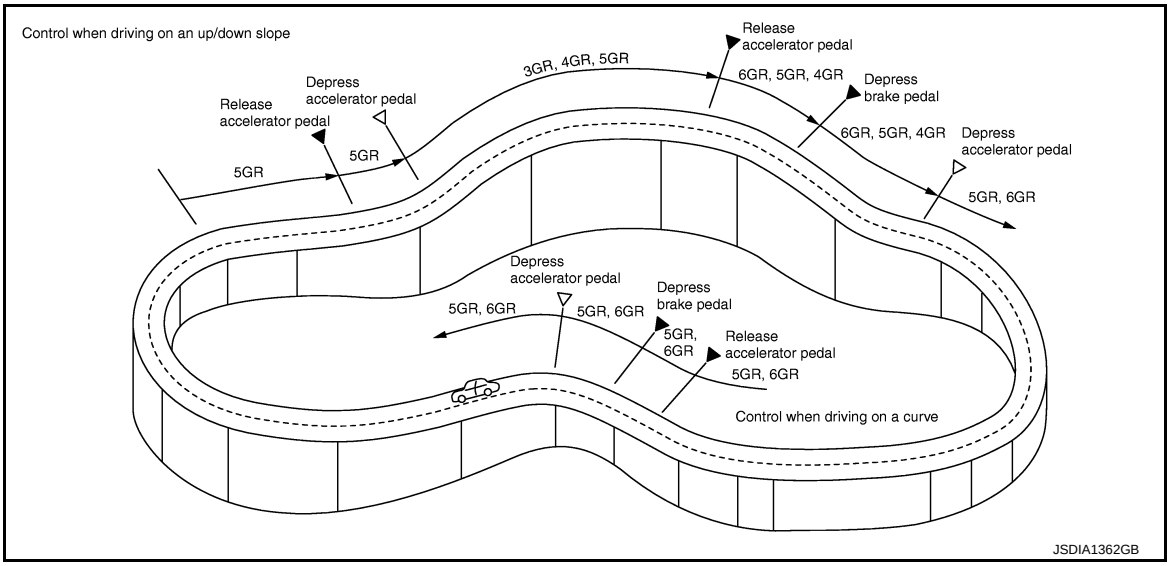
It automatically selects the shift pattern (such as road environment and driving style) suitable for the various situations so as to allow the vehicle to be driven efficiently and smoothly.

For example.....

- When driving on an up/down slope
  ASC judges up/down slope according to engine torque data transmitted from the ECM and vehicle speed. Fixing at 4GR, 5GR or 6GR on an up-slope prevents shift hunting and controls the vehicle to gain optimum

driving force. On a down-slope, automatic shift-down to 4GR, 5GR or 6GR controls to gain optimum engine brake.

- When driving on a curve
  TCM receives the side G sensor signal from the ABS actuator and electric unit (control unit). It locks to 4GR, 5GR or 6GR position in moderate cornering or to 3GR position in sharp cornering based on this signal. This prevents any upshift and kickdown during cornering, maintaining smooth vehicle travel.

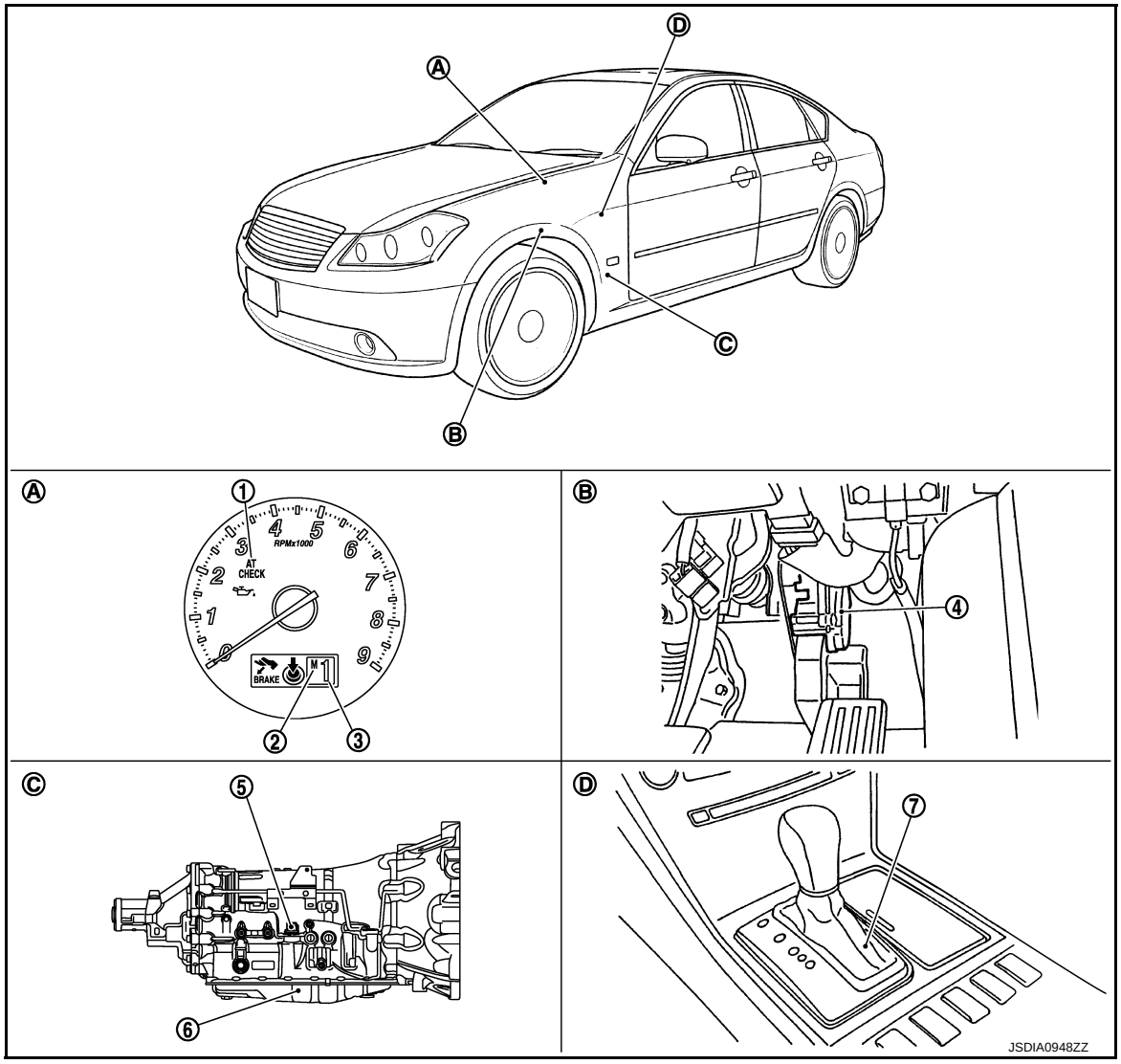


DS Mode

- Changes to the shift schedule that mainly utilizes the high engine speed zone when ASC is active.
- DS mode can be switched according to the following method.
- When the selector lever is in the “D” position, shifting the selector lever to manual shift gate enables switching to DS mode.
- When in DS mode, shifting the selector lever to the main gate enables to cancel DS mode.

ASC (ADAPTIVE SHIFT CONTROL) : Component Parts Location

INFOID:0000000005352684



1. A/T CHECK indicator lamp
2. A/T shift selector assembly
3. Shift position indicator
4. Accelerator pedal position sensor
5. A/T assembly connector
6. Control valve with TCM*
7. Control device assembly

A. Combination meter
B. Accelerator pedal
C. A/T assembly
D. Center console

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (7).
  - Manual mode select switch
  - Manual mode position select switch
- The following components are included in control valve with TCM (6).
  - TCM
  - Input speed sensor 1, 2
  - Output speed sensor
  - A/T fluid temperature sensor
  - Transmission range switch
  - Direct clutch solenoid valve
  - High and low reverse clutch solenoid valve

- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

ASC (ADAPTIVE SHIFT CONTROL) : Component Description

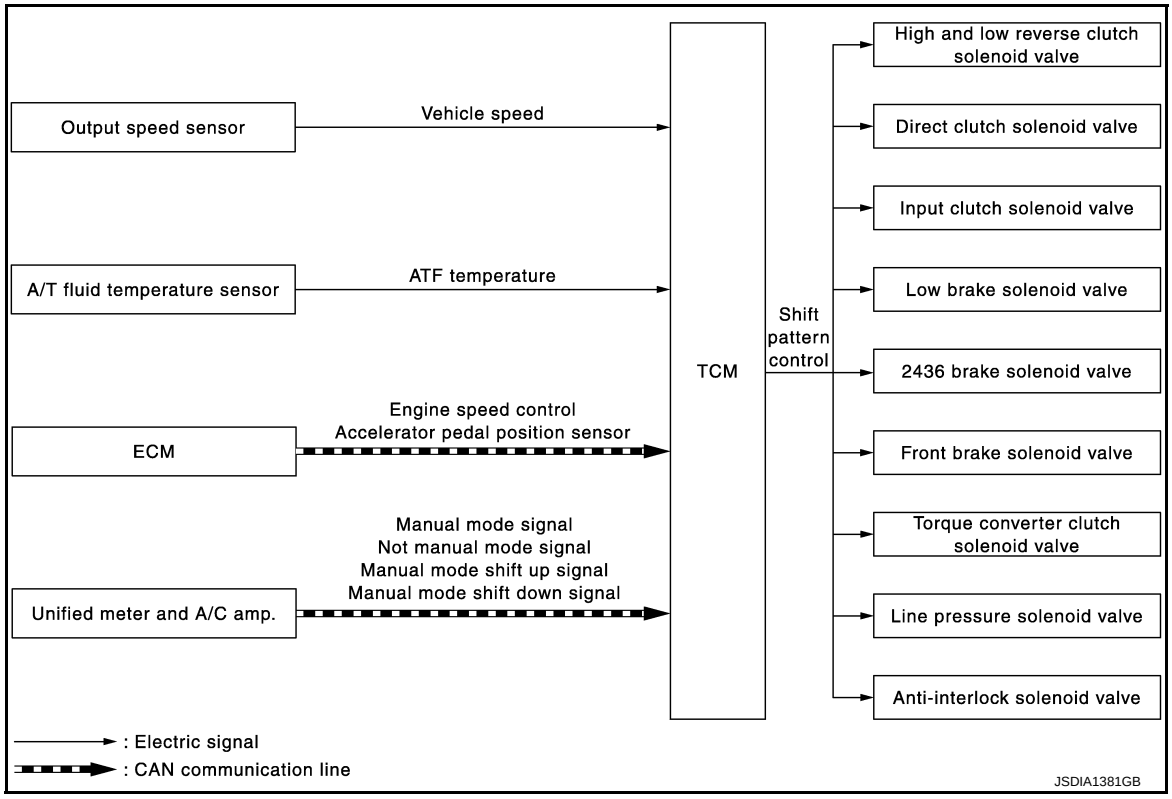
INFOID:0000000005352685

Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Output speed sensor	AT-407, "Description"
Input speed sensor 1	AT-405, "Description"
Input speed sensor 2	
A/T fluid temperature sensor	AT-403, "Description"
Input clutch solenoid valve	AT-429, "Description"
Front brake solenoid valve	AT-431, "Description"
Direct clutch solenoid valve	AT-448, "Description"
High and low reverse clutch solenoid valve	AT-445, "Description"
Low brake solenoid valve	AT-446, "Description"
Anti-interlock solenoid valve	AT-428, "Description"
2346 brake solenoid valve	AT-447, "Description"
Line pressure solenoid valve	AT-427, "Description"
Torque converter clutch solenoid valve	AT-424, "Description"
ECM	EC-32, "System Description"
BCM	BCS-4, "System Description"
ABS actuator and electric unit (control unit)	BRC-9, "Schematic"

MANUAL MODE

MANUAL MODE : System Diagram

INFOID:0000000005352686



MANUAL MODE : System Description

INFOID:0000000005352687

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to TCM	TCM function	Actuator
Output speed sensor	Vehicle speed	Shift pattern control	• High and low reverse clutch solenoid valve • Direct clutch solenoid valve • Input clutch solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Front brake solenoid valve • Torque converter clutch solenoid valve • Line pressure solenoid valve • Anti-interlock solenoid valve
A/T fluid temperature sensor	ATF temperature		
ECM	Engine speed signal*		
	Accelerator pedal position signal*		
Unified meter and A/C amp.	Manual mode signal*		
	Not manual mode signal*		
	Manual mode shift up signal*		
	Manual mode shift down signal*		

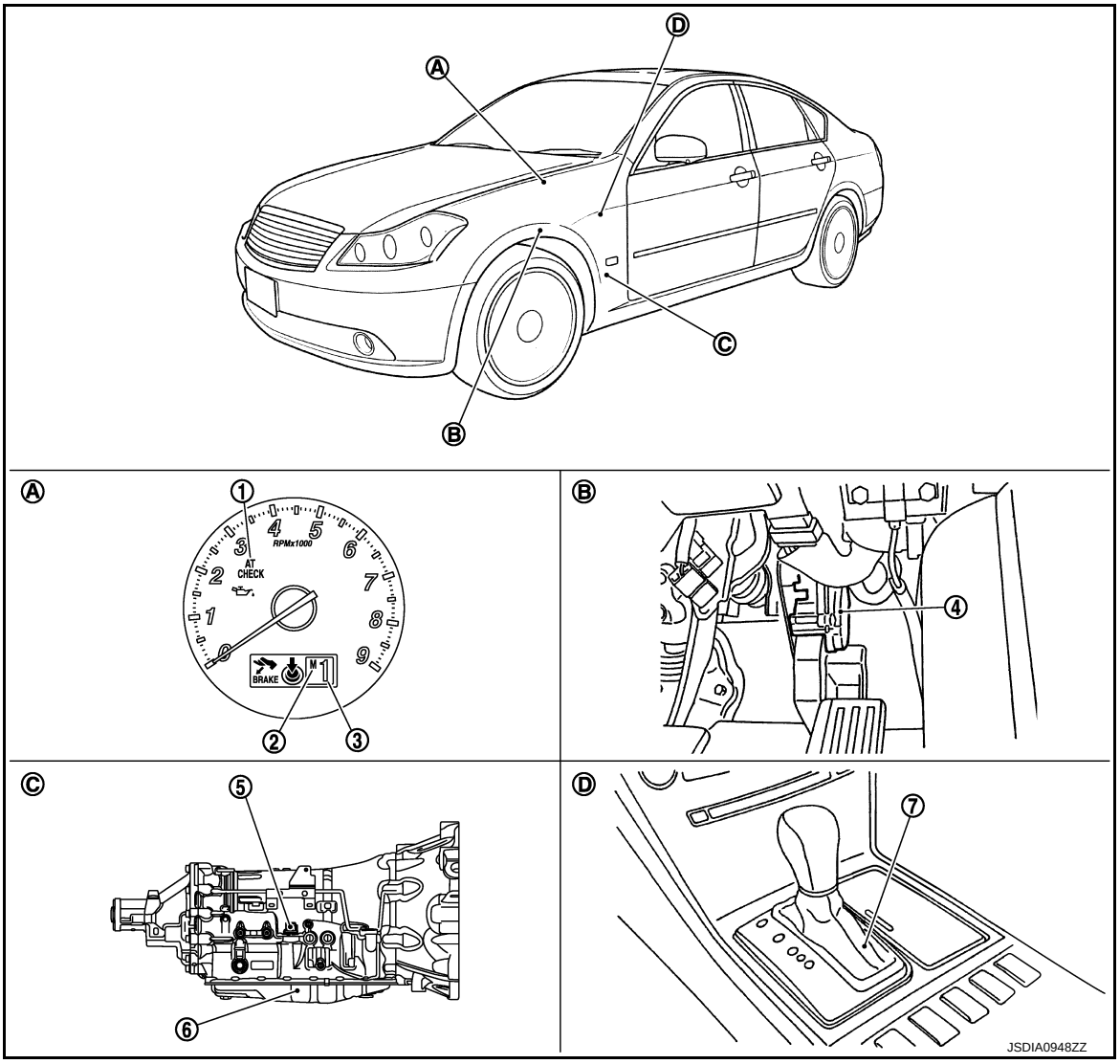
*: This signal is transmitted via CAN communication line.

SYSTEM DESCRIPTION

- The TCM receives the manual mode signal, not manual mode signal, manual mode shift up signal and manual mode shift down signal from unified meter and A/C amp. via CAN communication line. The TCM shifts shift pattern control to the manual mode based on these signals, and then shifts the A/T by operating each solenoid valve according to the shift operation of the driver.
- The TCM prohibits the manual mode while being in fail-safe mode due to an A/T malfunction, etc. Refer to AT-466, "Fail-Safe".

MANUAL MODE : Component Parts Location

INFOID:0000000005352688



1. A/T CHECK indicator lamp
2. A/T shift selector assembly
3. Shift position indicator
4. Accelerator pedal position sensor
5. A/T assembly connector
6. Control valve with TCM*
7. Control device assembly

A. Combination meter
B. Accelerator pedal
C. A/T assembly
D. Center console

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (7).
  - Manual mode select switch
  - Manual mode position select switch
- The following components are included in control valve with TCM (6).
  - TCM
  - Input speed sensor 1, 2
  - Output speed sensor
  - A/T fluid temperature sensor
  - Transmission range switch
  - Direct clutch solenoid valve
  - High and low reverse clutch solenoid valve

- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

MANUAL MODE : Component Description

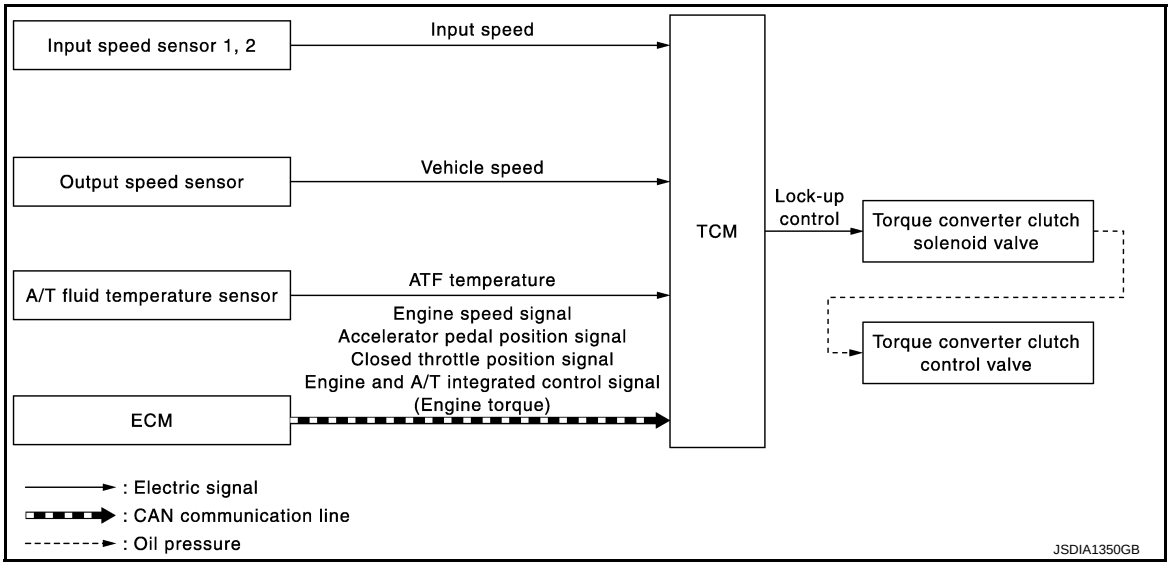
INFOID:0000000005352689

Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Output speed sensor	AT-407, "Description"
A/T fluid temperature sensor	AT-403, "Description"
Input clutch solenoid valve	AT-429, "Description"
Front brake solenoid valve	AT-431, "Description"
Direct clutch solenoid valve	AT-448, "Description"
High and low reverse clutch solenoid valve	AT-445, "Description"
Low brake solenoid valve	AT-446, "Description"
Anti-interlock solenoid valve	AT-428, "Description"
2346 brake solenoid valve	AT-447, "Description"
Line pressure solenoid valve	AT-427, "Description"
Torque converter clutch solenoid valve	AT-424, "Description"
ECM	EC-32, "System Description"
Unified meter and A/C amp.	DI-26, "System Description"

LOCK-UP CONTROL

System Diagram

INFOID:0000000005352690



System Description

INFOID:0000000005352691

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to TCM	TCM function	Actuator
Input speed sensor 1, 2	Input speed	Lock-up control	Torque converter clutch solenoid valve ↓ Torque converter clutch control valve
Output speed sensor	Vehicle speed		
A/T fluid temperature sensor	ATF temperature		
ECM	Engine speed signal*		
	Accelerator pedal position signal*		
	Closed throttle position signal*		
	Engine and A/T integrated control signal (Engine torque)*		

*: This signal is transmitted via CAN communication line.

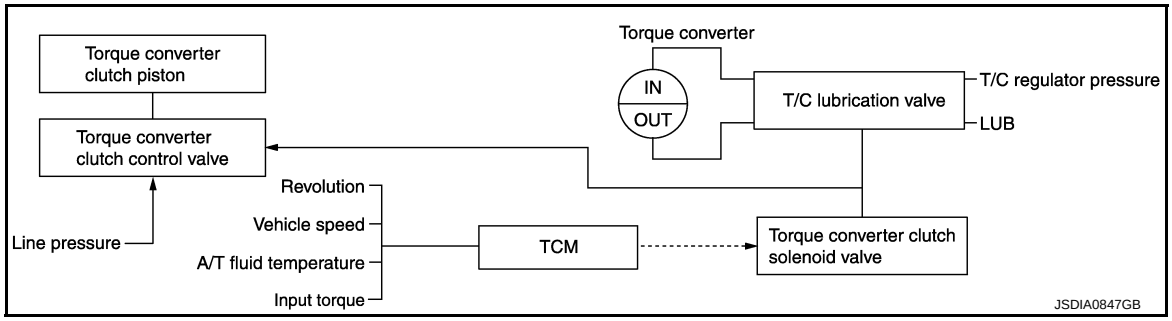
SYSTEM DESCRIPTION

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

Lock-up operation condition table

Selector lever	"D" position						"M" position					
Gear position	7	6	5	4	3	2	7	6	5	4	3	2
Lock-up	×	–	–	–	–	–	×	×	×	×	×	×
Slip lock-up	×	×	×	×	×	×	×	×	×	×	×	×

Torque Converter Clutch Control Valve Control
Lock-up control system diagram



Lock-up released
- In the lock-up released state, the torque converter clutch control valve is set into the unlocked state by the torque converter clutch solenoid and the lock-up apply pressure is drained.
  in this way, the torque converter clutch piston is not coupled.

Lock-up Applied
- In the lock-up applied state, the torque converter clutch control valve is set into the locked state by the torque converter clutch solenoid and lock-up apply pressure is generated.
  In this way, the torque converter clutch piston is pressed and coupled.

Smooth Lock-up Control

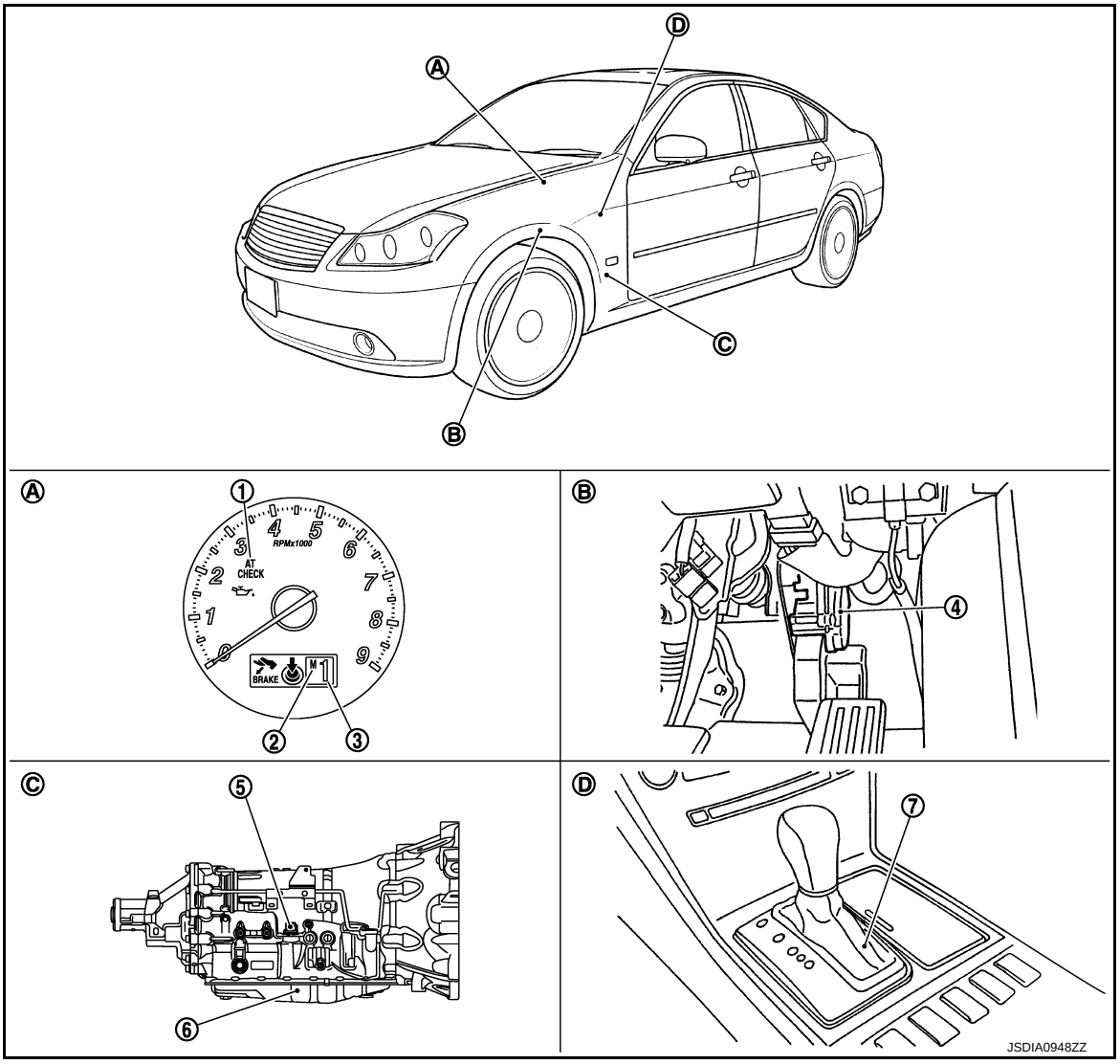
When shifting from the lock-up released state to the lock-up applied state, the current output to the torque converter clutch solenoid is controlled with the TCM. In this way, when shifting to the lock-up applied state, the torque converter clutch is temporarily set to the half-clutched state to reduce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

Half-clutched State
- The current output from the TCM to the torque converter clutch solenoid is varied to steadily increase the torque converter clutch solenoid pressure.
  In this way, the lock-up apply pressure gradually rises and while the torque converter clutch piston is put into half-clutched states, the torque converter clutch piston operating pressure is increased and the coupling is completed smoothly.

Slip Lock-up Control
- In the slip region, the torque converter clutch solenoid current is controlled with the TCM to put it into the half-clutched state. This absorbs the engine torque fluctuation and lock-up operates from low speed.
  This raises the fuel efficiency for 2GR, 3GR, 4GR 5GR, 6GR and 7GR.

Component Parts Location

INFOID:0000000005352692



1. A/T CHECK indicator lamp
2. A/T shift selector assembly
3. Shift position indicator
4. Accelerator pedal position sensor
5. A/T assembly connector
6. Control valve with TCM*
7. Control device assembly

A. Combination meter
B. Accelerator pedal
C. A/T assembly
D. Center console

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (7).
  - Manual mode select switch
  - Manual mode position select switch
- The following components are included in control valve with TCM (6).
  - TCM
  - Input speed sensor 1, 2
  - Output speed sensor
  - A/T fluid temperature sensor
  - Transmission range switch
  - Direct clutch solenoid valve
  - High and low reverse clutch solenoid valve

- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

Component Description

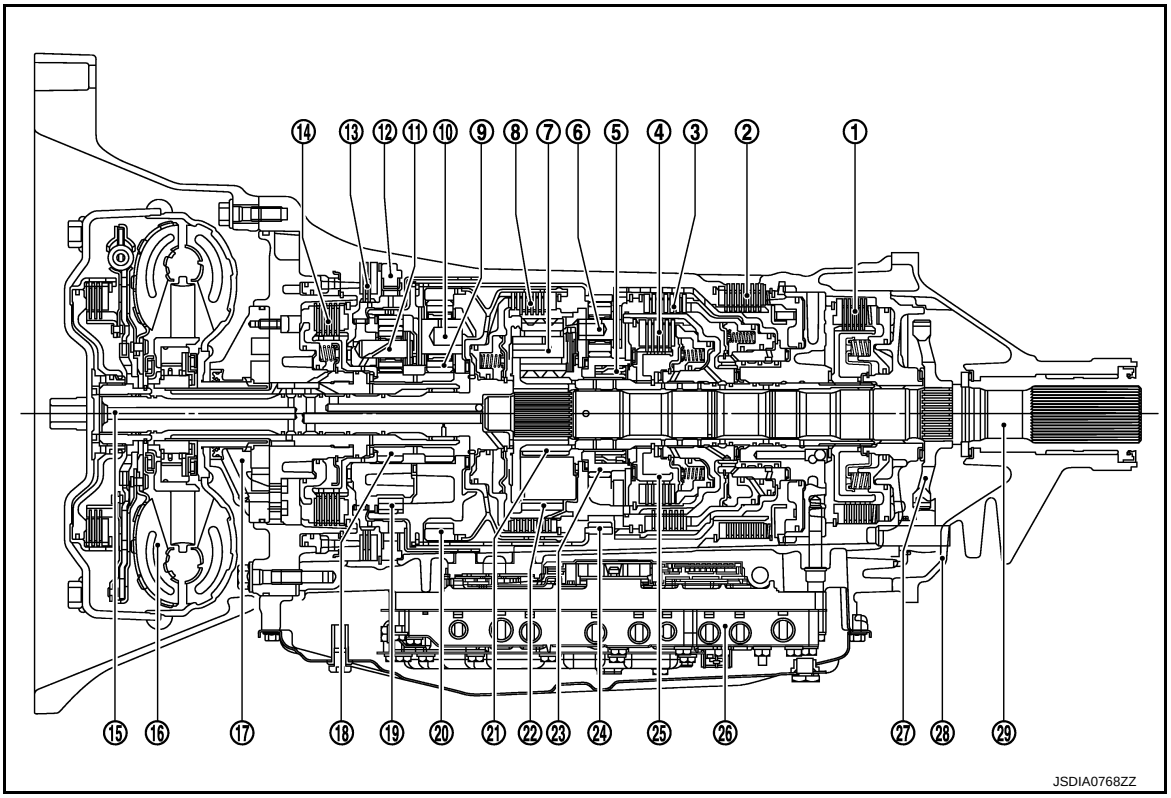
INFOID:0000000005352693

Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Output speed sensor	AT-407, "Description"
Input speed sensor 1	AT-405, "Description"
Input speed sensor 2	
A/T fluid temperature sensor	AT-403, "Description"
Torque converter clutch solenoid valve	AT-424, "Description"
Torque converter clutch control valve	Switches the lock-up to operating or released. Also, by performing the lock-up operation transiently, lock-up smoothly.
ECM	EC-32, "System Description"

SHIFT MECHANISM

Cross-Sectional View

INFOID:0000000005352694

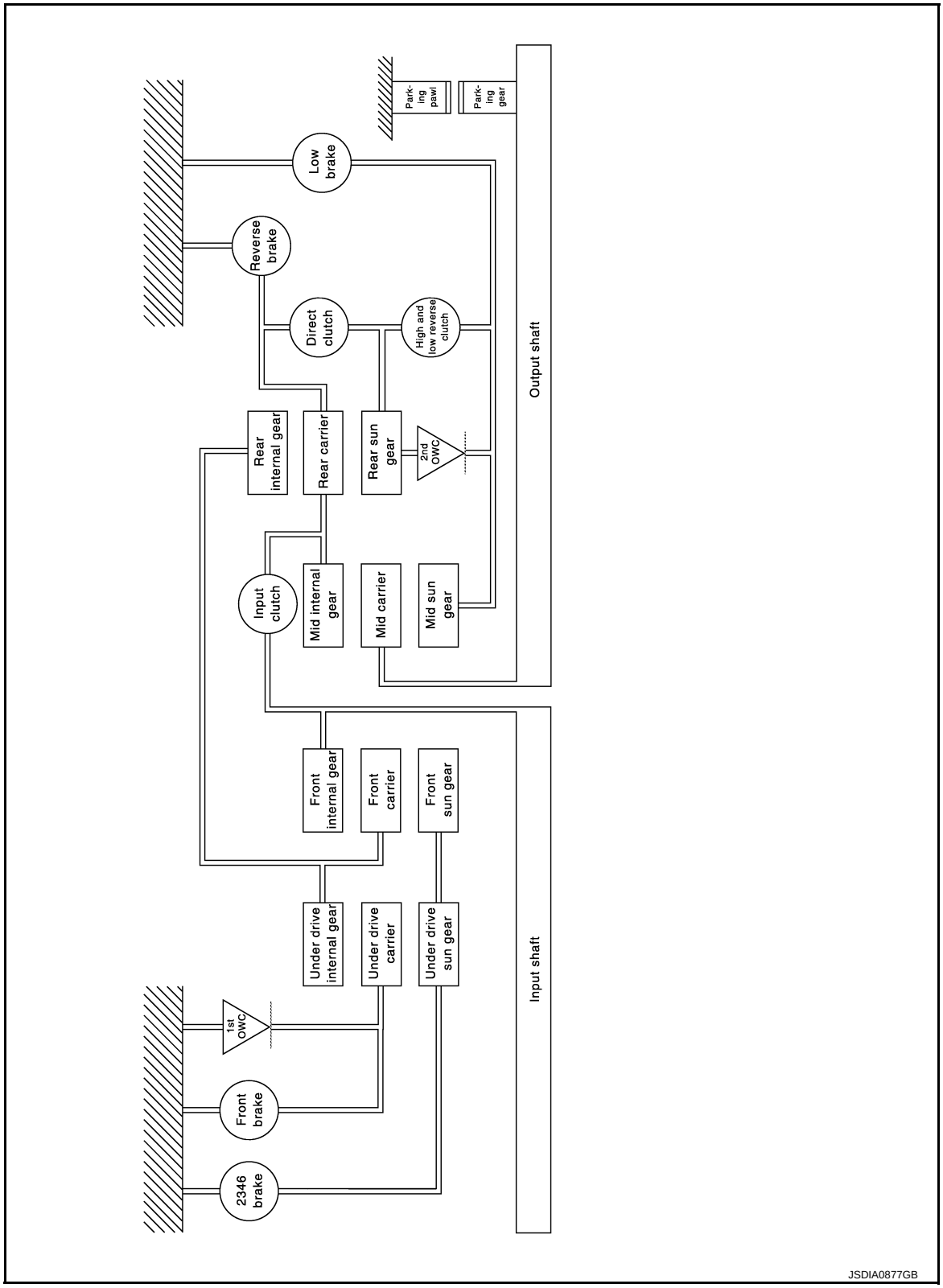


1.	Low brake	2.	Reverse brake	3.	Direct clutch
4.	High and low reverse clutch	5.	2nd one-way clutch	6.*1	Rear carrier
7.	Mid carrier	8.	Input clutch	9.*2	Front sun gear
10.*3	Front carrier	11.	Under drive carrier	12.	1st one-way clutch
13.	Front brake	14.	2346 brake	15.*4	Input shaft
16.	Torque converter	17.	Oil pump	18.*2	Under drive sun gear
19.*3	Under drive internal gear	20.*4	Front internal gear	21.	Mid sun gear
22.*1	Mid internal gear	23.	Rear sun gear	24.	Rear internal gear
25.	High and low reverse clutch hub	26.	Control valve with TCM	27.	Parking gear
28.	Rear extension	29.	Output shaft		

*1: 6 and 22 are one unit.
*2: 9 and 18 are one unit.
*3: 10 and 19 are one unit.
*4: 15 and 20 are one unit.

System Diagram

INFOID:0000000005352695



System Description

INFOID:0000000005352696

DESCRIPTION

With the use of 4 sets of planetary gears, A/T enables 7-speed transmission for forward and 1-speed transmission for backward, depending on the combination of 3 sets of multiple-disc clutches, 4 sets of multiple-disc brakes and 2 sets of one-way clutches.

CLUTCH AND BAND CHART

Name of the part / Shift position		I/C	D/C		H&LR/C	F/B	L/B		2346/B	REV/B	1st OWC	2nd OWC	Remarks
			FRONT	REAR			INNER	OUTER					
P					△	△							Park position
R					◇	◇				○	◎	◎	Reverse position
N					△	△							Neutral position
D, DS	1st				☆	☆	○	○			◎	◎	Automatic shift 1⇔2⇔3⇔4⇔5⇔6⇔7
	2nd						○	○	○			◎	
	3rd		○	○			○		○				
	4th		○	○	○				○				
	5th	○		○	○								
	6th	○			○				○				
	7th	○			○	○							
7M	7th	○			○	○							Locks* (held stationary) in 7GR
6M	6th	○			○				○				Locks* (held stationary) in 6GR
5M	5th	○		○	○								Locks* (held stationary) in 5GR
4M	4th		○	○	○				○				Locks* (held stationary) in 4GR
3M	3rd		○	○			○		○				Locks* (held stationary) in 3GR
2M	2nd				◇		○	○	○			◎	Locks* (held stationary) in 2GR
1M	1st				◇	◇	○	○			◎	◎	Locks* (held stationary) in 1GR

*: Down shift automatically according to the vehicle speed.

○ – Operates
◎ – Operates during “progressive” acceleration.
◇ – Operates and affects power transmission while coasting.
△ – Line pressure is applied but does not affect power transmission.
☆ – Operates at the fixed speed or less.

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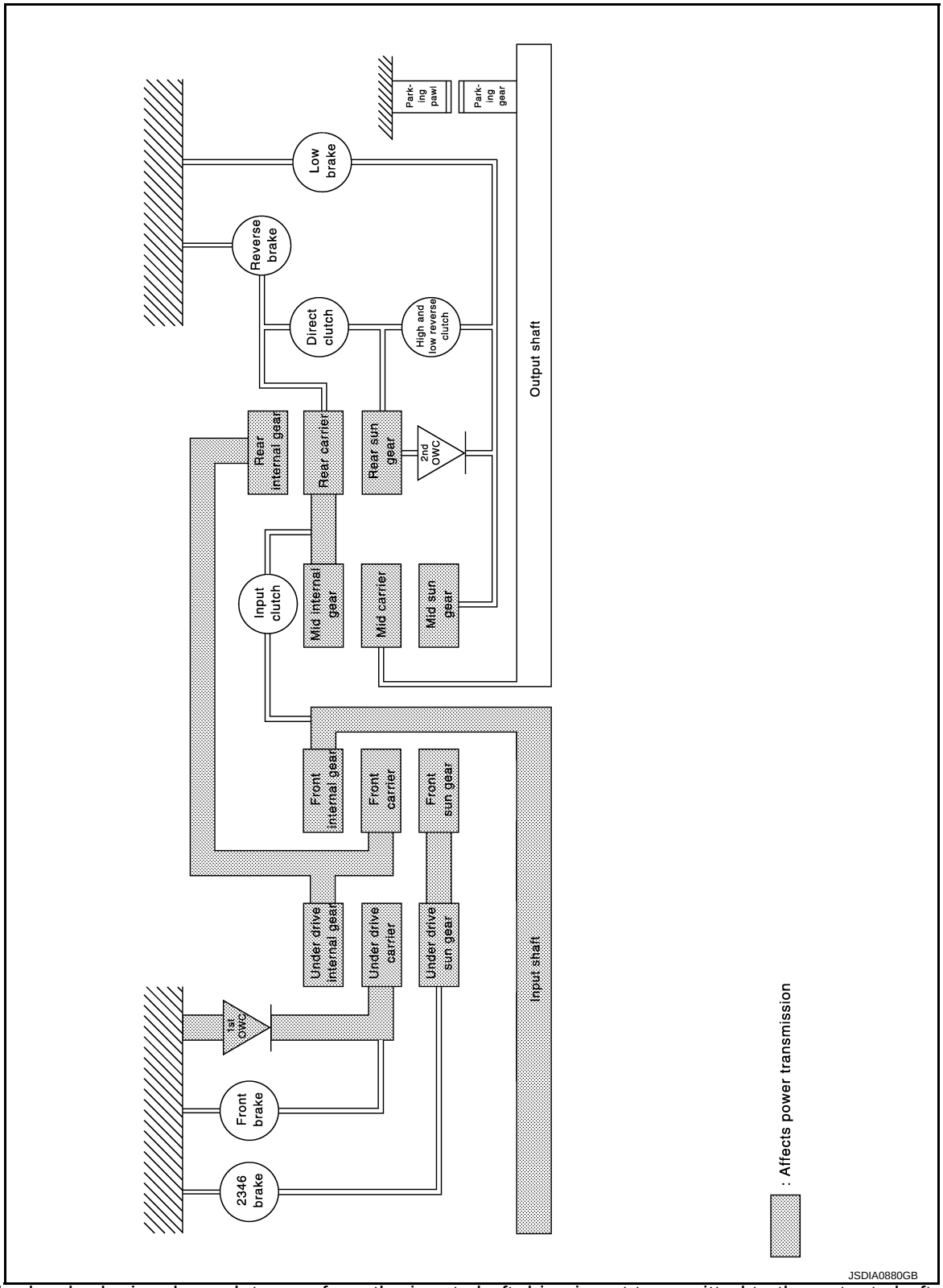
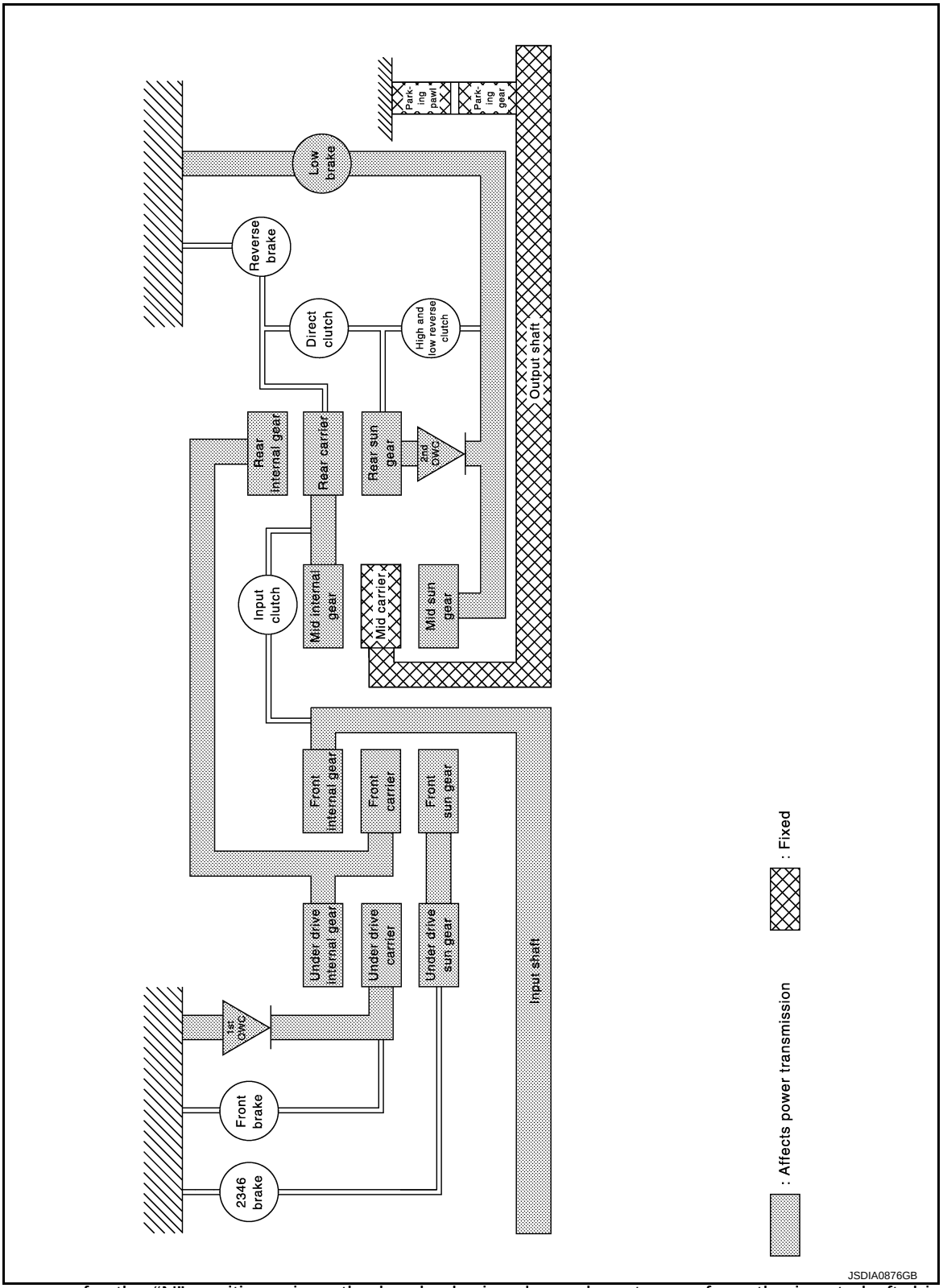
POWER TRANSMISSION

“N” Position



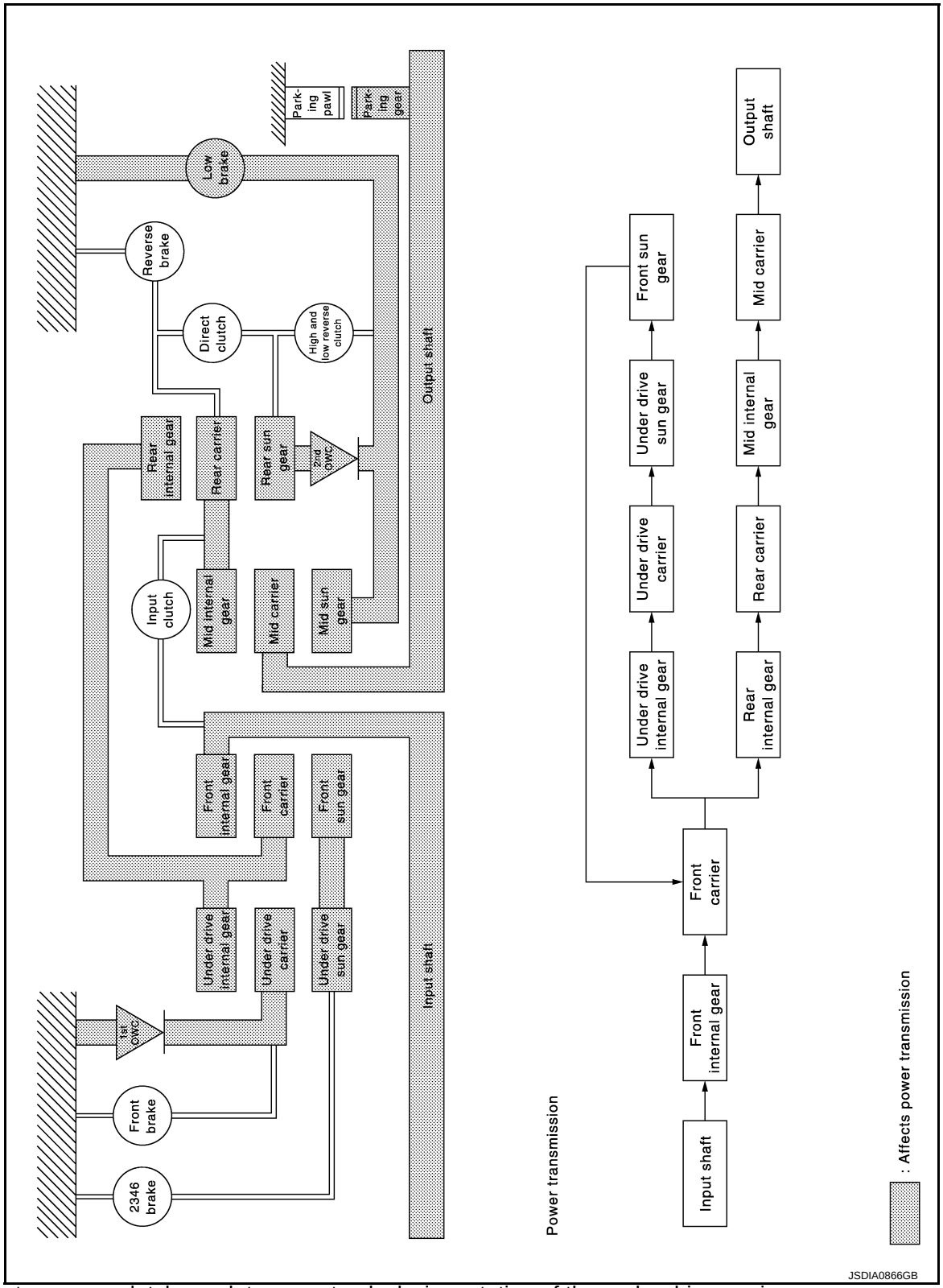
Since the low brake is released, torque from the input shaft drive is not transmitted to the output shaft.

“P” Position



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

“D1” and “DS1” Positions



- The 1st one-way clutch regulates counterclockwise rotation of the under drive carrier.
- The 2nd one-way clutch regulates counterclockwise rotation of the rear sun gear.
- The mid sun gear is fixed by the low brake.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	—	Output	Input
Direction of rotation	Counterclockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Deceleration from front internal gear	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	—	Fixed	Input/Output
Direction of rotation	Counterclockwise revolution	—	Clockwise revolution
Number of revolutions	Acceleration from under drive internal gear	—	Same number of revolution as the front carrier

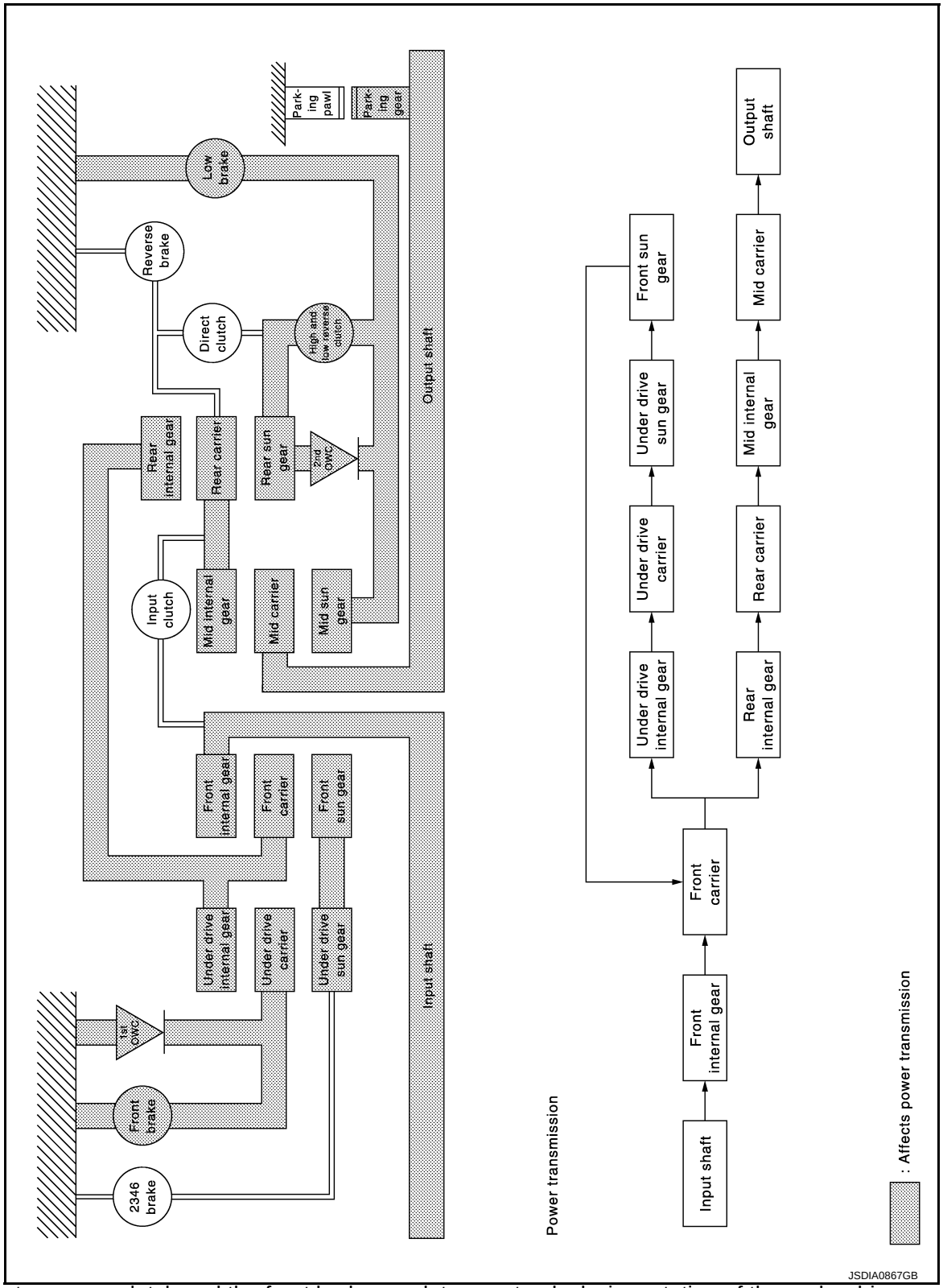
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from mid internal gear	Same number of revolution as the rear carrier

“M1” Position



- The 1st one-way clutch and the front brake regulate counterclockwise rotation of the under drive carrier.
  NOTE:
  The front brake operates only while coasting.
- The 2nd one-way clutch and the high and low reverse clutch regulate counterclockwise rotation of the rear sun gear.
  NOTE:
  The high and low reverse clutch operates only while coasting.
- The mid sun gear is fixed by the low brake.

• Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	—	Output	Input
Direction of rotation	Counterclockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Deceleration from front internal gear	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	—	Fixed	Input/Output
Direction of rotation	Counterclockwise revolution	—	Clockwise revolution
Number of revolutions	Acceleration from under drive internal gear	—	Same number of revolution as the front carrier

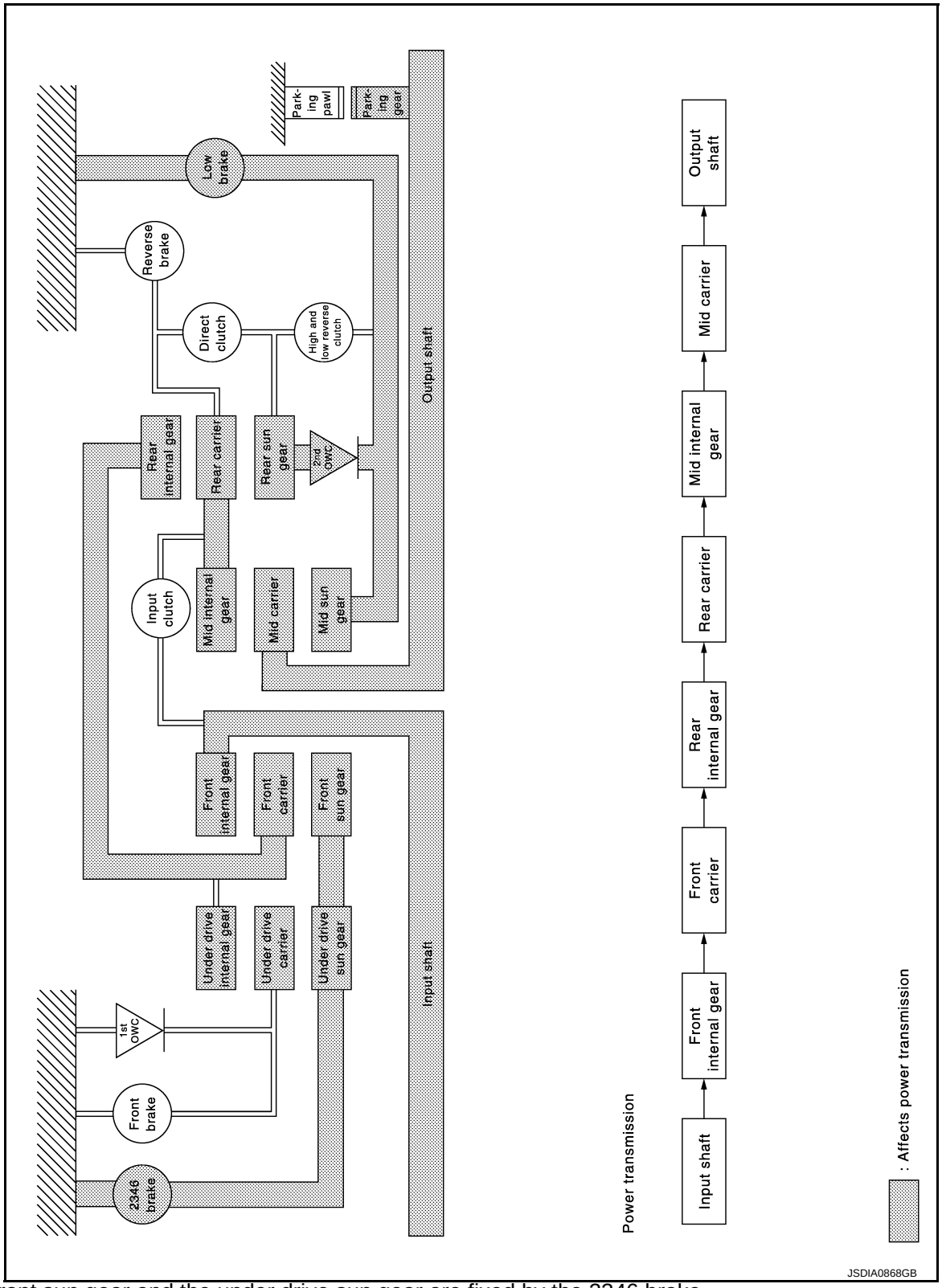
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from mid internal gear	Same number of revolution as the rear carrier

“D2” and “DS2” Positions



- The front sun gear and the under drive sun gear are fixed by the 2346 brake.
- The 2nd one-way clutch regulates counterclockwise rotation of the rear sun gear.
- The mid sun gear is fixed by the low brake.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	Fixed	—	Input/Output
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from under drive internal gear	Same number of revolution as the front carrier

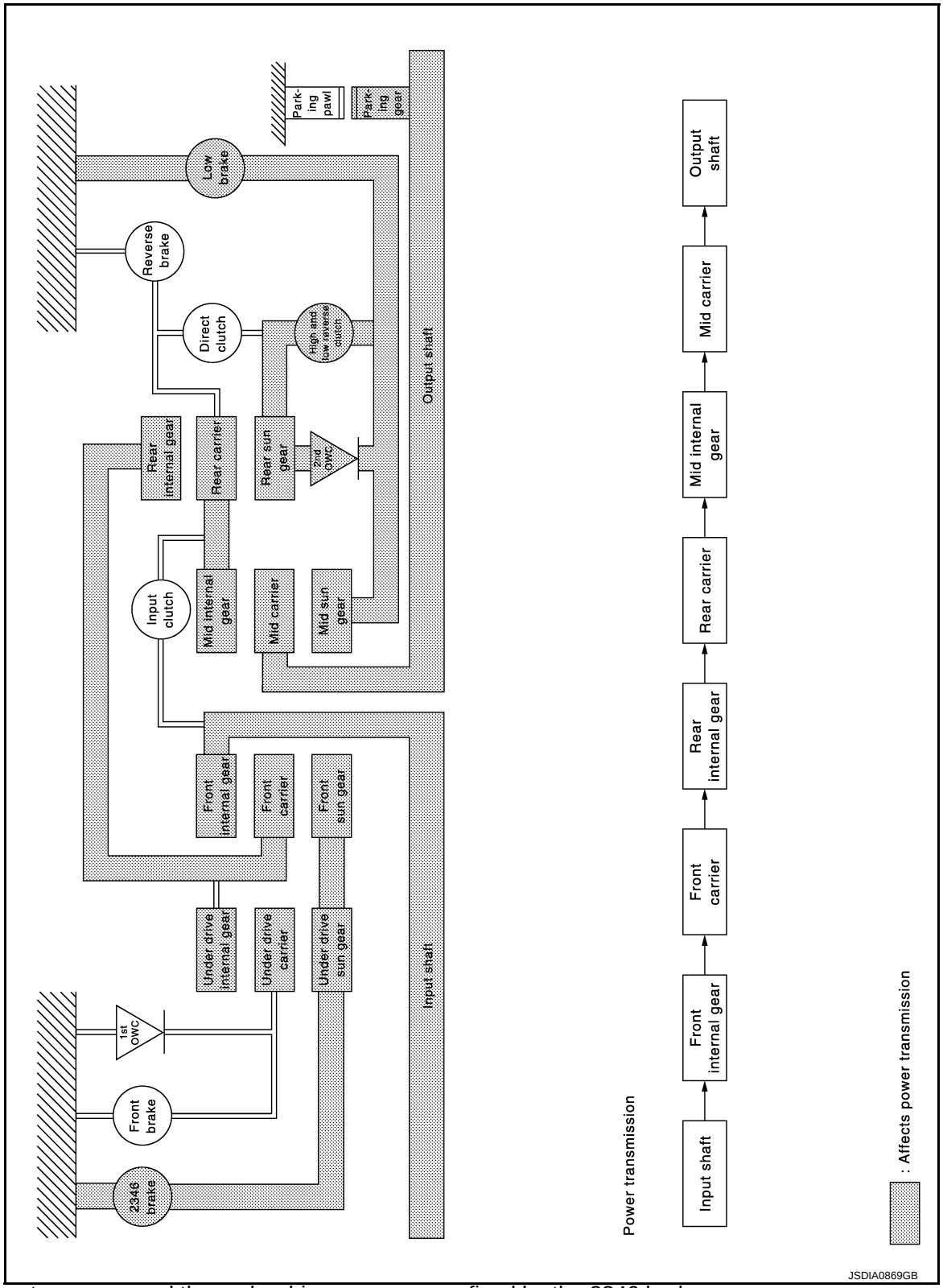
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from mid internal gear	Same number of revolution as the rear carrier

“M2” Position



- The front sun gear and the under drive sun gear are fixed by the 2346 brake.
- The 2nd one-way clutch and the high and low reverse clutch regulate counterclockwise rotation of the rear sun gear.

  NOTE:

  The high and low reverse clutch operates only while coasting.
- The mid sun gear is fixed by the low brake.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	Fixed	—	Input/Output
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from under drive internal gear	Same number of revolution as the front carrier

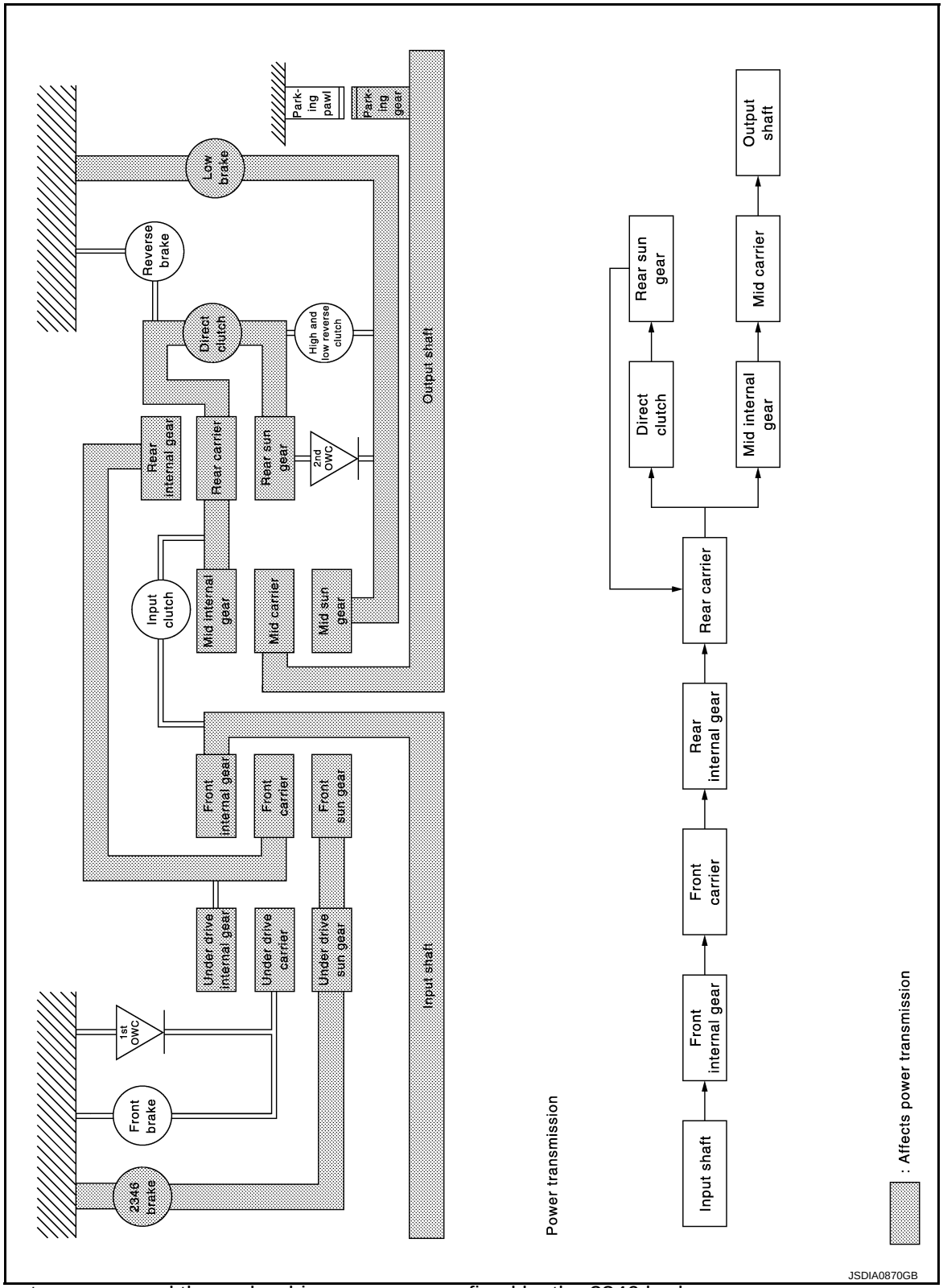
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from mid internal gear	Same number of revolution as the rear carrier

“D3”, “DS3” and “M3” Positions



- The front sun gear and the under drive sun gear are fixed by the 2346 brake.
- The direct clutch gets engaged and connects the rear sun gear with the rear carrier.
- The mid sun gear is fixed by the low brake.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	Fixed	—	Input/Output
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from under drive internal gear	Same number of revolution as the front carrier

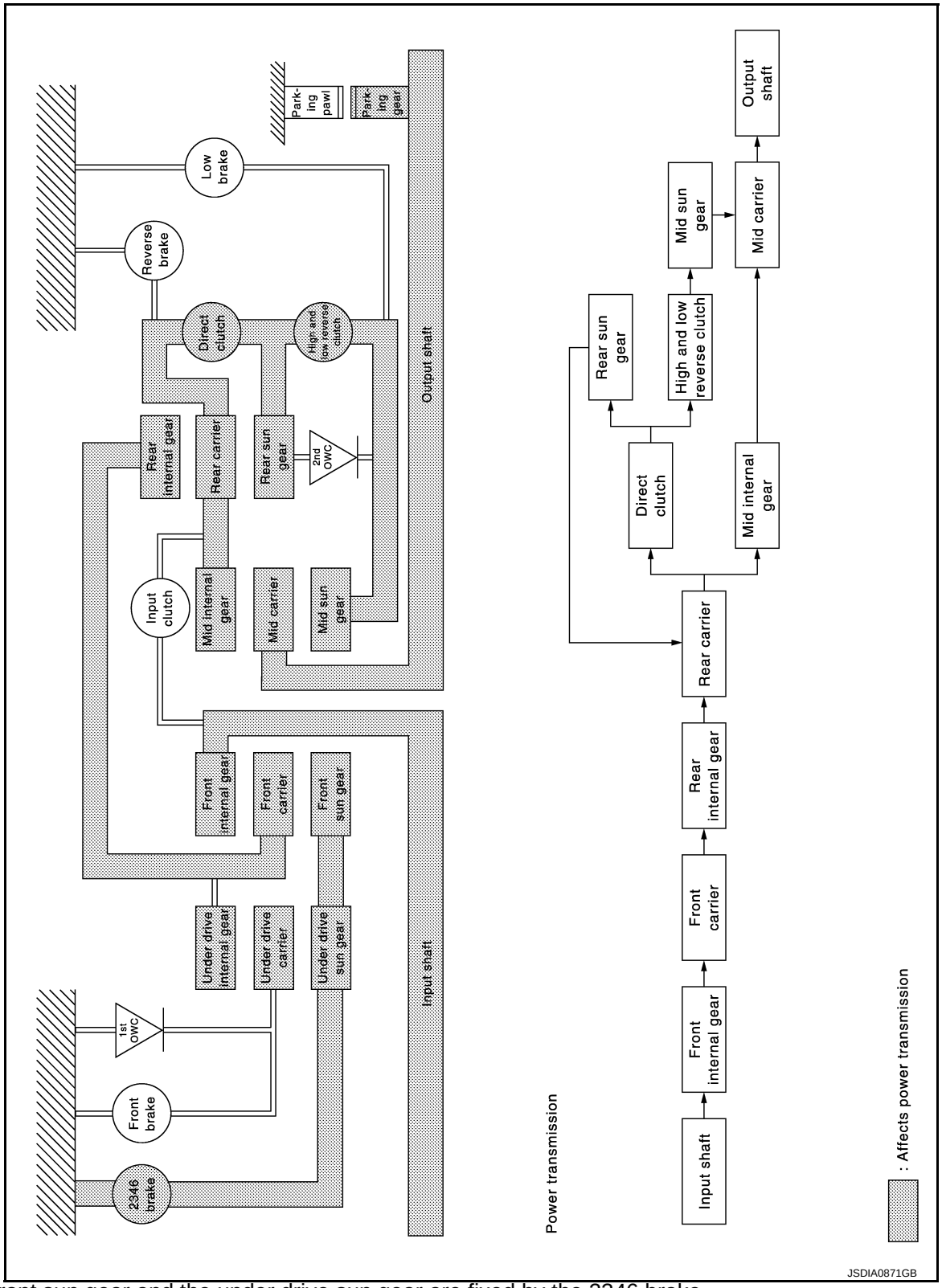
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Same number of revolution as the rear internal gear	Same number of revolution as the rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from mid internal gear	Same number of revolution as the rear carrier

“D4”, “DS4” and “M4” Positions



- The front sun gear and the under drive sun gear are fixed by the 2346 brake.
- The direct clutch gets engaged and connects the rear sun gear with the rear carrier.
- The high and low reverse clutch gets engaged and connects the rear sun gear with the mid sun gear.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	Fixed	—	Input/Output
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from under drive internal gear	Same number of revolution as the front carrier

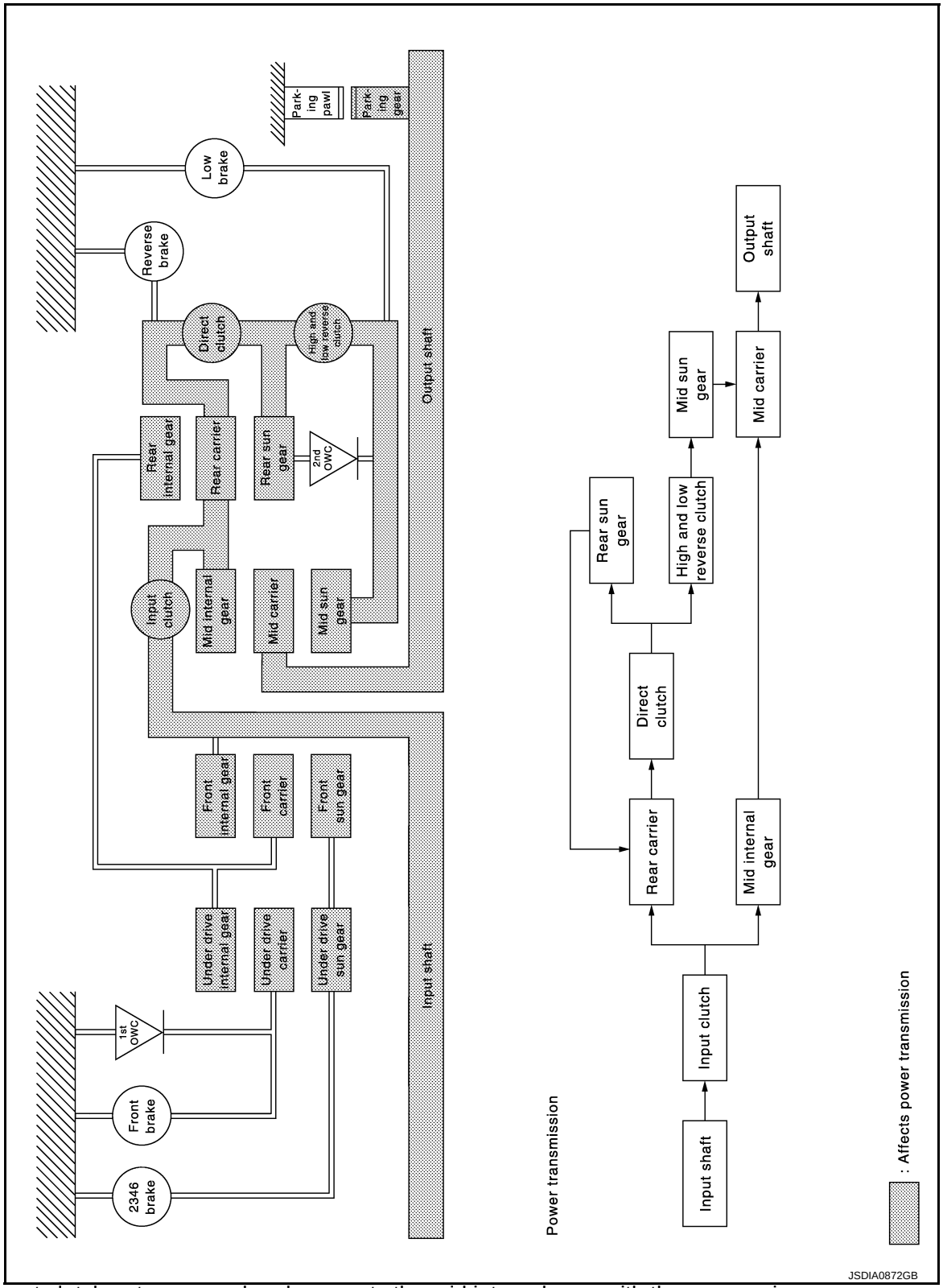
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Same number of revolution as the rear internal gear	Same number of revolution as the rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Same number of revolution as the mid internal gear	Same number of revolution as the mid internal gear	Same number of revolution as the rear carrier

“D5”, “DS5” and “M5” Positions



- The input clutch gets engaged and connects the mid internal gear with the rear carrier.
- The direct clutch gets engaged and connects the rear sun gear with the rear carrier.
- The high and low reverse clutch gets engaged and connects the rear sun gear with the mid sun gear.
- Each planetary gear enters the state described below.

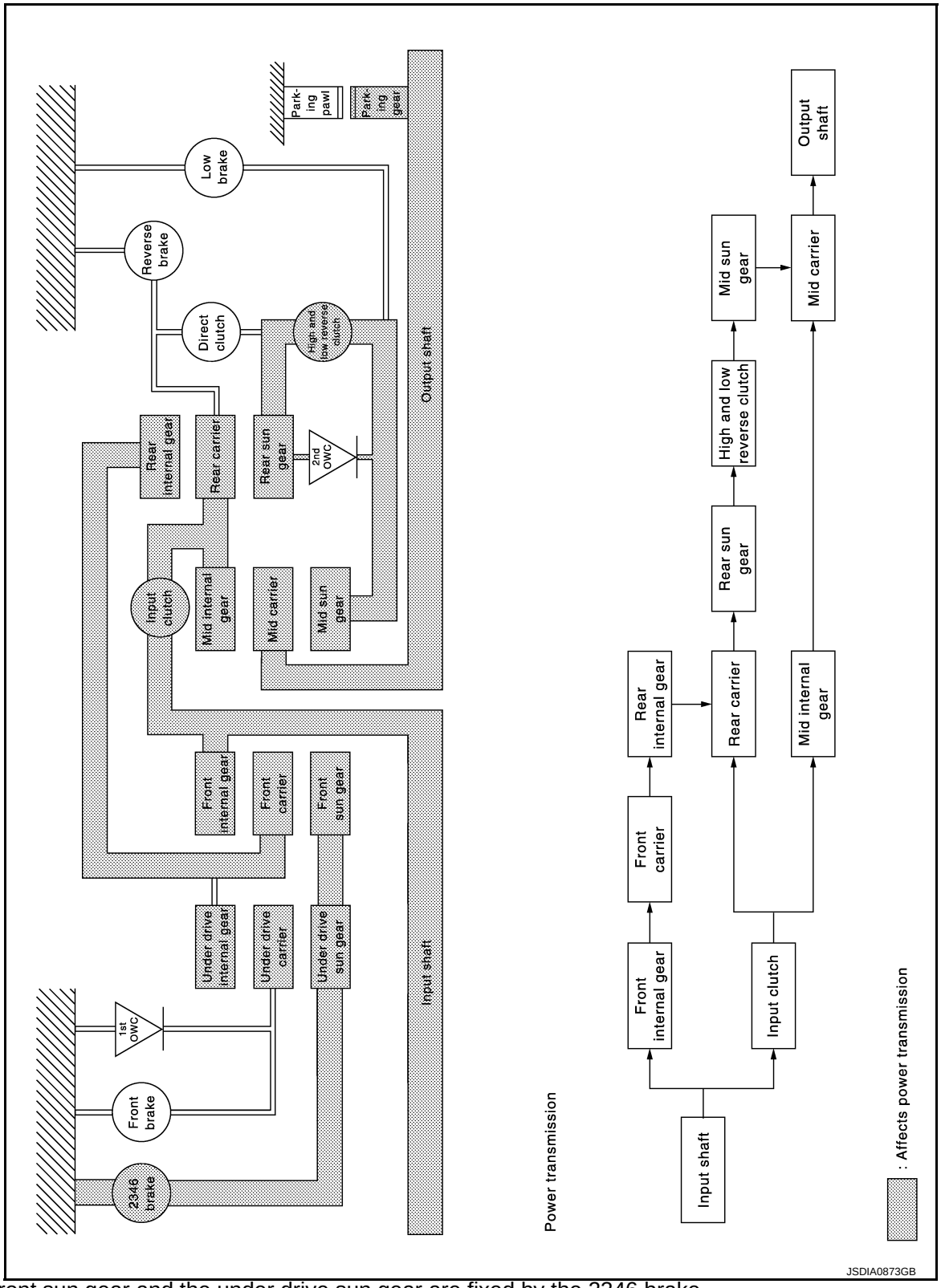
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	—	input/Output	—
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Same number of revolution as the rear carrier	Same number of revolution as the input shaft	Same number of revolution as the rear carrier

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Same number of revolution as the mid internal gear	Same number of revolution as the mid internal gear	Same number of revolution as the input shaft

“D6”, “DS6” and “M6” Positions



- The front sun gear and the under drive sun gear are fixed by the 2346 brake.
- The input clutch gets engaged and connects the mid internal gear with the rear carrier.
- The high and low reverse clutch gets engaged and connects the rear sun gear with the mid sun gear.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from front internal gear	Same number of revolution as the input shaft

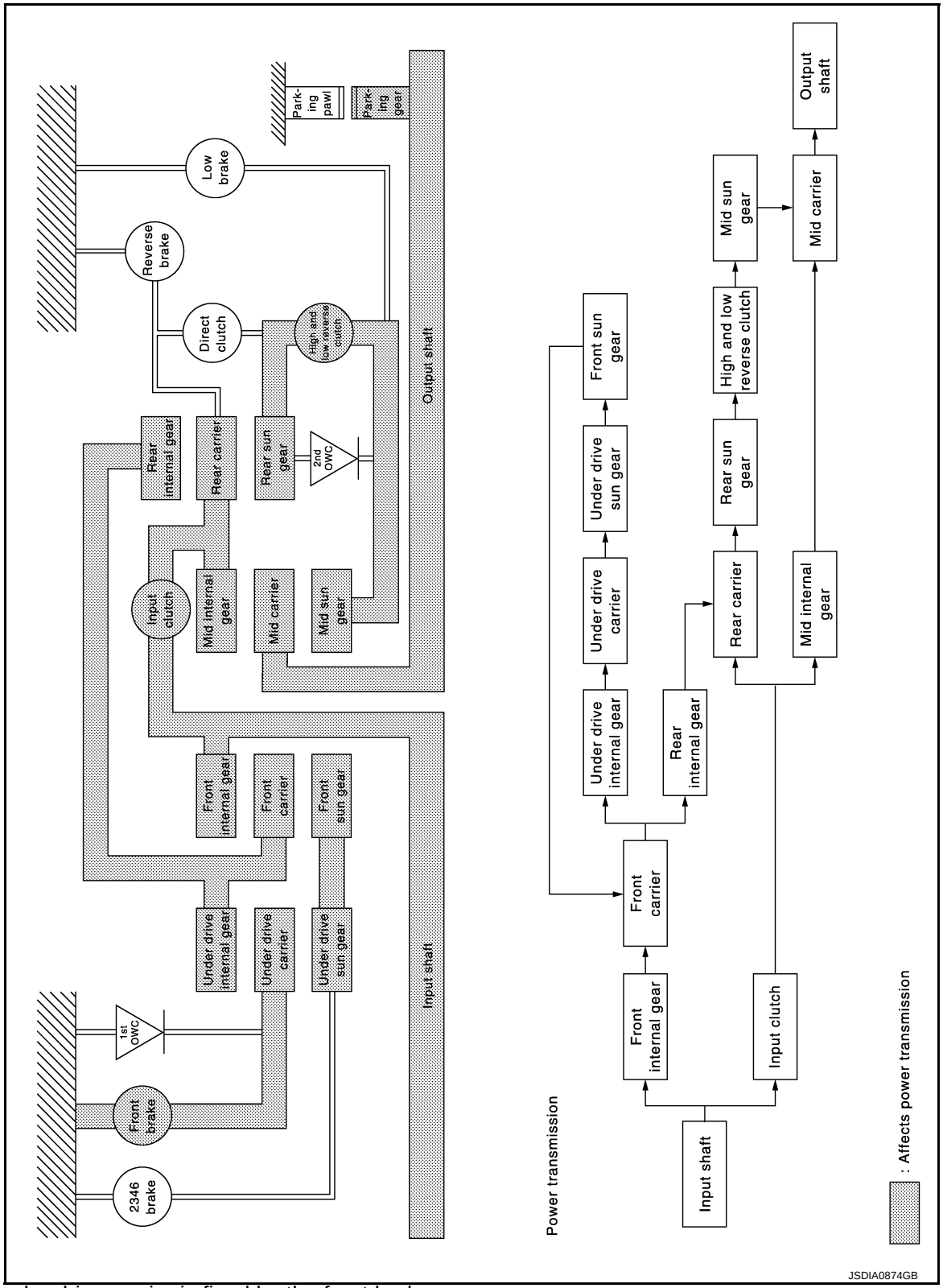
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	—	Input/Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Acceleration from rear carrier	Same number of revolution as the input shaft	Same number of revolution as the front carrier

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Acceleration from mid internal gear	Acceleration from mid internal gear	Same number of revolution as the input shaft

“D7”, “DS7” and “M7” Positions



- The under drive carrier is fixed by the front brake.
- The input clutch gets engaged and connects the mid internal gear with the rear carrier.
- The high and low reverse clutch gets engaged and connects the rear sun gear with the mid sun gear.
- Each planetary gear enters state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	—	Output	Input
Direction of rotation	Counterclockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Deceleration from front internal gear	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	—	Fixed	Input/Output
Direction of rotation	Counterclockwise revolution	—	Clockwise revolution
Number of revolutions	Acceleration from under drive internal gear	—	Same number of revolution as the front carrier

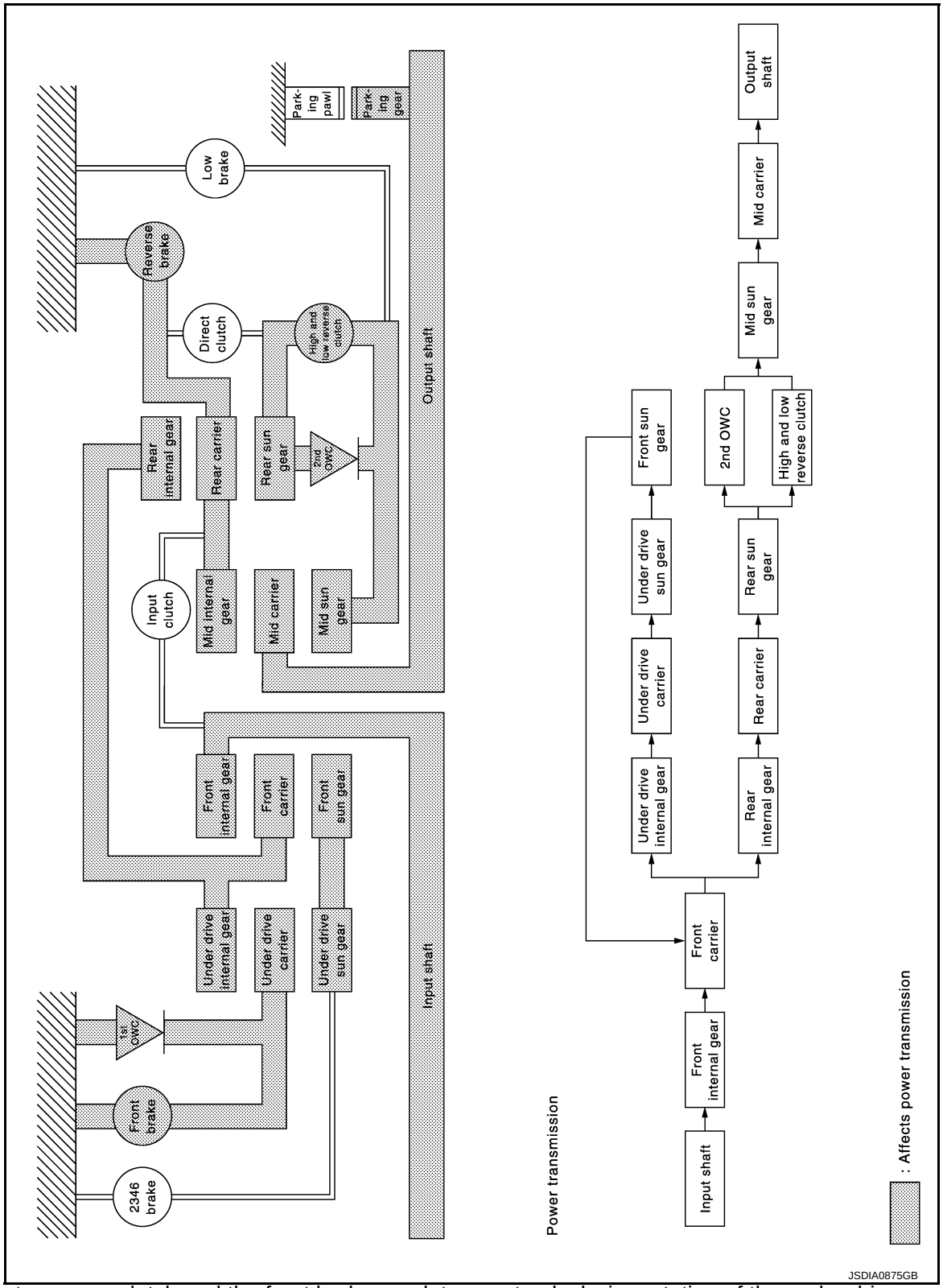
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	—	Input/Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Acceleration from rear carrier	Same number of revolution as the input shaft	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Acceleration from mid internal gear	Acceleration from mid internal gear	Same number of revolution as the input shaft

“R” Position



- The 1st one-way clutch and the front brake regulate counterclockwise rotation of the under drive carrier.
  NOTE:
  The front brake operates at the fixed speed or less.
- The rear carrier and the mid internal gear are fixed by the reverse brake.
- The mid sun gear rotates at the same speed as the rear sun gear by operation of the 2nd one-way clutch and the high and low reverse clutch.
  NOTE:
  The high and low reverse clutch operates at the fixed speed or less.

• Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	—	Output	Input
Direction of rotation	Counterclockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Deceleration from front internal gear	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	—	Fixed	Input/Output
Direction of rotation	Counterclockwise revolution	—	Clockwise revolution
Number of revolutions	Acceleration from under drive internal gear	—	Same number of revolution as the front carrier

Rear planetary gear

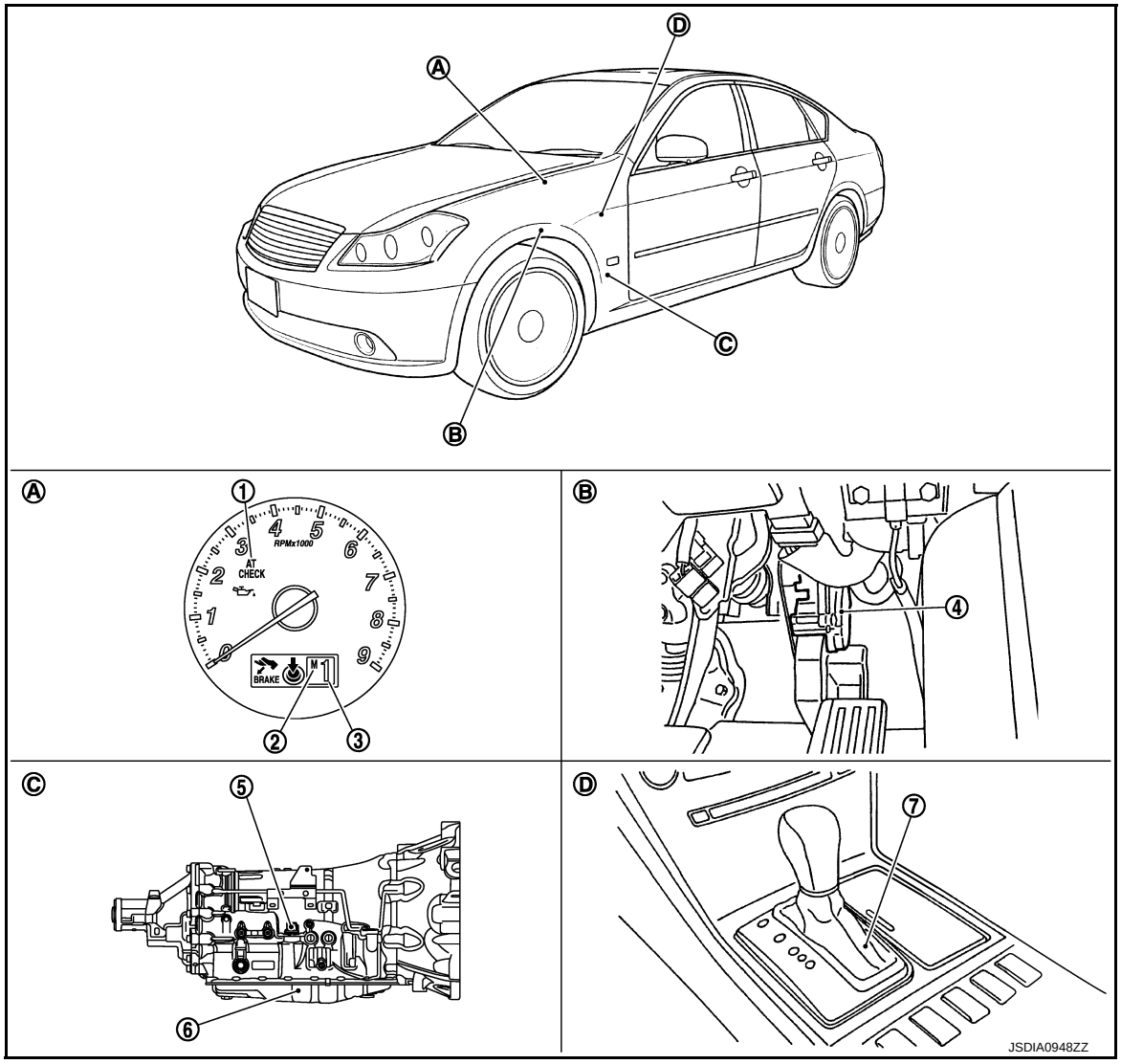
Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	Output	Fixed	Input
Direction of rotation	Counterclockwise revolution	—	Clockwise revolution
Number of revolutions	Acceleration from rear internal gear	—	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Input	Output	Fixed
Direction of rotation	Counterclockwise revolution	Counterclockwise revolution	—
Number of revolutions	Same number of revolution as the rear sun gear	Deceleration from mid sun gear	—

Component Parts Location

INFOID:0000000005352697



1. A/T CHECK indicator lamp
2. A/T shift selector assembly
3. Shift position indicator
4. Accelerator pedal position sensor
5. A/T assembly connector
6. Control valve with TCM*
7. Control device assembly

A. Combination meter
B. Accelerator pedal
C. A/T assembly
D. Center console

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (7).
- Manual mode select switch
- Manual mode position select switch
- The following components are included in control valve with TCM (6).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve

- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

Component Description

INFOID:0000000005352698

Name of the Part (Abbreviation)	Function
Front brake (FR/B)	Fastens the under drive carrier.
Input clutch (I/C)	Connects the input shaft, the mid internal gear and the rear carrier.
Direct clutch (D/C)	Connects the rear carrier and the rear sun gear.
High and low reverse clutch (HLR/C)	Connects the rear sun gear and the mid sun gear.
Reverse brake (R/B)	Fastens the rear carrier.
Low brake (L/B)	Fastens the mid sun gear.
2346 brake (2346/B)	Fastens the under drive sun gear.
1st one-way clutch (1st OWC)	Allows the under drive carrier to turn freely in the forward direction but fastens it for reverse rotation.
2nd one-way clutch (2nd OWC)	Allows the rear sun gear to turn freely in the forward direction but fastens it for reverse rotation.
Torque converter	Amplifies driving force the engine, and transmits it to transmission input shaft.
Oil pump	Driven by the engine, oil pump supplies oil to torque converter, control valve assembly, and each lubricating system.

SHIFT LOCK SYSTEM

System Description

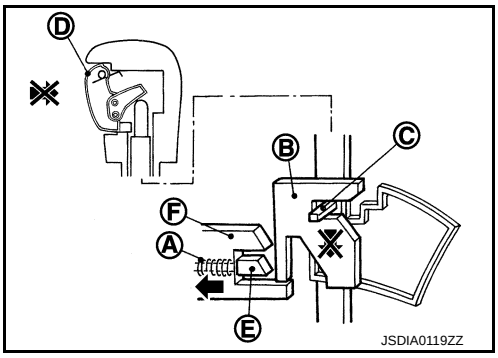
INFOID:0000000005352699

The selector lever cannot be shifted from the “P” position unless the brake pedal is depressed while the ignition switch is ON.
The shift lock is unlocked by the shift lock unit that is activated when the ignition switch is ON and the stop lamp switch is turned ON (brake pedal is depressed).
Therefore, the shift lock unit receives no ON signal and the shift lock remains locked if the above conditions are not fulfilled. (However, a shift operation is allowed if the shift lock release button is pressed.)

SHIFT LOCK OPERATION AT “P” POSITION

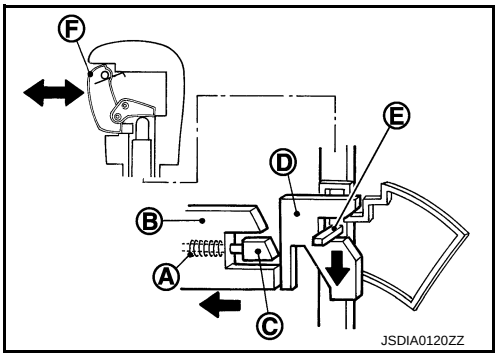
When Brake Pedal Is Not Depressed (No Shift Operation Allowed)

The shift lock solenoid (A) inside the shift lock unit is not energized if the brake pedal is not depressed while the ignition switch is ON.
The lock plate (B) lowers according to the downward movement of the position pin (C) when the selector button (D) is pressed, and presses only slider B (E) into the shift lock unit. Slider A (F) located below the lock plate prevents the downward movement of the lock plate with the spring force. The selector lever cannot be shifted from the “P” position for this reason.
However, slider A is forcibly pressed into the shift lock unit, allowing the selector lever to shift if the shift lock release button is pressed.



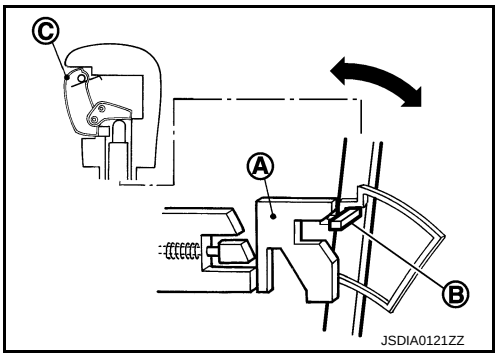
When Brake Pedal Is Depressed (Shift Operation Allowed)

The shift lock solenoid (A) inside the shift lock unit is energized and the relative positions of sliders A (B) and B (C) are maintained when the brake pedal is depressed while the ignition switch is ON.
The lock plate (D) lowers according to the downward movement of the position pin (E), thrusting away sliders A and B, when the selector button (F) is pressed.
The position pin lowers to the position that allows shift operation for this reason. As a result, the selector lever can be shifted out of the P position.



OPERATION AT OTHER THAN “P” POSITION

The shift lock function will not operate at any position other than “P” because the lock plate (A) is only set for the “P” position. Accordingly, the selector lever can be shifted to any position regardless of the brake operation.
The position pin (B) enters the “P” position thrusting away the lock plate when the selector lever is shifted to the “P” position. Then, the shift mechanism is locked when the selector button (C) is released.



“P” POSITION RETAINING MECHANISM (IGNITION SWITCH LOCK)

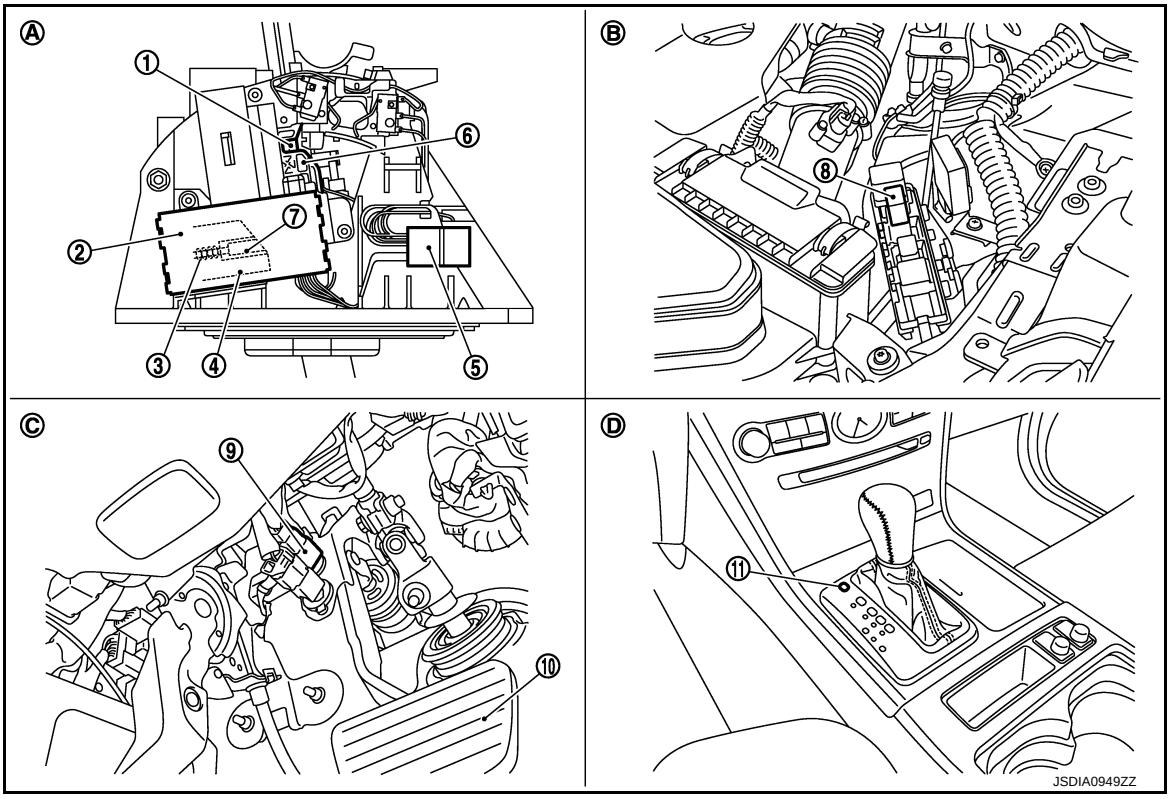
When ignition switch is not in the ON position, power is not applied to the shift lock solenoid in the shift lock unit. This causes shift lock state, and then “P” position is retained.
When an actuating system in the shift lock unit has a malfunction, selector lever is unable to operate from the “P” position even when pressing the brake pedal with the ignition switch ON. However, when pressing the shift lock release button, slider A is forcibly pressed into the shift lock unit. This allows shift lock to be released and selector lever enables the select operation from the “P” position.

CAUTION:

Never use the shift lock release button except when the select lever is inoperative even when pressing the brake pedal with the ignition switch ON.

Component Parts Location

INFOID:0000000005352700



1. Position pin
2. Shift lock unit
3. Shift lock solenoid
4. Slider A
5. A/T shift selector connector
6. Lock plate
7. Slider B
8. Shift lock relay
9. Stop lamp switch
10. Brake pedal
11. Shift lock cover *
A. A/T shift selector assembly
B. Engine room LH
C. Brake pedal, upper
D. Center console

*: Shift lock release button becomes operative by removing shift lock cover.

Component Description

INFOID:0000000005352701

Component			Function
A/T shift selector assembly	Shift lock unit	Shift lock solenoid	AT-452, "Description"
		Lock plate	The lock plate restricts the position pin stroke by selector button operation according to the shift lock unit status.
		Shift lock release button	Pressing the shift lock release button cancels the shift lock forcibly.
	Position pin		The position pin, linking with the selector button, restricts the selector lever movement.
Shift lock relay			AT-452, "Description"
Stop lamp switch			AT-452, "Description"

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Diagnosis Description

INFOID:0000000005352702

Refer to EC-121, "Diagnosis Description".

DIAGNOSIS SYSTEM (TCM)

CONSULT-III Function (TRANSMISSION)

INFOID:0000000005352703

CONSULT-III APPLICATION ITEMS

Diagnostic test mode	Function
Work Support	This mode enables a technician to adjust some devices faster and more accurately.
Self Diagnostic Results	Retrieve DTC from ECU and display diagnostic items.
Data Monitor	Monitor the input/output signal of the control unit in real time.
CAN Diagnosis	This mode displays a network diagnosis result about CAN by a diagram.
CAN Diagnostic Support Monitor	It monitors the starts of CAN communication.
DTC & SRT confirmation	The status of system monitoring tests and the self-diagnosis status/result can be confirmed.
ECU Identification	Display the ECU identification number (part number etc.) of the selected system.

SELF DIAGNOSTIC RESULTS

Display Items List

Refer to AT-470, "DTC Index".

DATA MONITOR

Display Items List

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

Monitored item (Unit)		Monitor Item Selection			Remarks
		ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
VHCL/S SE-A/T	(km/h)	X	X	▼	Displays the vehicle speed calculated by the TCM from the output shaft revolution.
ESTM VSP SIG	(km/h)	X	—	▼	Displays the vehicle speed signal received via CAN communication.
OUTPUT REV	(rpm)	X	X	▼	Displays the output shaft revolution calculated from the pulse signal of revolution sensor.
INPUT SPEED	(rpm)	X	X	▼	Displays the input speed calculated from front sun gear revolution and front carrier revolution.
F SUN GR REV	(rpm)	—	—	▼	Displays the front sun gear revolution calculated from the pulse signal of input speed sensor 1.
F CARR GR REV	(rpm)	—	—	▼	Displays the front carrier gear revolution calculated from the pulse signal of input speed sensor 2.
ENGINE SPEED	(rpm)	X	X	▼	Displays the engine speed received via CAN communication.
TC SLIP SPEED	(rpm)	—	X	▼	Displays the revolution difference between turbine revolution and engine speed.
ACCELE POSI	(0.0/8)	X	—	▼	Displays the accelerator position estimated value received via CAN communication.
THROTTLE POSI	(0.0/8)	X	X	▼	Displays the throttle position received via CAN communication.
ATF TEMP 1	(°C)	X	X	▼	Displays the ATF temperature of oil pan calculated from the signal voltage of A/T fluid temperature sensor.
ATF TEMP 2	(°C)	X	X	▼	Displays the ATF temperature estimated value of torque converter outlet calculated from the signal voltage of A/T fluid temperature sensor.

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
ATF TEMP SE 1 (V)	—	—	▼	Displays the signal voltage of A/T fluid temperature sensor.
BATTERY VOLT (V)	X	—	▼	Displays the power supply voltage of TCM.
LINE PRES SOL (A)	—	X	▼	Displays the command current from TCM to the line pressure solenoid.
TCC SOLENOID (A)	—	X	▼	Displays the command current from TCM to the torque converter clutch solenoid.
L/B SOLENOID (A)	—	X	▼	Displays the command current from TCM to the low brake solenoid.
FR/B SOLENOID (A)	—	X	▼	Displays the command current from TCM to the front brake solenoid.
HLR/C SOL (A)	—	X	▼	Displays the command current from TCM to the high and low reverse clutch solenoid.
I/C SOLENOID (A)	—	X	▼	Displays the command current from TCM to the input clutch solenoid.
D/C SOLENOID (A)	—	X	▼	Displays the command current from TCM to the direct clutch solenoid.
2346/B SOL (A)	—	X	▼	Displays the command current from TCM to the 2346 brake solenoid.
L/P SOL MON (A)	—	—	▼	Monitors the command current from TCM to the line pressure solenoid, and displays the monitor value.
TCC SOL MON (A)	—	—	▼	Monitors the command current from TCM to the torque converter clutch solenoid, and displays the monitor value.
L/B SOL MON (A)	—	—	▼	Monitors the command current from TCM to the low brake solenoid, and displays the monitor value.
FR/B SOL MON (A)	—	—	▼	Monitors the command current from TCM to the front brake solenoid, and displays the monitor value.
HLR/C SOL MON (A)	—	—	▼	Monitors the command current from TCM to the high and low reverse clutch solenoid, and displays the monitor value.
I/C SOL MON (A)	—	—	▼	Monitors the command current from TCM to the input clutch solenoid, and displays the monitor value.
D/C SOL MON (A)	—	—	▼	Monitors the command current from TCM to the direct clutch solenoid, and displays the monitor value.
2346/B SOL MON (A)	—	—	▼	Monitors the command current from TCM to the 2346 brake solenoid, and displays the monitor value.
GEAR RATIO	—	X	▼	Displays the gear ratio calculated from turbine revolution and output revolution.
ENGINE TORQUE (Nm)	—	—	▼	Displays the engine torque estimated value received via CAN communication.
ENG TORQUE D (Nm)	—	—	▼	Displays the engine torque estimated value reflected the requested torque of each control unit received via CAN communication.

Monitored item (Unit)		Monitor Item Selection			Remarks
		ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
INPUT TRQ S	(Nm)	—	—	▼	Displays the input torque using for the oil pressure calculation process of shift change control.
INPUT TRQ L/P	(Nm)	—	—	▼	Displays the input torque using for the oil pressure calculation process of line pressure control.
TRGT PRES L/P	(kPa)	—	—	▼	Displays the target oil pressure value of torque converter clutch solenoid valve calculated by the oil pressure calculation process of lock-up control.
TRGT PRES TCC	(kPa)	—	—	▼	Displays the target oil pressure value of torque converter clutch solenoid valve calculated by the oil pressure calculation process of shift change control.
TRGT PRES L/B	(kPa)	—	—	▼	Displays the target oil pressure value of low brake solenoid valve calculated by the oil pressure calculation process of shift change control.
TRGT PRE FR/B	(kPa)	—	—	▼	Displays the target oil pressure value of front brake solenoid valve calculated by the oil pressure calculation process of shift change control.
TRG PRE HLR/C	(kPa)	—	—	▼	Displays the target oil pressure value of high and low reverse clutch solenoid valve calculated by the oil pressure calculation process of shift change control.
TRGT PRES I/C	(kPa)	—	—	▼	Displays the target oil pressure value of input clutch solenoid valve calculated by the oil pressure calculation process of shift change control.
TRGT PRES D/C	(kPa)	—	—	▼	Displays the target oil pressure value of direct clutch solenoid valve calculated by the oil pressure calculation process of shift change control.
TRG PRE 2346/B	(kPa)	—	—	▼	Displays the target oil pressure value of 2346 brake solenoid valve calculated by the oil pressure calculation process of shift change control.
SHIFT PATTERN		—	—	▼	Displays the gear change data using the shift pattern control.
VEHICLE SPEED	(km/h)	—	—	▼	Displays the vehicle speed for control using the control of TCM.
RANGE SW 4	(ON/OFF)	X	—	▼	Displays the operation status of transmission range switch 4.
RANGE SW 3	(ON/OFF)	X	—	▼	Displays the operation status of transmission range switch 3.
RANGE SW 2	(ON/OFF)	X	—	▼	Displays the operation status of transmission range switch 2.
RANGE SW 1	(ON/OFF)	X	—	▼	Displays the operation status of transmisson range switch 1.
SFT DWN ST SW	(ON/OFF)	X	—	▼	• Displays the operation status of paddle shifter (down switch). • Not mounted but displayed.
SFT UP ST SW	(ON/OFF)	X	—	▼	• Displays the operation status of paddle shifter (up switch). • Not mounted but displayed.
DOWN SW LEVER	(ON/OFF)	X	—	▼	Displays the operation status of selector lever (down switch).

Monitored item (Unit)		Monitor Item Selection			Remarks
		ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
UP SW LEVER	(ON/OFF)	X	—	▼	Displays the operation status of selector lever (up switch).
NON M-MODE SW	(ON/OFF)	X	—	▼	Displays whether the selector lever is in any position other than manual shift gate position.
MANU MODE SW	(ON/OFF)	X	—	▼	Displays whether the selector lever is in the manual shift gate position.
DS RANGE	(ON/OFF)	—	—	▼	Displays whether it is the DS mode.
1 POSITION SW	(ON/OFF)	X	—	▼	• Displays the reception status of 1 position switch signal received via CAN communication. • Not mounted but displayed.
OD CONT SW	(ON/OFF)	X	—	▼	• Displays the reception status of overdrive control switch signal received via CAN communication. • Not mounted but displayed.
BRAKESW	(ON/OFF)	X	—	▼	Displays the reception status of stop lamp switch signal received via CAN communication.
POWERSHIFT SW	(ON/OFF)	X	—	▼	• Displays the reception status of POWER mode signal received via CAN communication. • Not mounted but displayed.
ASCD-OD CUT	(ON/OFF)	X	—	▼	Displays the reception status of ASCD OD cancel request signal received via CAN communication.
ASCD-CRUISE	(ON/OFF)	X	—	▼	Displays the reception status of ASCD operation signal received via CAN communication.
ABS SIGNAL	(ON/OFF)	X	—	▼	Displays the reception status of ABS operation signal received via CAN communication.
TCS GR/P KEEP	(ON/OFF)	X	—	▼	Displays the reception status of TCS gear keep request signal received via CAN communication.
TCS SIGNAL 2	(ON/OFF)	X	—	▼	Displays whether the reception value of A/T shift schedule change demand signal received via CAN communication is “cold”.
TCS SIGNAL 1	(ON/OFF)	X	—	▼	Displays whether the reception value of A/T shift schedule change demand signal received via CAN communication is “warm”.
LOW/B PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of low brake.
HC/IC/FRB PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of high and low reversed clutch, input clutch or front brake.
IC/FRB PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of input clutch or front brake.
HLR/C PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of high and low reversed clutch.
W/O THL POS	(ON/OFF)	X	—	▼	Displays the kickdown condition signal status received via CAN communication.
CLSD THL POS	(ON/OFF)	X	—	▼	Displays the idling status signal status received via CAN communication.

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
DRV CST JUDGE (DRIVE/COAST)	—	—	▼	Displays the judgment results of “driving” or “coasting” judged by TCM.
SHIFT IND SIGNAL	—	—	▼	Displays the transmission value of shift position signal transmitted via CAN communication.
STARTER RELAY (ON/OFF)	—	—	▼	Displays the command status from TCM to starter relay.
F-SAFE IND/L (ON/OFF)	—	—	▼	Displays the transmission status of A/T CHECK indicator lamp signal transmitted via CAN communication.
ATF WARN LAMP (ON/OFF)	—	—	▼	• Displays the transmission status of ATF temperature signal transmitted via CAN communication. • Not mounted but displayed.
MANU MODE IND (ON/OFF)	—	—	▼	Displays the transmission status of manual mode signal transmitted via CAN communication.
ON OFF SOL MON (ON/OFF)	—	—	▼	Monitors the command value from TCM to the anti-interlock solenoid, and displays the monitor status.
START RLY MON (ON/OFF)	—	—	▼	Monitors the command value from TCM to the starter relay, and displays the monitor status.
ON OFF SOL (ON/OFF)	—	—	▼	Displays the command status from TCM to anti-interlock solenoid.
SLCT LVR POSI	—	X	▼	Displays the shift positions recognized by TCM.
GEAR	—	X	▼	Displays the current transmission gear position recognized by TCM.
NEXT GR POSI	—	—	▼	Displays the target gear position of gear change that is calculated based on the vehicle speed information and throttle information.
SHIFT MODE	—	—	▼	Displays the transmission driving mode recognized by TCM.
D/C PARTS (FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of direct clutch.
FR/B PARTS (FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of front brake.
2346/B PARTS (FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of 2346 brake.
2346B/DC PARTS (FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of 2346 brake or direct clutch.

DTC & SRT CONFIRMATION

DTC Work Support

Item	Description	Check item
1ST GR FNCTN P0731	Following items for “1GR function” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	• Input clutch solenoid valve • Front brake solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit
2ND GR FNCTN P0732	Following items for “2GR function” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
3RD GR FNCTN P0733	Following items for “3GR function” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
4TH GR FNCTN P0734	Following items for “4GR function” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
5TH GR FNCTN P0735	Following items for “5GR function” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
6TH GR FNCTN P0729	Following items for “6GR function” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
7TH GR FNCTN P1734	Following items for “7GR function” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
TCC SOL FUNCTN CHECK	Following items for “TCC solenoid function” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	• Harness or connectors • Torque converter clutch solenoid valve • Torque converter • Input speed sensor 1, 2 • Hydraulic control circuit

IGN COUNTER

IGN counter indicates the number of items that ignition switch is turned ON after DTC is detected.

- The number is 0 when a malfunction is detected now.
- The number increases like 1 → 2 → 3...38 → 39 after returning to the normal condition whenever ignition switch OFF → ON.
- The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.

COMPONENT DIAGNOSIS

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000005352704

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 independently). 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.

DTC Logic

INFOID:0000000005352705

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
U1000	CAN communication line	TCM is not transmitting or receiving CAN communication signal for 2 seconds or more.	• Harness or connectors (CAN communication line is open or shorted.) • TCM

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Run engine for at least 2 consecutive seconds at idle speed.
3. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”

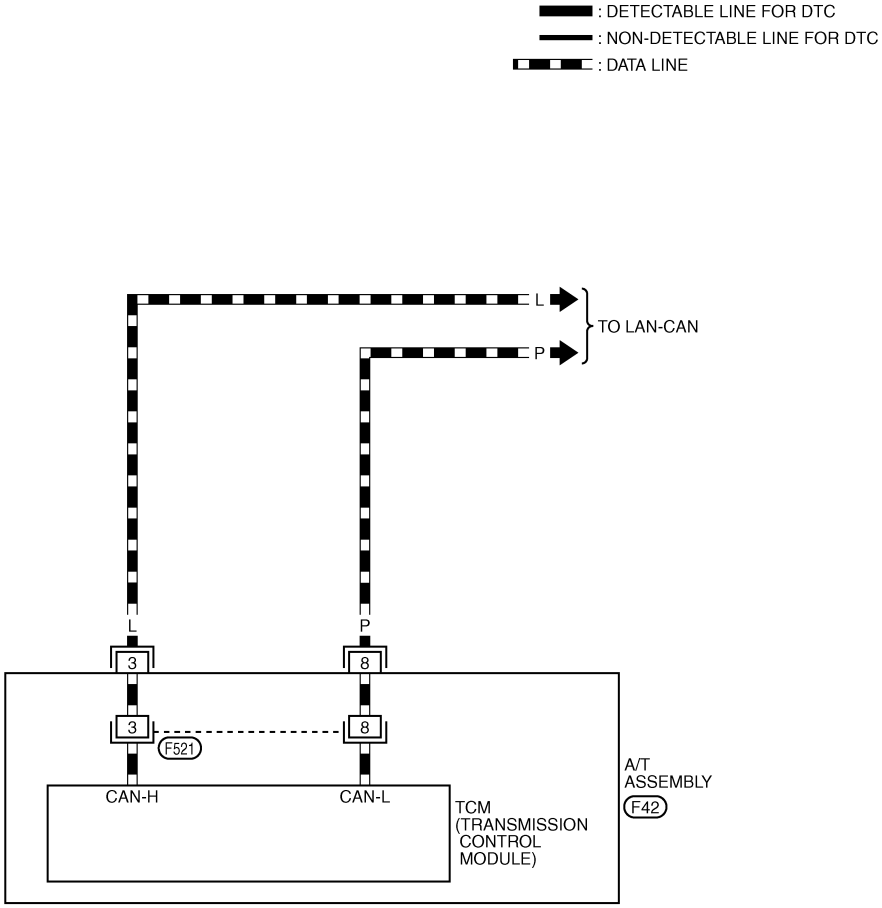
Is “U1000” detected?

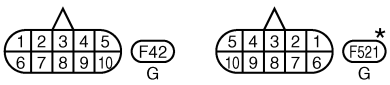
YES >> Go to AT-398, "Diagnosis Procedure".
NO >> INSPECTION END

Wiring Diagram - AT - CAN

INFOID:0000000005352706

AT-CAN-01





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

TCWT0687E

Diagnosis Procedure

INFOID:0000000005352707

Go to LAN-20, "Trouble Diagnosis Flow Chart".

P0615 STARTER RELAY

Description

INFOID:0000000005352708

TCM prohibits cranking other than at “P” or “N” position.

DTC Logic

INFOID:0000000005352709

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0615	Starter Relay Circuit	The starter monitor value is OFF when the ignition switch is ON at the “P” and “N” positions.	• Harness or connectors (Starter relay and TCM circuit is open or shorted.) • Starter relay circuit

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Shift the selector lever to “P” and “N” positions.
2. Turn ignition switch ON and wait 2 seconds or more.
3. Perform “Self Diagnostic Results” in “TRANSMISSION”.

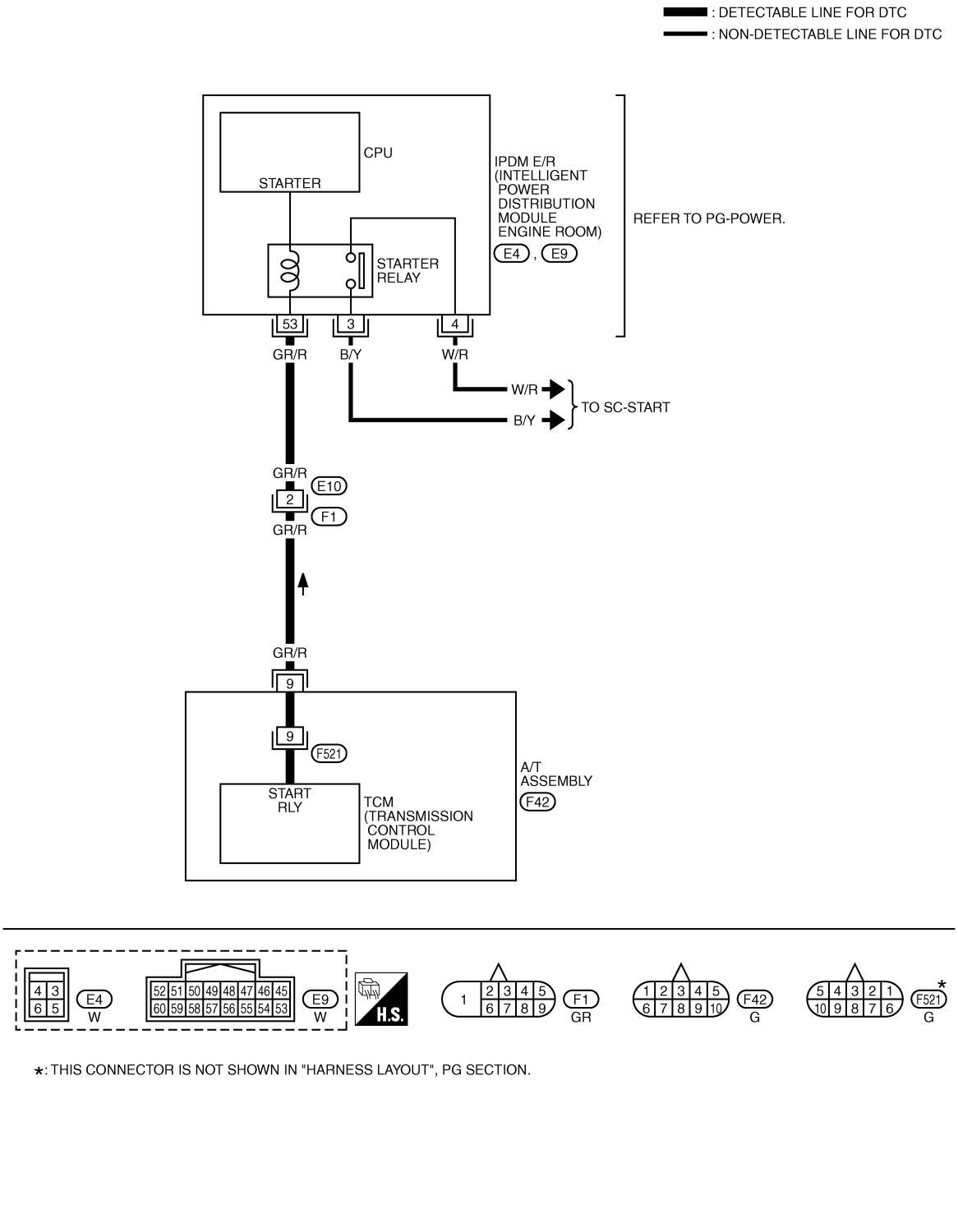
Is “P0615” detected?

YES >> Go to AT-400, "Diagnosis Procedure".
NO >> INSPECTION END

Wiring Diagram - AT - STSIG

INFOID:0000000005352710

AT-STSIG-01



TCWT0688E

Diagnosis Procedure

INFOID:0000000005352711

1. CHECK STARTER RELAY SIGNAL

1. Turn ignition switch ON.
2. Check voltage between IPDM E/R connector terminal and ground.

IPDM E/R connector		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E9	53		Selector lever in “P” and “N” positions.	Battery voltage
			Selector lever in other positions.	0 V

Is the inspection result normal?

YES >> Check starter relay circuit. Refer to SC-9, "Wiring Diagram - START -".
NO >> GO TO 2.

2. CHECK HARNESS BETWEEN A/T ASSEMBLY AND IPDM E/R (PART 1)

1. Turn ignition switch OFF.
2. Disconnect A/T assembly connector and IPDM E/R connector.
3. Check continuity between A/T assembly vehicle side harness connector terminal and IPDM E/R vehicle side harness connector terminal.

A/T assembly vehicle side harness connector		IPDM E/R vehicle side harness connector		Continuity
Connector	Terminal	Connector	Terminal	
F42	9	E9	53	Existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

3. CHECK HARNESS BETWEEN A/T ASSEMBLY AND IPDM E/R (PART 2)

Check continuity between A/T assembly vehicle side harness connector terminal and ground.

A/T assembly vehicle side harness connector		Ground	Continuity
Connector	Terminal		
F42	9		Not existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace damaged parts.

4. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0705 TRANSMISSION RANGE SWITCH A

Description

INFOID:0000000005352712

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

DTC Logic

INFOID:0000000005352713

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0705	Transmission Range Sensor (PRNDL input)	Transmission range signals input with impossible pattern.	• Harness or connectors [Transmission range switches 1, 2, 3, 4 and TCM circuit is open or shorted.] • Transmission range switches 1, 2, 3 and 4

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “ACCELE POSI” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Shift the selector lever throughout the entire shift position from “P” to “D”. (Hold the selector lever at each position for 2 seconds or more)
4. Drive vehicle and maintain the following conditions for 2 seconds or more.

ACCELE POSI	: More than 1.0/8
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

5. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0705” detected?

YES >> Go to AT-402, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352714

1.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0710 TRANSMISSION FLUID TEMPERATURE SENSOR A

Description

INFOID:0000000005352715

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

DTC Logic

INFOID:0000000005352716

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...		Possible cause
P0710	Transmission Fluid Temperature Sensor A Circuit	The A/T fluid temperature sensor is –40°C (–40°F) or less for 5 seconds while driving the vehicle at the vehicle speed 10 km/h (7 MPH) or more.		• Harness or connectors (Sensor circuit is open.) • A/T fluid temperature sensor
		The A/T fluid temperature sensor is 180°C (356°F) or more for 5 seconds.		• Harness or connectors (Sensor circuit is short.) • A/T fluid temperature sensor
		The A/T fluid temperature sensor is in the following conditions while driving the vehicle at the vehicle speed 10 km/h (7 MPH) or more.		• Harness or connectors (Sensor circuit is stuck.) • A/T fluid temperature sensor
		For 4 minutes	: 15°C – 20°C (59°F – 68°F)	
			: 10°C – 15°C (50°F – 59°F)	
			: 5°C – 10°C (41°F – 50°F)	
			: 0°C – 5°C (32°F – 41°F)	
		For 7 minutes	: –5°C – 0°C (23°F – 32°F)	
			: –10°C – –5°C (14°F – 23°F)	
			: –15°C – –10°C (5°F – 14°F)	
			: –20°C – –15°C (–4°F – 5°F)	
		For 14 minutes	: –40°C – –20°C (–40°F – –4°F)	

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “SLCT LVR POSI” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 14 minutes or more.

SLCT LVR POSI	: D
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0710” detected?

YES >> Go to AT-404, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352717

1.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0717 INPUT SPEED SENSOR A

Description

INFOID:0000000005352718

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

DTC Logic

INFOID:0000000005352719

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0717	Input/Turbine Speed Sensor A Circuit No Signal	The revolution of input speed sensor 1 and/or 2 is 270 rpm or less.	• Harness or connectors (Sensor circuit is open.) • Input speed sensor 1 and/or 2

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “SLCT LVR POSI”, “GEAR”, “VHCL/S SE-A/T”, “W/O THL POS” and “ENGINE SPEED” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.
   CAUTION:
   Keep the same gear position.
   NOTE:
   Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

SLCT LVR POSI	: D
GEAR	: 2, 3, 4, 5 or 6
VHCL/S SE-A/T	: More than 40 km/h (25 MPH)
W/O THL POS	: ON
ENGINE SPEED	: More than 1,500 rpm

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0717” detected?

YES >> Go to AT-405, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352720

1.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".

NO >> Repair or replace damaged parts.

P0720 OUTPUT SPEED SENSOR

Description

INFOID:0000000005352721

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

DTC Logic

INFOID:0000000005352722

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0720	Output Speed Sensor Circuit	• The output speed sensor recognizes that the vehicle speed is 5 km/h (3 MPH) or less even if the vehicle speed signal recognizes that the vehicle speed is 20 km/h (12 MPH) or more. (Only when starts after the ignition switch is turned ON.) • The vehicle speed recognized by the output speed sensor decelerates 36 km/h (23 MPH) or more during 60 msec when the output speed sensor recognizes that the vehicle speed is 36 km/h (23 MPH) or more and the vehicle speed signal recognizes that the vehicle speed is 24 km/h (15 MPH) or less. • The vehicle speed of output speed sensor decelerates 36 km/h (23 MPH) or more even if the vehicle speed of vehicle speed signal accelerates or decelerates 24 km/h (15 MPH) or less during 60 msec when the output speed sensor recognizes that the vehicle speed is 36 km/h (23 MPH) or more.	• Harness or connectors (Sensor circuit is open.) • Output speed sensor

DTC CONFIRMATION PROCEDURE

CAUTION:

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

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Shift the selector lever to manual shift gate side.
3. Start up in M1, and then upshift to M2.
4. Accelerate to approximately 40 km/h (25 MPH) in M2.
5. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0720” detected?

YES >> Go to AT-408, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352723

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0725 ENGINE SPEED

Description

INFOID:0000000005352724

The engine speed signal is transmitted from the ECM to the TCM via CAN communication line.

DTC Logic

INFOID:0000000005352725

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0725	Engine speed input Circuit	• TCM does not receive the CAN communication signal from the ECM. • The engine speed is more less 150 rpm even if the vehicle speed is more than 10 km/h (7 MPH).	Harness or connectors (ECM to TCM circuit is open or shorted.)

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “SLCT LVR POSI” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

SLCT LVR POSI	: D
VHCL/S SE-A/T	: More than 10 km/h (7 MPH)

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0725” detected?

YES >> Go to AT-409, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352726

1.CHECK DTC OF ECM

With CONSULT-III

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Results” in “ENGINE”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to EC-667, "DTC Index".
NO >> GO TO 2.

2.CHECK DTC OF TCM

With CONSULT-III

Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to AT-470, "DTC Index".
NO >> GO TO 3.

3.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0729 6GR INCORRECT RATIO

Description

INFOID:0000000005352727

This malfunction is detected when the A/T does not shift into 6GR gear position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

DTC Logic

INFOID:0000000005352728

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0729	Gear 6 incorrect Ratio	The gear ratio is: • 0.914 or more • 0.813 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"AT-412, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

ATF TEMP 1 : 20°C (68°F) – 140°C (284°F)

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "6TH GR FNCTN P0729" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 6
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0729” is detected, check the DTC. Refer to AT-470, "DTC Index".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 6th
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0729” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to AT-412, "Diagnosis Procedure".
YES-4 >> “P0729” is detected: Go to AT-412, "Diagnosis Procedure".
NO >> Check intermittent incident. Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

4.CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR gear and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352729

1.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0730 INCORRECT GEAR RATIO

Description

INFOID:0000000005352730

- TCM detects a high-rpm state of the under drive sun gear.
- The number of revolutions of the under drive sun gear is calculated with the input speed sensor 1 and 2.

DTC Logic

INFOID:0000000005352731

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0730	Incorrect Gear Ratio	The revolution of under drive sun gear is 8,000 rpm or more.	• 2346 brake solenoid valve • Front brake solenoid valve • Input speed sensor 1, 2

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"AT-413, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select "Self Diagnostic Results" in "ENGINE".
3. Drive vehicle under the similar conditions to (1st trip) Freeze Frame Data for 10 minutes. Refer to the table below.
   Hold the accelerator pedal as steady as possible.

ENGINE SPEED	Same value as the Freeze Frame Data.
VEHICLE SPEED	Same value as the Freeze Frame Data.
B/FUEL SCHDL	Same value as the Freeze Frame Data.

4. Check 1st trip DTC.

With GST

Follow the procedure "With CONSULT-III".

Is 1st trip DTC detected?

YES >> Go to AT-413, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352732

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0731 1GR INCORRECT RATIO

Description

INFOID:0000000005352733

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

DTC Logic

INFOID:0000000005352734

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0731	Gear 1 Incorrect Ratio	The gear ratio is: • 5.219 or more • 4.645 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Outout speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"AT-415, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

ATF TEMP 1 : 20°C (68°F) – 140°C (284°F)

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "1ST GR FNCTN P0731" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 1
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0731” is detected, check the DTC. Refer to AT-470, "DTC Index".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 1st
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0731” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to AT-415, "Diagnosis Procedure".
YES-4 >> “P0731” is detected: Go to AT-415, "Diagnosis Procedure".
NO >> Check intermittent incident. Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

4. CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352735

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0732 2GR INCORRECT RATIO

Description

INFOID:0000000005352736

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

DTC Logic

INFOID:0000000005352737

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0732	Gear 2 Incorrect Ratio	The gear ratio is: • 3.386 or more • 3.013 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"AT-417, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

ATF TEMP 1 : 20°C (68°F) – 140°C (284°F)

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "2ND GR FNCTN P0732" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 2
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0732” is detected, check the DTC. Refer to AT-470, "DTC Index".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 2nd
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0732” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to AT-417, "Diagnosis Procedure".
YES-4 >> “P0732” is detected: Go to AT-417, "Diagnosis Procedure".
NO >> Check intermittent incident. Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

4. CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352738

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0733 3GR INCORRECT RATIO

Description

INFOID:0000000005352739

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

DTC Logic

INFOID:0000000005352740

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0733	Gear 3 Incorrect Raito	The gear ratio is: • 2.166 or more • 1.927 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"AT-419, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in T"RANSMISSION".
3. Check ATF temperature is in the following range.

ATF TEMP 1 : 20°C (68°F) – 140°C (284°F)

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "3RD GR FNCTN P0733" in "DTC & SRT confirmation" in T"RANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 3
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0733” is detected, check the DTC. Refer to AT-470, "DTC Index".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 3rd
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0733” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to AT-419, "Diagnosis Procedure".
YES-4 >> “P0733” is detected: Go to AT-419, "Diagnosis Procedure".
NO >> Check intermittent incident. Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

4. CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352741

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0734 4GR INCORRECT RATIO

Description

INFOID:0000000005352742

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

DTC Logic

INFOID:0000000005352743

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0734	Gear 4 Incorrect Ratio	The gear ratio is: • 1.497 or more • 1.332 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"AT-421, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

ATF TEMP 1 : 20°C (68°F) – 140°C (284°F)

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "4TH GR FNCTN P0734" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 4
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0734” is detected, check the DTC. Refer to AT-470, "DTC Index".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 4th
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0734” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to AT-421, "Diagnosis Procedure".
YES-4 >> “P0734” is detected: Go to AT-421, "Diagnosis Procedure".
NO >> Check intermittent incident. Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

4. CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352744

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0735 5GR INCORRECT RATIO

Description

INFOID:0000000005352745

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

DTC Logic

INFOID:0000000005352746

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0735	Gear 5 incorrect Ratio	The gear ratio is: • 1.060 or more • 0.943 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"AT-423, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

ATF TEMP 1 : 20°C (68°F) – 140°C (284°F)

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "5TH GR FNCTN P0735" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 5
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.

CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0735” is detected, check the DTC. Refer to AT-470, "DTC Index".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 5th
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0735” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to AT-423, "Diagnosis Procedure".
YES-4 >> “P0735” is detected: Go to AT-423, "Diagnosis Procedure".
NO >> Check intermittent incident. Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

4. CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352747

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0740 TORQUE CONVERTER

Description

INFOID:0000000005352748

- The torque converter clutch solenoid valve is activated, with the gear in D2, D3, D4, D5, D6, D7, M2, M3, M4, M5, M6 and M7 by the TCM in response to signals transmitted from the vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Torque converter clutch piston operation will then be controlled.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- When the accelerator pedal is depressed (less than 1.0/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.

DTC Logic

INFOID:0000000005352749

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0740	Torque Converter Clutch Circuit/Open	The torque converter clutch solenoid valve monitor value is 0.4 A or less when the torque converter clutch solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Torque converter clutch solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “MANU MODE SW”, “GEAR” and “VEHICLE SPEED” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 30 seconds or more.
   NOTE:
   Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

MANU MODE SW	: ON
GEAR	: 2
VEHICLE SPEED	: 40 km/h (25 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0740” detected?

YES >> Go to AT-424, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352750

1.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0744 TORQUE CONVERTER

Description

INFOID:0000000005352751

This malfunction is detected when the A/T does not shift into 7th gear position or the torque converter clutch does not lock-up as instructed by the TCM. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

DTC Logic

INFOID:0000000005352752

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0744	Torque Converter Clutch Circuit Intermittent	The lock-up is not performed in spite of within the lock-up area.	• Harness or connectors • Torque converter clutch solenoid valve • Torque converter • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “MANU MODE SW”, “GEAR” and “VEHICLE SPEED” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 10 seconds or more.
   NOTE:
   Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

MANU MODE SW	: ON
GEAR	: 2
VEHICLE SPEED	: 40 km/h (25 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0744” detected?

YES >> Go to AT-426, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352753

1.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0745 PRESSURE CONTROL SOLENOID A

Description

INFOID:0000000005352754

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

DTC Logic

INFOID:0000000005352755

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0745	Pressure Control Solenoid A	The line pressure solenoid valve monitor value is 0.4 A or less when the line pressure solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Line pressure solenoid valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Wait for 5 seconds or more at idle speed in “N” position.
3. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0745” detected?

YES >> Go to AT-427, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352756

1.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0750 SHIFT SOLENOID A

Description

INFOID:0000000005352757

- Anti-interlock solenoid valve prevents the simultaneous activation of the input clutch and the low brake.
- The anti-interlock solenoid valve is an ON/OFF type solenoid valve.

DTC Logic

INFOID:0000000005352758

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0750	Shift Solenoid A	• The anti-interlock solenoid valve monitor value is ON when the anti-interlock solenoid valve command value is OFF. • The anti-interlock solenoid valve monitor value is OFF when the anti-interlock solenoid valve command value is ON.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Anti-interlock solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 1
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0750” detected?

YES >> Go to AT-428, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352759

1.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0775 PRESSURE CONTROL SOLENOID B

Description

INFOID:0000000005352760

- The Input clutch solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The Input clutch solenoid valve controls the input clutch control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000005352761

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0775	Pressure Control Solenoid B	The input clutch solenoid valve monitor value is 0.4 A or less when the input clutch solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Input clutch solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 1
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0775” detected?

YES >> Go to AT-429, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352762

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0780 SHIFT

Description

INFOID:0000000005352763

- TCM detects the malfunction of low brake solenoid valve.
- TCM measures the downshift time from 4GR to 3GR during “D” position, and detects the malfunction if the shifting time is excessively short.

DTC Logic

INFOID:0000000005352764

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0780	Shift Error	The shift change time from 4GR gear to 3GR is 0.2 second or less.	• Anti-interlock solenoid valve • Low brake solenoid valve • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “GEAR” in “Data Monitor” in “TRANSMISSION”.
3. Shift the selector lever to “D” position.
4. Accelerate until “4” appears on “GEAR”, then release the accelerator pedal.
5. Decelerate until “3” appears on “GEAR” by depressing the brake pedal gradually.
   CAUTION:
   The brake pedal must be depressed slowly.
6. Then repeat steps 4 to 5 three more times.
7. Stop the vehicle, and then turn the ignition switch OFF.
8. Perform steps 1 to 7 again.
9. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0780” detected?

YES >> Go to AT-430, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352765

1.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P0795 PRESSURE CONTROL SOLENOID C

Description

INFOID:0000000005352766

- The front brake solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The front brake solenoid valve controls the front brake control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000005352767

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0795	Pressure Control Solenoid C	The front brake solenoid valve monitor value is 0.4 A or less when the front brake solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Front brake solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 7
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0795” detected?

YES >> Go to AT-431, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352768

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P1705 TP SENSOR

Description

INFOID:0000000005352769

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

DTC Logic

INFOID:0000000005352770

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1705	Accelerator Pedal Position Sensor Signal Circuit	TCM does not receive the proper accelerator pedal position signal, closed throttle position signal and wide open throttle position signal (input via CAN communication) from ECM.	Harness or connectors (Sensor circuit is open or shorted.)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine and let it idle for 5 seconds or more.
2. Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is “P1705” detected?

YES >> Go to AT-432, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352771

1.CHECK DTC OF ECM

With CONSULT-III

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Results” in “ENGINE”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to EC-667, "DTC Index".
NO >> GO TO 2.

2.CHECK DTC OF TCM

With CONSULT-III

Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to AT-470, "DTC Index".
NO >> GO TO 3.

3.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P1721 VEHICLE SPEED SIGNAL

Description

INFOID:0000000005352772

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

DTC Logic

INFOID:0000000005352773

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1721	Vehicle Speed Signal Circuit	• The vehicle speed signal recognizes that the vehicle speed is 5 km/h (3 MPH) or less even if the output speed sensor recognizes that the vehicle speed is 20 km/h (12 MPH) or more. (Only when starts after the ignition switch is turned ON.) • The vehicle speed recognized by the vehicle speed signal decelerates 36 km/h (23 MPH) or more during 60 msec when the vehicle speed signal recognizes that the vehicle speed is 36 km/h (23 MPH) or more and the output speed sensor recognizes that the vehicle speed is 24 km/h (15 MPH) or less. • The vehicle speed of vehicle speed signal decelerates 36 km/h (23 MPH) or more even if the vehicle speed of output speed sensor accelerates or decelerates 24 km/h (15 MPH) or less during 60 msec when the vehicle speed signal recognizes that the vehicle speed is 36 km/h (23 MPH) or more.	Harness or connectors (Sensor circuit is open or shorted.)

DTC CONFIRMATION PROCEDURE

CAUTION:

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

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Shift the selector lever to manual shift gate side.
3. Start up in M1, and then upshift to M2.
4. Accelerate to approximately 40 km/h (25 MPH) in M2.

5. Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is “P1721” detected?

YES >> Go to AT-434, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352774

1.CHECK DTC OF ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT).

With CONSULT-III

Perform “Self Diagnostic Results” in “ABS”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to BRC-30, "CONSULT-III Function (ABS)".
NO >> GO TO 2.

2.CHECK DTC OF UNIFIED METER AND A/C AMP.

With CONSULT-III

Perform “Self Diagnostic Results” in “METER/M&A”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to DI-28, "CONSULT-III Function (METER/M&A)".
NO >> GO TO 3.

3.CHECK DTC OF TCM

With CONSULT-III

Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to AT-470, "DTC Index".
NO >> GO TO 4.

4.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P1730 INTERLOCK

Description

INFOID:0000000005352775

Fail-safe function to detect interlock conditions.

DTC Logic

INFOID:0000000005352776

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1730	Interlock	The revolution sensor detects the deceleration of 12 km/h (7 MPH) or more for 1 second.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Hydraulic control circuit

NOTE:
When the vehicle is driven fixed in 2GR, a input speed sensor malfunction is displayed, but this is not a turbine revolution sensor malfunction.

DTC CONFIRMATION PROCEDURE

CAUTION:
- **"AT-436, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III
1. Start the engine.
2. Select "SLCT LVR POSI" and "GEAR" in "Data Monitor" in "TRANSMISSION".
3. Drive vehicle the following condition.

SLCT LVR POSI	: D
GEAR	: 1 through 7

4. Perform "Self Diagnostic Results" in "TRANSMISSION".

With GST
Follow the procedure "With CONSULT-III".

Is "P1730" detected?

YES >> Go to AT-436, "Diagnosis Procedure".
NO >> INSPECTION END

Judgment of Interlock

INFOID:0000000005352777

Refer to AT-466, "Fail-Safe".

Diagnosis Procedure

INFOID:0000000005352778

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P1734 7GR INCORRECT RATIO

Description

INFOID:0000000005352779

This malfunction is detected when the A/T does not shift into 7GR position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

DTC Logic

INFOID:0000000005352780

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1734	Gear 7 Incorrect Ratio	The gear ratio is: • 0.818 or more • 0.728 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"AT-438, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

ATF TEMP 1 : 20°C (68°F) – 140°C (284°F)

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "7TH GR FNCTN P1734" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 7
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P1734” is detected, check the DTC. Refer to AT-470, "DTC Index".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 7th
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P1734” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to AT-438, "Diagnosis Procedure".
YES-4 >> “P1734” is detected: Go to AT-438, "Diagnosis Procedure".
NO >> Check intermittent incident. Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

4.CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1st to 7th gear and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352781

1.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P1815 M-MODE SWITCH

Description

INFOID:0000000005352782

Manual mode switch is installed in control device. It transmits manual mode switch, shift up and shift down switch signals to unified meter and A/C amp. Then unified meter and A/C amp. transmits signals to TCM via CAN communication.
TCM transmits the switch signals to unified meter and A/C amp. via CAN communication line. Then manual mode switch position is indicated on the shift position indicator. For inspection, refer to AT-451.

DTC Logic

INFOID:0000000005352783

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1815	Manual Mode Switch Circuit	TCM monitors manual mode, non manual mode, up or down switch signal, and detects as irregular when impossible input pattern occurs 2 second or more.	• Harness or connectors (These switches circuit is open or shorted.) • Manual mode select switch (Into control device) • Manual mode position select switch (Into control device)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SLCT LVR POSI” and “MANU MODE SW” in “Data Monitor” in “TRANSMISSION”.
3. Maintain the following each conditions more than 2 seconds.

SLCT LVR POSI	: D
MANU MODE SW	: ON

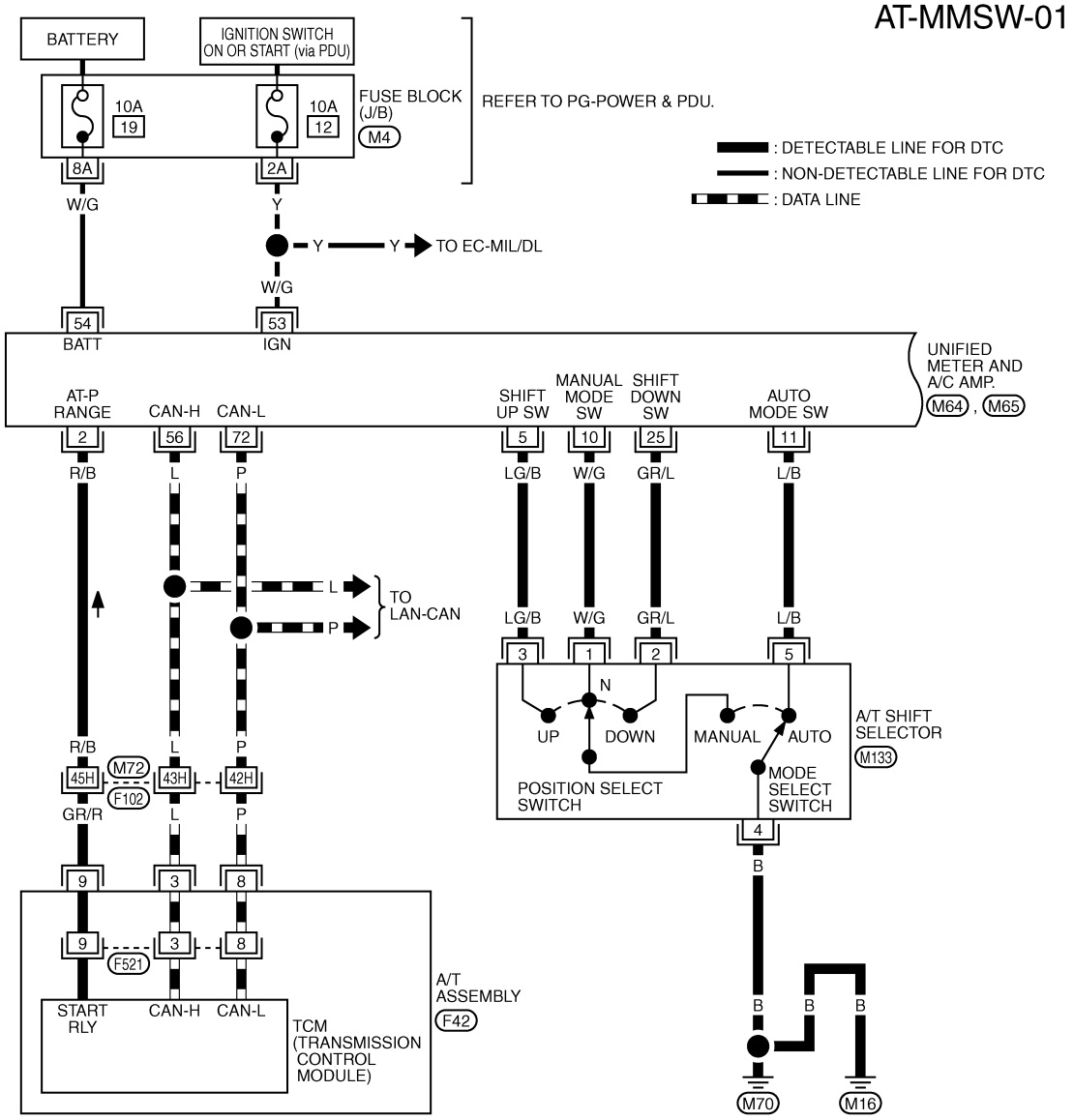
4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is “P1815” detected?

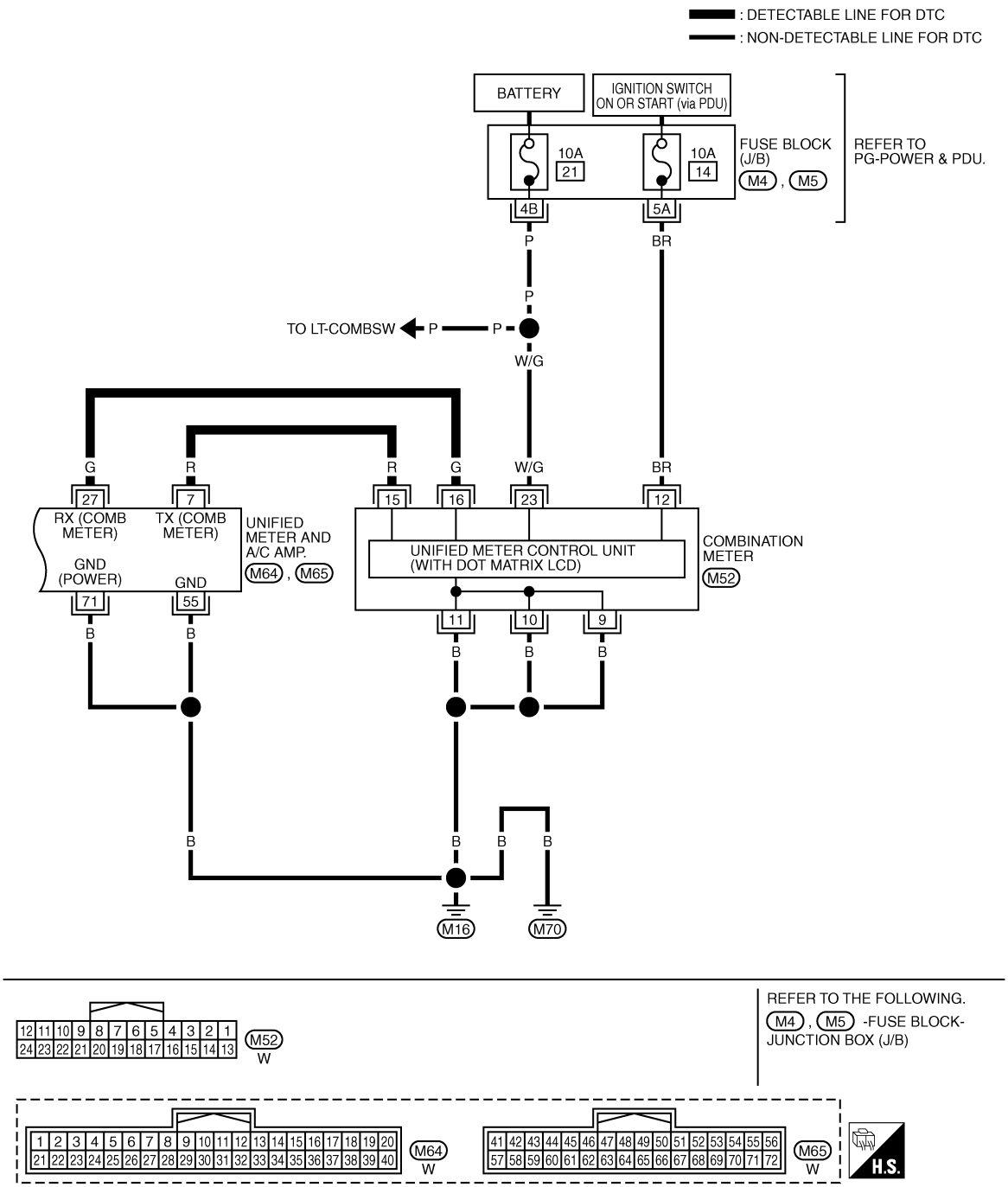
YES >> Go to AT-441, "Diagnosis Procedure".
NO >> INSPECTION END

Wiring Diagram - AT - MMSW

INFOID:0000000005352784



AT-MMSW-02



TCWT0690E

Diagnosis Procedure

INFOID:0000000005352785

1. CHECK MANUAL MODE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T shift selector connector.
3. Turn ignition switch ON.
4. Check voltage between A/T shift selector vehicle side harness connector terminals.

A/T shift selector vehicle side harness connector			Voltage (Approx.)
Connector	Terminal		
	(+)	(–)	
M133	1	4	Battery voltage
	2		
	3		
	5		

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 4.

2.CHECK MANUAL MODE SWITCH

Check manual mode switch. Refer to AT-443, "Component Inspection (Manual Mode Switch)".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

3.CHECK MALFUNCTIONING ITEM

Check the following.
- Check terminals of A/T shift selector harness connector and harness cladding for damage.
- Check connector for loose connection.

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace damaged parts.

4.CHECK GROUND CIRCUIT

Check continuity between A/T shift selector vehicle side harness connector terminal and ground.

A/T shift selector vehicle side harness connector		Ground	Continuity
Connector	Terminal		
M133	4		Existed

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace damaged parts.

5.CHECK HARNESS BETWEEN A/T SHIFT SELECTOR AND UNIFIED METER AND A/C AMP. (PART 1)

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between A/T shift selector vehicle side harness connector terminals and unified meter and A/C amp. vehicle side harness connector terminals.

A/T shift selector vehicle side harness connector		Unified meter and A/C amp. vehicle side harness connector		Continuity
Connector	Terminal	Connector	Terminal	
M133	1	M64	10	Existed
	2		25	
	3		5	
	5		11	

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace damaged parts.

6.CHECK HARNESS BETWEEN A/T SHIFT SELECTOR AND UNIFIED METER AND A/C AMP. (PART 2)

Check continuity between control device vehicle side harness connector terminals and ground.

A/T shift selector vehicle side harness connector		Ground	Continuity
Connector	Terminal		
M133	1		Not existed
	2		
	3		
	5		

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace damaged parts.

7.CHECK MALFUNCTIONING ITEM

Check the following.
- Check terminals of unified meter and A/C amp. connector for damage.
- Check connector for loose connection.

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace damaged parts.

8.CHECK UNIFIED METER AND A/C AMP.

1. Reconnect all the connectors.
2. Turn ignition switch ON.
3. Select “M RANGE SW”, “NM RANGE SW”, “AT SFT UP SW” and “AT SFT DWN SW” in “Data Monitor” in “METER/M&A”, and check the ON/OFF operations of each monitor item. Refer to DI-28, "CONSULT-III Function (METER/M&A)".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Replace unified meter and A/C amp. Refer to DI-34, "Removal and Installation of Unified Meter and A/C Amp".

9.CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

Component Inspection (Manual Mode Switch)

INFOID:0000000005352786

1.CHECK MANUAL MODE SWITCH

Check continuity between A/T shift selector connector terminals.

A/T shift selector harness connector			Condition	Continuity
Connector	Terminal			
M133	1	4	Selector lever is shifted to manual shift gate side	Existed
			Other than the above	Not existed
	2		Selector lever is shifted to – side	Existed
			Other than the above	Not existed
	3		Selector lever is shifted to + side	Existed
			Other than the above	Not existed
	5		Selector lever is shifted to manual shift gate side	Not existed
			Other than the above	Existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace damaged parts. Refer to AT-491, "Exploded View".

P2713 PRESSURE CONTROL SOLENOID D

Description

INFOID:0000000005352787

- The high and low reverse clutch solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The high and low reverse clutch solenoid valve controls the high and low reverse clutch control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000005352788

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P2713	Pressure Control Solenoid D	The high and low reverse clutch solenoid valve monitor value is 0.4 A or less when the high and low reverse clutch solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • High and low reverse clutch solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive the vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 3
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P2713” detected?

YES >> Go to AT-445, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352789

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P2722 PRESSURE CONTROL SOLENOID E

Description

INFOID:0000000005352790

- The low brake solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The low brake solenoid valve controls the low brake control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000005352791

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P2722	Pressure Control Solenoid E	The low brake solenoid valve monitor value is 0.4 A or less when the low brake solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Low brake solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 1
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P2722” detected?

YES >> Go to AT-446, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352792

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P2731 PRESSURE CONTROL SOLENOID F

Description

INFOID:0000000005352793

- The 2346 brake solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The 2346 brake solenoid valve controls the 2346 brake control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000005352794

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P2731	Pressure Control Solenoid F	The 2346 brake solenoid valve monitor value is 0.4 A or less when the 2346 brake solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • 2346 brake solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 2
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P2731” detected?

YES >> Go to AT-447, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352795

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

P2807 PRESSURE CONTROL SOLENOID G

Description

INFOID:0000000005352796

- The direct clutch solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The direct clutch solenoid valve controls the direct clutch control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000005352797

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected is...	Possible cause
P2807	Pressure Control Solenoid G	The direct clutch solenoid valve monitor value is 0.4 A or less when the direct clutch solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Direct clutch solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 1
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P2807” detected?

YES >> Go to AT-448, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005352798

1. CHECK INTERMITTENT INCIDENT

Refer to GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to AT-501, "Exploded View".
NO >> Repair or replace damaged parts.

MAIN POWER SUPPLY AND GROUND CIRCUIT

Description

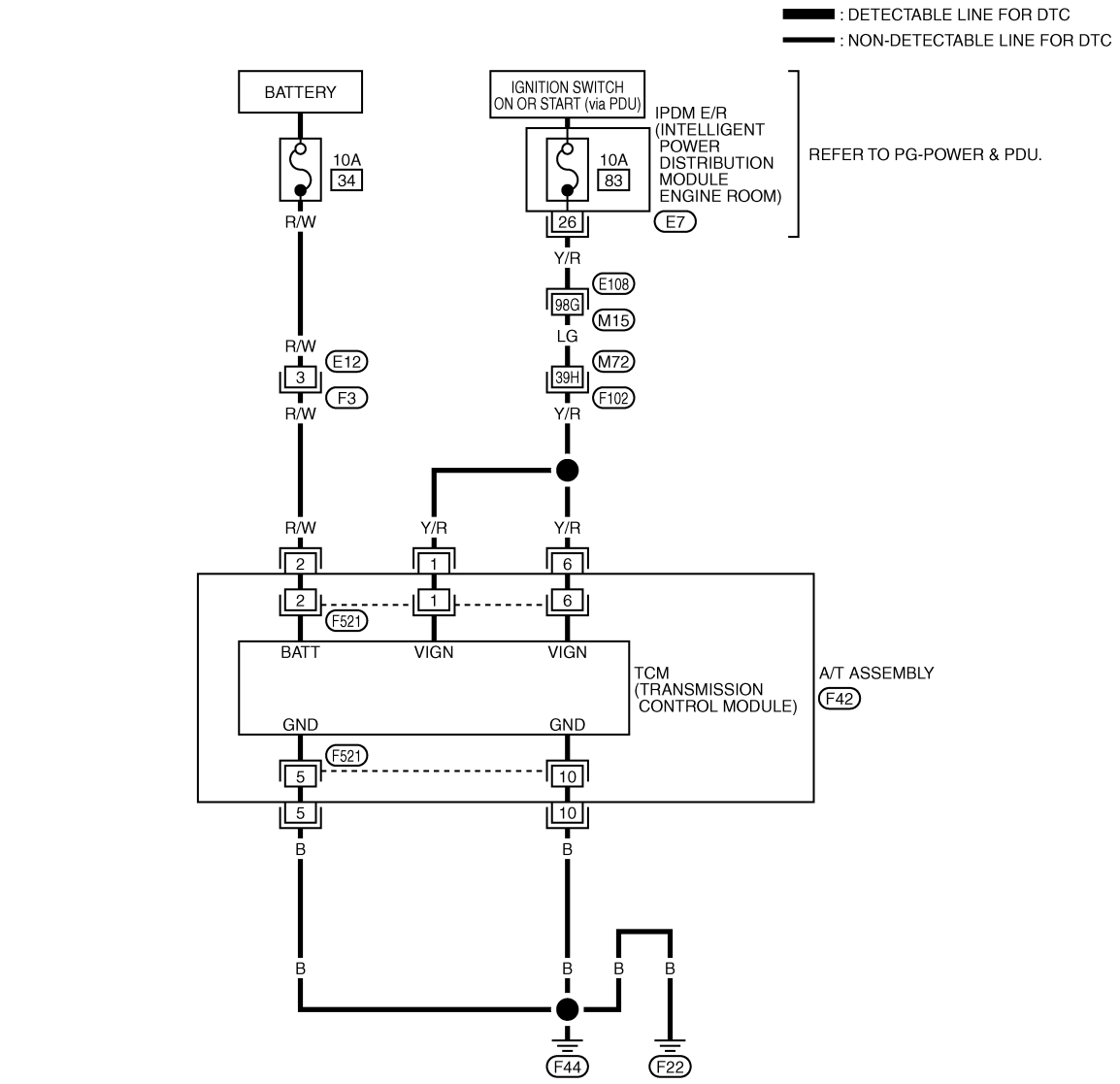
INFOID:0000000005352799

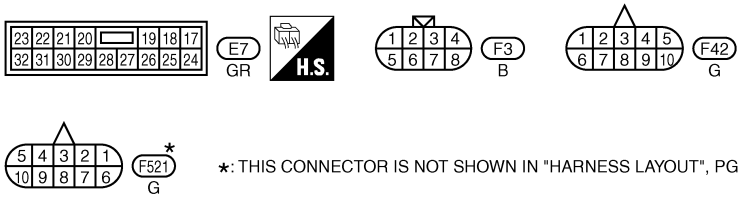
Supply power to TCM.

Wiring Diagram - AT - MAIN

INFOID:0000000005352800

AT-MAIN-01





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

REFER TO THE FOLLOWING.
E108 , F102 -SUPER MULTIPLE JUNCTION (SMJ)

TCWT0691E

Diagnosis Procedure

INFOID:0000000005352801

1.CHECK TCM POWER SOURCE

1. Turn ignition switch OFF.
2. Disconnect A/T assembly connector.
3. Turn ignition switch ON.
4. Check voltage between A/T assembly vehicle side harness connector terminals and ground.

A/T assembly vehicle side harness connector		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
F42	1, 6		Turn ignition switch ON	Battery voltage
			Turn ignition switch OFF	0 V
	2		Always	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check the following. If NG, repair or replace damaged parts.
- Harness for short or open between battery and A/T assembly vehicle side harness connector terminal 2.
- Harness for short or open between push-button ignition switch and IPDM E/R.
- Harness for short or open between IPDM E/R vehicle side harness connector terminal 26 and A/T assembly vehicle side harness connector terminal 1, 6.
- 10A fuse (No. 34, located in the fuse, fusible link and relay box)
- 10A fuse (No. 83, located in the IPDM E/R)
- Push-button ignition switch. Refer to PG-6, "Wiring Diagram - POWER -".

2.CHECK TCM GROUND CIRCUIT

Check continuity between A/T assembly vehicle side harness connector terminals and ground.

A/T assembly vehicle side harness connector		Ground	Continuity
Connector	Terminal		
F42	5		Existed
	10		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace damaged parts.

3.DETECT MALFUNCTIONING ITEM

Check the following.
- Check terminals of A/T assembly connector for damage.
- Check connector for loose connection.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace damaged parts.

SHIFT POSITION INDICATOR CIRCUIT

Description

INFOID:0000000005352802

TCM transmit the switch signals to unified meter and A/C amp. via CAN communication line. Then manual mode switch position is indicated on the shift position indicator.

Component Function Check

INFOID:0000000005352803

1. CHECK A/T INDICATOR

CAUTION:
Always drive vehicle at a safe speed.

1. Start the engine.
2. Check the actual selector lever position (“P”, “R”, “N”, “D” and “DS”) and the indication of the shift position indicator mutually coincide.
3. Drive vehicle in the manual mode, and then check that the actual gear position and the indication of the shift position indicator mutually coincide when the selector lever is shifted to “UP (+ side)” or “DOWN (– side)” side (1GR ⇔ 7GR).

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to AT-451, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000005352804

1. CHECK INPUT SIGNALS

With CONSULT-III

1. Start the engine.
2. Select “SLCT LVR POSI” in “Data Monitor” in “TRANSMISSION”.
3. Check the actual selector lever position (“P”, “R”, “N”, “D” and “DS”) and the indication of the “SLCT LVR POSI” mutually coincide. Refer to AT-459, "Reference Value".
4. Drive vehicle in the manual mode, and then check that the actual gear position and the indication of the “SLCT LVR POSI” mutually coincide when the selector lever is shifted to the “UP (+ side)” or “DOWN (– side)” side (1GR ⇔ 7GR). Refer to AT-459, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END
NO-1 >> The actual gear position does not change, or shifting into the manual mode is not possible (no gear shifting in the manual mode possible). Or the shift position indicator is not indicated.
- Check manual mode switch. Refer to AT-443, "Component Inspection (Manual Mode Switch)".
- Check A/T main system (Fail-safe function actuated).
  - Perform “Self Diagnostic Results” in “TRANSMISSION”. Refer to AT-470, "DTC Index".

NO-2 >> The actual gear position changes, but the shift position indicator is not indicated.
- Perform “Self Diagnostic Results” in “TRANSMISSION”. Refer to AT-470, "DTC Index".

NO-3 >> The actual gear position and the indication on the shift position indicator do not coincide.
- Perform “Self Diagnostic Results” in “TRANSMISSION”. Refer to AT-470, "DTC Index".

NO-4 >> Only a specific position or positions is/are not indicated on the shift position indicator.
- Replace the unified meter and A/C amp. Refer to DI-34, "Removal and Installation of Unified Meter and A/C Amp".

SHIFT LOCK SYSTEM

Description

INFOID:0000000005352805

Shift lock system circuit consists of the following part.

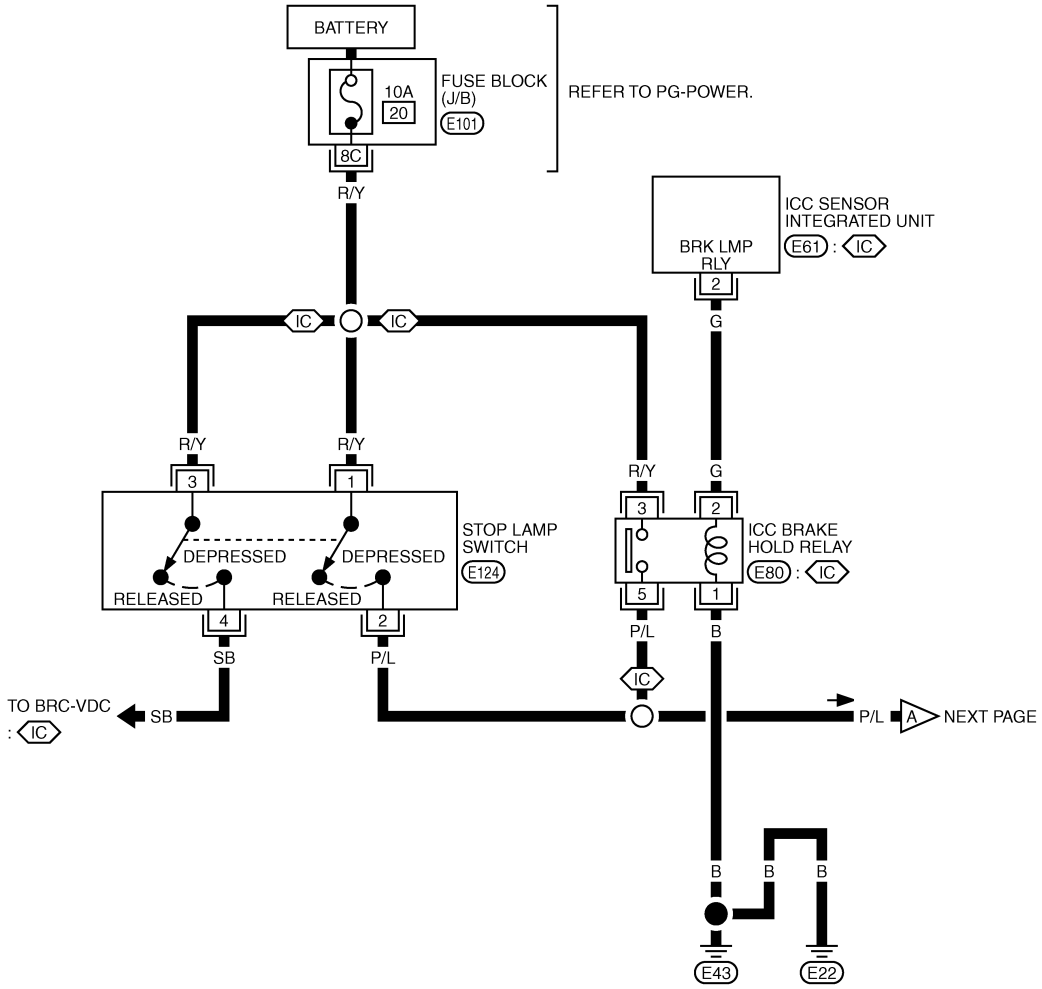
Component	Function
Shift lock solenoid	Activated by the ignition switch and stop lamp signals, it holds the relative positions of sliders A and B.
Shift lock relay	Current flow to stop lamp switch allows shift lock solenoid contact ON, and then power is applied to shift lock solenoid.
Stop lamp switch	Depressing the brake pedal turns ON the stop lamp switch and energizes the shift lock solenoid.

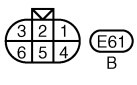
Wiring Diagram - AT - SHIFT

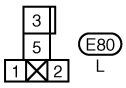
INFOID:0000000005352806

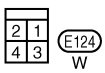
AT-SHIFT-01

IC : WITH ICC





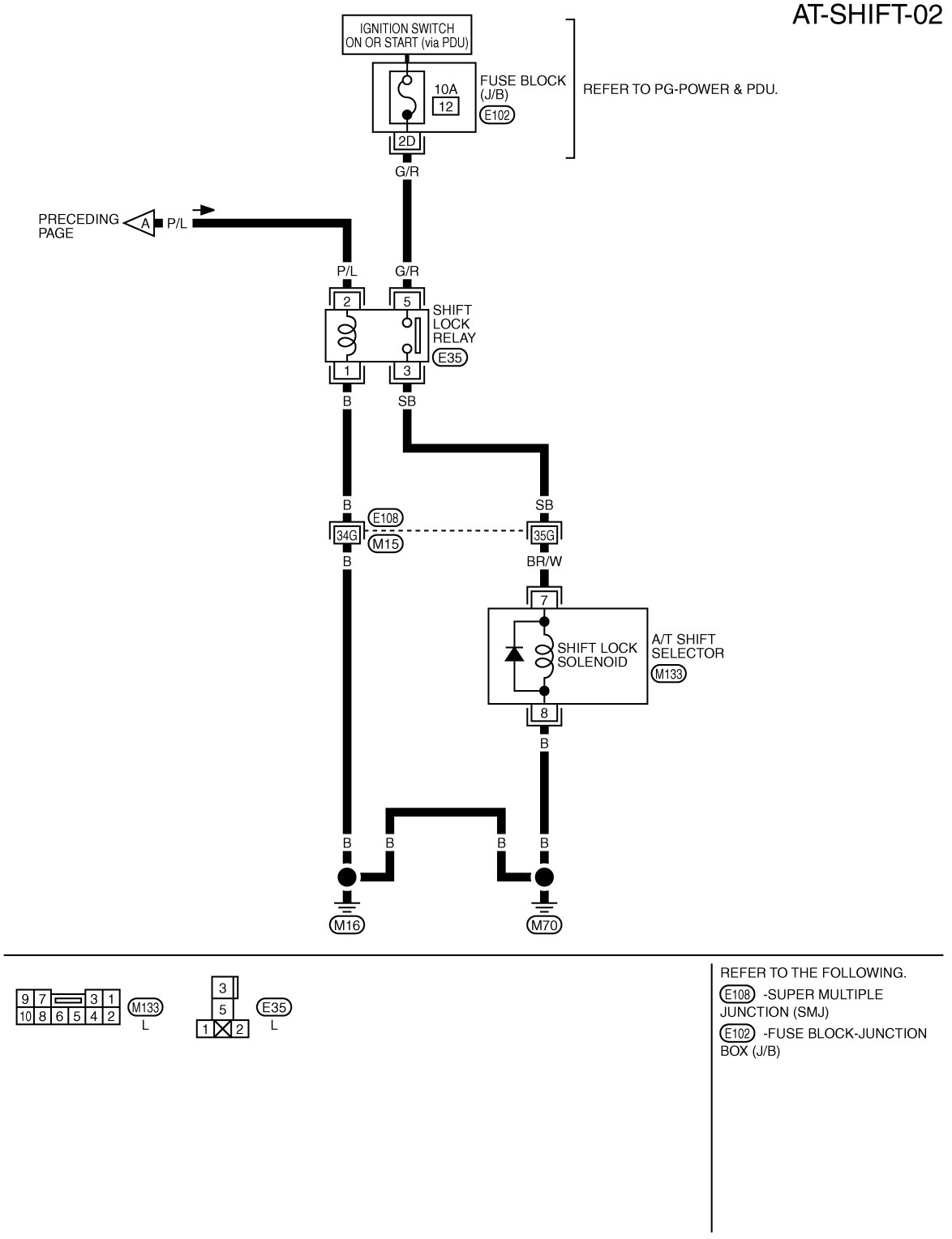




REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TCWT0695E

AT-SHIFT-02



TCWT0696E

Component Function Check

INFOID:0000000005352807

1. CHECK A/T SHIFT LOCK OPERATION (PART 1)

1. Turn ignition switch ON.
2. Shift the selector lever to “P” position.
3. Attempt to shift the selector lever to any other position with the brake pedal released.

Can the selector lever be shifted to any other position?

YES >> Go to AT-455, "Diagnosis Procedure".
NO >> GO TO 2.

2.CHECK A/T SHIFT LOCK OPERATION (PART 2)

Attempt to shift the selector lever to any other position with the brake pedal depressed.

Can the selector lever be shifted to any other position?

YES >> INSPECTION END
NO >> Go to AT-455, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000005352808

1.CHECK SELECTOR LEVER POSITION

Check the selector lever position for damage. Refer to AT-490, "Inspection and Adjustment".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Adjust control linkage. Refer to AT-490, "Inspection and Adjustment".

2.CHECK POWER SOURCE

1. Turn ignition switch OFF.
2. Disconnect shift lock relay.
3. Check voltage between shift lock relay harness connector terminal and ground.

Shift lock relay harness connector		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E35	2		Depressed brake pedal.	Battery voltage
			Released brake pedal.	0 V

Is the inspection result normal?

YES >> GO TO 7.
NO-1 >> When pressing the brake pedal, the voltage is 0 V: GO TO 3.
NO-2 >> When releasing the brake pedal, the voltage is battery voltage: GO TO 5.

3.CHECK POWER SOURCE

1. Disconnect stop lamp switch connector.
2. Check voltage between stop lamp switch vehicle side harness connector terminal and ground.

Stop lamp switch vehicle side harness connector		Ground	Voltage (Approx.)
Connector	Terminal		
E124	1		Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Check the following. If NG, repair or replace damaged parts.
- 10A fuse [No. 20, located in the fuse block (J/B)]
- Harness for short to ground or open between battery and fuse block (J/B).
- Harness for short to ground or open between fuse block (J/B) vehicle side harness connector terminal 8C and stop lamp switch vehicle side harness connector terminal 1.
- Harness for short to ground between fuse block (J/B) vehicle side harness connector terminal 8C and ICC brake hold relay vehicle side harness connector terminal 3. [With ICC (Full Speed Range) System]

4.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to AT-490, "Inspection and Adjustment".

Is the inspection result normal?

YES >> Check the following. If NG, repair or replace damaged parts.
- Harness for short to ground or open between stop lamp switch vehicle side harness connector terminal 2 and shift lock relay vehicle side harness connector terminal 2.

- Harness for short to ground between ICC brake hold relay vehicle side harness connector terminal 5 and shift lock relay vehicle side harness connector 2. [With ICC (Full Speed Range) System]

NO >> Repair or replace damaged parts.

5.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to AT-490, "Inspection and Adjustment".

Is the inspection result normal?

YES-1 >> Without ICC System: Repair or replace harness between stop lamp switch and shift lock relay.
YES-2 >> With ICC System: GO TO 6.
NO >> Repair or replace damaged parts.

6.CHECK DTC WITH ICC SYSTEM

With CONSULT-III

Perform “Self Diagnostic Results” in “ICC”.

Is any malfunction detected?

YES >> Check the DTC detected item. Refer to ACS-40, "Diagnostic Trouble Code (DTC) Chart".
NO >> Repair or replace harness between stop lamp switch and shift lock relay.

7.CHECK GROUND CIRCUIT

Check continuity between shift lock relay vehicle side harness connector terminal and ground.

Shift lock relay vehicle side harness connector		Ground	Continuity
Connector	Terminal		
E35	1		Existed

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace damaged parts.

8.CHECK SHIFT LOCK RELAY

Check shift lock relay. Refer to AT-457, "Component Inspection (Shift lock relay)".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair or replace damaged parts.

9.CHECK POWER SOURCE

1. Turn ignition switch ON.
2. Check voltage between shift lock relay vehicle side harness connector terminal and ground.

Shift lock relay vehicle side harness connector		Ground	Voltage (Approx.)
Connector	Terminal		
E35	5		Battery voltage

Is the inspection result normal?

YES >> GO TO 10.
NO >> Check the following. If NG, repair or replace damaged parts.

- 10A fuse [No. 12, located in the fuse block (J/B)]
- Harness for short to ground or open between push-button ignition switch and fuse block (J/B).
- Harness for short to ground or open between fuse block (J/B) vehicle side harness connector terminal 2D and shift lock relay vehicle side harness connector terminal 5.

10.CHECK POWER SOURCE

1. Turn ignition switch OFF.
2. Connect shift lock relay.
3. Disconnect A/T shift selector connector.
4. Turn ignition switch ON.
5. Check voltage between A/T shift selector vehicle side harness connector terminal and ground.

A/T shift selector vehicle side harness connector		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
M133	7		Depressed brake pedal.	Battery voltage
			Released brake pedal.	0 V

Is the inspection result normal?

YES >> GO TO 11.
NO >> Check the following. If NG, repair or replace damaged parts.
- Harness for short to ground or open between shift lock relay vehicle side harness connector terminal 3 and control A/T shift selector side harness connector terminal 7.

11. CHECK GROUND CIRCUIT

Check continuity between A/T shift selector vehicle side harness connector terminal and ground.

A/T shift selector vehicle side harness connector		Ground	Continuity
Connector	Terminal		
M133	8		Existed

Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair or replace damaged parts.

12. CHECK SHIFT LOCK SOLENOID

1. Turn ignition switch OFF.
2. Connect A/T shift selector connector.
3. Check shift lock solenoid operation. Refer to AT-454, "Component Function Check".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace control device assembly. Refer to AT-491, "Exploded View".

Component Inspection (Shift lock relay)

INFOID:0000000005352809

1. CHECK SHIFT LOCK RELAY

Check continuity between shift lock relay terminals.

CAUTION:
Connect the fuse between the terminals when applying the voltage.

Shift lock relay connector			Condition	Continuity
Connector	Terminal			
E35	3	5	Apply 12 V direct current between terminals 1 and 2.	Existed
			OFF	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace shift lock relay.

Component Inspection (Stop lamp switch)

INFOID:0000000005352810

1. CHECK STOP LAMP SWITCH

Check continuity between stop lamp switch connector terminals.

Stop lamp switch connector			Condition	Continuity
Connector	Terminal			
E124	1	2	Depressed brake pedal.	Existed
			Released brake pedal.	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace stop lamp switch. Refer to BR-6, "Removal and Installation".

ECU DIAGNOSIS

TCM

Reference Value

INFOID:0000000005352811

VALUES ON DIAGNOSIS TOOL

NOTE:

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

- Actual shift schedule has more or less tolerance or allowance
- Shift schedule in Service Manual refers to the point where shifting starts
- Gear position on CONSULT-III indicates the point where shifting completes

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

CONSULT-III MONITOR ITEM

Item name	Condition	Value / Status (Approx.)
VHCL/S SE-A/T	During driving	Approximately equals the speedometer reading.
ESTM VSP SIG	During driving	Approximately equals the speedometer reading.
OUTPUT REV	During driving (lock-up ON)	Tachometer / Gear ratio
INPUT SPEED	During driving (lock-up ON)	Approximately equals the engine speed.
F SUN GR REV	During driving	Revolution of front sun gear is indicated.
F CARR GR REV	During driving	Revolution of front carrier is indicated.
ENGINE SPEED	Engine running	Closely equals the tachometer reading.
TC SLIP SPEED	During driving	Engine speed – Input speed
ACCELE POSI	Accelerator pedal is released	0.0/8
	Accelerator pedal is fully depressed	8.0/8
THROTTLE POSI	Accelerator pedal is released	0.0/8
	Accelerator pedal is fully depressed	8.0/8
ATF TEMP 1	Ignition switch ON	Temperature of ATF in the oil pan is indicated.
ATF TEMP 2	Ignition switch ON	Temperature of ATF at the exit of torque converter.
ATF TEMP SE 1	0°C (32° F) – 20°C (68°F) – 80°C (176°F)	3.3 – 2.7 – 0.9 V
BATTERY VOLT	Ignition switch ON	Battery voltage (11 V – 14 V)
LINE PRES SOL	During driving	0.2 – 0.6 A
TCC SOLENOID	Slip lock-up is active	0.2 – 0.8 A
	Lock-up is active	0.8 A
	Other than the above	0 A
L/B SOLENOID	Low brake is engaged	0.6 – 0.8 A
	Low brake is disengaged	0 – 0.05 A

Item name	Condition	Value / Status (Approx.)
FR/B SOLENOID	Front brake is engaged	0.6 – 0.8 A
	Front brake is disengaged	0 – 0.05 A
HLR/C SOL	High and low reverse clutch is disengaged	0.6 – 0.8 A
	High and low reverse clutch is engaged	0 – 0.05 A
I/C SOLENOID	Input clutch is disengaged	0.6 – 0.8 A
	Input clutch is engaged	0 – 0.05 A
D/C SOLENOID	Direct clutch is disengaged	0.6 – 0.8 A
	Direct clutch is engaged	0 – 0.05 A
2346/B SOL	2346 brake is engaged	0.6 – 0.8 A
	2346 brake is disengaged	0 – 0.05 A
L/P SOL MON	During driving	0.2 – 0.6 A
TCC SOL MON	Slip lock-up is active	0.2 – 0.8 A
	Lock-up is active	0.8 A
	Other than the above	0 A
L/B SOL MON	Low brake is engaged	0.6 – 0.8 A
	Low brake is disengaged	0 – 0.05 A
FR/B SOL MON	Front brake is engaged	0.6 – 0.8 A
	Front brake is disengaged	0 – 0.05 A
HLR/C SOL MON	High and low reverse clutch is disengaged	0.6 – 0.8 A
	High and low reverse clutch is engaged	0 – 0.05 A
I/C SOL MON	Input clutch is disengaged	0.6 – 0.8 A
	Input clutch is engaged	0 – 0.05 A
D/C SOL MON	Direct clutch is disengaged	0.6 – 0.8 A
	Direct clutch is engaged	0 – 0.05 A
2346/B SOL MON	2346 brake is engaged	0.6 – 0.8 A
	2346 brake is disengaged	0 – 0.05 A
GEAR RATIO	Driving with 1GR	4.924
	Driving with 2GR	3.194
	Driving with 3GR	2.043
	Driving with 4GR	1.412
	Driving with 5GR	1.000
	Driving with 6GR	0.862
	Driving with 7GR	0.772
ENGINE TORQUE	During driving	Changes the value according to the acceleration or deceleration.
ENG TORQUE D	During driving	Changes the value according to the acceleration or deceleration.
INPUT TRQ S	During driving	Changes the value according to the acceleration or deceleration.
INPUT TRQ L/P	During driving	Changes the value according to the acceleration or deceleration.
TRGT PRES L/P	Selector lever in “P” and “N” positions	490 kPa
	Other than the above	490 – 1370 kPa
TRGT PRES TCC	Slip lock-up is active	0 – 600 kPa
	Lock-up is active	600 kPa
	Other than the above	0 kPa

Item name	Condition	Value / Status (Approx.)
TRGT PRES L/B	Low brake is engaged	1370 kPa
	Low brake is disengaged	0 kPa
TRGT PRE FR/B	Front brake is engaged	1370 kPa
	Front brake is disengaged	0 kPa
TRG PRE HLR/C	High and low reverse clutch is disengaged	1370 kPa
	High and low reverse clutch is engaged	0 kPa
TRGT PRES I/C	Input clutch is disengaged	1370 kPa
	Input clutch is engaged	0 kPa
TRGT PRES D/C	Direct clutch is disengaged	1370 kPa
	Direct clutch is engaged	0 kPa
TRG PRE 2346/B	2346 brake is engaged	1370 kPa
	2346 brake is disengaged	0 kPa
SHIFT PATTERN	During normal driving (without shift changes)	FF
VEHICLE SPEED	During driving	Approximately equals the speedometer reading.
RANGE SW 4	Selector lever in “P” and “N” positions	ON
	Other than the above	OFF
RANGE SW 3	Selector lever in “P”, “R” and “N” positions	ON
	Other than the above	OFF
RANGE SW 2	Selector lever in “P” and “R” positions	ON
	Other than the above	OFF
RANGE SW 1	Selector lever in “P” position	ON
	Other than the above	OFF
SFT DWN ST SW*	Paddle shifter (shift-up) is pulled	ON
	Other than the above	OFF
SFT UP ST SW*	Paddle shifter (shift-down) is pulled	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever is shifted to – side	ON
	Other than the above	OFF
UP SW LEVER	Selector lever is shifted to + side	ON
	Other than the above	OFF
NON M-MODE SW	Selector lever is shifted to manual shift gate side	OFF
	Other than the above	ON
MANU MODE SW	Selector lever is shifted to manual shift gate side	ON
	Other than the above	OFF
DS RANGE	Driving with DS mode	ON
	Other than the above	OFF
1 POSITION SW*	Selector lever in “1” position	ON
	Other than the above	OFF
OD CONT SW*	When overdrive control switch is depressed	ON
	When overdrive control switch is released	OFF
BRAKESW	Brake pedal is depressed	ON
	Brake pedal is released	OFF
POWERSHIFT SW*	Power mode	ON
	Other than the above	OFF

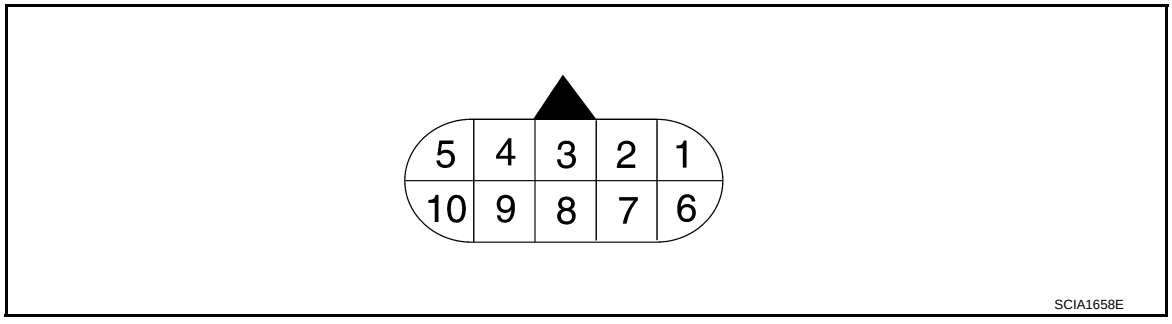
Item name	Condition	Value / Status (Approx.)
ASCD-OD CUT	When TCM receives ASCD OD cancel request signal	ON
	Other than the above	OFF
ASCD-CRUISE	ASCD operate	ON
	Other than the above	OFF
ABS SIGNAL	ABS operate	ON
	Other than the above	OFF
TCS GR/P KEEP	When TCM receives TCS gear keep request signal	ON
	Other than the above	OFF
TCS SIGNAL 2	When the reception value of A/T shift schedule change demand signal is “cold”	ON
	Other than the above	OFF
TCS SIGNAL 1	When the reception value of A/T shift schedule change demand signal is “warm”	ON
	Other than the above	OFF
LOW/B PARTS	At 4 - 5 - 6 gear shift control	FAIL
	Other than the above	NOTFAIL
HC/IC/FRB PARTS	At 1 - 2 - 3 gear shift control	FAIL
	Other than the above	NOTFAIL
IC/FRB PARTS	At 4 - 5 - 6 gear shift control	FAIL
	Other than the above	NOTFAIL
HLR/C PARTS	At 4 - 5 - 6 gear shift control	FAIL
	Other than the above	NOTFAIL
W/O THL POS	Accelerator pedal is fully depressed	ON
	Accelerator pedal is released	OFF
CLSD THL POS	Accelerator pedal is released	ON
	Accelerator pedal is fully depressed	OFF
DRV CST JUDGE	Accelerator pedal is depressed	DRIVE
	Accelerator pedal is released	COAST

Item name	Condition	Value / Status (Approx.)
SHIFT IND SIGNAL	When the selector lever is positioned in between each position.	OFF
	Selector lever in “P” position	P
	Selector lever in “R” position	R
	Selector lever in “N” position	N
	Selector lever in “D” position	D
	Selector lever in “D” position: 7GR	
	Selector lever in “D” position: 6GR	6
	Selector lever in “D” position: 5GR	5
	Selector lever in “D” position: 4GR	4
	Selector lever in “D” position: 3GR	3
	Selector lever in “D” position: 2GR	2
	Selector lever in “D” position: 1GR	1
	Selector lever in “M” position: 1GR	M1
	Selector lever in “M” position: 2GR	M2
	Selector lever in “M” position: 3GR	M3
	Selector lever in “M” position: 4GR	M4
	Selector lever in “M” position: 5GR	M5
	Selector lever in “M” position: 6GR	M6
	Selector lever in “M” position: 7GR	M7
	Driving with DS mode	DS
STARTER RELAY	Selector lever in “P” and “N” positions	ON
	Other than the above	OFF
F-SAFE IND/L	For 2 seconds after the ignition switch is turned ON	ON
	Other than the above	OFF
ATF WARN LAMP*	When TCM transmits the ATF indicator lamp signal	ON
	Other than the above	OFF
MANU MODE IND	Driving with manual mode	ON
	Other than the above	OFF
ON OFF SOL MON	Selector lever in “P” and “N” positions	ON
	Driving with 1GR to 3GR	
	Other than the above	OFF
START RLY MON	Selector lever in “P” and “N” positions	ON
	Other than the above	OFF
ON OFF SOL	Selector lever in “P” and “N” positions	ON
	Driving with 1GR to 3GR	
	Other than the above	OFF

Item name	Condition	Value / Status (Approx.)
SLCT LVR POSI	Selector lever in “N” and “P” positions	N/P
	Selector lever in “R” position	R
	Selector lever in “D” and “DS” positions	D
	Selector lever in “M” position: 7GR	
	Selector lever in “M” position: 6GR	6
	Selector lever in “M” position: 5GR	5
	Selector lever in “M” position: 4GR	4
	Selector lever in “M” position: 3GR	3
	Selector lever in “M” position: 2GR	2
	Selector lever in “M” position: 1GR	1
GEAR	During driving	1, 2, 3, 4, 5, 6, 7
NEXT GR POSI	During driving	1, 2, 3, 4, 5, 6, 7
SHIFT MODE	Driving with the D position	0 or 3
	Driving with the manual mode	4 or 8
D/C PARTS	At 1 - 2 gear shift control	FAIL
	Other than the above	NOTFAIL
FR/B PARTS	At control fixed to 1GR	FAIL
	Other than the above	NOTFAIL
2346/B PARTS	At control fixed to 1GR	FAIL
	Other than the above	NOTFAIL
2346B/DC PARTS	At 2 - 3 - 4 gear shift control	FAIL
	Other than the above	NOTFAIL

*: Not mounted but always display as OFF.

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
1 (Y/R)	Ground	Power supply	Input	Ignition switch ON	Battery voltage
				Ignition switch OFF	0 V
2 (R/W)	Ground	Power supply (Memory back-up)	Input	Always	Battery voltage
3 (L)	—	CAN-H	Input/ Output	—	—

Terminal (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
4 (V)	—	K-line	Input/ Output	—		—
5 (B)	Ground	Ground	Output	Always		0 V
6 (Y/R)	Ground	Power supply	Input	Ignition switch ON		Battery voltage
				Ignition switch OFF		0 V
7 (R/L)	Ground	Back-up lamp relay	Input	Ignition switch ON	Selector lever in “R” position.	0 V
					Selector lever in other than above.	Battery voltage
8 (P)	—	CAN-L	Input/ Output	—		—
9 (GR/R)	Ground	Starter relay	Output	Ignition switch ON	Selector lever in “N” and “P” positions.	Battery voltage
					Selector lever in other than above.	0 V
10 (B)	Ground	Ground	Output	Always		0 V

Wiring Diagram - A/T CONTROL SYSTEM -

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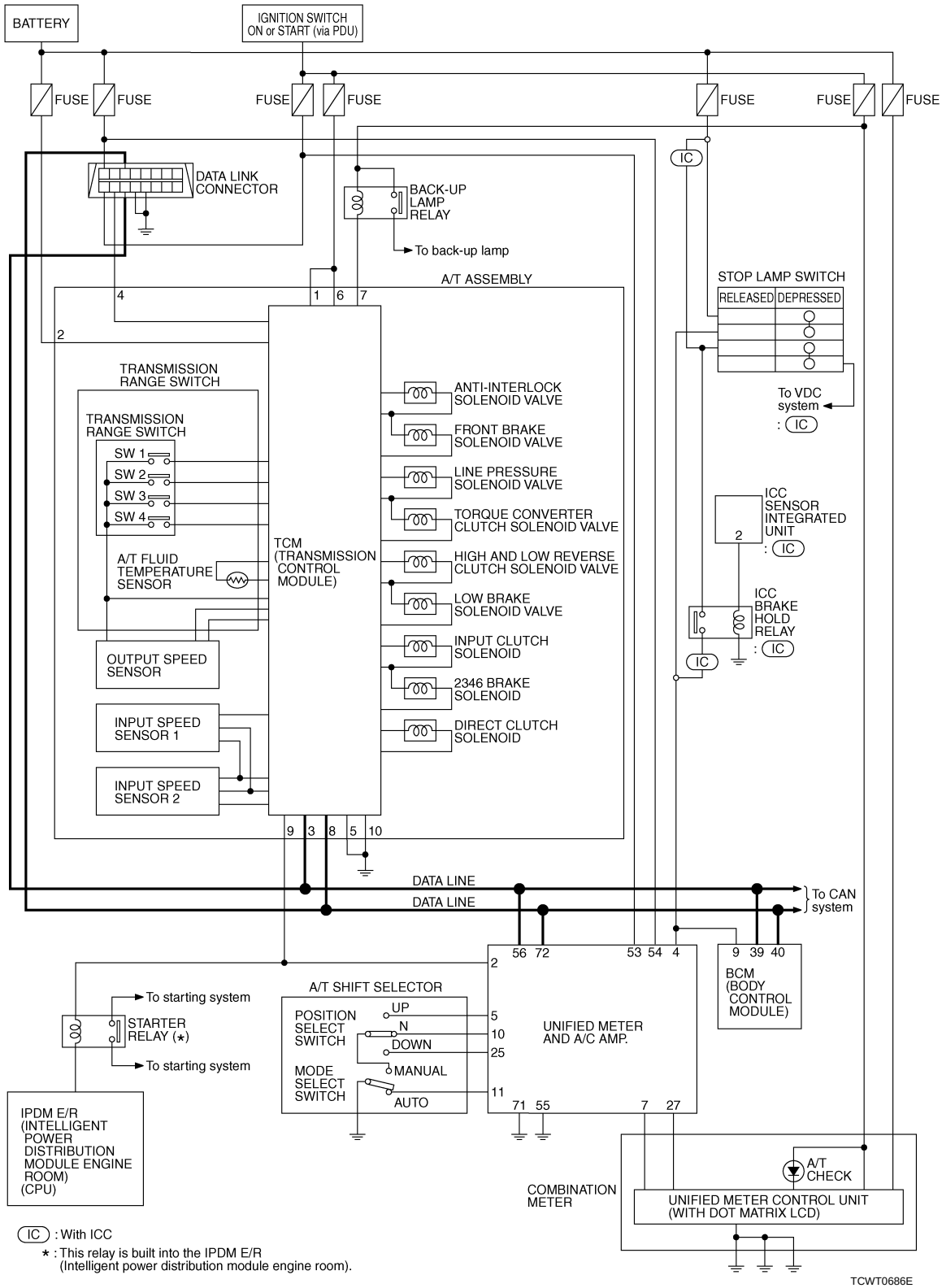


Fail-Safe

INFOID:0000000005352813

TCM has the electrical fail-safe mode. The mode is divided into a maximum of 3 phases (1st Fail-Safe, 2nd Fail-Safe and Final Fail-Safe) and functions so that the operation can be continued even if the signal circuit of the main electronically controlled input/output parts is damaged.

Even if the electronic circuit is normal, the fail-safe mode may start under special conditions (such as when the brake pedal is depressed suddenly from a hard wheel spin status to stop the rotation of wheels). In this case, turn the ignition switch OFF and back to ON after 5 seconds to resume the normal shift pattern.
Consequently, the customer's vehicle may already return to the normal condition. Refer to AT-335, "Diagnosis Flow".

1st fail-safe	The mode that the vehicle can stop safely, to prompt the driver to stop if the malfunction occurs and to shift to 2nd Fail-Safe early. It shifts to 2nd Fail-Safe or Final Fail-Safe after the vehicle stopped.
2nd fail-safe	The mode that the vehicle shifts to Final Fail-Safe without changing the behavior, by identifying the malfunctioning parts in the condition that the driving force required for the driving is secured.
Final fail-safe	• Selects the shifting pattern that the malfunctioning parts identified at 1st and 2nd Fail-Safe are not used, and then secure the driving force that is required for the driving. • The mode that the shifting performance does not decrease by normal shift control.

FAIL-SAFE FUNCTION

DTC	Vehicle condition	Vehicle behavior for 1st fail-safe	Vehicle behavior for 2nd fail-safe	Vehicle behavior for final fail-safe
P0615	—	Starter is disabled	—	Starter is disabled
P0705	—	• Fixed in the “D” position (The shifting can be performed) • 30 km/h (19MPH) or less • Lock-up is prohibited • The shifting between the gears of 3 - 4 - 5 - 6 - 7 can be performed • Manual mode is prohibited • Shift position indicator is switched OFF • Starter relay is switched OFF (starter is disabled) • Back-up lamp is OFF • Large shift shock	—	• Fixed in the “D” position (The shifting can be performed) • 30 km/h (19 MPH) or less • Lock-up is prohibited • The shifting between the gears of 3 - 4 - 5 - 6 - 7 can be performed • Manual mode is prohibited • Shift position indicator is switched OFF • Starter relay is switched OFF (starter is disabled) • Back-up lamp is OFF • Large shift shock
P0710	Between the gears of 1 - 2 - 3	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	—	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	• Fix the gear while driving • Manual mode is prohibited	—	
P0717	Between the gears of 1 - 2 - 3	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	—	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	• Fix the gear while driving • Manual mode is prohibited	—	
P0720	Between the gears of 1 - 2 - 3	• Only downshift can be performed • Manual mode is prohibited • Treat the vehicle speed that the vehicle speed signal receives as positive	—	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	• Fix the gear at driving • Manual mode is prohibited • Treat the vehicle speed that the vehicle speed signal receives as positive	—	

DTC	Vehicle condition	Vehicle behavior for 1st fail-safe	Vehicle behavior for 2nd fail-safe	Vehicle behavior for final fail-safe
P0729 P0731 P0732 P0733 P0734 P0735 P1734	Neutral malfunction between the gears of 1 - 2 - 3 and 7th gear	• Locks in 4GR • Manual mode is prohibited • Neutral	—	• Locks in 1GR • he shifting between the gears of 1 - 2 can be performed • The shifting between the gears of 1 - 2 - 3 can be performed • The shifting between the gears of 4 - 5 - 6 can be performed • Manual mode is prohibited
	Between the gears of 3 - 4 - 5 - 6 - 7	• Fix the gear while driving • Manual mode is prohibited	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	• Locks in 1GR • The shifting between the gears of 1 - 2 can be performed • The shifting between the gears of 2 - 3 - 4 can be performed • The shifting between the gears of 3 - 4 can be performed • The shifting between the gears of 4 - 5 - 6 can be performed • Manual mode is prohibited
	Other than the above	• Driving with the gear ratio between 2GR and 3GR • Locks in 3GR • Manual mode is prohibited • Neutral		
P0730	—	• Manual mode is prohibited • Neutral	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	• Locks in 1GR • The shifting between the gears of 1 - 2 can be performed • The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
P0740	—	• Lock-up is prohibited • Slip lock-up is prohibited	—	• Lock-up is prohibited • Slip lock-up is prohibited
P0744	—	• Lock-up is prohibited • Slip lock-up is prohibited	—	• Lock-up is prohibited • Slip lock-up is prohibited
P0750 P0775 P0795 P2713 P2722 P2731 P2807	—	• Locks in 2GR, 3GR, 4GR, 5GR, 6GR or 7GR • Manual mode is prohibited	—	• Locks in 1GR • The shifting between the gears of 1 - 2 - 3 can be performed • The shifting between the gears of 3 - 4 - 5 can be performed • The shifting between the gears of 4 - 5 - 6 can be performed • The shifting between the gears of 1 - 2 - 3 - 4 - 5 - 6 can be performed • Manual mode is prohibited
P0780	—	Manual mode is prohibited	—	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
P1705	—	• Downshift when accelerator pedal is depressed is prohibited • Upshift when accelerator pedal is released is prohibited • Manual mode is prohibited	• Downshift when accelerator pedal is depressed is prohibited • Upshift when accelerator pedal is released is prohibited • Manual mode is prohibited	• Downshift when accelerator pedal is depressed is prohibited • Upshift when accelerator pedal is released is prohibited • Manual mode is prohibited
P1730	—	• Neutral • Driving with the gear ratio between 2GR and 3GR • Locks in 5GR, 6GR or 7GR • Manual mode is prohibited	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	• Locks in 1GR • The shifting between the gears of 2 - 3 - 4 can be performed • The shifting between the gears of 3 - 4 can be performed • The shifting between the gears of 4 - 5 - 6 can be performed • Manual mode is prohibited
P1815	—	Manual mode is prohibited	—	Manual mode is prohibited

DTC	Vehicle condition	Vehicle behavior for 1st fail-safe	Vehicle behavior for 2nd fail-safe	Vehicle behavior for final fail-safe
U1000	Between the gears of 1 - 2 - 3	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	—	• The shifting between the gears of 1 - 2 - 3 can be performed • Line pressure is set to the maximum hydraulic pressure • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	• Fix the gear at driving • Manual mode is prohibited	—	
P0720 and P1721	—	Locks in 5GR	—	Locks in 5GR

Protection Control

INFOID:0000000005352814

The TCM becomes the protection control status temporarily to protect the safety when the safety of TCM and transmission is lost. It automatically returns to the normal status if the safety is secured.
The TCM has the following protection control.

REVERSE INHIBIT CONTROL

Intercepts the torque transmission and shift to the neutral status if the selector lever is shifted to “R” position while the vehicle moves forward at the vehicle speed 10 km/h (7 MPH) or more.

Malfunction detection condition	Vehicle speed: 10 km/h (7 MPH) or more
Control at malfunction	Neutral
Normal return condition	• Vehicle speed: 8 km/h (5 MPH) or less • Engine speed: 2,200 rpm or less
Vehicle behavior	• The torque transmission cannot be performed • There is a shock just before a vehicle stop

1ST ENGINE BRAKE PROTECTION CONTROL

Controls the engine brake so as not to make effective by turning the front brake solenoid output to OFF when each solenoid becomes the electricity pattern of engine brake during driving at the vehicle speed 25 km/h or more in any positions other than “R” position and 1GR.

Malfunction detection condition	• Select lever and gear: Any position other than “R” position and 1GR • Vehicle speed: More than 25 km/h (16 MPH)
Control at malfunction	Front brake solenoid output signal; OFF
Normal return condition	Other than detection condition of malfunction
Vehicle behavior	Does not exist

TCM HIGH TEMPERATURE PROTECTION CONTROL

Limit the accelerator opening and forcibly control the vehicle to the low torque driving when the electronic substrate in TCM reaches the high temperature.

Malfunction detection condition	TCM electronic substrate temperature • 145°C (293°F) and 120 seconds • 150°C (302°F)
Control at malfunction	Accelerator opening: 0.5/8 or less
Normal return condition	• TCM electronic substrate temperature: Less than 140°C (284°F) • Vehicle speed: 5 km/h (3 MPH) or less
Vehicle behavior	Accelerator opening: output torque of approximately 0.5/8

DTC Inspection Priority Chart

INFOID:0000000005352815

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

Priority	Detected items (DTC)
1	• U1000 CAN COMM CIRCUIT
2	• P0615 STARTER RELAY • P0705 T/M RANGE SWITCH A • P0710 FLUID TEMP SENSOR A • P0717 INPUT SPEED SENSOR A • P0720 OUTPUT SPEED SENSOR • P0740 TORQUE CONVERTER • P0745 PC SOLENOID A • P0750 SHIFT SOLENOID A • P0775 PC SOLENOID B • P0795 PC SOLENOID C • P2713 PC SOLENOID D • P2722 PC SOLENOID E • P2731 PC SOLENOID F • P2807 PC SOLENOID G
3	• P0729 6GR INCORRECT RATIO • P0730 INCORRECT GR RATIO • P0731 1GR INCORRECT RATIO • P0732 2GR INCORRECT RATIO • P0733 3GR INCORRECT RATIO • P0734 4GR INCORRECT RATIO • P0735 5GR INCORRECT RATIO • P0744 TORQUE CONVERTER • P0780 SHIFT • P1730 INTERLOCK • P1734 7GR INCORRECT RATIO
4	• P0725 ENGINE SPEED • P1705 TP SENSOR • P1721 VEHICLE SPEED SIGNAL • P1815 M-MODE SWITCH

DTC Index

INFOID:0000000005352816

NOTE:
If DTC “U1000” is displayed with other DTC, first perform the trouble diagnosis for “DTC U1000 CAN COMMUNICATION LINE”. Refer to AT-397, "Description".

Items (CONSULT-III screen terms)	DTC*2		Reference
	MIL*1, “ENGINE” with CONSULT-III or GST	CONSULT-III only “TRANSMISSION”	
STARTER RELAY	—	P0615	AT-399
T/M RANGE SWITCH A	P0705	P0705	AT-402
FLUID TEMP SENSOR A	P0710	P0710	AT-403
INPUT SPEED SENSOR	P0717	P0717	AT-405
OUTPUT SPEED SENSOR	P0720	P0720	AT-407
ENGINE SPEED	—	P0725	AT-409
6GR INCORRECT RATIO	P0729	P0729	AT-411
INCORRECT GR RATIO	P0730	P0730	AT-413
1GR INCORRECT RATIO	P0731	P0731	AT-414
2GR INCORRECT RATIO	P0732	P0732	AT-416
3GR INCORRECT RATIO	P0733	P0733	AT-418
4GR INCORRECT RATIO	P0734	P0734	AT-420
5GR INCORRECT RATIO	P0735	P0735	AT-422
TORQUE CONVERTER	P0740	P0740	AT-424

Items (CONSULT-III screen terms)	DTC*2		Reference
	MIL*1, “ENGINE” with CONSULT-III or GST	CONSULT-III only “TRANSMISSION”	
TORQUE CONVERTER	P0744	P0744	AT-426
PC SOLENOID A	P0745	P0745	AT-427
SHIFT SOLENOID A	P0750	P0750	AT-428
PC SOLENOID B	P0775	P0775	AT-429
SHIFT	P0780	P0780	AT-430
&	P0795	P0795	AT-431
TP SENSOR	—	P1705	AT-432
VEHICLE SPEED SIGNAL	—	P1721	AT-433
INTERLOCK	P1730	P1730	AT-435
7GR INCORRECT RATIO	P1734	P1734	AT-437
M-MODE SWITCH	—	P1815	AT-439
PC SOLENOID D	P2713	P2713	AT-445
PC SOLENOID E	P2722	P2722	AT-446
PC SOLENOID F	P2731	P2731	AT-447
PC SOLENOID G	P2807	P2807	AT-448
CAN COMM CIRCUIT	U1000	U1000	AT-397

*1: Refer to AT-390, "Diagnosis Description".

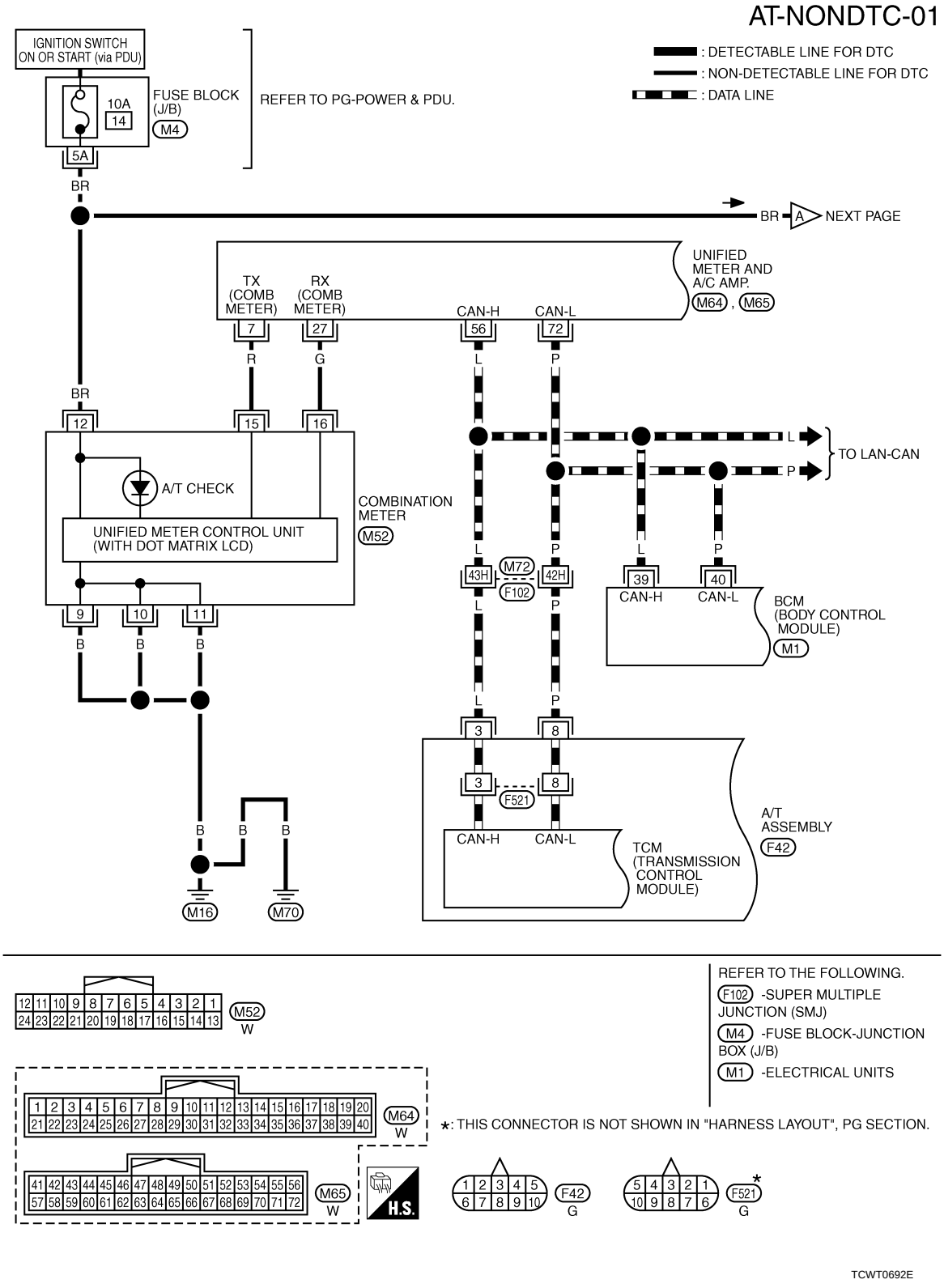
*2: These numbers are prescribed by SAE J2012.

SYMPTOM DIAGNOSIS

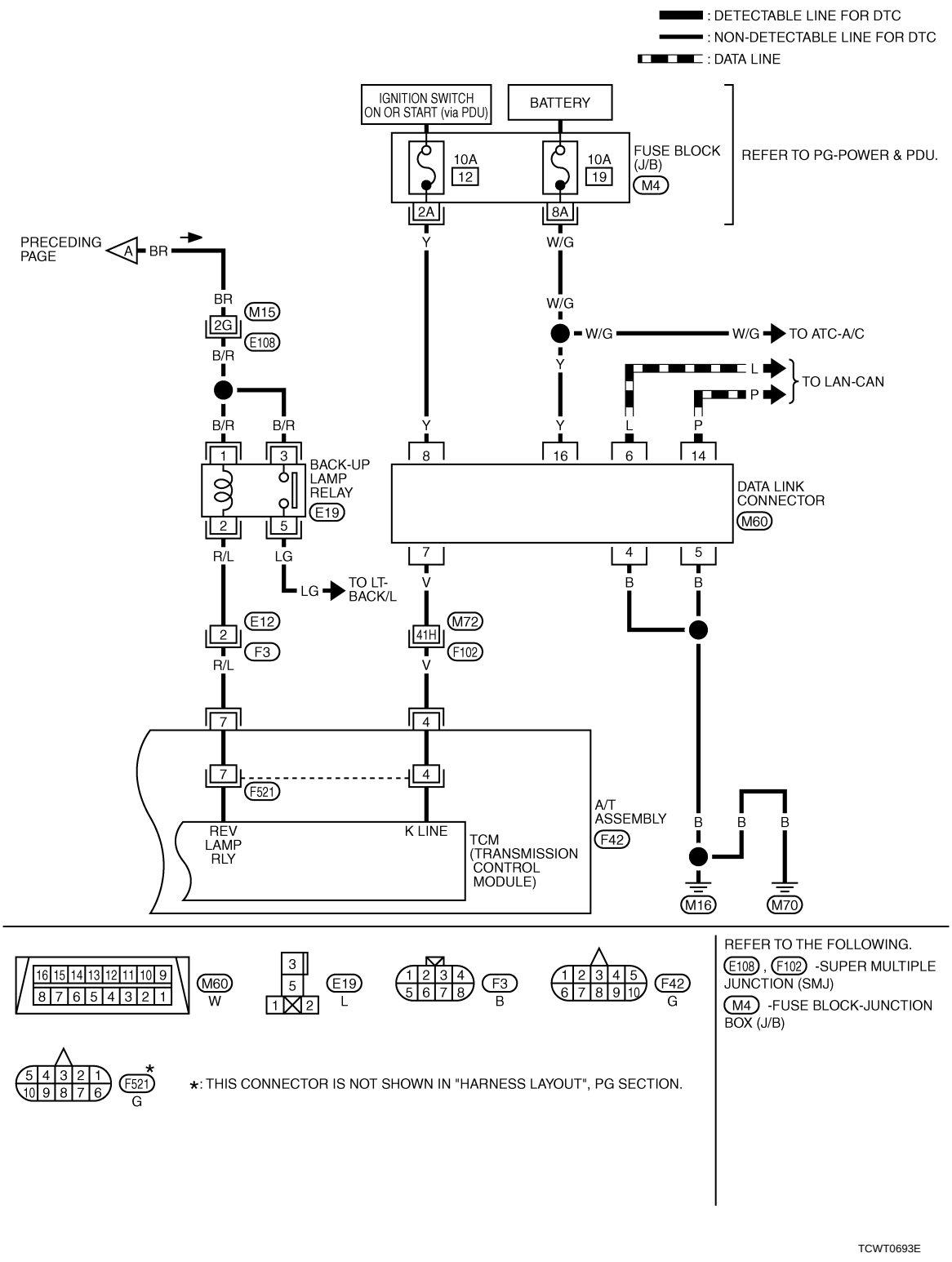
SYSTEM SYMPTOM

Wiring Diagram - AT - NONDTC

INFOID:0000000005352817

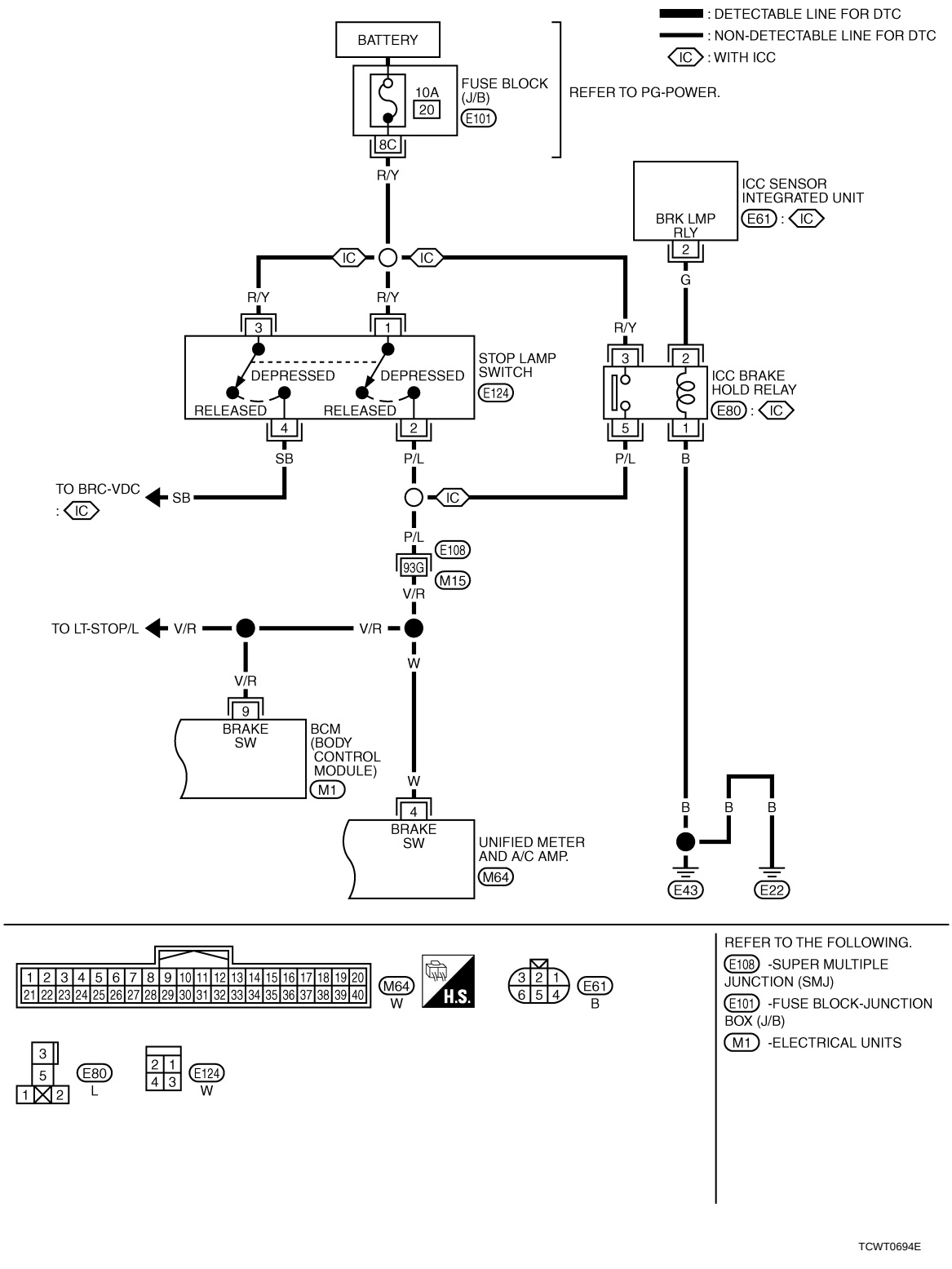


AT-NONDTC-02



TCWT0693E

AT-NONDTC-03



TCWT0694E

Symptom Table

INFOID:0000000005352818

The diagnostics item numbers show the sequence for inspection. Inspect in order from item 1.

CAUTION:

If any malfunction occurs in the RE7R01A transmission, replace the A/T assembly.

Symptom				Diagnostic item																		
				Control linkage AT-490	Output speed sensor AT-407	Vehicle speed signal AT-433	Accelerator pedal position sensor AT-432	Engine speed signal AT-409	Input speed sensor AT-405	A/T fluid temperature switch AT-403	Transmission range switch AT-402	Line pressure solenoid valve AT-427	Torque converter solenoid valve AT-424	Low brake solenoid valve AT-446	Front brake solenoid valve AT-431	High and low reverse clutch solenoid valve AT-445	Input clutch solenoid valve AT-429	Direct clutch solenoid valve AT-448	2346 brake solenoid valve AT-447	Anti-interlock solenoid valve AT-428	CAN communication AT-397
Poor performance	Driving performance	Shift point is high in “D” position.			1		2			3												
		Shift point is low in “D” position.			1		2															
		Large shock	When shifting gears	→ “D” position	3			6	5		5	4	2		1						2	5
				→ “R” position	3			6	5		5	4	2						1			5
				1GR ⇔ 2GR		3		1	5	3	3									2		4
				2GR ⇔ 3GR		3		1	5	3	3								2			4
				3GR ⇔ 4GR		3		1	5	3	3				2		2					4
				4GR ⇔ 5GR		3		1	5	3	3							2		2		4
				5GR ⇔ 6GR		3		1	5	3	3								2	2		4
				6GR ⇔ 7GR		3		1	5	3	3					2				2		4
				Downshift when accelerator pedal is depressed		2		1	4	2	2											3
				Upshift when accelerator pedal is released		2		1	4	2	2											3
				Lock-up		3		1	3	3	3			2								4
		Judder		Lock-up				2	1	1	4			3								
	Strange noise			In “R” position		2			1													
				In “N” position		2			1													
				In “D” position		2			1													
				Engine at idle		2			1													

Symptom				Diagnostic item																		
				Output speed sensor AT-407	Engine speed signal AT-409	Input speed sensor AT-405	A/T fluid temperature sensor AT-403	Battery voltage AT-449	Transmission range switch AT-402	Manual mode switch AT-439	Stop lamp switch AT-457	Line pressure solenoid valve AT-427	Torque converter solenoid valve AT-424	Low brake solenoid valve AT-446	Front brake solenoid valve AT-431	High and low reverse clutch solenoid valve AT-445	Input clutch solenoid valve AT-429	Direct clutch solenoid valve AT-448	2346 brake solenoid valve AT-447	Anti-interlock solenoid valve AT-428	CAN communication AT-397
Function trouble	Gear does no change	"D" position	Locks in 1GR	1											1		1		1			
			Locks in 5GR					1														
			1GR → 2GRr	1											1		1		1			
			2GR → 3GR															1				
			3GR → 4GR	1		1	1							1	1	1	1					1
			4GR → 5GR															1	1			
			5GR → 6GR															1				
			6GR → 7GR											1	1	1	1			1		
			5GR → 4GR														1					
			4GR → 3GR											1		1				1		
			3GR → 2GR						1									1				
			2GR → 1GR						1									1	1			
			Does not lock-up	1	1	1	1	3	4		2	1	1	1	1	1	1	1	1	1	1	1
		"M" position	1GR ⇔ 2GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2	2
			2GR ⇔ 3GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2	2
			3GR ⇔ 4GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2	2
			4GR ⇔ 5GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2	2
			5GR ⇔ 6GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2	2
			6GR ⇔ 7GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2	2

Symptom					Diagnostic item																	
					Control linkage AT-490	Output speed sensor AT-407	Engine speed signal AT-409	Input speed sensor AT-405	A/T fluid temperature sensor AT-403	Transmission range switch AT-402	Manual mode switch AT-439	Line pressure solenoid valve AT-427	Torque converter clutch solenoid valve AT-424	Low brake solenoid valve AT-446	Front brake solenoid valve AT-431	High and low reverse clutch solenoid valve AT-445	Input clutch solenoid valve AT-429	Direct clutch solenoid valve AT-448	2346 brake solenoid valve AT-447	Anti-interlock solenoid valve AT-428	CAN communication AT-397
Function trouble	Poor shifting	Slip	When shifting gears	1GR ⇔ 2GR		3	3	3	4			1							1		2
				2GR ⇔ 3GR		3	3	3	4			1						1			2
				3GR ⇔ 4GR		3	3	3	4			1		1		1				1	2
				4GR ⇔ 5GR		3	3	3	4			1					1		1		2
				5GR ⇔ 6GR		3	3	3	4			1						1	1		2
				6GR ⇔ 7GR		3	3	3	4			1			1				1		2
		Engine brake does not work	“D” position → “M” position			4	4	4	5	3	1	2									3
			“M” position	7GR → 6GR		4	4	4	5	3	1	2			2				2		3
				6GR → 5GR		4	4	4	5	3	1	2						2	2		3
				5GR → 4GR		4	4	4	5	3	1	2					2		2		3
				4GR → 3GR		4	4	4	5	3	1	2		2		2				2	3
				3GR → 2GR		4	4	4	5	3	1	2						2			3
				2GR → 1GR		4	4	4	5	3	1	2							2		3
	Poor power transmission	Slip		With selector lever in “D” position, acceleration is extremely poor.	5	3	3	3	4			1		1						1	2
				With selector lever in “R” position, acceleration is extremely poor.	5	3	3	3	4			1						1		1	2
				While starting off by accelerating in 1GR, engine races.		3	3	3	4			1		1						1	2
				While accelerating in 2GR, engine races.		3	3	3	4			1		1					1	1	2
				While accelerating in 3GR, engine races.		3	3	3	4			1		1				1	1		2
				While accelerating in 4GR, engine races.		3	3	3	4			1				1		1	1		2
				While accelerating in 5GR, engine races.		3	3	3	4			1				1	1	1		1	2

Symptom				Diagnostic item																
				Control linkage AT-490	Output speed sensor AT-407	Engine speed signal AT-409	Input speed sensor AT-405	A/T fluid temperature sensor AT-403	Transmission range switch AT-402	Manual mode switch AT-439	Line pressure solenoid valve AT-427	Torque converter clutch solenoid valve AT-424	Low brake solenoid valve AT-446	Front brake solenoid valve AT-431	High and low reverse clutch solenoid valve AT-445	Input clutch solenoid valve AT-429	Direct clutch solenoid valve AT-448	2346 brake solenoid valve AT-447	Anti-interlock solenoid valve AT-428	CAN communication AT-397
Function trouble	Poor power transmission	Slip	While accelerating in 6GR, engine races.		3	3	3	4			1				1	1		1	1	2
			While accelerating in 7GR, engine races.		3	3	3	4			1			1	1	1			1	2
			Lock-up		3	3	3	4			1	1								2
			No creep at all.								1	1	1	1	1	1	1	1	1	
			Extremely large creep.			1														

Symptom			Diagnostic item																
			Control linkage AT-490	Output speed sensor AT-407	Accelerator pedal position sensor AT-432	Engine speed signal AT-409	Battery voltage AT-449	Transmission range switch AT-402	Stop lamp switch AT-457	Line pressure solenoid valve AT-427	Torque converter clutch solenoid valve AT-424	Low brake solenoid valve AT-446	Front brake solenoid valve AT-431	High and low reverse clutch solenoid valve AT-445	Input clutch solenoid valve AT-429	Direct clutch solenoid valve AT-448	2346 brake solenoid valve AT-447	Anti-interlock solenoid valve AT-428	Starter relay AT-399
Function trouble	Power transmission cannot be performed	Vehicle cannot run in all position.	3					2		1	1	1	1	1	1	1	1	1	
		Driving is not possible in “D” position.	3					2		1	1	1	1	1	1	1	1	1	
		Driving is not possible in “R” position.	3					2		1						1		1	
		Engine stall		3	4	4	5		2		1								
		Engine stalls when selector lever shifted “N” → “D” or “R”.		3	4	4		2			1								
		Engine does not start in “N” or “P” position.	3				1	2											1
		Engine starts in position other than “N” or “P”.	3					2											1
	Poor operation	Vehicle does not enter parking condition.	1					2											
		Parking condition is not cancelled.	1					2											
		Vehicle runs with A/T in “P” position.	1					2											
		Vehicle moves forward with the “R” position.	1					2											
		Vehicle runs with A/T in “P” position.	1					2											
		Vehicle moves backward with the “D” position.	1					2											

PRECAUTION

PRECAUTIONS

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

INFOID:0000000005352819

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 “SUPPLEMENTAL RESTRAINT SYSTEM” and “SEAT BELTS” 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 “SUPPLEMENTAL RESTRAINT SYSTEM”.**
- **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 WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

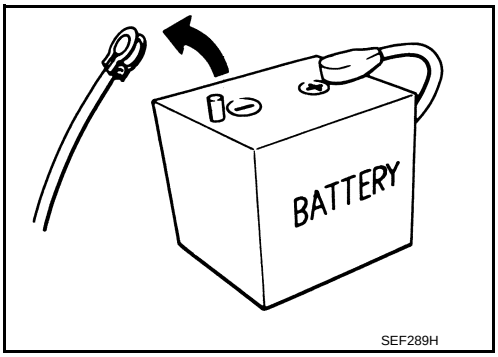
WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

General Precautions

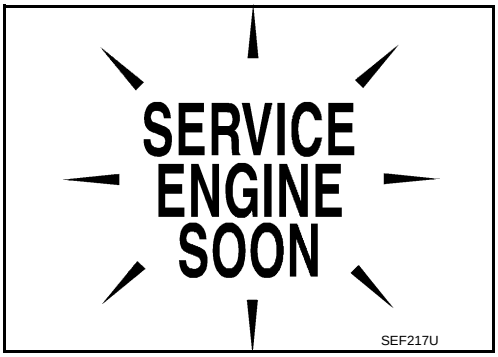
INFOID:0000000005352820

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



SEF289H

- **Perform “DTC (Diagnostic Trouble Code) CONFIRMATION PROCEDURE” after performing each TROUBLE DIAGNOSIS. If the repair is completed DTC should not be displayed in the “DTC CONFIRMATION PROCEDURE”.**
- Always use the specified brand of ATF. Refer to MA-9, "Fluids and Lubricants".
- Use lint-free paper not cloth rags during work.
- Dispose of the waste oil using the methods prescribed by law, ordinance, etc. after replacing the ATF.
- Before proceeding with disassembly, thoroughly clean the outside of the transmission. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.



SEF217U

- Disassembly should be done in a clean work area.
- Use lint-free paper or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transmission.
- Place disassembled parts in order for easier and proper assembly.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the A/T is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Never use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- Clean or replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer. Refer to AT-481, "Service Notice or Precaution".
- When the A/T drain plug is removed, only some of the ATF is drained. Old ATF will remain in torque converter and ATF cooling system.
  Always follow the procedures under “Changing” when changing ATF. Refer to AT-483, "Changing".
- Occasionally, the parking gear may be locked with the torque insufficiently released, when stopping the vehicle by shifting the selector lever from “D” or “R” to “P” position with the brake pedal depressed.
  In this case, the shock with a thud caused by the abrupt release of torque may occur when shifting the selector lever from “P” position to other positions.
  However, this symptom is not a malfunction which results in the damage of parts.

Service Notice or Precaution

INFOID:0000000005352821

ATF COOLER SERVICE

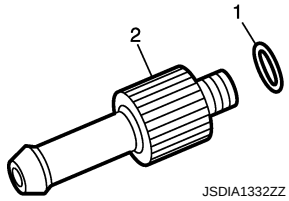
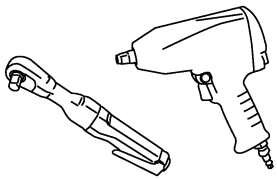
If ATF contains frictional material (clutches, bands, etc.), or if an A/T is repaired, overhauled, or replaced, inspect and clean the A/T fluid cooler mounted in the radiator or replace the radiator. Flush cooler lines using cleaning solvent and compressed air after repair. For A/T fluid cooler cleaning procedure, refer to AT-486, "Cleaning". For radiator replacement, refer to CO-13, "Component".

PREPARATION

PREPARATION

Commercial Service Tool

INFOID:0000000005352822

Tool number Tool name		Description
1. 315268E000* O-ring 2. 310811EA5A* Charging pipe	 JSDIA1332ZZ	A/T fluid changing and adjustment
Power tool	 PBIC0190E	Loosening bolts and nuts

*: Always check with the Parts Department for the latest parts information.

ON-VEHICLE MAINTENANCE

A/T FLUID

Changing

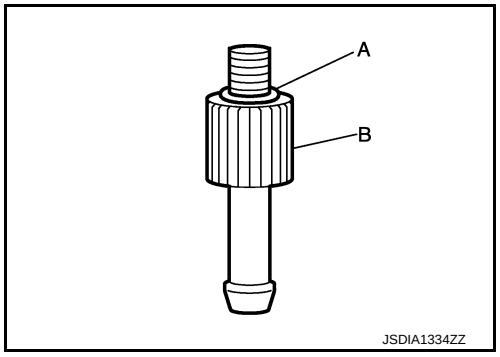
INFOID:0000000005352823

ATF	: Refer to AT-504, "General Specification".
Fluid capacity	: Refer to AT-504, "General Specification".

CAUTION:
- **Use only Genuine NISSAN Matic S ATF. Never mix with other ATF.**
- **Using ATF other than Genuine NISSAN Matic S ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**
- **When filling ATF, be careful not to scatter heat generating parts such as exhaust.**

1. Step 1

a. Install the O-ring (315268E000) (A) to the charging pipe (310811EA5A) (B).



2. Step 2

a. Use CONSULT-III to check that the ATF temperature is 40°C (104°F) or less.

b. Lift up the vehicle.

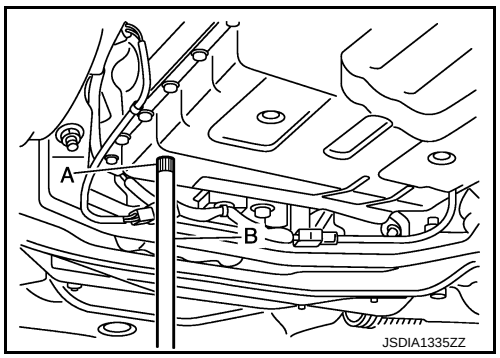
c. Remove the drain plug from the oil pan, and then drain the ATF.

d. When the ATF starts to drip, temporarily tighten the drain plug to the oil pan.
NOTE:
Never replace drain plug and drain plug gasket with new ones yet.

e. Remove overflow plug from oil pan.

f. Install the charging pipe (A) to the overflow plug hole.
CAUTION:
Tighten the charging pipe by hand.

g. Install the bucket pump hose (B) to the charging pipe.
CAUTION:
Insert the bucket pump hose all the way to the end of the charging pipe.



h. Fill approximately 3 liters (3-1/8 US qt, 2-5/8 lmp qt) of the ATF.

i. Remove the bucket pump hose to remove the charging pipe, and then temporarily tighten the overflow plug to the oil pan.
CAUTION:
Quickly perform the procedure to avoid ATF leakage from the oil pan.

j. Lift down the vehicle.

k. Start the engine and wait for approximately 3 minutes.

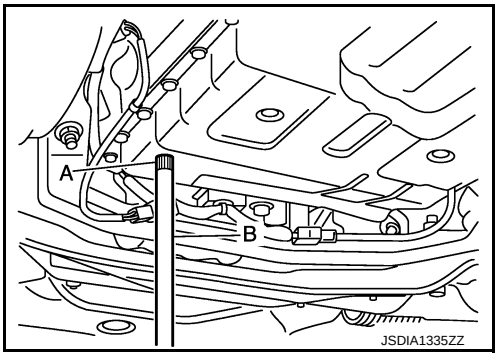
l. Stop the engine.

3. Step 3

a. Repeat “Step 2”.

4. Final Step

a. Use CONSULT-III to check that the ATF temperature is 40°C (104°F) or less.
b. Lift up the vehicle.
c. Remove the drain plug from the oil pan, and then drain the ATF.
d. When the ATF starts to drop, tighten the drain plug to the oil pan to the specified torque. Refer to AT-494, "Exploded View".
CAUTION:
Never reuse drain plug and drain plug gasket.
e. Remove overflow plug from oil pan.
f. Install the charging pipe (A) to the overflow plug hole.
CAUTION:
Tighten the charging pipe by hand.
g. Install the bucket pump hose (B) to the charging pipe.
CAUTION:
Insert the bucket pump hose all the way to the end of the charging pipe.
h. Fill approximately 3 liters (3-1/8 US qt, 2-5/8 lmp qt) of the ATF.
i. Remove the bucket pump hose to remove the charging pipe, and then temporarily tighten the overflow plug to the oil pan.
CAUTION:
Quickly perform the procedure to avoid ATF leakage from the oil pan.



j. Lift down the vehicle.
k. Start the engine.
l. Make the ATF temperature approximately 40°C (104°F).
NOTE:
The ATF level is greatly affected by the temperature. Always check the ATF temperature on “ATF TEMP 1” of “Data Monitor” using CONSULT-III.
m. Park vehicle on level surface and set parking brake.
n. Shift the selector lever through each gear position. Leave selector lever in “P” position.
o. Lift up the vehicle when the ATF temperature reaches 40°C (104°F), and then remove the overflow plug from the oil pan.
p. When the ATF starts to drop, tighten the overflow plug to the oil pan to the specified torque. Refer to AT-494, "Exploded View".
CAUTION:
Never reuse overflow plug.

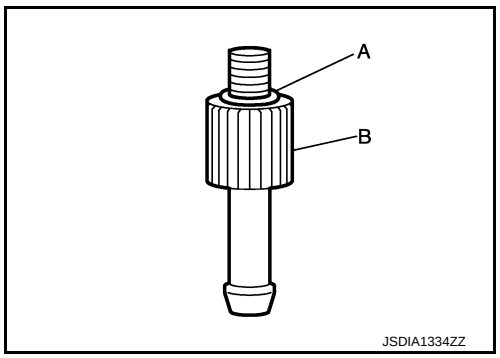
Adjustment

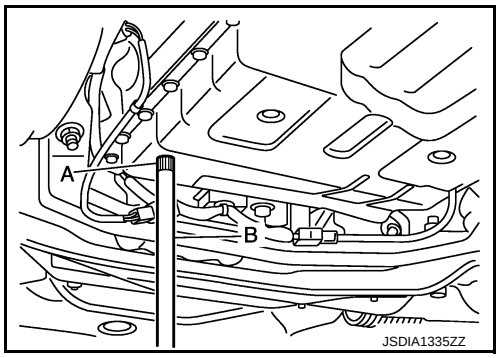
INFOID:0000000005352824

ATF	: Refer to AT-504, "General Specification".
Fluid capacity	: Refer to AT-504, "General Specification".

CAUTION:
- **Use only Genuine NISSAN Matic S ATF. Never mix with other ATF.**
- **Using ATF other than Genuine NISSAN Matic S ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**
- **When filling ATF, be careful not to scatter heat generating parts such as exhaust.**
- **Always maintain the ATF temperature within between 35°C (95°F) and 45°C (113°F) while checking with CONSULT-III when the ATF level adjustment is performed.**

1. Install the O-ring (315268E000) (A) to the charging pipe (310811EA5A) (B).
2. Start the engine.
3. Make the ATF temperature approximately 40°C (104°F).
   NOTE:
   The ATF level is greatly affected by the temperature. Always check the ATF temperature on “ATF TEMP 1” of “Data Monitor” using CONSULT-III.
4. Park vehicle on level surface and set parking brake.
5. Shift the selector lever through each gear position. Leave selector lever in “P” position.
6. Lift up the vehicle.
7. Check the ATF leakage from transmission.
8. Remove overflow plug from oil pan.
9. Install the charging pipe (A) to the overflow plug hole.
   CAUTION:
   Tighten the charging pipe by hand.
10. Install the bucket pump hose (B) to the charging pipe.
    CAUTION:
    Insert the bucket pump hose all the way to the end of the charging pipe.
11. Fill approximately 0.5 liters (1/2 US qt, 1/2 lmp qt) of the ATF.
12. Check that the ATF leaks when removing the charging pipe and the bucket pump hose. If the ATF does not leak, refill the ATF.
13. When the ATF starts to drop, tighten the overflow plug to the oil pan to the specified torque. Refer to AT-494, "Exploded View".
    CAUTION:
    Never reuse overflow plug.





A/T FLUID COOLER

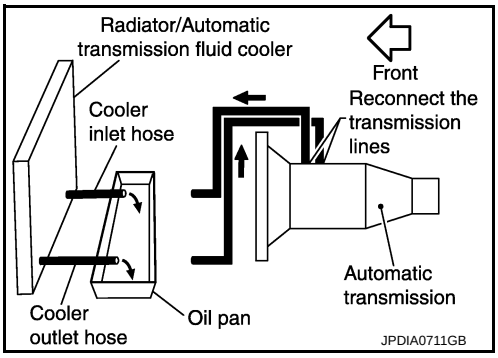
Cleaning

INFOID:0000000005352825

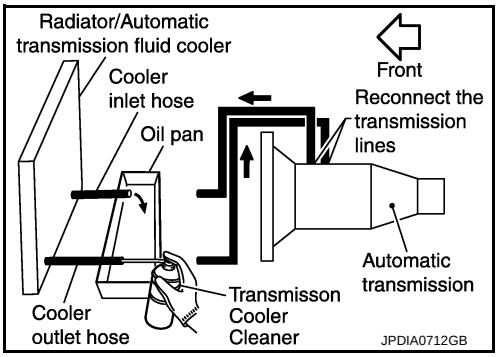
Whenever an A/T is replaced, the A/T fluid cooler mounted in the radiator must be inspected and cleaned.
Metal debris and friction material, if present, can become trapped in the A/T fluid cooler. This debris can contaminate the newly serviced A/T or, in severe cases, can block or restrict the flow of ATF. In either case, malfunction of the newly serviced A/T may result.
Debris, if present, may build up as ATF enters the cooler inlet. It will be necessary to back flush the cooler through the cooler outlet in order to flush out any built up debris.

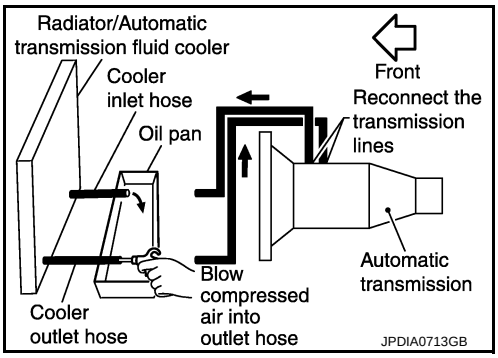
CLEANING PROCEDURE

1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Identify the inlet and outlet fluid cooler hoses.
3. Disconnect the A/T fluid cooler inlet and outlet rubber hoses from the steel cooler tubes or by-pass valve.
   NOTE:
   Replace the cooler hoses if rubber material from the hose remains on the tube fitting.
4. Allow any ATF that remains in the cooler hoses to drain into the oil pan.



5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.
   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray Transmission Cooler Cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Never breathe vapors or spray mist.**
6. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.
7. Insert the tip of an air gun into the end of the cooler outlet hose.
8. Wrap a shop rag around the air gun tip and of the cooler outlet hose.
9. Blow compressed air regulated to 5 to 9 kg/cm^2 (71 to 128 psi) through the cooler outlet hose for 10 seconds to force out any remaining ATF.
10. Repeat steps 5 through 9 three additional times.
11. Position an oil pan under the banjo bolts that connect the A/T fluid cooler steel lines to the A/T.
12. Remove the banjo bolts.
13. Flush each steel line from the cooler side back toward the A/T by spraying Transmission Cooler Cleaner in a continuous stream for 5 seconds.
14. Blow compressed air regulated to 5 to 9 kg/cm^2 (71 to 128 psi) through each steel line from the cooler side back toward the A/T for 10 seconds to force out any remaining ATF.
15. Ensure all debris is removed from the steel cooler lines.
16. Ensure all debris is removed from the banjo bolts and fittings.
17. Perform “DIAGNOSIS PROCEDURE”.





DIAGNOSIS PROCEDURE

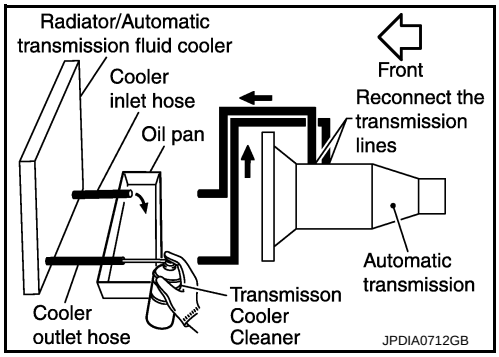
NOTE:

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

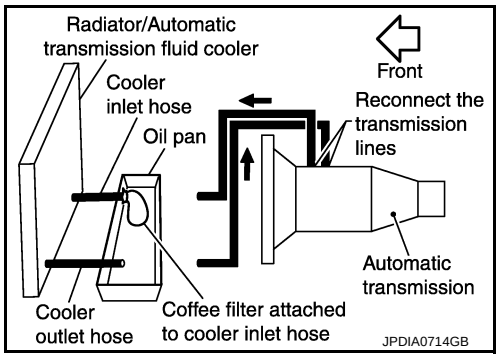
1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Clean the exterior and tip of the cooler inlet hose.
3. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

   CAUTION:

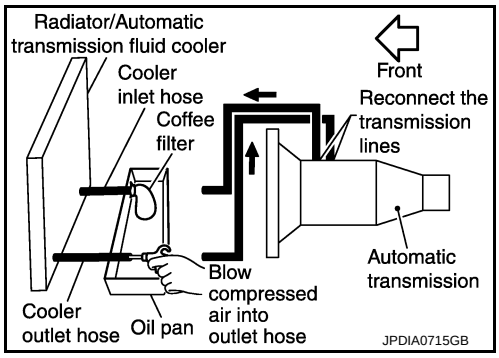
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray Transmission Cooler Cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Never breathe vapors or spray mist.**
4. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.



5. Tie a common white, basket-type coffee filter to the end of the cooler inlet hose.



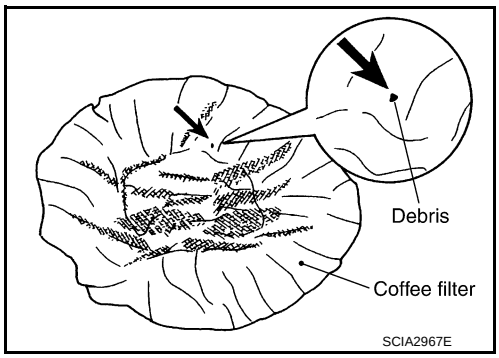
6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 to 9 kg/cm^2 (71 to 128 psi) through the cooler outlet hose to force any remaining ATF into the coffee filter.
9. Remove the coffee filter from the end of the cooler inlet hose.
10. Perform “INSPECTION PROCEDURE”.



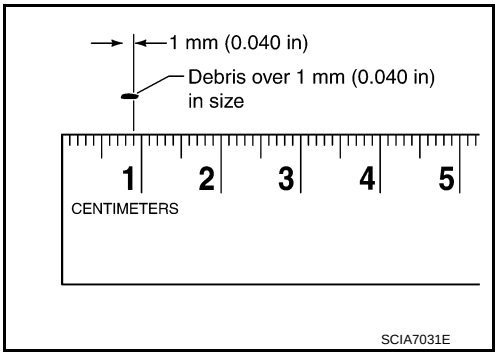
INSPECTION PROCEDURE

1. Inspect the coffee filter for debris.

a. If small metal debris less than 1 mm (0.040 in) in size or metal powder is found in the coffee filter, this is normal. If normal debris is found, the A/T fluid cooler/radiator can be re-used and the procedure is ended.



b. If one or more pieces of debris are found that are over 1 mm (0.040 in) in size and/or peeled clutch facing material is found in the coffee filter, the A/T fluid cooler is not serviceable. The A/T fluid cooler/radiator must be replaced and the inspection procedure is ended. Refer to CO-13, "Component".



Inspection

INFOID:0000000005352826

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

STALL TEST

Inspection and Judgment

INFOID:0000000005352827

INSPECTION

1. Inspect the amount of engine oil. Replenish the engine oil if necessary.
2. Drive for about 10 minutes to warm up the vehicle so that the A/T fluid temperature is 50 to 80°C (122 to 176°F). Inspect the amount of ATF. Replenish if necessary.
3. Securely engage the parking brake so that the tires do not turn.
4. Start the engine, apply foot brake, and place selector lever in “D” position.
5. Gradually press down the accelerator pedal while holding down the foot brake.
6. Quickly read off the stall speed, then quickly remove your foot from the accelerator pedal.
   CAUTION:
   Never hold down the accelerator pedal for more than 5 seconds during this test.

   Stall speed : Refer to AT-505, "Stall Speed".
7. Shift the selector lever to “N” position.
8. Cool down the ATF.
   CAUTION:
   Run the engine at idle for at least 1 minute.
9. Repeat steps 5 through 8 with selector lever in “R” position.

JUDGMENT OF STALL TEST

	Selector lever position		Possible location of malfunction
	“D” and “M”	“R”	
Stall speed	H	O	• Low brake • 1st one-way clutch • 2nd one-way clutch
	O	H	• Reverse brake • 1st one-way clutch • 2nd one-way clutch
	L	L	• Engine and torque converter one-way clutch
	H	H	• Line pressure low

O: Stall speed within standard value position

H: Stall speed higher than standard value

L: Stall speed lower than standard value

Stall test standard value position

Does not shift-up “D” or “M” position 1 → 2	Slipping in 2GR, 3GR 4GR or 6GR	2346 brake slippage
Does not shift-up “D” or “M” position 2 → 3	Slipping in 3GR, 4GR or 5GR	Direct clutch slippage
Does not shift-up “D” or “M” position 3 → 4	Slipping in 4GR, 5GR, 6GR or 7GR	High and low reverse clutch slippage
Does not shift-up “D” or “M” position 4 → 5	Slipping in 5GR, 6GR or 7GR	Input clutch slippage
Does not shift-up “D” or “M” position 5 → 6	Slipping in 2GR, 3GR, 4GR or 6GR	2346 brake slippage
Does not shift-up “D” or “M” position 6 → 7	Slipping in 7GR	Front brake slippage

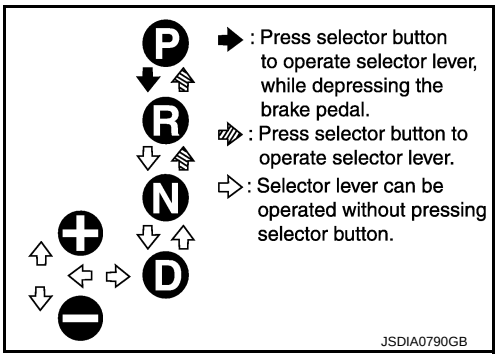
A/T POSITION

Inspection and Adjustment

INFOID:0000000005352828

INSPECTION

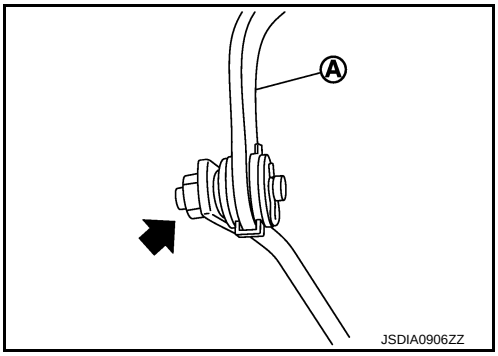
1. Place selector lever in “P” position, and turn ignition switch ON (engine stop).
2. Check that selector lever can be shifted to other than “P” position when brake pedal is depressed. Also check that selector lever can be shifted from “P” position only when brake pedal is depressed.
3. Shift the selector lever and check for excessive effort, sticking, noise or rattle.
4. Confirm that the selector lever stops at each position by feeling the engagement when it is moved through all the positions. Check whether or not the actual position the selector lever matches the position shown by the shift position indicator and the A/T body.
5. The method of operating the lever to individual positions correctly is shown in the figure.
6. When selector button is pressed in “P”, “R”, or “N” position without applying forward/backward force to selector lever, check button operation for sticking.
7. Confirm that the back-up lamps illuminate only when lever is placed in the “R” position. Confirm that the back-up lamps do not illuminate when selector lever is pushed against “R” position in the “P” or “N” position.
8. Confirm that the engine can only be started with the selector lever in the “P” and “N” positions. (With selector lever in the “P” position, engine can be started even when selector lever is moved forward and backward.)



9. Make sure that A/T is locked completely in “P” position.
10. DS mode must be indicated on the combination meter when the selector lever is shifted to the manual shift gate. When the selector lever is shifted to the “+” or “–” side in the DS mode, manual mode should be indicated on the combination meter.
    In addition, a set shift position must be changed when the selector lever is shifted to the “+” or “–” side in the manual mode. (Only while driving.)

ADJUSTMENT

1. Loosen nut (⬅).
2. Place manual lever and selector lever in “P” position.
3. While pressing lower lever (A) toward rear of vehicle (in “P” position direction), tighten nut to specified torque. Refer to AT-491, "Exploded View".

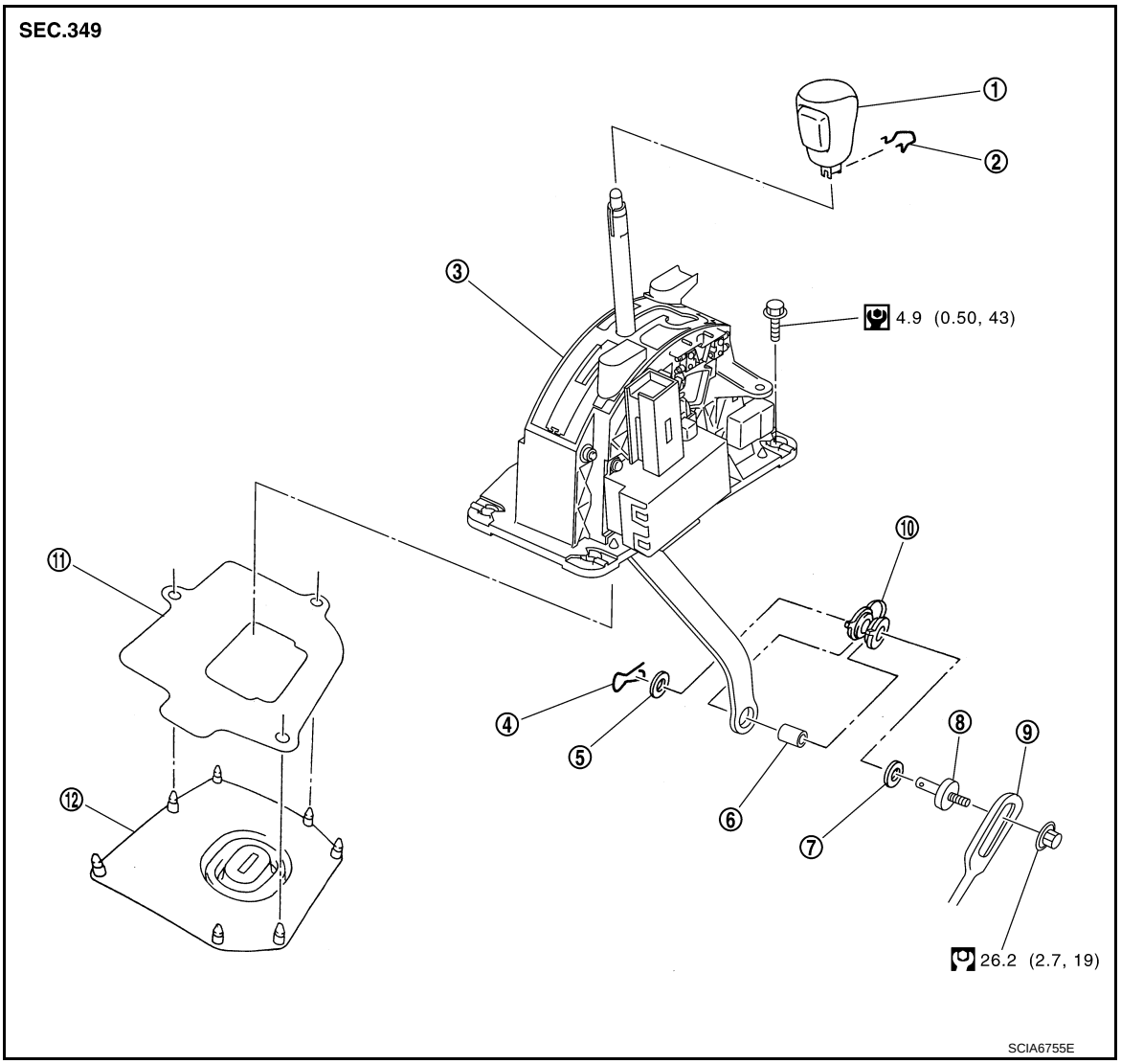


ON-VEHICLE REPAIR

CONTROL DEVICE

Exploded View

INFOID:0000000005352829



1. Selector lever knob	2. Lock pin	3. A/T shift selector assembly
4. Snap pin	5. Plain washer	6. Collar
7. Plain washer	8. Pivot pin	9. Control rod
10. Insulator	11. Dust cover plate	12. Dust cover

Refer to GI-9, "Component" for symbols in the figure.

Removal and Installation

INFOID:0000000005352830

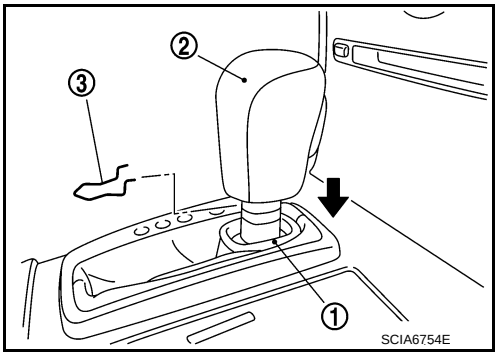
REMOVAL

CAUTION:

Make sure that parking brake is applied before removal/installation.

1. Move selector lever to “N” position.

2. Remove knob cover (1) below selector lever downward.
3. Pull lock pin (3) out of selector lever knob (2).
4. Remove selector lever knob.
5. Remove cup holder, switch finisher, cluster lid C and A/T console finisher. Refer to IP-18, "CLUSTER LID C : Component Parts Location"
6. Remove center console. Refer to IP-21, "CENTER CONSOLE : Component Parts Location".
7. Disconnect A/T shift selector harness connector.
8. Remove A/T shift selector assembly.



INSTALLATION

Note the following, and install in the reverse order of removal.

- When installing control rod to A/T shift selector assembly, refer to “ADJUSTMENT”. Refer to AT-490, "Inspection and Adjustment".

Inspection

INFOID:0000000005352831

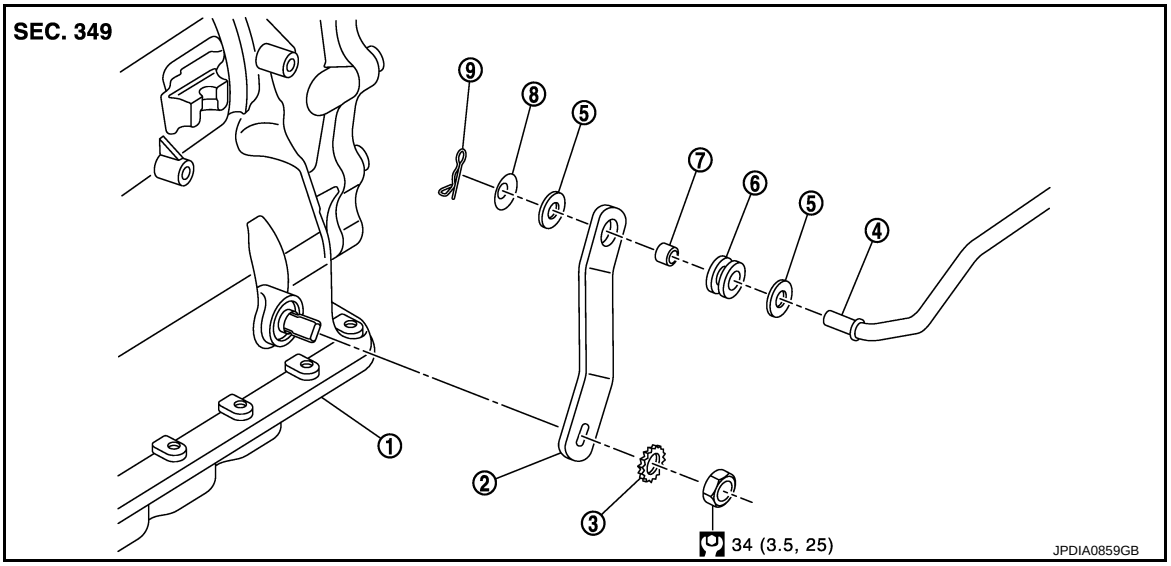
INSPECTION AFTER INSTALLATION

Check the A/T positions. Refer to AT-490, "Inspection and Adjustment".

CONTROL ROD

Exploded View

INFOID:0000000005352832



1.	A/T assembly	2.	Manual lever	3.	Lock washer
4.	Control rod	5.	Washer	6.	Insulator
7.	Collar	8.	Conical washer	9.	Snap pin

Refer to GI-9, "Component" for symbols in the figure.

Removal and Installation

INFOID:0000000005352833

REMOVAL

1. Shift the selector lever to “P” position.
2. Disconnect control device and control rod. Refer to AT-491, "Exploded View".
3. Remove manual lever from A/T assembly.
4. Remove control rod from manual lever.

INSTALLATION

Note the following, and install in the reverse order of removal.

- When installing control rod to control device assembly, refer to “ADJUSTMENT”. Refer to AT-490, "Inspection and Adjustment".

Inspection

INFOID:0000000005352834

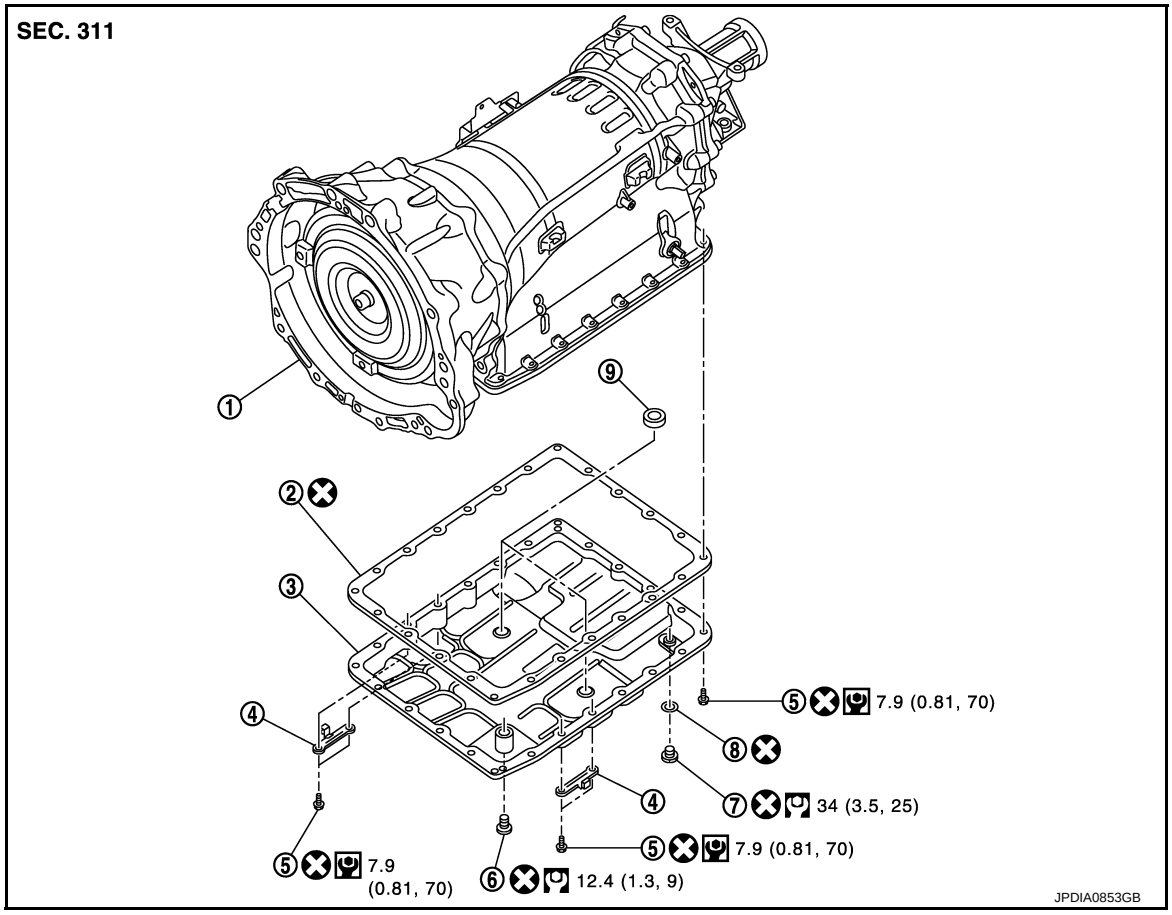
INSPECTION AFTER INSTALLATION

Check A/T positions. Refer to AT-490, "Inspection and Adjustment".

OIL PAN

Exploded View

INFOID:0000000005352835



1. A/T
2. Oil pan gasket
3. Oil pan
4. Clip
5. Oil pan mounting bolt
6. Overflow plug
7. Drain plug
8. Drain plug gasket
9. Magnet

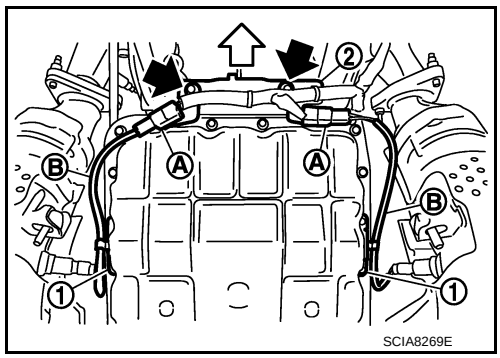
Refer to GI-9, "Component" for symbols in the figure.

Removal and Installation

INFOID:0000000005352836

REMOVAL

1. Drain ATF through drain plug.
2. Remove exhaust mounting bracket with a power tool. Refer to EX-3, "Component".
3. Disconnect heated oxygen sensor 2 connectors (A).



⇦ : Vehicle front

⬅ : Bolt

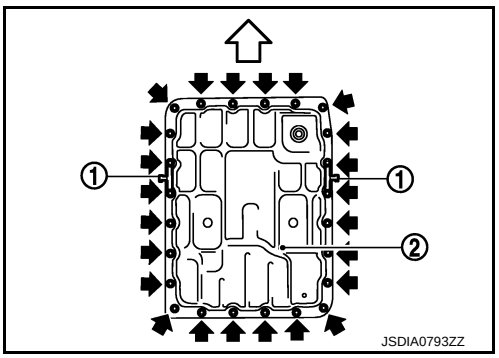
4. Remove heated oxygen sensor 2 harness (B) from clips (1).
5. Remove bracket (2) from A/T assembly. Refer to AT-501, "Exploded View".

6. Remove clips (1).

⇦ : Vehicle front

⬅ : Oil pan mounting bolt

7. Remove oil pan (2) and oil pan gasket.
8. Remove magnets from oil pan.



INSTALLATION

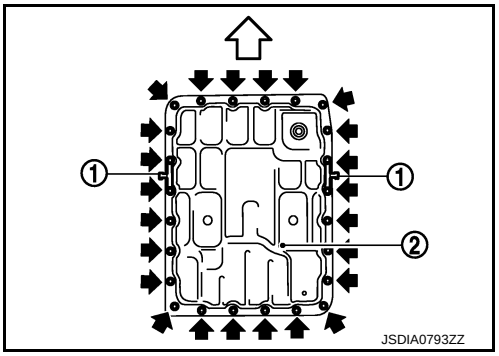
Note the following, and install in the reverse order of removal.

CAUTION:

- **Never reuse drain plug and drain plug gasket.**
- **Clean foreign materials (gear wear particles) that adhere on the inside of the oil pan and on the magnet, and then assembly.**
- Refer to the followings when installing oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

⇦ : Vehicle front

⬅ : Oil pan mounting bolt

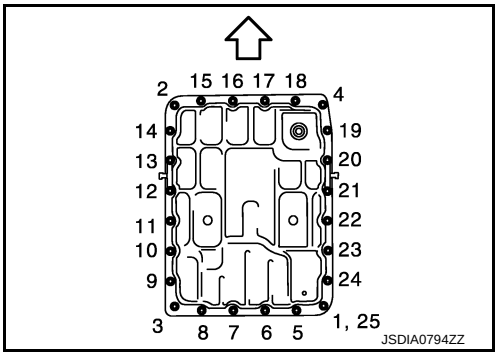


CAUTION:

- **Never reuse oil pan gasket and oil pan mounting bolts.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface of transmission case and oil pan.**
- **Install oil pan gasket in the direction to align hole position.**

- Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them.

⇦ : Vehicle front



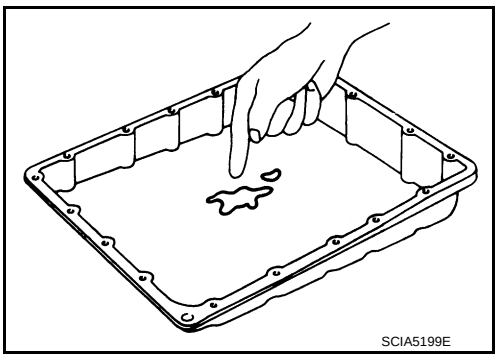
Inspection and Adjustment

INFOID:0000000005352837

INSPECTION AFTER REMOVAL

Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.

- **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to AT-486, "Cleaning".**



ADJUSTMENT AFTER INSTALLATION

Adjust A/T fluid level. Refer to AT-484, "Adjustment".

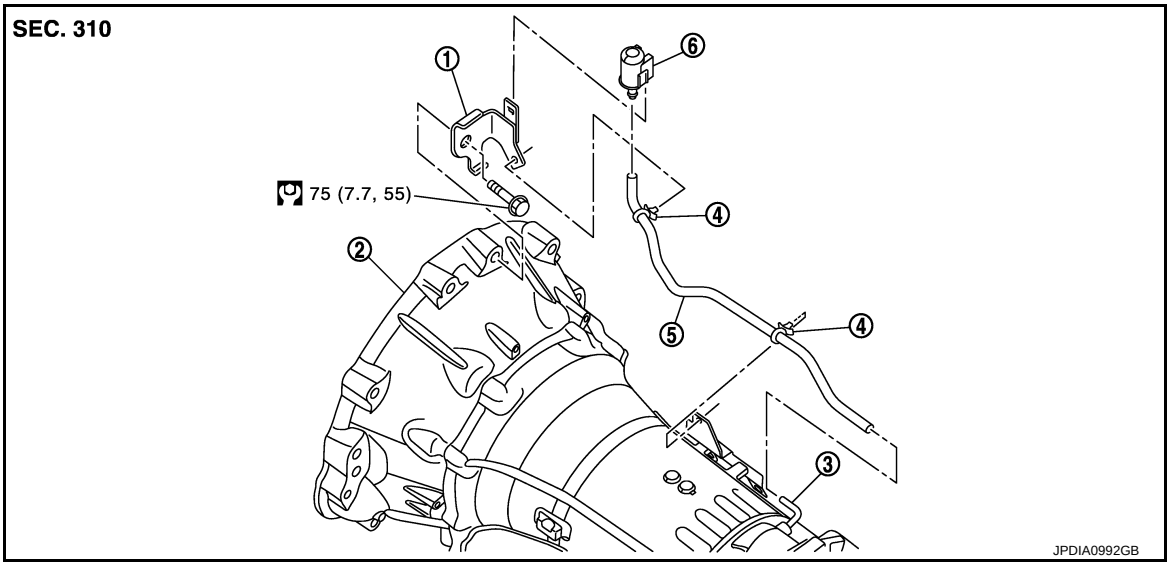
INSPECTION AFTER INSTALLATION

Check A/T fluid leakage.

AIR BREATHER HOSE

Exploded View

INFOID:0000000005352838



1. Bracket
2. A/T assembly
3. Air breather tube
4. Clip
5. Air breather hose
6. Air breather box

Refer to GI-9, "Component" for symbols in the figure.

Removal and Installation

INFOID:0000000005352839

REMOVAL

1. Remove clips from brackets.
2. Remove air breather box from bracket.
3. Remove air breather box from air breather hose.
4. Remove air breather hose.
5. Remove rear propeller shaft. Refer to PR-8, "Component".
6. Remove control rod from A/T shift selector. Refer to AT-491, "Exploded View".
7. Support A/T assembly with a transmission jack.
   CAUTION:
   When setting the transmission jack, be careful not to allow it to collide against the drain plug and overflow plug.
8. Remove rear engine mounting member with a power tool. Refer to EM-108, "2WD : Component".
9. Remove bolt fixing A/T assembly to engine assembly with a power tool.
10. Remove bracket.

INSTALLATION

Note the following, and install in the reverse order of removal.

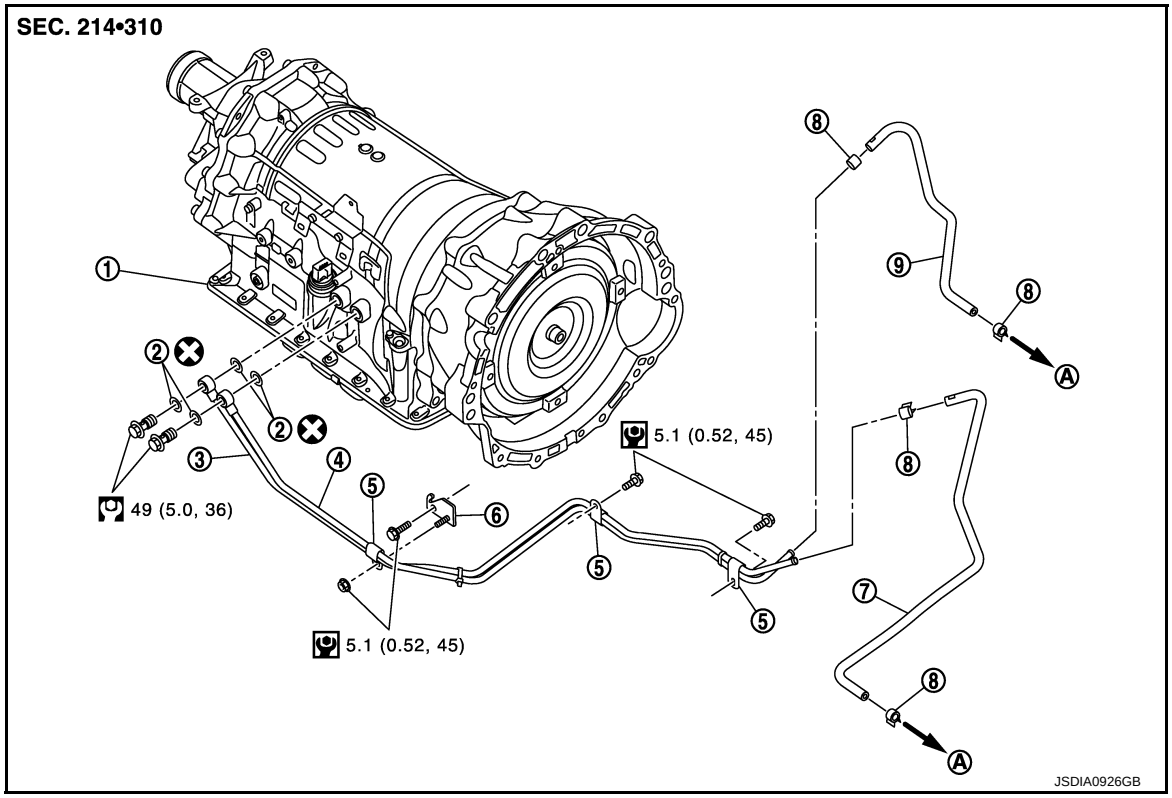
CAUTION:

- **When installing air breather hose, be careful not to be crushed or blocked by folding or bending the hose.**
- **When inserting air breather hose to air breather tube, be sure to insert it fully until its end reaches the radius curve end.**
- **When inserting air breather hose to air breather box, be sure to insert it fully until its end reaches the stop.**
- **Install air breather hose to air breather box so that the paint mark is facing backward.**
- **Ensure clips are securely installed to brackets when installing air breather hose to brackets.**

FLUID COOLER SYSTEM

Exploded View

INFOID:0000000005352840



1. A/T assembly
2. Copper washer
3. A/T fluid cooler tube
4. A/T fluid cooler tube
5. Clip
6. Bracket
7. A/T fluid cooler hose A
8. Hose clamp
9. A/T fluid cooler hose B

A. To radiator

Refer to GI-9, "Component" for symbols in the figure.

Removal and Installation

INFOID:0000000005352841

REMOVAL

1. Remove engine lower cover with a power tool. Refer to EI-35, "Component Parts Location".
2. Remove A/T fluid cooler hose A and A/T fluid cooler hose B.
3. Remove front suspension member. Refer to FSU-7, "Component".
4. Remove A/T fluid cooler tubes from A/T assembly and engine assembly.
   CAUTION:
   Be careful not to bend A/T fluid cooler tubes.
5. Plug up opening such as the A/T fluid cooler tube holes.
6. Remove clips and brackets.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

Never reuse copper washers.

- Refer to the following when installing A/T fluid cooler hoses.

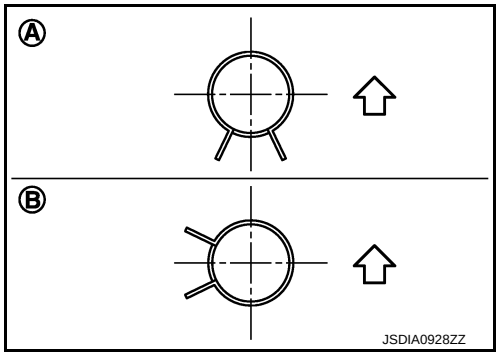
Hose name	Hose end	Paint mark	Position of hose clamp*
A/T fluid cooler hose A	Radiator assembly side	Facing downward	A
	A/T fluid cooler tube side	Facing forward	B
A/T fluid cooler hose B	Radiator assembly side	Facing downward	A
	A/T fluid cooler tube side	Facing forward	B

*: Refer to the illustrations for the specific position each hose clamp tab.

- The illustrations indicate the view from the hose ends.

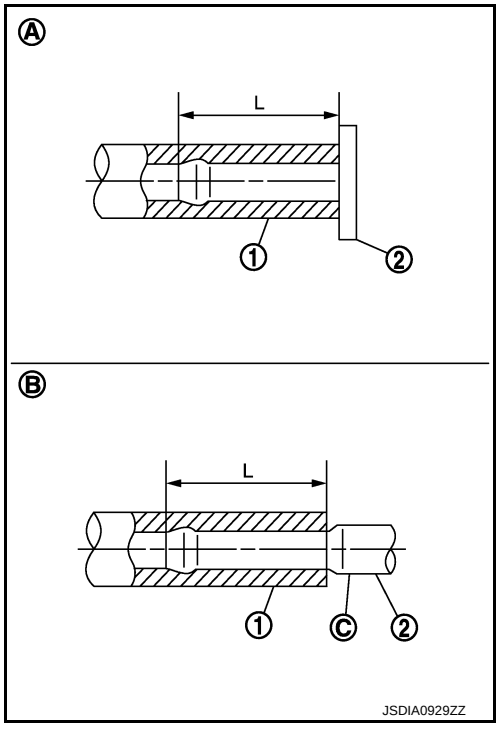
⇦ : Vehicle upper

- When installing hose clamps center line of each hose clamp tab should be positioned as shown in the figure.



- Insert A/T fluid cooler hoses according to dimension (L) described below.

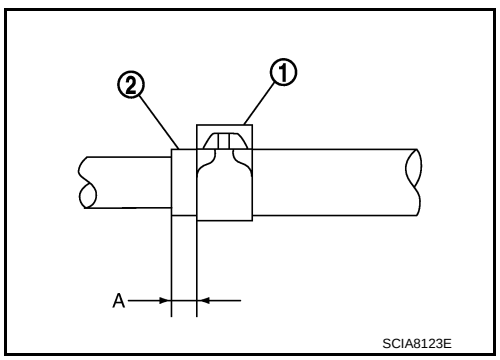
(1)	(2)	Tube type	Dimension (L)
A/T fluid cooler hose A	Radiator assembly side	A	Insert the hose until the hose touches the radiator.
	A/T fluid cooler tube side	B	30 mm (1.18 in) [End reaches the 2-stage bulge (C).]
A/T fluid cooler hose B	Radiator assembly side	A	Insert the hose until the hose touches the radiator.
	A/T fluid cooler tube side	B	30 mm (1.18 in) [End reaches the 2-stage bulge (C).]



- Set hose clamps (1) at the both ends of A/T fluid cooler hoses (2) with dimension (A) from the hose edge.

Dimension A : 5 – 9 mm (0.20 – 0.35 in)

- Hose clamp should not interfere with the bulge of fluid cooler tube.



Inspection and Adjustment

INFOID:0000000005352842

ADJUSTMENT AFTER INSTALLATION

Adjust A/T fluid level. Refer to AT-484, "Adjustment".

INSPECTION AFTER INSTALLATION

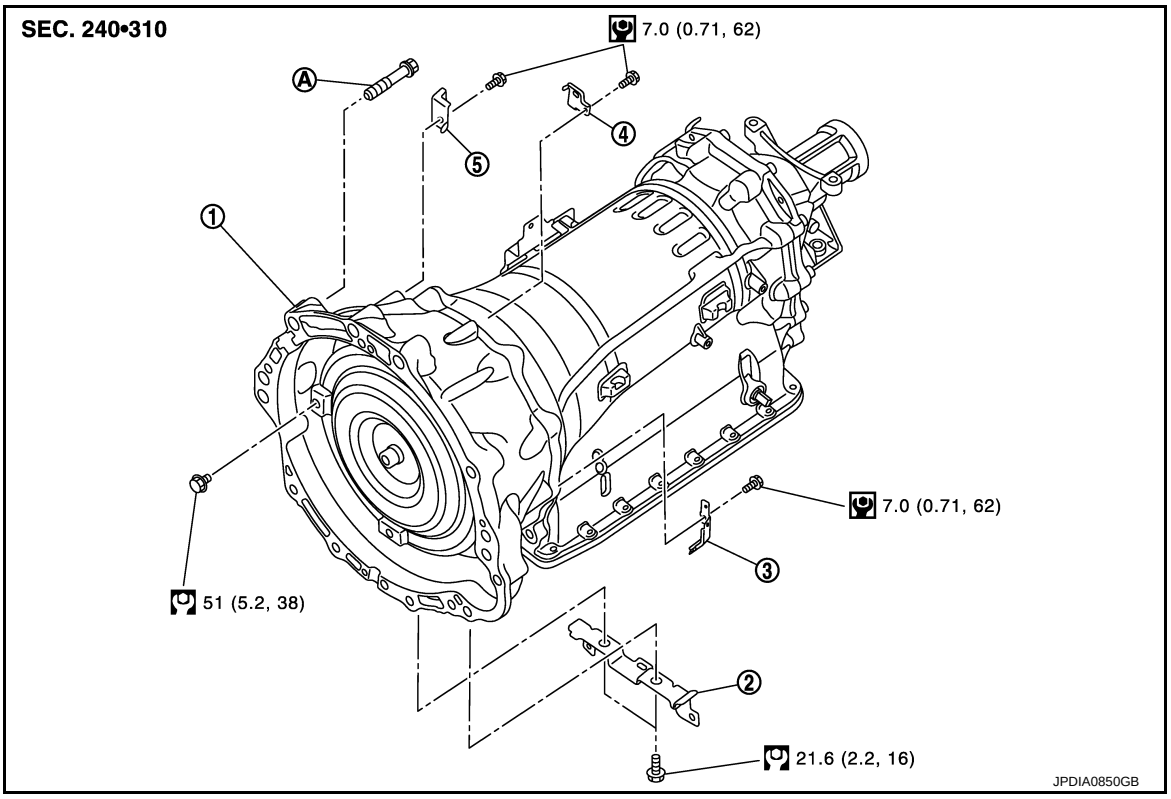
Check A/T fluid leakage.

REMOVAL AND INSTALLATION

TRANSMISSION ASSEMBLY

Exploded View

INFOID:0000000005352843



1. A/T assembly
2. Harness bracket
3. Harness bracket
4. Harness bracket
5. Harness bracket

A. For tightening torque, Refer to AT-501, "Removal and Installation".

Refer to GI-9, "Component" for symbols in the figure.

Removal and Installation

INFOID:0000000005352844

REMOVAL

CAUTION:

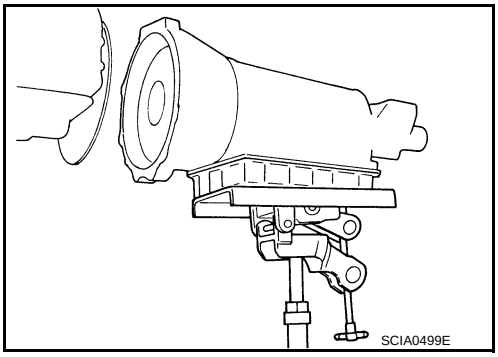
- **When removing the A/T assembly from engine, first remove the crankshaft position sensor (POS) from the A/T assembly.**
- **Be careful not to damage sensor edge.**

1. Shift the selector lever to “P” position, and then release the parking brake.
2. Disconnect the battery cable from the negative terminal.
3. Remove control rod. Refer to AT-493, "Exploded View".
4. Separate rear propeller shaft. Refer to PR-8, "Component".
5. Remove engine under cover and front under cover with a power tool. Refer to EI-35, "Component Parts Location".
6. Remove rack stay. Refer to FSU-7, "Component".
7. Remove crankshaft position sensor (POS) from A/T assembly. Refer to EM-119, "Component".

   CAUTION:

   - **Never subject it to impact by dropping or hitting it.**
   - **Never disassemble.**
   - **Never allow metal filings, etc. to get on the sensor's front edge magnetic area.**
   - **Never place in an area affected by magnetism.**

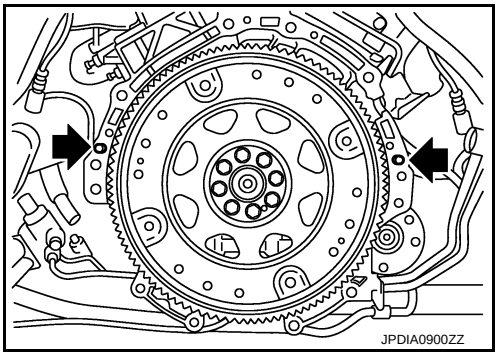
8. Remove starter motor. Refer to SC-13, "Removal and Installation".
9. Remove rear plate cover. Refer to EM-28, "2WD : Component".
10. Turn crankshaft, and remove the four tightening bolts for drive plate and torque converter.
    CAUTION:
    When turning the crankshaft, turn it clockwise as viewed from the front of the engine.
11. Remove A/T fluid cooler tubes. Refer to AT-498, "Exploded View".
12. Plug up openings such as the A/T fluid cooler tube holes.
13. Support A/T assembly with a transmission jack.
    CAUTION:
    When setting the transmission jack, be careful not to allow it to collide against the drain plug and overflow plug.
14. Remove rear engine mounting member and engine mounting insulator (rear) with a power tool. Refer to EM-108, "2WD : Component".
15. Disconnect A/T assembly connector.
16. Remove harness and harness brackets.
17. Remove bolts fixing A/T assembly to engine assembly with a power tool.
18. Remove air breather hose, air breather box and bracket. Refer to AT-497, "Exploded View".
19. Remove A/T assembly from the vehicle.
    CAUTION:
    - **Secure torque converter to prevent it from dropping.**
    - **Secure A/T assembly to a transmission jack.**
20. Remove dynamic damper. Refer to EM-108, "2WD : Component".



INSTALLATION

Note the following, and install in the reverse order of removal.

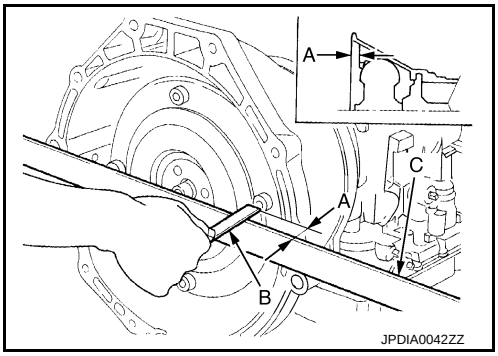
CAUTION:
Check fitting of dowel pin (⬅) when installing A/T assembly to engine assembly.



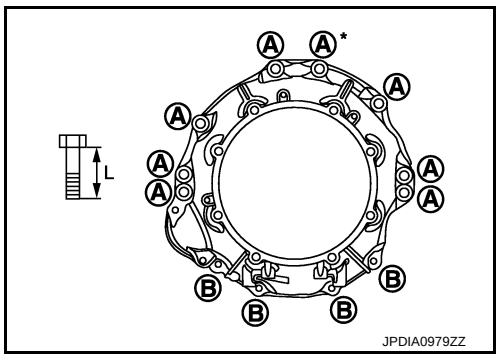
- When installing A/T assembly to the engine assembly, be sure to check dimension (A) to ensure it is within the reference value limit.

B : Scale
C : Straightedge

Dimension (A) : Refer to AT-505, "Torque Converter".



- When installing A/T assembly to the engine assembly, attach the fixing bolts in accordance with the following standard.



Insertion direction	A/T assembly to engine assembly	Engine assembly to A/T assembly
Bolt position	A	B
Number of bolts	8	4
Bolt length (L) mm (in)	65 (2.56)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7, 55)	46.6 (4.8, 34)

*: Tightening the bolt with bracket.

- Align the positions of tightening bolts for drive plate with those of the torque converter, and temporarily tighten the bolts. Then, tighten the bolts with the specified torque.

CAUTION:

- **When turning crankshaft, turn it clockwise as viewed from the front of the engine.**
- **When tightening the tightening bolts for the torque converter after fixing the crankshaft pulley bolts, be sure to confirm the tightening torque of the crankshaft pulley mounting bolts. Refer to EM-59, "Component".**
- **Rotate crankshaft several turns and check to be sure that A/T rotates freely without binding after converter is installed to drive plate.**

Inspection and Adjustment

INFOID:0000000005352845

ADJUSTMENT AFTER INSTALLATION

Adjust A/T fluid level. Refer to AT-484, "Adjustment".

INSPECTION AFTER INSTALLATION

Check the following item.

- A/T fluid leakage.
- A/T position. Refer to AT-490, "Inspection and Adjustment".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000005352846

Transmission model code number		1XJ3C
Stall torque ratio		1.92 : 1
Transmission gear ratio	1st	4.924
	2nd	3.194
	3rd	2.043
	4th	1.412
	5th	1.000
	6th	0.862
	7th	0.772
	Reverse	3.972
Recommended fluid		Genuine NISSAN Matic S ATF*1
Fluid capacity		9.2 liter (9-3/4 US qt, 8-1/8 Imp qt)*2

CAUTION:

- **Use only Genuine NISSAN Matic S ATF. Never mix with other ATF.**
- **Using ATF other than Genuine NISSAN Matic S ATF will cause deterioration driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**

- *1: Refer to MA-9, "Fluids and Lubricants".
- *2: The fluid capacity is the reference value.

Vehicle Speed at Which Gear Shifting Occurs

INFOID:0000000005352847

Unit: km/h (MPH)

Gear position	Throttle position	
	Full throttle	Half throttle
$D_1 \rightarrow D_2$	50 – 54 (32 – 33)	37 – 41 (23 – 25)
$D_2 \rightarrow D_3$	77 – 85 (48 – 52)	59 – 67 (37 – 41)
$D_3 \rightarrow D_4$	124 – 134 (78 – 83)	84 – 94 (53 – 58)
$D_4 \rightarrow D_5$	182 – 192 (114 – 119)	107 – 117 (67 – 72)
$D_5 \rightarrow D_6$	212 – 222 (132 – 137)	159 – 169 (99 – 105)
$D_6 \rightarrow D_7$	247 – 257 (154 – 159)	205 – 215 (128 – 133)
$D_7 \rightarrow D_6$	236 – 246 (147 – 152)	165 – 175 (103 – 108)
$D_6 \rightarrow D_5$	187 – 197 (117 – 122)	110 – 120 (69 – 74)
$D_5 \rightarrow D_4$	172 – 182 (107 – 113)	72 – 82 (45 – 50)
$D_4 \rightarrow D_3$	111 – 121 (69 – 75)	39 – 49 (25 – 30)
$D_3 \rightarrow D_2$	41 – 49 (26 – 30)	21 – 29 (14 – 18)
$D_2 \rightarrow D_1$	13 – 17 (9 – 10)	7 – 11 (5 – 6)

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

Vehicle Speed at Which Lock-up Occurs/Releases

INFOID:0000000005352848

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up ON	Lock-up OFF
Closed throttle	12 – 20 (8 – 12)	9 – 17 (6 – 10)
Half throttle	87 – 95 (55 – 59)	84 – 92 (53 – 57)

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

Stall Speed

INFOID:0000000005352849

Stall speed	2,475 – 2,775 rpm

Torque Converter

INFOID:0000000005352850

Dimension between end of converter housing and torque converter	25.0 mm (0.98 in)