SECTION TM
TRANSAXLE & TRANSMISSION

CONTENTS

CVT: RE0F11A

PRECAUTION

PRECAUTIONS

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

INFOID:0000000009578891

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

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

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- **When working near the Airbag Diagnosis Sensor Unit or other Airbag 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 three minutes before performing any service.**

General Precautions

INFOID:0000000009417578

CAUTION:

- **Do not reuse CSC (Concentric Slave Cylinder). CSC slides back to the original position every time when removing transaxle assembly. At this time, dust on the sliding parts may damage the seal of CSC and may cause clutch fluid leakage. Refer to CL-16, "Removal and Installation".**
- **Do not reuse transaxle gear oil, once it has been drained.**
- **Check oil level or replace gear oil with vehicle on level surface.**
- **During removal or installation, keep inside of transaxle clear of dust or dirt.**
- **Check for the correct installation alignment prior to removal or disassembly. If matching marks are required, be certain they do not interfere with the function of the parts marked.**
- **In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, use it.**
- **Do not damage sliding surfaces and mating surfaces.**

Precaution for Work

INFOID:0000000009417579

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and prevent them from being dropped.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with a new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components:

- Water soluble dirt:

- Dip a soft cloth into lukewarm water, wring the water out of the cloth and wipe the dirty area.
- Then rub with a soft, dry cloth.

- Oily dirt:
• Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%) and wipe the dirty area.
• Then dip a cloth into fresh water, wring the water out of the cloth and wipe the detergent off.
• Then rub with a soft, dry cloth.
- Do not use organic solvent such as thinner, benzene, alcohol or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

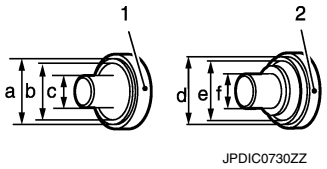
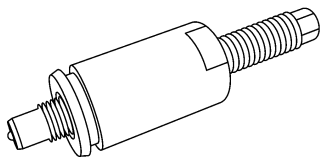
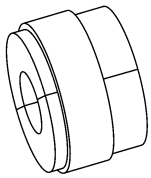
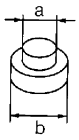
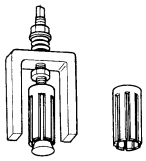
PREPARATION

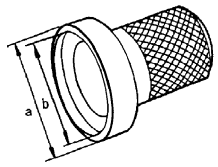
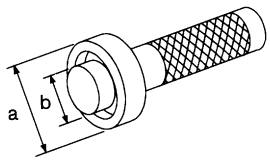
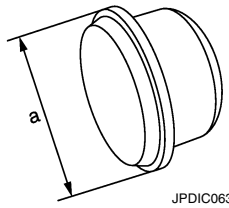
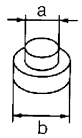
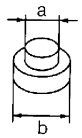
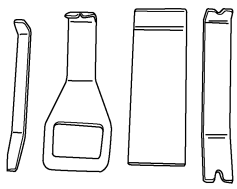
PREPARATION

Special Service Tools

INFOID:0000000009417580

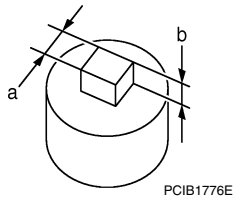
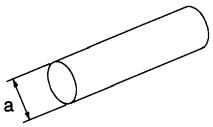
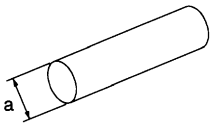
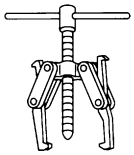
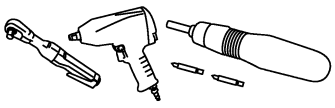
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV32500QAA (—) Drift set  JPDIC0730ZZ	Installing differential side oil seal 1. — **Drift** **a: 54.3 mm (2.138 in) dia.** **b: 45 mm (1.77 in) dia.** **c: 26.6 mm (1.047 in) dia.** 2. — **Drift** **d: 54 mm (2.13 in) dia.** **e: 48.6 mm (1.913 in) dia.** **f: 26.6 mm (1.047 in) dia**
KV32300QAC (—) Puller  SCIA1781J	Removing 5th main gear
KV32300QAD (—) Puller  SCIA1782J	Removing 5th main gear
ST35300000 (—) Drift  ZZA0969D	• Removing and installing input shaft rear bearing • Removing and installing mainshaft rear bearing **a: 45 mm (1.77 in) dia.** **b: 59 mm (2.32 in) dia.**
KV111011S0 (—) Valve seat remover  ZZA0872D	Removing mainshaft front bearing

Tool number (Kent-Moore No.) Tool name	Description
ST33400001 (—) Drift  ZZA0814D	Installing mainshaft front bearing **a: 60 mm (2.36 in) dia.** **b: 47 mm (1.85 in) dia.**
KV40100900 (—) Drift  NT084	Installing input shaft front bearing **a: 52 mm (2.05 in) dia.** **b: 39.5 mm (1.555 in) dia.**
KV32300QAE (—) Drift  JPDIC0635ZZ	Installing differential side bearing outer race **a: 61.5 mm (2.421 in) dia.**
ST33052000 (—) Drift  ZZA0969D	Removing differential side bearing **a: 22 mm (0.87 in) dia.** **b: 28mm (1.10 in) dia.**
KV40104920 (—) Drift  ZZA0969D	Installing differential side bearing **a: 21.7 mm (0.854 in) dia.** **b: 44.7 mm (1.760 in) dia.**
— (J-46534) Trim tool set  AWJIA0483ZZ	Removing trim components

Commercial Service Tools

INFOID:0000000009417581

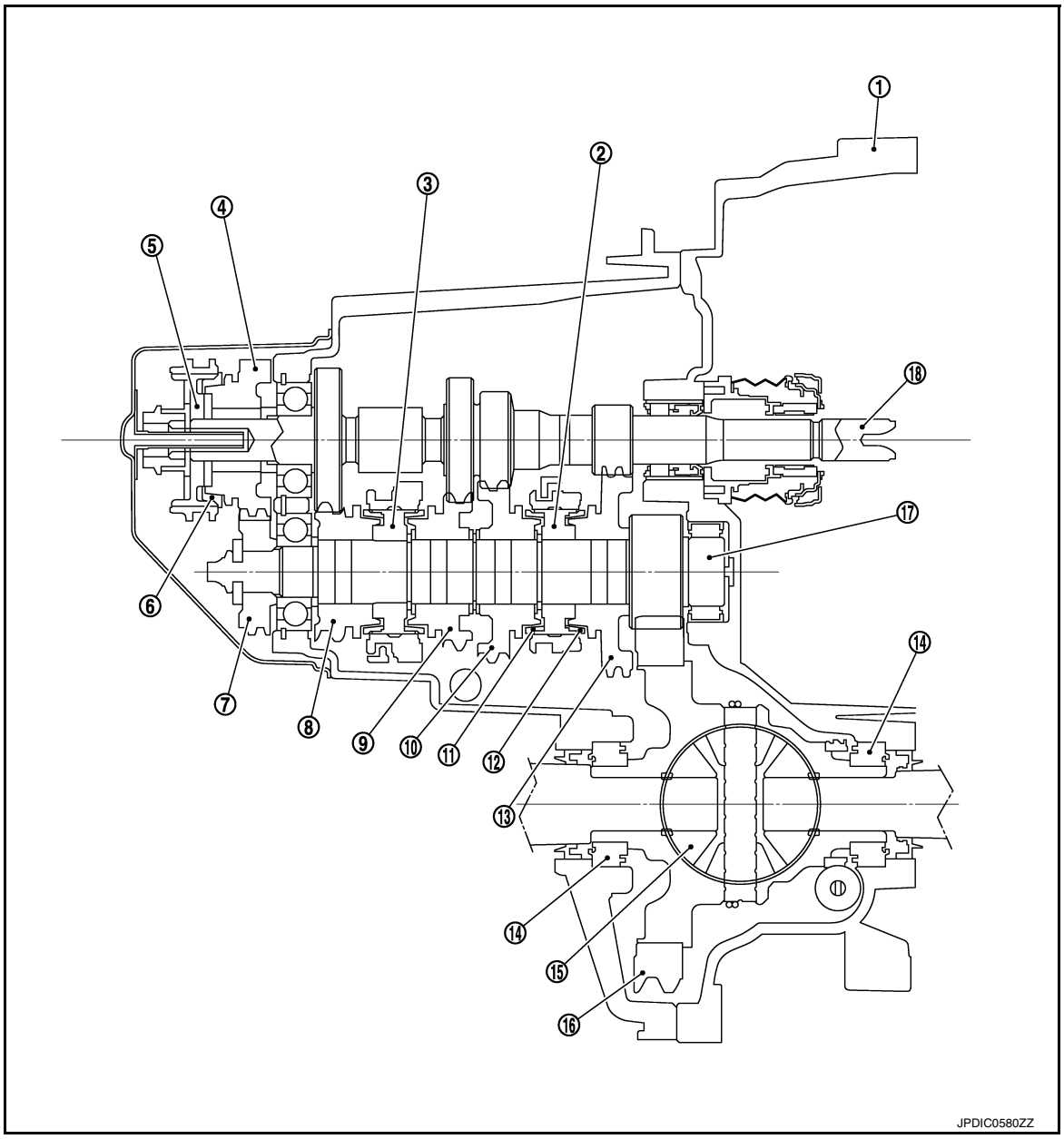
Tool name	Description
Socket  PCIB1776E	Removing and installing drain plug **a: 8 mm (0.31 in)** **b: 5 mm (0.20 in)**
Drift  S-NT063	Removing input shaft front bearing **a: 38 mm (1.50 in) dia.**
Drift  S-NT063	Installing bushing **a: 14.5 mm (0.571 in) dia.**
Puller  NT077	• Removing 5th-reverse synchronizer hub • Removing differential side bearing
Bearing remover  S-NT134	Removing bushing
Power tool  PIIB1407E	Loosening nuts, screws and bolts

SYSTEM DESCRIPTION

STRUCTURE AND OPERATION

Sectional View

INFOID:0000000009417582



1. Clutch housing
2. 1st-2nd synchronizer hub assembly
3. 3rd-4th synchronizer hub assembly
4. 5th input gear
5. 5th-reverse synchronizer hub assembly
6. 5th-reverse baulk ring
7. 5th main gear
8. 4th main gear
9. 3rd main gear
10. 2nd main gear
11. 2nd double-cone synchronizer
12. 1st double-cone synchronizer
13. 1st main gear
14. Differential side bearing
15. Differential
16. Final gear
17. Mainshaft
18. Input shaft

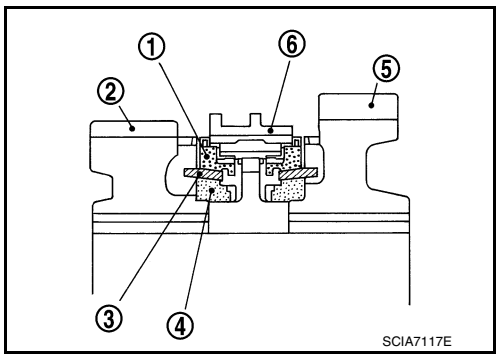
System Description

INFOID:0000000009417583

DOUBLE-CONE SYNCHRONIZER

Double-cone synchronizers are adopted for 1st and 2nd gears to reduce operating force of the shift selector.

(1) : Outer baulk ring
(2) : 2nd main gear
(3) : Synchronizer cone
(4) : Inner baulk ring
(5) : 1st main gear
(6) : 1st-2nd coupling sleeve



REVERSE GEAR NOISE PREVENTION FUNCTION (REVERSE BRAKE)

Description

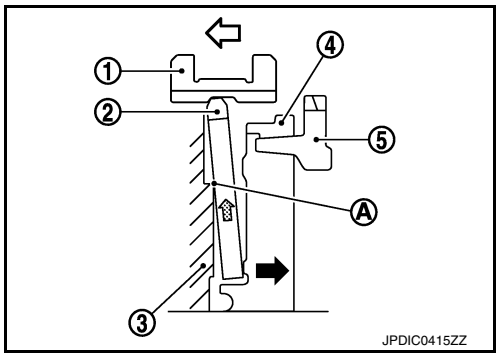
Soon after the clutch is disengaged, the input shaft is still rotating due to inertia. This may cause a gear noise when the shift selector is moved to reverse position. The reverse gear noise prevention function stops the rotation of the input shaft and enables smooth gear shifting when the reverse gear is selected.

Operation Principle

1. When the shift selector is moved to reverse position, 5th-reverse coupling sleeve (1) slides in the reverse direction. (⇦)

   (5) : 5th input gear

2. Synchronizer levers (2) with support point (A) at 5th-reverse synchronizer hub (3) presses 5th-reverse baulk ring (4). (⬅)
3. Friction that is generated at 5-reverse baulk ring presses synchronizer lever on 5th-reverse coupling sleeve. (⇦)
4. 5th-reverse coupling sleeve that is pressed by synchronizer lever stops the rotation of input shaft.



DTC/CIRCUIT DIAGNOSIS

POSITION SWITCH

BACK-UP LAMP SWITCH

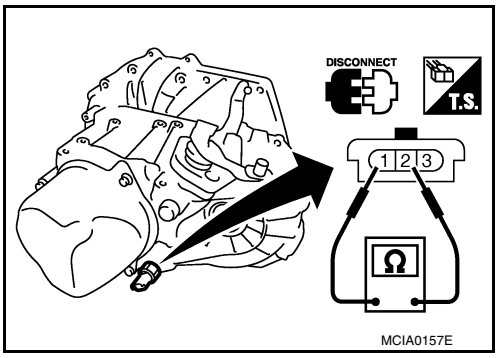
BACK-UP LAMP SWITCH : Component Inspection

INFOID:0000000009417584

1. CHECK BACK-UP LAMP SWITCH

1. Disconnect position switch connector. Refer to TM-18, "Removal and Installation".
2. Check continuity between position switch terminals.

Terminals		Condition	Continuity
1	2	Reverse gear position	Yes
		Except reverse gear position	No



Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace position switch. Refer to TM-18, "Removal and Installation".

PARK/NEUTRAL POSITION (PNP) SWITCH

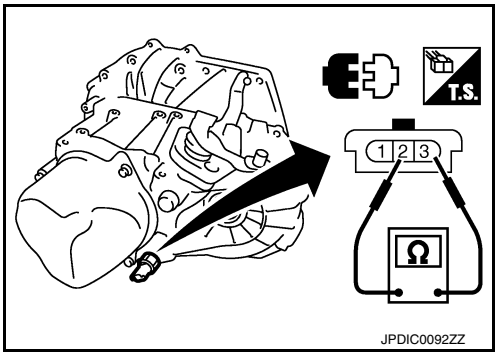
PARK/NEUTRAL POSITION (PNP) SWITCH : Component Inspection

INFOID:0000000009417585

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH

1. Disconnect position switch connector. Refer to TM-18, "Removal and Installation".
2. Check continuity between position switch terminals.

Terminals		Condition	Continuity
2	3	Neutral gear position	Yes
		Except neutral gear position	No



Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace position switch. Refer to TM-18, "Removal and Installation".

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000009417586

Use the chart below to find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

Reference page		TM-16			TM-25			TM-20	TM-25				
SUSPECTED PARTS (Possible cause)		OIL (Oil level is low)	OIL (Wrong oil)	OIL (Oil level is high)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	O-RING (Worn or damaged)	SHIFT CONTROL LINKAGE (Worn)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING (Damaged)
Symptoms	Noise	1	2							3	3		
	Oil leakage		3	1	2	2	2						
	Hard to shift or will not shift		1	1				2				3	3
	Jumps out of gear							1	2	2			

PERIODIC MAINTENANCE

GEAR OIL

Inspection

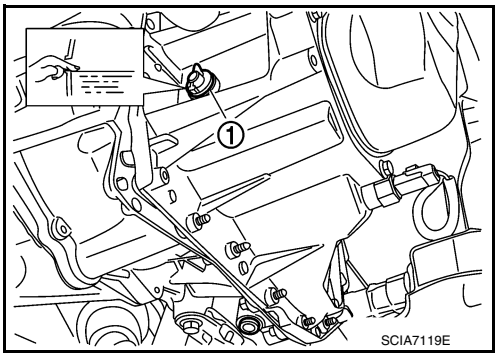
INFOID:0000000009417587

GEAR OIL LEAKS

Make sure that gear oil is not leaking from transaxle or around it.

GEAR OIL LEVEL

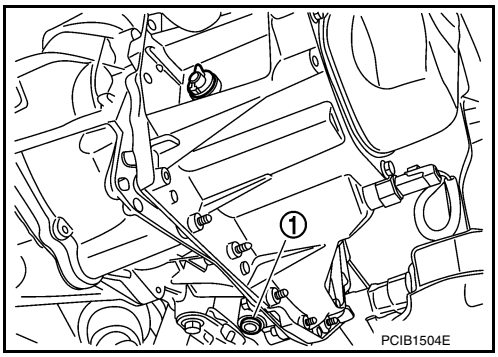
1. Remove filler plug (1) and gasket from transaxle case.
2. Check the gear oil level from filler plug hole as shown.
   CAUTION:
   Do not start engine while checking gear oil level.
3. Install a new gasket on filler plug and then install filler plug to transaxle case.
   CAUTION:
   Do not reuse gasket.
4. Tighten filler plug to the specified torque. Refer to TM-25, "Exploded View".



Draining

INFOID:0000000009417588

1. Start engine and let it run to warm up transaxle.
2. Stop engine. Remove drain plug (1) and gasket, using suitable tool and then drain gear oil.
3. Install a new gasket on drain plug (1) and install drain plug to clutch housing, using suitable tool.
   CAUTION:
   Do not reuse gasket.
4. Tighten drain plug (1) to the specified torque. Refer to TM-25, "Exploded View".

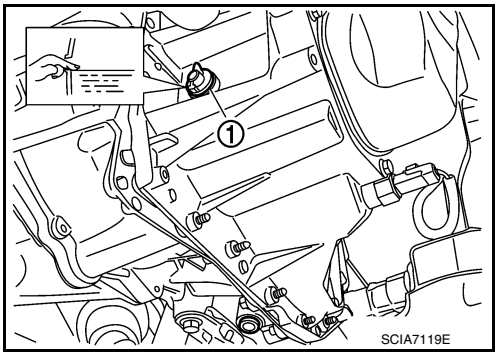


Refilling

INFOID:0000000009417589

1. Remove filler plug (1) and gasket from transaxle case.
2. Fill with new gear oil until gear oil level reaches the specified limit at filler plug hole as shown.
   CAUTION:
   Do not start engine while checking gear oil level.

   Oil capacity and viscosity : Refer to MA-12, "Fluids and Lubricants".
3. Install a new gasket on filler plug and then install filler plug to transaxle case.
   CAUTION:
   Do not reuse gasket.
4. Tighten filler plug to the specified torque. Refer to TM-25, "Exploded View".



REMOVAL AND INSTALLATION

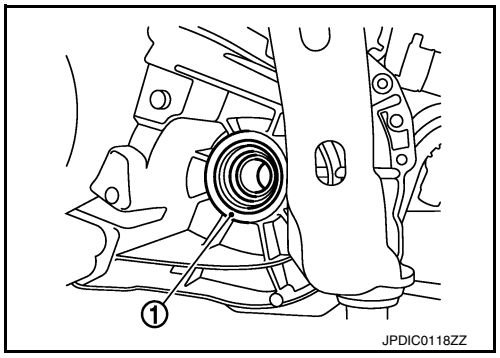
SIDE OIL SEAL

Removal and Installation

INFOID:0000000009417590

REMOVAL

1. Remove front drive shaft from transaxle assembly. Refer to FAX-19, "Removal and Installation".
2. Remove differential side oil seal (1) using suitable tool.
   CAUTION:
   Do not damage transaxle case and clutch housing.



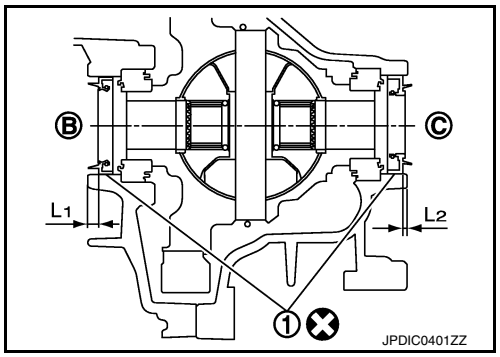
INSTALLATION

1. Install differential side oil seal (1) to transaxle case side (B) and clutch housing side (C) using Tool.

   Dimension (L_1) : 5.7 – 6.3 mm (0.224 – 0.248 in)
   Dimension (L_2) : 2.4 – 3.0 mm (0.094 – 0.118 in)

   Tool number : KV32500QAA (—)

   CAUTION:
   - **Do not reuse differential side oil seal.**
   - **Do not tilt differential side oil seal.**
   - **Do not damage clutch housing and transaxle case.**



2. Install the front drive shaft. Refer to FAX-19, "Removal and Installation".

Inspection

INFOID:0000000009417591

INSPECTION AFTER INSTALLATION

Check the gear oil level and for gear oil leaks. Refer to TM-16, "Inspection".

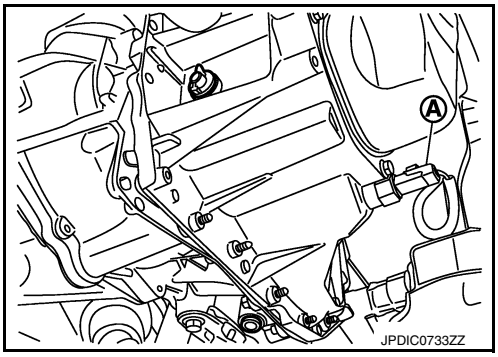
POSITION SWITCH

Removal and Installation

INFOID:0000000009417592

REMOVAL

1. Drain gear oil. Refer to TM-16, "Draining".
2. Disconnect the harness connector (A) from position switch.
3. Remove position switch from transaxle case.



INSTALLATION

1. Apply recommended sealant to threads of position switch.
   CAUTION:
   - **Use Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".**
   - **Remove old sealant and gear oil adhering to threads.**
2. Install position switch to transaxle case.
3. Tighten position switch to the specified torque. Refer to TM-25, "Exploded View".
4. Refill gear oil. Refer to TM-16, "Refilling".

Inspection

INFOID:0000000009417593

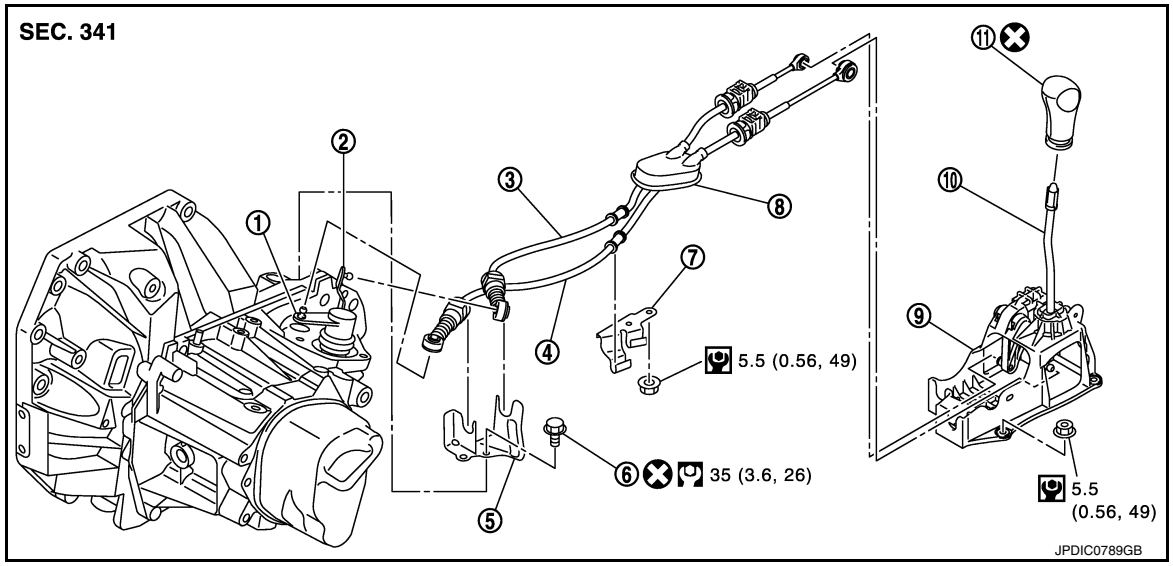
INSPECTION AFTER INSTALLATION

- Check continuity between position switch terminals. Refer to TM-14, "BACK-UP LAMP SWITCH : Component Inspection" (Back-up lamp switch) and TM-14, "PARK/NEUTRAL POSITION (PNP) SWITCH : Component Inspection" (PNP switch).
- Check the gear oil level and for gear oil leaks. Refer to TM-16, "Inspection".

CONTROL LINKAGE

Exploded View

INFOID:0000000009417594



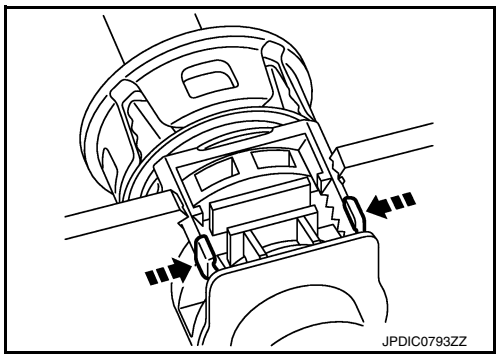
1. Shifter lever A
2. Selector lever
3. Selector cable
4. Shifter cable
5. Cable mounting bracket
6. Tapping bolt
7. Bracket
8. Grommet
9. Shift selector assembly
10. Shift selector
11. Shift selector handle

Removal and Installation

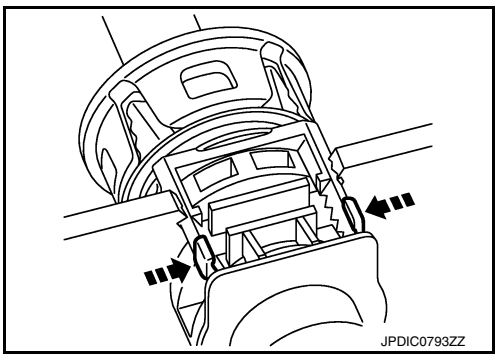
INFOID:0000000009417595

REMOVAL

1. Move the shift selector to the neutral position.
2. Remove the battery tray. Refer to PG-70, "Removal and Installation (Battery Tray)".
3. Pull out and disconnect cables from shifter lever A and selector lever, using a suitable tool.
4. While pressing the lock of the selector cable in the direction of the arrows shown, remove the selector cable from the cable mounting bracket.
5. While pressing the lock of the shifter cable in the direction of the arrows shown, remove the shifter cable from the cable mounting bracket.
6. Remove cable mounting bracket from clutch housing.
7. Pull the shift selector handle upward to remove.
8. Remove center console assembly. Refer to IP-18, "Removal and Installation".
9. Pull out and disconnect each cable from the shift selector assembly, using a suitable tool.



a. While pressing the lock of the selector cable in the direction of the arrows shown, remove the selector cable from the shift selector assembly.
b. While pressing the lock of the shifter cable in the direction of the arrows shown, remove the shifter cable from the shift selector assembly.
10. Remove the shift selector assembly.
11. Remove center muffler, exhaust front tube, and heat plate. Refer to EX-5, "Exploded View".
12. Remove the bracket from the vehicle.
13. Remove the grommet and then remove the shifter cable and selector cable from the vehicle.



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- **Install each cable without causing interference with other parts. Do not allow cable to bend less than 120 mm (4.72 in), or exceed 180 degree twist.**
- **Install boot of each cable without causing interference with other parts. Do not exceed 90 degree twist.**
- **Fit boot to center console assembly and the groove on shift selector handle.**
- To install the shift selector handle, press it onto the shift selector.

  CAUTION:

  - **Do not reuse shift selector handle.**
  - **Be careful with orientation of shift selector handle.**
- Bolt hole is not threaded on new clutch housing. Self-tapping bolt is used to attach lock plate to clutch housing.

  CAUTION:

  Do not reuse self-tapping bolt.
- Insert each cable until it reaches the cable mounting bracket and shift selector assembly.
- Insert each cable until it reaches the shifter lever A and the selector lever.
- Move the shift selector to the neutral position.

Inspection

INFOID:0000000009417596

INSPECTION AFTER INSTALLATION

Shift Selector Handle

Check that the shift selector handle is installed in the right position.

Shifter Cable and Selector Cable

- Pull each cable in the removal direction to check that it does not disconnect from the cable mounting bracket.
- Pull each cable in the removal direction to check that it does not disconnect from the shift selector assembly.
- Pull grommet in the removal direction to check that it does not disconnect from the vehicle.

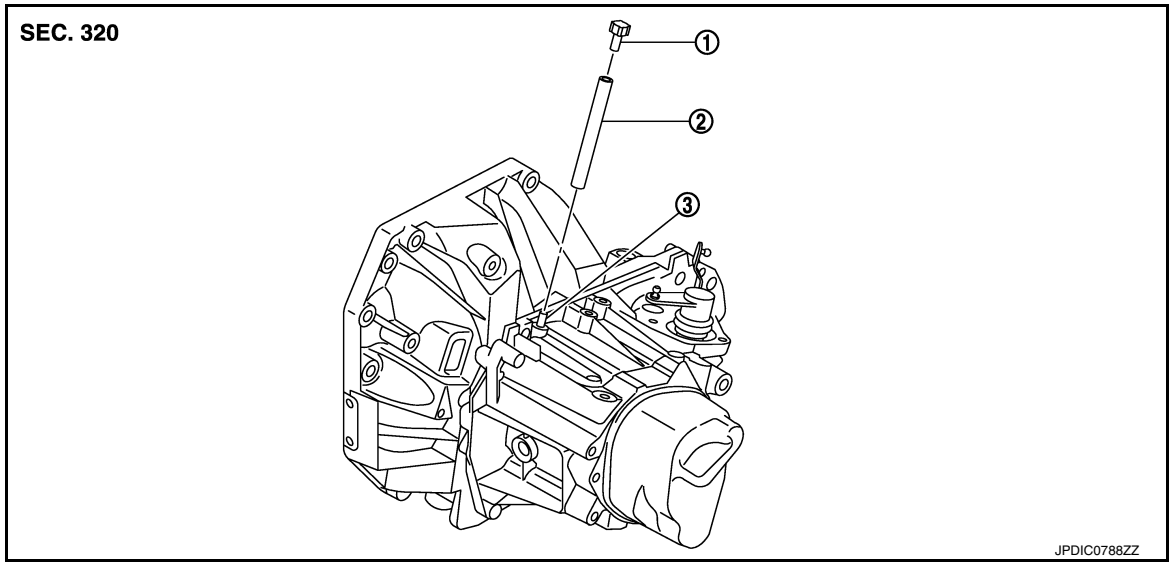
Shift Selector Assembly and Shift Selector

- Check that there is no unusual noise, binding, bending, looseness, and interference when the shift selector is moved to each position. If there is a malfunction, then repair or replace the malfunctioning part.
- Check that the shift selector smoothly returns to the neutral position after moving the shift selector from 1st to 2nd gear and releasing it. If there is a malfunction, then repair or replace the malfunctioning part.
- Check that the shift selector smoothly returns to the neutral position after moving the shift selector from 5th to the reverse gear position and releasing it. If there is a malfunction, then repair or replace the malfunctioning part.

AIR BREATHER HOSE

Exploded View

INFOID:0000000009417597



1. Cap
2. Air breather hose
3. 2-way connector

Removal and Installation

INFOID:0000000009417598

REMOVAL

1. Remove air cleaner case. Refer to EM-26, "Removal and Installation".
2. Remove air breather hose from the 2-way connector.
   CAUTION:
   When removing air breather hose, be sure to hold 2-way connector securely.
3. Remove cap from air breather hose.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- **Install air breather hose. Do not bend hose tightly, which may result in pinching or clogging.**
- **Insert the air breather hose to the base of the 2-way connector.**

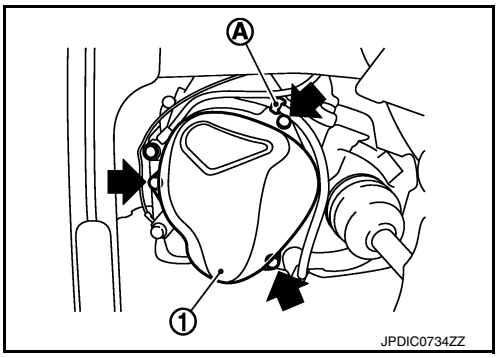
5TH MAIN GEAR ASSEMBLY

Removal and Installation

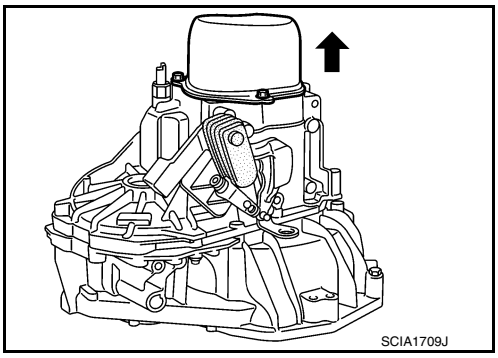
INFOID:0000000009417599

REMOVAL

1. Move the shift selector to the 3rd gear position.
2. Disconnect the shifter cable and the selector cable from shifter lever A and selector lever. Refer to TM-19, "Removal and Installation".
   CAUTION:
   Do not move shifter lever A and selector lever to disconnect each cable.
3. Drain gear oil. Refer to TM-16, "Draining".
4. Remove fender protector (LH). Refer to EXT-24, "Removal and Installation".
5. Remove the harness clamp (A) from rear housing (1).



6. Remove rear housing and O-ring.
   CAUTION:
   Remove in direction of input shaft (⬅) as shown. Rear housing gear oil channel is inserted to input shaft center hole.
7. Remove 5th main gear assembly. Refer to step 5 through 8 of “Disassembly of TRANSAXLE ASSEMBLY”. Refer to TM-29, "Disassembly".



INSTALLATION

Installation is in the reverse order of removal.

- Shift into 3rd with shifter lever to install the 5th main gear assembly, referring to Step 36 to 39 of “Assembly of TRANSAXLE ASSEMBLY” Refer to TM-35, "Assembly".
- Install O-ring and the rear housing to the transaxle case and tighten the bolts to the specified torque. Refer to TM-25, "Exploded View".
  CAUTION:
  - **Do not reuse O-ring.**
  - **Do not pinch O-ring when installing rear housing.**
- Refill gear oil. Refer to TM-16, "Refilling".

Inspection

INFOID:0000000009417600

INSPECTION AFTER INSTALLATION

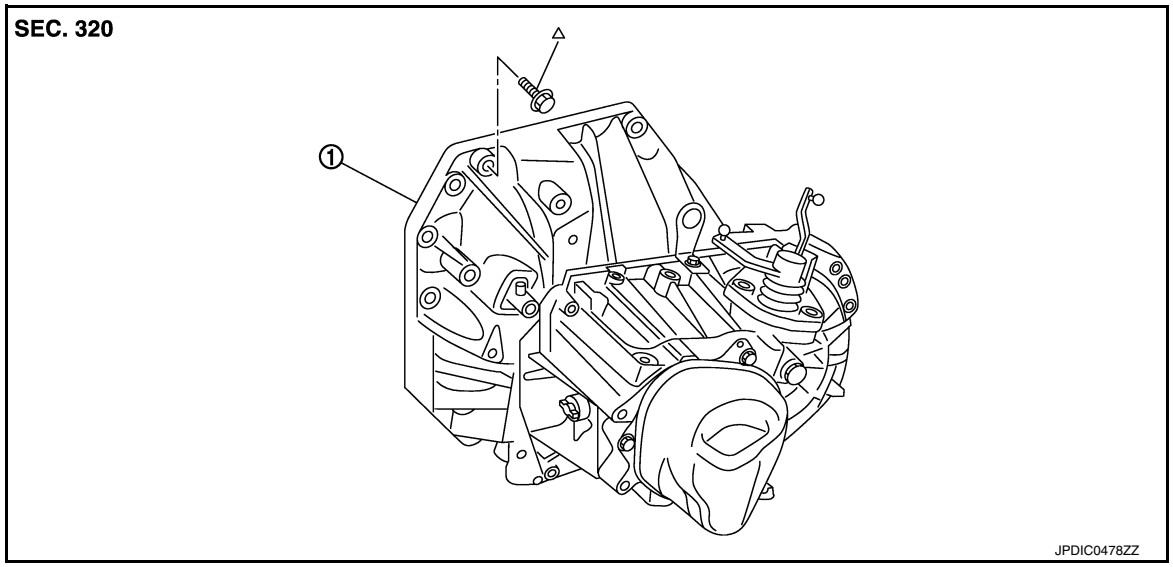
- Check the operation of the control linkage. Refer to TM-20, "Inspection".
- Check the gear oil level and for oil leaks. Refer to TM-16, "Inspection".

UNIT REMOVAL AND INSTALLATION

TRANSAXLE ASSEMBLY

Exploded View

INFOID:0000000009417601



1. Transaxle assembly

△: Refer to "INSTALLATION" in TM-23, "Removal and Installation" for the locations and tightening torque.

Removal and Installation

INFOID:0000000009417602

WARNING:
Do not remove the radiator cap when the engine is hot. Serious burns could occur from high pressure coolant escaping from the radiator. Wrap a thick cloth around the cap. Slowly turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by turning it all the way.
CAUTION:
Do not reuse CSC (Concentric Slave Cylinder). The CSC slides back to the original position every time the transaxle assembly is removed. This action may allow dust or contaminants to gather on the sliding parts and damage a seal of CSC causing clutch fluid leakage.
NOTE:
When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

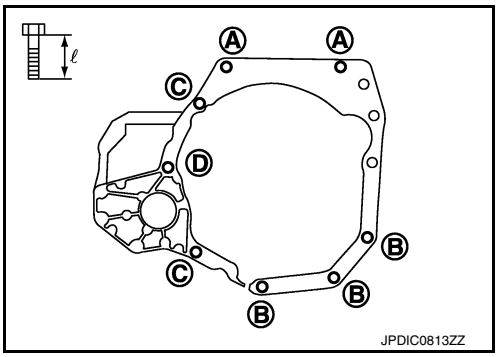
REMOVAL

1. Remove the engine and transaxle assembly. Refer to EM-86, "Removal and Installation".
2. Disconnect the reverse lamp switch harness connector.
3. Remove the bolts that fasten the transaxle assembly and engine assembly.
4. Remove transaxle assembly from the engine assembly.
5. Remove engine mounting bracket (LH). Refer to EM-85, "Exploded View".
6. Remove CSC (Concentric Slave Cylinder). Refer to CL-16, "Removal and Installation".

INSTALLATION

Installation is in the reverse order of removal.
CAUTION:
- **Secure transaxle assembly to a suitable jack.**
- **The transaxle assembly must not interfere with the wire harnesses and clutch tube.**
- **When installing transaxle assembly, do not bring input shaft into contact with clutch cover.**
- **Bolt hole is not threaded on new clutch housing. Self-tapping bolt is used to attach lock plate to clutch housing.**

- **Do not reuse self-tapping bolt.**
- Tighten transaxle assembly bolts to the specified torque. The illustration is the view from the engine.



Bolt symbol	A	B	C	D
Insertion direction	Transaxle to engine	Engine to transaxle		
Quantity	2	3	2	1
Bolt length (ℓ) mm (in)	55 (2.17)		49 (1.93)	69 (2.72)
Tightening torque N·m (kg-m, ft-lb)	48.0 (4.9, 35)			

Inspection

INFOID:0000000009417603

INSPECTION AFTER INSTALLATION

- Check the operation of the control linkage. Refer to TM-20, "Inspection".
- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-12, "Fluids and Lubricants".
- Use procedure below to check for fuel leaks.
- Turn ignition switch ON (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leaks at connection points.
- Start engine. With engine speed increased, check again for fuel leaks at connection points.
- Run engine to check for unusual noise and vibration.
  NOTE:
  If hydraulic pressure inside timing chain tensioner drops after removal and installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.
- Warm up engine thoroughly to make sure there is no leaks of fuel, exhaust gas, or any oils/fluids including engine oil and engine coolant.
- Bleed air from passages in lines and hoses, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to specified level, if necessary.
- Summary of the inspection items:

Item		Before starting engine	Engine running	After engine stopped
Engine coolant		Level	Leaks	Level
Engine oil		Level	Leaks	Level
Transmission/ transaxle fluid	CVT Models	Leaks	Level/Leaks	Leaks
	M/T Models	Level/Leaks	Leaks	Level/Leaks
Other oils and fluids*		Level	Leaks	Level
Fuel		Leaks	Leaks	Leaks
Exhaust gas		—	Leaks	—

*Power steering fluid, brake fluid, etc.

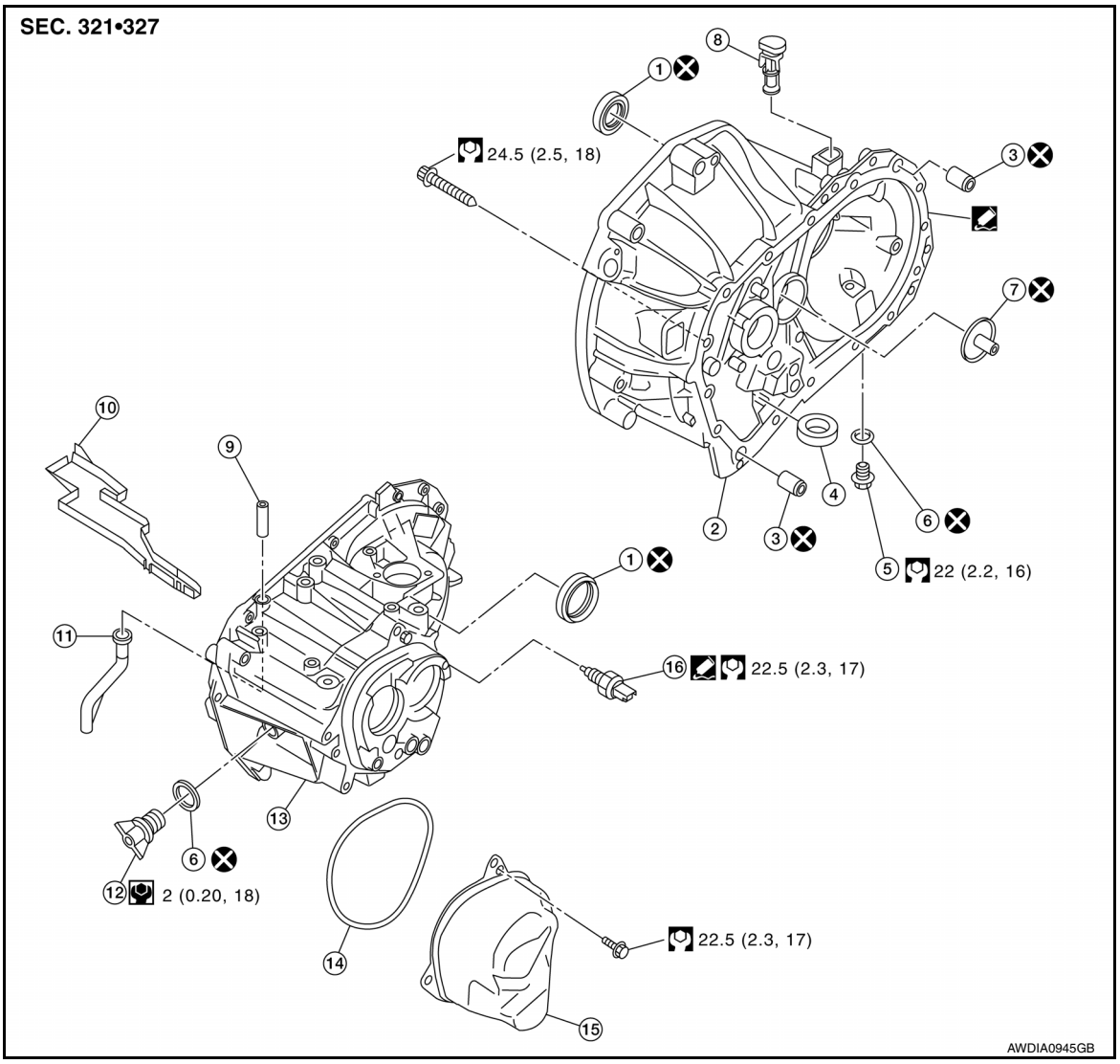
UNIT DISASSEMBLY AND ASSEMBLY

TRANSAXLE ASSEMBLY

Exploded View

INFOID:0000000009417604

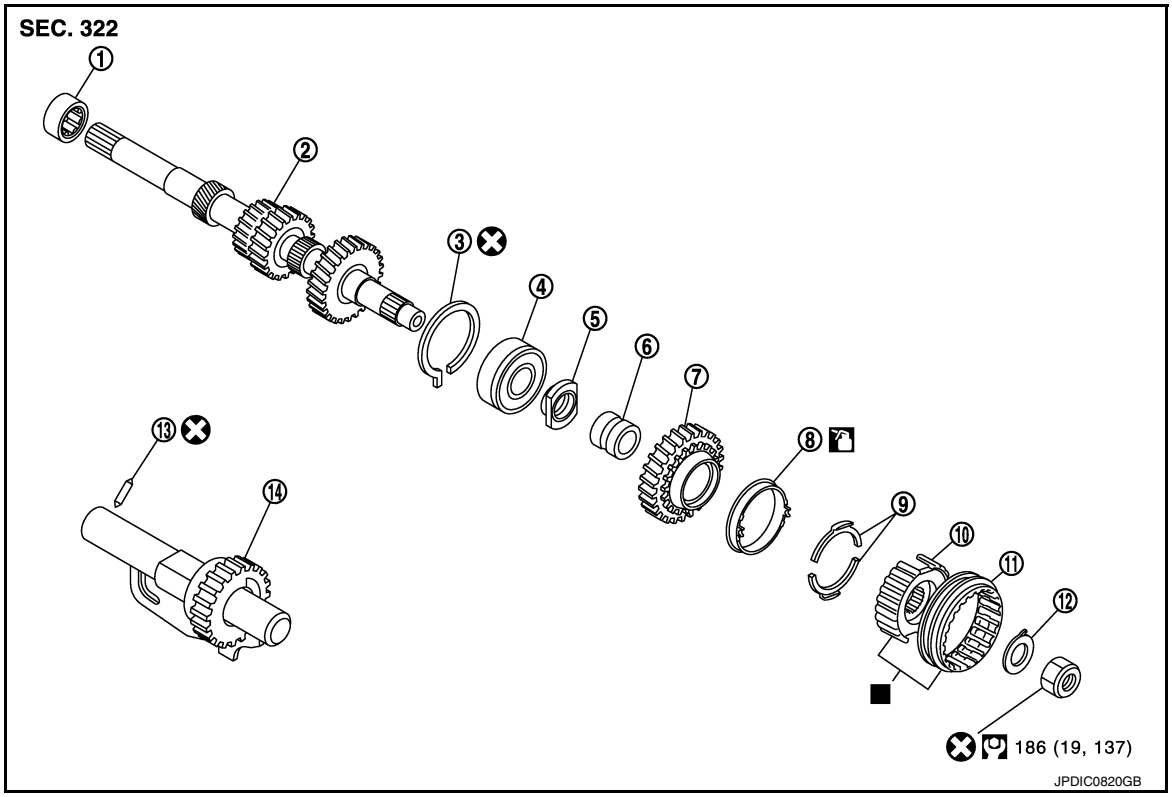
CASE AND HOUSING



1. Differential side oil seal
2. Clutch housing
3. Dowel pin
4. Magnet
5. Drain plug
6. Gasket
7. Oil channel
8. Plug
9. 2-way connector
10. Oil gutter
11. Air breather inner tube
12. Filler plug
13. Transaxle case
14. O-ring
15. Rear housing
16. Position switch

: Apply Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

INPUT SHAFT AND GEAR



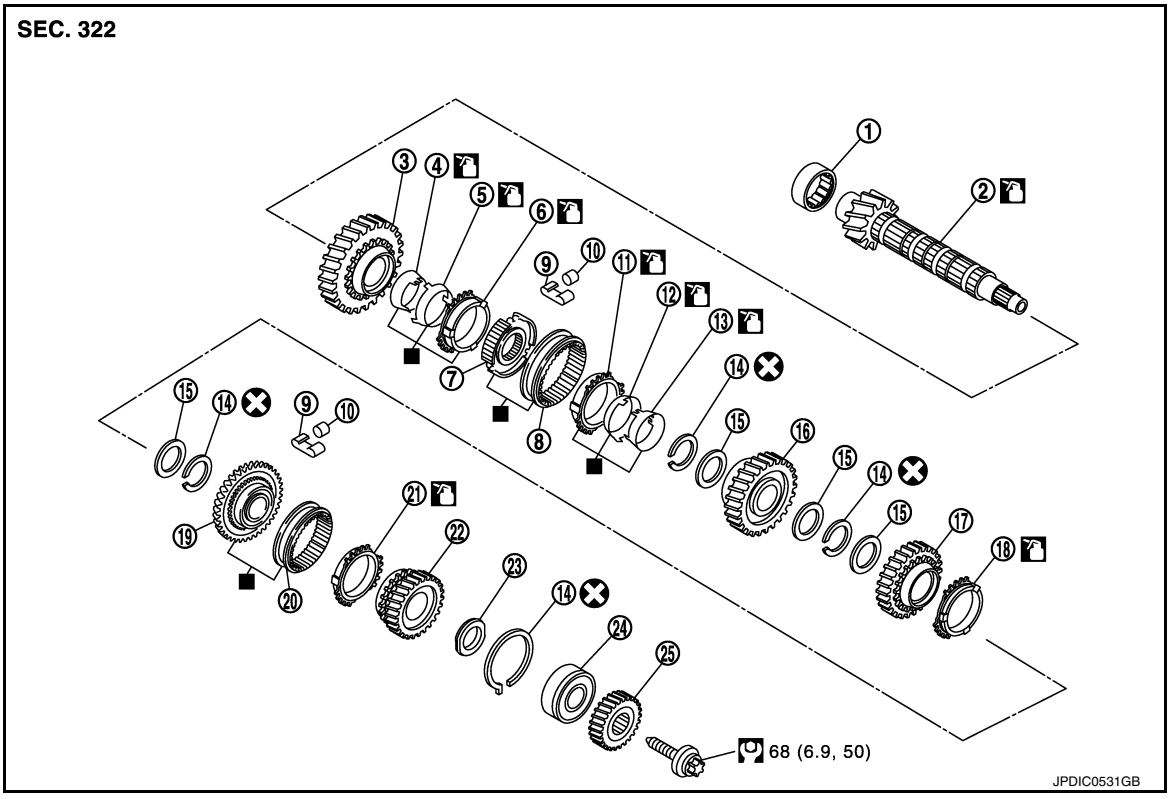
1. Input shaft front bearing
2. Input shaft
3. Snap ring
4. Input shaft rear bearing
5. Adapter plate
6. Bushing
7. 5th input gear
8. 5th-reverse baulk ring
9. Synchronizer lever
10. 5th-reverse synchronizer hub
11. 5th-reverse coupling sleeve
12. Lock washer
13. Retaining pin
14. Reverse gear

: Apply gear oil.

: Replace the parts as a set.

MAINSHAFT AND GEAR

SEC. 322

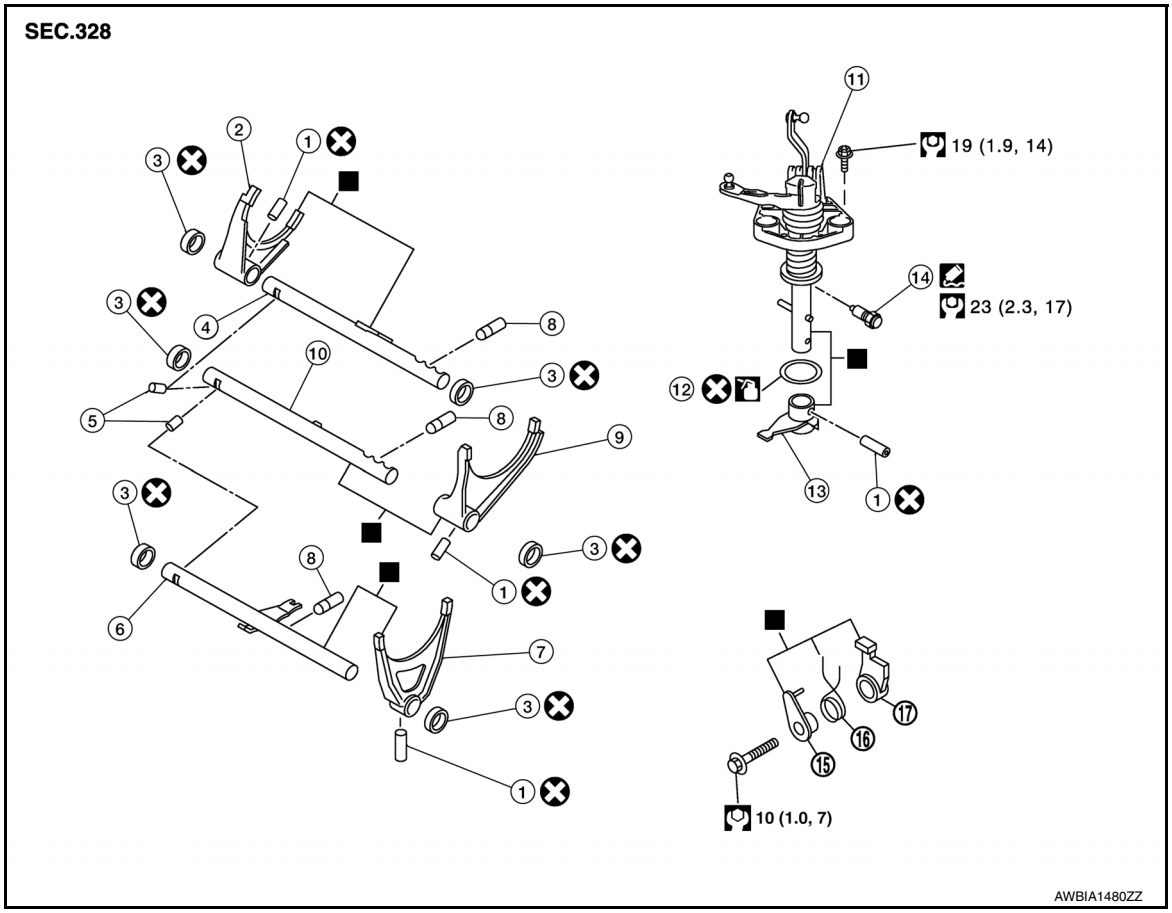


1. Mainshaft front bearing
2. Mainshaft
3. 1st main gear
4. 1st inner baulk ring
5. 1st synchronizer cone
6. 1st outer baulk ring
7. 1st-2nd synchronizer hub
8. 1st-2nd coupling sleeve
9. Spring
10. Insert key
11. 2nd outer baulk ring
12. 2nd synchronizer cone
13. 2nd inner baulk ring
14. Snap ring
15. Thrust washer
16. 2nd main gear
17. 3rd main gear
18. 3rd baulk ring
19. 3rd-4th synchronizer hub
20. 3rd-4th coupling sleeve
21. 4th baulk ring
22. 4th main gear
23. Spacer
24. Mainshaft rear bearing
25. 5th main gear

: Apply gear oil.

■: Replace the parts as a set.

SHIFT FORK AND FORK ROD



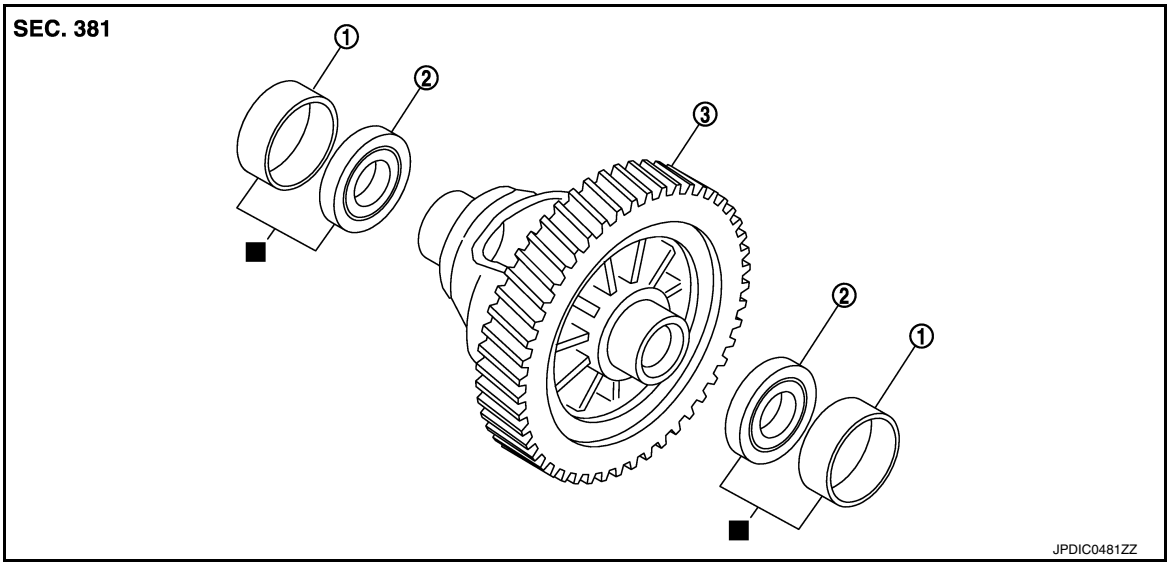
1. Retaining pin
2. 1st-2nd shift fork
3. Bushing
4. 1st-2nd fork rod
5. Lock pin
6. 5th-reverse fork rod
7. 5th-reverse shift fork
8. Check ball
9. 3rd-4th shift fork
10. 3rd-4th fork rod
11. Control shaft
12. O-ring
13. Selector
14. Check ball plug
15. Bushing
16. Spring
17. Gear catch

: Apply gear oil.

: Apply Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

: Replace the parts as a set.

FINAL DRIVE



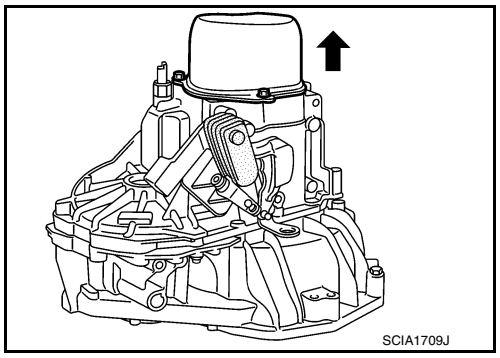
1. Differential side bearing outer race
2. Differential side bearing
3. Final drive

■: Replace the parts as a set.

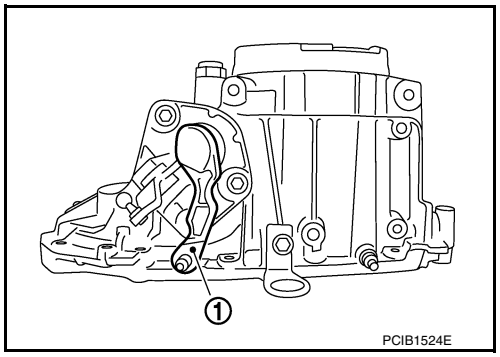
Disassembly

INFOID:0000000009417605

1. Remove drain plug and gasket from clutch housing using suitable tool, and drain gear oil.
2. Remove filler plug and gasket from transaxle case.
3. Remove rear housing and O-ring.
   CAUTION:
   Remove in direction of input shaft (⬅) as shown. Rear housing oil channel is inserted to input shaft center hole.



4. Move the shifter lever A (1) to the 3rd gear position.
   NOTE:
   - If it is not moved to the 3rd gear position, transaxle case cannot be removed from clutch housing.
   - The 3rd gear position means that shifter lever A is fully rotated clockwise and it is returned approximately 10 degrees.



5. Remove 5th-reverse shift fork (1) and 5th-reverse coupling sleeve.

a. Remove retaining pin from 5th-reverse shift fork, using a suitable tool (A).

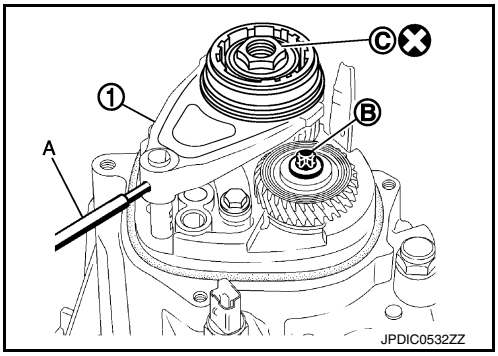
b. Press 5th-reverse shift fork, shift to 5th, and then engage it with 3rd gear.

c. Remove bolt (B).

d. Remove nut (C) and lock washer.

CAUTION:

- **Do not reuse nut.**
- **Do not use an impact wrench for removal. Gears may be damaged.**



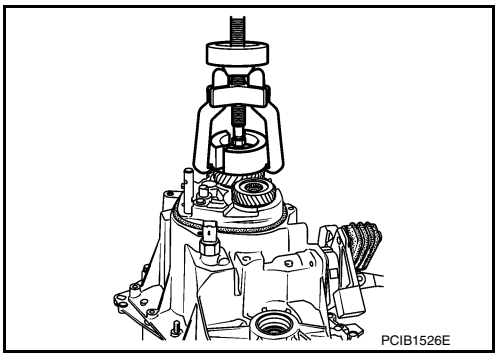
e. Remove 5th-reverse shift fork and 5th-reverse coupling sleeve from 5th-reverse synchronizer hub.

6. Remove 5th-reverse synchronizer hub from input shaft, using a suitable tool.

CAUTION:

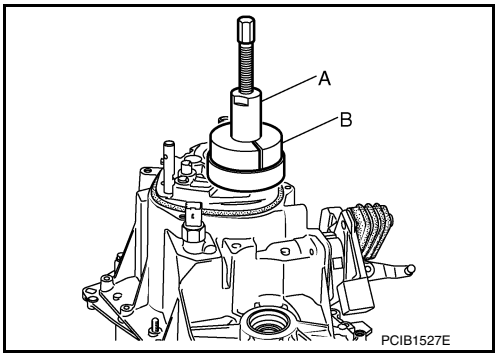
Set claw of suitable tool to the wider side of the hub when setting the suitable tool in 5th-reverse synchronizer hub.

7. Remove synchronizer levers, 5th-reverse baulk ring, 5th input gear, bushing, and adapter plate from input shaft.

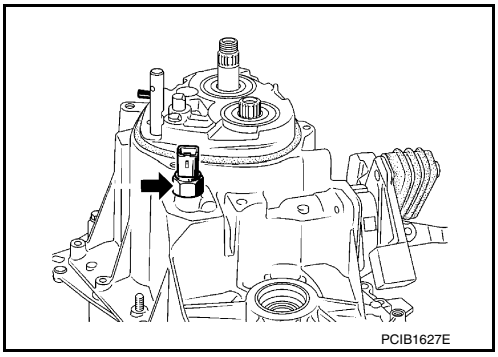


8. Remove 5th main gear from mainshaft, using Tools.

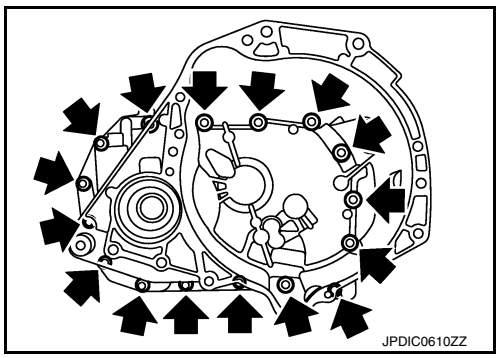
Tool number (A): KV32300QAC (—)
(B): KV32300QAD (—)



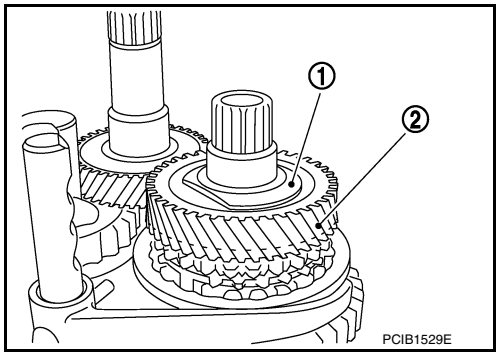
9. Remove position switch from transaxle case.



10. Remove transaxle case bolts (⬅).
11. Remove transaxle case from clutch housing.

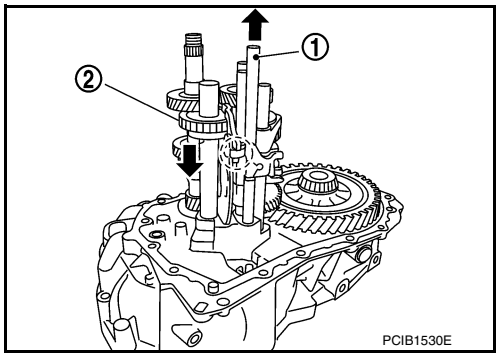


12. Remove spacer (1) and 4th main gear (2) from mainshaft.



13. Remove 5th-reverse fork rod (1).

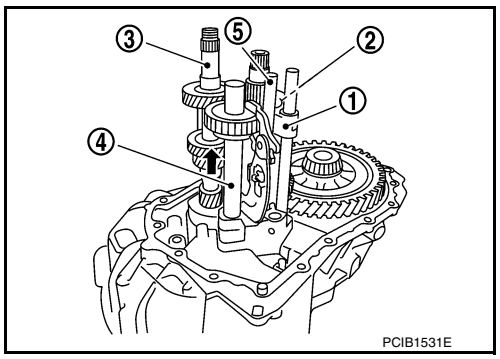
a. Pull 5th-reverse fork rod up until it contacts claw (⌒) of reverse gear (2).
b. Press gear portion of reverse gear down, and then remove 5th-reverse fork rod from clutch housing.

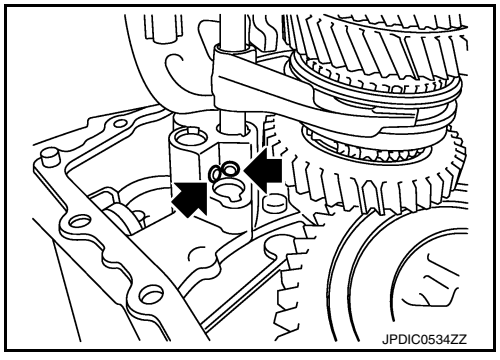


14. Remove 3rd-4th fork rod assembly (1), 3rd-4th coupling sleeve (2), and input shaft assembly (3).

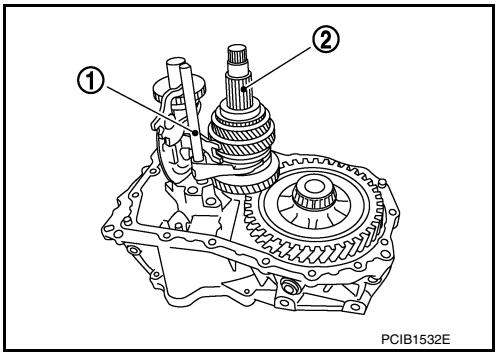
a. Remove 4th baulk ring, insert keys, and springs from mainshaft.
b. Pull gear of reverse gear (4) up.
c. Pull 1st-2nd fork rod (5) up, and then maintain the neutral position.
d. Remove 3rd-4th fork rod assembly, 3rd-4th coupling sleeve, and input shaft assembly from clutch housing at the same time.

15. Remove retaining pin from 3rd-4th shift fork, using a pin punch.
16. Remove 3rd-4th shift fork from 3rd-4th shift fork rod.
17. Remove lock pins (⬅) from clutch housing.

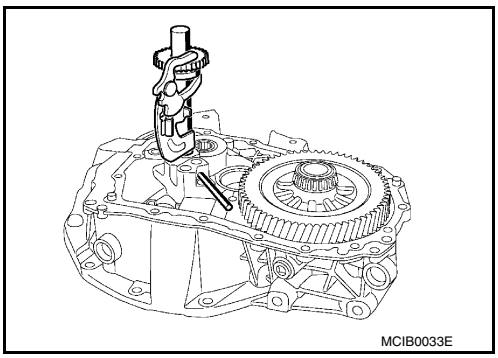




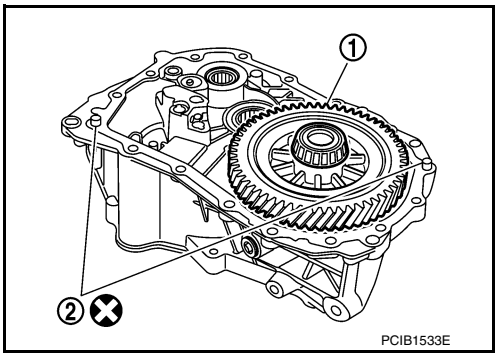
18. Remove 1st-2nd fork rod assembly (1) and mainshaft assembly (2) from clutch housing at the same time.
19. Remove retaining pin from 1st-2nd shift fork, using suitable tool.
20. Remove 1st-2nd shift fork from 1st-2nd shift fork rod.



21. Remove retaining pin from reverse gear, using suitable tool.
22. Remove reverse gear from clutch housing.



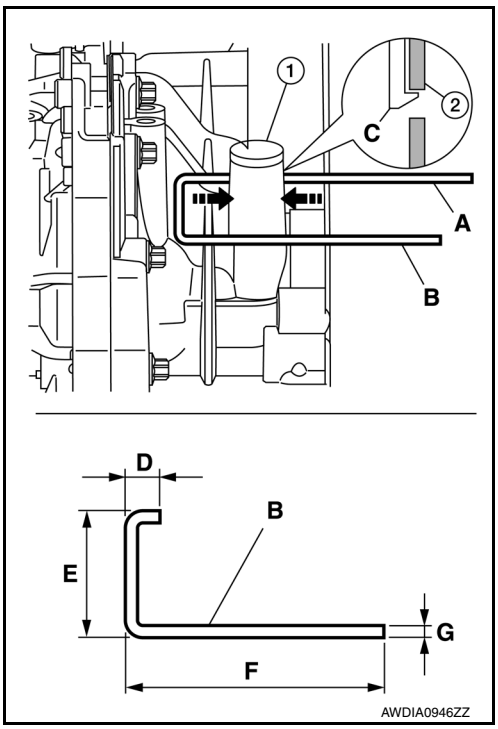
23. Remove final drive (1) from clutch housing.
24. Remove magnet and dowel pins (2) from clutch housing.



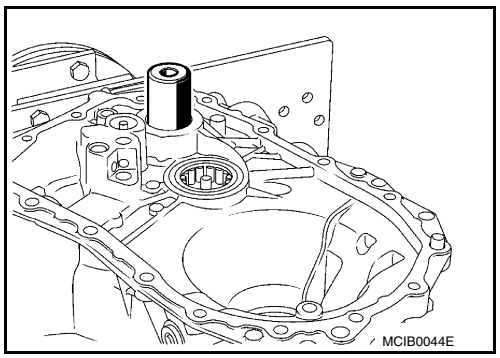
25. Remove plug (1) from clutch housing (2).
    - (C): Plug
    - (D): 15 mm (0.59 in)
    - (E): 45 mm (1.77 in)
    - (F): 95 mm (3.74 in) or more
    - (G): 4 mm (0.16 in)

a. Install suitable tool (A) and (B) to the holes of clutch housing as shown.

b. While pressing the suitable tool (A) and (B) in the direction of the arrows shown, remove plug from clutch housing.



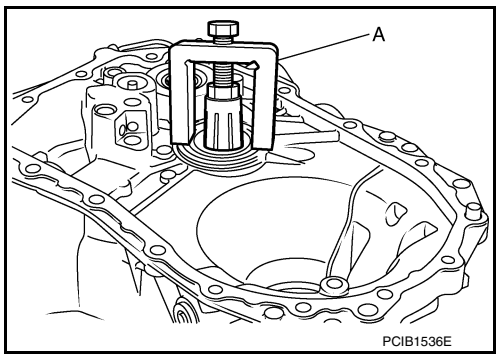
26. Remove input shaft front bearing from clutch housing, using suitable tool.



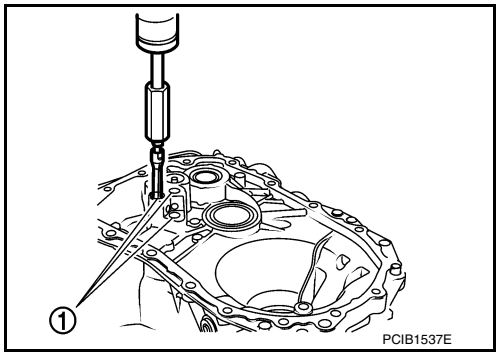
27. Cut oil channel tube at the base.
CAUTION:
Do not reuse oil channel.
NOTE:
Oil channel will be removed with the mainshaft front bearing.

28. Remove mainshaft front bearing and oil channel from clutch housing, using Tool (A).

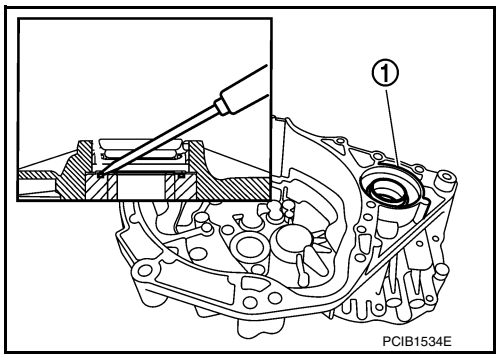
Tool number : KV111011S0 (—)



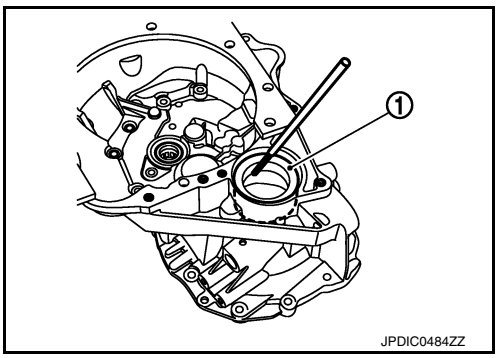
29. Remove bushings (1) from clutch housing, using suitable tool.



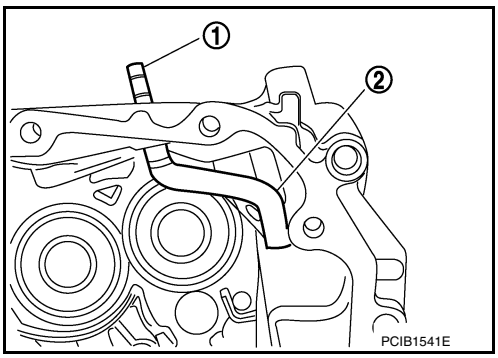
30. Remove differential side oil seals (1) from clutch housing and transaxle case, using suitable tool.
CAUTION:
Do not damage transaxle case and clutch housing.



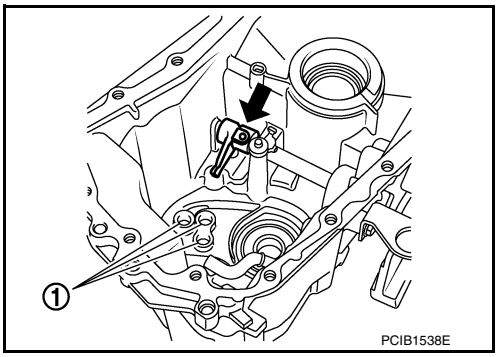
31. Remove differential side bearing outer races (1) from clutch housing and transaxle case, using suitable tool.
CAUTION:
Do not damage transaxle case and clutch housing.



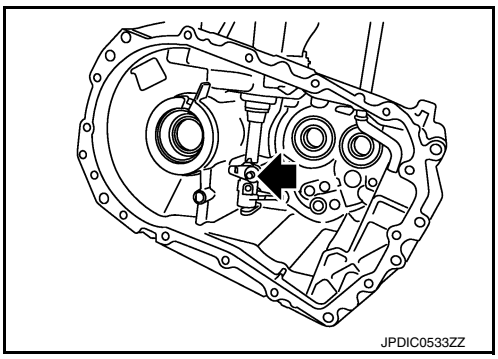
32. Pull 2-way connector (1) straight out to remove it from air breather inner tube (2).
33. Remove air breather inner tube from transaxle case.



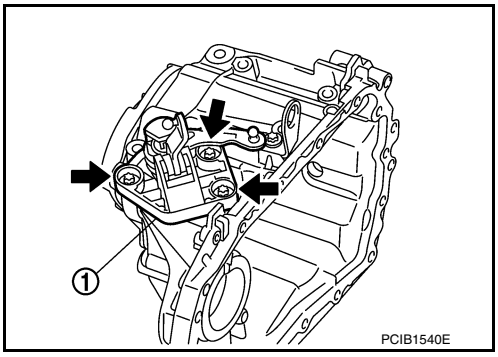
34. Remove bushings (1) from transaxle case, using suitable tool.
35. Remove retaining pin (⬅) from selector, using suitable tool.
36. Remove selector from control shaft.
37. Remove oil gutter from transaxle case.



38. Remove bolt (⬅), and then remove bushing, spring, and gear catch from transaxle case.
39. Remove check ball plug from transaxle case.



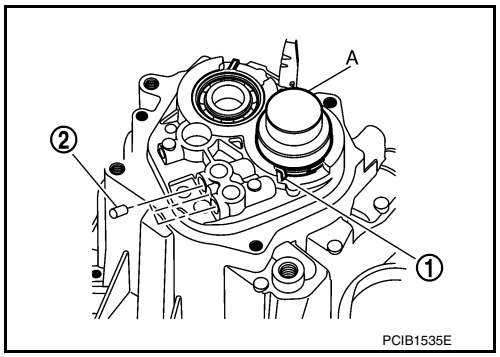
40. Remove bolts (⬅), and then remove control shaft (1) from transaxle case.
41. Remove O-ring from control shaft.



42. Expand snap rings (1) and remove input shaft rear bearing and mainshaft rear bearing from transaxle case, using Tool (A).

Tool number : ST35300000 (—)

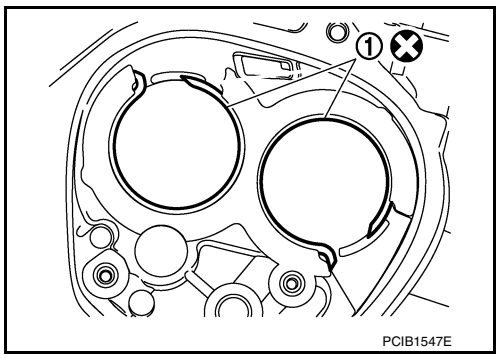
43. Remove snap rings from transaxle case.
44. Remove check balls (2) from transaxle case.



Assembly

INFOID:0000000009417606

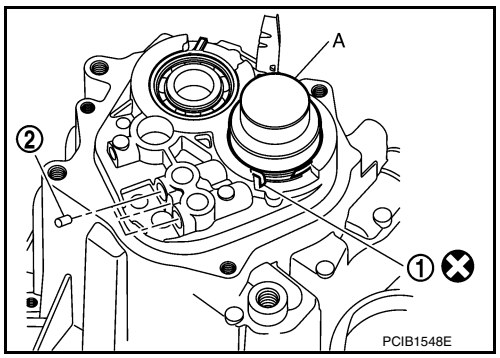
1. Install snap rings (1) along transaxle case groove so that notch mates with housing as shown.
CAUTION:
- **Do not reuse snap rings.**
- **Check snap ring installation direction.**
- **Be sure to align notch with housing.**



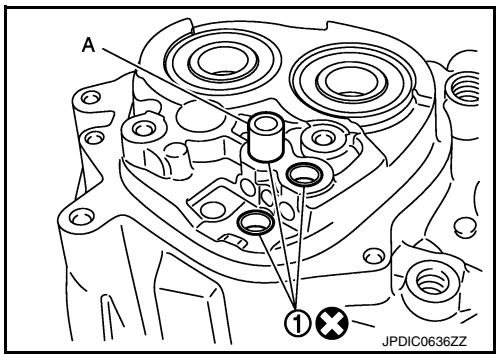
2. Expand snap rings (1) and install input shaft rear bearing and mainshaft rear bearing to transaxle case, using Tool (A).
CAUTION:
Check that snap ring is correctly installed within bearing groove.

Tool number : ST35300000 (—)

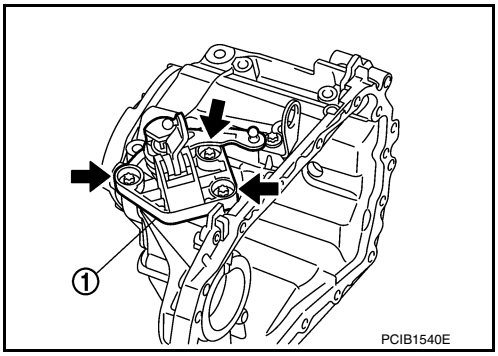
3. Install check balls (2) to transaxle case.



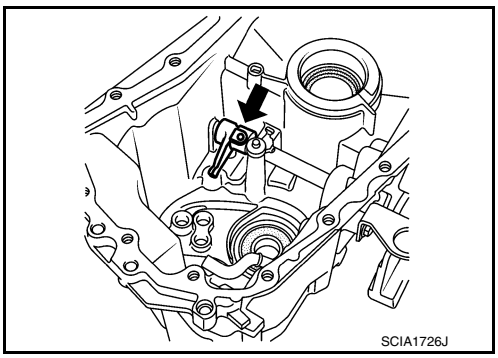
4. Install bushings (1) until they reach transaxle case, using suitable tool (A).
CAUTION:
Do not reuse bushings.
5. Apply gear oil to O-ring, and then install it to control shaft.
CAUTION:
Do not reuse O-ring.



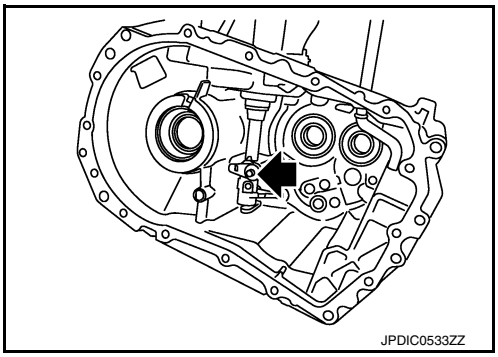
6. Install control shaft (1) to transaxle case, and tighten bolts (⬅) to the specified torque.
CAUTION:
Replace control shaft and selector as a set.



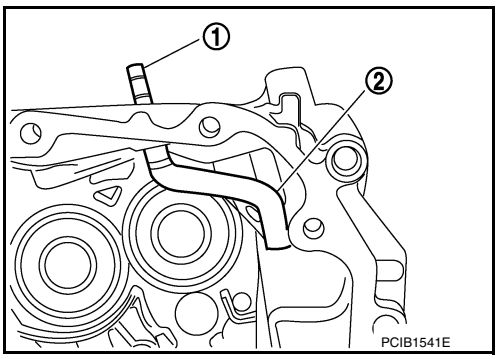
7. Install selector to control shaft, and then install retaining pin (⬅) to selector, using suitable tool.
CAUTION:
- **Be careful with the orientation of selector.**
- **Replace control shaft and selector as a set.**
- **Do not reuse retaining pin.**



8. Install gear catch, spring, and bushing to transaxle case, and then tighten bolt (⬅) to the specified torque.
CAUTION:
Replace gear catch, spring, and bushing as a set.
9. Install oil gutter to transaxle case.



10. Install air breather inner tube (2) to transaxle case.
CAUTION:
Do not damage air breather inner tube.
NOTE:
It is easier to install when air breather inner tube end is wrapped and narrowed by tape. Remove tape after installation.
11. Insert 2-way connector (1) straight, and then install it to air breather inner tube.
CAUTION:
Check air breather inner tube for twists after installing.

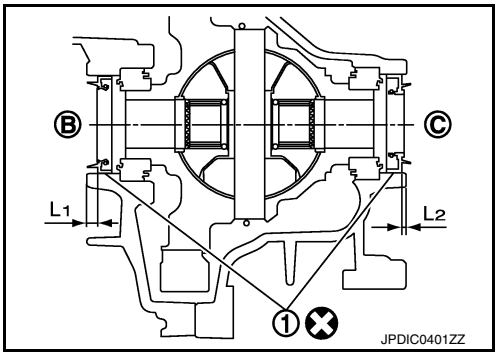


12. Install differential side oil seals (1) to clutch housing and transaxle case, using Tool.

(B) : Transaxle case side
(C) : Clutch housing side

Dimension (L_1) : 5.7 – 6.3 mm (0.224 – 0.248 in)
Dimension (L_2) : 2.4 – 3.0 mm (0.094 – 0.118 in)

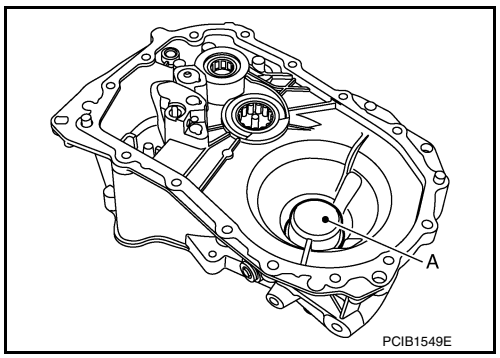
Tool number : KV32500QAA (—)



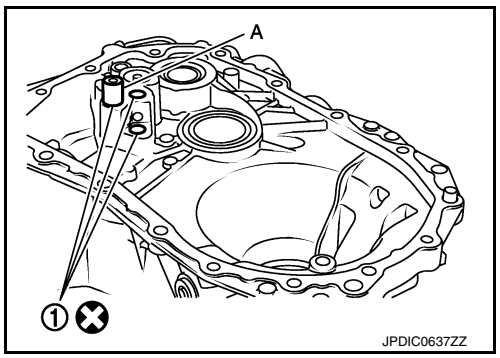
CAUTION:
- **Do not reuse differential side oil seal.**
- **Do not tilt differential side oil seal.**
- **Do not damage clutch housing and transaxle case.**

13. Install differential side bearing outer races until they reach clutch housing and transaxle case, using Tool (A).
CAUTION:
Replace differential side bearing outer race and differential side bearing as a set.

Tool number : KV32300QAE (—)

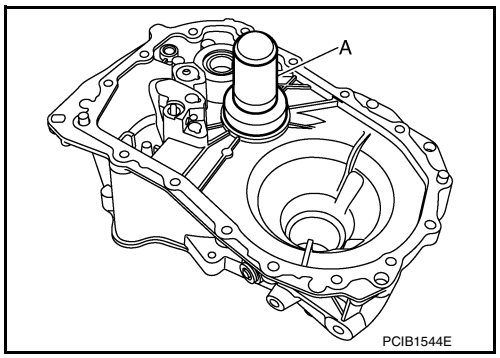


14. Install bushings (1) until they reach clutch housing, using suitable tool (A).
CAUTION:
Do not reuse bushings.
15. Install oil channel to clutch housing.
CAUTION:
Do not reuse oil channel.



16. Install mainshaft front bearing so that it becomes even with clutch housing surface, using Tool (A).

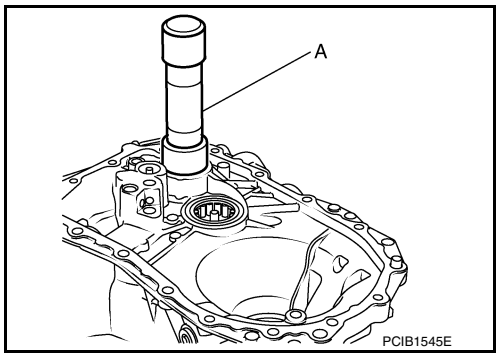
Tool number : ST33400001 (—)



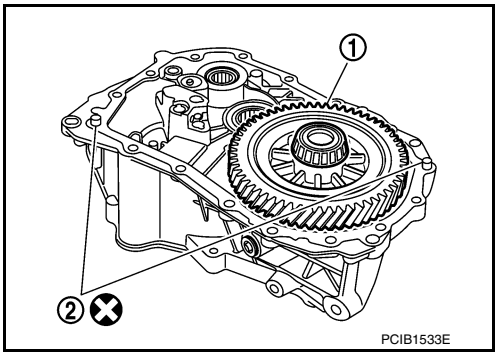
17. Install input shaft front bearing so that it becomes even with clutch housing surface, using Tool (A).

Tool number : KV40100900 (—)

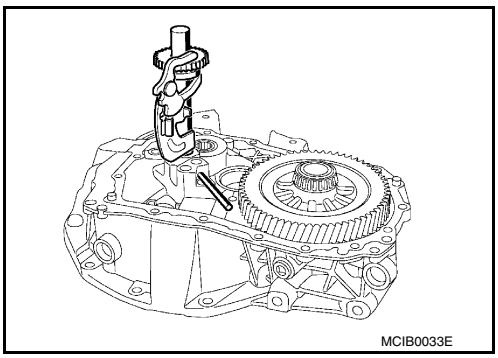
18. Install pinion gear, pinion shaft, and plug to clutch housing.



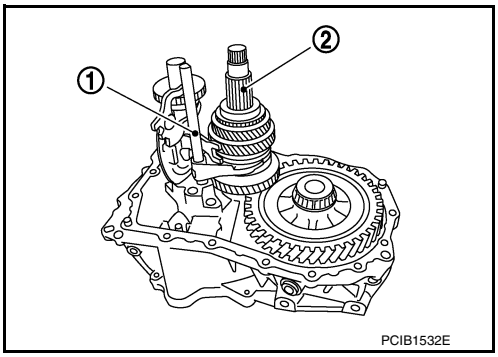
19. Install final drive (1) to clutch housing.
20. Install dowel pins (2) and magnet to clutch housing.
    CAUTION:
    Do not reuse dowel pins.



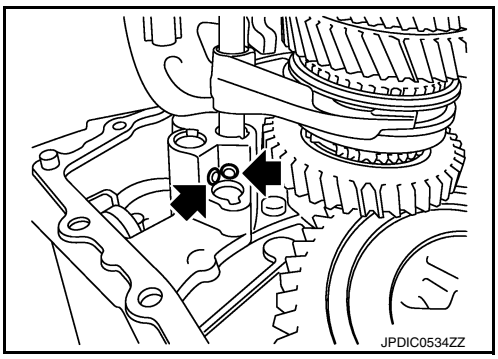
21. Install reverse gear to clutch housing, and then install retaining pin to clutch housing, using suitable tool.
    CAUTION:
    Do not reuse retaining pin.
22. Install 1st-2nd shift fork to 1st-2nd fork rod, and then install retaining pin to 1st-2nd shift fork.
    CAUTION:
    - **Do not reuse retaining pin.**
    - **Replace 1st-2nd fork rod and 1st-2nd shift fork as a set.**



23. Set 1st-2nd fork rod assembly (1) onto mainshaft assembly (2), and then install them to clutch housing.



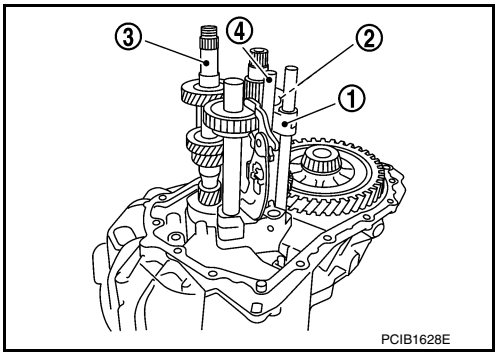
24. Install lock pins (⬅) to clutch housing.
25. Install 3rd-4th shift fork to 3rd-4th fork rod, and then install retaining pin to 3rd-4th shift fork.
    CAUTION:
    - **Do not reuse retaining pin.**
    - **Replace 3rd-4th fork rod and 3rd-4th shift fork as a set.**



26. Install 3rd-4th fork rod assembly (1), 3rd-4th coupling sleeve (2), and input shaft assembly (3) to clutch housing.

a. Pull 1st-2nd fork rod (4) up, and then maintain the neutral position.

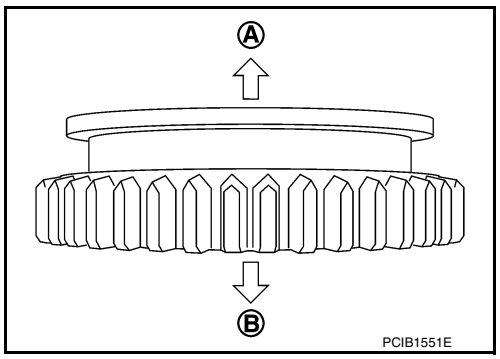
b. Set 3rd-4th fork rod assembly onto 3rd-4th coupling sleeve, and then install them together with input shaft assembly to clutch housing.
    CAUTION:
    - **Set lock pin (3rd-4th fork rod side) onto 1st-2nd fork rod groove and then install 3rd-4th fork rod assembly.**



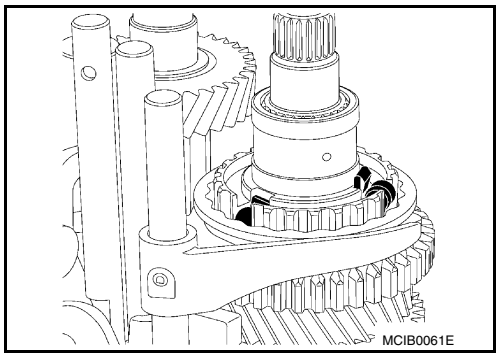
- **Be careful with the orientation of 3rd-4th coupling sleeve.**

  (A) : 4th main gear side
  (B) : 3rd main gear side

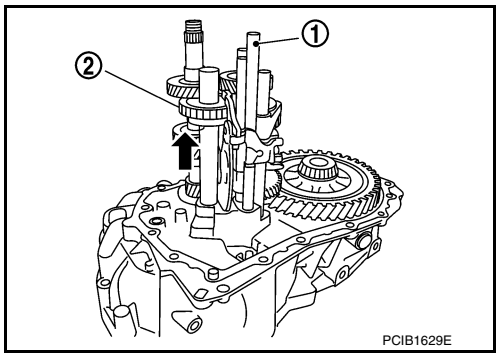
- **Install 3rd input gear of input shaft assembly so that it is set under reverse main gear of 3rd-4th coupling sleeve.**
- **Replace 3rd-4th coupling sleeve and 3rd-4th synchronizer hub as a set.**



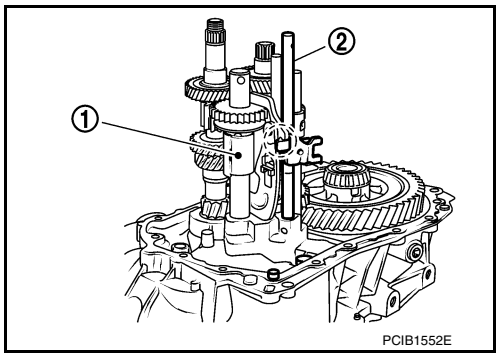
c. Install springs and insert keys to 3rd-4th synchronizer hub.
d. Apply gear oil to 4th baulk ring.
e. Install 4th baulk ring.



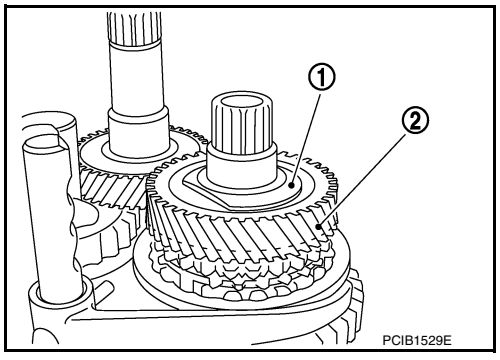
27. Install 5th-reverse fork rod (1) to clutch housing.
CAUTION:
Replace 5th-reverse fork rod and 5th-reverse shift fork as a set.
a. Pull gear of reverse gear (2) up.
b. Temporarily install 5th-reverse fork rod to clutch housing.



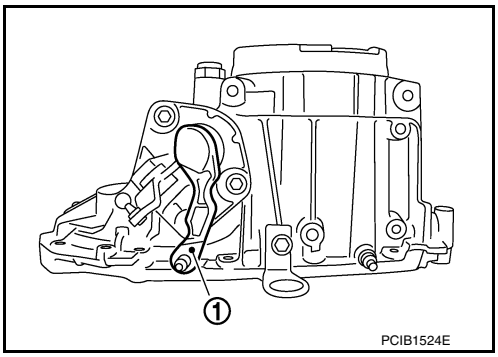
c. Press gear of reverse gear (1) down and then install 5th-reverse fork rod (2) to clutch housing.
CAUTION:
Set levers of 5th-reverse fork rod so as to align with reverse gear groove (◌).



28. Install 4th main gear (2) and spacer (1) to mainshaft.
CAUTION:
Install spacer so that spacer protrusion faces rear side of transaxle.
29. Press 3rd-4th shift fork down and then shift 3rd-4th coupling sleeve to 3rd gear side.



30. Move the shifter lever A (1) to the 3rd gear position.
NOTE:
- If it is not moved to the 3rd gear position, transaxle case cannot be installed to clutch housing.
- The 3rd gear position means that shifter lever A is fully rotated clockwise and it is returned approximately 10 degrees.

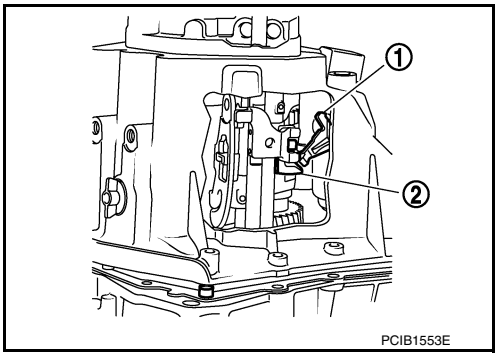


31. Apply recommended sealant to transaxle case mating surface of clutch housing.
CAUTION:
- **Use Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".**
- **Do not allow old Silicone RTV, moisture, oil, or foreign matter to remain on mating surface.**
- **Check that mating surface is not damaged.**
- **Apply a continuous bead of Silicone RTV to the mating surface.**

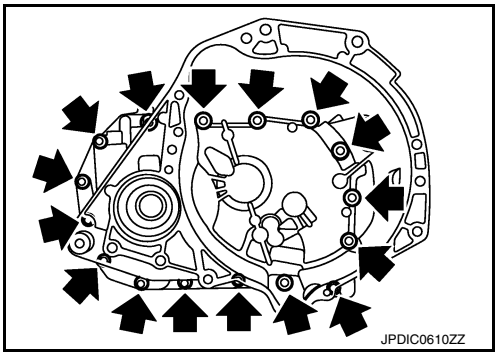
32. Install transaxle case to clutch housing. If it is difficult to install, slightly rotate shifter lever A counterclockwise, and then install.

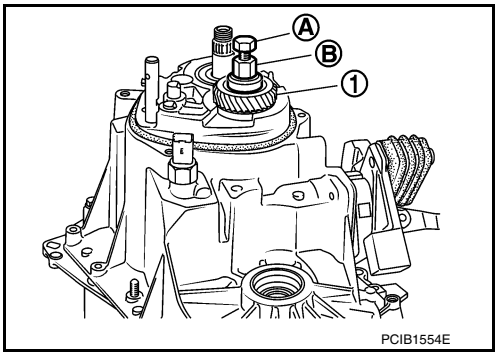
(1) : Selector
(2) : Shift fork

CAUTION:
- **Do not damage Silicone RTV bead with transaxle case or other objects during installation.**
- **Be careful to align the lever of 5th-reverse fork rod with reverse gear groove.**



33. Rotate input shaft so that bearing and shaft fit each other, and then tighten transaxle bolts (⬅) to the specified torque.
34. Apply recommended sealant to position switch thread and check ball plug thread. Install to transaxle case and tighten to specified torque.
CAUTION:
- **Use Genuine Silicone RTV or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".**
- **Do not allow old Silicone RTV, moisture, oil, or foreign matter to remain on thread.**
35. Apply gear oil to mainshaft spline.
36. Install 5th main gear (1) to mainshaft, using a suitable bolt (A) [M10 x 1.0] and a suitable nut (B).

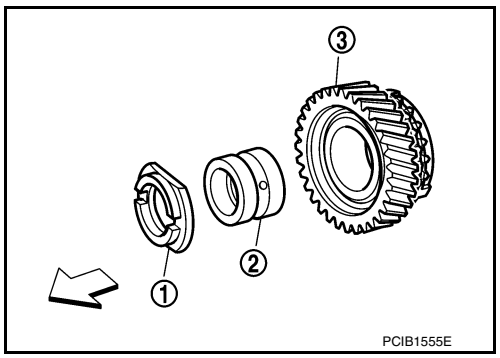




37. Install adapter plate (1), bushing (2), and 5th input gear (3) to input shaft.

CAUTION:
Be careful with the orientation of adapter plate.

⇦ : Transaxle case side



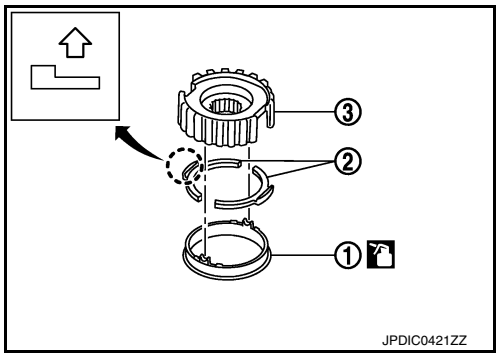
38. Install 5th-reverse synchronizer hub, 5th-reverse coupling sleeve, and 5th-reverse shift fork.

a. Apply gear oil to 5th-reverse baulk ring.

b. Install 5th-reverse baulk ring (1) to 5th input gear.

⇦ : 5th-reverse synchronizer hub side

CAUTION:
Be careful with the orientation of 5th-reverse baulk ring.



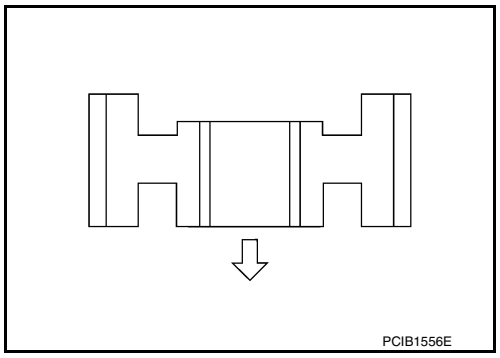
c. Install synchronizer levers (2) to 5th-reverse synchronizer hub (3).

CAUTION:
- **Replace 5th-reverse synchronizer hub and 5th-reverse coupling sleeve as a set.**
- **Be careful with the orientation of synchronizer lever.**

d. Install 5th-reverse synchronizer hub assembly and lock washer to input shaft.

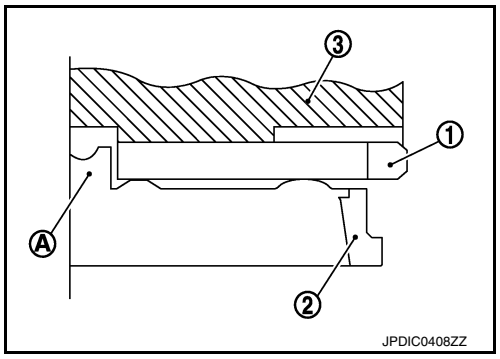
CAUTION:
- **Be careful with the orientation of 5th-reverse synchronizer hub.**

⇦ : 5th input gear side



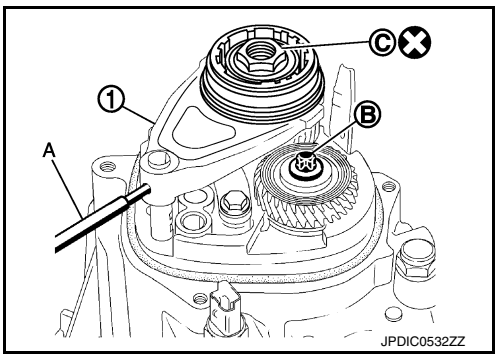
- **Do not allow synchronizer lever (1) to overlap 5th-reverse baulk ring protrusion (A).**

(2) : 5th-reverse baulk ring
(3) : 5th-reverse synchronizer hub



e. Set 5th-reverse shift fork (1) to 5th-reverse coupling sleeve, and then install them to 5th-reverse fork rod and input shaft.
CAUTION:
Do not reuse nut.

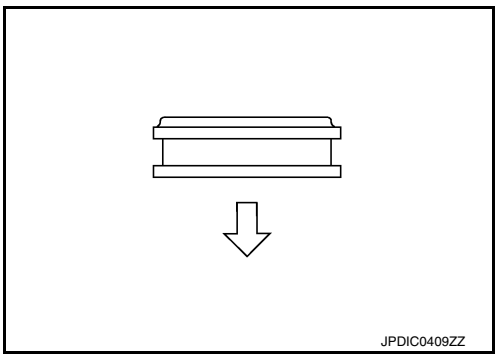
(A) : Suitable tool
(B) : Bolt
(C) : Nut



CAUTION:
- **Be careful with the orientation of 5th-reverse coupling sleeve.**

⇦ : 5th input gear side

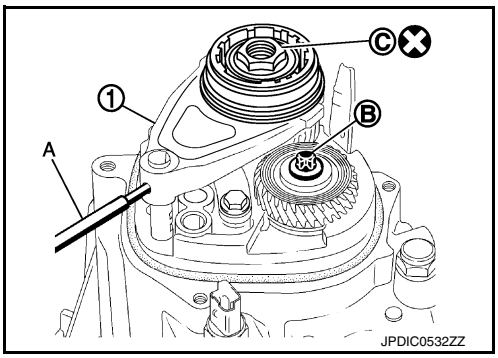
- **Replace 5th-reverse synchronizer hub and 5th-reverse coupling sleeve as a set.**
- **Replace 5th-reverse shift fork and 5th-reverse fork rod as a set.**

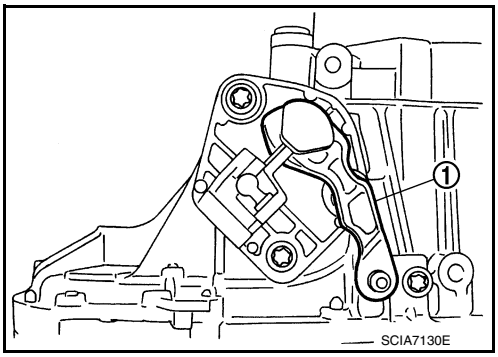


f. Check that the shifter lever A is in the 3rd position. Press 5th-reverse shift fork (1) and move shifter lever A to 5th gear.

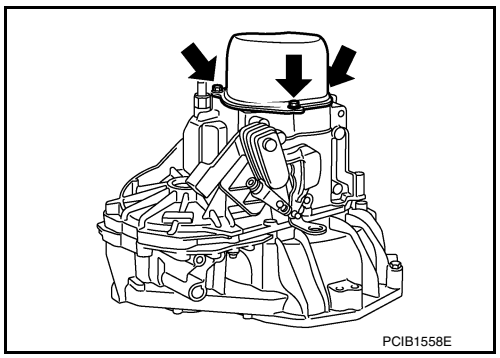
(A) : Suitable tool

g. Tighten bolt (B) to the specified torque.
h. Tighten nut (C) to the specified torque.
CAUTION:
Do not reuse nut.
i. Install retaining pin to 5th-reverse shift fork, using suitable tool.
CAUTION:
Do not reuse retaining pin.
39. Move shifter lever A (1) to the neutral position.
40. Install O-ring to rear housing.
CAUTION:
Do not reuse O-ring.





41. Install rear housing to transaxle case, and tighten bolts (⬅) to the specified torque.
CAUTION:
- **Do not reuse O-ring.**
- **Do not pinch O-ring when installing rear housing.**


PCIB1558E

42. Install drain plug.

a. Install gasket to drain plug.
CAUTION:
Do not reuse gasket.

b. Install drain plug to clutch housing, using suitable tool.

c. Tighten drain plug to the specified torque.

43. Install filler plug.

a. Install gasket to filler plug, and then install filler plug to transaxle case.
CAUTION:
Do not reuse gasket.

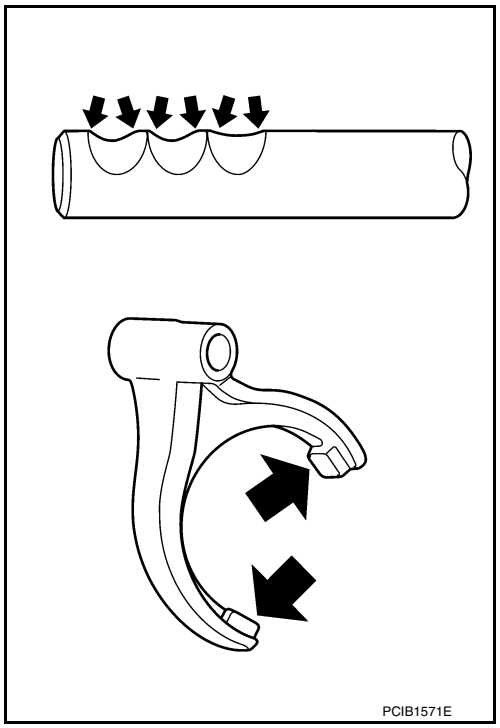
b. Tighten filler plug to the specified torque.
CAUTION:
Fill with gear oil before tightening filler plug to the specified torque.

Inspection

INFOID:0000000009417607

INSPECTION AFTER DISASSEMBLY

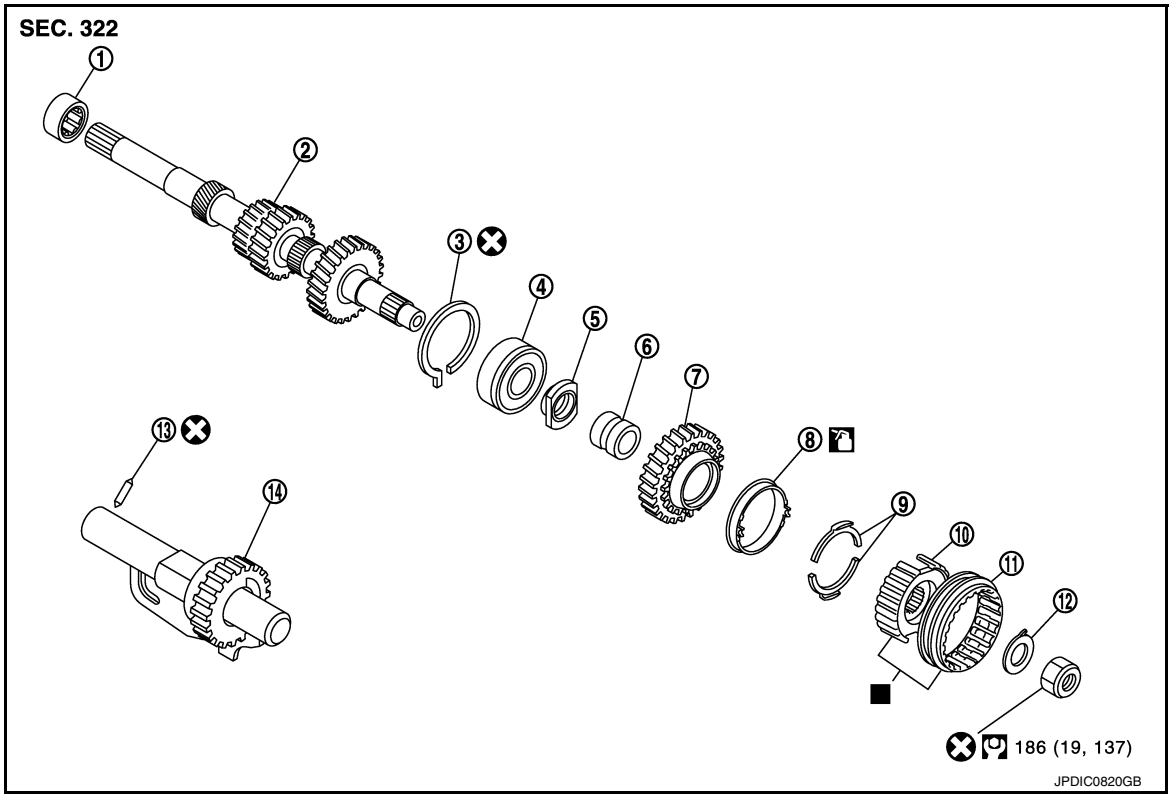
Check contact surface and sliding surface of fork rod and shift fork for excessive wear, uneven wear, and damage. Replace if necessary.


PCIB1571E

INPUT SHAFT AND GEAR

Exploded View

INFOID:0000000009417608



1. Input shaft front bearing
2. Input shaft
3. Snap ring
4. Input shaft rear bearing
5. Adapter plate
6. Bushing
7. 5th input gear
8. 5th-reverse baulk ring
9. Synchronizer lever
10. 5th-reverse synchronizer hub
11. 5th-reverse coupling sleeve
12. Lock washer
13. Retaining pin
14. Reverse gear

: Apply gear oil.

: Replace the parts as a set.

Disassembly

INFOID:0000000009417609

Refer to TM-29, "Disassembly" for disassembly procedure.

Assembly

INFOID:0000000009417610

Refer to TM-35, "Assembly" for assembly procedure.

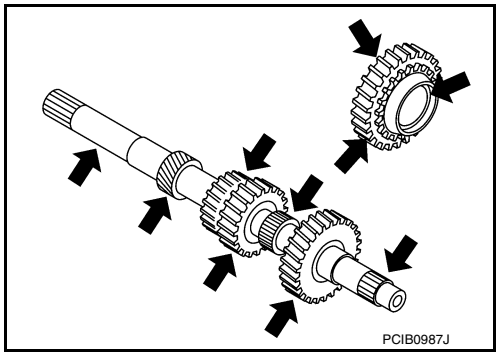
Inspection

INFOID:0000000009417611

INSPECTION AFTER DISASSEMBLY

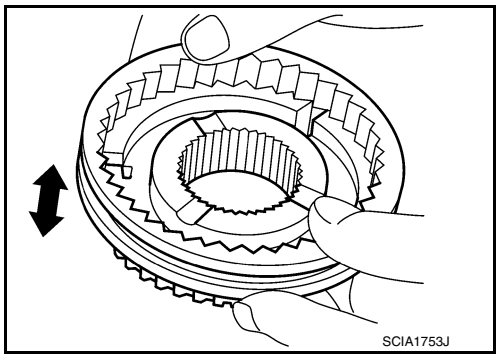
Input Shaft and Gear

Check the following items and replace if necessary.
- Damage, peeling, uneven wear, and distortion of shaft.
- Excessive wear, damage, and peeling of gear.

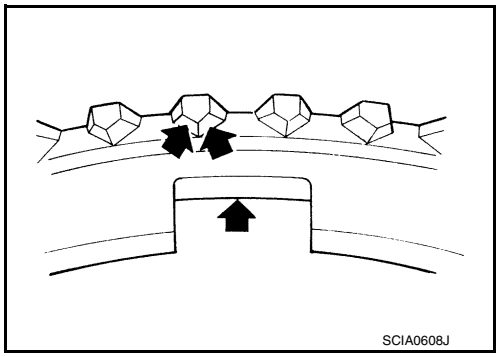

PCIB0987J

Synchronizer

Check for the following and replace if necessary.
- Contact surface breakage, damage, and unusual wear of coupling sleeve, synchronizer hub, and synchronizer lever.
- Coupling sleeve and synchronizer hub move smoothly.

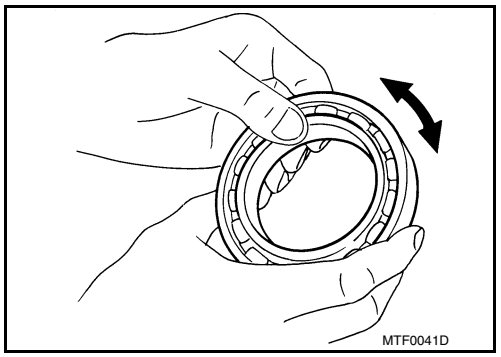

SCIA1753J

- Breakage, damage, and excessive wear of baulk ring cam surface and synchronizer lever contact surface.


SCIA0608J

Bearing

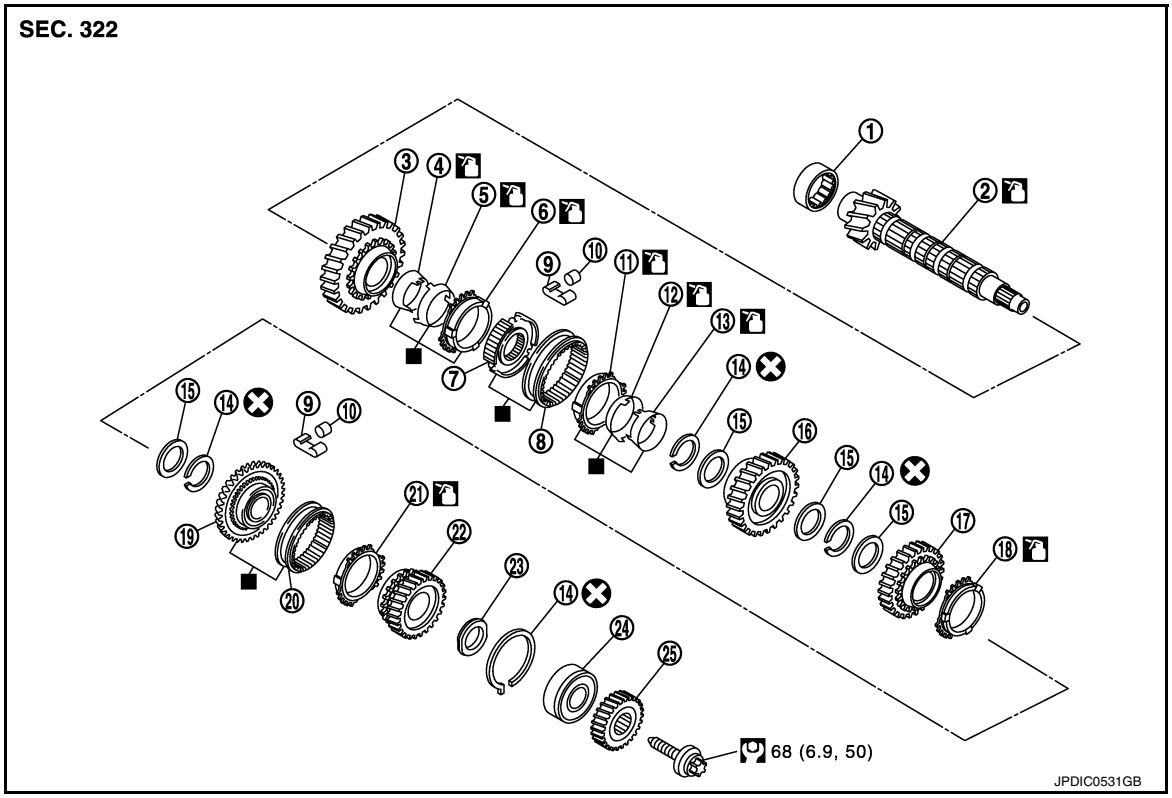
Check bearing for damage and rough rotation. Replace if necessary.


MTF0041D

MAINSHAFT AND GEAR

Exploded View

INFOID:0000000009417612



1. Mainshaft front bearing
2. Mainshaft
3. 1st main gear
4. 1st inner baulk ring
5. 1st synchronizer cone
6. 1st outer baulk ring
7. 1st-2nd synchronizer hub
8. 1st-2nd coupling sleeve
9. Spring
10. Insert key
11. 2nd outer baulk ring
12. 2nd synchronizer cone
13. 2nd inner baulk ring
14. Snap ring
15. Thrust washer
16. 2nd main gear
17. 3rd main gear
18. 3rd baulk ring
19. 3rd-4th synchronizer hub
20. 3rd-4th coupling sleeve
21. 4th baulk ring
22. 4th main gear
23. Spacer
24. Mainshaft rear bearing
25. 5th main gear

: Apply gear oil.

: Replace the parts as a set.

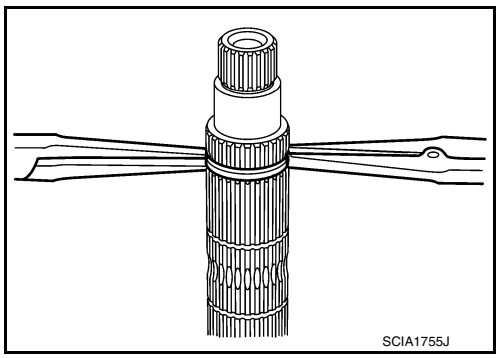
Disassembly

INFOID:0000000009417613

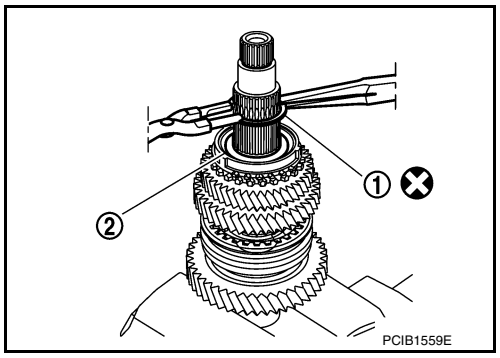
CAUTION:

- **Secure mainshaft in a vise using blocks of wood to prevent damage, and then remove gears and snap rings.**

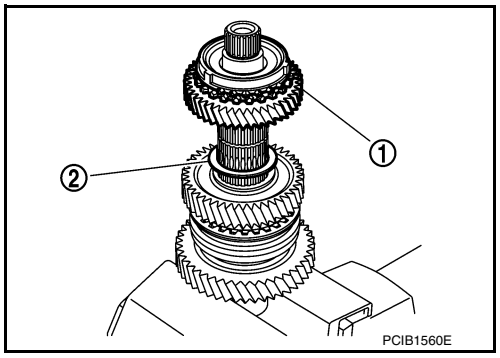
- **For removal of snap ring, set snap ring pliers and flat pliers at both sides of snap ring. While expanding snap ring with snap ring pliers, remove snap ring with flat pliers.**
- **Mark gear component direction for assembly without damaging component contact locations.**



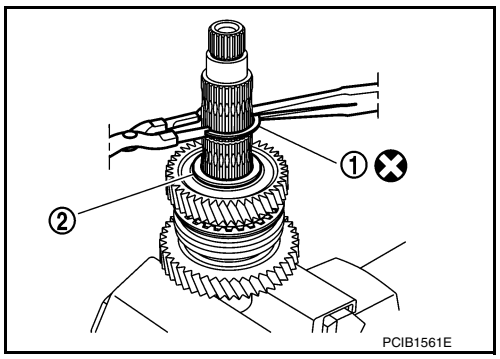
1. Remove 3rd-4th synchronizer hub and 3rd baulk ring.
2. Remove snap ring (1) and thrust washer (2).
   CAUTION:
   Do not reuse snap ring.



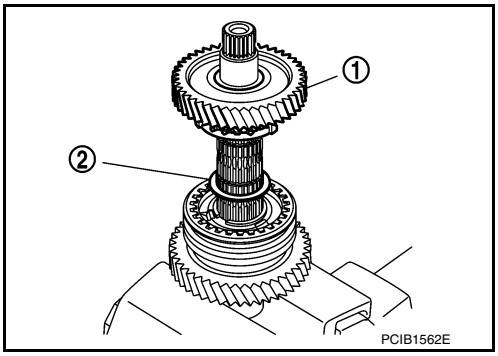
3. Remove 3rd main gear (1) and thrust washer (2).



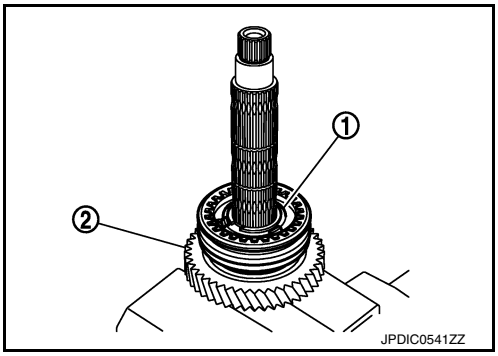
4. Remove snap ring (1) and thrust washer (2).
   CAUTION:
   Do not reuse snap ring.



5. Remove 2nd main gear (1) and thrust washer (2).



6. Remove snap ring (1), and then remove 2nd inner baulk ring, 2nd synchronizer cone, and 2nd outer baulk ring.
7. Remove 1st-2nd coupling sleeve, insert keys, springs, and 1st-2nd synchronizer hub.
8. Remove 1st outer baulk ring, 1st synchronizer cone, 1st inner baulk ring, and 1st main gear (2).



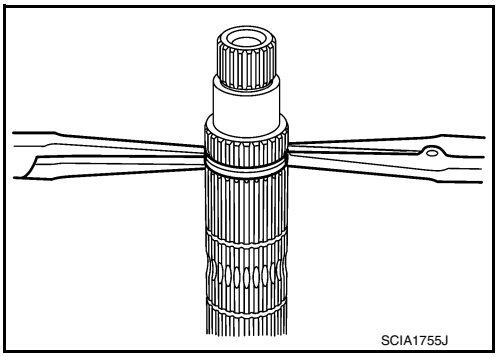
Assembly

INFOID:0000000009417614

Assembly is in the reverse order of disassembly.

CAUTION:

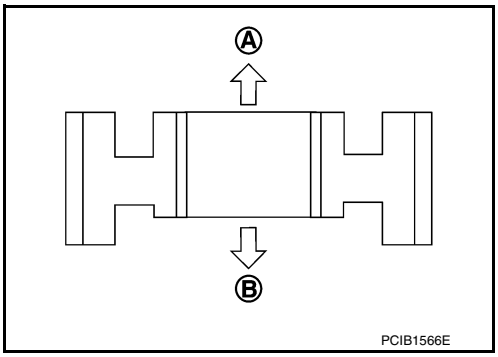
- **Do not reuse snap ring.**
- **For installation of snap ring, set snap ring pliers and flat pliers at both sides of snap ring. While expanding snap ring with snap ring pliers, remove snap ring with flat pliers.**
- **Check that snap ring is securely installed to the groove.**
- **Apply gear oil to 1st outer baulk ring, 1st synchronizer cone, 1st inner baulk ring, 2nd outer baulk ring, 2nd synchronizer cone, 2nd inner baulk ring, and 3rd baulk ring.**
- **Replace 1st outer baulk ring, 1st synchronizer cone, and 1st inner baulk ring as a set.**
- **Replace 2nd outer baulk ring, 2nd synchronizer cone, and 2nd inner baulk ring as a set.**



- **Be careful with the orientation of 1st-2nd synchronizer hub.**

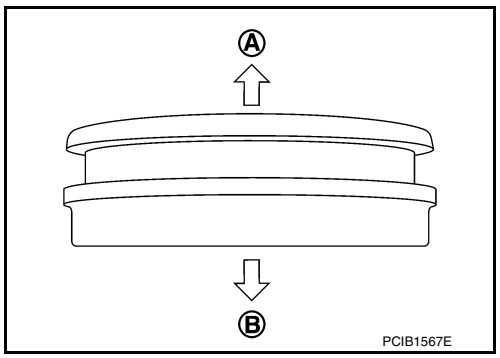
  (A) : 1st main gear side
  (B) : 2nd main gear side

- **Replace 1st-2nd synchronizer hub and 1st-2nd coupling sleeve as a set.**



- **Be careful with the orientation of 1st-2nd coupling sleeve.**

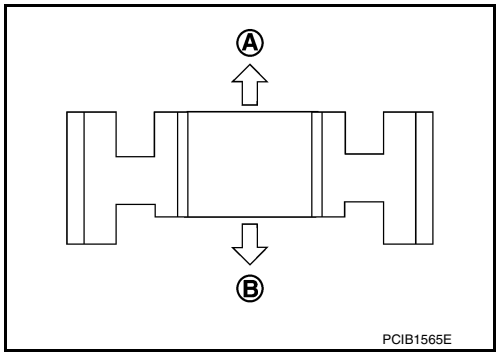
  (A) : 2nd main gear side
  (B) : 1st main gear side



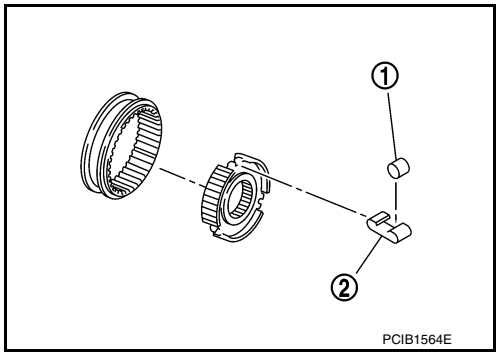
- **Be careful with the orientation of 3rd-4th synchronizer hub.**

  (A) : 4th main gear side
  (B) : 3rd main gear side

- **Replace 3rd-4th synchronizer hub and 3rd-4th coupling sleeve as a set.**



- **Be careful with the orientation of insert key (1) and spring (2).**



Inspection

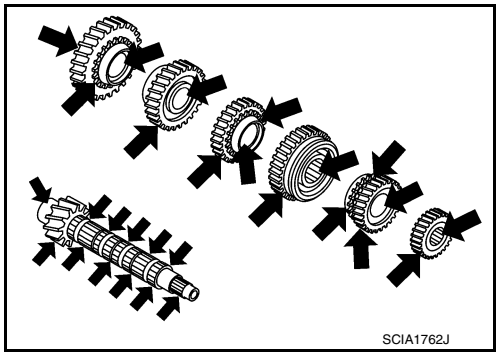
INFOID:0000000009417615

INSPECTION AFTER DISASSEMBLY

Mainshaft and Gear

Check the following items and replace if necessary.

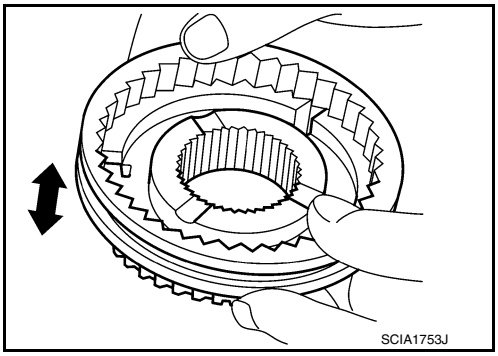
- Damage, peeling, uneven wear, and distortion of shaft.
- Excessive wear, damage, and peeling of gear.



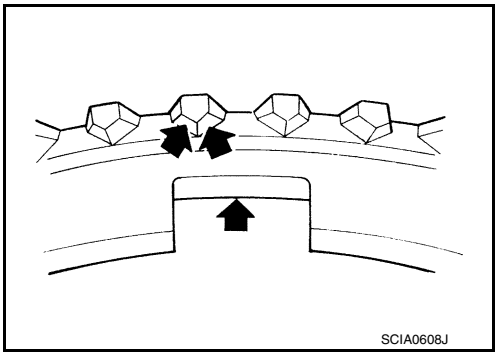
Synchronizer

Check the following items and replace if necessary.

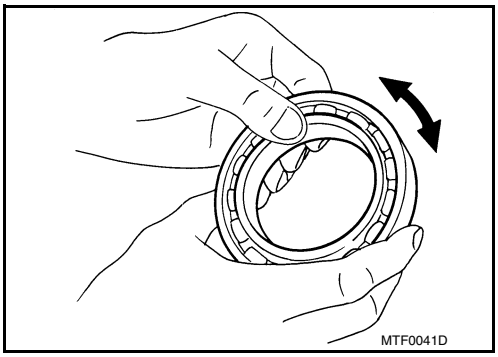
- Contact surface breakage, damage, and unusual wear of coupling sleeve, synchronizer hub, insert key, and spring.
- Coupling sleeve and synchronizer hub move smoothly.


SCIA1753J

- Breakage, damage, and excessive wear of baulk ring cam surface and insert contact surface.


SCIA0608J

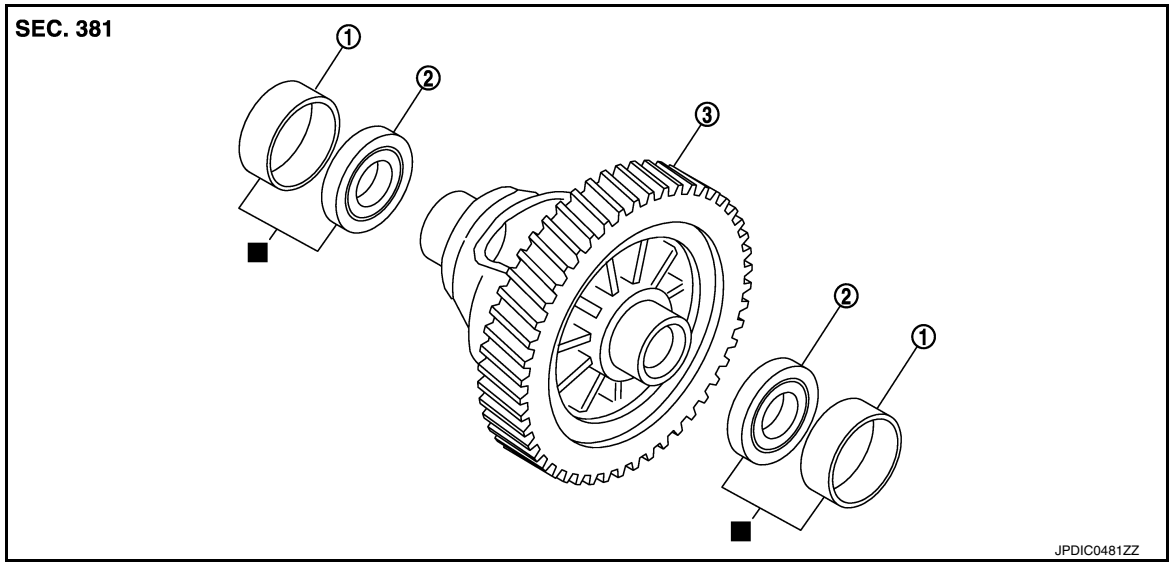
Bearing
Check bearing for damage and rough rotation. Replace if necessary.


MTF0041D

FINAL DRIVE

Exploded View

INFOID:0000000009417616



1. Differential side bearing outer race
2. Differential side bearing
3. Final drive

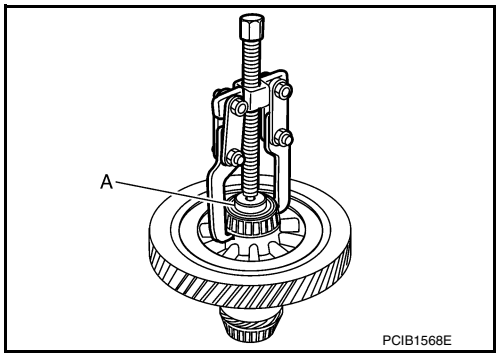
■: Replace the parts as a set.

Disassembly

INFOID:0000000009417617

- Remove differential side bearings, using Tool (A) and suitable tool.

Tool number : ST33052000 (—)



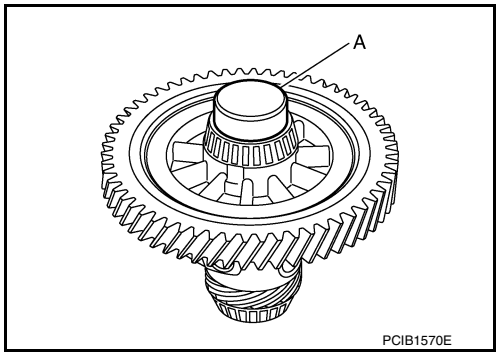
Assembly

INFOID:0000000009417618

- Install differential side bearings, using Tool (A).

CAUTION:
Replace differential side bearing outer race and differential side bearing as a set.

Tool number : KV40104920 (—)



Inspection

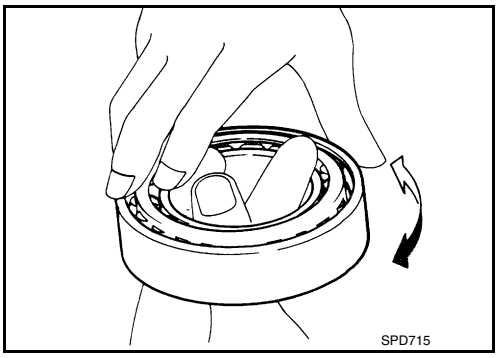
INFOID:0000000009417619

INSPECTION AFTER DISASSEMBLY

Gear and Final Drive

Check the sliding surfaces for wear, crack, or damage. Replace if necessary.

Bearing
Check bearing for damage and rough rotation. Replace if necessary.

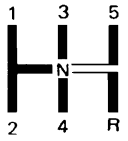


SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000009417620

Transaxle type			RS5F91R	
Engine type			HR16DE	
Model code number			3AM0C	3VB0B
Number of speed			5	
Synchromesh type			Warner	
Shift pattern			 SCIA0821E	
Gear ratio	1st		3.7273	
	2nd		2.0476	
	3rd		1.3929	
	4th		1.0294	
	5th		0.8205	
	Reverse		3.5455	
	Final gear		4.0667	4.2143
Number of teeth	Input gear	1st	11	
		2nd	21	
		3rd	28	
		4th	34	
		5th	39	
		Reverse	11	
	Main gear	1st	41	
		2nd	43	
		3rd	39	
		4th	35	
		5th	32	
		Reverse	39	
	Reverse idler gear		26	
	Final gear	Final gear/Pinion	61/15	59/14
		Side gear/Pinion mate gear	13/9	
Gear oil capacity (Reference)		ℓ (US pt, Imp pt)	Approx. 2.67 (5-5/8, 4-3/4)	
Remarks	Reverse brake		Installed	
	Double-cone synchronizer		1st and 2nd	
	Speedometer drive gear		Not installed	

PRECAUTION

PRECAUTIONS

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

INFOID:0000000009578896

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

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

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

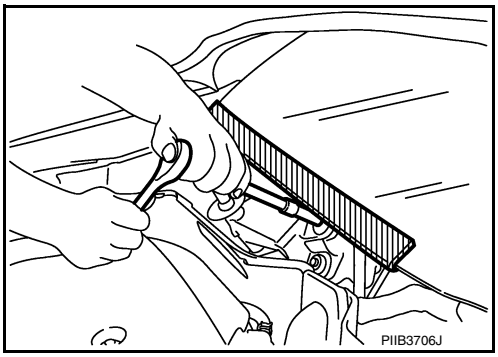
WARNING:

- **When working near the Airbag Diagnosis Sensor Unit or other Airbag 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 three minutes before performing any service.**

Precaution for Procedure without Cowl Top Cover

INFOID:0000000009019825

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



Precaution for TCM and Transaxle Assembly Replacement

INFOID:0000000009019826

CAUTION:

- **To replace TCM, refer to TM-126, "Description".**
- **To replace transaxle assembly, refer to TM-127, "Description".**

Precaution for G Sensor Removal/Installation or Replacement

INFOID:0000000009019827

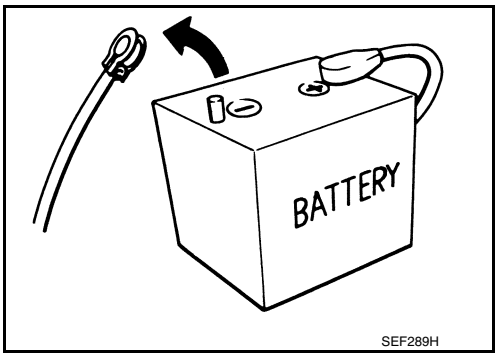
CAUTION:

To remove/install or replace G sensor, refer to TM-129, "Description".

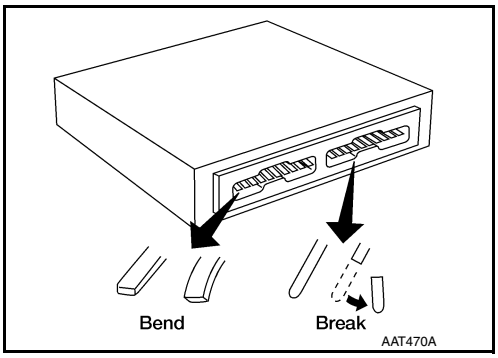
General Precautions

INFOID:0000000009019828

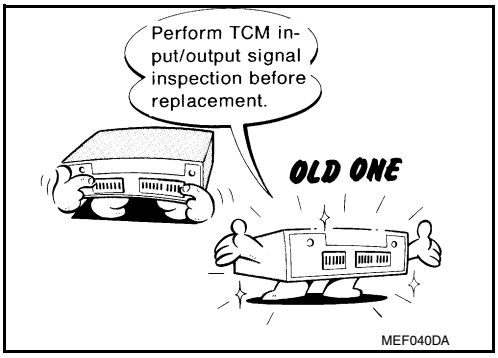
- **Turn ignition switch OFF and disconnect the battery cable from the negative terminal before connecting or disconnecting the CVT assembly harness connector. Because battery voltage is applied to TCM even if ignition switch is turned OFF.**



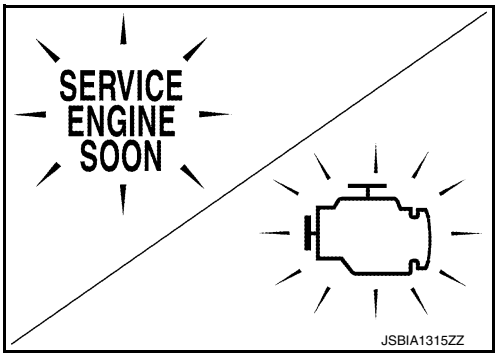
- **When connecting or disconnecting pin connectors into or from TCM, do not damage pin terminals (bend or break).**
  Check that there are not any bends or breaks on TCM pin terminal, when connecting pin connectors.



- **Perform TCM input/output signal inspection and check whether TCM functions normally or not before replacing TCM. Refer to TM-99, "Reference Value".**



- **Perform "DTC (Diagnostic Trouble Code) CONFIRMATION PROCEDURE".**
  If the repair is completed DTC should not be displayed in the "DTC CONFIRMATION PROCEDURE".



- Always use the specified brand of CVT fluid. Refer to MA-12, "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 CVT fluid.

On Board Diagnosis (OBD) System of CVT and Engine

INFOID:0000000009019829

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:

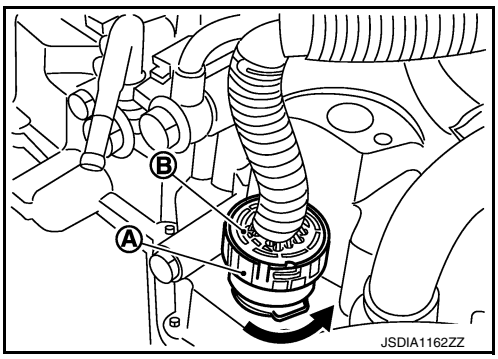
- **Be sure to turn the ignition switch OFF and disconnect the battery cable from the negative terminal before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to light up.**
- **Be sure to connect and lock the connectors securely 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.**

Removal and Installation Procedure for CVT Unit Connector

INFOID:0000000009019830

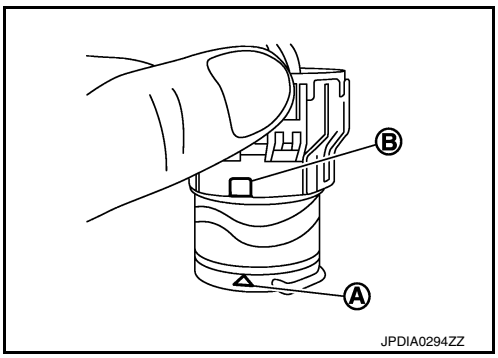
REMOVAL

- Rotate bayonet ring (A) counterclockwise. Pull out CVT unit harness connector (B) upward and remove it.

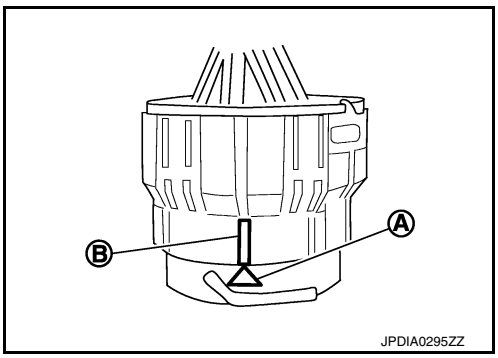


INSTALLATION

1. Align marking (A) on CVT unit harness connector terminal with marking (B) on bayonet ring. Insert CVT unit harness connector.
2. Rotate bayonet ring clockwise.

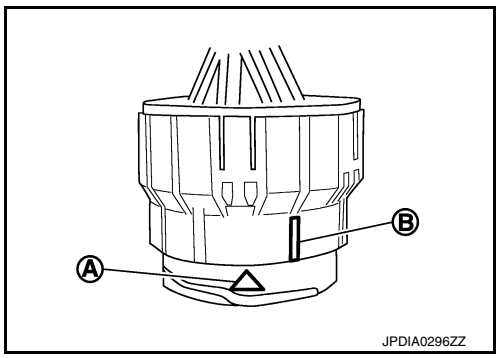


3. Rotate bayonet ring clockwise until marking (A) on CVT unit harness connector terminal body is aligned with the slit (B) on bayonet ring as shown in the figure (correctly fitting condition).



CAUTION:

- **Securely align marking (A) on CVT unit harness connector terminal body with bayonet ring slit (B). Then, be careful not to make a half fit condition as shown in the figure.**
- **Do not mistake the slit of bayonet ring for other dent portion.**

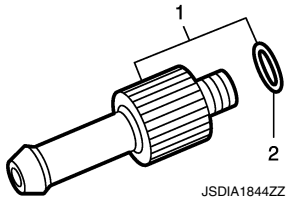
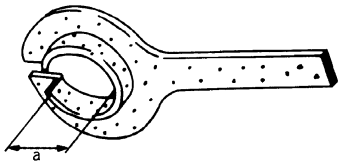


PREPARATION

PREPARATION

Special Service Tools

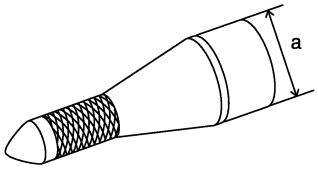
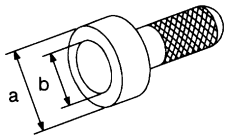
INFOID:0000000009019831

Tool number Tool name	Description
1. KV311039S0 Charging pipe set 2. KV31103920* O-ring  JSDIA1844ZZ	CVT fluid changing and adjustment
KV38107900 Protector a: ϕ 32 mm  PDIA1183J	Installing drive shaft

*: The O-ring as an unit part is set as a SST.

Commercial Service Tools

INFOID:0000000009019832

Tool number Tool name	Description
31197EU50A Drive plate location guide a: ϕ 25 mm  JPDIA0676ZZ	Installing transaxle assembly
Drift a: ϕ 56 mm b: ϕ 50 mm  NT115	Installing differential side oil seal

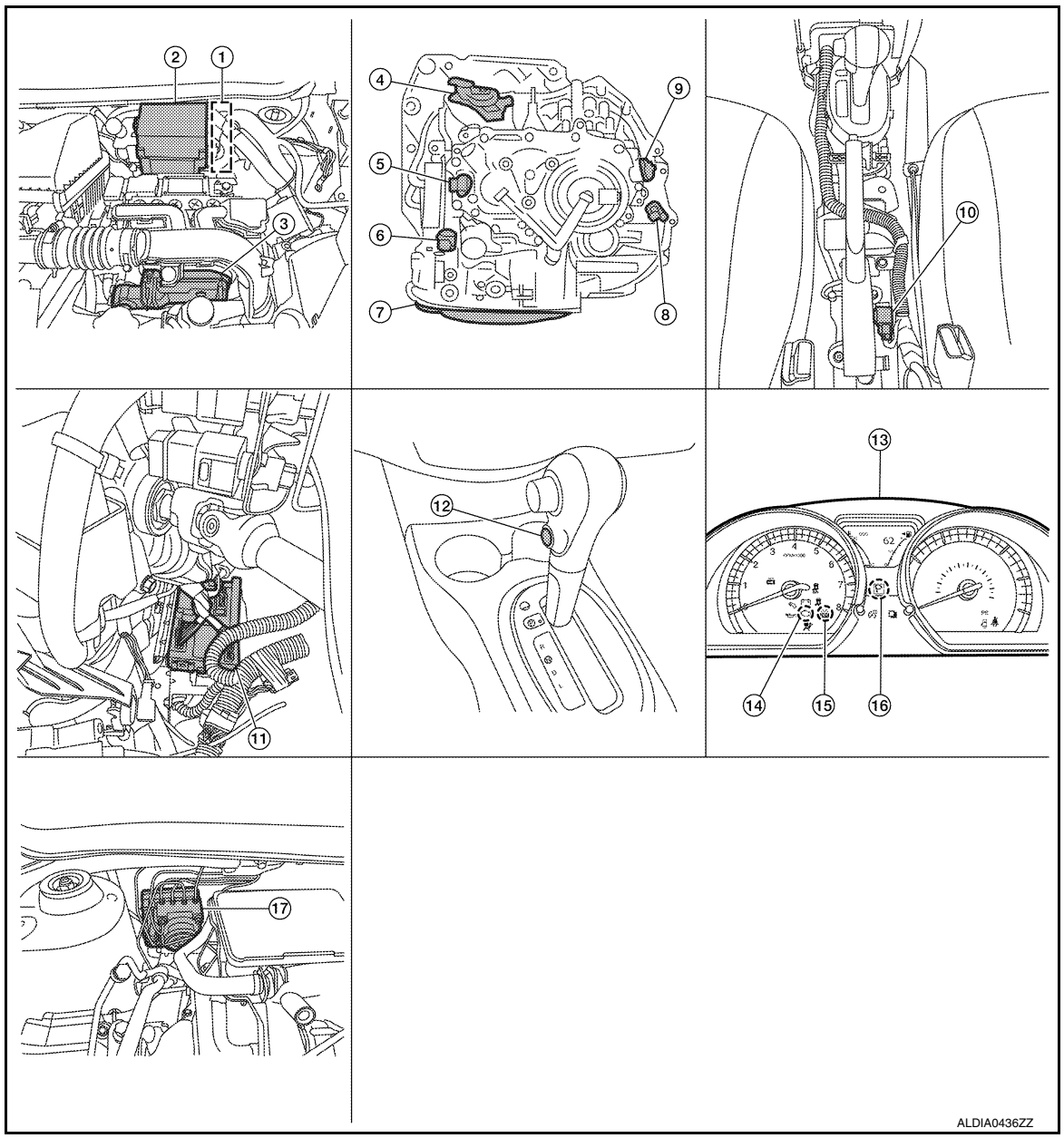
SYSTEM DESCRIPTION

COMPONENT PARTS

CVT CONTROL SYSTEM

CVT CONTROL SYSTEM : Component Parts Location

INFOID:0000000009019833



1. ECM
2. IPDM E/R
3. TCM
4. Transmission range switch
5. Primary speed sensor
6. CVT control unit
7. Control valve
8. Output speed sensor
9. Secondary speed sensor
10. G sensor
11. BCM
12. Sport mode switch
13. Combination meter
14. Malfunction indicator lamp (MIL)
15. Sport mode indicator lamp
16. Shift position indicator
17. ABS actuator and electric unit (control unit)

COMPONENT DESCRIPTION

Component		Function
IPDM E/R		The TCM receives the A/C compressor feedback signal via CAN communications from the IPDM E/R.
TCM		TM-60, "CVT CONTROL SYSTEM : TCM"
Transmission range switch		TM-61, "CVT CONTROL SYSTEM : Transmission Range Switch"
Primary speed sensor		TM-61, "CVT CONTROL SYSTEM : Primary Speed Sensor"
CVT unit		—
Control valve	ROM assembly*	TM-60, "CVT CONTROL SYSTEM : ROM Assembly"
	CVT fluid temperature sensor*	TM-62, "CVT CONTROL SYSTEM : CVT Fluid Temperature Sensor"
	Secondary pressure sensor*	TM-62, "CVT CONTROL SYSTEM : Secondary Pressure Sensor"
	Primary pressure solenoid valve*	TM-63, "CVT CONTROL SYSTEM : Primary Pressure Solenoid Valve"
	Low brake solenoid valve*	TM-63, "CVT CONTROL SYSTEM : Low Brake Solenoid Valve"
	High clutch & reverse brake solenoid valve*	TM-63, "CVT CONTROL SYSTEM : High Clutch & Reverse Brake Solenoid Valve"
	Torque converter clutch solenoid valve*	TM-63, "CVT CONTROL SYSTEM : Torque Converter Clutch Solenoid Valve"
	Line pressure solenoid valve*	TM-64, "CVT CONTROL SYSTEM : Line Pressure Solenoid Valve"
Output speed sensor		TM-62, "CVT CONTROL SYSTEM : Output Speed Sensor"
Secondary speed sensor		TM-61, "CVT CONTROL SYSTEM : Secondary Speed Sensor"
G sensor		TM-64, "CVT CONTROL SYSTEM : G Sensor"
Overdrive control switch		TM-64, "CVT CONTROL SYSTEM : Overdrive Control Switch"
Combination meter		The TCM receives the overdrive cntrol switch signal via CAN communications from the combination meter.
ABS actuator and electric unit (control unit)		The TCM receives the following signals via CAN communications from the ABS actuator and electric unit (control unit). • Vehicle speed signal • VDC operation signal • VDC malfunction signal
ECM		• For purposes including improving the feeling when shifting and preventing drops in engine speed, control signals are exchanged between the ECM and TCM, and real-time cooperative control is performed according to the vehicle driving conditions. (Engine and CVT integrated control) - Engine and CVT integrated control signal • The TCM receives the following signals via CAN communications from the ECM. - Engine speed signal - Accelerator pedal position signal - Closed throttle position signal • TCM sends and receives the following signals with ECM through CAN communication to perform D position N idle control. - N idle instruction signal
BCM		The TCM receives the following signals via CAN communications from the BCM. • Stop lamp switch signal • Turn indicator signal

*: These components are included in control valve assembly.

CVT CONTROL SYSTEM : TCM

INFOID:0000000009019834

- The vehicle driving status is judged based on the signals from the sensors, switches, and other control units, and the optimal transaxle control is performed.
- For TCM control items, refer to TM-73, "CVT CONTROL SYSTEM : System Description".

CVT CONTROL SYSTEM : ROM Assembly

INFOID:0000000009019835

- The ROM assembly is installed to control valve.

- The ROM assembly stores the calibration data (characteristic value) of each solenoid valve. TCM enables accurate hydraulic control by obtaining the calibration data.

CVT CONTROL SYSTEM : Transmission Range Switch

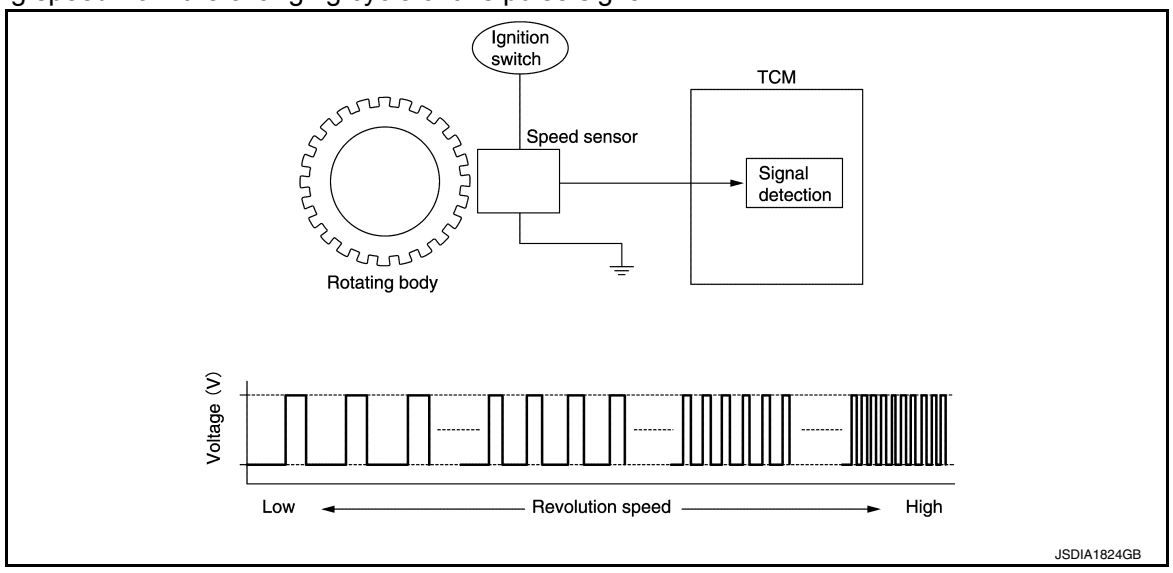
INFOID:0000000009019836

- The transmission range switch is installed to upper part of transaxle case.
- The transmission range switch detects the selector lever position.

CVT CONTROL SYSTEM : Primary Speed Sensor

INFOID:0000000009019837

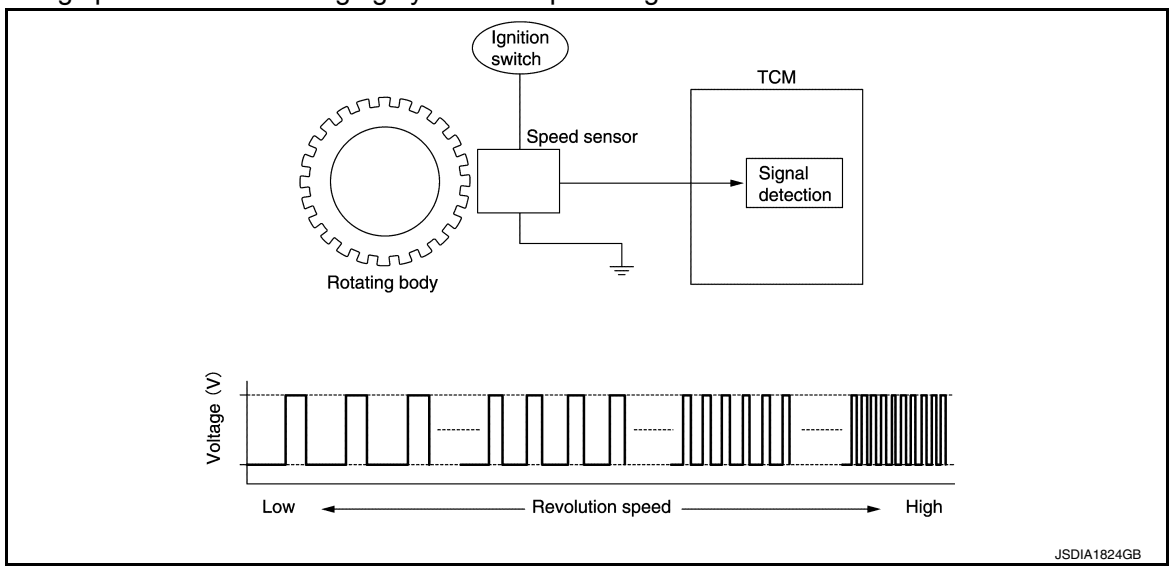
- The primary speed sensor is installed to side cover of transaxle.
- The primary speed sensor detects primary pulley speed.
- The primary speed sensor generates the ON-OFF pulse (short waveform) in proportion to the rotating body speed which is “The higher the rotating body speed is, the faster the change cycle is”. The TCM judges the rotating speed from the changing cycle of this pulse signal.



CVT CONTROL SYSTEM : Secondary Speed Sensor

INFOID:0000000009019838

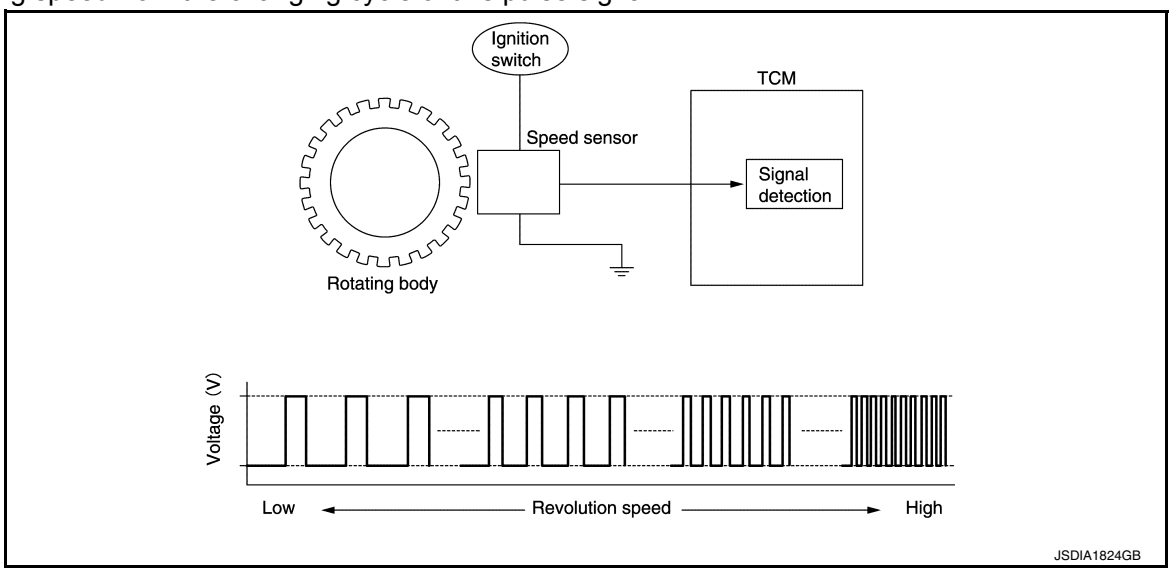
- The secondary speed sensor is installed to side cover of transaxle.
- The secondary speed sensor detects secondary pulley speed.
- The secondary speed sensor generates the ON-OFF pulse (short waveform) in proportion to the rotating body speed which is “The higher the rotating body speed is, the faster the change cycle is”. The TCM judges the rotating speed from the changing cycle of this pulse signal.



CVT CONTROL SYSTEM : Output Speed Sensor

INFOID:0000000009019839

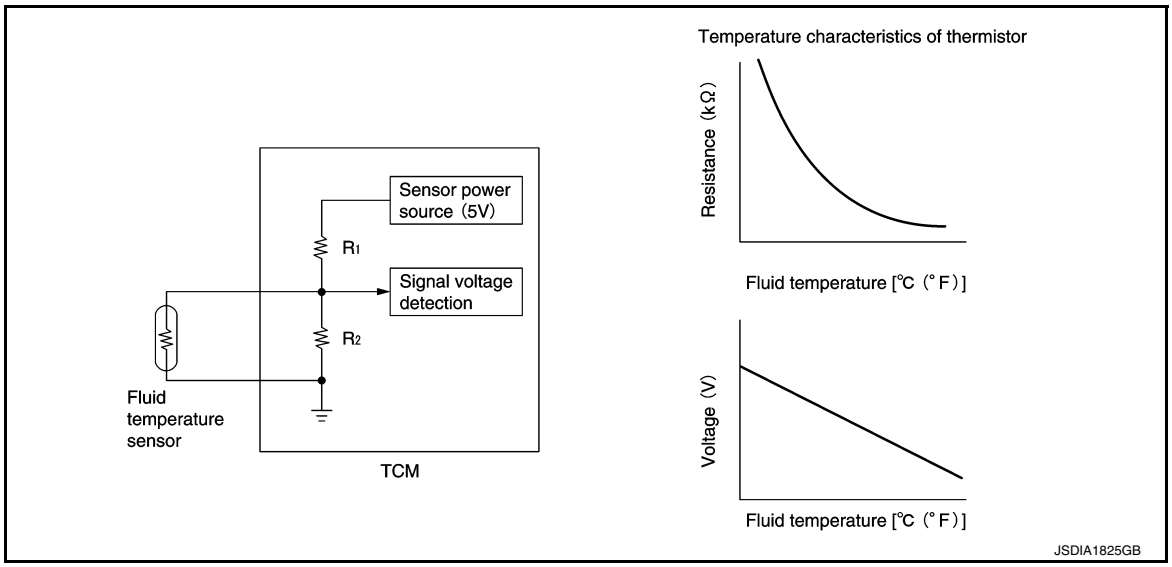
- The output speed sensor is installed to the back side of transaxle case.
- The output speed sensor detects final gear speed. TCM evaluates the vehicle speed from the final gear revolution.
- The output speed sensor generates the ON-OFF pulse (short waveform) in proportion to the rotating body speed which is “The higher the rotating body speed is, the faster the change cycle is”. The TCM judges the rotating speed from the changing cycle of this pulse signal.



CVT CONTROL SYSTEM : CVT Fluid Temperature Sensor

INFOID:0000000009019840

- The CVT fluid temperature sensor is installed to control valve.
- The CVT fluid temperature sensor detects CVT fluid temperature in oil pan.
- The fluid temperature sensor uses a thermistor, and changes the signal voltage by converting changes in the CVT fluid temperature to a resistance value. TCM evaluates the CVT fluid temperature from the signal voltage value.

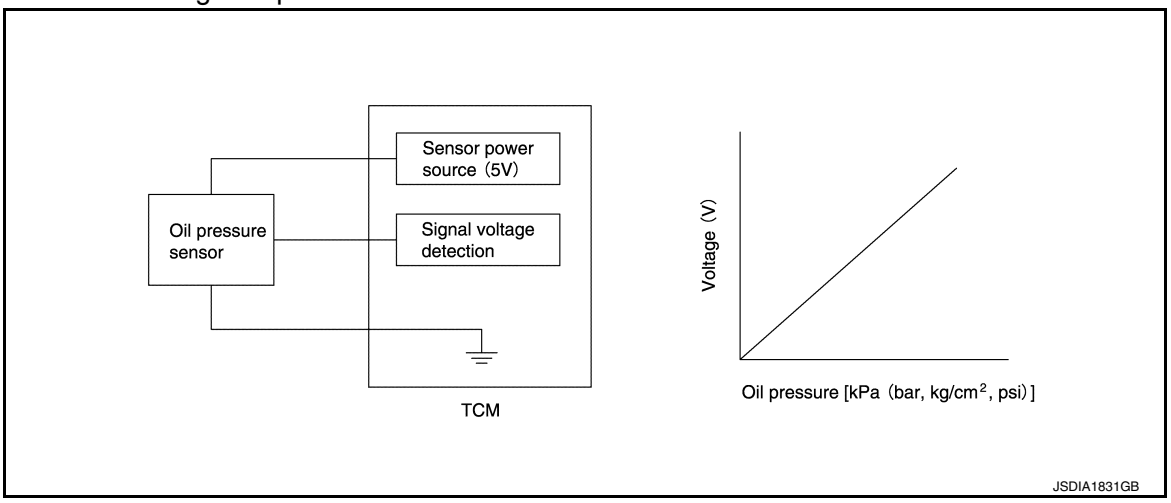


CVT CONTROL SYSTEM : Secondary Pressure Sensor

INFOID:0000000009019841

- The secondary pressure sensor is installed to control valve.
- The secondary pressure sensor detects the pressure applied to the secondary pulley.

- When pressure is applied to the ceramic device in the secondary pressure sensor, the ceramic device is deformed, resulting in voltage change. TCM evaluates the secondary pressure from its voltage change. Voltage is increased along with pressure increase.



CVT CONTROL SYSTEM : Primary Pressure Solenoid Valve

INFOID:0000000009019842

- The primary pressure solenoid valve is installed to control valve.
- The primary pressure solenoid valve controls the primary pressure control valve. For information about the primary pressure control valve, refer to TM-70, "TRANSAXLE : Component Description".
- The primary pressure solenoid valve uses the linear solenoid valve [N/H (normal high) type].

NOTE:
- The principle of the linear solenoid valve utilizes the fact that the force pressing on the valve spool installed inside the coil increases nearly in proportion to the current. This allows it to produce a fluid pressure that is proportional to this pressing force.
- The N/H (normal high) produces hydraulic control when the coil is not energized.

CVT CONTROL SYSTEM : Low Brake Solenoid Valve

INFOID:0000000009019843

- The low brake solenoid valve is installed to control valve.
- The low brake solenoid valve adjusts the tightening pressure of the low brake.
- The low brake solenoid valve uses the linear solenoid valve [N/L (normal low) type].

NOTE:
- The principle of the linear solenoid valve utilizes the fact that the force pressing on the valve spool installed inside the coil increases nearly in proportion to the current. This allows it to produce a fluid pressure that is proportional to this pressing force.
- The N/L (normal low) type does not produce hydraulic control when the coil is not energized.

CVT CONTROL SYSTEM : High Clutch & Reverse Brake Solenoid Valve

INFOID:0000000009019844

- The high clutch & reverse brake solenoid valve is installed to control valve.
- The high clutch & reverse brake solenoid valve adjusts the tightening pressure of the high clutch and reverse brake.
- The high clutch & reverse brake solenoid valve uses the linear solenoid valve [N/H (normal high) type].

NOTE:
- The principle of the linear solenoid valve utilizes the fact that the force pressing on the valve spool installed inside the coil increases nearly in proportion to the current. This allows it to produce a fluid pressure that is proportional to this pressing force.
- The N/H (normal high) produces hydraulic control when the coil is not energized.

CVT CONTROL SYSTEM : Torque Converter Clutch Solenoid Valve

INFOID:0000000009019845

- The torque converter clutch solenoid valve is installed to control valve.
- The torque converter clutch solenoid valve controls the torque converter clutch control valve. For information about the torque converter clutch control valve, refer to TM-70, "TRANSAXLE : Component Description".
- The torque converter clutch solenoid valve utilizes a linear solenoid valve [N/L (normal low) type].

NOTE:

- The principle of the linear solenoid valve utilizes the fact that the force pressing on the valve spool installed inside the coil increases nearly in proportion to the current. This allows it to produce a fluid pressure that is proportional to this pressing force.
- The N/L (normal low) type does not produce hydraulic control when the coil is not energized.

CVT CONTROL SYSTEM : Line Pressure Solenoid Valve

INFOID:0000000009019846

- The line pressure solenoid valve is installed to control valve.
- The line pressure solenoid valve controls the pressure regulator valve. For information about the pressure regulator valve, refer to TM-70, "TRANSAXLE : Component Description".
- The line pressure solenoid valve uses the linear solenoid valve [N/H (normal high) type].

NOTE:

- The principle of the linear solenoid valve utilizes the fact that the force pressing on the valve spool installed inside the coil increases nearly in proportion to the current. This allows it to produce a fluid pressure that is proportional to this pressing force.
- The N/H (normal high) produces hydraulic control when the coil is not energized.

CVT CONTROL SYSTEM : G Sensor

INFOID:0000000009019847

- G sensor is installed to floor under instrument lower cover.
- G sensor detects front/rear G and inclination applied to the vehicle.
- G sensor converts front/rear G and inclination applied to the vehicle to voltage signal. TCM evaluates front/rear G and inclination angle of the vehicle from the voltage signal.

CVT CONTROL SYSTEM : Overdrive Control Switch

INFOID:0000000009019848

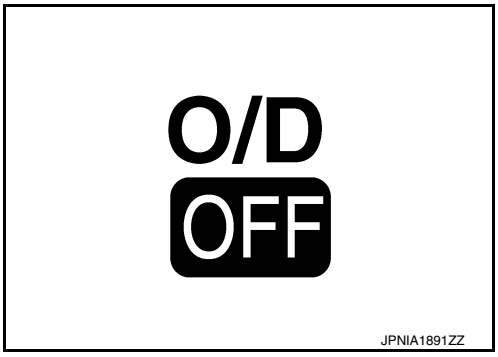
- The overdrive control switch is installed to the selector lever knob.
- When the OD OFF indicator lamp on the combination meter is OFF and the overdrive control switch is pressed, the overdrive is cancelled and the OD OFF indicator lamp is ON.
- When the OD OFF indicator lamp on the combination meter is ON and the overdrive control switch is pressed, the overdrive is active and the OD OFF indicator lamp is OFF.

CVT CONTROL SYSTEM : OD OFF Indicator Lamp

INFOID:0000000009019849

DESIGN/PURPOSE

The O/D OFF indicator notifies the driver that the shift control of transmaxle is in O/D OFF.



JPNIA1891ZZ

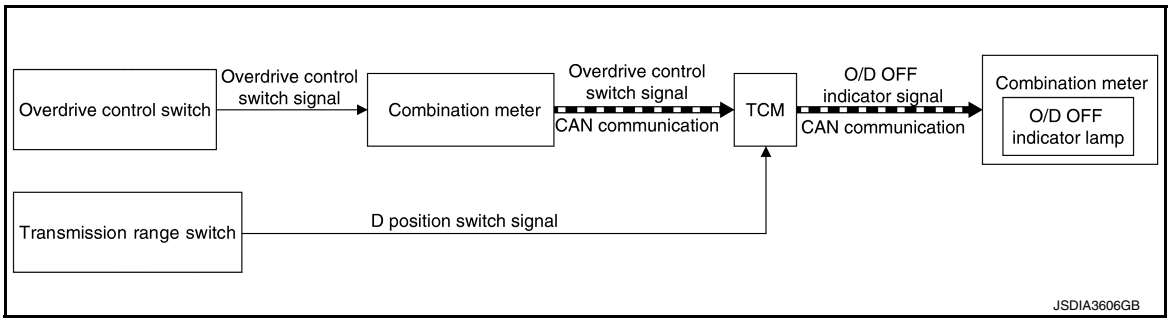
BULB CHECK

Approximately 2 seconds after ignition switch ON.

OPERATION AT COMBNATION METER CNA COMMUNICATION CUT-OFF OR UNUSUAL SIGNAL

For actions on CAN communications blackout in the combnation meter, refer to MWI-19, "Fail-safe".

SYSTEM DIAGRAM



SIGNAL PATH

- When a overdrive control switch signal is input to the combination meter, the combination meter transmits the overdrive control switch signal to the TCM via CAN communication.
- When all of the following conditions are satisfied, the TCM transmits a O/D OFF indicator signal to the combination meter via CAN communication. The combination meter turns ON the O/D OFF indicator lamp on the combination meter, according to the signal.

- TCM receives overdrive control switch signal via CAN communication from combination meter.
- Selector lever: D position

LIGHTING CONDITION

When all of the following conditions are satisfied.

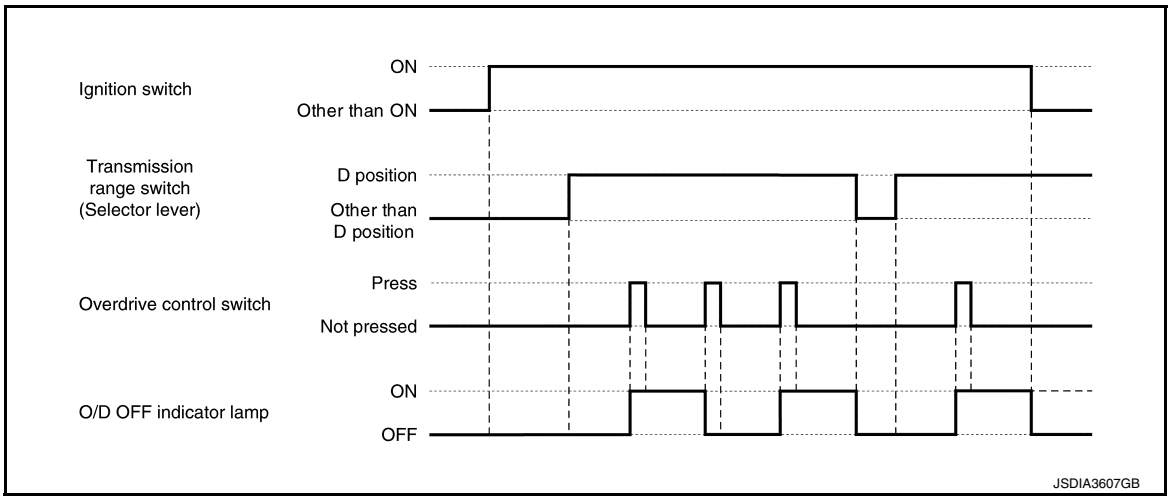
- Ignition switch: ON
- Selector lever: D position
- Overdrive control switch is pressed when the O/D OFF indicator lamp is OFF.

SHUTOFF CONDITION

When any of the conditions listed below is satisfied.

- Ignition switch: Other than ON
- Overdrive control switch is pressed when the O/D OFF indicator lamp is ON.
- Selector lever is shifted to other than D position when the O/D OFF indicator lamp is ON.

TIMING CHART



CVT CONTROL SYSTEM : Shift Position Indicator

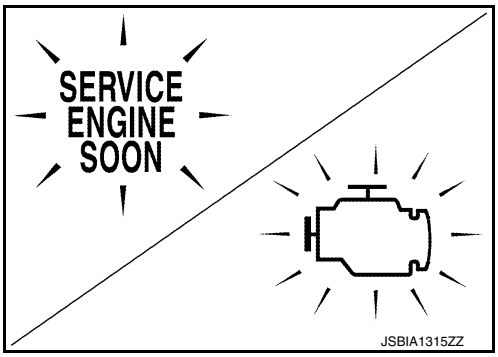
INFOID:0000000009019850

TCM transmits shift position signal to combination meter via CAN communication. The actual shift position is displayed on combination meter according to the signal.

CVT CONTROL SYSTEM : Malfunction Indicator Lamp (MIL)

INFOID:0000000009019851

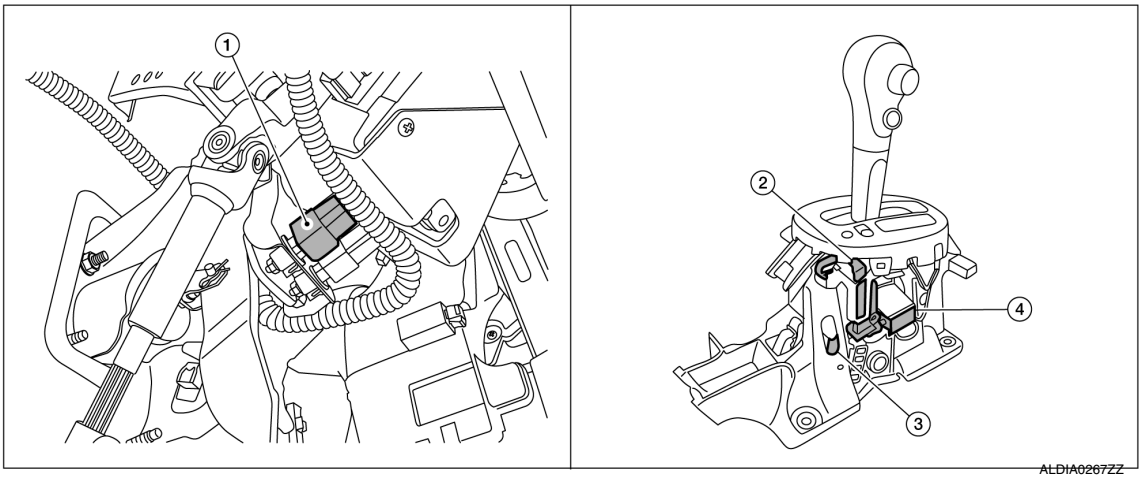
The malfunction indicator lamp (MIL) is located on the combination meter.
The MIL will illuminate when the ignition switch is turned ON without the engine running. This is a bulb check.
When the engine is started, the MIL should turn off. If the MIL remains illuminated, the on board diagnostic system has detected an engine system malfunction.
For details, refer to EC-24, "WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)".



SHIFT LOCK SYSTEM

SHIFT LOCK SYSTEM : Component Parts Location

INFOID:0000000009019852



1. Stop lamp switch
2. Shift lock release lever
3. Park position switch
4. Shift lock solenoid

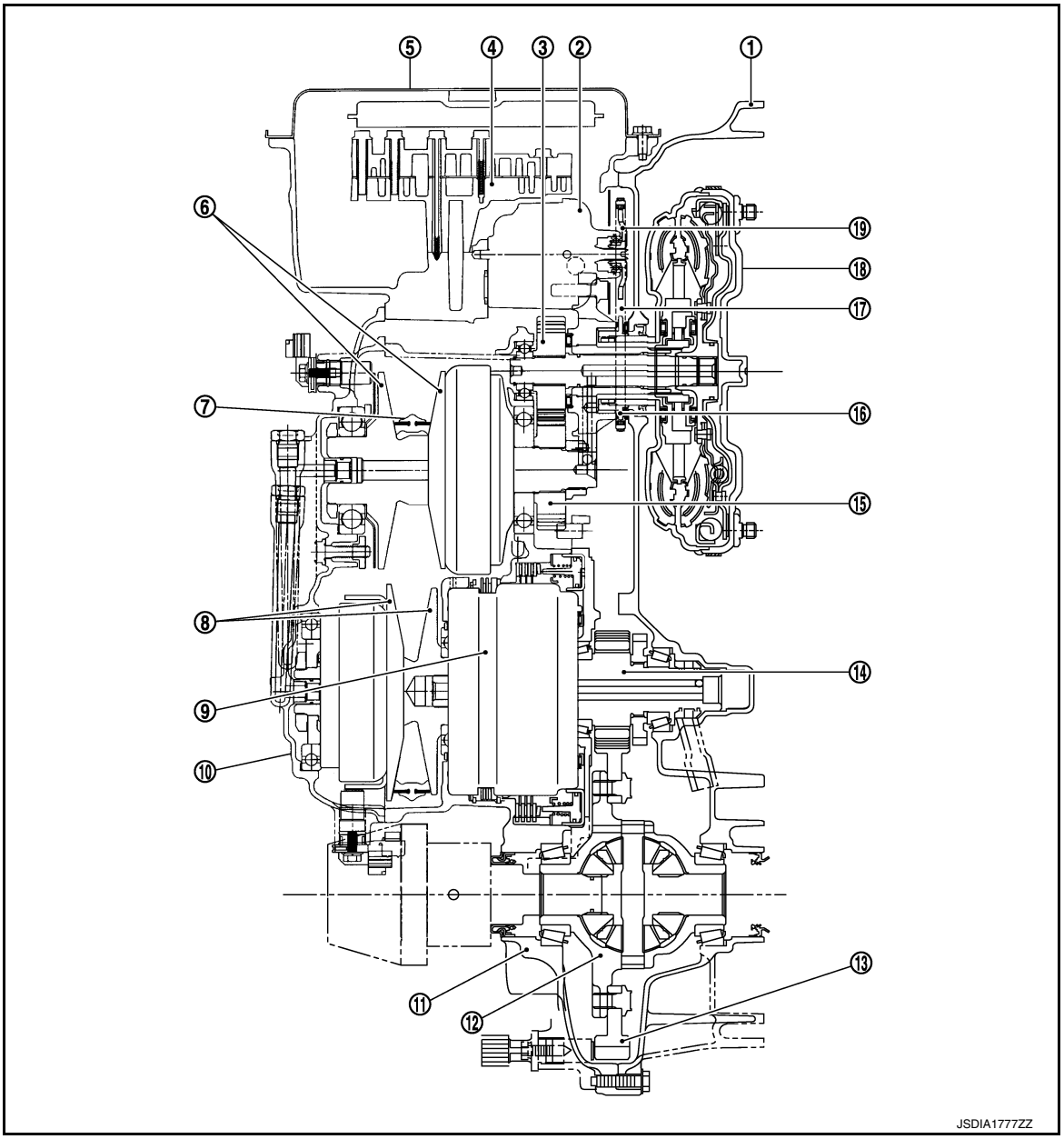
COMPONENT DESCRIPTION

Component	Function
Stop lamp switch	Stop lamp switch turns ON when brake pedal is depressed.
Shift lock release lever	Manually releases the shift lock.
Park position switch	Detects that the selector lever is in “P” position.
Shift lock solenoid	Operates according to the signal from the stop lamp switch and moves the lock lever.

STRUCTURE AND OPERATION
TRANSAXLE

TRANSAXLE : Cross-Sectional View

INFOID:0000000009019853



1.	Converter housing	2.	Oil pump	3.	Counter drive gear
4.	Control valve	5.	Oil pan	6.	Primary pulley
7.	Steel belt	8.	Secondary pulley	9.	Planetary gear (auxiliary gearbox)
10.	Side cover	11.	Transaxle case	12.	Differential case
13.	Final gear	14.	Reduction gear	15.	Counter driven gear
16.	Drive sprocket	17.	Oil pump chain	18.	Torque converter
19.	Driven sprocket				

TRANSAXLE : Transaxle Mechanism

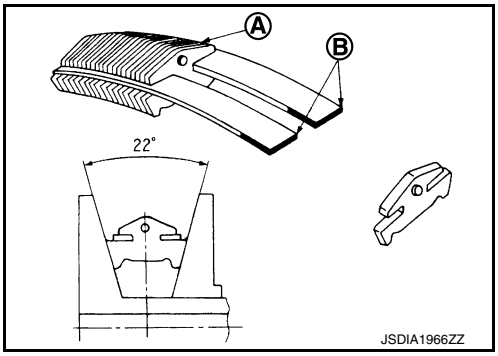
INFOID:0000000009019854

BELT & PULLEY

Mechanism

It is composed of a pair of pulleys (the groove width is changed freely in the axial direction) and the steel belt (the steel plates are placed continuously and the belt is guided with the multilayer steel rings on both sides). The groove width changes according to wrapping radius of steel belt and pulley from low status to overdrive status continuously with non-step. It is controlled with the oil pressures of primary pulley and secondary pulley.

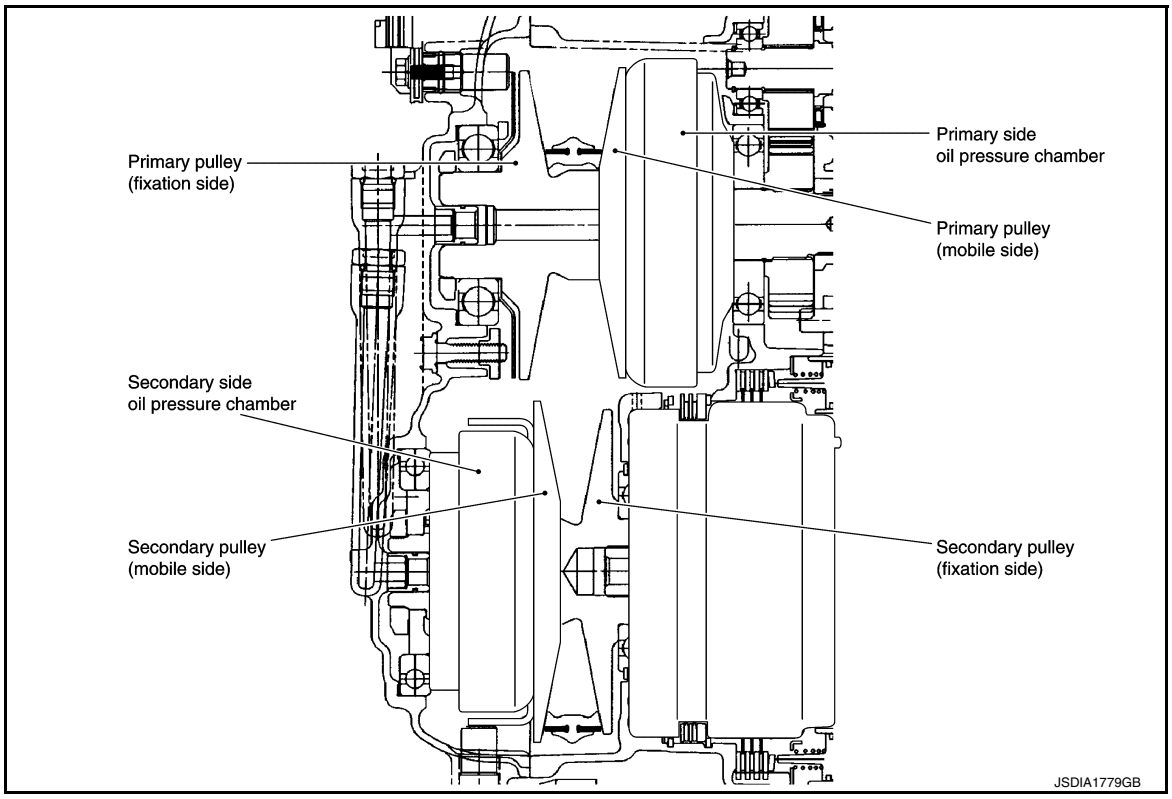
Steel belt



It is composed of multiple steel plates (A) and two steel rings (B) stacked to a several number. The feature of this steel belt transmits power with compression of the steel plate in contrast with transmission of power in pulling with a rubber belt. Friction force is required with the pulley slope to transmit power from the steel plate. The force is generated with the following mechanism:
Oil pressure applies to the secondary pulley to nip the plate. ⇒The plate is pushed and extended outward. ⇒The steel ring shows withstands. ⇒Pulling force is generated on the steel ring. ⇒The plate of the primary pulley is nipped between the pulley. ⇒Friction force is generated between the steel belt and the pulley.
Therefore, responsibilities are divided by the steel plate that transmits the power with compression and the steel ring that maintains necessary friction force. In this way, the tension of the steel ring is distributed on the entire surface and stress variation is limited, resulting in good durability.

Pulley

The primary pulley (input shaft side) and the secondary pulley (output shaft side) have the shaft with slope (fixed cone surface), movable sheave (movable cone surface that can move in the axial direction) and oil pressure chamber at the back of the movable sheave.

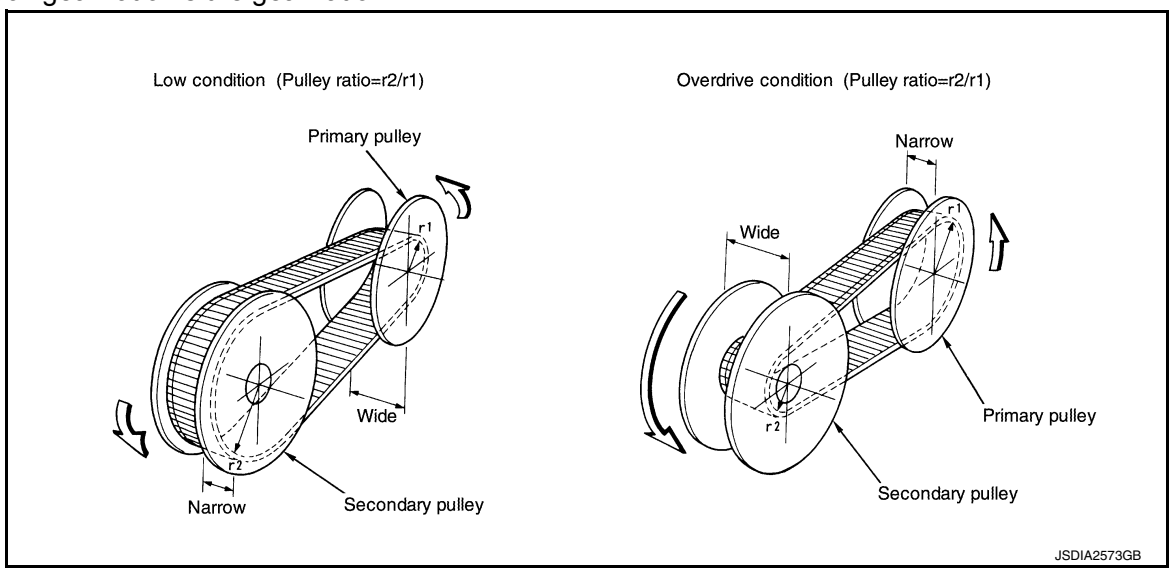


Pulley gear shifting operation

- Pulley gear shifting operation

  The movable sheave slides on the shaft to change the groove width of the pulley. Input signals of engine load (accelerator pedal opening), engine revolution and gear ratio (vehicle speed) change the operation pressures of the primary pulley and the secondary pulley, and controls the pulley groove width. Along with change of the pulley groove width, the belt contact radius is changed. This allows continuous and stepless

gear shifting from low to overdrive. “The contact radius ratio of each pulley in contact with the belt x auxiliary gearbox gear ratio” is the gear ratio.



AUXILIARY GEARBOX MECHANISM

1st, 2nd and reverse gears are changed with the planetary gear mechanism.

TRANSAXLE : Operation Status

INFOID:0000000009019855

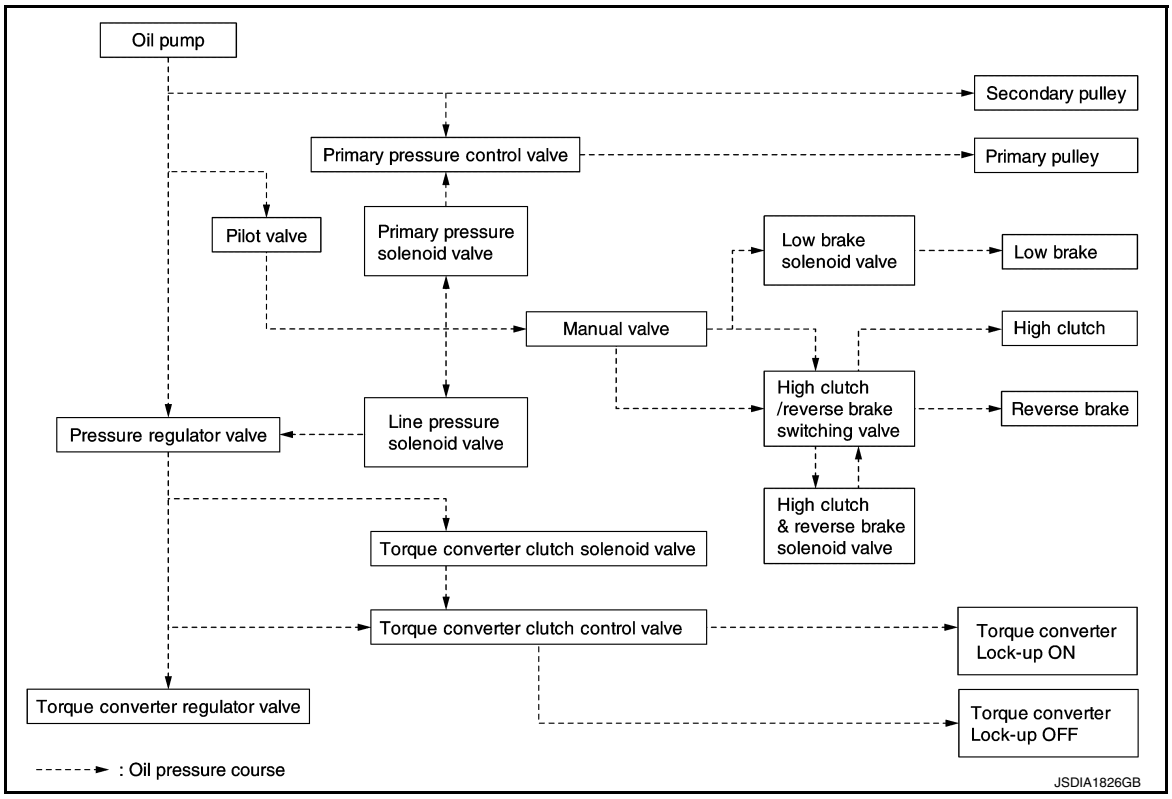
×: Engaged or applied.

Slector lever position	Parking mechanism	Counter gear set	Low brake	High clutch	Reverse brake	Primary pulley	Secondary pulley	Steel belt	Reduction gear set
P	×	×				×	×	×	
R		×			×	×	×	×	×
N		×				×	×	×	
D		×	× (1GR)	× (2GR)		×	×	×	×
L		×	× (1GR)	× (2GR)		×	×	×	×

TRANSAXLE : Oil Pressure System

INFOID:0000000009019856

Oil pressure required for operation of the transaxle transmission mechanism is generated by oil pump, oil pressure control valve, solenoid valve, etc.



TRANSAXLE : Component Description

INFOID:0000000009019857

Part name	Function
Torque converter	It is composed of the cover converter, turbine assembly, stator, pump impeller assembly, etc. It increases the engine torque and transmits the power to the transaxle.
Oil pump	Through the oil pump drive chain, it uses the vane oil pump driven by the engine. It generates necessary oil pressure to circulate fluid and to operate the clutch and brake.
Counter gear set	The power from the torque converter is transmitted to the primary pulley through the counter drive gear and the counter driven gear.
Belt & pulley (Continuously variable transmission)	It is composed of the primary pulley, secondary pulley, steel belt, etc. and the mechanism performs shifting, changes the gear ratio and transmits the power with oil pressure from the control valve.
Auxiliary gearbox (stepped transmission)	It is composed of the planetary gear, multi-disc clutch, multi-disc brake, etc. and the mechanism performs shifting (1-2 gear shifting and reverse) with oil pressure from the control valve.
Reduction gear set	Conveys power from the transmission mechanism to the reduction gear and the final gear.
Parking mechanism	When the shift lever is changed to P position, the mechanism fixes the parking gear (integrated with the reduction gear) and the fixes the output shaft.
Control valve	Controls oil pressure from the oil pump to the pressure suitable for the line pressure control system, shift control system, lock-up control system and lubrication system.
Pressure regulator valve	Adjusts the discharge pressure from the oil pump to the optimum pressure (line pressure) corresponding to the driving condition.
Torque converter regulator valve	Adjusts the feed pressure to the torque converter to the optimum pressure corresponding to the driving condition.
Pilot valve	Adjusts line pressure and produces a constant pressure (pilot pressure) necessary for activating each solenoid valve.

Part name	Function
Manual valve	Distributes the clutch and brake operation pressures (pilot pressure) corresponding to each shift position.
High clutch/reverse brake switching valve	Switches the circuit for the high clutch and the reverse brake.
Torque converter clutch control valve	It is operated with the torque converter clutch solenoid valve and it adjusts the tightening pressure and non-tightening pressure of the torque converter clutch piston of the torque converter.
Primary pressure control valve	It is operated with the primary pressure solenoid valve and adjusts the feed pressure to the primary pulley.
Primary pressure solenoid valve	TM-63, "CVT CONTROL SYSTEM : Primary Pressure Solenoid Valve"
Low brake solenoid valve	TM-63, "CVT CONTROL SYSTEM : Low Brake Solenoid Valve"
High clutch & reverse brake solenoid valve	TM-63, "CVT CONTROL SYSTEM : High Clutch & Reverse Brake Solenoid Valve"
Torque converter clutch solenoid valve	TM-63, "CVT CONTROL SYSTEM : Torque Converter Clutch Solenoid Valve"
Line pressure solenoid valve	TM-64, "CVT CONTROL SYSTEM : Line Pressure Solenoid Valve"

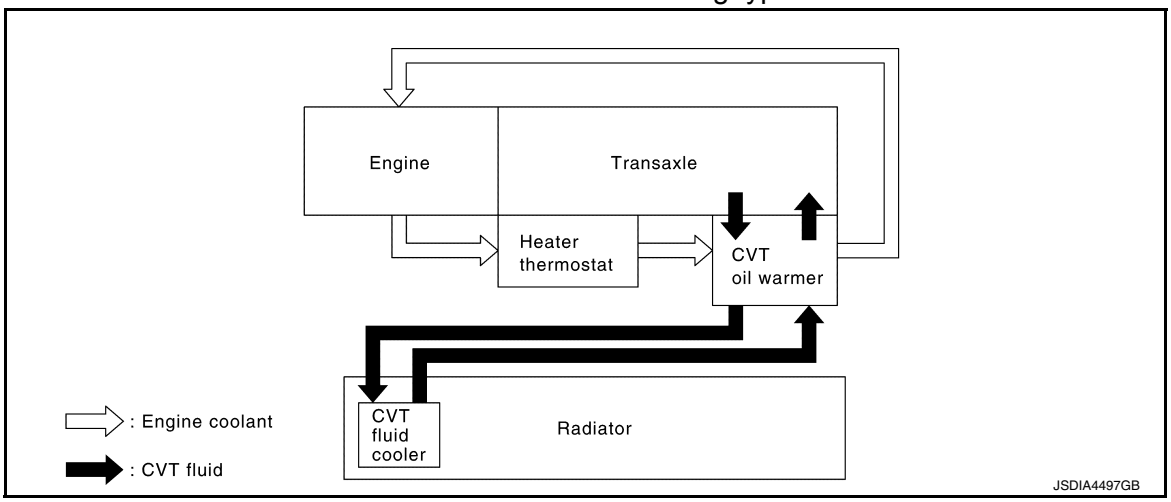
FLUID COOLER & FLUID WARMER SYSTEM

FLUID COOLER & FLUID WARMER SYSTEM : System Description

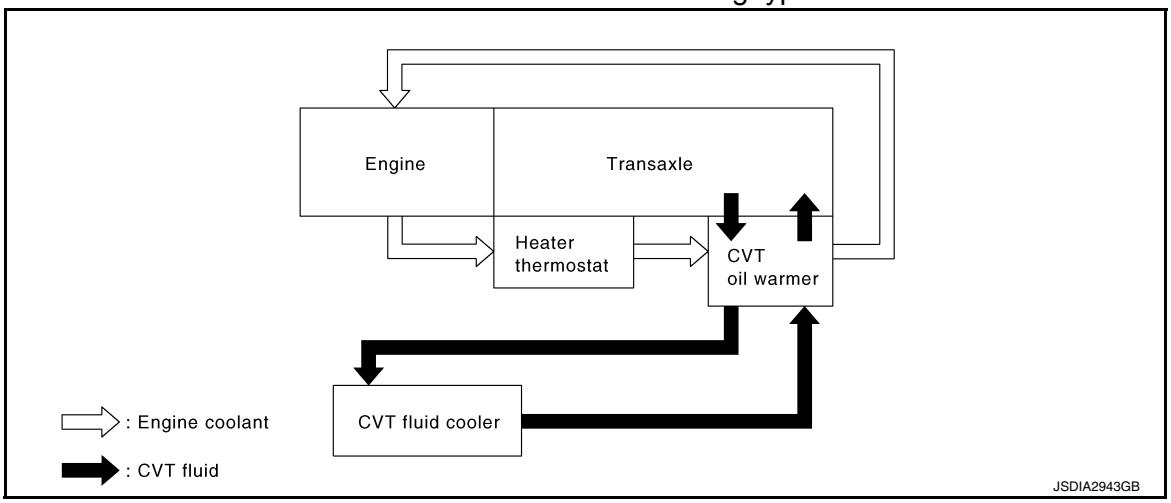
INFOID:0000000009019858

CVT FLUID COOLER SCHEMATIC

CVT fluid cooler air-cooling type



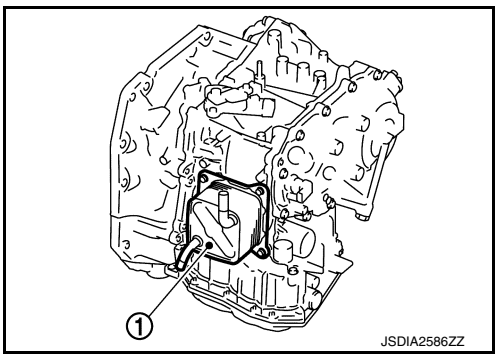
CVT fluid cooler water-cooling type



COMPONENT DESCRIPTION

CVT Oil Warmer

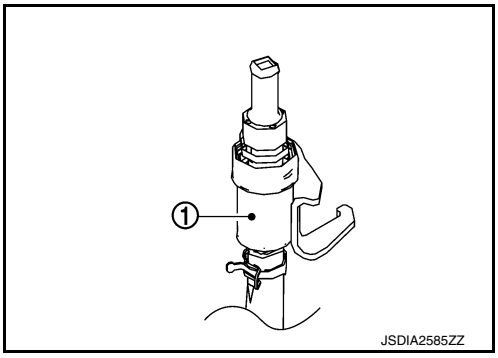
- The CVT oil warmer (1) is installed on the front part of transaxle assembly.
- When engine is started while engine and CVT are cold, engine coolant temperature rises more quickly than CVT fluid temperature. CVT oil warmer is provided with two circuits for CVT and engine coolant respectively so that warmed engine coolant warms CVT quickly. This helps shorten CVT warming up time, improving fuel economy.
- A cooling effect is obtained when CVT fluid temperature is high.



CVT Fluid Cooler (Water-cooling)
- The CVT fluid cooler (water-cooling) is installed in the radiator side tank (right side).
- CVT fluid is cooled by engine coolant.

CVT Fluid Cooler (Air-cooling)
- The CVT fluid cooler (air-cooling) is installed to vehicle front.
- The CVT fluid cooler (air-cooling) prevents CVT fluid temperature from an abnormal increase while driving the vehicle. When flowing into the CVT fluid cooler (air-cooling), CVT fluid is cooled by driving blast while driving the vehicle.

Heater Thermostat
- The heater thermostat (1) is installed on the front part of transaxle assembly.
- The heater thermostat open and close with set temperature.



SHIFT LOCK SYSTEM

SHIFT LOCK SYSTEM : System Description

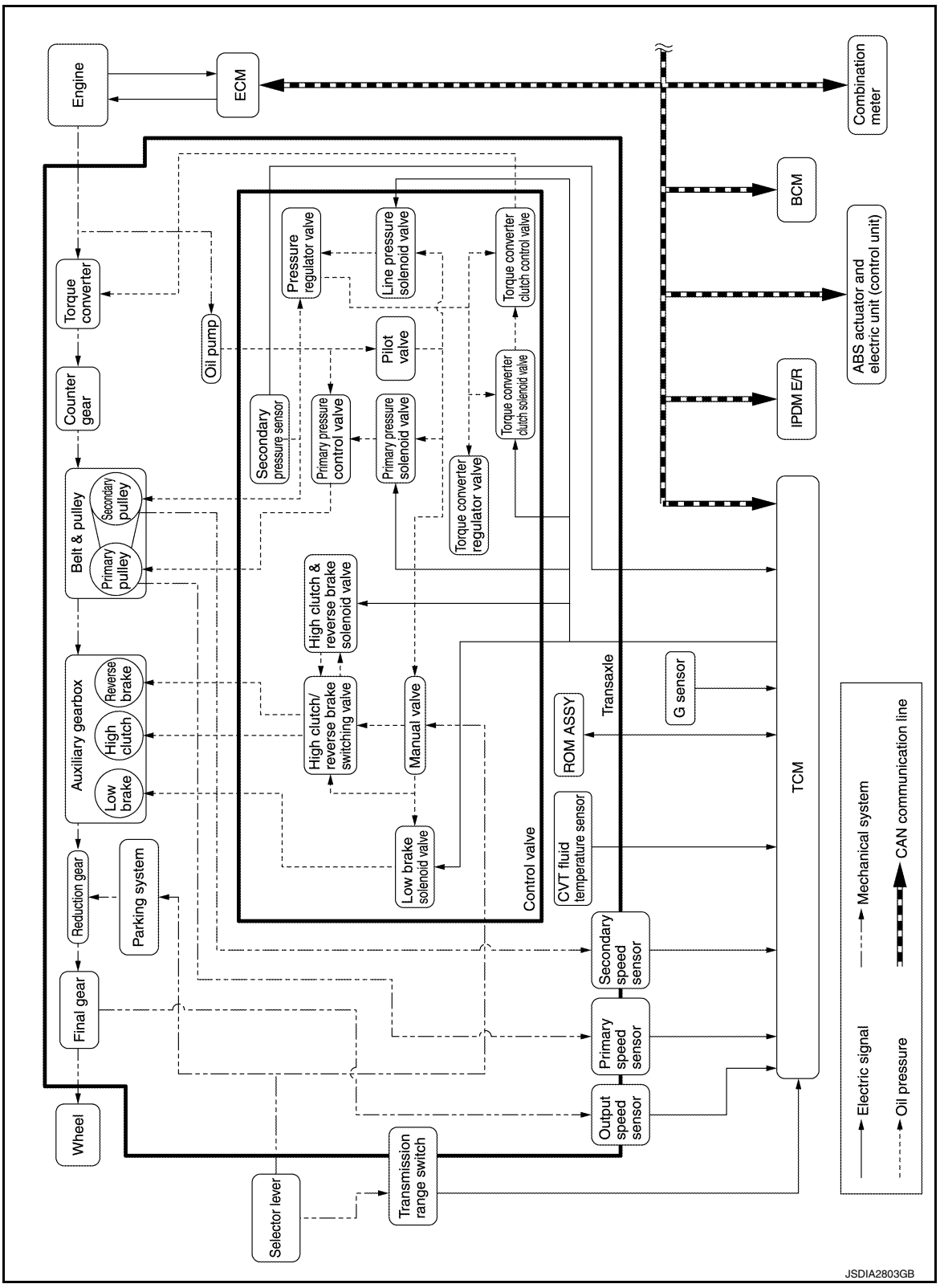
INFOID:0000000009019868

The selector lever cannot be shifted from “P” position to any other position unless the ignition switch is in the ON position and the brake pedal is depressed.

SYSTEM
CVT CONTROL SYSTEM
CVT CONTROL SYSTEM : System Description

INFOID:0000000009019859

SYSTEM DIAGRAM



INPUT/OUTPUT SIGNAL TABLE

Sensor (or signal)		TCM function		Actuator
• Engine and CVT integrated control signal • Engine speed signal • Accelerator pedal position signal • Closed throttle position signal • Stop lamp switch signal • Secondary pressure sensor • CVT fluid temperature sensor • Primary speed sensor • Secondary speed sensor • Output speed sensor • Transmission range switch signal • Overdrive control switch signal • Vehicle speed signal (ABS) • ABS operation signal • A/C compressor feedback signal • G sensor • N idle instruction signal • Turn indicator signal	⇒	• Line pressure control (TM-81, "LINE PRESSURE CONTROL : System Description") • Shift control (TM-82, "SHIFT CONTROL : System Description") • Select control (TM-84, "SELECT CONTROL : System Description") • Lock-up control (TM-85, "LOCK-UP CONTROL : System Description") • Idle neutral control (TM-86, "IDLE NEUTRAL CONTROL : System Description") • Fail-safe mode (TM-107, "Fail-safe") • Self-diagnosis function (TM-92, "CONSULT Function") • Communication function with CONSULT (TM-92, "CONSULT Function") • CAN communication control (TM-139, "Description")	⇒	• Line pressure solenoid valve • Primary pressure solenoid valve • Torque converter clutch solenoid valve • High clutch & reverse brake solenoid valve • Low brake solenoid valve • OD OFF indicator lamp • Shift position indicator

SYSTEM DESCRIPTION

- CVT detects the vehicle driving status from switches, sensors and signals, and controls the vehicle so that the optimum shift position and shift timing may always be achieved. It also controls the vehicle to reduce shift and lockup shock, etc.
- Receives input signals from switches and sensors.
- Sends the output signal necessary for operation of solenoid valves, and evaluates the line pressure, shift timing, lockup operation, engine brake performance, etc.
- If a malfunction occurs on the electric system, activate the fail-safe mode only to drive the vehicle.

LIST OF CONTROL ITEMS AND INPUT/OUTPUT

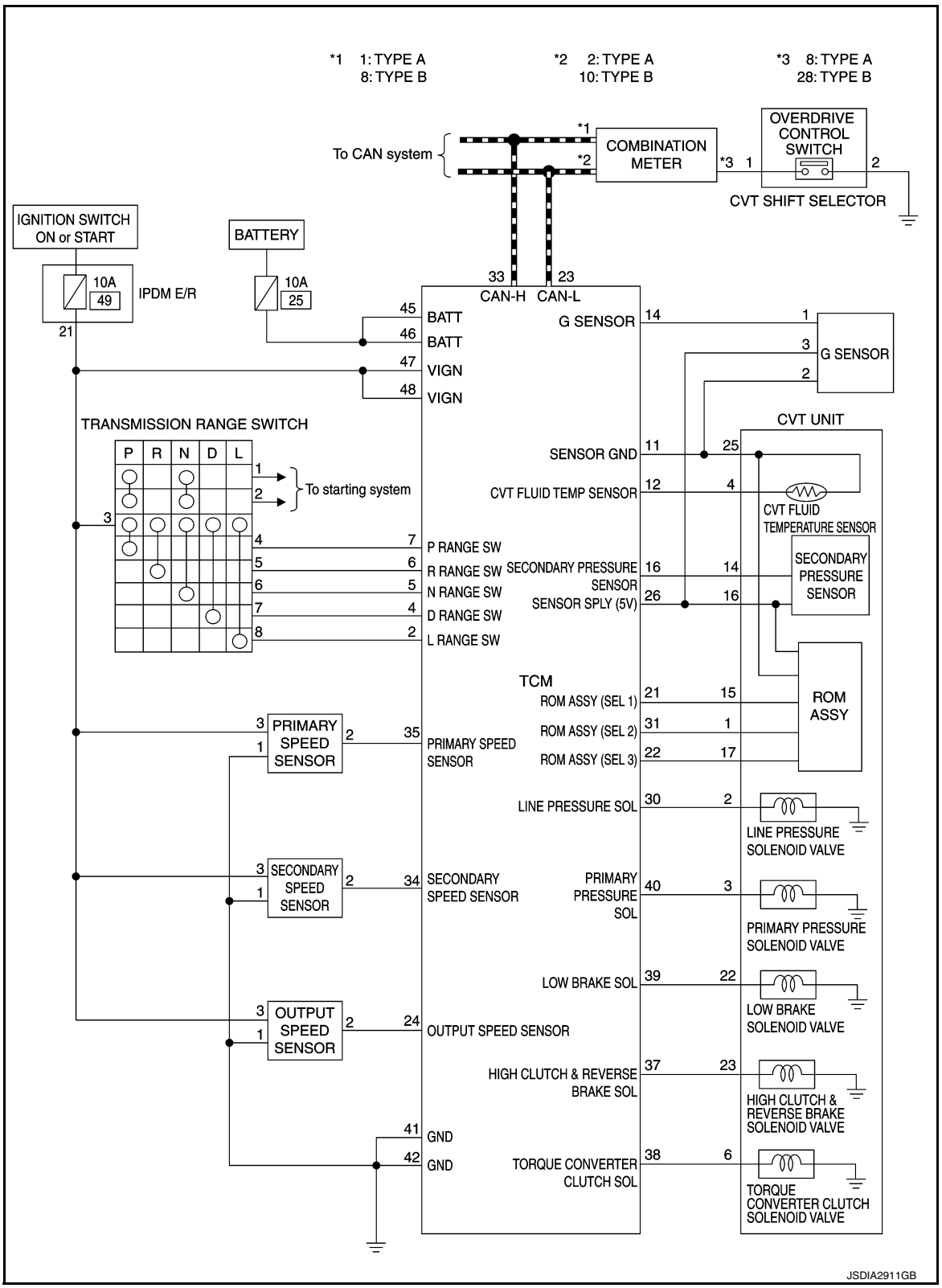
Control Item		Shift control	Line pressure control	Select control	Lock-up control	Fail-safe function *
Input	Engine torque signal (CAN communication)	×	×	×	×	×
	Engine speed signal (CAN communication)	×	×	×	×	×
	Accelerator pedal position signal (CAN communication)	×	×	×	×	×
	Closed throttle position signal (CAN communication)	×	×		×	
	Stop lamp switch signal (CAN communication)	×	×	×	×	
	Secondary pressure sensor	×	×	×		×
	CVT fluid temperature sensor		×	×	×	×
	Primary speed sensor	×	×		×	×
	Secondary speed sensor	×	×	×	×	×
	Output speed sensor	×	×	×	×	×
	Transmission range switch	×	×	×	×	×
	Overdrive control switch (CAN communication)	×				

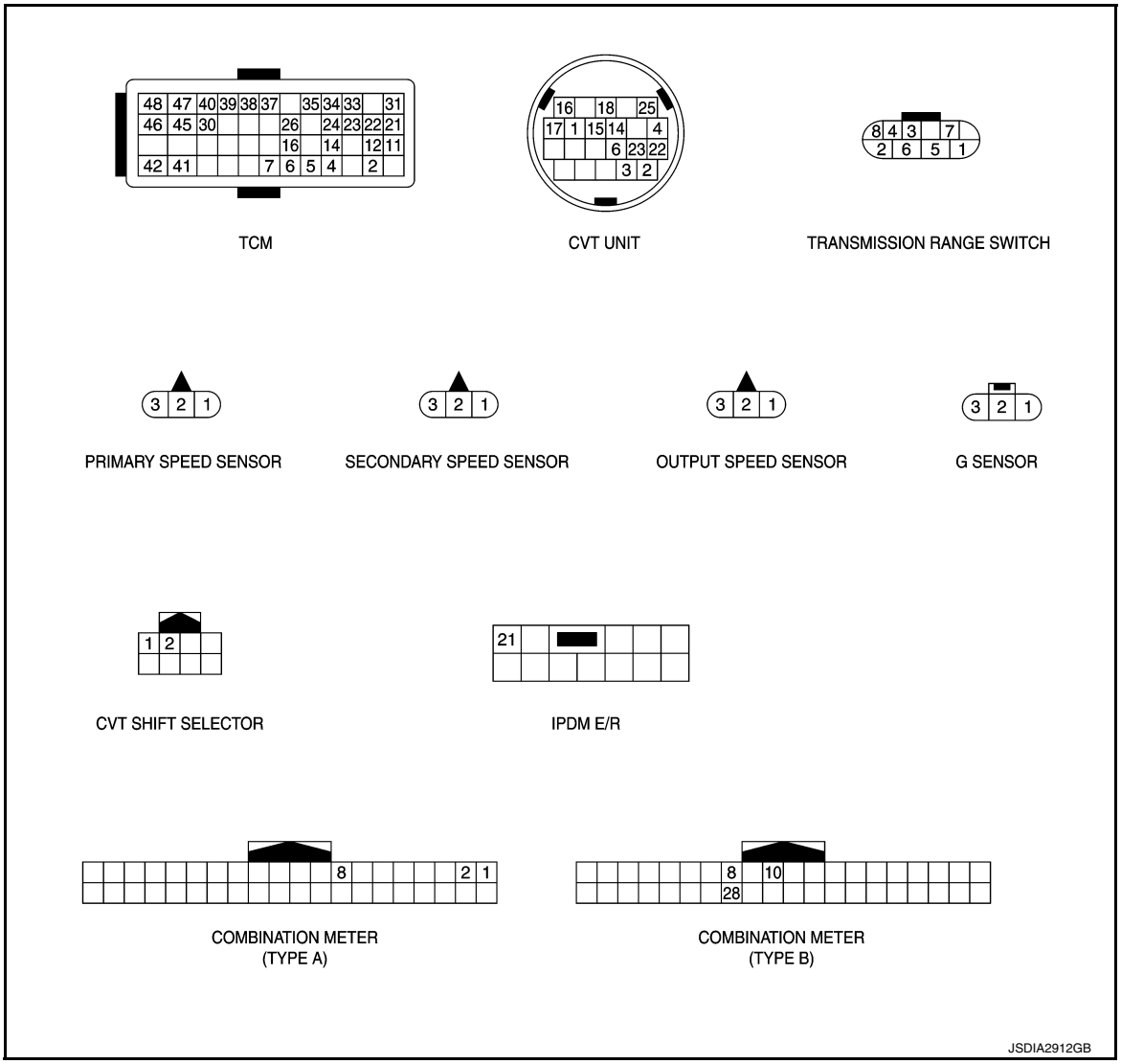
Control Item		Shift control	Line pressure control	Select control	Lock-up control	Fail-safe function *
Output	Line pressure solenoid valve	×	×	×		×
	Primary pressure solenoid valve	×				×
	Torque converter clutch solenoid valve				×	×
	High clutch & reverse brake solenoid valve	×		×		×
	Low brake solenoid valve	×		×		×
	Shift position indicator (CAN communication)			×		
	OD OFF indicator lamp (CAN communication)	×				

·*: If these input/output signals show errors, TCM activates the fail-safe function.

CVT CONTROL SYSTEM : Schematic

INFOID:0000000009019860





CVT CONTROL SYSTEM : Fail-safe

INFOID:0000000009019861

TCM has a fail-safe mode. The mode functions so that operation can be continued even if the signal circuit of the main electronically controlled input/output parts is damaged.
If the vehicle shows following behaviors including “poor acceleration”, a malfunction of the applicable system is detected by TCM and the vehicle may be in a fail-safe mode. At this time, check the DTC code and perform inspection and repair according to the malfunction diagnosis procedures.

Fail-safe function

DTC	Vehicle behavior	Conditions of vehicle
P062F	Not changed from normal driving	—
P0705	• Shift position indicator on combination meter is not displayed. • Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0706	• Shift position indicator on combination meter is not displayed. • Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—

DTC	Vehicle behavior	Conditions of vehicle
P0711	Acceleration is slow	Engine coolant temperature when engine start: Temp. ≥ 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: −35°C (−31°F) ≤Temp. < 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: Temp. < −35°C (−31°F)
P0712	Acceleration is slow	Engine coolant temperature when engine start: Temp. ≥ 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: −35°C (−31°F) ≤Temp. < 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: Temp. < −35°C (−31°F)
P0713	Acceleration is slow	Engine coolant temperature when engine start: Temp. ≥ 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: −35°C (−31°F) ≤Temp. < 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: Temp. < −35°C (−31°F)
P0715	• Selector shock is large • Start is slow • Acceleration is slow • Vehicle speed is not increased • Lock-up is not performed	—
P0720	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0740	Lock-up is not performed	—
P0743	Lock-up is not performed	—
P0744	Lock-up is not performed	—
P0746	• Selector shock is large • Start is slow • Acceleration is slow • Vehicle speed is not increased • Lock-up is not performed	—
P0846	• Start is slow • Acceleration is slow	—
P0847	Acceleration is slow	—
P0848	• Start is slow • Acceleration is slow	—
P0863	Not changed from normal driving	—
P0890	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0962	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0963	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—

DTC	Vehicle behavior	Conditions of vehicle
P0965	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0966	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0967	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0998	• Start is slow • Lock-up is not performed	—
P0999	• Start is slow • Lock-up is not performed	Wire disconnection
	• Vehicle speed is not increased • Lock-up is not performed	Voltage shorting
P099B	Start is slow	—
P099C	• Start is slow • Lock-up is not performed	Wire disconnection
	• Vehicle speed is not increased • Lock-up is not performed	Voltage shorting
P1586	Idle neutral control is not performed	—
P1588	Idle neutral control is not performed	—
P2765	• Selector shock is large • Start is slow • Acceleration is slow • Vehicle speed is not increased • Lock-up is not performed	—
P2857	• Start is slow • Lock-up is not performed	—
P2858	• Vehicle speed is not increased • Lock-up is not performed	—
P2859	Vehicle speed is not increased	—
P285A	Start is slow	—
U0073	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
U0100	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
U0140	Not changed from normal driving	—
U0141	Not changed from normal driving	—
U0155	Not changed from normal driving	—
U0300	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
U1000	Not changed from normal driving	—
U1114	Not changed from normal driving	—
U1117	Not changed from normal driving	—

CVT CONTROL SYSTEM : Protection Control

INFOID:0000000009019862

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.

CONTROL FOR WHEEL SPIN

Control	When a wheel spin is detected, the engine output and gear ratio are limited and the line pressure is increased. At the 1GR, the clutch pressure is increased.
Vehicle behavior in control	If the accelerator is kept depressing during wheel spin, the engine revolution and vehicle speed are limited to a certain degree. From the 1GR, upshift to a certain gear ratio is only allowed.
Normal return condition	Wheel spin convergence returns the control to the normal control.

CONTROL WHEN FLUID TEMPERATURE IS HIGH

Control	When the CVT fluid temperature is high, the gear shift permission maximum revolution and the maximum torque are reduced than usual to prevent increase of the oil temperature.
Vehicle behavior in control	Power performance may be lowered, compared to normal control.
Normal return condition	The control returns to the normal control when CVT fluid temperature is lowered.

TORQUE IS REDUCED WHEN DRIVING WITH THE REVERSE GEAR

Control	Engine output is controlled according to a vehicle speed while reversing the vehicle.
Vehicle behavior in control	Power performance may be lowered while reversing the vehicle.
Normal return condition	Torque returns to normal by positioning the selector lever in a range other than “R” position.

REVERSE PROHIBIT CONTROL

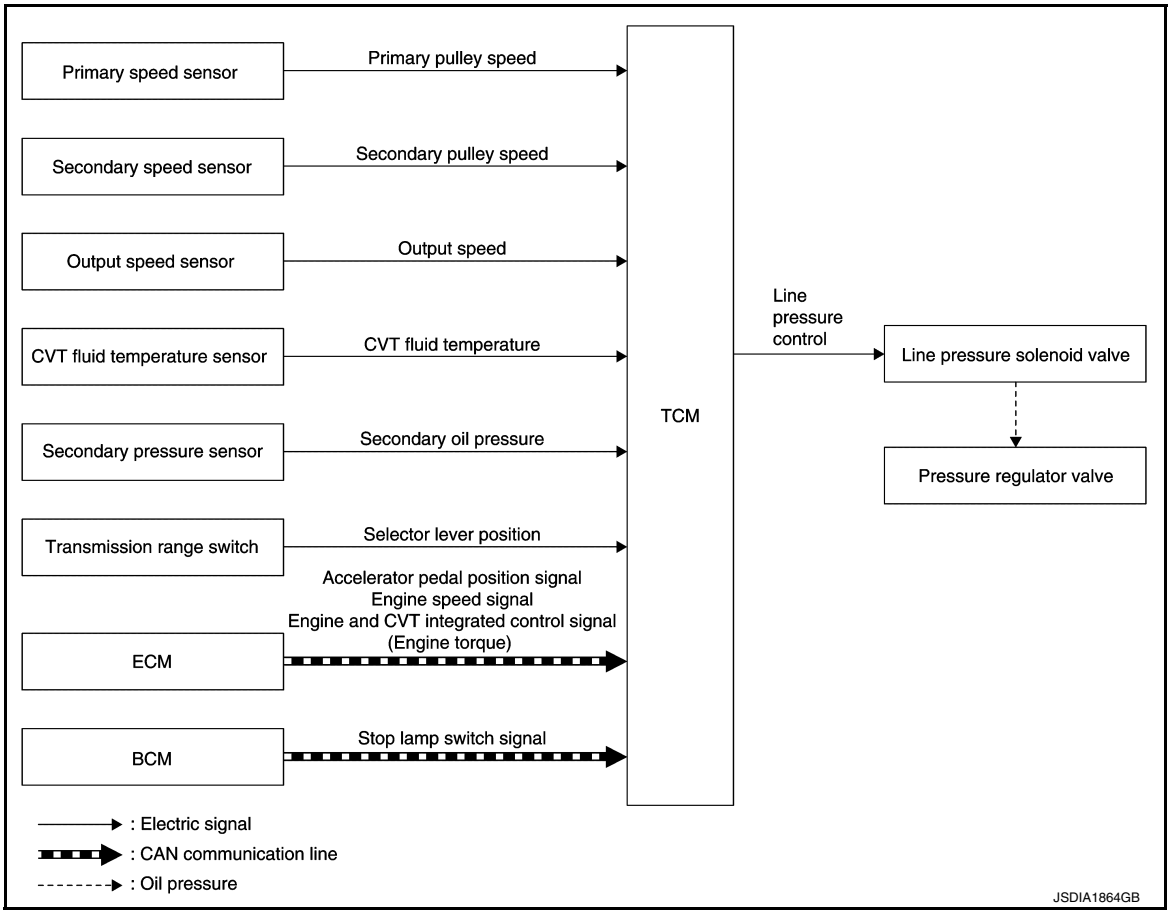
Control	The reverse brake is controlled to avoid becoming engaged when the selector lever is set in “R” position while driving in forward direction at more than the specified speed.
Vehicle behavior in control	If the selector lever is put at “R” position when driving with the forward gear, the gear becomes neutral, not reverse.
Normal return condition	The control returns to normal control when the vehicle is driven at low speeds. (The reverse brake becomes engaged.)

LINE PRESSURE CONTROL

LINE PRESSURE CONTROL : System Description

INFOID:0000000009019863

SYSTEM DIAGRAM



DESCRIPTION

Highly accurate line pressure control (secondary pressure control) reduces friction for improvement of fuel economy.

Normal Oil Pressure Control

Appropriate line pressure and secondary pressure suitable for driving condition are determined based on the accelerator pedal position, engine speed, primary pulley (input) speed, secondary pulley (output) speed, vehicle speed, input torque, stop lamp switch signal, transmission range switch signal, lock-up signal, power voltage, target shift ratio, oil temperature and oil pressure.

Secondary Pressure Feedback Control

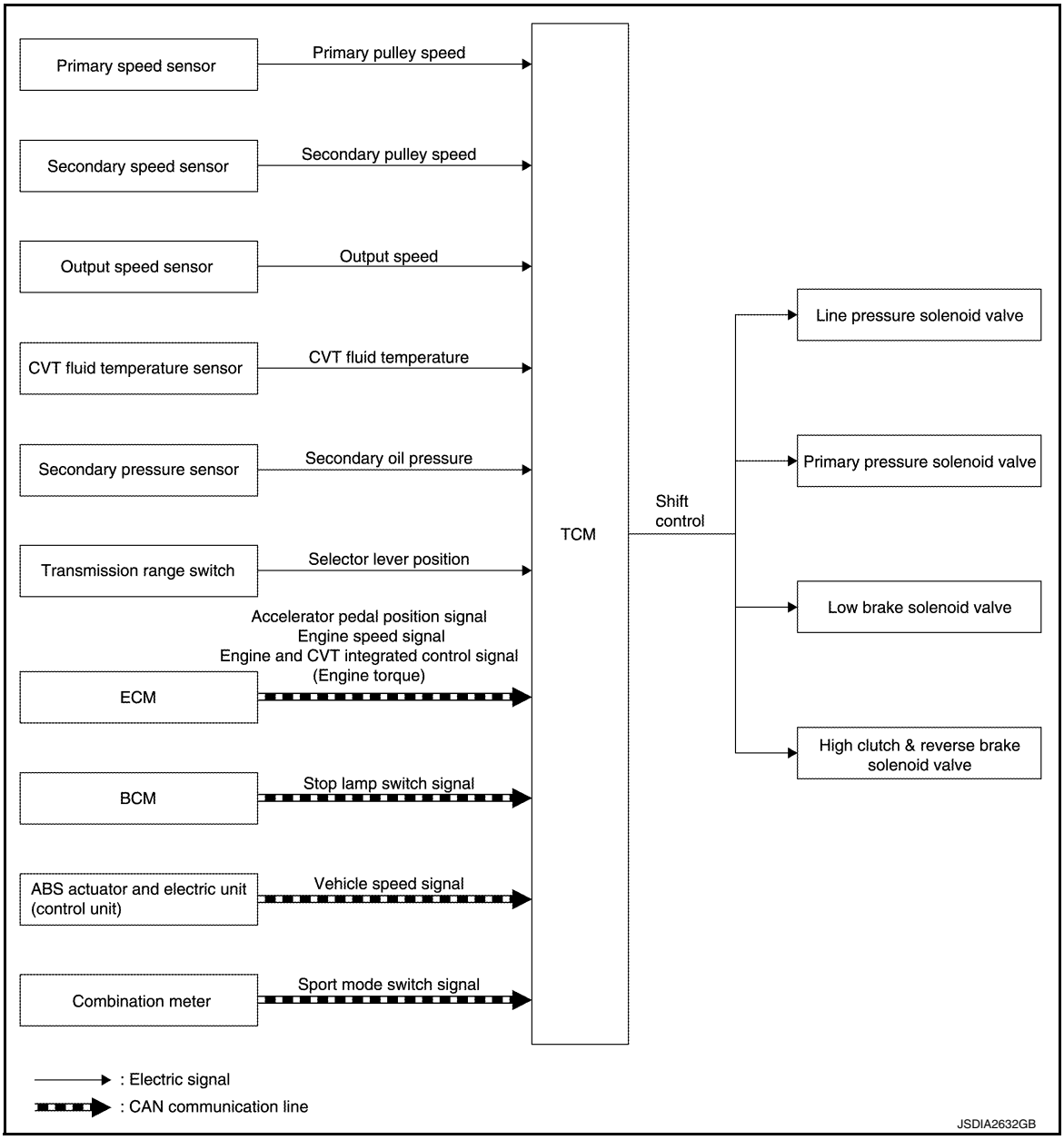
In normal oil pressure control and oil pressure control in shifting, highly accurate secondary pressure is determined by detecting the secondary pressure using a oil pressure sensor and by feedback control.

SHIFT CONTROL

SHIFT CONTROL : System Description

INFOID:0000000009019864

SYSTEM DIAGRAM

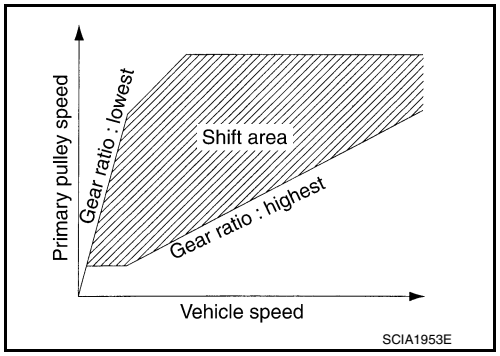


DESCRIPTION

To select the gear ratio that can give the driving force to meet driver's intent or vehicle situation, the vehicle driving condition such as vehicle speed or accelerator pedal position is detected and the most appropriate gear ratio is selected and the shifting method before reaching the speed is determined. The information is output to the primary pressure solenoid valve to control the line pressure input/output to the primary pulley, to determine the primary pulley (movable pulley) position and to control the gear position.

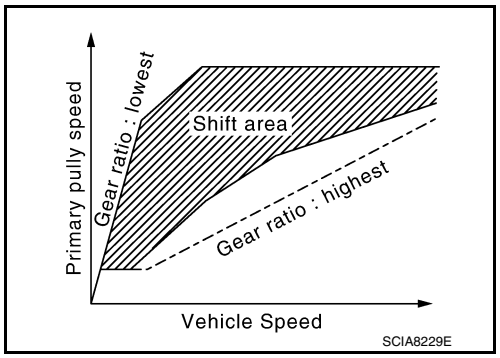
D Position (Normal)

Gear shifting is performed in all shifting ranges from the lowest to the highest gear ratio.



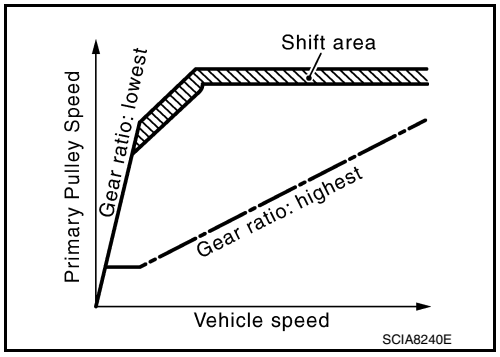
D Position (OD OFF)

The gear ratio is generally high by limiting the shifting range on the high side, and this always generates a large driving power.



L Position

By limiting the shifting range only to the lowest of the gear ratio, a large driving force and engine brake are obtained.

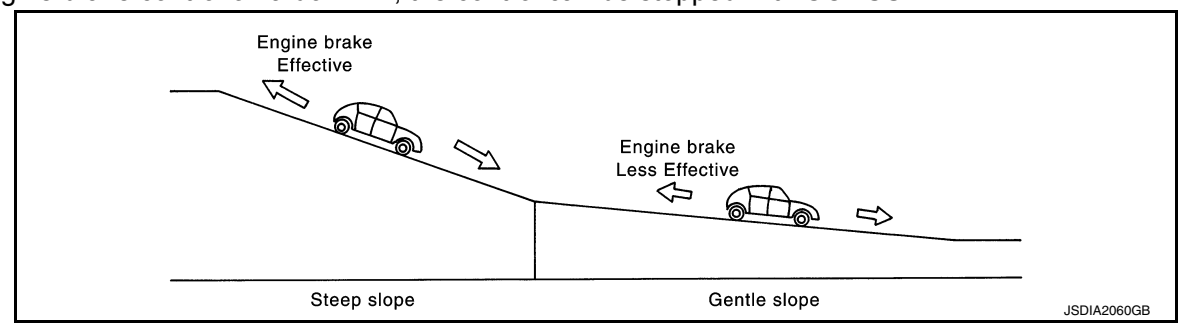


Hill Climbing And Descending Control

If a downhill is detected with the accelerator pedal is released, the system performs downshift to increase the engine brake force so that vehicle may not be accelerated more than necessary. If a climbing hill is detected, the system improves the acceleration performance in re-acceleration by limiting the gear shift range on the high side.

NOTE:

For engine brake control on a downhill, the control can be stopped with CONSULT.



Control In Acceleration

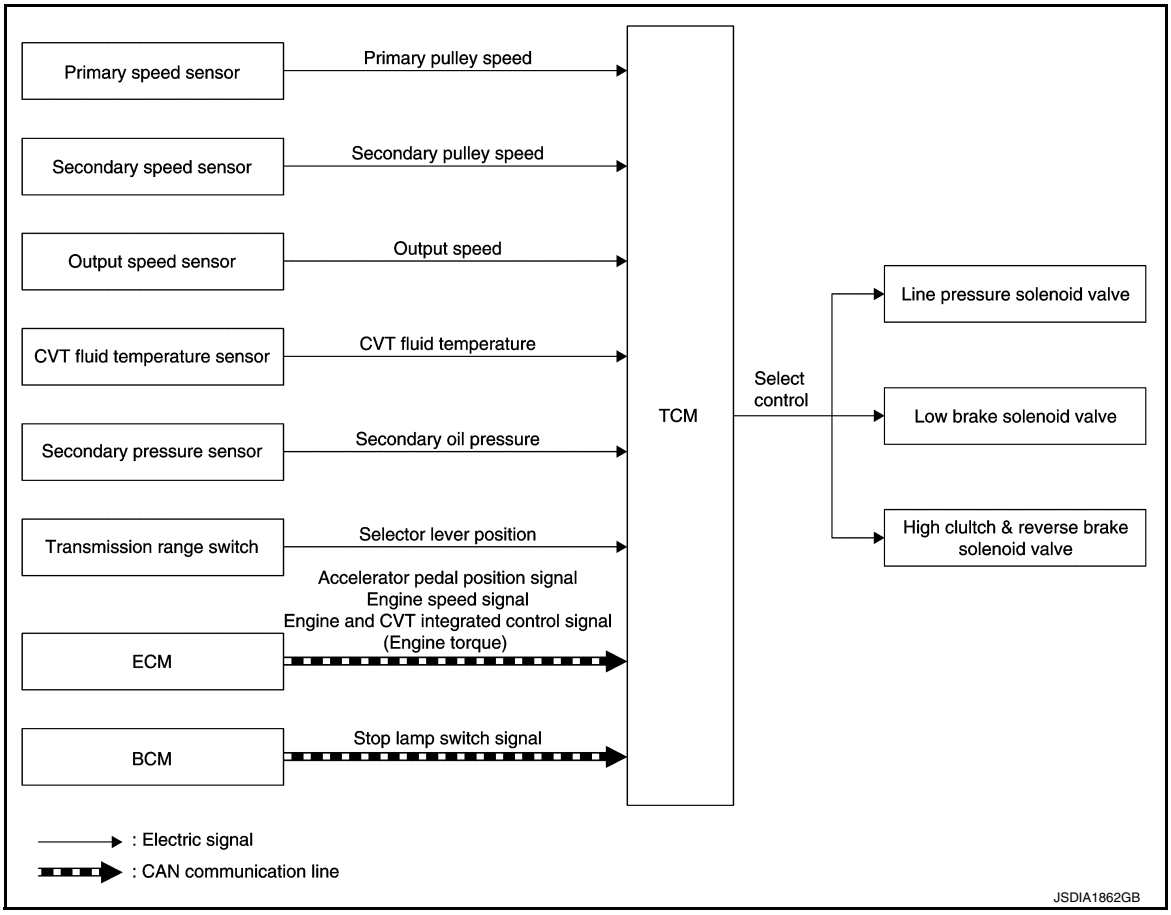
From change of the vehicle speed or accelerator pedal position, the acceleration request level of the driver or driving scene is evaluated. In start or acceleration during driving, the gear shift characteristics with linearity of revolution increase and vehicle speed increase are gained to improve the acceleration feel.

SELECT CONTROL

SELECT CONTROL : System Description

INFOID:0000000009019865

SYSTEM DIAGRAM



DESCRIPTION

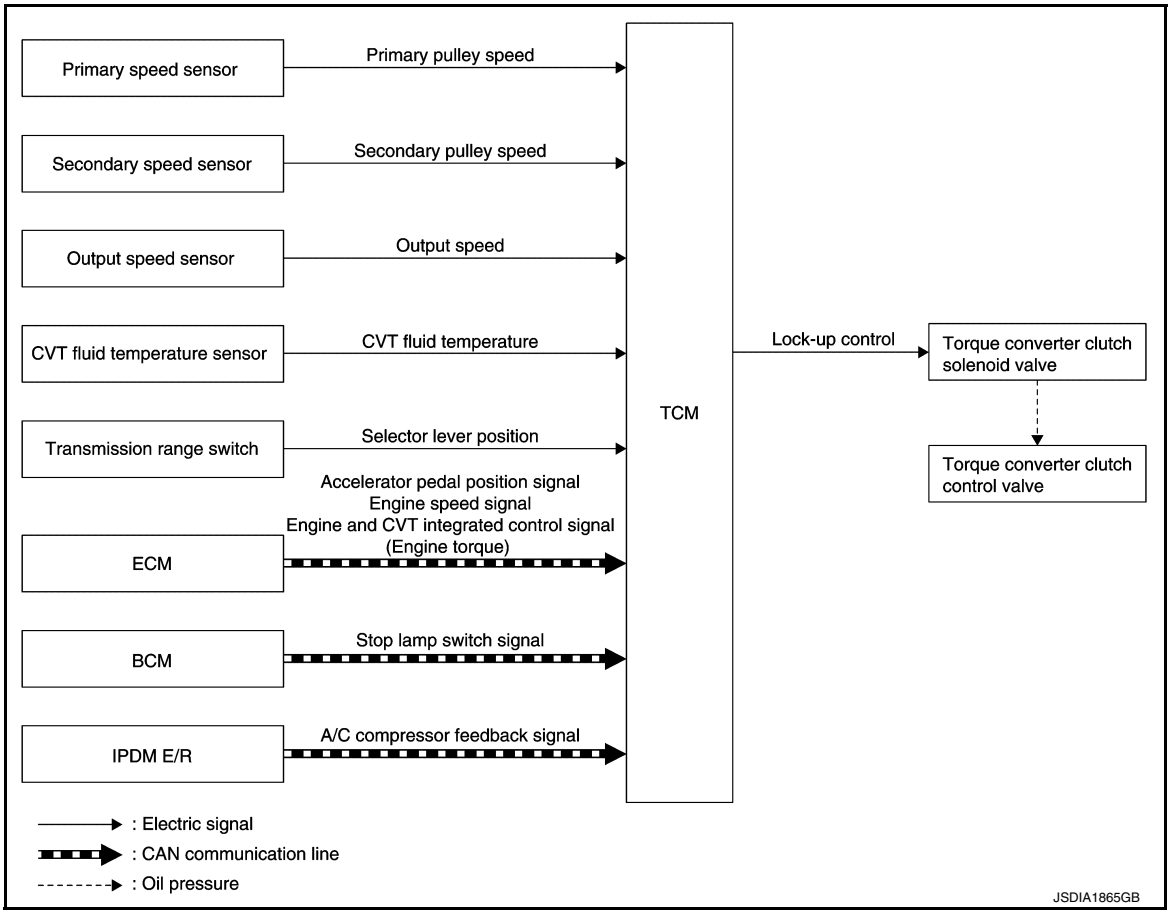
Based on accelerator pedal angle, engine speed, primary pulley speed, and the secondary pulley speed, the optimum operating pressure is set to reduce impact of a selector lever operation while shifting from “N” (“P”) to “D” (“R”) position.

LOCK-UP CONTROL

LOCK-UP CONTROL : System Description

INFOID:0000000009019866

SYSTEM DIAGRAM



DESCRIPTION

- Controls for improvement of the transmission efficiency by engaging the torque converter clutch in the torque converter and eliminating slip of the converter. Achieves comfortable driving with slip control of the torque converter clutch.
- The oil pressure feed circuit for the torque converter clutch piston chamber is connected to the torque converter clutch control valve. The torque converter clutch control valve is switched by the torque converter clutch solenoid valve with the signal from TCM. This controls the oil pressure circuit, which is supplied to the torque converter clutch piston chamber, to the release side or engagement side.
- If the CVT fluid temperature is low or the vehicle is in fail-safe mode due to malfunction, lock-up control is prohibited.

Lock-up engagement

In lock-up engagement, the torque converter clutch solenoid valve makes the torque converter clutch control valve locked up to generate the lock-up apply pressure. This pushes the torque converter clutch piston for engagement.

Lock-up release condition

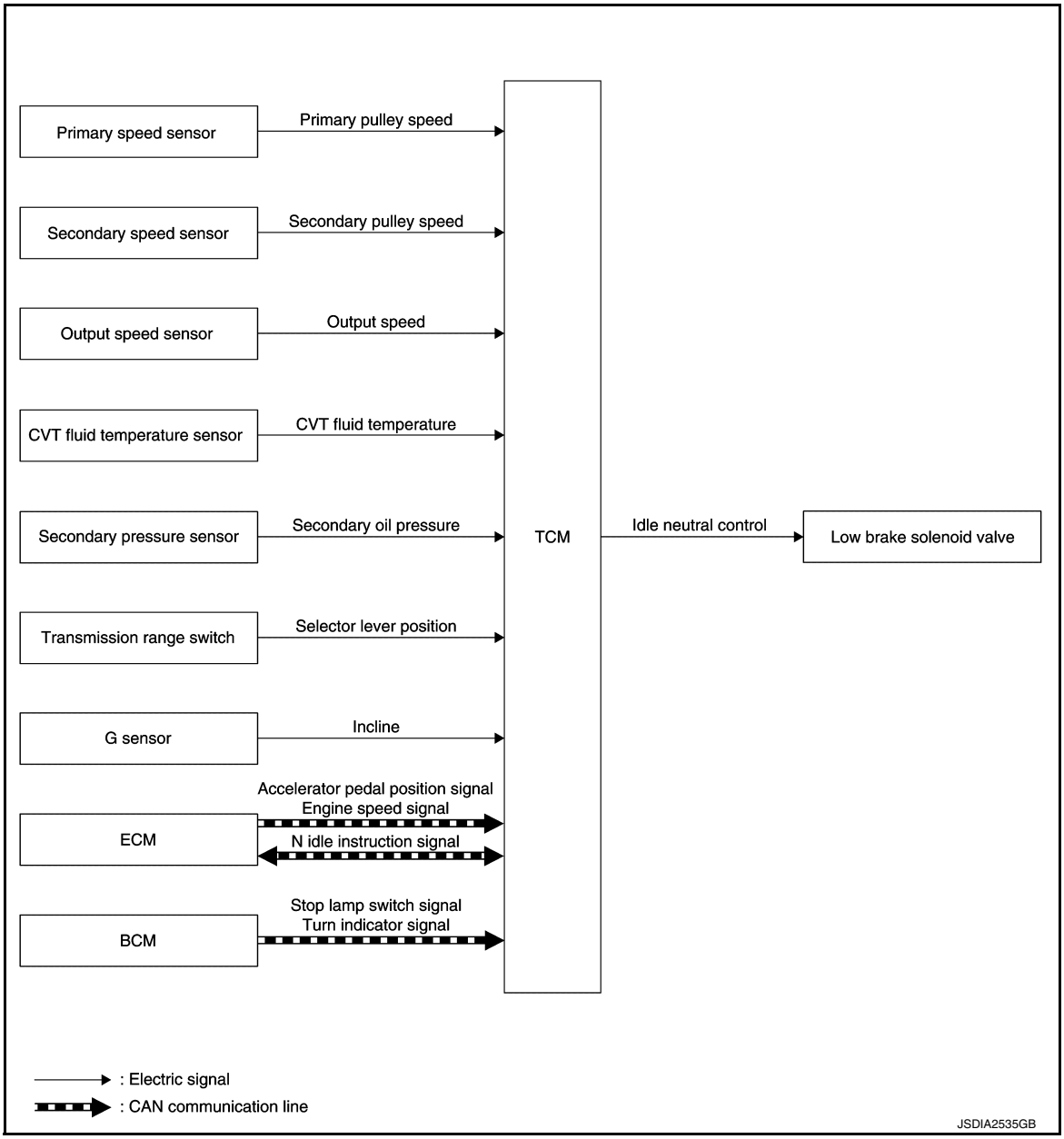
In lock-up release, the torque converter clutch solenoid valve makes the torque converter clutch control valve non-locked up to drain the lock-up apply pressure. This does not engage the torque converter clutch piston.

IDLE NEUTRAL CONTROL

IDLE NEUTRAL CONTROL : System Description

INFOID:0000000009019867

SYSTEM DIAGRAM

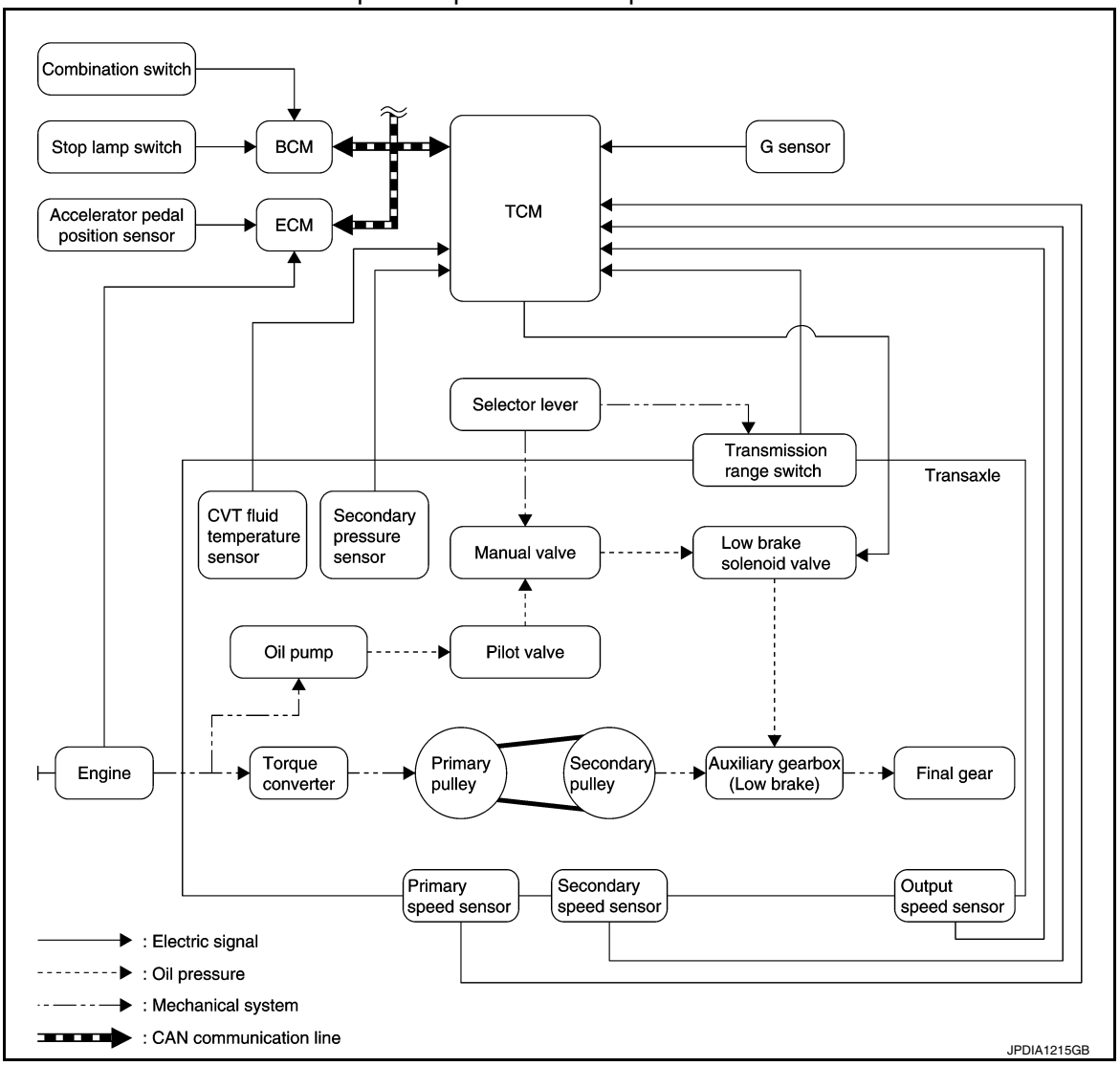


DESCRIPTION

If a driver has no intention of starting the vehicle in D position, TCM operates the low brake solenoid valve and controls the oil pressure of the low brake to be low pressure. Therefore, the low brake is in the release (slip) status and the power transmission route of transaxle is the same status as the N position. In this way, the transaxle is in idling status and load to the engine can be reduced to improve fuel economy.

NOTE:

Provides idle neutral control when stop/start operation is not performed.



Idle Neutral Control Start Condition

Idle neutral control is started when all of the following conditions are fulfilled. However, during idle neutral control, idle neutral control is stopped when any of the following conditions is not met or idle neutral control continues 30 seconds.

Driving environment	: Flat road or road with mild gradient
Selector lever position	: “D” position
Vehicle speed	: 0 km/h (0 MPH)
Accelerator pedal position	: 0.0/8
Brake pedal	: Depressed
Engine speed	: Idle speed
Turn signal lamp/hazard signal lamp	: Not activated

NOTE:

Stops or prohibits the idle neutral control when the TCM and ECM detect that the vehicle is in one of the following conditions.

- Engine coolant temperature and CVT fluid temperature are the specified temperature or more, or the specified temperature or less.
- When a transaxle malfunction occurs.
- When the vehicle detects DTC and is in the fail-safe mode.

Idle Neutral Control Resume Condition

When the idle neutral control finishes, if the vehicle is driven at more than the specified speed and the idle neutral control start conditions are satisfied, the idle neutral control starts again. If the vehicle has a malfunction, the idle neutral control does not start.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Description

INFOID:0000000009019870

This is an on board diagnosis system which records diagnosis information related to the exhaust gases. It detects malfunctions related to sensors and actuators. The malfunctions are indicated by means of the malfunction indicator lamp (MIL) and are stored as DTC in the ECU memory. The diagnosis information can be checked using a diagnosis tool (GST: Generic Scan Tool).

Function of OBD

INFOID:0000000009019871

The GST is connected to the diagnosis connector on the vehicle and communicates with the on-board control units to perform diagnosis. The diagnosis connector is the same as for CONSULT. Refer to GI-49, "Description".

DIAGNOSIS SYSTEM (TCM)

DIAGNOSIS DESCRIPTION

DIAGNOSIS DESCRIPTION : 1 Trip Detection Diagnosis and 2 Trip Detection Diagnosis

INFOID:0000000009019872

NOTE:
"Start the engine and turn OFF the ignition switch after warm-up." This is defined as 1 trip.

1 TRIP DETECTION DIAGNOSIS

When initial malfunction is detected, TCM memorizes DTC. In these diagnoses, some illuminate MIL and some do not. Refer to TM-111, "DTC Index".

2 TRIP DETECTION DIAGNOSIS

When initial malfunction is detected, TCM memorizes DTC of the 1st trip. MIL does not light at this stage. <1 trip>
If the same malfunction is detected again in next driving, TCM memorizes DTC. When DTC is memorized, MIL lights. <2 trip>
"Trip" of the "2 trip detection diagnosis" indicates the driving mode that executes self-diagnosis during driving.

×: Check possible —: Check not possible

Item	DTC at the 1st trip		DTC		MIL	
	Display at the 1st trip	Display at the 2nd trip	Display at the 1st trip	Display at the 2nd trip	Illumination at the 1st trip	Illumination at the 2nd trip
1 trip detection diagnosis (Refer to TM-111, "DTC Index")	—	—	×	—	×	—
2 trip detection diagnosis (Refer to TM-111, "DTC Index")	×	—	—	×	—	×

DIAGNOSIS DESCRIPTION : DTC and DTC of 1st Trip

INFOID:0000000009019873

2 TRIP DETECTION DIAGNOSIS THAT ILLUMINATES MIL

- The DTC number of the 1st trip is the same as the DTC number.
- When a malfunction is detected at the 1st trip, TCM memorizes DTC of the 1st trip. MIL does not light at this stage. If the same malfunction is not detected at the 2nd trip (conforming to necessary driving conditions), DTC at the 1st trip is erased from TCM. If the same malfunction is detected at the 2nd trip, TCM memorizes DTC and MIL lights at the same time.
- The DTC of the 1st trip is specified in Service $01 of SAE J1979/ISO 15031-5. Since detection of DTC at the 1st trip does not illuminate MIL, warning for a problem is not given to a driver.
- For procedure to delete DTC and 1st trip DTC from TCM, refer to TM-92, "CONSULT Function".
- If DTC of the 1st trip is detected, it is necessary to check the cause according to the "Diagnosis flow". Refer to TM-123, "Flowchart of Trouble Diagnosis".

DIAGNOSIS DESCRIPTION : Malfunction Indicator Lamp (MIL)

INFOID:0000000009019874

- TCM not only detects DTC, but also sends the MIL signal to ECM through CAN communication. ECM sends the MIL signal to the combination meter through CAN communication according to the signal, and illuminates MIL.
- For malfunction indicator lamp (MIL) description, refer to EC-24, "WARNING LAMPS/INDICATOR LAMPS : Malfunction Indicator Lamp (MIL)".

DIAGNOSIS DESCRIPTION : Counter System

INFOID:0000000009019875

RELATION BETWEEN DTC AT 1ST TRIP/DTC/MIL AND DRIVING CONDITIONS (FOR 2 TRIP DETECTION DIAGNOSIS THAT ILLUMINATES MIL)

- When initial malfunction is detected, TCM memorizes DTC of the 1st trip. MIL does not light at this stage.
- If the same malfunction is detected at the 2nd trip, TCM memorizes DTC and MIL lights at the same time.
- Then, MIL goes after driving the vehicle for 3 trips under "Driving condition B" without malfunction.
- DTC is displayed until 40 trips of "Driving condition A" are satisfied without detecting the same malfunction. DTC is erased when 40 trips are satisfied.

- When the self-diagnosis result is acceptable at the 2nd trip (conforming to driving condition B), DTC of the 1st trip is erased.

COUNTER SYSTEM LIST

Item	Driving condition	Trip
MIL (OFF)	B	3
DTC (clear)	A	40
DTC at 1st trip (clear)	B	1

DRIVING CONDITION

Driving condition A

Driving condition A is the driving condition that provides warm-up.
In specific, count-up is performed when all of the following conditions are satisfied.

- Engine speed is 400 rpm or more.
- After start of the engine, the water temperature increased by 20 °C (36 °F) or more.
- Water temperature was 70 °C (158 °F) or more.
- The ignition switch was changed from ON to OFF.

NOTE:

- If the same malfunction is detected regardless of the driving condition, reset the A counter.
- When the above is satisfied without detecting the same malfunction, count up the A counter.
- When MIL goes off due to the malfunction and the A counter reaches 40, the DTC is erased.

Driving condition B

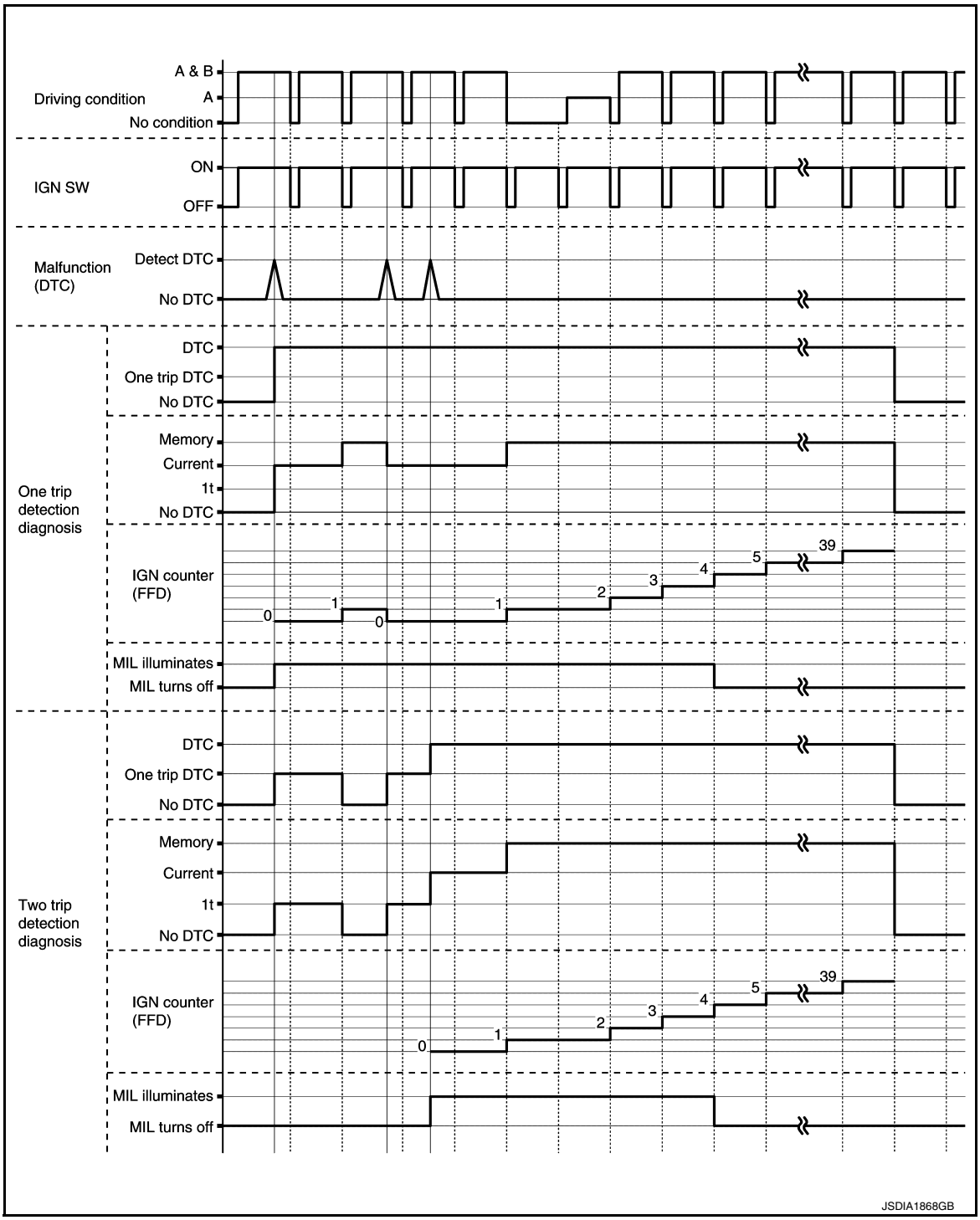
Driving condition B is the driving condition that performs all diagnoses once.
In specific, count-up is performed when all of the following conditions are satisfied.

- Engine speed is 400 rpm or more.
- Water temperature was 70 °C (158 °F) or more.
- In closed loop control, vehicle speed of 70 – 120 km/h (43 – 75 MPH) continued for 60 seconds or more.
- In closed loop control, vehicle speed of 30 – 60 km/h (19 – 37 MPH) continued for 10 seconds or more.
- In closed loop control, vehicle speed of 4 km/h (2 MPH) or less and idle determination ON continued for 12 seconds or more.
- After start of the engine, 22 minutes or more have passed.
- The condition that the vehicle speed is 10km/h (6 MPH) or more continued for 10 seconds or more in total.
- The ignition switch was changed from ON to OFF.

NOTE:

- If the same malfunction is detected regardless of the driving condition, reset the B counter.
- When the above is satisfied without detecting the same malfunction, count up the B counter.
- When the B counter reaches 3 without malfunction, MIL goes off.
- When the B counter is counted once without detecting the same malfunction after TCM memorizes DTC of the 1st trip, DTC of the 1st trip is erased.

TIME CHART



CONSULT Function

INFOID:0000000009019876

APPLICATION ITEMS

Conditions	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.

Conditions	Function
CAN Diagnosis Support Monitor	It monitors the status of CAN communication.
ECU Identification	Display the ECU identification number (part number etc.) of the selected system.
CALIB DATA	The calibration data status of TCM can be checked.

SELF DIAGNOSTIC RESULTS

Display Item List
Refer to TM-111, "DTC Index".

DTC at 1st trip and method to read DTC
- DTC (P0705, P0711, P0720, etc.) is specified by SAE J2012/ISO 15031-6.
- DTC and DTC at 1st trip are displayed on “Self Diagnostic results” of CONSULT.
  When DTC is currently detected, “CRNT” is displayed. If “PAST” is displayed, it shows a malfunction occurred in the past.The trip number of drive without malfunction of concerned DTC can be confirmed with “IGN counter” inside “FFD”.
- When the DTC at the 1st trip is detected, the “timing” is displayed as “1t”.

DTC deletion method
NOTE:
- If the battery terminal is disconnected, the TCM memory is erased. (The disconnection time varies from several seconds to several hours.
- If the ignition switch is left ON after repair, turn OFF the ignition switch and wait for 10 seconds or more. Then, turn the ignition ON again. (Engine stop)

1. Touch “TRANSMISSION” of CONSULT.
2. Touch “Self Diagnostic Result”.
3. Touch “Erase”. (DTC memorized in TCM is erased.)

IGN counter
The ignition counter is displayed in “FFD” and the number of times of satisfied “Driving condition A” is displayed after normal recovery of DTC. Refer to TM-90, "DIAGNOSIS DESCRIPTION : Counter System".
- If malfunction (DTC) is currently detected, “0” is displayed.
- After normal recovery, every time “Driving condition A” is satisfied, the display value increases from 1 → 2 → 3...38 → 39.
- When MIL turns OFF due to the malfunction and the counter reaches 40, the DTC is erased.
  NOTE:
  The counter display of “40” cannot be checked.

DATA MONITOR

NOTE:
The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

×: Application ▼: Optional selection

Monitored item	(Unit)	Monitor item selection		Remarks
		MAIN SIGNALS	ECU INPUT SIGNALS	
VSP SENSOR	(km/h or mph)	▼	×	Displays the vehicle speed calculated from the CVT output shaft speed.
ESTM VSP SIG	(km/h or mph)	▼	×	Displays the vehicle speed signal (ABS) received through CAN communication.
PRI SPEED SEN	(rpm)	▼	×	Displays the primary pulley speed calculated from the pulse signal of the primary speed sensor.
SEC REV SENSOR	(rpm)	▼	×	Displays the secondary pulley speed calculated from the pulse signal of the secondary speed sensor.
VHCL/S SE (REV)	(rpm)	▼	×	Displays the CVT output shaft speed calculated from the pulse signal of the output speed sensor.
ENG SPEED SIG	(rpm)	▼	×	Displays the engine speed received through CAN communication.

Monitored item	(Unit)	Monitor item selection		Remarks
		MAIN SIGNALS	ECU INPUT SIGNALS	
LINE PRESSURE SEN	(V)	▼	×	Displays the signal voltage of the line pressure sensor.
ATF TEMP SEN	(V)	▼	×	Displays the signal voltage of the CVT fluid temperature sensor.
G SENSOR	(V)	▼	×	Displays the signal voltage of the G sensor.
VIGN SEN	(V)	▼	×	Displays the battery voltage applied to TCM.
VEHICLE SPEED	(km/h or mph)	×	▼	Displays the vehicle speed recognized by TCM.
INPUT REV	(rpm)	▼	▼	Displays the input shaft speed of CVT recognized by TCM.
PRI SPEED	(rpm)	×	▼	Displays the primary pulley speed recognized by TCM.
SEC SPEED	(rpm)	▼	▼	Displays the secondary pulley speed recognized by TCM.
OUTPUT REV	(rpm)	▼	▼	Displays the output shaft speed of CVT recognized by TCM.
ENG SPEED	(rpm)	×	▼	Displays the engine speed recognized by TCM.
SLIP REV	(rpm)	×	▼	Displays the speed difference between the input shaft speed of CVT and the engine speed.
TOTAL GEAR RATIO		×	▼	Displays the total CVT gear ratio calculated from input shaft speed/output shaft speed of CVT.
PULLEY GEAR RATIO		×	▼	Displays the pulley gear ratio calculated from primary pulley speed/secondary pulley speed.
AUX GEARBOX		▼	▼	Displays the gear position of the auxiliary gearbox recognized by TCM.
G SPEED	(G)	▼	▼	Displays the acceleration and deceleration speed of the vehicle calculated from vehicle speed change.
ACCEL POSI SEN 1	(deg)	×	×	Displays the estimated throttle position received through CAN communication.
VENG TRQ	(Nm)	×	▼	Display the engine torque recognized by TCM.
PRI TRQ	(Nm)	▼	▼	Display the input shaft torque of CVT.
TRQ RTO		▼	▼	Display the torque ratio of torque converter.
LINE PRESSURE	(MPa)	×	▼	Displays the secondary pressure (line pressure) calculated from the signal voltage of the secondary pressure sensor.
FLUID TEMP	(°C or °F)	×	▼	Displays the CVT fluid temperature calculated from the signal voltage of the CVT fluid temperature sensor.
DSR REV	(rpm)	▼	▼	Displays the target primary pulley speed calculated from processing of gear shift control.
TRGT GEAR RATIO		▼	▼	Displays the target gear ratio from the input shaft to the output shaft of CVT calculated from processing of gear shift control.
TGT PLLY GR RATIO		▼	▼	Displays the target gear ratio of the pulley from processing of gear shift control.
TRGT AUX GEARBOX		▼	▼	Displays the target gear of the auxiliary gearbox calculated from processing of gear shift control.
LU PRS	(MPa)	▼	▼	Displays the target oil pressure of the torque converter clutch solenoid valve calculated from oil pressure processing of gear shift control.

Monitored item	(Unit)	Monitor item selection		Remarks
		MAIN SIGNALS	ECU INPUT SIGNALS	
LINE PRS	(MPa)	▼	▼	Displays the target oil pressure of the line pressure solenoid valve calculated from oil pressure processing of gear shift control.
TRGT PRI PRESSURE	(MPa)	▼	▼	Displays the target oil pressure of the primary pressure solenoid valve calculated from oil pressure processing of gear shift control.
TRGT HC/RB PRESS	(MPa)	▼	▼	Displays the target oil pressure of the high clutch & reverse brake solenoid valve calculated from oil pressure processing of gear shift control.
TRGT LB PRESSURE	(MPa)	▼	▼	Displays the target oil pressure of the low brake solenoid valve calculated from oil pressure processing of gear shift control.
ISOLT1	(A)	×	▼	Displays the command current from TCM to the torque converter clutch solenoid valve.
ISOLT2	(A)	×	▼	Displays the command current from TCM to the line pressure solenoid valve.
PRI SOLENOID	(A)	×	▼	Displays the command current from TCM to the primary pressure solenoid valve.
HC/RB SOLENOID	(A)	×	▼	Displays the command current from TCM to the high clutch& reverse brake solenoid valve.
L/B SOLENOID	(A)	×	▼	Displays the command current from TCM to the low brake solenoid valve.
SOLMON1	(A)	×	×	Monitors the command current from TCM to the torque converter clutch solenoid valve and displays the monitored value.
SOLMON2	(A)	×	×	Monitors the command current from TCM to the line pressure solenoid valve and displays the monitored value.
PRI SOL MON	(A)	×	×	Monitors the command current from TCM to the primary pressure solenoid valve and displays the monitored value.
HC/RB SOL MON	(A)	×	×	Monitors the command current from TCM to the high clutch& reverse brake solenoid valve and displays the monitored value.
L/B SOL MON	(A)	×	×	Monitors the current command from TCM to the low brake solenoid valve and displays the monitored value.
D POSITION SW	(On/Off)	▼	×	Displays the operation status of the transmission range switch (D position).
N POSITION SW	(On/Off)	▼	×	Displays the operation status of the transmission range switch (N position).
R POSITION SW	(On/Off)	▼	×	Displays the operation status of the transmission range switch (R position).
P POSITION SW	(On/Off)	▼	×	Displays the operation status of the transmission range switch (P position).
BRAKESW	(On/Off)	×	×	Displays the reception status of the stop lamp switch signal received through CAN communication.
L POSITION SW	(On/Off)	▼	×	Displays the operation status of the transmission range switch (L position).
IDLE SW	(On/Off)	×	×	Displays the reception status of the closed throttle position signal received through CAN communication.
SPORT MODE SW	(On/Off)	×	×	Displays the reception status of the overdrive control switch signal received through CAN communication.

Monitored item	(Unit)	Monitor item selection		Remarks
		MAIN SIGNALS	ECU INPUT SIGNALS	
STRDWNSW	(On/Off)	▼	×	• Displays the operation status of the paddle shifter (down switch). • It is displayed although not equipped.
STRUPSW	(On/Off)	▼	×	• Displays the operation status of the paddle shifter (up switch). • It is displayed although not equipped.
DOWNLVR	(On/Off)	▼	×	• Displays the operation status of the selector lever (down switch). • It is displayed although not equipped.
UPLVR	(On/Off)	▼	×	• Displays the operation status of the selector lever (up switch). • It is displayed although not equipped.
NONMMODE	(On/Off)	▼	×	• Displays if the selector lever position is not at the manual shift gate. • It is displayed although not equipped.
MMODE	(On/Off)	▼	×	• Displays if the selector lever position is at the manual shift gate. • It is displayed although not equipped.
INDLRNG	(On/Off)	▼	▼	Displays the transmission status of the shift position (L position) signal transmitted through CAN communication.
INDDRNG	(On/Off)	▼	▼	Displays the transmission status of the shift position (D position) signal transmitted through CAN communication.
INGNRNG	(On/Off)	▼	▼	Displays the transmission status of the shift position (N position) signal transmitted through CAN communication.
INGRRNG	(On/Off)	▼	▼	Displays the transmission status of the shift position (R position) signal transmitted through CAN communication.
INGPRNG	(On/Off)	▼	▼	Displays the transmission status of the shift position (P position) signal transmitted through CAN communication.
CVT LAMP	(On/Off)	▼	▼	Displays the transmission status of the OD OFF indicator lamp signal transmitted through CAN communication.
SPORT MODE IND	(On/Off)	▼	▼	Displays the transmission status of the OD OFF indicator lamp signal transmitted through CAN communication.
MMODE IND	(On/Off)	▼	▼	• Displays the transmission status of the manual mode signal transmitted through CAN communication. • It is displayed although not equipped.
VDC ON	(On/Off)	▼	×	• Displays the reception status of the VDC (ESP) operation signal received through CAN communication. • It is displayed although not equipped.
TCS ON	(On/Off)	▼	×	• Displays the reception status of the TCS operation signal received through CAN communication. • It is displayed although not equipped.
ABS FAIL SIGNAL	(On/Off)	▼	×	Displays the reception status of the ABS malfunction signal received through CAN communication.
ABS ON	(On/Off)	▼	×	Displays the reception status of the ABS operation signal received through CAN communication.
4WD FAIL SIGNAL	(On/Off)	▼	×	• Displays the reception status of the 4WD malfunction signal received through CAN communication. • It is displayed although not equipped.

Monitored item	(Unit)	Monitor item selection		Remarks
		MAIN SIGNALS	ECU INPUT SIGNALS	
4WD OPERATION SIG	(On/Off)	▼	×	• Displays the reception status of the 4WD operation signal received through CAN communication. • It is displayed although not equipped.
4WD-TCS SIGNAL	(On/Off)	▼	×	• Displays the reception status of the engine torque down request signal received through CAN communication. • It is displayed although not equipped.
RANGE		×	▼	Displays the gear position recognized by TCM.
M GEAR POS		×	▼	Display the target gear of manual mode
G SEN SLOPE	(%)	▼	▼	Displays the gradient angle calculated from the G sensor signal voltage.
ENGBRKLVL	(On/Off)	▼	▼	Displays the setting of “ENGINE BRAKE ADJ” in “Work Support”.
PVIGN VOLT	(V)	▼	×	Displays the backup voltage of TCM.
TRGT AUX GR RATIO		▼	▼	Displays the target gear ratio of the auxiliary gearbox calculated from processing of gear shift control.
G SEN CALIBRATION	(YET/DONE)	▼	▼	Displays the status of “G SENSOR CALIBRATION” in “Work Support”.
N IDLE STATUS	(On/Off)	▼	▼	Displays idle neutral status.
CVT-B		▼	▼	• Displays CVT fluid temperature count. • This monitor item does not use.
CVT-A		▼	▼	• Displays CVT fluid temperature count. • This monitor item does not use.

WORK SUPPORT

Item name	Description
ENGINE BRAKE ADJ.	Although there is no malfunction on the transaxle and the CVT system, if a customer make a complaint like “I do not feel comfortable with automatic operation of the engine brake on downhill”, the engine brake may be cancelled with “engine brake adjustment”.
CONFORM CVTF DETERIORTN	Check the degradation level of the CVT fluid under severe conditions.
G SENSOR CALIBRATION	Compensate the G sensor.
ERASE CALIBRATION DATA	Erase the calibration data memorized by TCM.
ERASE LEARNING VALUE	Erase the learning value memorized by TCM.
ERASE MEMORY DATA	Perform “erasing of the calibration data” and “erasing of the learned value” at the same time.
CLUTCH POINT LEARNING*	Allow learning of the clutch engagement point of the auxiliary gearbox for TCM.

*: “Clutch point learning” can be selected, but do not use it.

Engine brake adjustment

ENGINE BRAKE LEVEL
ON : Turn ON the engine brake control.
OFF : Turn OFF the engine brake control.

Check the degradation level of the CVT fluid.

CVTF degradation level data

210,000 or more : Replacement of the CVT fluid is required.
Less than 210,000 : Replacement of the CVT fluid is not required.

ECU DIAGNOSIS INFORMATION

TCM

Reference Value

INFOID:0000000009019877

CONSULT DATA MONITOR STANDARD VALUE

- In CONSULT, electric shift timing or lock-up timing, i.e. operation timing of each solenoid valve, is displayed. Therefore, if there is an obvious difference between the shift timing estimated from a shift shock (or engine speed variations) and that shown on the CONSULT, the mechanism parts (including the hydraulic circuit) excluding the solenoids and sensors may be malfunctioning. In this case, check the mechanical parts following the appropriate diagnosis procedure.
- Shift point (gear position) displayed on CONSULT slightly differs from shift pattern described in Service Manual. This is due to the following reasons.

- Actual shift pattern may vary slightly within specified tolerances.
- While shift pattern described in Service Manual indicates start of each shift, CONSULT shows gear position at end of shift.
- The solenoid display (ON/OFF) on CONSULT is changed at the start of gear shifting. In contrast, the gear position display is changed at the time when gear shifting calculated in the control unit is completed.

NOTE:
The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Monitor item	Condition	Value/Status (Approx.)
VSP SENSOR	While driving	Almost same as the speedometer display.
ESTM VSP SIG	While driving	Almost same as the speedometer display.
PRI SPEED SEN	In driving (lock-up ON)	A value obtained from dividing engine speed by counter gear ratio
SEC REV SENSOR	Auxiliary gearbox: 1GR	Approximately twice the “VHCL/S SE (REV)”
	Auxiliary gearbox: 2GR	Almost same as the “VHCL/S SE (REV)”
VHCL/S SE (REV)	Auxiliary gearbox: 1GR	Approximately half of the “SEC REV SENSOR”
	Auxiliary gearbox: 2GR	Almost same as the “SEC REV SENSOR”
ENG SPEED SIG	Engine running	Almost same reading as tachometer
LINE PRESSURE SEN	• Selector lever: “N” position • At idle	0.88 – 0.92 V
ATF TEMP SEN	CVT fluid: Approx. 20°C (68°F)	2.01 – 2.05 V
	CVT fluid: Approx. 50°C (122°F)	1.45 – 1.50 V
	CVT fluid: Approx. 80°C (176°F)	0.90 – 0.94 V
G SENSOR	Vehicle is level	2.5 V
VIGN SEN	Ignition switch: ON	10 – 16 V
VEHICLE SPEED	While driving	Almost same as the speedometer display.
INPUT REV	In driving (lock-up ON)	Almost same as the engine speed.
PRI SPEED	In driving (lock-up ON)	A value obtained from dividing engine speed by counter gear ratio
SEC SPEED	Auxiliary gearbox: 1GR	Approximately twice the “OUTPUT REV”
	Auxiliary gearbox: 2GR	Almost same as “OUTPUT REV”
OUTPUT REV	Auxiliary gearbox: 1GR	Approximately half of “SEC SPEED”
	Auxiliary gearbox: 2GR	Almost same as “SEC SPEED”
ENG SPEED	Engine running	Almost same reading as tachometer
SLIP REV	While driving	Engine speed – Input speed

Monitor item	Condition	Value/Status (Approx.)
TOTAL GEAR RATIO	Auxiliary gearbox: 1GR	Counter gear ratio ×Pulley ratio Auxiliary gearbox gear ratio
	Auxiliary gearbox: 2GR	Counter gear ratio ×Pulley ratio
PULLEY GEAR RATIO	In driving (forward)	2.20 – 0.55
	In driving (reverse)	2.20
AUX GEARBOX	Vehicle started with selector lever in “L” position	1st
	Release the accelerator pedal after the following conditions are satisfied • Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 50 km/h (31 MPH) or more	2nd
	In gear shifting of auxiliary gearbox	1st ⇔ 2nd
G SPEED	Vehicle stopped	0.00 G
	During acceleration	The value changes to the positive side along with acceleration.
	During deceleration	The value changes to the positive side along with deceleration.
ACCEL POSI SEN 1	Accelerator pedal released	0.00 deg
	Accelerator pedal fully depressed	80.00 deg
VENG TRQ	While driving	The value changes along with acceleration/ deceleration.
PRI TRQ	While driving	The value changes along with acceleration/ deceleration.
TRQ RTO	While driving	The value changes along with acceleration/ deceleration.
LINE PRESSURE	Selector lever: “P” position	0.575 MPa
FLUID TEMP	Ignition switch ON.	Displays the CVT fluid temperature.
DSR REV	While driving	It varies along with the driving condition.
TRGT GEAR RATIO	While driving	It varies along with the driving condition.
TGT PLLY GR RATIO	In driving (forward)	2.20 – 0.55
	In driving (reverse)	2.20
TRGT AUX GEARBOX	Vehicle started with selector lever in “L” position	1st
	Release the accelerator pedal after the following conditions are satisfied • Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 50 km/h (31 MPH) or more	2nd
	In gear shifting of auxiliary gearbox	Display gear position after gear shifting
LU PRS	• Engine started • Vehicle is stopped.	–0.500 MPa
	• Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 20 km/h (12 MPH) or more	0.450 MPa
LINE PRS	• After engine warm up • Selector lever: “N” position • At idle	0.500 MPa
	• After engine warming up • Selector lever: “N” position • Depress the accelerator pedal fully	4.930 – 5.430 MPa
TRGT PRI PRESSURE	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	0.325 MPa

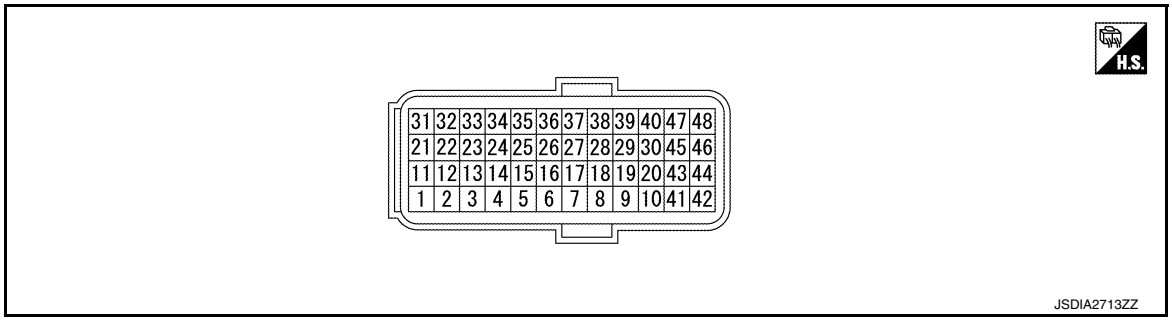
Monitor item	Condition	Value/Status (Approx.)
TRGT HC/RB PRESS	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	0.000 MPa
	Release the accelerator pedal after the following conditions are satisfied • Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 50 km/h (31 MPH) or more	0.400 MPa
TRGT LB PRESSURE	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	0.325 MPa
	Release the accelerator pedal after the following conditions are satisfied • Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 50 km/h (31 MPH) or more	0.000 MPa
ISOLT1	• Engine started • Vehicle is stopped.	0.000 A
	• Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 20 km/h (12 MPH) or more	0.500 A
ISOLT2	• After engine warm up • Selector lever: “N” position • At idle	0.800 – 0.900 A
	• After engine warming up • Selector lever: “N” position • Depress the accelerator pedal fully	0.350 – 0.400 A
PRI SOLENOID	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	0.850 – 0.900 A
HC/RB SOLENOID	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	1.000 A
	Release the accelerator pedal after the following conditions are satisfied • Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 50 km/h (31 MPH) or more	0.800 – 0.850 A
L/B SOLENOID	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	0.200 – 0.250 A
	Release the accelerator pedal after the following conditions are satisfied • Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 50 km/h (31 MPH) or more	0.000 A
SOLMON1	• Engine started • Vehicle is stopped.	0.000 A
	• Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 20 km/h (12 MPH) or more	0.500 A
SOLMON2	• After engine warm up • Selector lever: “N” position • At idle	0.800 – 0.900 A
	• After engine warming up • Selector lever: “N” position • Depress the accelerator pedal fully	0.350 – 0.400 A
PRI SOL MON	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	0.850 – 0.900 A

Monitor item	Condition	Value/Status (Approx.)
HC/RB SOL MON	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	1.000 A
	Release the accelerator pedal after the following conditions are satisfied • Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 50 km/h (31 MPH) or more	0.800 – 0.850 A
L/B SOL MON	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	0.200 – 0.250 A
	Release the accelerator pedal after the following conditions are satisfied • Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 50 km/h (31 MPH) or more	0.000 A
D POSITION SW	Selector lever: “D” position	On
	Other than the above	Off
N POSITION SW	Selector lever: “N” position	On
	Other than the above	Off
R POSITION SW	Selector lever: “R” position	On
	Other than the above	Off
P POSITION SW	Selector lever: “P” position	On
	Other than the above	Off
BRAKESW	Brake pedal is depressed	On
	Brake pedal is released	Off
L POSITION SW	Selector lever: “L” position	On
	Other than the above	Off
IDLE SW	Accelerator pedal is released	On
	Accelerator pedal is fully depressed	Off
SPORT MODE SW	Press the overdrive control switch	On
	Release the overdrive control switch	Off
STRDWNSW	Always	Off
STRUPSW	Always	Off
DOWNLVR	Always	Off
UPLVR	Always	Off
NONMMODE	Always	Off
MMODE	Always	Off
INDLRNG	Selector lever: “L” position	On
	Other than the above	Off
INDDRNG	Selector lever: “D” position	On
	Other than the above	Off
INDNRNG	Selector lever: “N” position	On
	Other than the above	Off
INDRRNG	Selector lever: “R” position	On
	Other than the above	Off
INDPRNG	Selector lever: “P” position	On
	Other than the above	Off
CVT LAMP	In overdrive OFF	On
	Other than the above	Off

Monitor item	Condition	Value/Status (Approx.)
SPORT MODE IND	In overdrive OFF	On
	Other than the above	Off
MMODE IND	Always	Off
VDC ON	Always	Off
TCS ON	Always	Off
ABS FAIL SIGNAL	When ABS malfunction signal is received	On
	Other than the above	Off
ABS ON	ABS is activated	On
	Other than the above	Off
4WD FAIL SIGNAL	Always	Off
4WD OPERATION SIG	Always	Off
4WD-TCS SIGNAL	Always	Off
RANGE	Selector lever: “P” and “N” positions	N/P
	Selector lever: “R” position	R
	Selector lever: “D” position (OD OFF indicator lamp OFF)	D
	Selector lever: “D” position (OD OFF indicator lamp ON)	S
	Selector lever: “L” position	L
M GEAR POS	Always	1
G SEN SLOPE	Flat road	0%
	Uphill gradient	The value changes to the positive side along with uphill gradient. (Maximum 40.45%)
	Downhill gradient	The value changes to the negative side along with downhill gradient. (Minimum – 40.45%)
ENGBRKLVL	When the engine brake level of “ENGINE BRAKE ADJ”. in “Work Support” is ON	On
	When the engine brake level of “ENGINE BRAKE ADJ”. in “Work Support” is OFF	Off
PVIGN VOLT	Ignition switch: ON	10 – 16 V
TRGT AUX GR RATIO	Vehicle started with selector lever in “L” position	1.80
	Release the accelerator pedal after the following conditions are satisfied • Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 50 km/h (31 MPH) or more	1.00
G SEN CALIBRATION	When G sensor calibration is completed	DONE
	When G sensor calibration is not completed	YET
N IDLE STATUS	When idle neutral control is operated	On
	When idle neutral control is not operated	Off
CVT-B*	—	—
CVT-A*	—	—

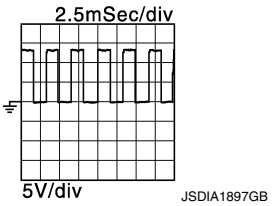
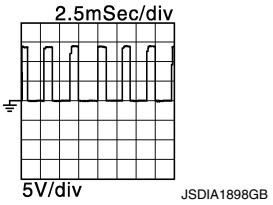
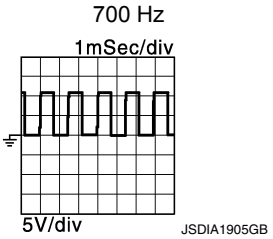
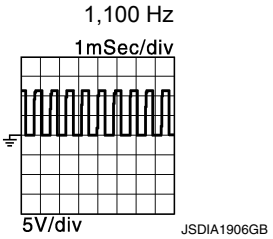
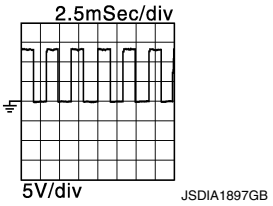
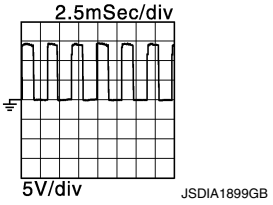
*: These monitor items do not use.

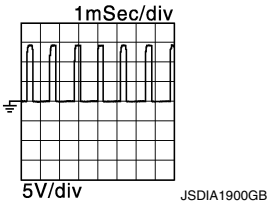
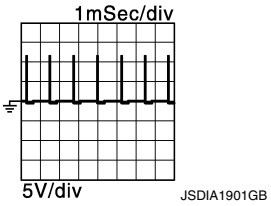
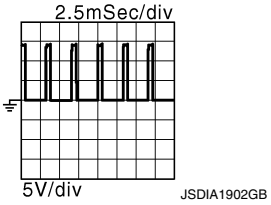
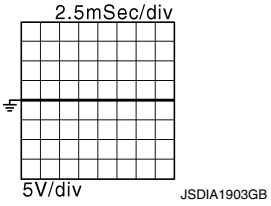
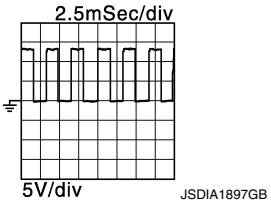
TERMINAL LAYOUT



INPUT/OUTPUT SIGNAL STANDARD

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal	Input/ Output			
2 (R/B)	Ground	L range switch	Input	Ignition switch ON	Selector lever: “L” position	10 – 16 V
					Other than the above	0 V
4 (W/B)	Ground	D range switch	Input		Selector lever: “D” position	10 – 16 V
					Other than the above	0 V
5 (L/B)	Ground	N range switch	Input		Selector lever: “N” position	10 – 16 V
					Other than the above	0 V
6 (O)	Ground	R range switch	Input		Selector lever: “R” position	10 – 16 V
					Other than the above	0 V
7 (Y)	Ground	P range switch	Input		Selector lever: “P” position	10 – 16 V
					Other than the above	0 V
11 (LG)	Ground	Sensor ground	Input	Always		0 V
12 (G/W)	Ground	CVT fluid temperature sensor	Output	Ignition switch ON	CVT fluid: Approx. 20°C	2.01 – 2.05 V
					CVT fluid: Approx. 50°C	1.45 – 1.50 V
					CVT fluid: Approx. 80°C	0.90 – 0.94 V
14 (G/R)	Ground	G sensor	Input	Ignition switch ON	When the vehicle stops on a flat road	2.5 V
15* (V)	—	—	—	—		—
16 (L/R)	Ground	Secondary pressure sensor	Input	• Selector lever: “N” position • At idle		0.88 – 0.92 V
21 (R/W)	—	ROM ASSY (CHIP SELECT)	—	—		—
22 (V)	—	ROM ASSY (DATA I/O)	—	—		—
23 (P/L)	—	CAN-L	Input/ Output	—		—
24 (BR)	Ground	Output speed sensor	Input	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)		200 Hz 2.5mSec/div 5V/div JSDIA1904GB

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	−	Signal	Input/ Output		
26 (O/W)	Ground	Sensor power supply	Output	Ignition switch: ON	5.0 V
				Ignition switch: OFF	0 V
30 (BR/B)	Ground	Line pressure solenoid valve	Output	• After engine warming up • Selector lever: “N” position • At idle	
				• After engine warming up • Selector lever: “N” position • Depress the accelerator pedal fully	
31 (L/W)	—	ROM ASSY (CLOCK)	—	—	—
33 (L/G)	—	CAN-H	Input/ Output	—	—
34 (W)	Ground	Secondary speed sensor	Input	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	
35 (LG/R)	Ground	Primary speed sensor	Input	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	
37 (BR/W)	Ground	High clutch & reverse brake solenoid valve	Output	In driving at “L” position	
				Release the accelerator pedal after the following conditions are satisfied • Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 50 km/h (31 MPH) or more	

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal	Input/ Output		
38 (G)	Ground	Torque converter clutch solenoid valve	Output	• Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 20 km/h (12 MPH) or more	
				• Engine started • Vehicle is stopped	
39 (G/B)	Ground	Low brake solenoid valve	Output	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	
				Release the accelerator pedal after the following conditions are satisfied • Selector lever: “D” position • Accelerator pedal position: 1/8 or less • Vehicle speed: 50 km/h (31 MPH) or more	
40 (Y/B)	Ground	Primary pressure solenoid valve	Output	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	
41 (B)	Ground	Ground	Output	Always	0 V
42 (B)	Ground	Ground	Output	Always	0 V
45 (LG)	Ground	Battery power supply (memory back-up)	Input	Always	10 – 16 V
46 (LG)	Ground	Battery power supply (memory back-up)	Input	Always	10 – 16 V
47 (R/W)	Ground	Ignition power supply	Input	Ignition switch: ON	10 – 16 V
				Ignition switch: OFF	0 V

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal	Input/ Output		
48 (R)	Ground	Ignition power supply	Input	Ignition switch: ON	10 – 16 V
				Ignition switch: OFF	0 V

*: This harness is not used.

Fail-safe

INFOID:0000000009019878

TCM has a fail-safe mode. The mode functions so that operation can be continued even if the signal circuit of the main electronically controlled input/output parts is damaged.
If the vehicle shows following behaviors including “poor acceleration”, a malfunction of the applicable system is detected by TCM and the vehicle may be in a fail-safe mode. At this time, check the DTC code and perform inspection and repair according to the malfunction diagnosis procedures.

Fail-safe function

DTC	Vehicle behavior	Conditions of vehicle
P062F	Not changed from normal driving	—
P0705	• Shift position indicator on combination meter is not displayed. • Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0706	• Shift position indicator on combination meter is not displayed. • Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0711	Acceleration is slow	Engine coolant temperature when engine start: Temp. ≥ 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: –35°C (–31°F) ≤Temp. < 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: Temp. < –35°C (–31°F)
P0712	Acceleration is slow	Engine coolant temperature when engine start: Temp. ≥ 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: –35°C (–31°F) ≤Temp. < 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: Temp. < –35°C (–31°F)
P0713	Acceleration is slow	Engine coolant temperature when engine start: Temp. ≥ 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: –35°C (–31°F) ≤Temp. < 10°C (50°F)
	• Selector shock is large • Start is slow	Engine coolant temperature when engine start: Temp. < –35°C (–31°F)
P0715	• Selector shock is large • Start is slow • Acceleration is slow • Vehicle speed is not increased • Lock-up is not performed	—

DTC	Vehicle behavior	Conditions of vehicle
P0720	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0740	Lock-up is not performed	—
P0743	Lock-up is not performed	—
P0744	Lock-up is not performed	—
P0746	• Selector shock is large • Start is slow • Acceleration is slow • Vehicle speed is not increased • Lock-up is not performed	—
P0846	• Start is slow • Acceleration is slow	—
P0847	Acceleration is slow	—
P0848	• Start is slow • Acceleration is slow	—
P0863	Not changed from normal driving	—
P0890	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0962	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0963	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0965	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0966	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0967	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
P0998	• Start is slow • Lock-up is not performed	—
P0999	• Start is slow • Lock-up is not performed	Wire disconnection
	• Vehicle speed is not increased • Lock-up is not performed	Voltage shorting
P099B	Start is slow	—
P099C	• Start is slow • Lock-up is not performed	Wire disconnection
	• Vehicle speed is not increased • Lock-up is not performed	Voltage shorting
P1586	Idle neutral control is not performed	—
P1588	Idle neutral control is not performed	—

DTC	Vehicle behavior	Conditions of vehicle
P2765	• Selector shock is large • Start is slow • Acceleration is slow • Vehicle speed is not increased • Lock-up is not performed	—
P2857	• Start is slow • Lock-up is not performed	—
P2858	• Vehicle speed is not increased • Lock-up is not performed	—
P2859	Vehicle speed is not increased	—
P285A	Start is slow	—
U0073	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
U0100	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
U0140	Not changed from normal driving	—
U0141	Not changed from normal driving	—
U0155	Not changed from normal driving	—
U0300	• Selector shock is large • Start is slow • Acceleration is slow • Lock-up is not performed	—
U1000	Not changed from normal driving	—
U1114	Not changed from normal driving	—
U1117	Not changed from normal driving	—

Protection Control

INFOID:0000000009019879

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.

CONTROL FOR WHEEL SPIN

Control	When a wheel spin is detected, the engine output and gear ratio are limited and the line pressure is increased. At the 1GR, the clutch pressure is increased.
Vehicle behavior in control	If the accelerator is kept depressing during wheel spin, the engine revolution and vehicle speed are limited to a certain degree. From the 1GR, upshift to a certain gear ratio is only allowed.
Normal return condition	Wheel spin convergence returns the control to the normal control.

CONTROL WHEN FLUID TEMPERATURE IS HIGH

Control	When the CVT fluid temperature is high, the gear shift permission maximum revolution and the maximum torque are reduced than usual to prevent increase of the oil temperature.
Vehicle behavior in control	Power performance may be lowered, compared to normal control.
Normal return condition	The control returns to the normal control when CVT fluid temperature is lowered.

TORQUE IS REDUCED WHEN DRIVING WITH THE REVERSE GEAR

Control	Engine output is controlled according to a vehicle speed while reversing the vehicle.
Vehicle behavior in control	Power performance may be lowered while reversing the vehicle.
Normal return condition	Torque returns to normal by positioning the selector lever in a range other than “R” position.

REVERSE PROHIBIT CONTROL

Control	The reverse brake is controlled to avoid becoming engaged when the selector lever is set in “R” position while driving in forward direction at more than the specified speed.
Vehicle behavior in control	If the selector lever is put at “R” position when driving with the forward gear, the gear becomes neutral, not reverse.
Normal return condition	The control returns to normal control when the vehicle is driven at low speeds. (The reverse brake becomes engaged.)

DTC Inspection Priority Chart

INFOID:0000000009019880

If multiple malfunction codes are detected at the same time, check each code according to the DTC check priority list below.

Priority	DTC (Diagnostic Trouble Code)	Reference
1	P0863 CONTROL UNIT (CAN)	TM-177
	U0073 COMM BUS A OFF	TM-133
	U0100 LOST COMM (ECM A)	TM-134
	U0140 LOST COMM (BCM)	TM-135
	U0141 LOST COMM (BCM A)	TM-136
	U0155 LOST COMM (IPC)	TM-137
	U0300 CAN COMM DATA	TM-138
	U1000 CAN COMM CIRC	TM-139
	U1117 LOST COMM (ABS)	TM-140
2	P0740 TORQUE CONVERTER	TM-163
	P0743 TORQUE CONVERTER	TM-165
	P0962 PC SOLENOID A	TM-180
	P0963 PC SOLENOID A	TM-182
	P0966 PC SOLENOID B	TM-185
	P0967 PC SOLENOID B	TM-187
	P0998 SHIFT SOLENOID F	TM-189
	P0999 SHIFT SOLENOID F	TM-191
	P099B SHIFT SOLENOID G	TM-193
	P099C SHIFT SOLENOID G	TM-195
3	P0890 TCM	TM-178

Priority	DTC (Diagnostic Trouble Code)	Reference
4	P062F EEPROM	TM-141
	P0705 T/M RANGE SENSOR A	TM-142
	P0706 T/M RANGE SENSOR A	TM-148
	P0711 FLUID TEMP SENSOR A	TM-151
	P0712 FLUID TEMP SENSOR A	TM-153
	P0713 FLUID TEMP SENSOR A	TM-155
	P0715 INPUT SPEED SENSOR A	TM-157
	P0847 FLUID PRESS SEN/SW B	TM-173
	P0848 FLUID PRESS SEN/SW B	TM-175
	P1586 G SENSOR	TM-197
	P1588 G SENSOR	TM-200
	P2765 OUTPUT SPEED SENSOR	TM-202
5	P0720 OUTPUT SPEED SENSOR	TM-160
6	P0746 PC SOLENOID A	TM-169
	P2857 CLUTCH B PRESSURE	TM-205
	P2858 CLUTCH A PRESSURE	TM-206
	P2859 CLUTCH A PRESSURE	TM-207
	P285A CLUTCH B PRESSURE	TM-209
7	P0744 TORQUE CONVERTER	TM-167
	P0846 FLUID PRESS SEN/SW B	TM-171
	P0965 PC SOLENOID B	TM-184

DTC Index

INFOID:0000000009019881

NOTE:
- If multiple malfunction codes are detected at the same time, check each code according to the “DTC check priority list”. TM-110, "DTC Inspection Priority Chart".
- The ignition counter is displayed in “FFD”. Refer to TM-92, "CONSULT Function".

DTC*1, *2		Items (CONSULT screen terms)	Trip	MIL	Reference
GST	CONSULT (TRANSMISSION)				
P062F	P062F	EEPROM	1	ON	TM-141
P0705	P0705	T/M RANGE SENSOR A	2	ON	TM-142
P0706	P0706	T/M RANGE SENSOR A	2	ON	TM-148
P0711	P0711	FLUID TEMP SENSOR A	2	ON	TM-151
P0712	P0712	FLUID TEMP SENSOR A	2	ON	TM-153
P0713	P0713	FLUID TEMP SENSOR A	2	ON	TM-155
P0715	P0715	INPUT SPEED SENSOR A	2	ON	TM-157
P0720	P0720	OUTPUT SPEED SENSOR	2	ON	TM-160
P0740	P0740	TORQUE CONVERTER	2	ON	TM-163
P0743	P0743	TORQUE CONVERTER	2	ON	TM-165
P0744	P0744	TORQUE CONVERTER	2	ON	TM-167
P0746	P0746	PC SOLENOID A	2	ON	TM-169
P0846	P0846	FLUID PRESS SEN/SW B	2	ON	TM-171
P0847	P0847	FLUID PRESS SEN/SW B	2	ON	TM-173
P0848	P0848	FLUID PRESS SEN/SW B	2	ON	TM-175

DTC*1, *2		Items (CONSULT screen terms)	Trip	MIL	Reference
GST	CONSULT (TRANSMISSION)				
P0863	P0863	CONTROL UNIT (CAN)	1	ON	TM-177
P0890	P0890	TCM	1	ON	TM-178
P0962	P0962	PC SOLENOID A	2	ON	TM-180
P0963	P0963	PC SOLENOID A	2	ON	TM-182
P0965	P0965	PC SOLENOID B	2	ON	TM-184
P0966	P0966	PC SOLENOID B	2	ON	TM-185
P0967	P0967	PC SOLENOID B	2	ON	TM-187
P0998	P0998	SHIFT SOLENOID F	2	ON	TM-189
P0999	P0999	SHIFT SOLENOID F	2	ON	TM-191
P099B	P099B	SHIFT SOLENOID G	2	ON	TM-193
P099C	P099C	SHIFT SOLENOID G	2	ON	TM-195
—	P1586	G SENSOR	1	—	TM-197
—	P1588	G SENSOR	1	—	TM-200
P2765	P2765	OUTPUT SPEED SENSOR	2	ON	TM-202
P2857	P2857	CLUTCH A PRESSURE	2	ON	TM-205
P2858	P2858	CLUTCH B PRESSURE	2	ON	TM-206
P2859	P2859	CLUTCH A PRESSURE	2	ON	TM-207
P285A	P285A	CLUTCH B PRESSURE	2	ON	TM-209
U0073	U0073	COMM BUS A OFF	1	ON	TM-133
U0100	U0100	LOST COMM (ECM A)	1	ON	TM-134
—	U0140	LOST COMM (BCM)	1	—	TM-135
—	U0141	LOST COMM (BCM A)	1	—	TM-136
—	U0155	LOST COMM (IPC)	1	—	TM-137
—	U0300	CAN COMM DATA	1	—	TM-138
—	U1000	CAN COMM CIRC	1	—	TM-139
—	U1117	LOST COMM (ABS)	1	—	TM-140

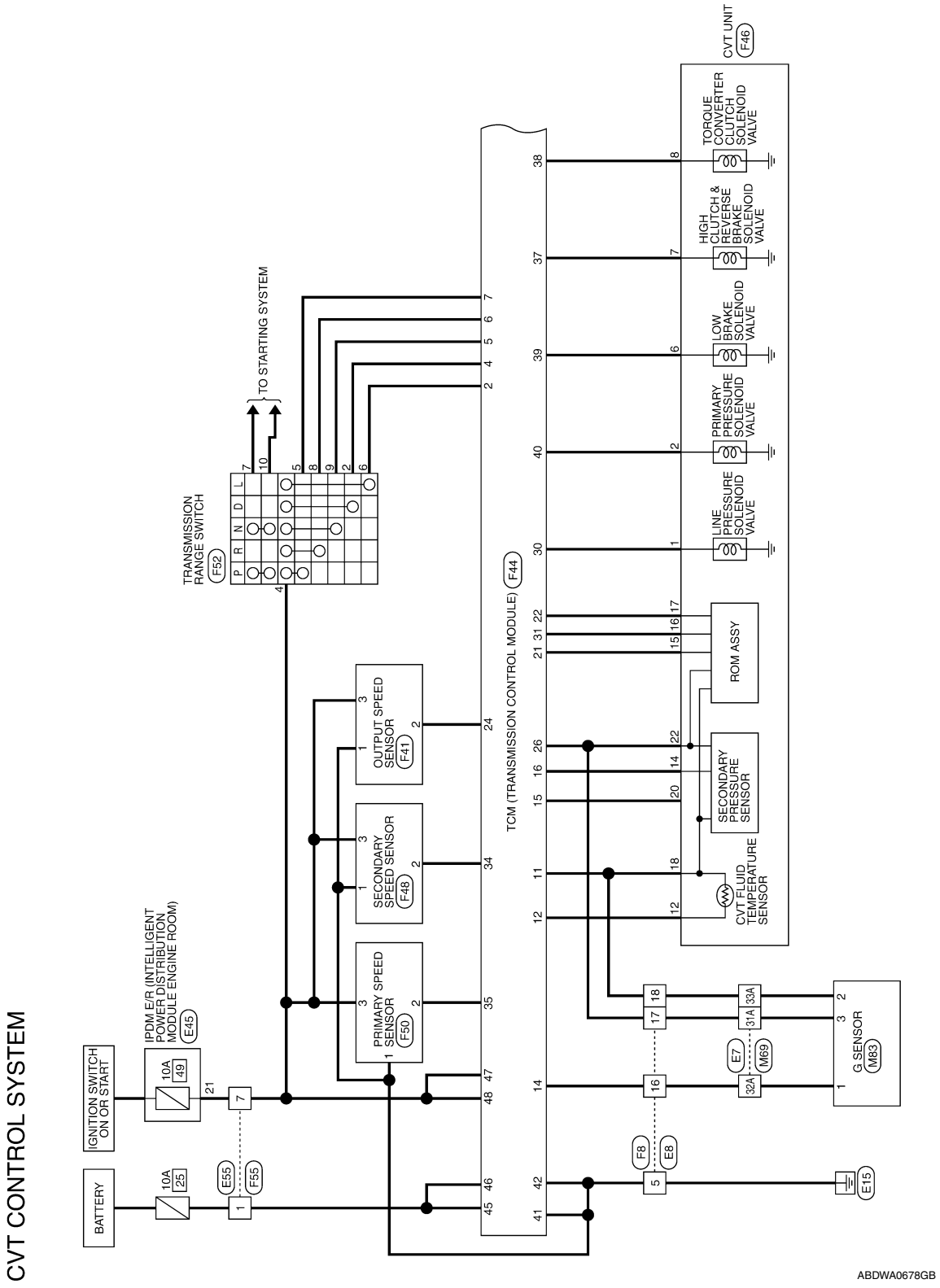
*1: These numbers are specified by SAE J2012/ISO 15031-6.
*2: The DTC number of the 1st trip is the same as the DTC number.

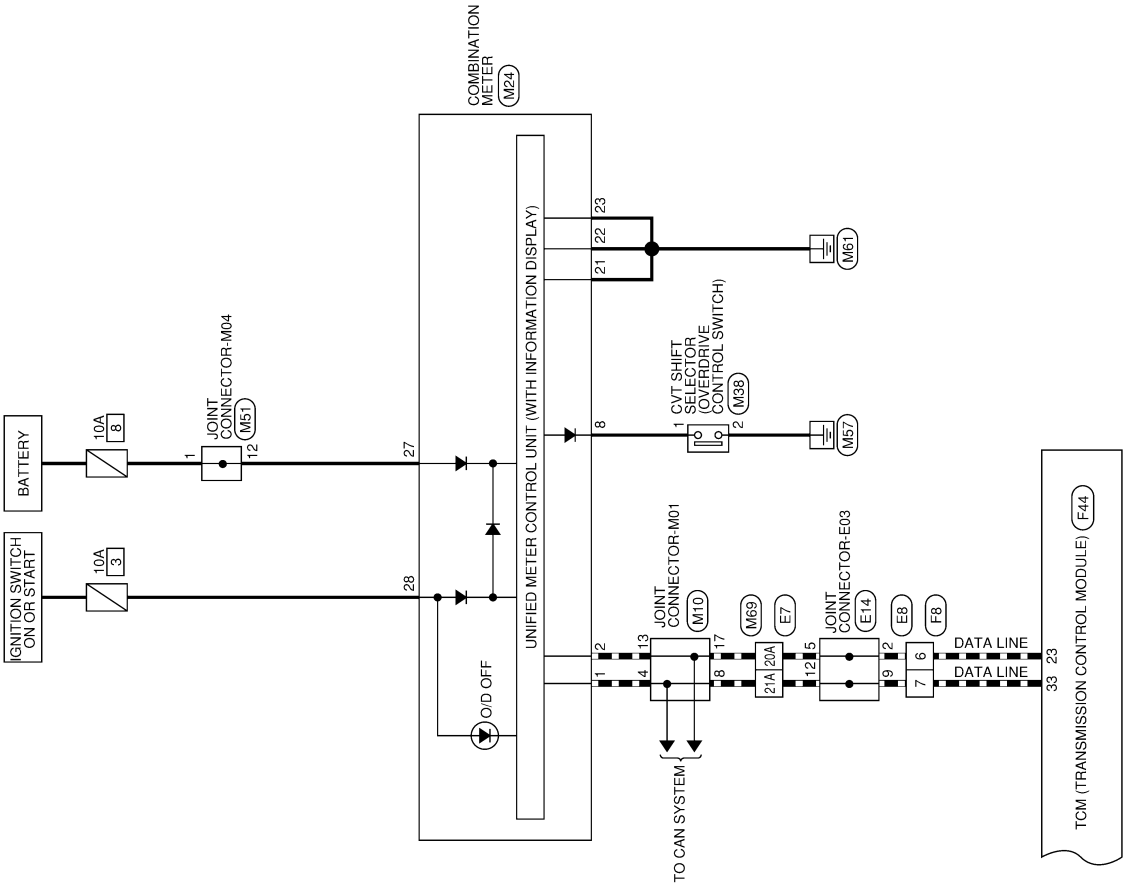
WIRING DIAGRAM

CVT CONTROL SYSTEM

Wiring Diagram

INFOID:0000000009019882





ABDWA0679GB

CVT CONTROL SYSTEM CONNECTORS

Connector No.	M10
Connector Name	JOINT CONNECTOR-M01
Connector Color	BLUE

H.S.

9	8	7	6	5	4	3	2	1
20	19	18	17	16	15	14	13	12	11	10

Terminal No.	Color of Wire	Signal Name
4	L	–
8	L	–
13	P	–
17	P	–

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE

H.S.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
2	P	CAN-L
8	P	O/D OFF/SPORT SW
21	B	GND (ILL)
22	B	GND (POWER)
23	B	GND (CIRCUIT)
27	R/W	BAT
28	GR	IGN

Connector No.	M38
Connector Name	CVT SHIFT SELECTOR
Connector Color	WHITE

H.S.

1	2	3	4
5	6	7	8

Terminal No.	Color of Wire	Signal Name
1	P	–
2	B/W	–

Connector No.	M51
Connector Name	JOINT CONNECTOR-M04
Connector Color	GRAY

H.S.

10	9	8	7	6	5	4	3	2	1
20	19	18	17	16	15	14	13	12	11

Terminal No.	Color of Wire	Signal Name
1	LG	–
12	R/W	–

ABDIA1055GB

Connector No.	E7
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1A	2A	3A	4A	5A
6A	7A	8A	9A	10A

11A	12A	13A	14A	15A	16A	17A	18A	19A	20A	21A
	22A	23A	24A	25A	26A	27A	28A	29A	30A	

31A	32A	33A	34A	35A	36A	37A	38A	39A	40A	41A
	42A	43A	44A	45A	46A	47A	48A	49A	50A	

51A	52A	53A	54A	55A	56A	57A	58A	59A	60A	61A
	62A	63A	64A	65A	66A	67A	68A	69A	70A	

71A	72A	73A	74A	75A	76A	77A	78A	79A	80A	81A
	82A	83A	84A	85A	86A	87A	88A	89A	90A	

91A	92A	93A	94A	95A
96A	97A	98A	99A	100A

Terminal No.	Color of Wire	Signal Name
20A	P	–
21A	L	–
31A	LG	–
32A	Y	–
33A	R	–

Connector No.	M83
Connector Name	G SENSOR
Connector Color	BLACK

H.S.

3	2	1

Terminal No.	Color of Wire	Signal Name
1	Y	–
2	R	–
3	W	–

Connector No.	M69
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

5A	4A	3A	2A	1A
10A	9A	8A	7A	6A

21A	20A	19A	18A	17A	16A	15A	14A	13A	12A	11A
	30A	29A	28A	27A	26A	25A	24A	23A	22A	

41A	40A	39A	38A	37A	36A	35A	34A	33A	32A	31A
	50A	49A	48A	47A	46A	45A	44A	43A	42A	

61A	60A	59A	58A	57A	56A	55A	54A	53A	52A	51A
	70A	69A	68A	67A	66A	65A	64A	63A	62A	

81A	80A	79A	78A	77A	76A	75A	74A	73A	72A	71A
	90A	89A	88A	87A	86A	85A	84A	83A	82A	

95A	94A	93A	92A	91A
100A	99A	98A	97A	96A

Terminal No.	Color of Wire	Signal Name
20A	P	–
21A	L	–
31A	W	–
32A	Y	–
33A	R	–

ABDIA1056GB

Connector No.	E45
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BROWN

H.S.

21	20		19	18	17
28	27	26	25	24	23	22

Terminal No.	Color of Wire	Signal Name
21	R	AT ECU

Connector No.	E14
Connector Name	JOINT CONNECTOR-E03
Connector Color	BLUE

H.S.

12	11	10	9	8	7	6	5	4	3	2	1

Terminal No.	Color of Wire	Signal Name
2	P	–
5	P	–
9	L	–
12	L	–

Connector No.	E8
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

Terminal No.	Color of Wire	Signal Name
5	B	–
6	P	–
7	L	–
16	Y	–
17	G	–
18	BG	–

Connector No.	F41
Connector Name	OUTPUT SPEED SENSOR
Connector Color	BLACK

H.S.

3	2	1

Terminal No.	Color of Wire	Signal Name
1	B	–
2	BR	–
3	R/W	–

Connector No.	F8
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

12	11	10	9	8	7	6	5	4	3	2	1
24	23	22	21	20	19	18	17	16	15	14	13

Terminal No.	Color of Wire	Signal Name
5	B	–
6	P/L	–
7	L/G	–
16	G/R	–
17	O	–
18	LG	–

Connector No.	E55
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

1	2	3		4	5
6	7	8	9	10	11	12

Terminal No.	Color of Wire	Signal Name
1	P	–
7	R	–

ABDIA1057GB

Connector No.	F44
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Color	BLACK

Terminal No.	Color of Wire	Signal Name
1	–	–
2	R/B	L RANGE SWITCH
3	–	–
4	W/B	D RANGE SWITCH
5	L/B	N RANGE SWITCH
6	O	R RANGE SWITCH
7	Y	P RANGE SWITCH
8	–	–
9	–	–
10	–	–
11	LG	SENSOR GROUND
12	G/W	CVT FLUID TEMPERATURE SENSOR
13	–	–
14	G/R	G SENSOR
15	V	–
16	L/R	SECONDARY PRESSURE SENSOR
17	–	–
18	–	–
19	–	–
20	–	–
21	R/W	ROM ASSY (CHIP SELECT)
22	V	ROM ASSY (DATA I/O)
23	P/L	CAN-L
24	BR	OUTPUT SPEED SENSOR
25	–	–
26	O/W	SENSOR POWER SUPPLY
27	–	–
28	–	–
29	–	–
30	BR/B	LINE PRESSURE SOLENOID VALVE
31	L/W	ROM ASSY (CLOCK)
32	–	–
33	L/G	CAN-H
34	W	SECONDARY SPEED SENSOR
35	LG/R	PRIMARY SPEED SENSOR
36	–	–
37	BR/W	HIGH CLUTCH & REVERSE BRAKE SOLENOID VALVE
38	G	TORQUE CONVERTER CLUTCH SOLENOID VALVE
39	G/B	LOW BRAKE SOLENOID VALVE
40	Y/B	PRIMARY PRESSURE SOLENOID VALVE
41	B	GROUND
42	B	GROUND
43	–	–
44	–	–
45	LG	POWER SUPPLY (BACKUP)
46	LG	POWER SUPPLY (BACKUP)
47	R	POWER SUPPLY
48	R/W	POWER SUPPLY

ABDIA1058GB

Connector No.	F46
Connector Name	CVT UNIT
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	BR/B	–
2	Y/B	–
3	–	–
4	–	–
5	–	–
6	G/B	–

Connector No.	F50
Connector Name	PRIMARY SPEED SENSOR
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	B	–
2	LG/R	–
3	R	–

Terminal No.	Color of Wire	Signal Name
7	BR/W	–
8	G	–
9	–	–
10	–	–
11	–	–
12	G/W	–
13	–	–
14	L/R	–
15	R/W	–
16	L/W	–
17	V	–
18	LG	–
19	–	–
20	V	–
21	–	–
22	O/W	–

Connector No.	F52
Connector Name	TRANSMISSION RANGE SWITCH
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	–	–
2	W/B	–
3	–	–
4	R/W	–
5	Y	–
6	R/B	–
7	R	–
8	O	–
9	L/B	–
10	BR	–

Connector No.	F48
Connector Name	SECONDARY SPEED SENSOR
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	B	–
2	W	–
3	R	–

Connector No.	F55
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

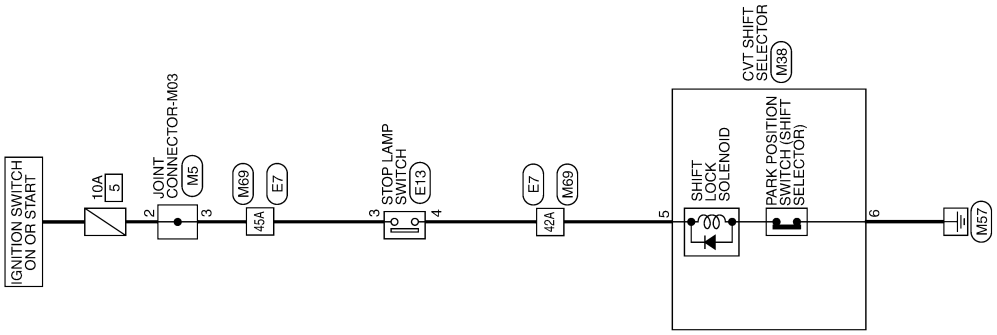
Terminal No.	Color of Wire	Signal Name
1	LG	–
7	R	–

ABDIA1059GB

CVT SHIFT LOCK SYSTEM

Wiring Diagram

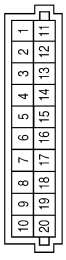
INFOID:0000000009019883



CVT SHIFT LOCK SYSTEM CONNECTORS

Connector No.	M5
Connector Name	JOINT CONNECTOR-M03
Connector Color	BROWN

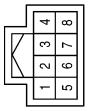
H.S.



Terminal No.	Color of Wire	Signal Name
2	O	–
3	L	–

Connector No.	M38
Connector Name	CVT SHIFT SELECTOR
Connector Color	WHITE

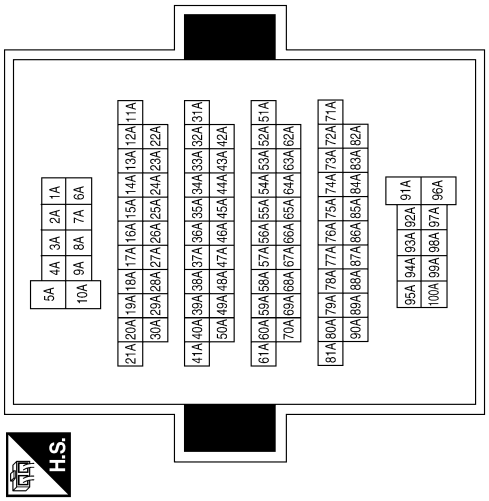
H.S.



Terminal No.	Color of Wire	Signal Name
5	LG	–
6	B/W	–

Connector No.	M69
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
42A	LG	–
45A	L	–

ABDIA1060GB

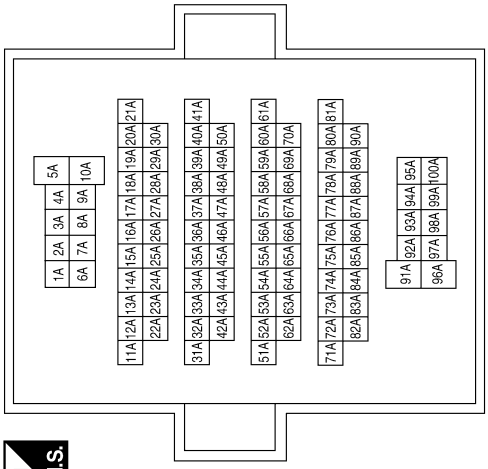
Connector No.	E13
Connector Name	STOP LAMP SWITCH (WITH CVT)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
3	L	–
4	P	–

Connector No.	E7
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
42A	P	–
45A	L	–

ABDIA1061GB

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Flowchart of Trouble Diagnosis

INFOID:0000000009019884

NOTE:
"DTC" includes DTC at the 1st trip.

1.OBTAIN INFORMATION ABOUT SYMPTOM

Refer to TM-124, "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.

>> GO TO 2.

2.CHECK DTC

1. Before checking the malfunction, check whether any DTC exists.
2. If DTC exists, perform the following operations.

- Records the DTCs. (Print out using CONSULT and affix to the Work Order Sheet.)
- Erase DTCs.
- Check the relation between the cause found by DTC and the malfunction information from customer. TM-219, "Symptom Table" can be used effectively.

3. Check the relevant information including STI, etc.

Do malfunction information and DTC exist?

Malfunction information and DTC exist.>>GO TO 3.
Malfunction information exists but no DTC.>>GO TO 4.
No malfunction information, but DTC exists.>>GO TO 5.

3.REPRODUCE MALFUCTION SYSTEM

Check the malfunction described by the customer on the vehicle.
Check if the behavior is fail safe or normal operation. Refer toTM-107, "Fail-safe".
Interview sheet can be used effectively when reproduce malfunction conditions. Refer to TM-124, "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.
Check if the behavior is fail safe or normal operation. Refer toTM-107, "Fail-safe".
Interview sheet can be used effectively when reproduce malfunction conditions.TM-124, "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 TM-110, "DTC Inspection Priority Chart" when multiple DTCs are detected, and then determine the order for performing the diagnosis.

Is any DTC detected?

YES >> GO TO 7.
NO >> Follow GI-41, "Intermittent Incident" to check.

6.IDENTIFY MALFUNCTIONING SYSTEM WITH "DIAGNOSIS CHART BY SYMPTOM"

Use TM-219, "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 is reproduced.)>>GO TO 6.
NO >> Before delivering the vehicle to the customer, make sure that DTC is erased.

Question sheet

INFOID:0000000009019885

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, perception of a problem varies depending on individuals. Ask the customer about his/her concerns carefully. It is important to understand the phenomenon or status. To systemize all the information for the diagnosis, prepare the question sheet referring to the question points.
In some cases, multiple conditions that appear simultaneously may cause a DTC to be detected.

KEY POINTS

WHAT ..... Vehicle & engine model
WHEN ..... Date, Frequencies
WHERE..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SEF907L

Worksheet Sample

Question sheet

Customer's name	MR/MS	Registration number		Initial year registration	Year Month day
		Vehicle type		Chassis No.	
Storage date	Year Month day	Engine		Mileage	km
Symptom	☐ Vehicle does not start. (☐ R position ☐ D position ☐ L position ☐ M position)				
	☐ Upshifting does not occur. ☐ Downshifting does not occur.				
	☐ Lock-up malfunction				
	☐ Shift point is too high. ☐ Shift point is too low.				
	☐ Shift shock (☐ N⇒D ☐ Lock-up ☐ R, D, L and M position)				
	☐ Slip (☐ N⇒D ☐ Lock-up ☐ R, D, L and M position)				
	☐ Noise ☐ Vibration				
	When selector lever position is shifted, shift pattern does not change.				
	☐ Other ( )				
First occurrence	☐ Recently (as from month of year)				
Frequency of occurrence	☐ Always ☐ Under certain conditions ☐ Sometimes (time(s)/day)				

Question sheet

Customer's name	MR/MS	Registration number		Initial year registration	Year Month day
		Vehicle type		Chassis No.	
Storage date	Year Month day	Engine		Mileage	km
Climate conditions		Irrelevant			
	Weather	☐ Clear ☐ Cloud ☐ Rain ☐ Snow ☐ Others)			
	Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold ☐ Temperature (Approx. °C)			
	Relative humidity	☐ High ☐ Moderate ☐ Low			
Transaxle condition		☐ In cold-start ☐ During warm-up (approx. °C) ☐ After warm-up ☐Engine speed: rpm			
Road conditions		☐ Urban area ☐ Suburb area ☐ Highway ☐ Mountainous road (uphill or downhill)			
Operating condition, etc.		Irrelevant ☐ When engine starts ☐ During idling ☐ During driving ☐ During acceleration ☐ At constant speed driving ☐ During deceleration ☐ During cornering (RH curve or LH curve)			
Other conditions					

ADDITIONAL SERVICE WHEN REPLACING TCM

Description

INFOID:0000000009019886

When replacing the TCM, perform the following work.

CHECK LOADING OF CALIBRATION DATA
- The TCM acquires calibration data (individual characteristic value) of each solenoid that is stored in the ROM assembly (in the control valve). This enables the TCM to perform accurate control. After the TCM is replaced, check that the TCM has correctly loaded the calibration data.

CALIBRATION OF G SENSOR
- TCM stores calibration data (inherent characteristic value) of G sensor to provide accurate control. Therefore, it is required to perform calibration of G sensor after the replacement of TCM.

CAUTION:

When replacing TCM and transaxle assembly as a set, replace transaxle assembly first and then replace TCM.

If the TCM is replaced in advance, perform "ADDITIONAL SERVICE WHEN REPLACING TRANSAXLE ASSEMBLY" after "G sensor calibration".

Procedure

INFOID:0000000009019887

1.CHECK WORK CONTENTS

Replacing only the TCM>>GO TO 2.
Replacing the TCM after the transaxle assembly is replaced>>GO TO 2.
Replacing the transaxle assembly after the TCM is replaced>>GO TO 5.

2.LOADING OF CALIBRATION DATA

1. Shift the selector lever to the "P" position.
2. Turn ignition switch ON.
3. Check that "P" is displayed on shift position indicator on combination meter.
   NOTE:
   Displayed approximately 4 – 5 seconds after the selector lever is moved to the "P" position.

Does the shift position indicator display "P"?

YES >> GO TO 3.
NO >> GO TO 4.

3.PERFORM G SENSOR CALIBRATION

Refer to TM-129, "Procedure".

>> WORK END

4.DETECT MALFUNCTIONING ITEM

Check the following items:
- Harness between the TCM and the ROM assembly inside the transaxle assembly is open or shorted.
- Disconnected, loose, bent, collapsed, or otherwise abnormal connector housing terminals

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the malfunctioning parts.

5.PERFORM G SENSOR CALIBRATION

Refer to TM-129, "Procedure".

>> Perform "ADDITIONAL SERVICE WHEN REPLACING TRANSAXLE ASSEMBLY" after "CALIBRATION OF G SENSOR". Refer to TM-127, "Procedure".

ADDITIONAL SERVICE WHEN REPLACING TRANSAXLE ASSEMBLY

Description

INFOID:0000000009019888

When replacing the transaxle, perform the following work.

ERASING THE CALIBRATION DATA
- The TCM acquires calibration data (individual characteristic value) of each solenoid that is stored in the ROM assembly (in the control valve). This enables the TCM to perform accurate control. For this reason, after the transaxle assembly is replaced, it is necessary to erase the calibration data that is stored in the TCM and load new calibration data.

ERASING THE LEARNED VALUE DATA
- TCM learns indicated pressure for appropriate control of the transaxle assembly and records the learned values. For this reason, the leaned values stored in TCM must be erased after replacing a transaxle assembly.

ERASING CVT FLUID DEGRADATION LEVEL DATA
- TCM records the degradation level of the CVT fluid calculated from the vehicle driving status. Therefore, if the transaxle assembly is replaced, it is necessary to erase the CVT fluid degradation level data recorded by TCM.

Procedure

INFOID:0000000009019889

1. INITIALIZE TCM

With CONSULT
1. Set parking brake.
2. Turn ignition switch ON.
3. Select “Work Support” in “TRANSMISSION”.
4. Select “ERASE MEMORY DATA”.
5. While maintaining the conditions below, touch “Start”.

- Vehicle stop status
- With engine stopped
- Selector lever: “R” position
- Accelerator pedal: Depressed

NOTE:
Select “Start” and complete within approximately 20 seconds.

Is “COMPLETED” displayed?

YES >> GO TO 2.
NO >> Turn the ignition switch OFF and wait for a minimum of 10 seconds then perform the work again.

2. CHECK AFTER TCM IS INITIALIZED

With CONSULT
1. Turn ignition switch OFF with the selector lever in “R” position and wait for 10 seconds or more.
2. Turn ignition switch ON with the selector lever in “R” position.
   CAUTION:
   Never start the engine.
3. Select “Special function” in “TRANSMISSION”.
4. Select “CALIB DATA”.
5. Check that indicated value of “CALIB DATA” is equal to the value shown in the following table.

Item name	Display value	Item name	Display value
UNIT CLB ID1	00	MAP NO HC/RB	00
UNIT CLB ID2	00	MAP NO L/B	00
UNIT CLB ID3	00	OFFSET2 LU	0
UNIT CLB ID4	00	OFFSET2 PL	0
UNIT CLB ID5	00	OFFSET2 PRI	0
UNIT CLB ID6	00	OFFSET2 H/R	0

Item name	Display value	Item name	Display value
UNIT CLB ID7	00	OFFSET2 L/B	0
UNIT CLB ID8	00	INIT OFFSET H/R A	0
UNIT CLB ID9	00	INIT OFFSET H/R B	0
UNIT CLB ID10	00	INIT OFFSET H/R C	0
UNIT CLB ID11	00	INIT OFFSET H/R D	0
GAIN LU	256	INIT OFFSET H/R E	0
GAIN PL	256	INIT OFFSET H/R F	0
GAIN PRI	256	INIT OFSET LB A	0
GAIN HC/RB	256	INIT OFSET LB B	0
GAIN L/B	256	INIT OFSET LB C	0
OFFSET LU	0	INIT OFSET LB D	0
OFFSET PL	0	INIT OFSET LB E	0
OFFSET PRI	0	INIT OFSET LB F	0
OFFSET HC/RB	0	LB INITIALIZE LEARN	–1
OFFSET L/B	0	HC INITIALIZE LEARN	–1
MAP NO LU	00	LB INITIALIZE TEMP	FF
MAP NO PL	00	LB INITIALIZE TEMP	FF
MAP NO PRI	00		

Is the indicated value of “CALIB DATA” equal to the value shown in the table?

YES >> GO TO 3.
NO >> GO TO 1.

3. LOADING OF CALIBRATION DATA

1. Shift the selector lever to the “P” position.
2. Check that “P” is displayed on shift position indicator on combination meter.
   NOTE:
   Displayed approximately 4 – 5 seconds after the selector lever is moved to the “P” position.

Does shift position indicator display “P”?

YES >> GO TO 5.
NO >> GO TO 4.

4. DETECT MALFUNCTIONING ITEMS

Check the following items:
- Harness between the TCM and the ROM assembly inside the transaxle assembly is open or shorted.
- Disconnected, loose, bent, collapsed, or otherwise abnormal connector housing terminals

Is the inspection result normal?

YES >> GO TO 1.
NO >> Repair or replace the malfunctioning parts.

5. ERASE THE CVT FLUID DEGRADATION LEVEL DATA

With CONSULT
1. Select “WORK SUPPORT” in “TRANSMISSION”.
2. Select “CONFORM CVTF DETERIORTN”.
3. Touch “Clear”.

>> WORK END

CALIBRATION OF G SENSOR

Description

INFOID:0000000009019890

TCM stores calibration data (inherent characteristic value) of G sensor to provide accurate control. Therefore, it is required to perform calibration of G sensor after the following work is performed.
- Removal/installation or replacement of G sensor
- Replacement of TCM

Procedure

INFOID:0000000009019891

1.PREPARATION BEFORE CALIBRATION PROCEDURE

1. Park the vehicle on a level surface.
2. Adjust air pressure of all tires to the specified pressure. WT-9, "Tire Air Pressure".

>> GO TO 2.

2.PERFORM CALIBRATION

With CONSULT
1. Turn ignition switch ON.
   CAUTION:
   Never start engine.
2. Select “Work Support” in “TRANSMISSION”.
3. Select “G SENSOR CALIBRATION”.
4. Touch “Start”.
   CAUTION:
   Never swing the vehicle during “G sensor calibration”.

Is “COMPLETED” displayed?

YES >> GO TO 3.
NO >> Perform steps 1 and 2 again.

3.PERFORM THE SELF-DIAGNOSIS

With CONSULT
1. Turn ignition switch OFF and wait for 10 seconds.
2. Turn ignition switch ON.
3. Select “Self Diagnostic Results” in “TRANSMISSION”.

Is “P1586” or “P1588” detected?

YES >> Go to TM-111, "DTC Index".
NO >> Calibration end

STALL TEST

Work Procedure

INFOID:0000000009019894

INSPECTION

1. Check the engine oil level. Replenish if necessary.
2. Check for leak of the CVT fluid. Refer to TM-224, "Inspection".
3. Drive for about 10 minutes to warm up the vehicle so that the CVT fluid temperature is 50 to 80°C (122 to 176°F).
4. Be sure to apply the parking brake and block the tires.
5. Start the engine, depress the brake pedal and put the selector lever to the D position.
6. While depressing the brake pedal, depress the accelerator pedal gradually.
7. Read the stall speed quickly. Then, release your foot from the accelerator pedal quickly.
   CAUTION:
   Do not depress the accelerator pedal for 5 seconds or more during the test.

   Stall speed : Refer to TM-254, "Stall Speed".
8. Place the selector lever in the N position.
9. Cool the CVT fluid.
   CAUTION:
   Run the engine with the idle speed for at least 1 minute.
10. Put the selector lever to the R position and perform Step 6 to Step 9 again.

NARROWING-DOWN MALFUNCTIONING PARTS

	Selector lever position		Possible cause
	D	R	
Stall speed	H	O	• Low brake
	O	H	• Reverse brake
	L	L	• Engine • Torque converter one way clutch
	H	H	• Line pressure is low. • Primary pulley • Secondary pulley • Steel belt

O: Within the stall speed standard value

H: Stall speed is higher than the standard value.

L: Stall speed is lower than the standard value.

LINE PRESSURE TEST

Work Procedure

INFOID:0000000009019895

INSPECTION

1. Check the engine oil level. Replenish if necessary. Refer to LU-7, "Inspection".
2. Check for CVT fluid leaks. Refer to TM-224, "Inspection".
3. Drive for about 10 minutes to warm up the vehicle so that the CVT fluid temperature is 50 to 80°C (122 to 176°F).
4. Stop the vehicle, apply the parking brake and block the tires.
5. Start the engine.
6. Select “Data Monitor” in “TRANSMISSION”.
7. Select “LINE PRESSURE”.
8. Measure the line pressure at both idle and the stall speed.
   CAUTION:
   Keep brake pedal pressed all the way down during measurement.

Line pressure : TM-255, "Line Pressure"

NARROWING-DOWN MALFUNCTIONING PARTS

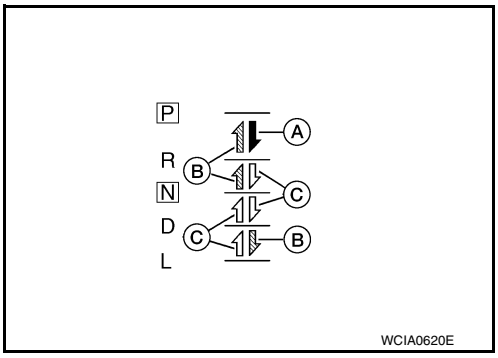
Judgment		Possible cause
Idle speed	Low for all positions (“P”, “R”, “N”, “D”, “L”)	Possible causes include malfunctions in the pressure supply system and low oil pump output. For example: • Oil pump wear • Damage of chain and sprocket • Pressure regulator valve or plug sticking or spring fatigue • Oil 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 • CVT fluid temperature sensor malfunction • Line pressure solenoid malfunction (sticking in OFF state, filter clog, cut line) • Pressure regulator valve or plug sticking
Stall speed	Line pressure does not rise higher than the line pressure for idle.	Possible causes include a sensor malfunction or malfunction in the pressure adjustment function. For example: • TCM malfunction • Line pressure solenoid malfunction (shorting, sticking in ON state) • Pressure regulator valve or plug sticking
	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: • Oil pump wear • Line pressure solenoid malfunction (sticking, filter clog) • Pressure regulator valve or plug sticking
	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.

CVT POSITION

Inspection

INFOID:0000000009020197

1. Turn ON the ignition switch with the shift selector in the "P" position.
2. Press the shift selector handle button with the brake pedal depressed, and confirm that the shift selector can be moved from the "P" position. Also confirm that shift selector will not move from the "P" position without depressing the brake pedal.
3. Move the shift selector and check for “excessive effort,” “sticking,” “noise” or “rattle”.
4. Confirm that shift selector 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 shift selector is in matches the position shown by the transaxle body.
5. The method of operating the shift selector to individual positions correctly should be as shown.
   - (A): Press shift selector button to operate shift selector, while depressing the brake pedal.
   - (B): Press shift selector button to operate shift selector.
   - (C): Shift selector can be operated without pressing shift selector button.



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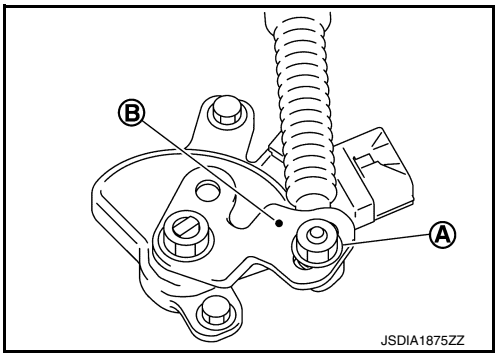
6. When the shift selector handle button is pressed without applying forward/backward force to the shift selector at “P”, “R”, “N” and “D” positions, there should be no “sticking” of the button.
7. Confirm the back-up lamps illuminate only when shift selector is placed in the “R” position. Confirm the back-up lamps do not illuminate when the shift selector is pushed toward the “R” position side when shift selector is in the “P” or “N” position.
8. Check that the engine can be started only when the shift selector is in the “P” and “N” positions.
9. Check that the transaxle is locked when the shift selector is in the "P" position.

Adjustment

INFOID:0000000009020198

1. Move the shift selector to the “P” position.
   CAUTION:
   Rotate the wheels at least a quarter turn and be certain the transaxle is locked in the "P" position.
2. Remove nut (A) and set manual lever (B) to the “P” position.
   CAUTION:
   Do not apply force to the manual lever.
3. Tighten nuts to the specified torque. Refer to TM-230, "Exploded View".
   CAUTION:
   Do not move the manual lever when tightening.



JSDIA1875ZZ

DTC/CIRCUIT DIAGNOSIS

U0073 COMMUNICATION BUS A OFF

Description

INFOID:0000000009019896

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:0000000009019897

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
U0073	Control Module Communication Bus A Off	TCM communication blockage lasts for 2 seconds or more when turning ON the ignition switch. (Communication not established.)	Harness or connector (CAN communication line is error)

DTC CONFIRMATION PROCEDURE

1. PREPARATION BEFORE WORK

If another “DTC CONFIRMATION PROCEDURE” occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and wait for at least 5 seconds.
2. Check the DTC.

Is “U0073” detected?

YES >> Go to TM-133, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019898

For the diagnosis procedure, refer to LAN-15, "Trouble Diagnosis Flow Chart".

U0100 LOST COMMUNICATION (ECM A)

Description

INFOID:0000000009019899

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:0000000009019900

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
U0100	Lost Communication With ECM/PCM A	When the ignition switch is ON, TCM is unable to receive the CAN communications signal from ECM continuously for 2 seconds or more.	• ECM • Harness or connector (CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another “DTC CONFIRMATION PROCEDURE” occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and wait for at least 5 seconds.
2. Check the DTC.

Is “U0100” detected?

YES >> Go to TM-134, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019901

For the diagnosis procedure, refer to LAN-15, "Trouble Diagnosis Flow Chart".

U0140 LOST COMMUNICATION (BCM)

Description

INFOID:0000000009019902

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:0000000009019903

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
U0140	Lost Communication With Body Control Module	When the ignition switch is ON, TCM is unable to receive the CAN communications signal from BCM continuously for 2 seconds or more.	• BCM • Harness or connector (CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another “DTC CONFIRMATION PROCEDURE” occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Start the engine and wait for at least 5 seconds.
2. Check the DTC.

Is “U0140” detected?

YES >> Go to TM-135, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019904

For the diagnosis procedure, refer to LAN-15, "Trouble Diagnosis Flow Chart".

U0141 LOST COMMUNICATION (BCM A)

Description

INFOID:0000000009019905

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:0000000009019906

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
U0141	Lost Communication With Body Control Module A	When the ignition switch is turned ON, TCM continues no reception of the CAN communication signal from IPDM E/R for 2 seconds or more.	• IPDM E/R • Harness or connector (CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another “DTC CONFIRMATION PROCEDURE” occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Start the engine and wait for at least 5 seconds.
2. Check the DTC.

Is “U0141” detected?

YES >> Go to TM-133, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019907

For the diagnosis procedure, refer to LAN-15, "Trouble Diagnosis Flow Chart".

U0155 LOST COMMUNICATION (IPC)

Description

INFOID:0000000009019908

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:0000000009019909

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
U0155	Lost Communication With Instrument Panel Cluster (IPC) Control Module	When the ignition switch is ON, TCM is unable to receive the CAN communications signal from the combination meter continuously for 2 seconds or more.	• Combination meter • Harness or connector (CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another “DTC CONFIRMATION PROCEDURE” occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Start the engine and wait for at least 5 seconds.
2. Check the DTC.

Is “U0155” detected?

YES >> Go to TM-137, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019910

For the diagnosis procedure, refer to LAN-15, "Trouble Diagnosis Flow Chart".

U0300 CAN COMMUNICATION DATA

Description

INFOID:0000000009019911

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:0000000009019912

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
U0300	Internal Control Module Software Incompatibility	When the ignition switch is ON, the data length transmitted from each control unit is shorter than the specified length and the status continues for 2 seconds or more.	Control unit other than TCM

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another “DTC CONFIRMATION PROCEDURE” occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Start the engine and wait for 5 seconds or more.
2. Check the DTC.

Is “U0300” detected?

YES >> Go to TM-138, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019913

1.CONTROL UNIT CHECK

Check the number of control units replaced before “U0300” is detected.

Is one control unit replaced?

YES >> The specification of the control unit replaced may be incorrect. Check the part number and the specification.
NO >> GO TO 2.

2.CONTROL UNIT CHECK

With CONSULT
1. Remove one of the control unit replaced.
2. Assemble the old control unit before replacement.
3. Turn ignition switch ON, and wait for 2 seconds or more.
4. Select “Self Diagnostic Results” in “TRANSMISSION”.

Is “U0300”detected?

YES >> Turn OFF the ignition switch and check other control units in the same manner.
NO >> The specification of the control unit removed may be incorrect. Check the part number and the specification.

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000009019914

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:0000000009019915

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
U1000	CAN Communication Line	When the ignition switch is ON, TCM cannot send the CAN communication signal continuously for 2 seconds or more.	Harness or connector (CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another “DTC CONFIRMATION PROCEDURE” occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Start the engine and wait for at least 5 seconds.
2. Check the DTC.

Is “U1000” detected?

YES >> Go to TM-139, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019916

For the diagnosis procedure, refer to LAN-15, "Trouble Diagnosis Flow Chart".

U1117 LOST COMMUNICATION (ABS)

Description

INFOID:0000000009019917

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:0000000009019918

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
U1117	Lost Communication With ABS	When the ignition switch is ON, TCM is unable to receive the CAN communications signal from ABS actuator and electric unit (control unit) continuously for 2 seconds or more.	• ABS actuator and electric unit (control unit) • Harness or connector (CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT
1. Start the engine and wait for 5 seconds or more.
2. Check the DTC.

Is “U1117” detected?

YES >> Go to TM-133, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019919

For the diagnosis procedure, refer to LAN-15, "Trouble Diagnosis Flow Chart".

P062F EEPROM

Description

INFOID:0000000009019920

TCM compares the calculated value stored in the flash ROM with the value stored in TCM. If the calculated value does not agree with the stored value, TCM judges this as a malfunction.

DTC Logic

INFOID:0000000009019921

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P062F	Internal Control Module EEPROM Error	Flash ROM error is detected when turning ON the ignition switch.	• TCM (flash ROM) • Harness or connector [TCM power supply (back-up) circuit is open or shorted]

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Check the DTC.

Is “P062F” detected?

YES >> Go to TM-141, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019922

1.CHECK INTERMITTENT INCIDNT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace the TCM. Refer to TM-235, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

P0705 TRANSMISSION RANGE SENSOR A

DTC Logic

INFOID:0000000009019923

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0705	Transmission Range Sensor A Circuit (PRNDL Input)	Two or more range signals simultaneously stay ON continuously for 5 seconds under the following diagnosis condition 1 and 2: • Diagnosis condition 1 (continued for 5 seconds or more) - TCM power supply voltage: More than 11 V • Diagnosis condition 2 (continued for 2 seconds or more) - Vehicle speed: Less than 3 km/h (2 MPH) - Accelerator pedal position: 0.6/8 or less - Idle switch: ON - Stop lamp switch: ON	• Harness or connector (Short circuit between transmission range switch and TCM) • Transmission range switch

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Maintain the following conditions.

Accelerator pedal position	: 0.0/8
Brake pedal	: Depressed
Vehicle speed	: 0 km/h (0 MPH)

3. Shift the selector lever through entire positions from “P” to “L”. (Hold the selector lever at each position for 10 seconds or more.)
4. Check the first trip DTC.

Is “P0705” detected?

YES >> Go to TM-142, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019924

1.CHECK TCM INPUT SIGNALS

With CONSULT

1. Turn ignition switch ON.
2. Select “Data Monitor” in “TRANSMISSION”.
3. Select “D POSITION SW”, “N POSITION SW”, “R POSITION SW”, “P POSITION SW” and “L POSITION SW”.
4. Shift the selector lever through entire positions from “P” to “L” and check ON/OFF of each monitor item.

Monitor item	Test condition	Condition
D POSITION SW	Selector lever: “D” position	On
	Other than the above	Off

Monitor item	Test condition	Condition
N POSITION SW	Selector lever: “N” position	On
	Other than the above	Off
R POSITION SW	Selector lever: “R” position	On
	Other than the above	Off
P POSITION SW	Selector lever: “P” position	On
	Other than the above	Off
L POSITION SW	Selector lever: “L” position	On
	Other than the above	Off

Without CONSULT

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Turn ignition switch ON.
4. Shift the selector lever from “P” to “L” and check voltage between TCM harness connector terminals and ground.

+		–	Condition	Voltage
TCM				
Connector	Terminal			
F44	2	Ground	Selector lever: “ L” position	Battery voltage
			Other than the above	Approx. 0 V
	4		Selector lever: “D” position	Battery voltage
			Other than the above	Approx. 0 V
	5		Selector lever: “N” position	Battery voltage
			Other than the above	Approx. 0 V
	6		Selector lever: “R” position	Battery voltage
			Other than the above	Approx. 0 V
	7		Selector lever: “P” position	Battery voltage
			Other than the above	Approx. 0 V

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO-1 [“D POSITION SW” is “ON” when selector is not in “D” position. (Or connector terminal 4 is at power voltage.)]>>GO TO 2.
NO-2 [“N POSITION SW” is “ON” when selector is not in “N” position. (Or connector terminal 5 is at power voltage.)]>>GO TO 4.
NO-3 [“R POSITION SW” is “ON” when selector is not in “R” position. (Or connector terminal 6 is at power voltage.)]>>GO TO 6.
NO-4 [“P POSITION SW” is “ON” when selector is not in “P” position. (Or connector terminal 7 is at power voltage.)]>>GO TO 8.
NO-5 [“L POSITION SW” is “ON” when selector is not in “L” position. (Or connector terminal 2 is at power voltage.)]>>GO TO 10.

2. CHECK D POSITION SW CIRCUIT (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between TCM harness connector terminals.

TCM			Continuity
Connector	Terminal		
F44	4	2	Not existed
		5	
		6	
		7	

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3.CHECK D POSITION SW CIRCUIT (PART 2)

1. Disconnect transmission position switch connector.
2. Turn ignition switch ON.
3. Check voltage between TCM harness connector terminal and ground.

+		−	Voltage (Approx.)
TCM			
Connector	Terminal		
F44	4	Ground	0 V

Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair or replace malfunctioning parts.

4.CHECK N POSITION SW CIRCUIT (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between TCM harness connector terminals.

TCM			Continuity
Connector	Terminal		
F44	5	2	Not existed
		4	
		6	
		7	

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning parts.

5.CHECK N POSITION SW CIRCUIT (PART 2)

1. Disconnect transmission position switch connector.
2. Turn ignition switch ON.
3. Check voltage between TCM harness connector terminal and ground.

+		−	Voltage (Approx.)
TCM			
Connector	Terminal		
F44	5	Ground	0 V

Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair or replace malfunctioning parts.

6.CHECK P POSITION SW CIRCUIT (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between TCM harness connector terminals.

TCM			Continuity
Connector	Terminal		
F44	7	2	Not existed
		4	
		5	
		6	

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace malfunctioning parts.

7.CHECK P POSITION SW CIRCUIT (PART 2)

1. Disconnect transmission position switch connector.
2. Turn ignition switch ON.
3. Check voltage between TCM harness connector terminal and ground.

+		–	Voltage (Approx.)
TCM			
Connector	Terminal		
F44	7	Ground	0 V

Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair or replace malfunctioning parts.

8.CHECK R POSITION SW CIRCUIT (PART1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between TCM harness connector terminals.

TCM			Continuity
Connector	Terminal		
F44	6	2	Not existed
		4	
		5	
		7	

Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair or replace malfunctioning parts.

9.CHECK R POSITION SW CIRCUIT (PART 2)

1. Disconnect transmission position switch connector.
2. Turn ignition switch ON.
3. Check voltage between TCM harness connector terminal and ground.

+		−	Voltage (Approx.)
TCM			
Connector	Terminal		
F44	6	Ground	0 V

Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair or replace malfunctioning parts.

10.CHECK L POSITION SWITCH CIRCUIT (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between TCM harness connector terminals.

TCM			Continuity
Connector	Terminal		
F44	2	4	Not existed
		5	
		6	
		7	

Is the inspection result normal?

YES >> GO TO 11.
NO >> Repair or replace malfunctioning parts.

11.CHECK L POSITION SWITCH CIRCUIT (PART 2)

1. Disconnect transmission position switch connector.
2. Turn ignition switch ON.
3. Check voltage between TCM harness connector terminal and ground.

+		−	Voltage (Approx.)
TCM			
Connector	Terminal		
F44	2	Ground	0 V

Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair or replace malfunctioning parts.

12.CHECK TRANSMISSION RANGE SWITCH

Check transmission range switch. Refer to TM-146, "Component Inspection (Transmission Range Switch)".

Is the check result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (Transmission Range Switch)

INFOID:0000000009019925

1.CHECK TRANSMISSION RANGE SWITCH

Check continuity between transmission range switch connector terminals.

Transmission range switch	Condition	Continuity
Terminal		
7 – 10	Manual lever: “P” and “N” positions	Existed
	Other than the above	Not existed

Transmission range switch Terminal	Condition	Continuity
4 – 5	Manual lever: “P” position	Existed
	Other than the above	Not existed
4 – 8	Manual lever: “R” position	Existed
	Other than the above	Not existed
4 – 9	Manual lever: “N position	Existed
	Other than the above	Not existed
4 – 2	Manual lever: “D” position	Existed
	Other than the above	Not existed
4 – 6	Manual lever: “L” position	Existed
	Other than the above	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of transmission range switch. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0706 TRANSMISSION RANGE SENSOR A

DTC Logic

INFOID:0000000009019926

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0706	Transmission Range Sensor A Circuit Range/Performance	All range signals stay OFF continuously for 30 seconds under the following diagnosis condition 1 and 2: • Diagnosis condition 1 (continued for 30 seconds or more) - TCM power supply voltage: More than 11 V • Diagnosis condition 2 (continued for 2 seconds or more) - Vehicle speed: Less than 3 km/h (2 MPH) - Accelerator pedal position: 0.6/8 or less - Idle switch: ON - Stop lamp switch: ON	• Harness or connector (Open circuit between ignition switch and transmission range switch/open circuit between transmission range switch and TCM) • Transmission range switch • Control cable

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine.
2. Maintain the following conditions.

Accelerator pedal position	: 0.0/8
Brake pedal	: Depressed
Vehicle speed	: 0 km/h (0 MPH)

3. Shift the selector lever through entire positions from “P” to “L”. (Hold the selector lever at each position for 35 seconds or more.)
4. Check the first trip DTC.

Is “P0706” detected?

YES >> Go to TM-148, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019927

1.ADJUSTMENT OF CONTROL CABLE

Adjust control cable. Refer to TM-228, "Inspection".

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

1. Turn ignition switch ON.
2. Select “Self Diagnostic Results” in “TRANSMISSION”.
3. Touch “Erase”.
4. Perform "DTC CONFIRMATION PROCEDURE". Refer to TM-148, "DTC Logic".

Is “P0706” detected?

YES >> GO TO 3.
NO >> INSPECTION END

3.CHECK POWER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect transmission range switch connector.
3. Turn ignition switch ON.
4. Check voltage between transmission range switch harness connector terminal and ground.

+		–	Voltage
Transmission range switch			
Connector	Terminal		
F52	4	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 7.

4.CHECK CIRCUIT BETWEEN TRANSMISSION RANGE SWITCH AND TCM (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between transmission range switch harness connector terminals and TCM harness connector terminals.

Transmission range switch		TCM		Continuity
Connector	Terminal	Connector	Terminal	
F52	2	F44	4	Existed
	5		7	
	6		6	
	8		6	
	9		5	

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning parts.

5.CHECK CIRCUIT BETWEEN TRANSMISSION RANGE SWITCH AND TCM (PART 2)

Check continuity between transmission range switch harness connector terminals and ground.

Transmission range switch		—	Continuity
Connector	Terminal		
F52	2	Ground	Not existed
	5		
	6		
	8		
	9		

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace malfunctioning parts.

6.CHECK TRANSMISSION RANGE SWITCH

Check transmission range switch. Refer to TM-150, "Component Inspection (Transmission Range Switch)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

7. CHECK CIRCUIT BETWEEN IPDM E/R AND TRANSMISSION RANGE SWITCH

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector and transmission range switch.

IPDM E/R		Transmission range switch		Continuity
Connector	Terminal	Connector	Terminal	
E45	21	F52	4	Existed

Is the check result normal?

YES >> GO TO 8.
NO >> Repair or replace malfunctioning parts.

8. DETECT MALFUNCTIONING ITEMS

Check the following items:
- Open circuit or short circuit in harness between ignition switch and IPDM E/R. Refer to PG-22, "Wiring Diagram — Ignition Power Supply —".
- Short circuit in harness between IPDM E/R harness connector terminal 21 and transmission range switch harness connector terminal 4.
- 10A fuse (No. 49, IPDM E/R). Refer to PG-39, "IPDM E/R Terminal Arrangement".
- IPDM E/R

Is the check result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (Transmission Range Switch)

INFOID:0000000009019928

1. CHECK TRANSMISSION RANGE SWITCH

Check continuity between transmission range switch connector terminals.

Transmission range switch	Condition	Continuity
Terminal		
7 – 10	Manual lever: “P” and “N” positions	Existed
	Other than the above	Not existed
4 – 5	Manual lever: “P” position	Existed
	Other than the above	Not existed
4 – 8	Manual lever: “R” position	Existed
	Other than the above	Not existed
4 – 9	Manual lever: “N position	Existed
	Other than the above	Not existed
4 – 2	Manual lever: “D” position	Existed
	Other than the above	Not existed
4 – 6	Manual lever: “L” position	Existed
	Other than the above	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of transmission range switch. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0711 TRANSMISSION FLUID TEMPERATURE SENSOR A

DTC Logic

INFOID:0000000009019929

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0711	Transmission Fluid Temperature Sensor A Circuit Range/ Performance	Under the following diagnosis conditions, CVT fluid temperature recognized by TCM does not change for 10 minutes or more in a temperature range. • Diagnosis condition - Selector lever: “D” position - Vehicle speed: 10 km/h (7 MPH) or more - Engine speed: 450 rpm or more - Accelerator pedal position: 1.0/8 or more - TCM power supply voltage: More than 11 V - CVT fluid temperature: Less than 10°C **NOTE:** Every time the CVT fluid temperature increases, reset the detection time and start the diagnosis again.	CVT fluid temperature sensor

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine.
2. Drive the vehicle.
3. Maintain the following conditions for a total of 10 minutes or more.

Selector lever	: “D” position
Accelerator pedal position	: 1.0/8 or more
Vehicle speed	: 20 km/h (12 MPH) or more

4. Stop the vehicle.
5. Check the first trip DTC.

Is “P0711” detected?

YES >> Go to TM-166, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019930

1.CHECK CVT FLUID TEMPERATURE SENSOR

1. Turn ignition switch OFF.
2. Disconnect CVT unit connector.
3. Check CVT fluid temperature sensor. Refer to TM-152, "Component Inspection (CVT Fluid Temperature Sensor)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (CVT Fluid Temperature Sensor)

INFOID:0000000009019931

1. CHECK CVT FLUID TEMPERATURE SENSOR

Check resistance between CVT unit connector terminals.

CVT unit Terminal	Condition	Resistance (Approx.)
12 – 18	CVT fluid temperature: 20°C (68°C)	6.5 kΩ
	CVT fluid temperature: 50°C (122°C)	2.2 kΩ
	CVT fluid temperature: 80°C (176°C)	0.87 kΩ

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of CVT fluid temperature sensor. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0712 TRANSMISSION FLUID TEMPERATURE SENSOR A

DTC Logic

INFOID:0000000009019932

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0712	Transmission Fluid Temperature Sensor A Circuit Low	The CVT fluid temperature identified by the TCM is 180°C (356°F) or more continuously for 5 seconds or more under the following diagnosis conditions: • Diagnosis conditions - Ignition switch: ON - TCM power supply voltage: More than 11 V	• Harness or connector (CVT fluid temperature sensor circuit is shorted to ground) • CVT fluid temperature sensor

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine and wait for 10 seconds or more.
2. Check the first trip DTC.

Is “P0712” detected?

YES >> Go to TM-153, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019933

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminal and ground.

TCM		—	Continuity
Connector	Terminal		
F44	12	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning part.

2.CHECK CVT FLUID TEMPERATURE SENSOR

Check CVT fluid temperature sensor. Refer to TM-153, "Component Inspection (CVT Fluid Temperature Sensor)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (CVT Fluid Temperature Sensor)

INFOID:0000000009019934

1.CHECK CVT FLUID TEMPERATURE SENSOR

Check resistance between CVT unit connector terminals.

CVT unit Terminal	Condition	Resistance (Approx.)
12 – 18	CVT fluid temperature: 20°C (68°C)	6.5 kΩ
	CVT fluid temperature: 50°C (122°C)	2.2 kΩ
	CVT fluid temperature: 80°C (176°C)	0.87 kΩ

Is the inspection result normal?

YES >> INSPECTION END

NO >> There is a malfunction of CVT fluid temperature sensor. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0713 TRANSMISSION FLUID TEMPERATURE SENSOR A

DTC Logic

INFOID:0000000009019935

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0713	Transmission Fluid Temperature Sensor A Circuit High	The CVT fluid temperature identified by the TCM is –40°C (–40°F) or less continuously for 5 seconds or more under the following diagnosis conditions: • Diagnosis conditions - Ignition switch: ON - Vehicle speed: More than 10 km/h (7 MPH) - TCM power supply voltage: More than 11 V	• Harness or connector (CVT fluid temperature sensor circuit is open or shorted to power supply) • CVT fluid temperature sensor

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.PERFORM DTC CONFIRMATION PROCEDURE

1. Start the engine.
2. Maintain the following condition for 10 seconds or more.

Vehicle speed : 20 km/h (12 MPH) or more

3. Stop the vehicle.
4. Check the first trip DTC.

Is “P0713” detected?

YES >> Go to TM-153, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019936

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminals and CVT unit harness connector terminals.

TCM		CVT unit		Continuity
Connector	Terminal	Connector	Terminal	
F44	12	F46	12	Existed
	11		18	

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning part.

2.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT (PART 2)

1. Turn ignition switch ON.
2. Check voltage between TCM harness connector terminal and ground.

+		–	Voltage (Approx.)
TCM			
Connector	Terminal		
F44	12	Ground	0 V

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning part.

3.CHECK CVT FLUID TEMPERATURE SENSOR

Check CVT fluid temperature sensor. Refer to TM-156, "Component Inspection (CVT Fluid Temperature Sensor)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (CVT Fluid Temperature Sensor)

INFOID:0000000009019937

1.CHECK CVT FLUID TEMPERATURE SENSOR

Check resistance between CVT unit connector terminals.

CVT unit	Condition	Resistance (Approx.)
Terminal		
12 – 18	CVT fluid temperature: 20°C (68°C)	6.5 kΩ
	CVT fluid temperature: 50°C (122°C)	2.2 kΩ
	CVT fluid temperature: 80°C (176°C)	0.87 kΩ

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of CVT fluid temperature sensor. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0715 INPUT SPEED SENSOR A

DTC Logic

INFOID:0000000009019938

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0715	Input/Turbine Speed Sensor A Circuit	The primary speed sensor value is less than 150 rpm continuously for 5 seconds or more under the following diagnosis conditions: • Diagnosis conditions - Secondary pulley speed: 1,000 rpm or more - TCM power supply voltage: More than 11 V	• Harness or connector (Primary speed sensor circuit is open or shorted) • Primary speed sensor
		The primary speed sensor value is 240 rpm or less continuously for 500 msec or more under the following diagnosis conditions: • Diagnosis conditions - 10-msec-ago primary pulley speed: 1,000 rpm or more - TCM power supply voltage: More than 11 V	

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Drive the vehicle.
3. Maintain the following conditions for 10 seconds or more.

Selector lever	: “L” POSITION
Vehicle speed	: 40 km/h (25 MPH) or more

4. Stop the vehicle.
5. Check the first trip DTC.

Is “P0715” detected?

YES >> Go to TM-157, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019939

1.CHECK PRIMARY SPEED SENSOR POWER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect primary speed sensor connector.
3. Turn ignition switch ON.
4. Check voltage between primary speed sensor harness connector terminal and ground.

+		–	Voltage
Primary speed sensor			
Connector	Terminal		
F50	3	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 6.

2.CHECK PRIMARY SPEED SENSOR GROUND CIRCUIT

Check continuity between primary speed sensor harness connector terminal and ground.

Primary speed sensor		—	Continuity
Connector	Terminal		
F50	1	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3.CHECK CIRCUIT BETWEEN PRIMARY SPEED SENSOR AND TCM (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between primary speed sensor harness connector terminal and TCM harness connector terminal.

Primary speed sensor		TCM		Continuity
Connector	Terminal	Connector	Terminal	
F50	2	F44	35	Existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace malfunctioning parts.

4.CHECK CIRCUIT BETWEEN PRIMARY SPEED SENSOR AND TCM (PART 2)

Check continuity between primary speed sensor harness connector terminal and ground.

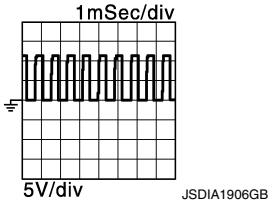
Primary speed sensor		—	Continuity
Connector	Terminal		
F50	2	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning parts.

5.CHECK TCM INPUT SIGNALS

1. Connect all of disconnected connectors.
2. Lift the vehicle.
3. Start the engine.
4. Check frequency of primary speed sensor.

+		–	Condition	Frequency (Approx.)
TCM				
Connector	Terminal			
F44	35	Ground	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	1,100 Hz 

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Replace primary speed sensor. TM-240, "Removal and Installation".

6. CHECK CIRCUIT BETWEEN IPDM E/R AND PRIMARY SPEED SENSOR

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector terminal and primary speed sensor harness connector terminal.

IPDM E/R		Primary speed sensor		Continuity
Connector	Terminal	Connector	Terminal	
E45	21	F50	3	Existed

Is the check result normal?

YES >> GO TO 7.
NO >> Repair or replace malfunctioning parts.

7. DETECT MALFUNCTIONING ITEMS

Check the following items:
- Open circuit or short circuit in harness between ignition switch and IPDM E/R. Refer to PG-22, "Wiring Diagram — Ignition Power Supply —".
- Short circuit in harness between IPDM E/R harness connector terminal 21 and primary speed sensor harness connector terminal 3.
- 10A fuse (No.49, IPDM E/R). Refer to PG-39, "IPDM E/R Terminal Arrangement".
- IPDM E/R

Is the check result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

P0720 OUTPUT SPEED SENSOR

DTC Logic

INFOID:0000000009019940

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0720	Output Speed Sensor Circuit	The output speed sensor value is less than 150 rpm continuously for 10 seconds or more under the following diagnosis conditions: • Diagnosis conditions - Selector lever: “D”, “L” or “R” position - Auxiliary gearbox shifting is not in progress. - When the “D” position switch, “L” position switch or “R” position switch is ON, the output speed has not experienced 250 rpm or more. - After shifting the selector lever, the input speed has experienced less than 300 rpm. - Secondary pulley speed: 1,500 rpm or more - TCM power supply voltage: More than 11 V	• Harness or connector (Output speed sensor circuit is open or shorted) • Output speed sensor
		The output speed sensor value is 90 rpm or less continuously for 500 msec or more under the following diagnosis conditions: • Diagnosis conditions - 10-msec-ago output speed: 730 rpm or more - TCM power supply voltage: More than 11 V	

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Drive the vehicle.
3. Maintain the following conditions for 10 seconds or more.

Selector lever	: “D” position
Vehicle speed	: 55 km/h (34 MPH) or more

4. Stop the vehicle.
5. Check the first trip DTC.

Is “P0720” detected?

YES >> Go to TM-160, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019941

1.CHECK OUTPUT SPEED SENSOR POWER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect output speed sensor connector.
3. Turn ignition switch ON.
4. Check voltage between output speed sensor harness connector terminal and ground.

+		–	Voltage
Output speed sensor			
Connector	Terminal		
F41	3	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 6.

2.CHECK OUTPUT SPEED SENSOR GROUND CIRCUIT

Check continuity between output speed sensor harness connector terminal and ground.

Output speed sensor		—	Continuity
Connector	Terminal		
F41	1	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3.CHECK CIRCUIT BETWEEN OUTPUT SPEED SENSOR AND TCM (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between output speed sensor harness connector terminal and TCM harness connector terminal.

Output speed sensor		TCM		Continuity
Connector	Terminal	Connector	Terminal	
F41	2	F44	24	Existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace malfunctioning parts.

4.CHECK CIRCUIT BETWEEN OUTPUT SPEED SENSOR AND TCM (PART 2)

Check continuity between output speed sensor harness connector terminal and ground.

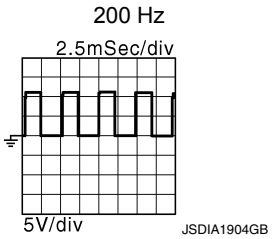
Output speed sensor		—	Continuity
Connector	Terminal		
F41	2	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning parts.

5.CHECK TCM INPUT SIGNALS

1. Connect all of disconnected connectors.
2. Lift the vehicle.
3. Start the engine.
4. Check frequency of output speed sensor.

+ TCM Connector	+ TCM Terminal	–	Condition	Frequency (Approx.)
F44	24	Ground	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Replace output speed sensor. Refer to TM-242, "Removal and Installation".

6. CHECK CIRCUIT BETWEEN IPDM E/R AND OUTPUT SPEED SENSOR

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector terminal and output speed sensor harness connector terminal.

IPDM E/R Connector	IPDM E/R Terminal	Output speed sensor Connector	Output speed sensor Terminal	Continuity
E45	21	F41	3	Existed

Is the check result normal?

YES >> GO TO 7.
NO >> Repair or replace malfunctioning parts.

7. DETECT MALFUNCTIONING ITEMS

Check the following items:
- Open circuit or short circuit in harness between ignition switch and IPDM E/R. Refer to PG-22, "Wiring Diagram — Ignition Power Supply —".
- Short circuit in harness between IPDM E/R harness connector terminal 21 and output speed sensor harness connector terminal 3.
- 10A fuse (No.49, IPDM E/R). Refer to PG-39, "IPDM E/R Terminal Arrangement".
- IPDM E/R

Is the check result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

P0740 TORQUE CONVERTER

DTC Logic

INFOID:0000000009019942

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0740	Torque Converter Clutch Circuit/Open	The TCM torque converter clutch solenoid valve current monitor reading is 200 mA or less continuously for 5 seconds or more under the following diagnosis conditions: • Diagnosis conditions - Solenoid valve output current: 750 mA or more - GND short diagnosis of the solenoid valve circuit is not satisfied. - TCM power supply voltage: More than 11 V	• Harness or connector (Torque converter clutch solenoid valve circuit is open or shorted to power supply) • Torque converter clutch solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1. PREPARATION BEFORE OPERATION (PART 1)

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2. PREPARATION BEFORE OPERATION (PART 2)

With CONSULT

1. Start the engine.
2. Select “Data Monitor” in “TRANSMISSION”.
3. Select “FLUID TEMP”.
4. Confirm that the CVT fluid temperature is in the following range.

FLUID TEMP : 10°C (50°F) or more

With GST

1. Start the engine.
2. Set the CVT fluid to 10°C (50°F) or more.

NOTE:

When the ambient temperature is 20°C (68°F), the CVT fluid usually increases to 50 to 80°C (122 to 176°F) with driving in an urban area for approximately 10 minutes.

Is the CVT fluid 10°C (50°F) or more?

YES >> GO TO 3.
NO >> 1. Warm the transaxle.
2. GO TO 3.

3. CHECK DTC DETECTION

1. Drive the vehicle.
2. Maintain the following conditions for 10 seconds or more.

Selector lever	: “D” position
Vehicle speed	: 40 km/h (25 MPH) or more

3. Stop the vehicle.
4. Check the first trip DTC.

Is “P0740” detected?

YES >> Go to TM-164, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019943

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminal and CVT unit harness connector terminal.

TCM		CVT unit		Continuity
Connector	Terminal	Connector	Terminal	
F44	38	F46	8	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK TORQUE CONVERTER CLUTCH SOLENOID VALVE

Check torque converter clutch solenoid valve. Refer to TM-164, "Component Inspection (Torque Converter Clutch Solenoid Valve)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (Torque Converter Clutch Solenoid Valve)

INFOID:0000000009019944

1.CHECK TORQUE CONVERTER CLUTCH SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit / Terminal	—	Condition	Resistance (Approx.)
8	Ground	CVT fluid temperature: 20°C (68°F)	6.1 Ω
		CVT fluid temperature: 50°C (122°F)	6.9 Ω
		CVT fluid temperature: 80°C (176°F)	7.7 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of torque converter clutch solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0743 TORQUE CONVERTER

DTC Logic

INFOID:0000000009019945

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0743	Torque Converter Clutch Circuit Electrical	The TCM torque converter clutch solenoid valve current monitor reading is 200 mA or less continuously for 480 msec or more under the following diagnosis conditions: • Diagnosis conditions - Solenoid valve output current: 750 mA or more - GND short circuit diagnosis occurs in the solenoid valve drive circuit. - TCM power supply voltage: More than 11 V	• Harness or connector (Torque converter clutch solenoid valve circuit is shorted to ground) • Torque converter clutch solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1. PREPARATION BEFORE OPERATION (PART 1)

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2. PREPARATION BEFORE OPERATION (PART 2)

With CONSULT

1. Start the engine.
2. Select “Data Monitor” in “TRANSMISSION”.
3. Select “FLUID TEMP”.
4. Confirm that the CVT fluid temperature is in the following range.

FLUID TEMP : 10°C (50°F) or more

With GST

1. Start the engine.
2. Set the CVT fluid to 10°C (58°F) or more.

NOTE:

When the ambient temperature is 20°C (68°F), the CVT fluid usually increases to 50 to 80°C (122 to 176°F) with driving in an urban area for approximately 10 minutes.

Is the CVT fluid 10°C (58°F) or more?

YES >> GO TO 3.
NO >> 1. Warm the transaxle.
2. GO TO 3.

3. CHECK DTC DETECTION

1. Drive the vehicle.
2. Maintain the following conditions for 5 seconds or more.

Selector lever	: “D” position
Vehicle speed	: 40 km/h (25 MPH) or more

3. Stop the vehicle.
4. Check the first trip DTC.

Is “P0743” detected?

YES >> Go to TM-166, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019946

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminal and ground.

TCM		—	Continuity
Connector	Terminal		
F44	38	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK TORQUE CONVERTER CLUTCH SOLENOID VALVE

Check torque converter clutch solenoid valve. Refer to TM-166, "Component Inspection (Torque Converter Clutch Solenoid Valve)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (Torque Converter Clutch Solenoid Valve)

INFOID:0000000009019947

1.CHECK TORQUE CONVERTER CLUTCH SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit	—	Condition	Resistance (Approx.)
Terminal			
8	Ground	CVT fluid temperature: 20°C (68°F)	6.1 Ω
		CVT fluid temperature: 50°C (122°F)	6.9 Ω
		CVT fluid temperature: 80°C (176°F)	7.7 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of torque converter clutch solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0744 TORQUE CONVERTER

DTC Logic

INFOID:0000000009019948

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0744	Torque converter clutch circuit intermittent	The torque converter slip speed is at or above a set value (40 rpm + (Vehicle speed / 2) continuously for 30 seconds or more under the following diagnosis conditions: • Diagnosis conditions - Selector lever: “D” position - Accelerator pedal position: 1.0/8 or more - Vehicle speed: 10 km/h (6 MPH) or more - Engine speed: 450 rpm or more - CVT fluid temperature: 20°C (68°F) ≤ CVT fluid temperature ≤ 180°C (356°F) - Lockup command is being given (except for slip lockup). - LU PRS: More than 0.2 MPa - TCM power supply voltage: More than 11 V	• Torque converter clutch solenoid valve • Control valve assembly • Torque converter

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1.PREPARATION BEFORE OPERATION 1

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.PREPARATION BEFORE OPERATION 2

With CONSULT

1. Start the engine.
2. Select “Data Monitor” in “TRANSMISSION”.
3. Select “FLUID TEMP”.
4. Confirm that the CVT fluid temperature is in the range below.

FLUID TEMP : 20°C (68°F) or more

With GST

1. Start the engine.
2. Set the CVT fluid to 20°C (68°F) or more.
   NOTE:
   When the ambient temperature is 20°C (68°F), the CVT fluid usually increases to 50 to 80°C (122 to 176°F) with driving in an urban area for approximately 10 minutes.

Is the CVT fluid 20°C (68°F) or more?

YES >> GO TO 3.
NO >> 1. Warm the transaxle.
2. GO TO 3.

3.CHECK DTC DETECTION

1. Drive the vehicle.
2. Maintain the following conditions for 40 seconds or more.

Selector lever	: “D” position
Accelerator pedal position	: 1.0/8 or more
Vehicle speed	: 40 km/h (25 MPH) or more

3. Stop the vehicle.
4. Check the first trip DTC.

Is “P0744” detected?

YES >> Go to TM-168, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019949

1.CHECK LINE PRESSURE

Perform line pressure test. Refer to TM-131, "Work Procedure".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace the malfunction items.

2.CHECK TORQUE CONVERTER CLUTCH SOLENOID VALVE

1. Turn ignition switch OFF.
2. Disconnect CVT unit connector.
3. Check torque converter clutch solenoid valve. Refer to TM-168, "Component Inspection (Torque Converter Clutch Solenoid Valve)".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace the malfunction items.

3.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace the transaxle assembly. Refer to TM-250, "Removal and Installation".
NO >> Repair or replace the malfunction items.

Component Inspection (Torque Converter Clutch Solenoid Valve)

INFOID:0000000009019950

1.CHECK TORQUE CONVERTER CLUTCH SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit / Terminal	—	Condition	Resistance (Approx.)
8	Ground	CVT fluid temperature: 20°C (68°F)	6.1 Ω
		CVT fluid temperature: 50°C (122°F)	6.9 Ω
		CVT fluid temperature: 80°C (176°F)	7.7 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of torque converter clutch solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0746 PRESSURE CONTROL SOLENOID A

DTC Logic

INFOID:0000000009019951

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0746	Pressure Control Solenoid A Performance/Stuck Off	The detecting condition A or detection condition B is detected twice or more (1 second or more later after detection of the first) in the same DC under the following diagnosis conditions: • Diagnosis conditions - After the ignition switch is ON, 500 msec or more have passed. - Selector lever: Other than “P” and “N” positions - Idle is not being detected. - Engine speed: 600 rpm or more - Primary pulley speed: 500 rpm or more - Auxiliary gearbox shifting is not in progress. - Acceleration/deceleration speed: −0.05 G or more - The primary pulley speed experienced 306 rpm or more and the secondary pulley speed experienced 230 rpm or more at least once. - The output speed is 107 rpm or less or the secondary pulley speed exceeds 61 rpm. • Detection condition A - Status with the shifting ratio of the primary pulley speed/secondary pulley ratio exceeding 2.55 is 200 msec or more continuously. • Detection condition B - Status with the shifting ratio of the primary pulley speed/secondary pulley ratio exceeding 3.35 is 100 msec or more continuously.	• Line pressure solenoid valve • Control valve assembly

NOTE:
DC stands for "DRIVING CYCLE" and indicates a series of driving cycle of "Ignition switch OFF → ON → driving → OFF".

DTC CONFIRMATION PROCEDURE

CAUTION:
Be careful of the driving speed.

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Drive the vehicle.
3. Maintain the following conditions for 10 seconds or more.

Selector lever	: “D” position
Accelerator pedal position	: 0.1/8 or more
Vehicle speed	: 40 km/h (25 MPH) or more

4. Stop the vehicle.
5. Check the first trip DTC.

Is “P0746”detected?

YES >> Go to TM-170, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019952

1.CHECK LINE PRESSURE SOLENOID VALVE

1. Turn ignition switch OFF.
2. Disconnect CVT unit connector.
3. Check line pressure solenoid valve. Refer to TM-170, "Component Inspection (Line Pressure Solenoid Valve)"

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK LINE PRESSURE

Perform line pressure test. Refer to TM-131, "Work Procedure".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (Line Pressure Solenoid Valve)

INFOID:0000000009019953

1.CHECK LINE PRESSURE SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit Terminal	—	Condition	Resistance (Approx.)
1	Ground	CVT fluid temperature: 20°C (68°F)	5.3 Ω
		CVT fluid temperature: 50°C (122°F)	6.0 Ω
		CVT fluid temperature: 80°C (176°F)	6.7 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of line pressure solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0846 TRANSMISSION FLUID PRESSURE SEN/SW B

DTC Logic

INFOID:0000000009019954

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0846	Transmission Fluid Pressure Sensor/Switch B Circuit Range/Performance	The detection conditions continuously for 5 seconds or more under the following diagnosis conditions: • Diagnosis conditions - Selector lever: “D” position - The primary pulley speed experienced 306 rpm or more and the secondary pulley speed experienced 230 rpm or more at least once. - Wheel spin is not being detected. - The rate of change in pulley ratio: Between –0.09 and +0.09 inclusive - Solenoid valve output current: 750 mA or more - GND short diagnosis of the solenoid valve circuit is not satisfied. - TCM power supply voltage: More than 11 V • Detection conditions - After the value of “Actual secondary pressure – Target secondary pressure” exceeds 0.675 MPa: • The rate of change in vehicle speed [km/h (MPH)]: Between –49 (–30) and +49 (+30) inclusive • The rate of change in accelerator pedal angle: Between –1.3/8 and +1.3/8 inclusive	• Secondary pressure sensor • Control valve assembly

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Shift the selector lever to “D” position.
3. Drive the vehicle at a constant velocity of 40 km/h (25 MPH) at lease for 10 seconds.
   CAUTION:
   At the same time, the accelerator pedal angle must be maintained constant.
4. Stop the vehicle.
5. Check the first trip DTC.

Is “P0846”detected?

YES >> Go to TM-171, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019955

1.CHECK TCM INPUT SIGNAL

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

+		–	Condition	Voltage
TCM				
Connector	Terminal			
F44	16	Ground	• Selector lever: “N” position • At idle	0.88 – 0.92 V

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> There is a malfunction of secondary pressure sensor value. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0847 TRANSMISSION FLUID PRESSURE SEN/SW B

DTC Logic

INFOID:0000000009019956

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0847	Transmission Fluid Pressure Sensor/Switch B Circuit Low	The secondary pressure sensor voltage is 0.09 V or less continuously for 5 seconds or more under the following diagnosis conditions: • Diagnosis conditions - CVT fluid temperature: –20°C (–4°F) or more - TCM power supply voltage: More than 11 V	• Harness or connector (Secondary pressure sensor circuit is open or shorted to ground) • Secondary pressure sensor • Control valve assembly

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT

1. Start the engine.
2. Select “Data Monitor” in “TRANSMISSION”.
3. Select “FLUID TEMP”.
4. Maintain the following conditions for 10 seconds or more.

FLUID TEMP : –19°C (–2.2°F) or more

5. Check the first trip DTC.

With GST

1. Start the engine and wait for at least 10 seconds.
   CAUTION:
   When the ambient temperature is –20°C (–4°F) or less and the engine is cold, warm up the engine for approximately 5 minutes.
2. Check the first trip DTC.

Is “P0847”detected?

YES >> Go to TM-173, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019957

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminals and CVT unit harness connector terminals.

TCM		CVT unit		Continuity
Connector	Terminal	Connector	Terminal	
F44	11	F46	18	Existed
	16		14	
	26		22	

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT (PART 2)

Check continuity between TCM harness connector terminals and ground.

TCM		—	Continuity
Connector	Terminal		
F44	16	Ground	Not existed
	26		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3.CHECK TCM INPUT SIGNALS

1. Connect all connectors removed.
2. Start the engine.
3. Check voltage between TCM harness connector terminal and ground.

+		–	Condition	Voltage
TCM				
Connector	Terminal			
F44	16	Ground	• Selector lever: “N” position • At idle	0.88 – 0.92 V

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> There is malfunction of secondary pressure sensor. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0848 TRANSMISSION FLUID PRESSURE SEN/SW B

DTC Logic

INFOID:0000000009019958

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0848	Transmission Fluid Pressure Sensor/Switch B Circuit Low	The secondary pressure sensor voltage is 4.7 V or more continuously for 5 seconds or more under the following diagnosis conditions: • Diagnosis conditions - CVT fluid temperature: –20°C (–4°F) or more - Secondary pressure target value: 5.7 MPa or less - TCM power supply voltage: More than 11 V	• Harness or connector (Secondary pressure sensor circuit is shorted to power supply) • Secondary pressure sensor • Control valve assembly

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, the ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Start the engine.
2. Select “Data Monitor” in “TRANSMISSION”.
3. Select “FLUID TEMP”.
4. Maintain the following conditions for 10 seconds or more.

FLUID TEMP : –19°C (–2.2°F) or more

5. Check the first trip DTC.

With GST
1. Start the engine and wait for at least 10 seconds.
   CAUTION:
   When the ambient temperature is –20°C (–4°F) or less and the engine is cold, warm up the engine for approximately 5 minutes.
2. Check the first trip DTC.

Is “P0848”detected?

YES >> Go to TM-175, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019959

1.CHECK SECONDARY PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect CVT unit connector.
3. Turn ignition switch ON.
4. Check voltage between CVT unit harness connector terminal and ground.

+		–	Voltage (Approx.)
CVT unit			
Connector	Terminal		
F46	22	Ground	5.0 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK SECONDARY PRESSURE SENSOR SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between TCM harness connector terminals.

TCM			Continuity
Connector	Terminal		
F46	22	Other than 22	Not existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3.CHECK TCM INPUT SIGNALS

1. Connect all connectors removed.
2. Start the engine.
3. Check voltage between TCM harness connector terminal and ground.

+		–	Condition	Voltage
TCM				
Connector	Terminal			
F46	22	Ground	• Selector lever: “N” position • At idle	0.88 – 0.92 V

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> There is a malfunction of secondary pressure sensor. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0863 TCM COMMUNICATION

DTC Logic

INFOID:0000000009019960

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0863	TCM Communication Circuit	An error is detected at the initial CAN diagnosis of TCM.	TCM

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Turn ignition switch ON.
2. Check the DTC.

Is “P0863” detected?

YES >> Go to TM-177, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019961

1.CHECK INTERMITTENT INCIDNT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace TCM. Refer to TM-235, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

P0890 TCM

DTC Logic

INFOID:0000000009019962

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0890	Transmission control module power relay sense circuit low	The battery voltage supplied to the TCM is less than 8.4 V continuously for 200 msec or more under the following diagnosis condition: • Diagnosis condition - TCM power supply voltage: More than 11 V	• Harness or connector (TCM power supply (back-up) circuit is open or shorted.) • TCM

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine and wait for 5 seconds or more.
2. Check the DTC.

Is “P0890” detected?

YES >> Go to TM-178, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019963

1.CHECK TCM POWER SUPPLY (BACK-UP) CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check voltage between TCM harness connector terminals and ground.

+		–	Voltage
TCM			
Connector	Terminal		
F44	45	Ground	10 – 16 V
	46		

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 3.

2.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace TCM. Refer to TM-235, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

3.DETECT MALFUNCTIONING ITEMS

Check the following items:

- Open circuit or short circuit in harness between battery positive terminal and TCM connectors terminals 45, and 46.
- 10A fuse (No.25, fuse and fusible link block). Refer to PG-39, "IPDM E/R Terminal Arrangement".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

P0962 PRESSURE CONTROL SOLENOID A

DTC Logic

INFOID:0000000009019964

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0962	Pressure Control Solenoid A Control Circuit Low	The line pressure solenoid valve current is 200 mA or less continuously for 200 msec or more under the following diagnosis conditions: • Diagnosis conditions - Solenoid output current: 750 mA or more - GND short diagnosis of the solenoid drive circuit is satisfied. - TCM power supply voltage: More than 11 V	• Harness or connector (Line pressure solenoid valve circuit is shorted to ground) • Line pressure solenoid valve

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine and wait for 5 seconds or more.
2. Check the first trip DTC.

Is “P0962” detected?

YES >> Go to TM-180, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019965

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminal and ground.

TCM		—	Continuity
Connector	Terminal		
F44	30	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK LINE PRESSURE SOLENOID VALVE

Check line pressure solenoid valve. Refer to TM-180, "Component Inspection (Line Pressure Solenoid Valve)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (Line Pressure Solenoid Valve)

INFOID:0000000009019966

1.CHECK LINE PRESSURE SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit / Terminal	—	Condition	Resistance (Approx.)
1	Ground	CVT fluid temperature: 20°C (68°F)	5.3 Ω
		CVT fluid temperature: 50°C (122°F)	6.0 Ω
		CVT fluid temperature: 80°C (176°F)	6.7 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> There is a malfunction of line pressure solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0963 PRESSURE CONTROL SOLENOID A

DTC Logic

INFOID:0000000009019967

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0963	Pressure Control Solenoid A Control Circuit High	The line pressure solenoid valve current is 200 mA or less continuously for 200 msec or more under the following diagnosis conditions: • Diagnosis conditions - Solenoid output current: 750 mA or more - GND short diagnosis of the solenoid drive circuit is not satisfied. - TCM power supply voltage: More than 11 V	• Harness or connector (Line pressure solenoid valve circuit is open or shorted to power supply) • Line pressure solenoid valve

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine and wait for 5 seconds or more.
2. Check the first trip DTC.

Is “P0963” detected?

YES >> Go to TM-182, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019968

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminal and CVT unit harness connector terminal.

TCM		CVT unit		Continuity
Connector	Terminal	Connector	Terminal	
F44	30	F46	1	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK LINE PRESSURE SOLENOID VALVE

Check line pressure solenoid valve. Refer to TM-182, "Component Inspection (Line Pressure Solenoid Valve)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (Line Pressure Solenoid Valve)

INFOID:0000000009019969

1.CHECK LINE PRESSURE SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit / Terminal	—	Condition	Resistance (Approx.)
1	Ground	CVT fluid temperature: 20°C (68°F)	5.3 Ω
		CVT fluid temperature: 50°C (122°F)	6.0 Ω
		CVT fluid temperature: 80°C (176°F)	6.7 Ω

Is the inspection result normal?

YES >> INSPECTION END

NO >> There is a malfunction of line pressure solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0965 PRESSURE CONTROL SOLENOID B

DTC Logic

INFOID:0000000009019970

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0965	Pressure control solenoid B control circuit range performance	The detection conditions continuously for 5 seconds or more under the following diagnosis conditions: • Diagnosis conditions - Selector lever: Other than “P” and “N” positions - Auxiliary gearbox shifting is not in progress. - Engine speed: More than 500 rpm • Detection condition A - Actual primary pulley ratio: 2.0 – 2.4 - Target primary pulley ratio: Less than 1.2 • Detection condition B - Actual primary pulley ratio: 0.35 – 0.75 - Target primary pulley ratio: More than 1.55	Primary pressure solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

- **Be sure to perform “TM-184, "Diagnosis Procedure"” and then perform “DTC CONFIRMATION PROCEDURE”.**
- **Never perform “DTC CONFIRMATION PROCEDURE” before the repairs. Doing so may result in a secondary malfunction.**
- **Be careful of the driving speed.**

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Drive the vehicle.
3. Maintain the following conditions for 20 seconds or more.

Vehicle speed	: 20 km/h (13 MPH) or more

4. Stop the vehicle.
5. Check the first trip DTC.

Is “P0965”detected?

YES >> Go to TM-184, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019971

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace transaxle assembly. Refer to TM-250, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

P0966 PRESSURE CONTROL SOLENOID B

DTC Logic

INFOID:0000000009019972

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0966	Pressure control solenoid B control circuit low	The primary pressure solenoid valve current is 200 mA or less continuously for 480 msec or more under the following diagnosis conditions: • Diagnosis conditions - Solenoid valve output current: 750 mA or more - GND short circuit diagnosis occurs in the solenoid valve drive circuit. - TCM power supply voltage: More than 11 V	• Harness or connector (Primary pressure solenoid valve circuit shorted to ground) • Primary pressure solenoid valve

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine and wait for 5 seconds or more.
2. Check the first trip DTC.

Is “P0966” detected?

YES >> Go to TM-185, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019973

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminal and ground.

TCM		—	Continuity
Connector	Terminal		
F44	40	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK PRIMARY PRESSURE SOLENOID VALVE

Check primary pressure solenoid valve. Refer to TM-185, "Component Inspection (Primary Pressure Solenoid Valve)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (Primary Pressure Solenoid Valve)

INFOID:0000000009019974

1.CHECK PRIMARY PRESSURE SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit / Terminal	—	Condition	Resistance (Approx.)
2	Ground	CVT fluid temperature: 20°C (68°F)	5.3 Ω
		CVT fluid temperature: 50°C (122°F)	6.0 Ω
		CVT fluid temperature: 80°C (176°F)	6.7 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of primary pressure solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0967 PRESSURE CONTROL SOLENOID B

DTC Logic

INFOID:0000000009019975

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0967	Pressure control solenoid B control circuit high	The primary pressure solenoid valve current is 200 mA or less continuously for 200 msec or more under the following diagnosis conditions: • Diagnosis conditions - Solenoid valve output current: 750 mA or more - GND short diagnosis of the solenoid valve circuit is not satisfied. - TCM power supply voltage: More than 11 V	• Harness or connector (Primary pressure solenoid valve circuit open or shorted to power supply) • Primary pressure solenoid valve

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine and wait for 5 seconds or more.
2. Check the first trip DTC.

Is “P0967” detected?

YES >> Go to TM-187, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019976

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminal and CVT unit harness connector terminal.

TCM		CVT unit		Continuity
Connector	Terminal	Connector	Terminal	
F44	40	F46	2	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK PRIMARY PRESSURE SOLENOID VALVE

Check primary pressure solenoid valve. Refer to TM-187, "Component Inspection (Primary Pressure Solenoid Valve)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (Primary Pressure Solenoid Valve)

INFOID:0000000009019977

1.CHECK PRIMARY PRESSURE SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit / Terminal	—	Condition	Resistance (Approx.)
2	Ground	CVT fluid temperature: 20°C (68°F)	5.3 Ω
		CVT fluid temperature: 50°C (122°F)	6.0 Ω
		CVT fluid temperature: 80°C (176°F)	6.7 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of primary pressure solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0998 SHIFT SOLENOID F

DTC Logic

INFOID:0000000009019978

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0998	Shift solenoid F control circuit low	The TCM low brake solenoid valve current monitor reading is 200 mA or less continuously for 480 msec or more under the following diagnosis conditions: • Diagnosis conditions - Solenoid valve output current: 750 mA or more - GND short circuit diagnosis occurs in the solenoid valve drive circuit. - TCM power supply voltage: More than 11 V	• Harness or connector (Low brake solenoid valve circuit shorted to ground) • Low brake solenoid valve

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Shift the selector lever to “D” position and wait for 5 seconds or more.
3. Check the first trip DTC.

Is “P0998” detected?

YES >> Go to TM-189, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019979

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminal and ground.

TCM		Ground	Continuity
Connector	Terminal		
F44	39	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK LOW BRAKE SOLENOID VALVE

Check low brake solenoid valve. Refer to TM-189, "Component Inspection (Low Brake Solenoid Valve)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (Low Brake Solenoid Valve)

INFOID:0000000009019980

1.CHECK LOW BRAKE SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit Terminal	—	Condition	Resistance (Approx.)
6	Ground	CVT fluid temperature: 20°C (68°F)	5.3 Ω
		CVT fluid temperature: 50°C (122°F)	6.0 Ω
		CVT fluid temperature: 80°C (176°F)	6.7 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of low brake solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P0999 SHIFT SOLENOID F

DTC Logic

INFOID:0000000009019981

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P0999	Shift solenoid F control circuit high	The TCM low brake solenoid valve current monitor reading is 200 mA or less continuously for 200 msec or more under the following diagnosis conditions: • Diagnosis conditions - Solenoid valve output current: 750 mA or more - GND short diagnosis of the solenoid valve circuit is not satisfied. - TCM power supply voltage: More than 11 V	• Harness or connector (Low brake solenoid valve circuit is open or shorted to power supply) • Low brake solenoid valve

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Shift the selector lever to “D” position and wait for 5 seconds or more.
3. Check the first trip DTC.

Is “P0999” detected?

YES >> Go to TM-191, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019982

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminal and CVT unit harness connector terminal.

TCM		CVT unit		Continuity
Connector	Terminal	Connector	Terminal	
F44	39	F46	6	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK LOW BRAKE SOLENOID VALVE

Check low brake solenoid valve. Refer to TM-191, "Component Inspection (Low Brake Solenoid Valve)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (Low Brake Solenoid Valve)

INFOID:0000000009019983

1.CHECK LOW BRAKE SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit Terminal	—	Condition	Resistance (Approx.)
6	Ground	CVT fluid temperature: 20°C (68°F)	5.3 Ω
		CVT fluid temperature: 50°C (122°F)	6.0 Ω
		CVT fluid temperature: 80°C (176°F)	6.7 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of low brake solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P099B SHIFT SOLENOID G

DTC Logic

INFOID:0000000009019984

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P099B	Shift solenoid G control circuit low	The TCM high clutch & reverse brake solenoid valve current monitor reading is 200 mA or less continuously for 200 msec or more under the following diagnosis conditions: • Diagnosis conditions - Solenoid valve output current: 750 mA or more - GND short circuit diagnosis occurs in the solenoid valve drive circuit. - TCM power supply voltage: More than 11 V	• Harness or connector (High& clutch reverse brake solenoid valve circuit shorted to ground) • High clutch & reverse brake solenoid valve

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine and wait for 5 seconds or more.
2. Check the first trip DTC.

Is “P099B” detected?

YES >> Go to TM-193, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019985

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminal and ground.

TCM		—	Continuity
Connector	Terminal		
F44	37	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK HIGH CLUTCH & REVERSE BRAKE SOLENOID VALVE

Check high clutch & reverse brake solenoid valve. Refer to TM-193, "Component Inspection (High Clutch & Reverse Brake Solenoid Valve)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (High Clutch & Reverse Brake Solenoid Valve)

INFOID:0000000009019986

1.CHECK HIGH CLUTCH & REVERSE BRAKE SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit Terminal	—	Condition	Resistance (Approx.)
7	Ground	CVT fluid temperature: 20°C (68°F)	5.3 Ω
		CVT fluid temperature: 50°C (122°F)	6.0 Ω
		CVT fluid temperature: 80°C (176°F)	6.7 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of high & reverse brake solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P099C SHIFT SOLENOID G

DTC Logic

INFOID:0000000009019987

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P099C	Shift solenoid G control circuit high	The TCM high clutch & reverse brake solenoid valve current monitor reading is 200 mA or less continuously for 200 msec or more under the following diagnosis conditions: • Diagnosis conditions - Solenoid valve output current: 750 mA or more - GND short diagnosis of the solenoid valve circuit is not satisfied. - TCM power supply voltage: More than 11 V	• Harness or connector (High clutch & reverse brake solenoid valve circuit is open or shorted to power supply) • High clutch & reverse brake solenoid valve

DTC CONFIRMATION PROCEDURE

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine and wait for 5 seconds or more
2. Check the first trip DTC.

Is “P099C” detected?

YES >> Go to TM-195, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019988

1.CHECK CIRCUIT BETWEEN TCM AND CVT UNIT

1. Turn ignition switch OFF.
2. Disconnect TCM connector and CVT unit connector.
3. Check continuity between TCM harness connector terminal and CVT unit harness connector terminal.

TCM		CVT unit		Continuity
Connector	Terminal	Connector	Terminal	
F44	37	F46	7	Existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK HIGH CLUTCH & REVERSE BRAKE SOLENOID VALVE

Check high clutch & reverse brake solenoid valve. Refer to TM-195, "Component Inspection (High Clutch & Reverse Brake Solenoid Valve)".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

Component Inspection (High Clutch & Reverse Brake Solenoid Valve)

INFOID:0000000009019989

1.CHECK HIGH CLUTCH & REVERSE BRAKE SOLENOID VALVE

Check resistance between CVT unit connector terminal and ground.

CVT unit / Terminal	—	Condition	Resistance (Approx.)
7	Ground	CVT fluid temperature: 20°C (68°F)	5.3 Ω
		CVT fluid temperature: 50°C (122°F)	6.0 Ω
		CVT fluid temperature: 80°C (176°F)	6.7 Ω

Is the inspection result normal?

YES >> INSPECTION END
NO >> There is a malfunction of high & reverse brake solenoid valve. Replace transaxle assembly. Refer to TM-250, "Removal and Installation".

P1586 G SENSOR

DTC Logic

INFOID:0000000009019990

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P1586	G Sensor Circuit Electrical	When the following diagnosis conditions are satisfied and the detection conditions are satisfied twice in the same DC: • Diagnosis conditions - While driving - TCM power supply voltage: More than 11 V • Detection condition - The G sensor detection voltage is 0.7 V or less continuously for 5 seconds or more.	• Harness or connector (G sensor circuit) • G sensor
		When the following diagnosis conditions are satisfied and the detection conditions are satisfied twice in the same DC: • Diagnosis conditions - While driving - TCM power supply voltage: More than 11 V • Detection condition - The G sensor detection voltage is 3.2 V or more continuously for 5 seconds or more.	

NOTE:
DC stands for "DRIVING CYCLE" and indicates a series of driving cycle of "Ignition switch OFF → ON → driving → OFF".

DTC CONFIRMATION PROCEDURE

CAUTION:
Be careful of the driving speed.

1. PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT
1. Start the engine.
2. Drive the vehicle for 10 seconds or more.
3. Stop the vehicle.
   CAUTION:
   Never stop the engine.
4. Repeat step 2 through 3.
5. Check the DTC.

Is “P1586” detected?

YES >> Go to TM-197, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019991

1. CHECK G SENSOR SIGNAL

With CONSULT
1. Park the vehicle on a level surface.
2. Turn ignition switch ON.
3. Select “Data Monitor” in “TRANSMISSION”.

4. Select “G SEN SLOPE”.
5. Swing the vehicle and check if value varies between –40.45% and 40.45%.

Monitor item	Condition	Standard
G SEN SLOPE	Flat road	0%
	Uphill	Positive value (Maximum 40.45%)
	Downhill	Negative value (Minimum –40.45%)

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 3.

2.G SENSOR CALIBRATION (PART 1)

With CONSULT

1. Select “Self Diagnostic Results” in “TRANSMISSION”.
2. Touch “Erase”.

>> Perform "G SENSOR CALIBRATION". Refer to TM-129, "Procedure".

3.CHECK SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect G sensor connector.
3. Turn ignition switch ON.
4. Check voltage between G sensor harness connector terminal and ground.

+		–	Voltage (Approx.)
G sensor			
Connector	Terminal		
M83	3	Ground	5.0 V

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 8.

4.CHECK CIRCUIT BETWEEN TCM AND G SENSOR (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between TCM harness connector terminals and G sensor harness connector terminals.

TCM		G sensor		Continuity
Connector	Terminal	Connector	Terminal	
F44	11	M83	2	Existed
	14		1	

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning parts.

5.CHECK CIRCUIT BETWEEN TCM AND G SENSOR (PART 2)

Check continuity between TCM harness connector terminals and ground.

TCM		—	Continuity
Connector	Terminal		
F44	14	Ground	Not existed

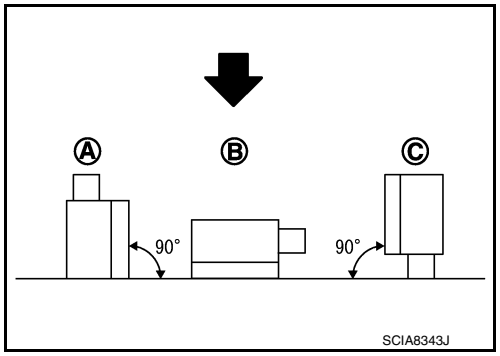
Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace malfunctioning parts.

6.CHECK G SENSOR

1. Remove G sensor. TM-237, "Removal and Installation".
2. Connect the all connectors.
3. Turn ignition switch ON.
4. Check voltage between TCM harness connector terminal and ground.

⬅ : Direction of gravitational force



+ TCM		−	Condition	Voltage (Approx.)
Connector	Terminal			
F44	14	Ground	Vertical (−1G) (A)	1.17 V
			Horizontal (B)	2.5 V
			Vertical (1G) (C)	3.83 V

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace G sensor.TM-237, "Removal and Installation".

7.G SENSOR CALIBRATION (PART 2)

With CONSULT

1. Install G sensor. TM-237, "Removal and Installation".
2. Select “Self Diagnostic Results” in “TRANSMISSION”.
3. Touch “Erase”.

>> Perform "G SENSOR CALIBRATION". Refer to TM-129, "Procedure".

8.CHECK SENSOR POWER SUPPLY CIRCUIT (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between TCM harness connector terminal and G sensor harness connector terminal.

TCM		G sensor		Continuity
Connector	Terminal	Connector	Terminal	
F44	26	M83	3	Existed

Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair or replace malfunctioning parts.

9.CHECK SENSOR POWER SUPPLY CIRCUIT (PART 2)

Check continuity between TCM harness connector terminal and ground.

TCM		—	Continuity
Connector	Terminal		
F44	26	Ground	Not existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

P1588 G SENSOR

DTC Logic

INFOID:0000000009019992

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P1588	G Sensor Circuit Range/Performance	When the following diagnosis conditions are satisfied and the detection conditions are satisfied twice in the same DC: • Diagnosis condition (1 second or more) - The rate of change in G sensor detection value (mV): Between −15 and +15 inclusive • Detection condition - The rate of change in acceleration/deceleration stays +0.0273 G or more/−0.0273 or less at least for 5 seconds or more.	G sensor

NOTE:
DC stands for "DRIVING CYCLE" and indicates a series of driving cycle of "Ignition switch OFF → ON → driving → OFF".

DTC CONFIRMATION PROCEDURE

CAUTION:
Be careful of the driving speed.

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT
1. Start the engine.
2. Select “Data Monitor” in “TRANSMISSION”.
3. Select “G SPEED”.
4. Drive the vehicle.
5. Maintain the following conditions for 10 seconds or more.

Selector lever	: “D” position
G SPEED	: 0.05 G or more

6. Stop the vehicle.
   CAUTION:
   Never stop the engine.
7. Repeat steps 4 through 6.
8. Check the DTC.

Is “P1588” detected?

YES >> Go to TM-200, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019993

1.CHECK G SENSOR SIGNAL

With CONSULT
1. Park the vehicle on a level surface.
2. Turn ignition switch ON.
3. Select “Data Monitor” in “TRANSMISSION”.
4. Select “G SEN SLOPE”.

5. Swing the vehicle and check if value varies between −40.45% and 40.45%.

Monitor item	Condition	Standard
G SEN SLOPE	Flat road	0%
	Uphill	Positive value (Maximum 40.45%)
	Downhill	Negative value (Minimum −40.45%)

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 3.

2. G SENSOR CALIBRATION (PART 1)

With CONSULT

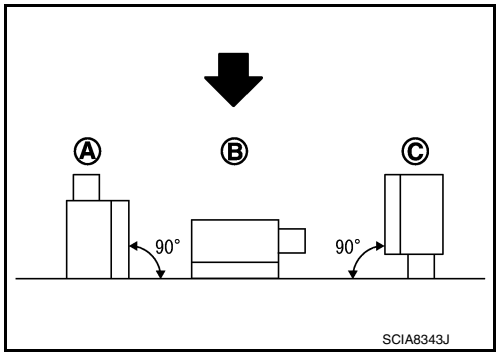
1. Select “Self Diagnostic Results” in “TRANSMISSION”.
2. Touch “Erase”.

>> Perform "G SENSOR CALIBRATION". Refer to TM-129, "Procedure".

3. CHECK G SENSOR

1. Remove G sensor. TM-237, "Removal and Installation".
2. Connect the all connectors.
3. Turn ignition switch ON.
4. Check voltage between TCM harness connector terminal and ground.

: Direction of gravitational force



+		−	Condition	Voltage (Approx.)
TCM				
Connector	Terminal			
F44	14	Ground	Vertical (−1G) (A)	1.17 V
			Horizontal (B)	2.5 V
			Vertical (1G) (C)	3.83 V

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace G sensor.TM-237, "Removal and Installation".

4. G SENSOR CALIBRATION (PART 2)

With CONSULT

1. Install G sensor. TM-237, "Removal and Installation".
2. Select “Self Diagnostic Results” in “TRANSMISSION”.
3. Touch “Erase”.

>> Perform "G SENSOR CALIBRATION". Refer to TM-129, "Procedure".

P2765 CLUTCH B SPEED SENSOR

DTC Logic

INFOID:0000000009019994

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P2765	Input/Turbine Speed Sensor B Circuit	The secondary speed sensor value is less than 150 rpm continuously for 5 seconds or more under the following diagnosis conditions: • Diagnosis conditions - Primary pulley speed: 1,000 rpm or more - TCM power supply voltage: More than 11 V	• Harness or connector (Secondary speed sensor circuit is open or shorted) • Secondary speed sensor
		The secondary pulley speed sensor value is 240 rpm or less continuously for 500 msec or more under the following diagnosis conditions: • Diagnosis condition - 10-msec-ago secondary pulley speed: 1,000 rpm or more - TCM power supply voltage: More than 11 V	

DTC CONFIRMATION PROCEDURE

CAUTION:

Be careful of the driving speed.

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Drive the vehicle.
3. Maintain the following conditions for 10 seconds or more.

Selector lever	: “D” position
Vehicle speed	: 55 km/h (34 MPH) or more

4. Stop the vehicle.
5. Check the first trip DTC.

Is “P2765” detected?

YES >> Go to TM-202, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019995

1.CHECK SECONDARY SPEED SENSOR POWER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect secondary speed sensor connector.
3. Turn ignition switch ON.
4. Check voltage between secondary speed sensor harness connector terminal and ground.

+		–	Voltage
Secondary speed sensor			
Connector	Terminal		
F48	3	Ground	10 – 16 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 6.

2.CHECK SECONDARY SPEED SENSOR GROUND CIRCUIT

Check continuity between of primary speed sensor harness connector terminal and ground.

Secondary speed sensor		—	Continuity
Connector	Terminal		
F48	1	Ground	Existed

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3.CHECK CIRCUIT BETWEEN SECONDARY SPEED SENSOR AND TCM (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check continuity between secondary speed sensor harness connector terminal and TCM harness connector terminal.

Secondary speed sensor		TCM		Continuity
Connector	Terminal	Connector	Terminal	
F48	2	F44	34	Existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace malfunctioning parts.

4.CHECK CIRCUIT BETWEEN SECONDARY SPEED SENSOR AND TCM (PART 2)

Check continuity between secondary speed sensor harness connector terminal and ground.

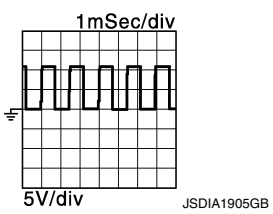
Secondary speed sensor		—	Continuity
Connector	Terminal		
F48	2	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning parts.

5.CHECK TCM INPUT SIGNALS

1. Connect all of disconnected connectors.
2. Lift the vehicle.
3. Start the engine.
4. Check frequency of secondary speed sensor.

+		–	Condition	Frequency (Approx.)
TCM				
Connector	Terminal			
F44	34	Ground	• Selector lever: “L” position • Vehicle speed: 20 km/h (12 MPH)	700 Hz 

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Replace secondary speed sensor. TM-241, "Removal and Installation".

6. CHECK CIRCUIT BETWEEN IPDM E/R AND SECONDARY SPEED SENSOR

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector terminal and secondary speed sensor harness connector terminal.

IPDM E/R		Secondary speed sensor		Continuity
Connector	Terminal	Connector	Terminal	
E45	21	F48	3	Existed

Is the check result normal?

YES >> GO TO 7.
NO >> Repair or replace malfunctioning parts.

7. DETECT MALFUNCTIONING ITEMS

Check the following items:
- Open circuit or short circuit in harness between ignition switch and IPDM E/R. Refer to PG-22, "Wiring Diagram — Ignition Power Supply —".
- Short circuit in harness between IPDM E/R harness connector terminal 21 and secondary speed sensor harness connector terminal 3.
- 10A fuse (No.49, IPDM E/R). Refer to PG-39, "IPDM E/R Terminal Arrangement".
- IPDM E/R

Is the check result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

P2857 CLUTCH A PRESSURE

DTC Logic

INFOID:0000000009019996

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P2857	Clutch A pressure engagement performance	The auxiliary gearbox gear ratio is 2.232 or more for the auxiliary gearbox 1GR ratio continuously for 5 seconds or more under the following diagnosis conditions: • Diagnosis conditions - Selector lever: Other than “P”, “R” and “N” positions - Accelerator pedal position: 0.7/8 or more - Engine speed: More than 550 rpm - Output speed: More than 300 rpm - Secondary pulley speed: More than 300 rpm - Command for the 1GR of auxiliary gearbox is in progress. - Auxiliary gearbox shifting is not in progress. - TCM power supply voltage: More than 11 V	• Low brake solenoid valve • Control valve assembly

DTC CONFIRMATION PROCEDURE

CAUTION:

- **Be sure to perform “TM-205, "Diagnosis Procedure"” and then perform “DTC CONFIRMATION PROCEDURE”.**
- **Never perform "DTC CONFIRMATION PROCEDURE" before the repairs. Doing so may result in a secondary malfunction.**
- **Be careful of the driving speed.**

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Drive the vehicle.
3. Maintain the following conditions for 10 seconds or more.

Selector lever	: “L” POSITION
Accelerator pedal position	: 0.7/8 or more
Vehicle speed	: 10 km/h (6 MPH) or more

4. Stop the vehicle.
5. Check the first trip DTC.

Is “P2857” detected?

YES >> Go to TM-205, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019997

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace transaxle assembly. Refer to TM-250, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

P2858 CLUTCH B PRESSURE

DTC Logic

INFOID:0000000009019998

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P2858	Clutch B pressure engagement performance	The auxiliary gearbox gear ratio is 2.232 or more for the auxiliary gearbox 2GR ratio continuously for 5 seconds or more under the following diagnosis conditions: • Diagnosis conditions - Selector lever: Other than “P”, “R” and “N” positions - Accelerator pedal position: 0.7/8 or more - Engine speed: More than 550 rpm - Output speed: More than 300 rpm - Secondary pulley speed: More than 300 rpm - Command for the 2GR of auxiliary gearbox is in progress. - Auxiliary gearbox shifting is not in progress. - TCM power supply voltage: More than 11 V	• High clutch & reverse brake solenoid valve • Control valve assembly

DTC CONFIRMATION PROCEDURE

CAUTION:

- **Be sure to perform “TM-206, "Diagnosis Procedure"” and then perform “DTC CONFIRMATION PROCEDURE”.**
- **Never perform "DTC CONFIRMATION PROCEDURE" before the repairs. Doing so may result in a secondary malfunction.**
- **Be careful of the driving speed.**

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Drive the vehicle.
3. Maintain the following conditions for 10 seconds or more.

Selector lever	: “D” POSITION
Accelerator pedal position	: 0.7/8 or more
Vehicle speed	: 45 km/h (28 MPH) or more

4. Stop the vehicle.
5. Check the first trip DTC.

Is “P2858” detected?

YES >> Go to TM-206, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009019999

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace transaxle assembly. Refer to TM-250, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

P2859 CLUTCH A PRESSURE

DTC Logic

INFOID:0000000009020000

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P2859	Clutch A pressuren disengagement performance	The detection conditions continuously for 200 msec or more under the following diagnosis conditions: • Diagnosis conditions - Selector lever: Other than “P”, “R” and “N” positions - Vehicle speed: 10 km/h (6 MPH) or more - Engine speed: More than 550 rpm - Output speed: More than 300 rpm - Secondary pulley speed: More than 300 rpm - A lapse of 500 msec or more after the stop lamp switch is turned from ON to OFF. - Command for the 2GR of auxiliary gearbox is in progress. - Auxiliary gearbox shifting is not in progress. - TCM power supply voltage: More than 11 V • Detection conditions - Acceleration/deceleration: Less than −0.05 G - Actual auxiliary gearbox gear ratio − Auxiliary gearbox 2GR ratio ≥ 50%	• Low brake solenoid valve • Control valve assembly
		The auxiliary gearbox gear ratio is ±10% or less for the auxiliary gearbox 1GR ratio continuously for 500 msec or more under the following diagnosis conditions: • Diagnosis conditions - Selector lever: Other than “P”, “R” and “N” positions - Accelerator pedal position: 0.7/8 or more - Engine speed: More than 550 rpm - Secondary pulley speed: More than 300 rpm - Output speed: More than 300 rpm - Command for the 2GR of auxiliary gearbox is in progress. - Auxiliary gearbox shifting is not in progress. - TCM power supply voltage: More than 11 V	

DTC COFIRMATION PROCEDURE

CAUTION:

- **Be sure to perform "TM-208, "Diagnosis Procedure"" and then perform "DTC CONFIRMATION PROCEDURE".**
- **Never perform "TC CONFIRMATION PROCEDURE" before the repairs. Doing so may result in a secondary malfunction.**
- **Be careful of the driving speed.**

1. PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

1. Start the engine.

2. Drive the vehicle.
3. Maintain the following conditions for 10 seconds or more.

Selector lever	: “D” position
Accelerator pedal position	: 0.7/8 or more
Vehicle speed	: 45 km/h (28 MPH) or more

4. Stop the vehicle
5. Check the first trip DTC.

Is “P2859” detected?

YES >> Go to TM-208, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009020001

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace transaxle assembly. Refer to TM-250, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

P285A CLUTCH B PRESSURE

DTC Logic

INFOID:0000000009020002

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC detection condition	Possible causes
P285A	Clutch B pressure disengagement performance	The detection conditions continuously for 200 msec or more under the following diagnosis conditions: • Diagnosis conditions - Selector lever: Other than “P”, “R” and “N” positions - Vehicle speed: 10 km/h (6 MPH) or more - Engine speed: More than 550 rpm - Output speed: More than 300 rpm - Secondary pulley speed: More than 300 rpm - Command for the 1GR of auxiliary gearbox is in progress. - Auxiliary gearbox shifting is not in progress. - TCM power supply voltage: More than 11 V • Detection conditions - Acceleration/deceleration: Less than −0.05 G - Actual auxiliary gearbox gear ratio − Auxiliary gearbox 1GR ratio ≥ 50%	• High clutch & reverse brake solenoid valve • Control valve assembly
		The auxiliary gearbox gear ratio is ±10% or less for the auxiliary gearbox 2GR ratio continuously for 500 msec or more under the following diagnosis conditions: • Diagnosis conditions - Selector lever: Other than “P”, “R” and “N” positions - Accelerator pedal position: 0.7/8 or more - Engine speed: More than 550 rpm - Secondary pulley speed: More than 300 rpm - Output speed: More than 300 rpm - Command for the 1GR of auxiliary gearbox is in progress. - Auxiliary gearbox shifting is not in progress. - TCM power supply voltage: More than 11 V	

DTC CONFIRMATION PROCEDURE

CAUTION:

- **Be sure to perform “TM-210, "Diagnosis Procedure"” and then perform “DTC CONFIRMATION PROCEDURE”.**
- **Never perform "DTC CONFIRMATION PROCEDURE" before the repairs. Doing so may result in a secondary malfunction.**
- **Be careful of the driving speed.**

1.PREPARATION BEFORE WORK

If another "DTC CONFIRMATION PROCEDURE" occurs just before, turn ignition switch OFF and wait for at least 10 seconds, then perform the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

1. Start the engine.
2. Drive the vehicle.
3. Maintain the following conditions for 10 seconds or more.

Selector lever	: “L” POSITION
Accelerator pedal position	: 0.7/8 or more
Vehicle speed	: 10 km/h (6 MPH) or more

4. Stop the vehicle.
5. Check the first trip DTC.

Is “P285A” detected?

YES >> Go to TM-210, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000009020003

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace transaxle assembly. Refer to TM-250, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

MAIN POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:0000000009020004

1.CHECK TCM POWER CIRCUIT (PART 1)

1. Turn ignition switch OFF.
2. Disconnect TCM connector.
3. Check voltage between TCM harness connector terminals and ground.

+		–	Voltage
TCM			
Connector	Terminal		
F44	45	Ground	10 – 16 V
	46		

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 4.

2.CHECK TCM POWER CIRCUIT (PART 2)

Check voltage between TCM harness connector terminals and ground.

+		–	Condition	Voltage
TCM				
Connector	Terminal			
F44	47	Ground	Ignition switch ON	10 – 16 V
			Ignition switch OFF	Approx. 0 V
	48		Ignition switch ON	10 – 16 V
			Ignition switch OFF	Approx. 0 V

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 5.

3.CHECK TCM GROUND CIRCUIT

Check continuity between TCM harness connector terminals and ground.

TCM		—	Continuity
Connector	Terminal		
F44	41	Ground	Existed
	42		

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

4.DETECT MALFUNCTION ITEMS (PART 1)

Check the following items:

- Open circuit or short circuit in harness between battery positive terminal and TCM connectors terminals 45, and 46.
- 10A fuse (No.33, fuse and fusible link block). Refer to PG-39, "IPDM E/R Terminal Arrangement".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

5. CHECK CIRCUIT BETWEEN IPDM E/R AND TCM

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector terminal and TCM harness connector terminals.

IPDM E/R		TCM		Continuity
Connector	Terminal	Connector	Terminal	
E45	21	F44	47	Existed
			48	

Is the check result normal?

YES >> GO TO 6.
NO >> Repair or replace malfunctioning parts.

6. DETECT MALFUNCTIONING ITEMS (PART 2)

Check the following items:

- Open circuit or short circuit in harness between ignition switch and IPDM E/R. Refer to PG-22, "Wiring Diagram — Ignition Power Supply —".
- Short circuit in harness between IPDM E/R harness connector terminal 21 and TCM harness connector terminal 47, and 48.
- 10A fuse (No.49, IPDM E/R). Refer to PG-39, "IPDM E/R Terminal Arrangement".
- IPDM E/R

Is the check result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Repair or replace malfunctioning parts.

OVERDRIVE CONTROL SWITCH

Component Function Check

INFOID:0000000009020005

1.CHECK OD OFF INDICATOR LAMP FUNCTION

Check OD OFF indicator lamp turns ON for approx. 2 seconds when ignition switch turns ON.

Is the inspection results normal?

YES >> GO TO 2.
NO >> Go to TM-215, "Diagnosis Procedure".

2.CHECK OVERDRIVE CONTROL SWITCH FUNCTION

1. Shift the selector lever to “D” position.
2. Check that OD OFF indicator lamp turns ON/OFF when overdrive control switch is operated.

Is the inspection results normal?

YES >> INSPECTION END
NO >> Go to TM-213, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009020006

1.CHECK OVERDRIVE CONTROL SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect CVT shift selector connector.
3. Turn ignition switch ON.
4. Check voltage between CVT shift selector harness connector terminals.

CVT shift selector			Voltage (Approx.)
Connector	+	–	
	Terminal		
M38	1	2	5 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 4.

2.CHECK OVERDRIVE CONTROL SWITCH

Check overdrive control switch. Refer to TM-214, "Component Inspection (Overdrive Control Switch)".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3.CHECK GROUND CIRCUIT

Check continuity between CVT shift selector harness connector terminal and ground.

CVT shift selector		—	Continuity
Connector	Terminal		
M38	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace malfunctioning parts.

4.CHECK CIRCUIT BETWEEN COMBINATION METER AND CVT SHIFT SELECTOR (PART 1)

1. Turn ignition switch OFF.
2. Disconnect combination meter connector.
3. Check continuity between combination meter harness connector terminal and CVT shift selector harness connector terminal.

Combination meter		CVT shift selector		Continuity
Connector	Terminal	Connector	Terminal	
M24	8	M38	1	Existed

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning parts.

5. CHECK CIRCUIT BETWEEN COMBINATION METER AND CVT SHIFT SELECTOR (PART 2)

Check continuity between combination meter harness connector terminal and ground.

Combination meter		—	Continuity
Connector	Terminal		
M24	8	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace malfunctioning parts.

6. CHECK COMBINATION METER INPUT SIGNAL

1. Connect all of disconnected connectors.
2. Turn ignition switch ON.
3. Select “Data Monitor” in “METER/M&A”.
4. Select “O/D OFF SW”.
5. Check that “O/D OFF SW” turns ON/OFF when overdrive control switch is operated. Refer to MWI-17, "Reference Value".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-41, "Intermittent Incident".
NO >> Replace combination meter. Refer to MWI-48, "Removal and Installation".

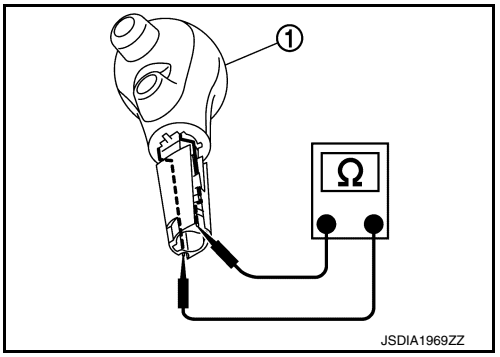
Component Inspection (Overdrive Control Switch)

INFOID:0000000009020007

1. CHECK OVERDRIVE CONTROL SWITCH

Check continuity between wires of selector lever knob (1)

Condition	Continuity
Overdrive control switch is depressed	Existed
Overdrive control switch is depressed	Not existed



Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace selector lever knob. Refer to TM-227, "Removal and Installation".

OD OFF INDICATOR LAMP

Component Function Check

INFOID:0000000009020008

1.CHECK OD OFF INDICATOR LAMP FUNCTION

Check OD OFF indicator lamp turns ON for approx. 2 seconds when ignition switch turns ON.

Is the inspection results normal?

YES >> INSPECTION END
NO >> Go to TM-215, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009020009

1.CHECK DTC (TCM)

With CONSULT
1. Turn ignition switch ON.
2. Check “Self Diagnostic Results” in “TRANSMISSION”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to TM-111, "DTC Index".
NO >> GO TO 2.

2.CHECK DTC (COMBINATION METER)

With CONSULT
Check “Self Diagnostic Results” in “METER/M&A”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to MWI-20, "DTC Index".
NO >> GO TO 3.

3.CHECK COMBINATION METER INPUT SIGNAL

With CONSULT
1. Shift the selector lever to “D” position.
2. Select “Data Monitor” in “METER/M&A”.
3. Select “O/D OFF IND”.
4. Check that “O/D OFF IND” turns ON/OFF when overdrive control switch is operated. Refer to MWI-17, "Reference Value".

Is the inspection result normal?

YES >> Replace combination meter. Refer to MWI-48, "Removal and Installation".
NO >> GO TO 4.

4.CHECK TCM INPUT/OUTPUT SIGNAL

With CONSULT
1. Select “Data Monitor” in “TRANSMISSION”.
2. Select “SPORT MODE SW”.
3. Check that “SPORT MODE SW” turns ON/OFF when overdrive control switch is operated. Refer to TM-99, "Reference Value".

Is the inspection result normal?

YES >> Replace combination meter. Refer to MWI-48, "Removal and Installation".
NO >> Check overdrive control switch. Refer to TM-213, "Diagnosis Procedure".

SHIFT POSITION INDICATOR CIRCUIT

Component Parts Function Inspection

INFOID:0000000009020010

1.CHECK SHIFT POSITION INDICATOR

1. Start the engine.
2. Shift selector lever.
3. Check that the selector lever position and the shift position indicator on the combination meter are identical.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to TM-216, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009020011

1.CHECK TCM INPUT/OUTPUT SIGNAL

With CONSULT
1. Start the engine.
2. Select “Data Monitor” in “TRANSMISSION”.
3. Select “RANGE”.
4. Shift selector lever.
5. Check that selector lever position, “RANGE” on CONSULT screen, and shift position indicator display on combination meter are identical.

Is the check result normal?

YES >> INSPECTION END
NO-1 (“RANGE” is changed but is not displayed on shift position indicator.>>Check “Self Diagnostic Result” in “TRANSMISSION”.
NO-2 (“RANGE” and shift position indicator are different.)>>Check “Self Diagnostic Result” in “TRANSMISSION”.
NO-3 (Specific“RANGE” is not displayed on shift position indicator.)>>Check “Self Diagnostic Result” in “METER/M&A”.

SHIFT LOCK SYSTEM

Component Function Check

INFOID:0000000009020012

1.CHECK SHIFT LOCK OPERATION (BRAKE PEDAL RELEASED)

1. Ignition switch ON.
2. Attempt to shift selector lever to any position other than “P” position with brake pedal released.

Can the selector lever be shifted?

YES >> Go to TM-217, "Diagnosis Procedure".
NO >> GO TO 2.

2.CHECK SHIFT LOCK OPERATION (BRAKE PEDAL APPLIED)

Attempt to shift the selector lever to any position other than “P” position with brake pedal applied.

Can the selector lever be shifted?

YES >> Inspection End.
NO >> Go to TM-217, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000009020013

1.CHECK STOP LAMP SWITCH

1. Ignition switch ON.
2. Check voltage between stop lamp switch connector E13 terminal 4 and ground.

Stop lamp switch		Ground	Brake pedal	Voltage
Connector	Terminal			
E13	4	Ground	Applied	Battery voltage
			Released	0V

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 4.

2.CHECK CVT SHIFT SELECTOR

Check voltage between CVT shift selector connector M38 terminal 6 and ground.

CVT shift selector		Ground	Brake pedal	Shift selector	Voltage
Connector	Terminal				
M38	6	Ground	Applied	Park	Battery voltage
				Others	0V

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 5.

3.CHECK GROUND CIRCUIT

1. Ignition switch OFF.
2. Disconnect CVT shift selector connector.
3. Check continuity between CVT shift selector connector M38 terminal 6 and ground.

CVT shift selector		Ground	Continuity
Connector	Terminal		
M38	6	Ground	Yes

Is the inspection result normal?

YES >> Replace CVT shift selector. Refer to TM-227, "Removal and Installation".
NO >> Repair or replace ground circuit.

4. CHECK STOP LAMP SWITCH POWER CIRCUIT

Check voltage between stop lamp switch connector E13 terminal 3 and ground.

Stop lamp switch		Ground	Voltage
Connector	Terminal		
E13	3	Ground	Battery voltage

Is the inspection result normal?

YES >> Replace stop lamp switch.
NO >> Repair or replace power circuit.

5. CHECK CVT SHIFT SELECTOR POWER CIRCUIT

Check voltage between CVT shift selector connector M38 terminal 5 and ground.

CVT shift selector		Ground	Brake pedal	Voltage
Connector	Terminal			
M38	5	Ground	Applied	Battery voltage

Is the inspection result normal?

YES >> Replace CVT shift selector. Refer to TM-227, "Removal and Installation".
NO >> Repair or replace power circuit.

SYMPTOM DIAGNOSIS

CVT CONTROL SYSTEM

Symptom Table

INFOID:0000000009020014

The diagnosis item number indicates the order of check. Start checking in the order from 1.

Symptom diagnosis chart 1-1

Symptom		Check under on board condition (repair and part replacement)				Replace the transaxle assembly.												
						Electric system												
		Engine system	Incorrect adjustment of CVT fluid level	Line pressure is out of the standard value.	Control cable	TCM	Overdrive control switch	Primary speed sensor (P0715)	Secondary speed sensor (P2765)	Output speed sensor (P0720)	Transmission position switch (P0705, P0706)	Secondary pressure sensor (P0846, P0847, P0848)	Primary pressure solenoid valve (P17BA, P17BB)	Line pressure solenoid valve (P0746, P0962, P0963)	Lock-up solenoid valve (P0740, P0743, P0744)	High clutch &reverse brake solenoid valve (P1739, P173C, P17B7, P17B8)	Low brake solenoid valve (P173A, P173B, P17B4, P17B5)	CVT fluid temperature sensor (P0711, P0712, P0713)
		EC-107	TM-225	TM-130	TM-228	TM-99	TM-213							TM-111				
Driving is not possible.	The engine speed increases in “D”, “L”, or “R” position, but the vehicle cannot start.	1	1	1	1	1		1	1		1	2		1		1	1	2
	Engine stall occurs in “D”, “L”, or “R” position and the vehicle does not start.				1	1		1	1		1	1	1	1		1	1	2
	Acceleration at start is not sufficient in “D”, “L”, or “R” position.	1		2		1		1	1	1	2	2	1	1	2	1	1	1
	The engine speed increases suddenly in “D”, “L”, or “R” position during driving.		1	1								2	1	1		1	1	
	Engine brake is suddenly applied in “D” or “R” position during driving.	1		1									1	1		1	1	

Symptom		Check under on board condition (repair and part replacement)				Replace the transaxle assembly.												
						Electric system												
		Engine system	Incorrect adjustment of CVT fluid level	Line pressure is out of the standard value.	Control cable	TCM	Overdrive control switch	Primary speed sensor (P0715)	Secondary speed sensor (P2765)	Output speed sensor (P0720)	Transmission position switch (P0705, P0706)	Secondary pressure sensor (P0846, P0847, P0848)	Primary pressure solenoid valve (P17BA, P17BB)	Line pressure solenoid valve (P0746, P0962, P0963)	Lock-up solenoid valve (P0740, P0743, P0744)	High clutch &reverse brake solenoid valve (P1739, P173C, P17B7, P17B8)	Low brake solenoid valve (P173A, P173B, P17B4, P17B5)	CVT fluid temperature sensor (P0711, P0712, P0713)
		EC-107	TM-225	TM-130	TM-228	TM-99	TM-213							TM-111				
Shifting is not possible.	The engine races when the auxiliary gearbox is shifted from 1GR ⇔ 2GR.	2		1										1		1	1	
	Engine braking is not effective in “L” position.			1	1	1		1	1		1		2	1	1		1	
	Shifting does not occur with OD OFF.					1	1	1	1	1	1		1	1				
	Engine stall occurs immediately before stop at deceleration in “D” or “L” position.									1					1			
	During driving in “D” position, slippage occurs in lockup or lockup is not possible.					1		1	1	1	1	2	1	1	1			1

Symptom diagnosis chart 1-2

Symptom		Replace the transaxle assembly.												
		Oil pressure control		Power transmission										
		Valve body, control valve	Oil pump	Torque converter	Pulley, steel belt	Low brake	High clutch	Reverse brake	Bearings	Counter gear	Planetary gear	Reduction gear	Final gear, differential gear	Parking mechanism
							TM-250							
Driving is not possible.	The engine speed increases in “D”, “L”, or “R” position, but the vehicle cannot start.	1	1		1	1 (In “D” or “L”)		1 (In “R”)		1	1	1	1	
	Engine stall occurs in “D”, “L”, or “R” position and the vehicle does not start.	1							1	1	1	1	1	1
	Acceleration at start is not sufficient in “D”, “L”, or “R” position.	1		1		1 (In “D” or “L”)		1 (In “R”)						
	The engine speed increases suddenly in “D”, “L”, or “R” position during driving.	1	1		1	1 (In “D” or “L”)	1 (In “D” or “L”)	1 (In “R”)						
	Engine brake is suddenly applied in “D” or “R” position during driving.	1				1 (In “D” or “L”)	1 (In “D” or “L”)	1 (In “R”)						
Shifting is not possible.	The engine races when the auxiliary gearbox is shifted from 1GR ⇔ 2GR.	1	1		2	1	1							
	Engine braking is not effective in “L” position.	1	2	1	2	1	1							
	Shifting does not occur with OD OFF.													
	Engine stall occurs immediately before stop at deceleration in “D” or “L” position.	1		1										
	During driving in “D” position, slippage occurs in lockup or lockup is not possible.	1		1										

Symptom diagnosis chart 2-1

Symptom		Check under on board condition (repair and part replacement)				Replace the transaxle assembly.												
						Electric system												
		Engine system	Incorrect adjustment of CVT fluid level	Line pressure is out of the standard value.	Control cable	TCM	Overdrive control switch	Primary speed sensor (P0715)	Secondary speed sensor (P2765)	Output speed sensor (P0720)	Transmission position switch (P0705, P0706)	Secondary pressure sensor (P0846, P0847, P0848)	Primary pressure solenoid valve (P17BA, P17BB)	Line pressure solenoid valve (P0746, P0962, P0963)	Lock-up solenoid valve (P0740, P0743, P0744)	High clutch &reverse brake solenoid valve (P1739, P173C, P17B7, P17B8)	Low brake solenoid valve (P173A, P173B, P17B4, P17B5)	CVT fluid temperature sensor (P0711, P0712, P0713)
		EC-107	TM-225	TM-130	TM-228	TM-99	TM-213							TM-111				
Shock vibration Noise	Shock at start is large in “D”, “L”, or “R” position.			1								2		1	1			
	Shock is large when the auxiliary gearbox is shifted from 1GR → 2GR.	2		1		2							2	2		1	1	
	Shock in lockup is large during driving in “D” or “L” position.					1									1			
	Shock is large when the lever is shifted from “N” → “D” and “N” → “R” positions.	1		1		2		1	1		1			1	1	1	1	1
	Shock is large when the lever is shifted from “D” → “L” position.																	
	Vibration occurs in “D”, “L”, or “R” position during driving.	1	1	1		1				1		2			1	1	1	
	Noise occurs during driving.		1															
	Noise occurs in idling.	1	1															
Other	Starter operates in “D”, “L”, or “R” position.				1	1					1							
	Starter does not operate in “P” or “N” position.				1	1					1							
	Engine stall occurs in “D”, “L”, or “R” position during stop.	1				1				1					1			
	Engine stall occurs in “P” or “N” position during stop.	1				1				1					1			
	Parking lock does not operate in “P” position.				1						1							
	Parking lock cannot be cancelled when the selector lever is shifted from “P” position to other position.				1						1							

Symptom diagnosis chart 2-2

Symptom		Replace the transaxle assembly.												
		Oil pressure control		Power transmission										
		Valve body, control valve	Oil pump	Torque converter	Pulley, steel belt	Low brake	High clutch	Reverse brake	Bearings	Counter gear	Planetary gear	Reduction gear	Final gear, differential gear	Parking mechanism
							TM-250							
Shock vibration Noise	Shock at start is large in “D”, “L”, or “R” position.	1			1	1 (In “D” or “L”)		1 (In “R”)		2	2	2	2	
	Shock is large when the auxiliary gearbox is shifted from 1GR → 2GR.	1				1	1							
	Shock in lockup is large during driving in “D” or “L” position.	1		1										
	Shock is large when the lever is shifted from “N” → “D” and “N” → “R” positions.	1				1 (“N” → “D”)		1 (“N” → “D”)						
	Shock is large when the lever is shifted from “D” → “L” position.	1				1	1							
	Vibration occurs in “D”, “L”, or “R” position during driving.	1	1	1	1	1 (In “D” or “L”)	1 (In “D” or “L”)	1 (In “R”)	1	1	1	1	1	
	Noise occurs during driving.	1	1		1				1	1	1	1	1	
	Noise occurs in idling.	1	1		1				1	1	1			
Other	Starter operates in “D”, “L”, or “R” position.													
	Starter does not operate in “P” or “N” position.													
	Engine stall occurs in “D”, “L”, or “R” position during stop.	1		1										
	Engine stall occurs in “P” or “N” position during stop.													
	Parking lock does not operate in “P” position.													1
	Parking lock cannot be cancelled when the selector lever is shifted from “P” position to other position.													1

PERIODIC MAINTENANCE

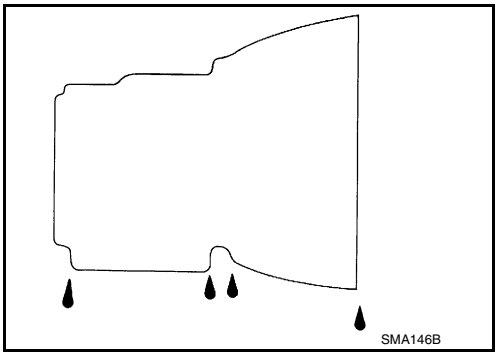
CVT FLUID

Inspection

INFOID:0000000009020015

FLUID LEAKAGE

- Check transaxle surrounding area (oil seal and plug etc.)for fluid leakage.
- If anything is found, repair or replace damaged parts and adjust CVT fluid level. Refer to TM-225, "Adjustment".



Replacement

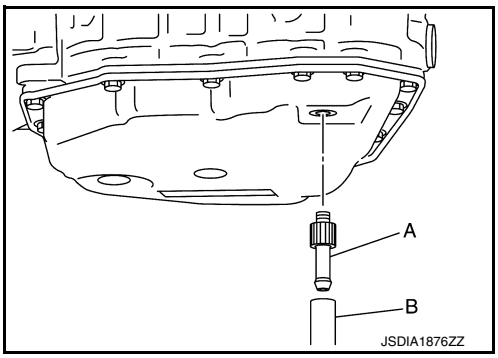
INFOID:0000000009019892

CVT fluid	**: Refer to TM-254, "General Specification".**
Fluid capacity	**: Refer to TM-254, "General Specification".**

CAUTION:

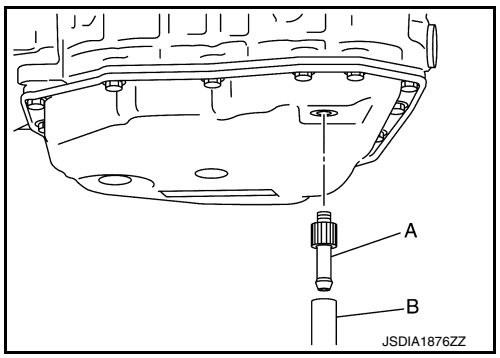
- **Use only Genuine NISSAN CVT Fluid NS-3. Using transmission fluid other than Genuine NISSAN CVT Fluid NS-3 will damage the CVT, which is not covered by the (NISSAN new vehicle limited) warranty.**
- **Always use shop paper. Never use shop cloth.**
- **Replace a drain plug gasket with new ones at the final stage of the operation when installing.**
- **Use caution when looking into the drain hole as there is a risk of dripping fluid entering the eye.**
- **After replacement, always perform CVT fluid leakage check.**

1. Select “Data Monitor” in “TRANSMISSION” using CONSULT.
2. Select “FLUID TEMP” and confirm that the CVT fluid temperature is 40°C (104°F) or less.
3. Check that the selector lever is in the “P” position, then completely engage the parking brake.
4. Lift up the vehicle.
5. Remove the drain plug and overflow tube and drain the CVT fluid from the oil pan. TM-238, "Removal and Installation".
6. Install the charging pipe set (KV311039S0) (A) into the drain hole.
   CAUTION:
   Tighten the charging pipe by hand.
7. Install the ATF changer hose (B) to the charging pipe.
   CAUTION:
   Press the ATF changer hose all the way onto the charging pipe until it stops.
8. Fill approximately 3 liter (2-5/8 lmp qt) of the CVT fluid.
9. Remove the ATF changer hose and charging pipe, then install the drain plug.
   NOTE:
   Perform this work quickly because CVT fluid leaks.
10. Lift down the vehicle.
11. Start the engine.
12. While depressing the brake pedal, shift the selector lever to the entire position from “P” to “L”, and shift it to the “P” position.
    NOTE:



Hold the lever at each position for 5 seconds.

13. Check that the CONSULT “Data monitor” in “FLUID TEMP” is 35°C (95°F) to 45°C (113°F).
14. Stop the engine.
15. Lift up the vehicle.
16. Remove the drain plug, and then drain CVT fluid from oil pan.
17. Repeat steps 6 to 16 (one time).
18. Install the overflow tube. Refer to TM-238, "Removal and Installation".
    CAUTION:
    Be sure to tighten to the specified torque. If it is not tightened to the specified torque, the tube may be damaged.
19. Install the charging pipe set (KV311039S0) (A) into the drain hole.
    CAUTION:
    Tighten the charging pipe by hand.
20. Install the ATF changer hose (B) to the charging pipe.
    CAUTION:
    Press the ATF changer hose all the way onto the charging pipe until it stops.
21. Fill approximately 3 liter (2-5/8 Imp qt) of the CVT fluid.
22. Remove the ATF changer hose and charging pipe, then install the drain plug.
    NOTE:
    Perform this work quickly because CVT fluid leaks.



23. Lift down the vehicle.
24. Start the engine.
25. While depressing the brake pedal, shift the selector lever to the entire position from “P” to “L”, and shift it to the “P” position.
    NOTE:
    Hold the lever at each position for 5 seconds.
26. Check that the CONSULT “Data monitor” in “FLUID TEMP” is 35°C (95°F) to 45°C (113°F).
27. Lift up the vehicle.
28. Remove the drain plug and confirm that the CVT fluid is drained from the overflow tube.
    CAUTION:
    Perform this work with the vehicle idling.
    NOTE:
    If the CVT fluid is not drained, refer to “Adjustment” and refill with the CVT fluid.
29. When the flow of CVT fluid slows to a drip, tighten the drain plug to the specified torque. TM-238, "Removal and Installation".
    CAUTION:
    Never reuse drain plug gasket.
30. Lift down the vehicle.
31. Select “Work Support” in “TRANSMISSION” using CONSULT.
32. Select “CONFORM CVTF DETERIORTN”.
33. Select “Erase”.
34. Stop the engine.

Adjustment

INFOID:0000000009019893

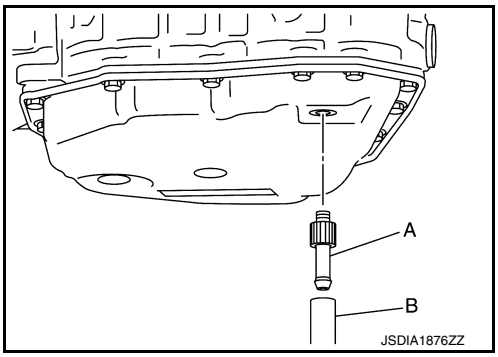
CVT fluid	**: Refer to TM-254, "General Specification".**
Fluid capacity	**: Refer to TM-254, "General Specification".**

CAUTION:

- **Use only Genuine NISSAN CVT Fluid NS-3. Using transmission fluid other than Genuine NISSAN CVT Fluid NS-3 will damage the CVT, which is not covered by the (NISSAN new vehicle limited) warranty.**

- **During adjustment of the CVT fluid level, check CONSULT so that the oil temperature may be maintained from 35 to 45°C (95 to 113°F).**
- **Use caution when looking into the drain hole as there is a risk of dripping fluid entering the eye.**

1. Check that the selector lever is in the “P” position, then completely engage the parking brake.
2. Start the engine.
3. Adjust the CVT fluid temperature to be approximately 40°C (104°F).
   NOTE:
   The CVT fluid is largely affected by temperature. Therefore be sure to use CONSULT and check the “FLUID TEMP” under “TRANSMISSION” in “Data Monitor” while adjusting.
4. While depressing the brake pedal, shift the selector lever to the entire position from “P” to “L”, and shift it to the “P” position.
   NOTE:
   Hold the lever at each position for 5 seconds.
5. Lift up the vehicle.
6. Check that there is no CVT fluid leakage.
7. Remove the drain plug. Refer to TM-238, "Removal and Installation".
8. Install the charging pipe set (KV311039S0) (A) into the drain plug hole.
   CAUTION:
   Tighten the charging pipe by hand.
9. Install the ATF changer hose (B) to the charging pipe.
   CAUTION:
   Press the ATF changer hose all the way onto the charging pipe until it stops.
10. Fill approximately 0.5 liter (1/2 lmp qt) of the CVT fluid.
11. Remove the ATF changer hose from the charging pipe, and check that the CVT fluid drains out from the charging pipe. If it does not drain out, perform charging again.
    CAUTION:
    Perform this work with the vehicle idling.



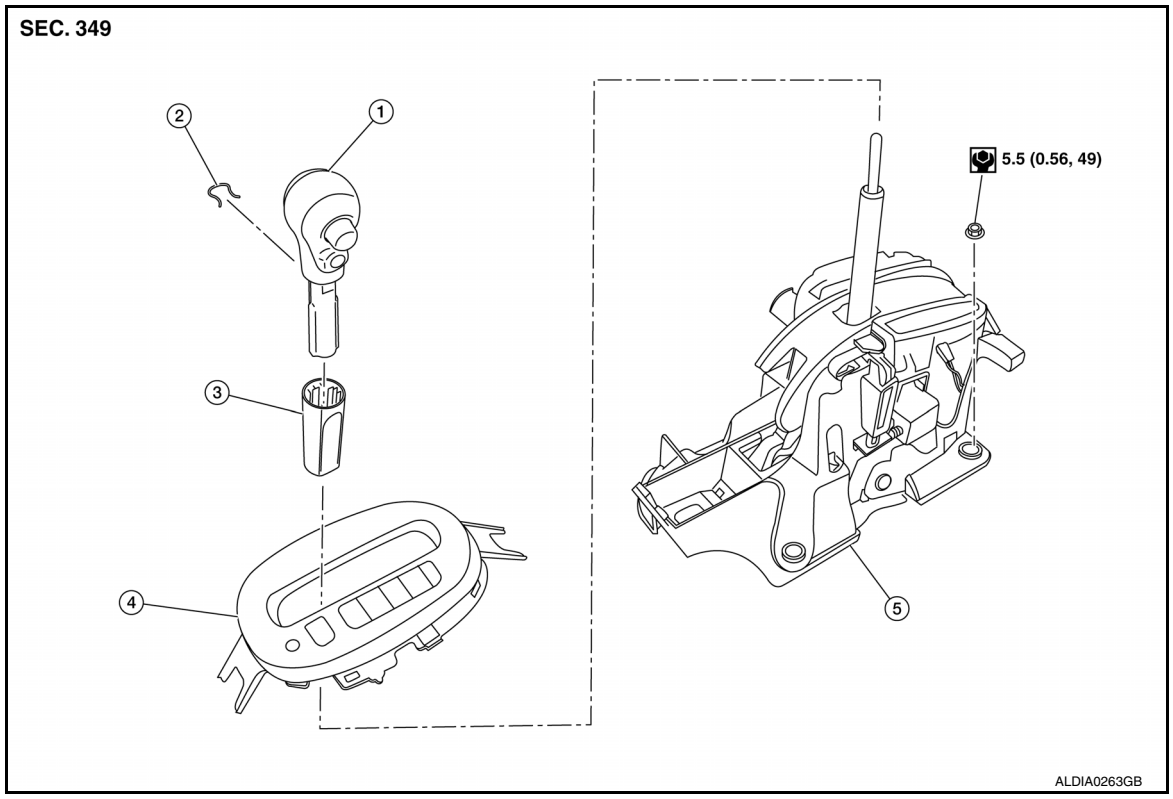
12. When the flow of CVT fluid slows to a drip, remove the charging pipe from the oil pan.
13. Tighten the drain plug to the specified torque. Refer to TM-238, "Removal and Installation".
    CAUTION:
    Never reuse drain plug gasket.
14. Lift down the vehicle.
15. Stop the engine.

REMOVAL AND INSTALLATION

CVT SHIFT SELECTOR

Exploded View

INFOID:0000000009020016



1. Shift selector handle
2. Lock pin
3. Shift selector handle cover
4. Position indication panel
5. Shift selector assembly

Removal and Installation

INFOID:0000000009020017

CAUTION:
Always apply the parking brake before performing removal and installation.

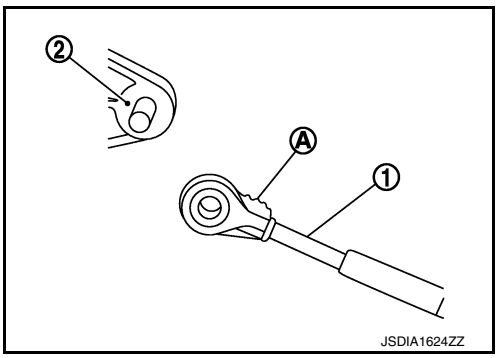
REMOVAL

1. Move the shift selector to the “N” position.
2. Remove the shift selector handle. Refer to TM-228, "Disassembly and Assembly".
3. Remove the center console. Refer to IP-18, "Removal and Installation".
4. Disconnect the harness connectors from shift selector.
5. Move the shift selector to the “P” position.
6. Remove the key interlock cable from the shift selector assembly. Refer to TM-233, "Exploded View".
7. Remove the control cable from the shift selector assembly. Refer to TM-230, "Exploded View".
8. Remove the shift selector assembly.

INSTALLATION

Installation is in the reverse order of removal.

- When connecting the control cable (1) to the shift selector assembly (2), face the grooved surface of the rib (A) up and insert the control cable until it stops.

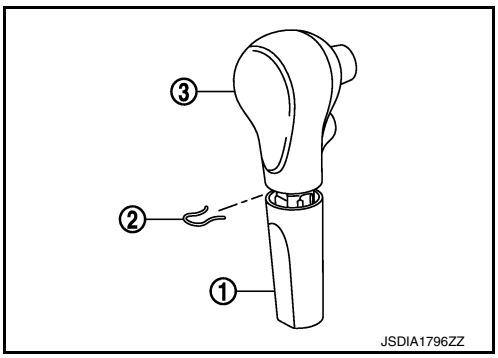


Disassembly and Assembly

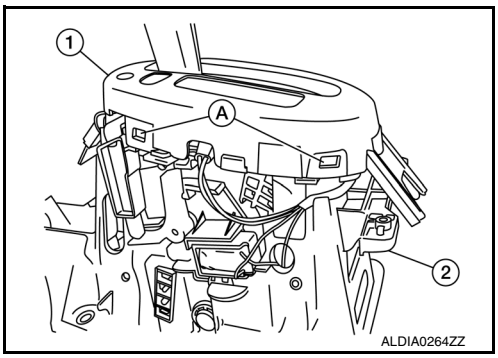
INFOID:0000000009020018

DISASSEMBLY

1. Slide the shift selector handle cover (1) down.
   CAUTION:
   Do not damage the shift selector handle cover.
2. Pull out the lock pin (2).
3. Pull the shift selector handle (3) and shift selector handle cover upward to remove.
4. Remove the position lamp.



5. Disengage the hooks (A) (4 locations), and lift up the position indication panel (1) to separate it from the shift selector assembly (2).
   CAUTION:
   Do not damage the shift selector assembly.

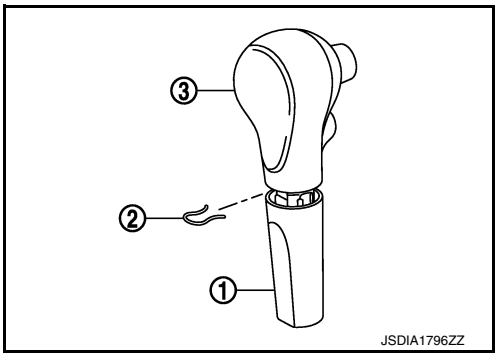


ASSEMBLY

Assembly is in the reverse order of disassembly.

- Follow the procedure below to install the shift selector handle.

1. Install the lock pin (2) onto the shift selector handle (3).
2. Install the shift selector handle cover (1) onto the shift selector handle.
3. Press the shift selector handle onto the shift selector until it clicks.
   CAUTION:
   - **When pressing the shift selector handle onto the shift selector, do not press the shift selector handle button.**
   - **Do not strike the shift selector handle to install it.**



Inspection

INFOID:0000000009020019

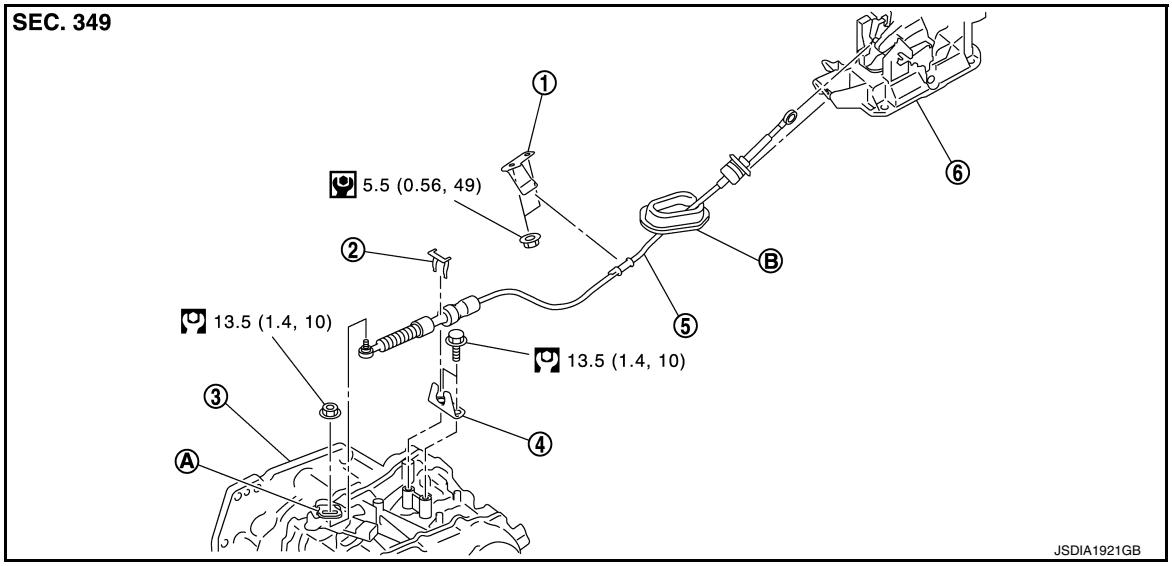
INSPECTION AFTER INSTALLATION

Check CVT position. Refer to TM-132, "Inspection".

CONTROL CABLE

Exploded View

INFOID:0000000009020020



1. Bracket B
2. Lock plate
3. Transaxle assembly
4. Bracket A
5. Control cable
6. CVT shift selector assembly

A: Manual lever
B: Grommet

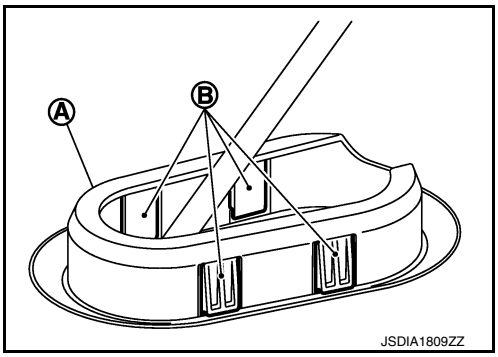
Removal and Installation

INFOID:0000000009020021

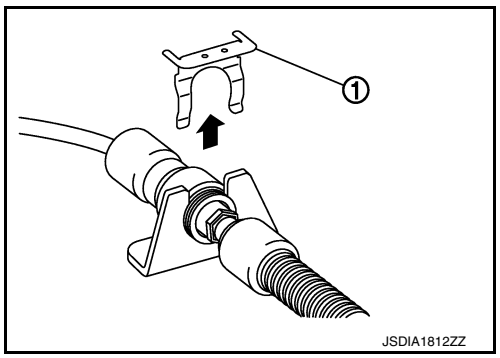
CAUTION:
Always apply the parking brake before performing removal and installation.

REMOVAL

1. Remove the battery negative terminal. Refer to PG-69, "Exploded View".
2. Remove the TCM and bracket. Refer to TM-235, "Removal and Installation".
3. Remove the IPDM E/R. Refer to PCS-30, "Removal and Installation".
4. Remove the battery tray and bracket.
5. Remove instrument lower panel LH. Refer to IP-24, "Removal and Installation".
6. Remove the center console. Refer to IP-18, "Removal and Installation".
7. Remove the control cable from the shift selector assembly.
8. Disengage the pawls (B) of the grommet (A), and pull downward to remove.
9. Remove the control cable nut from the manual lever.

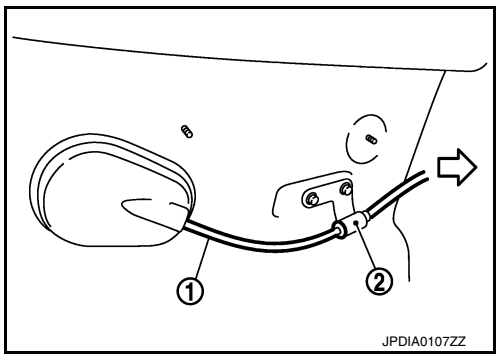


10. Remove the lock plate (1).



11. Lift up the heat plate.
12. Remove the control cable (1) from the bracket (2).

⇦ Front

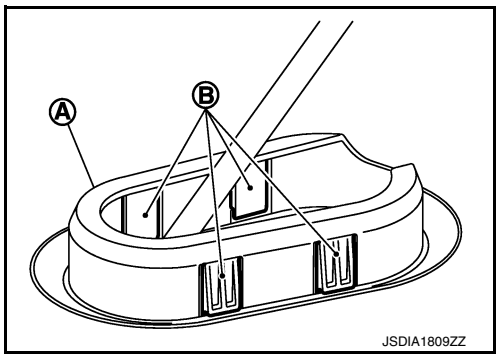


13. Remove the control cable from the vehicle.
14. Remove bracket.

INSTALLATION

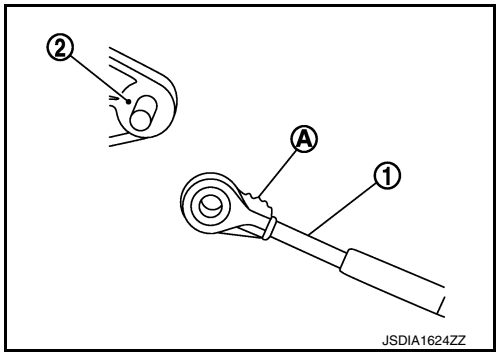
Installation is in the reverse order of removal.

- From below the vehicle, press the grommet (A) into place until the pawls (B) make a click sound.
  CAUTION:
  Check that pulling down on the grommet does not disconnect it.

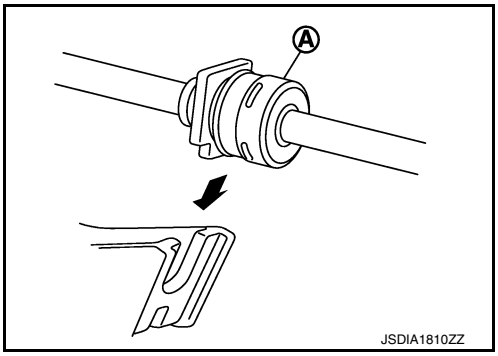


- Pay attention to the following when connecting the control cable to the shift selector.

1. When connecting the control cable (1) to the shift selector assembly (2), face the grooved surface of the rib (A) up and insert the control cable until it stops.



2. Install the socket (A) onto the shift selector assembly.
CAUTION:
- **Insert the socket into the shift selector assembly, then push it firmly in place.**
- **Check that pulling on the socket does not disconnect it.**



Inspection and Adjustment

INFOID:0000000009020022

INSPECTION AFTER INSTALLATION

Check CVT position. Refer to TM-132, "Inspection".

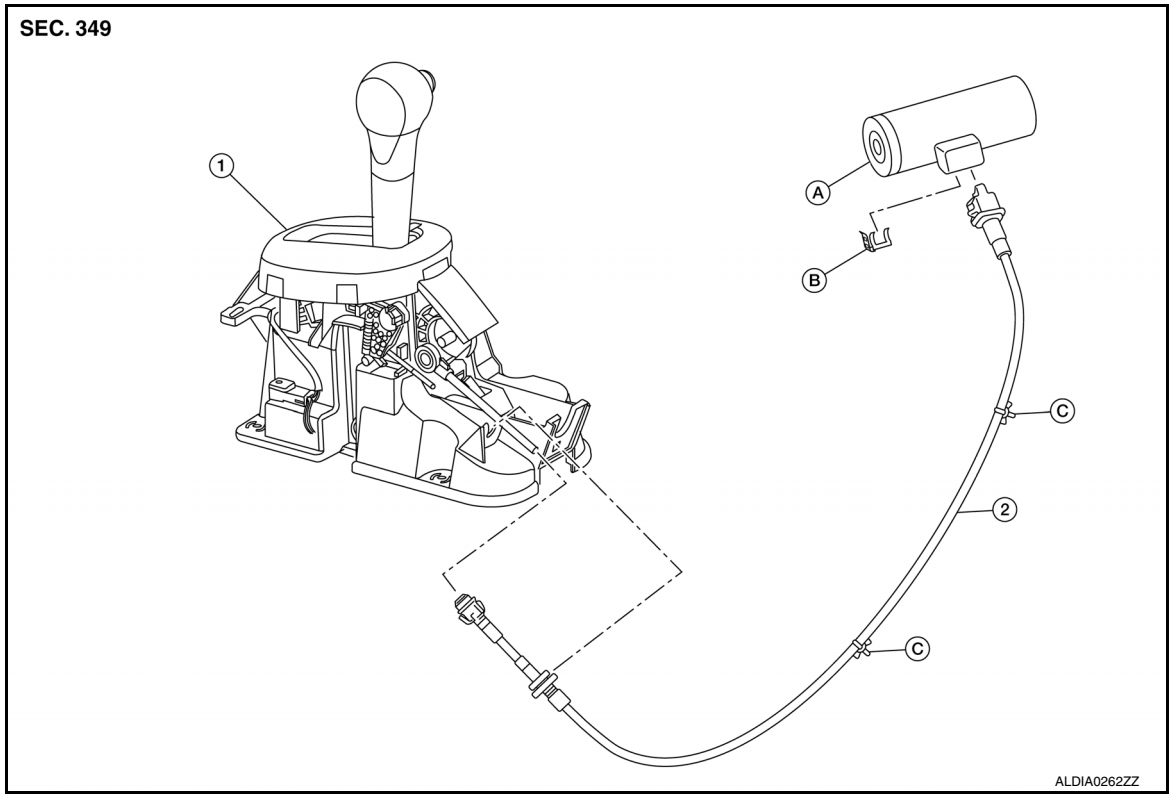
ADJUSTMENT AFTER INSTALLATION

Adjust CVT position. Refer to TM-132, "Adjustment".

KEY INTERLOCK CABLE

Exploded View

INFOID:0000000009020023



1. Shift selector assembly
2. Key interlock cable
A: Key cylinder
B: Lock plate
C: Clip

Removal and Installation

INFOID:0000000009020024

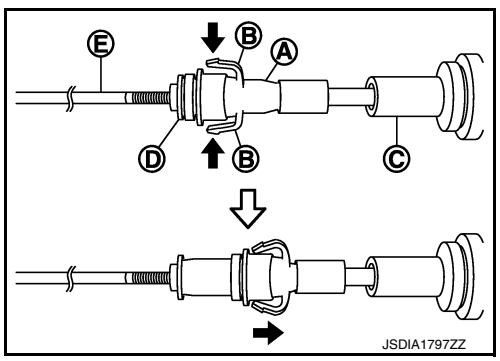
REMOVAL

CAUTION:

Always apply the parking brake before performing removal and installation.

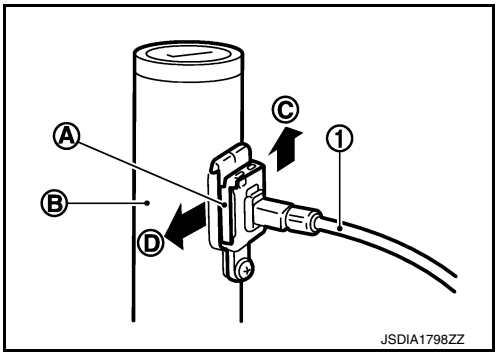
1. Move the shift selector to the “N” position.
2. Remove the shift selector handle. Refer to TM-228, "Disassembly and Assembly".
3. Remove the instrumental lower panel LH. Refer to IP-24, "Removal and Installation".
4. Remove steering column covers. Refer to IP-17, "Removal and Installation".
5. Remove the center console. Refer to IP-18, "Removal and Installation".
6. Move the shift selector to the “P” position.
7. Press the pawls (B) of the key interlock cable slider (A) while sliding it in the direction of the casing cap (C), and separate the adjusting holder (D) and slider.

   (E) :Key interlock rod



8. Remove the key interlock cable from the shift selector assembly.

9. Lift lock plate (A) in the direction of the arrow (⬅C) and remove in the direction of the arrow (⬅D).



(1) :Key interlock cable
(B) :Key cylinder

10. Remove the key interlock cable from the key cylinder.
11. Disengage the clips and remove the key interlock cable from the vehicle.

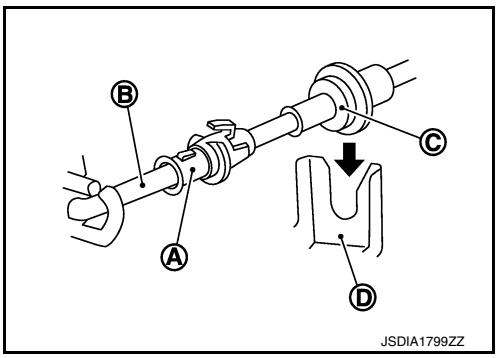
INSTALLATION

Installation is in the reverse order of removal.

- Temporarily install the adjust holder (A) to the key interlock rod (B).
- Install the casing cap (C) to the cable bracket (D) on the shift selector assembly.

CAUTION:

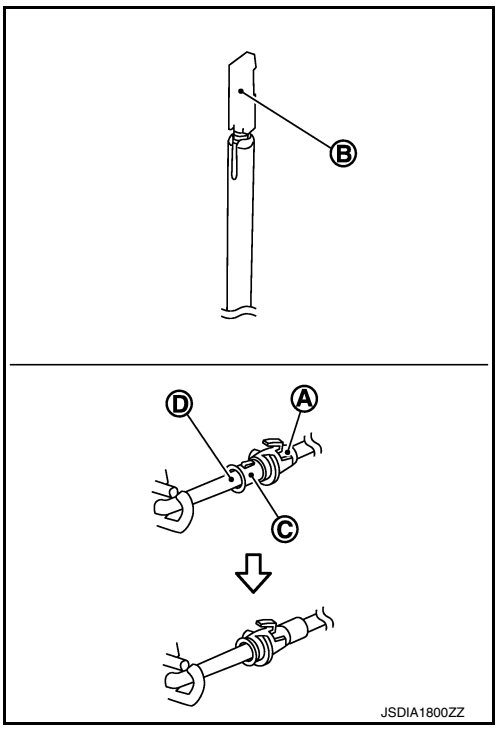
- **Do not bend or twist key interlock cable excessively when installing.**
- **After installing key interlock cable to cable bracket (D) on shift selector assembly, make sure casing caps (C) is firmly secured in cable bracket (D) on shift selector assembly.**
- **If casing cap (C) is loose [less than 39.2 N (4.0 kg, 8.8 lb) removing force], replace key interlock cable.**



- Slide the slider (A) toward the key interlock rod (D) while pressing the pull lock (B) down to securely connect the adjust holder (C) with the key interlock rod (D).

CAUTION:

- **Do not press tabs when holding slider (A).**
- **Do not apply any side to side force to key interlock rod (D) when sliding slider (A).**



Inspection

INFOID:0000000009020025

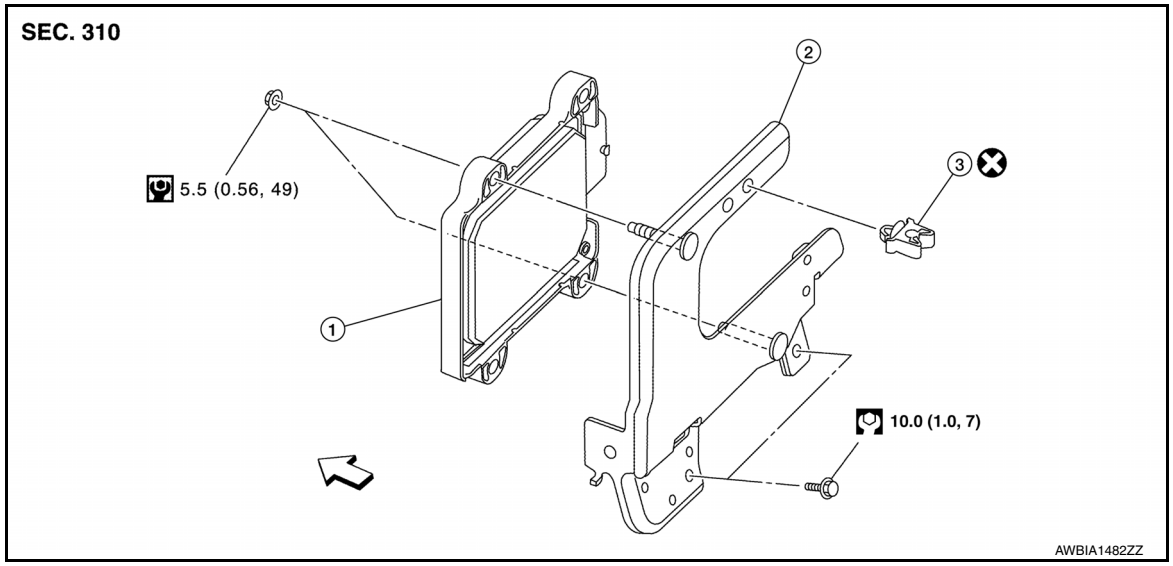
INSPECTION AFTER INSTALLATION

- Check the CVT operation. If a malfunction is found, adjust the CVT position. Refer to TM-228, "Inspection".
- Make sure the key can be removed only when the shift selector is in the “P” position.
- Make sure the ignition switch will not turn to LOCK position when the shift selector is not in the “P” position.

TCM

Exploded View

INFOID:0000000009020026



1. TCM
2. Bracket
3. Clip

⇦ Front

Removal and Installation

INFOID:0000000009020027

CAUTION:
When replacing TCM, note the "CVTF DETERIORATION DATE" value displayed on CONSULT "CONFORM CVTF DETERIORTN" in MAINTENANCE BOOKLET, before starting the operation.
NOTE:
When replacing the TCM and transaxle assembly as a set, replace the transaxle assembly first and then replace the TCM. Refer to TM-126, "Description".

REMOVAL

1. Remove the battery. Refer to PG-69, "Removal and Installation (Battery)".
2. Disconnect the harness connector from the TCM.
3. Remove the TCM and bracket as an assembly.
4. Remove the TCM from the bracket (if necessary).

INSTALLATION

Installation is in the reverse order of removal.

Adjustment

INFOID:0000000009020028

ADJUSTMENT AFTER INSTALLATION

Perform "ADDITIONAL SERVICE WHEN REPLACING TCM". Refer to TM-126, "Description".

AIR BREATHER HOSE

Removal and Installation

INFOID:0000000009020029

REMOVAL

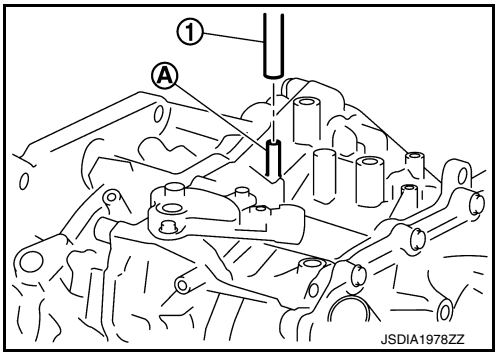
1. Remove air duct (inlet). Refer to EM-26, "Exploded View".
2. Remove air breather hose from transaxle assembly.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

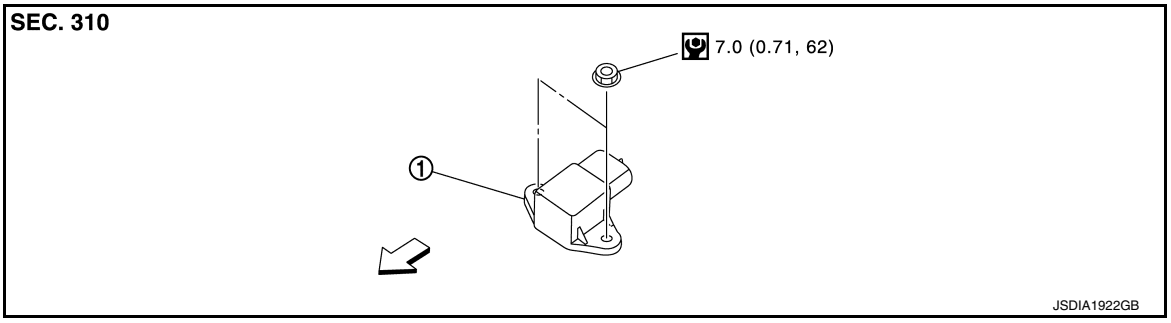
- **Check that air breather hose is not collapsed or blocked due to folding or bending when installed.**
- **Be sure to insert air breather hose (1) fully until it reaches the base of the transaxle tube (A).**



G SENSOR

Exploded View

INFOID:0000000009020030



1. G sensor ⇦ Front

Removal and Installation

INFOID:0000000009020031

CAUTION:
- **Do not drop or strike G sensor, because it may be damaged by impact.**
- **Do not use a power tool.**

REMOVAL

1. Disconnect the battery negative terminal. Refer to PG-69, "Exploded View".
2. Remove center console. Refer to IP-18, "Removal and Installation".
3. Disconnect the harness connector from G sensor.
4. Remove G sensor.

INSTALLATION

Installation is in the reverse order of removal.

Adjustment

INFOID:0000000009020032

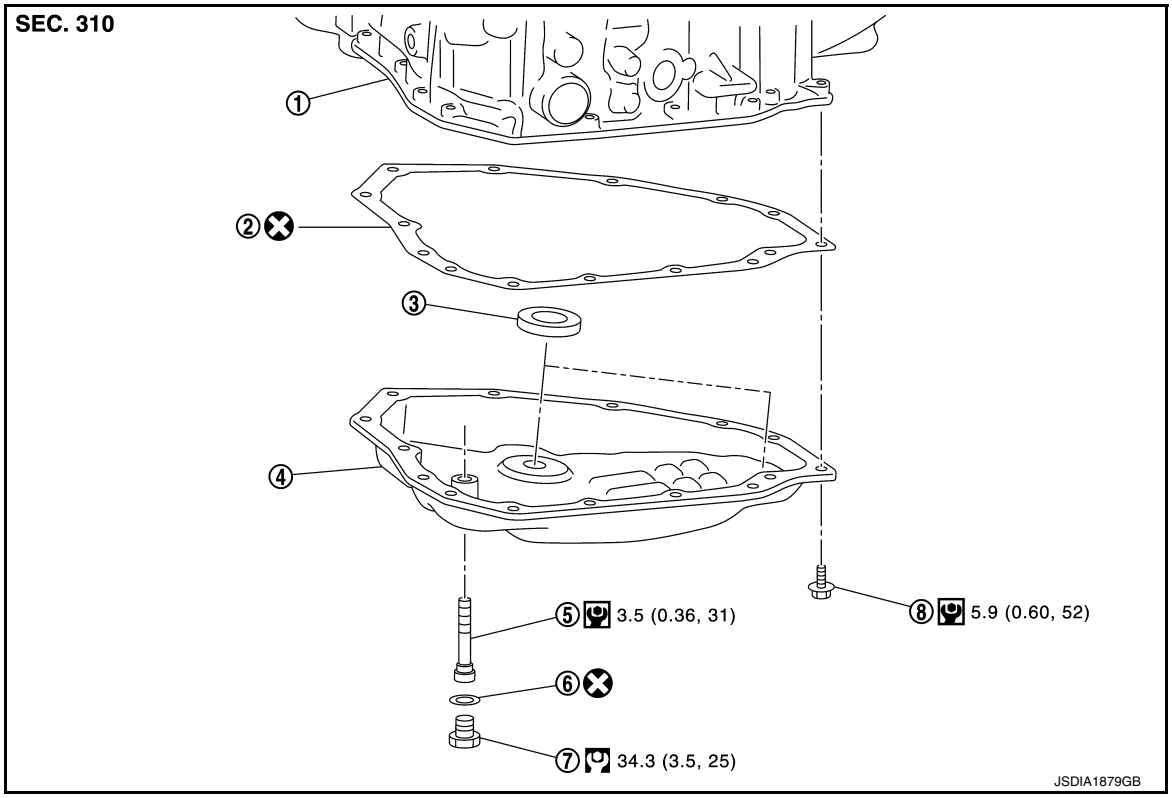
ADJUSTMENT AFTER INSTALLATION

Perform “G SENSOR CALIBRATION”. Refer to TM-129, "Description".

OIL PAN

Exploded View

INFOID:0000000009020033



1. Transaxle assembly
2. Oil pan gasket
3. Magnet
4. Oil pan
5. Overflow tube
6. Drain plug gasket
7. Drain plug
8. Oil pan fitting bolt

Removal and Installation

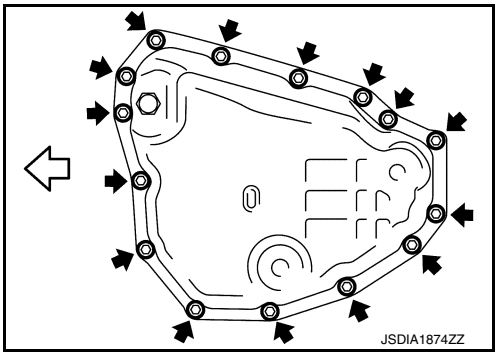
INFOID:0000000009020034

REMOVAL

1. Remove the drain plug and overflow tube, and then drain the CVT fluid.
   WARNING:
   CVT fluid can splash when draining, use safety glasses to protect eyes.
2. Remove the drain plug gasket from the drain plug.
3. Remove the oil pan bolts (⇦), and then remove the oil pan and oil pan gasket.

   ⇦ : Front

4. Remove the magnets from the oil pan.



INSTALLATION

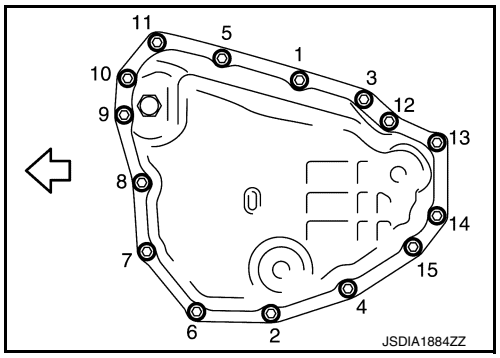
Installation is in the reverse order of removal.

CAUTION:

- **Do not reuse oil pan gasket and drain plug gasket.**

- **Do not reuse oil pan bolts.**
- **Completely remove all moisture, oil and old gasket, etc. from the oil pan gasket mating surface of transaxle case and oil pan.**
- **When installing the overflow tube, be sure to tighten to the specified torque. If it is not tightened to the specified torque, the tube may be damaged.**
- When the oil pan is installed, temporarily tighten oil pan bolts, then tighten the oil pan bolts to specification in the order shown.

⇦ : Front



Inspection and Adjustment

INFOID:0000000009020035

INSPECTION AFTER REMOVAL

Check oil pan for foreign material.

- If a large amount of worn material is found, clutch plate may be worn.
- If iron powder is found, bearings, gears, or clutch plates may be worn.
- If aluminum powder is found, bushing may be worn, or chips or burrs of aluminum casting parts may enter.

Check points where wear is found in all cases.

INSPECTION AFTER INSTALLATION

Check for CVT fluid leakage. Refer to TM-224, "Inspection".

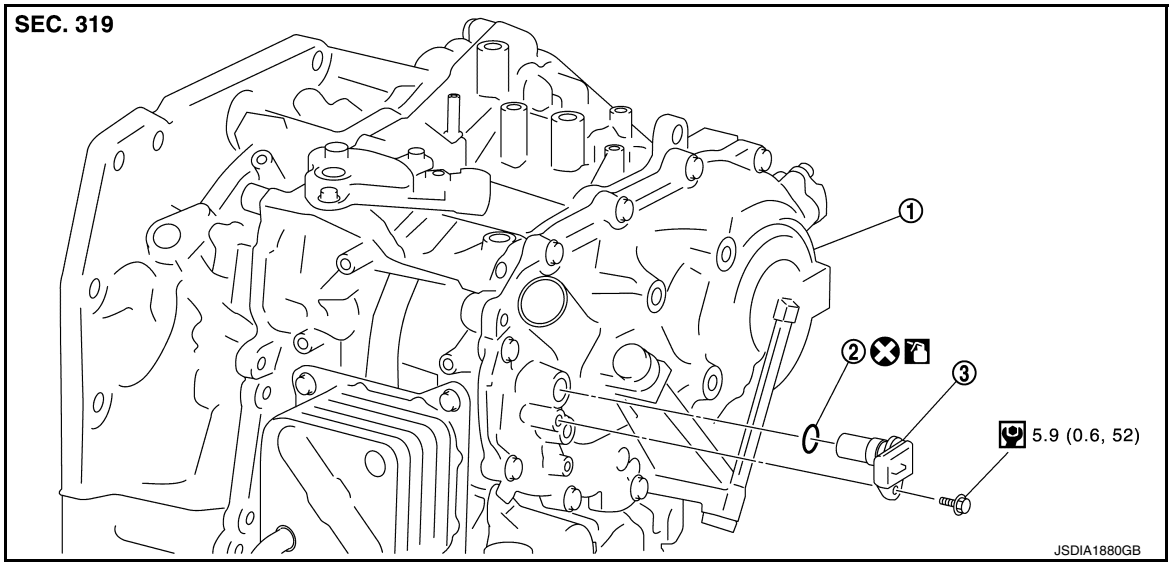
ADJUSTMENT AFTER INSTALLATION

Check the CVT fluid level. Refer to TM-225, "Adjustment".

PRIMARY SPEED SENSOR

Exploded View

INFOID:0000000009020036



1. Transaxle assembly
2. O-ring
3. Primary speed sensor
- Front
- : Genuine NISSAN CVT Fluid NS-3

Removal and Installation

INFOID:0000000009020037

REMOVAL

1. Partially remove fender protector (LH). Refer to EXT-24, "Removal and Installation".
2. Disconnect the harness connector from primary speed sensor.
3. Remove the primary speed sensor.
4. Remove the O-ring from the primary speed sensor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- **Do not reuse O-ring.**
- **Apply Genuine NISSAN CVT Fluid NS-3 to the O-ring.**

Inspection and Adjustment

INFOID:0000000009020038

INSPECTION AFTER INSTALLATION

Check for CVT fluid leakage. Refer to TM-224, "Inspection".

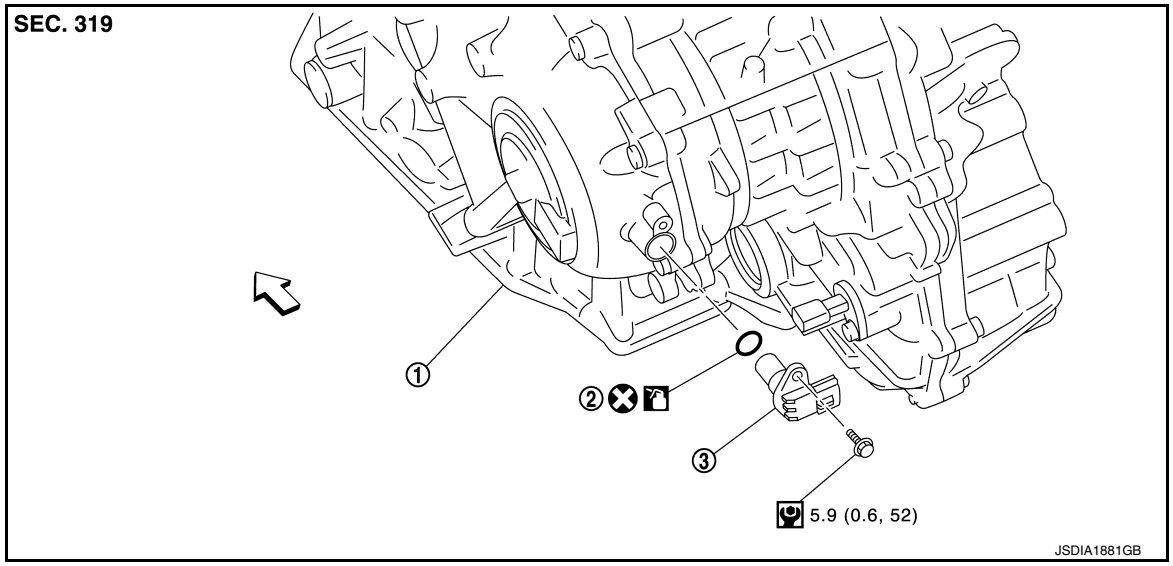
ADJUSTMENT AFTER INSTALLATION

Adjust the CVT fluid level. Refer to TM-225, "Adjustment".

SECONDARY SPEED SENSOR

Exploded View

INFOID:0000000009020039



1. Transaxle assembly
2. O-ring
3. Secondary speed sensor
⇦ Front
: Genuine NISSAN CVT Fluid NS-3

Removal and Installation

INFOID:0000000009020040

REMOVAL

1. Remove battery tray. Refer to PG-70, "Removal and Installation (Battery Tray)".
2. Remove IPDM/ER. Refer to PCS-30, "Removal and Installation".
3. Disconnect the harness connector from secondary speed sensor.
4. Remove the secondary speed sensor.
5. Remove the O-ring from the secondary speed sensor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- **Do not reuse O-ring.**
- **Apply Genuine NISSAN CVT Fluid NS-3 to the O-ring.**

Inspection and Adjustment

INFOID:0000000009020041

INSPECTION AFTER INSTALLATION

Check for CVT fluid leakage. Refer to TM-224, "Inspection".

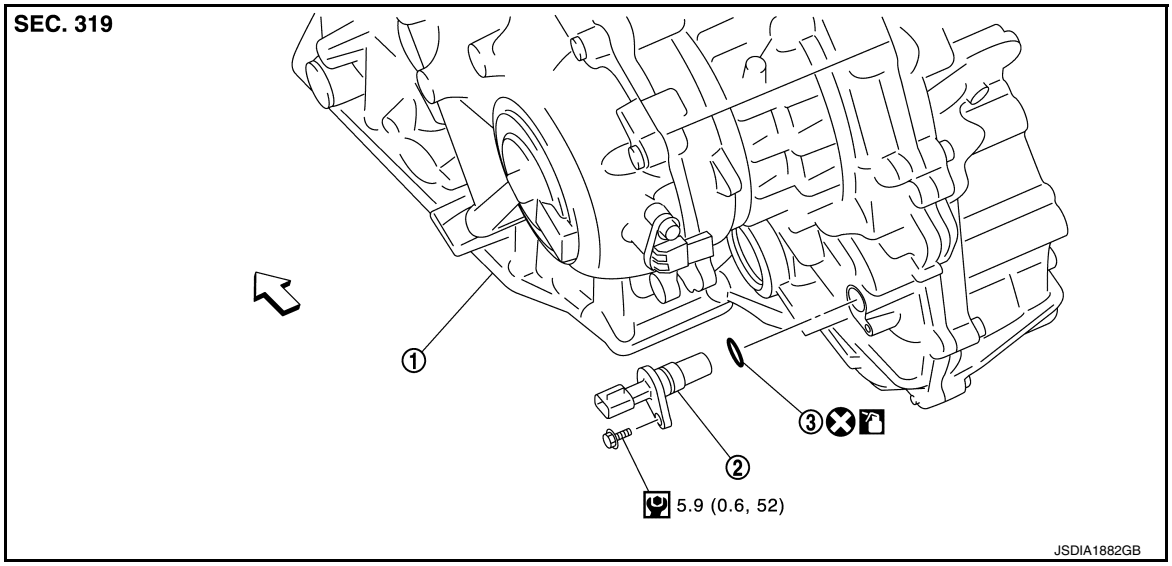
ADJUSTMENT AFTER INSTALLATION

Adjust the CVT fluid level. Refer to TM-225, "Adjustment".

OUTPUT SPEED SENSOR

Exploded View

INFOID:0000000009020042



1. Transaxle assembly
2. Output speed sensor
3. O-ring
- Front
- Genuine NISSAN CVT Fluid NS-3

Removal and Installation

INFOID:0000000009020043

REMOVAL

1. Disconnect the harness connector from output speed sensor.
   NOTE:
   Lift up the vehicle and perform the work from rear of the transaxle assembly.
2. Remove the output speed sensor.
3. Remove the O-ring from the output speed sensor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- **Do not reuse O-ring.**
- **Apply Genuine NISSAN CVT Fluid NS-3 to the O-ring.**

Inspection and Adjustment

INFOID:0000000009020044

INSPECTION AFTER INSTALLATION

Check for CVT fluid leakage. Refer to TM-224, "Inspection".

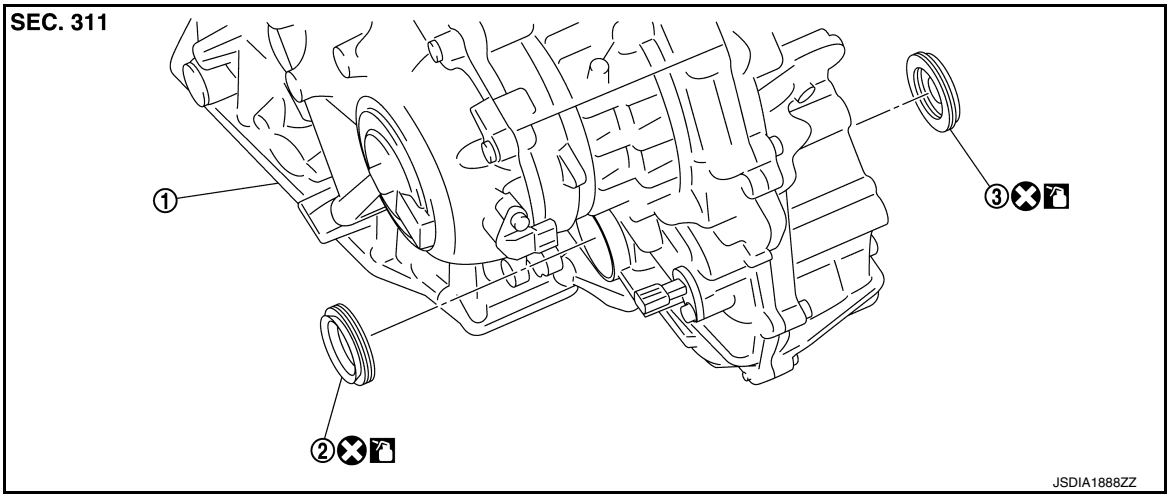
ADJUSTMENT AFTER INSTALLATION

Check the CVT fluid level. Refer to TM-225, "Adjustment".

DIFFERENTIAL SIDE OIL SEAL

Exploded View

INFOID:0000000009020045



1. Transaxle assembly
2. Differential side oil seal (left side)
3. Differential side oil seal (right side)

⇦ Front

Genuine NISSAN CVT Fluid NS-3

Removal and Installation

INFOID:0000000009020046

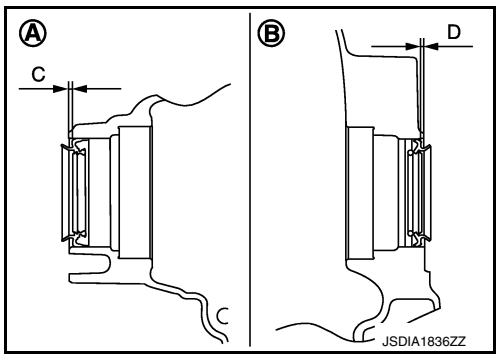
NOTE:
When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

1. Remove the front drive shaft from the transaxle assembly. Refer to FAX-19, "Removal and Installation"
2. Remove the differential side oil seal using suitable tool.
   CAUTION:
   When removing the differential side oil seal, be careful not to scratch the oil seal mating surfaces of the transaxle case and converter housing.

INSTALLATION

1. Drive the differential side oil seal into the transaxle case side (A) and converter housing side (B) using suitable tool to the specified dimension.



CAUTION:
- **Be careful not to scratch the lip of the differential side oil seal when press-fitting it.**
- **Do not reuse differential side oil seal.**
- **Apply Genuine NISSAN CVT Fluid NS-3 to the differential side oil seal lip and around the oil seal.**

Dimension (C) : 1.8 ± 0.5 mm (0.071 ± 0.020 in).
Dimension (D) : 1.8 ± 0.5 mm (0.071 ± 0.020 in).

2. Install the front drive shaft. Refer to FAX-19, "Removal and Installation".

Inspection and Adjustment

INFOID:0000000009020047

INSPECTION AFTER INSTALLATION

Check for CVT fluid leakage. Refer to TM-224, "Inspection".

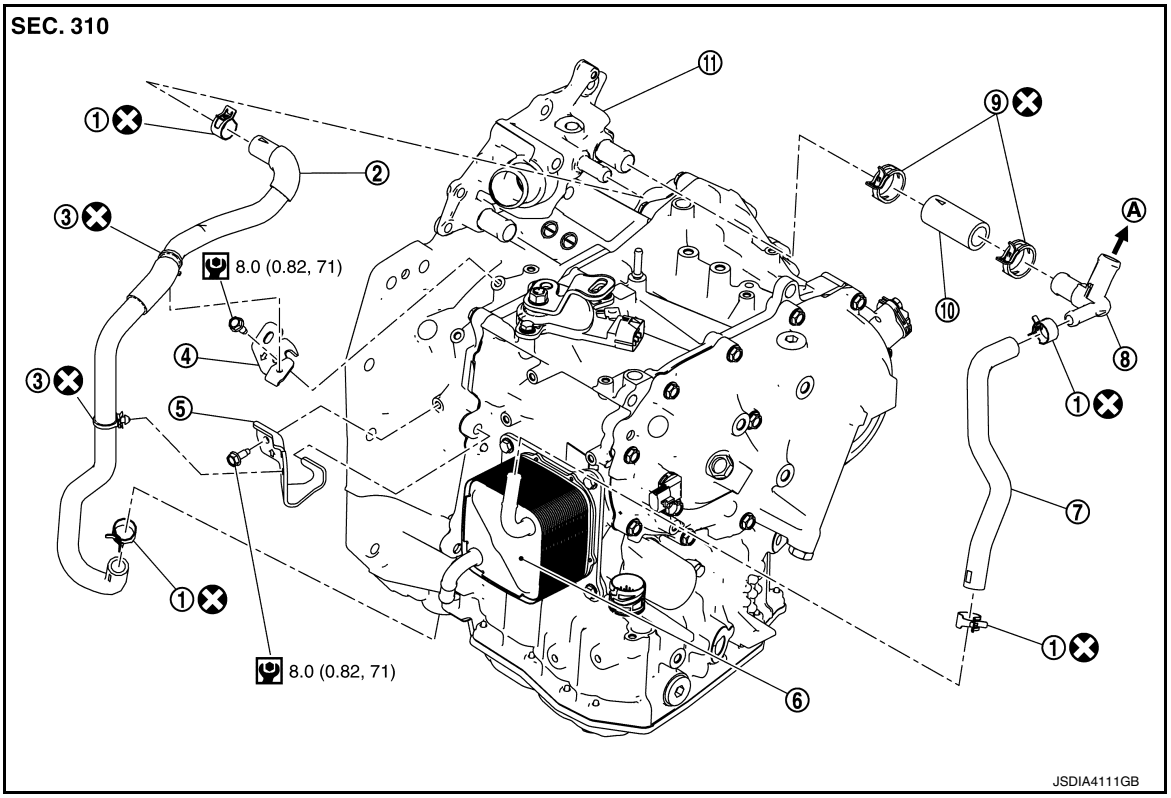
ADJUSTMENT AFTER INSTALLATION

Adjust the CVT fluid level. Refer to TM-225, "Adjustment".

WATER HOSE

Exploded View

INFOID:0000000009020048



1. Hose clamp
2. Water hose A
3. Clip
4. Bracket A
5. Bracket B
6. CVT oil warner
7. Water hose B
8. Water bypass pipe
9. Hose clamp
10. Water hose C
11. Water outlet

A. To heater core

: Always replace after every disassembly.

: N·m (kg-m, in-lb)

Removal and Installation

INFOID:0000000009020049

REMOVAL

WARNING:

Do not remove the radiator cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the radiator. Wrap a thick cloth around the cap. Slowly push down and turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by pushing it down and turning it all the way.

CAUTION:

Perform these steps after the engine coolant temperature has cooled sufficiently.

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Remove the hose clamp and pull out the water hose A.
2. Remove the hose clamp and pull out the water hose B.
3. Remove the hose clamp and pull out the water hose C.
4. Pull out the heater hose and remove the water bypass pipe.
5. Remove the heater thermostat assembly.

6. Remove the bracket.

INSTALLATION

Installation is in the reverse order of removal.

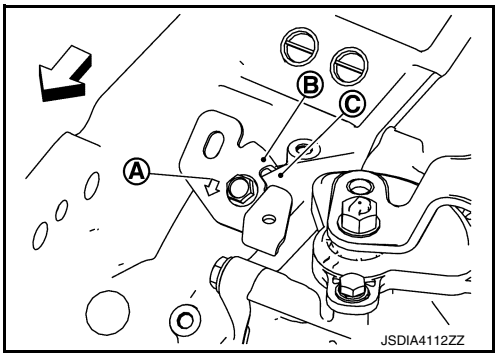
CAUTION:

- **Do not reuse hose clamps.**
- **Do not reuse clips.**

- When installing bracket A to the transaxle assembly.
- Face arrow (A) of bracket A toward the front of the vehicle.

⇦ : Front

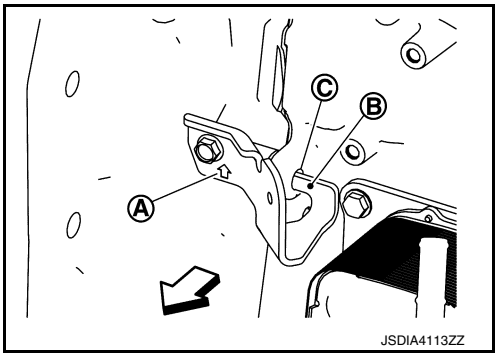
- Set baffle (B) of bracket A to rib (C) of transaxle.



- When installing the bracket B to the transaxle assembly.
- Face arrow (A) of bracket A towards the top of vehicle.

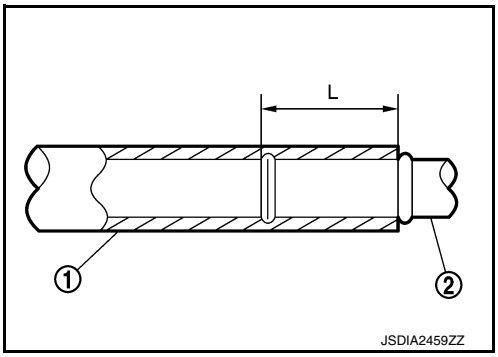
⇦ : Front

- Insert baffle (B) into the boss hole (C) of transaxle.



- Refer to the following when installing water hoses.

Water hose (1)	Installation side tube (2)	Direction of paint mark	Hose insertion depth (L)
Water hose A	Water outlet	Upward	(A): 27 mm (1.06 in) (End reaches the 2-stage bulge.)
	CVT oil warmer	Frontward	
Water hose B	CVT oil warmer	Frontward	
	Water bypass pipe	Rightward (Align with the mark of the water by-pass pipe side)	
Water hose C	Water bypass pipe	—	
	Water outlet	Upward	

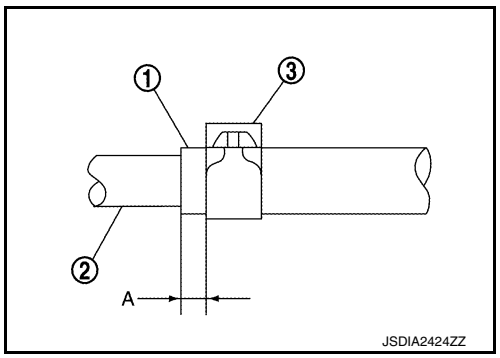


- Refer to the following when installing hose clamp.

CAUTION:

Hose clamp should not interfere with the bulge of fluid cooler tube.

Water hose (1)	Installation side tube (2)	Hose clamp (3)	
		Dieection of tab	Clamping position
Water hose A	Water outlet	Upward	5 - 7 mm (0.20 - 0.28 in) (A) from hose end
	CVT oil warmer	Frontward	
Water hose B	CVT oil warmer	Leftward	
	Water bypass pipe	Rightward	
Water hose C	Water bypass pipe	Upward and 45° frontward	
	Water outlet	Upward and 45° frontward	



Inspection

INFOID:0000000009020050

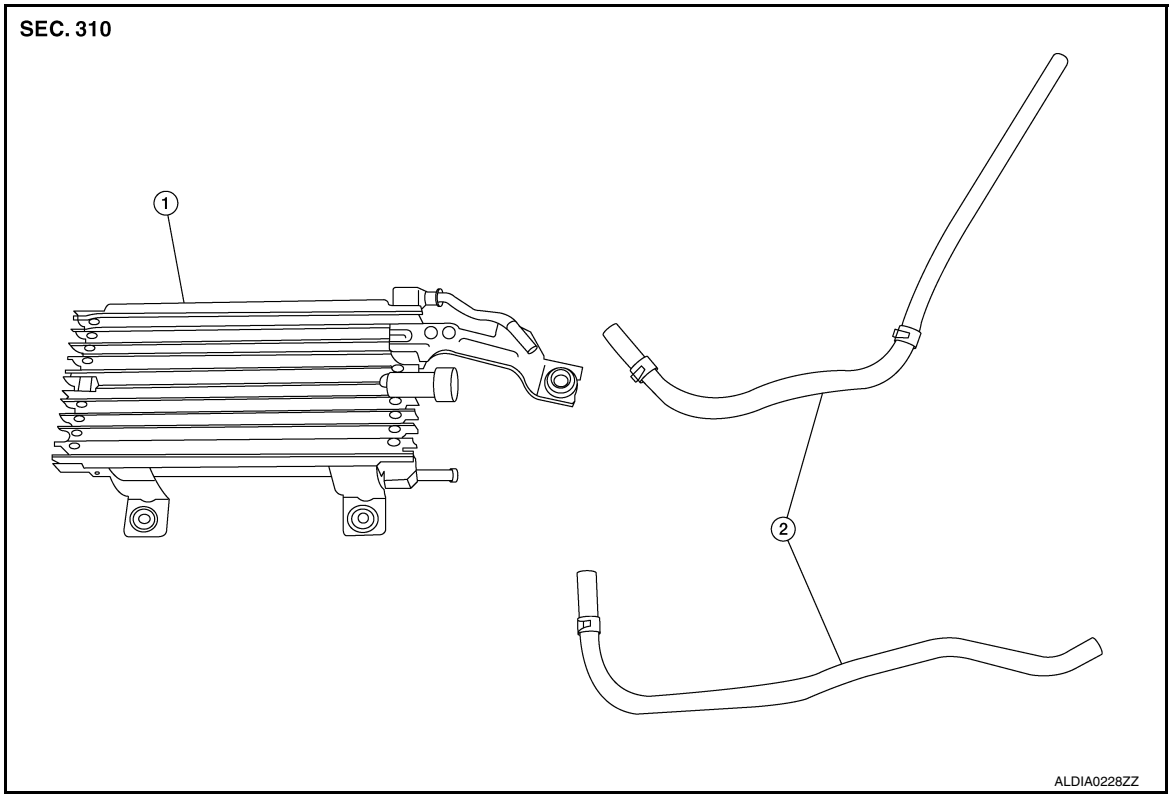
INSPECTION AFTER INSTALLATION

Start the engine and check visually that there is no leakage of engine coolant.

FLUID COOLER HOSE

Exploded View

INFOID:0000000009300274



1. CVT oil cooler
2. Hoses

Removal and Installation

INFOID:0000000009300275

NOTE:
When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

REMOVAL

1. Remove the front bumper fascia. Refer to EXT-16, "Removal and Installation".
2. Disconnect oil cooler hoses.
3. Remove oil cooler bolts.
4. Remove oil cooler assembly.

INSTALLATION

Installation is in the reverse order of removal.
After installation be sure to check the CVT fluid and add the specified CVT fluid as necessary. Refer to TM-224, "Inspection".

CAUTION:
Do not reuse hose clamps.

Inspection and Adjustment

INFOID:0000000009300276

INSPECTION AFTER INSTALLATION

Check for CVT fluid leakage. Refer to TM-224, "Inspection".

ADJUSTMENT AFTER INSTALLATION

Adjust the CVT fluid level. Refer to TM-225, "Adjustment".

PLUG

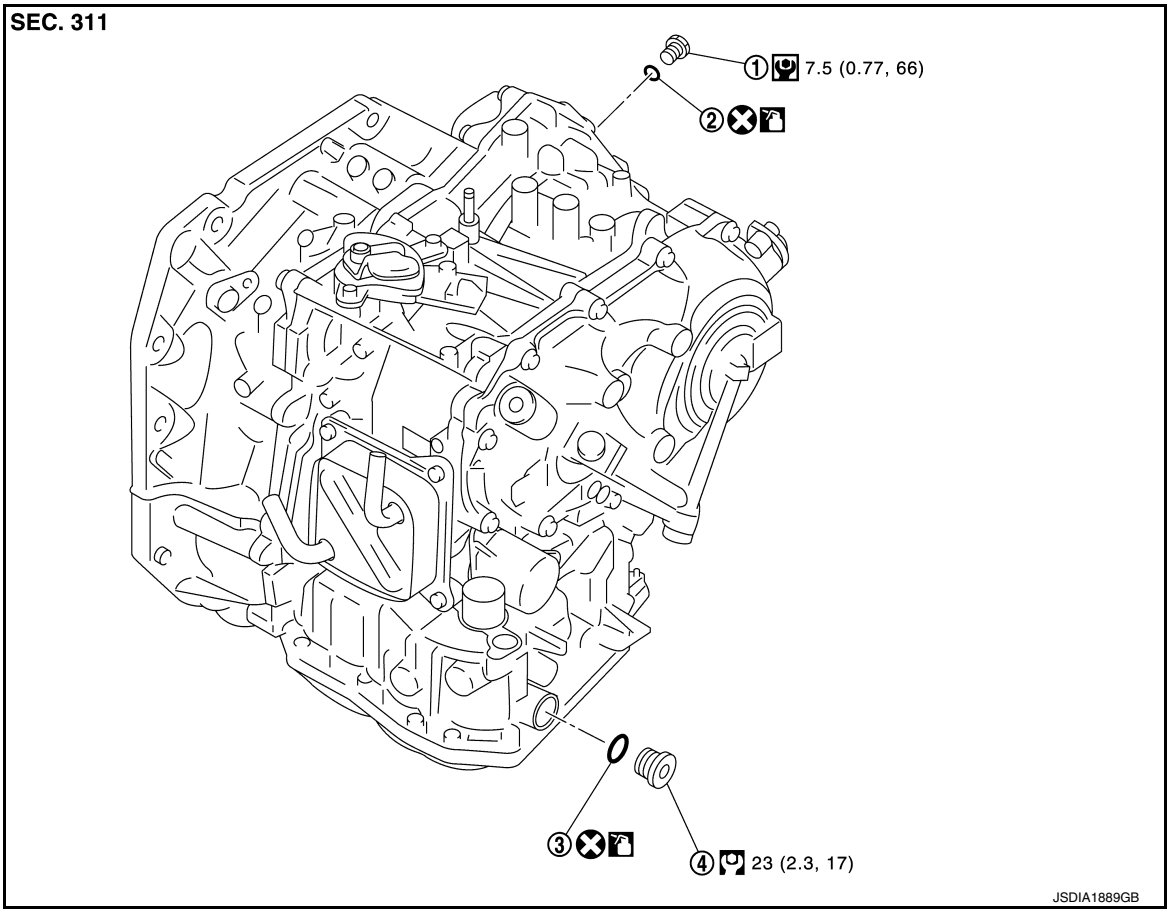
Description

INFOID:0000000009020051

Replace the O-ring if oil leakage or exudes from the plug.

Exploded View

INFOID:0000000009020052



1. Plug
2. O-ring
3. O-ring
4. Plug

Genuine NISSAN CVT Fluid NS-3

Removal and Installation

INFOID:0000000009020053

REMOVAL

Remove the plugs and O-rings.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- **Do not reuse O-rings.**
- **Apply Genuine NISSAN CVT Fluid NS-3 to O-rings.**

Inspection and Adjustment

INFOID:0000000009020054

INSPECTION AFTER INSTALLATION

Check for CVT fluid leakage. Refer to TM-224, "Inspection".

ADJUSTMENT AFTER INSTALLATION

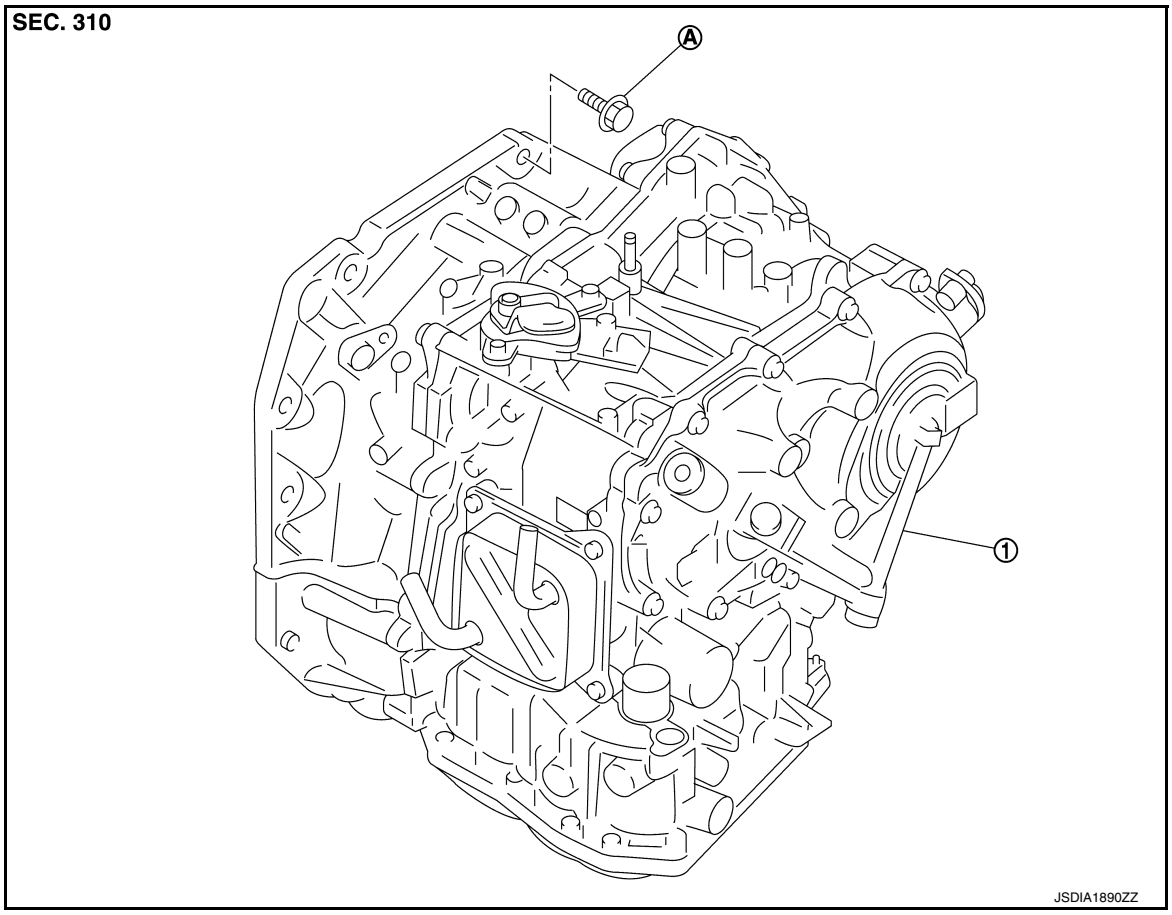
Adjust the CVT fluid level. Refer to TM-225, "Adjustment".

UNIT REMOVAL AND INSTALLATION

TRANSMISSION ASSEMBLY

Exploded View

INFOID:0000000009020055



1. Transaxle assembly

A : For the tightening torque, refer to TM-250, "Removal and Installation".

Removal and Installation

INFOID:0000000009020056

WARNING:

Do not remove the radiator cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the radiator. Wrap a thick cloth around the cap. Slowly push down and turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by pushing it down and turning it all the way.

CAUTION:

- **Perform these steps after the coolant temperature has cooled sufficiently.**

NOTE:

- When removing components such as hoses, tubes/line, etc., cap or plug openings to prevent fluid from spilling.
- When replacing the TCM and transaxle assembly as a set, replace the transaxle assembly first and then replace the TCM. Refer to TM-126, "Description".

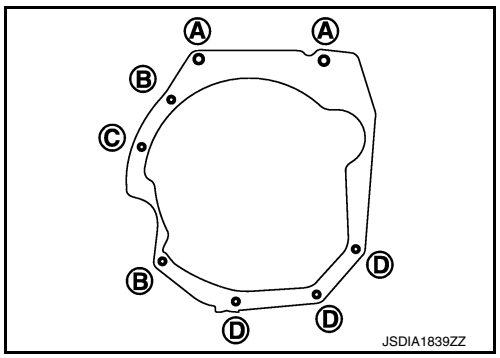
REMOVAL

1. Remove the engine and transaxle assembly. Refer to EM-86, "Removal and Installation".
2. Disconnect the harness connectors and harnesses.
   - For CVT unit harness connector.
   - Transmission position switch harness connector

- Primary speed sensor harness connector
- Secondary speed sensor harness connector
- Output speed sensor harness connector
- Ground

3. Rotate the crankshaft and remove the nuts that secure the drive plate to the torque converter from the stator motor mount.
CAUTION:
When turning crankshaft, turn it clockwise as viewed from the front of the engine.

4. Remove the bolts (engine to transaxle) that fasten the transaxle assembly and engine assembly.

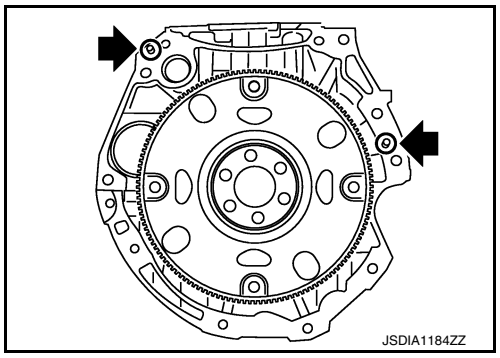


Bolt position	A	B	C	D
Direction of insertion	Transaxle assembly ⇒ Engine assembly	Engine assembly ⇒ Transaxle assembly		
Quantity	2	2	1	3
Nominal length [mm (in)]	40 (1.57)	44 (1.73)	69 (2.72)	49 (1.93)
Tightening torque N·m (kg-m, ft-lb)	48.0 (4.9, 35)			

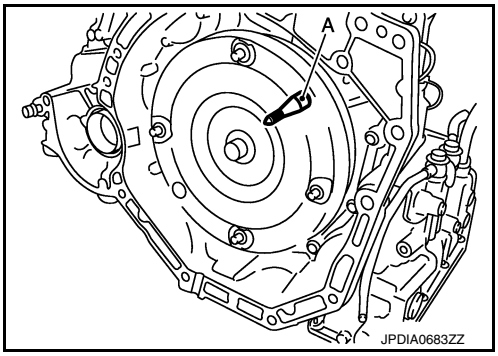
5. Remove transaxle assembly from vehicle.
CAUTION:
- **Secure torque converter to prevent it from dropping.**
- **Secure transaxle assembly to a suitable jack.**

INSTALLATION

Installation is in the reverse order of removal.
CAUTION:
- **Do not reuse O-rings.**
- **Apply Genuine NISSAN CVT Fluid NS-3 to the O-rings.**
- When installing the transaxle assembly onto the engine assembly, check the engagement of the dowel pins (⬅).

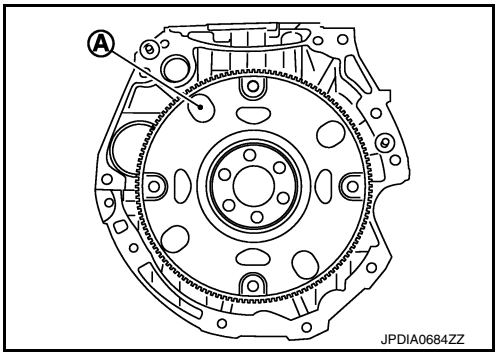


- When using suitable tool (A) for alignment, install it to the alignment stud bolt used to align the torque converter to the drive plate.



- Rotate the crankshaft so that the alignment hole (A) of drive plate aligns with the position of the torque converter alignment stud bolt.

CAUTION:
- **Rotate the crankshaft clockwise (as viewed from the front of the engine).**
- **Be careful that torque converter stud bolts are aligned to the drive plate holes. Otherwise the stud bolts contact the drive plate.**



- Insert the alignment stud bolt of torque converter into the alignment hole of the drive plate, aligning the drive plate holes with the torque converter stud bolts.

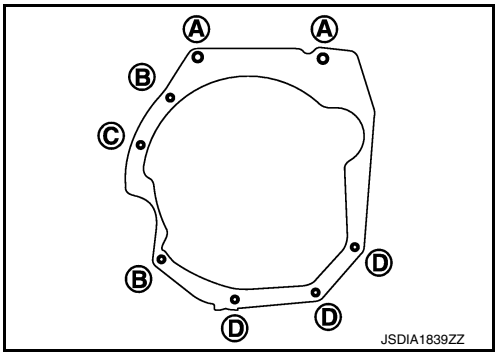
CAUTION:
Be careful not to strike the drive plate with the torque converter stud bolts.

- When installing the torque converter nuts, temporarily tighten the nuts. Then, after installing the engine and transaxle assembly bolts tighten the nuts to the specified torque.

Tightening torque : 51 N·m (5.2 kg-m, 38 ft-lb)

CAUTION:
- **Rotate the crankshaft clockwise (as viewed from the front of the engine).**
- **Check the tightening torque for the crankshaft pulley bolts after the bolts fastening the drive plate and torque converter have been tightened and the crankshaft pulley bolts have been secured. Refer to EM-51, "Removal and Installation".**

- Install the transaxle assembly and engine assembly bolts according to the following standards.



Bolt position	A	B	C	D
Direction of insertion	Transaxle assembly ⇒ Engine assembly	Engine assembly ⇒ Transaxle assembly		
Quantity	2	2	1	3
Nominal length [mm (in)]	40 (1.57)	44 (1.73)	69 (2.72)	49 (1.93)
Tightening torque N·m (kg-m, ft-lb)	48.0 (4.9, 35)			

Inspection and Adjustment

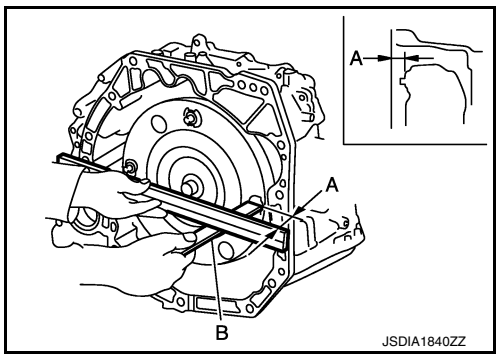
INFOID:0000000009020057

INSPECTION BEFORE INSTALLATION

Check the distance (A) between the converter housing and torque converter.

(B) : Scale
(C) : Straightedge

Dimension (A) : TM-255, "Torque Converter"



INSPECTION AFTER INSTALLATION

Check the following items:

- For CVT position, refer to TM-228, "Inspection".
- Before starting engine, check oil/fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-12, "Fluids and Lubricants".
- Use procedure below to check for fuel leakage.
- Turn ignition switch ON (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
- Start engine. With engine speed increased, check again for fuel leakage at connection points.
- Run engine to check for unusual noise and vibration.

  NOTE:
  If hydraulic pressure inside timing chain tensioner drops after removal and installation, slack in the guide may generate a pounding noise during and just after engine start. However, this is normal. Noise will stop after hydraulic pressure rises.
- Warm up engine thoroughly to make sure there is no leakage of fuel, exhaust gas, or any oils/fluids including engine oil and engine coolant.
- Bleed air from passages in lines and hoses, such as in cooling system.
- After cooling down engine, again check oil/fluid levels including engine oil and engine coolant. Refill to specified level, if necessary.
- Summary of the inspection items:

Item		Before starting engine	Engine running	After engine stopped
Engine coolant		Level	Leakage	Level
Engine oil		Level	Leakage	Level
Transmission/ transaxle fluid	A/T and CVT Models	Leakage	Level/Leakage	Leakage
	M/T Models	Level/Leakage	Leakage	Level/Leakage
Other oils and fluids*		Level	Leakage	Level
Fuel		Leakage	Leakage	Leakage
Exhaust gas		—	Leakage	—

*Power steering fluid, brake fluid, etc.

ADJUSTMENT AFTER INSTALLATION

- Adjust the CVT fluid level. TM-225, "Adjustment".
- Perform "ADDITIONAL SERVICE WHEN REPLACING TRANSAXLE ASSEMBLY". Refer to TM-127, "Description".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000009020058

Engine model			HR16DE	
Drive type			2WD	
Transaxle	Transaxle model		RE0F11A	
	Stall torque ratio		1.91 : 1	
	Pulley ratio	Forward	2.200 – 0.550	
		Reverse	2.200	
	Auxiliary gearbox gear ratio	1GR	1.821	
		2GR	1.000	
		Reverse	1.714	
	Counter gear		0.967	
	Final drive		3.882	
	Recommended fluid		Genuine NISSAN CVT Fluid NS-3*1	
	Fluid capacity (Approx.)		6.9 liter (6-1/8 Imp qt)*2	7.1 liter (6-1/4 Imp qt)*2
Remarks	CVT fluid cooler (air-cooling)		Not applicable	Applicable

CAUTION:

- **Use only Genuine NISSAN CVT Fluid NS-3. Do not mix with other fluid.**
- **Use only Genuine NISSAN CVT Fluid NS-3. Using transmission fluid other than Genuine NISSAN CVT Fluid NS-3 will damage the CVT, which is not covered by the (NISSAN new vehicle limited) warranty.**

*1: Refer to MA-12, "Fluids and Lubricants".

*2: The CVT fluid capacity is the reference value.

Shift Characteristics

INFOID:0000000009020059

Unit: rpm

Throttle position	Shift pattern	Engine speed	
		At 40 km/h (25 MPH)	At 60 km/h (37 MPH)
2/8	“D” position (Overdrive control OFF)	1,400 – 2,700	1,500 – 3,100
	“D” position (Overdrive control ON)	1,500 – 2,700	2,400 – 3,200
	“L” position	3,000 – 3,800	3,800 – 4,600
8/8	“D” position (Overdrive control OFF)	3,900 – 4,700	4,500 – 5,300
	“D” position (Overdrive control ON)	3,600 – 4,400	4,300 – 5,100
	“L” position	3,600 – 4,400	4,300 – 5,100

CAUTION:

Lock-up is engaged at the vehicle speed of approximately 10 km/h (11 MPH) to 90 km/h (56 MPH).

Stall Speed

INFOID:0000000009020060

Unit: rpm

Stall speed	2,420 – 2,870

Line Pressure

INFOID:0000000009020061

Unit: MPa (bar, kg/cm^2, psi)

Shift selector position	Engine speed	Line pressure
“P” and “N”	At idle	0.40 (4, 4.1, 58)
“R” and “D”	At idle	0.40 (4, 4.1, 58) – 1.39 (13.9, 14.2, 201.6)
	At stall	4.20 (42, 42.8, 609) – 4.70 (47, 47.9, 681.5)

Torque Converter

INFOID:0000000009020062

Distance (A) between the converter housing and torque converter	16.2 mm

Heater Thermostat

INFOID:0000000009020063

Standard

Valve lift	More than 5.0 mm (0.197 in)

Reference value

Valve opening temperature	71°C (160°F)
Minimum valve lift	5.0 mm/85°C (0.197 in/203°F)