SECTION TM
TRANSAXLE & TRANSMISSION

CONTENTS

7AT: RE7R01A

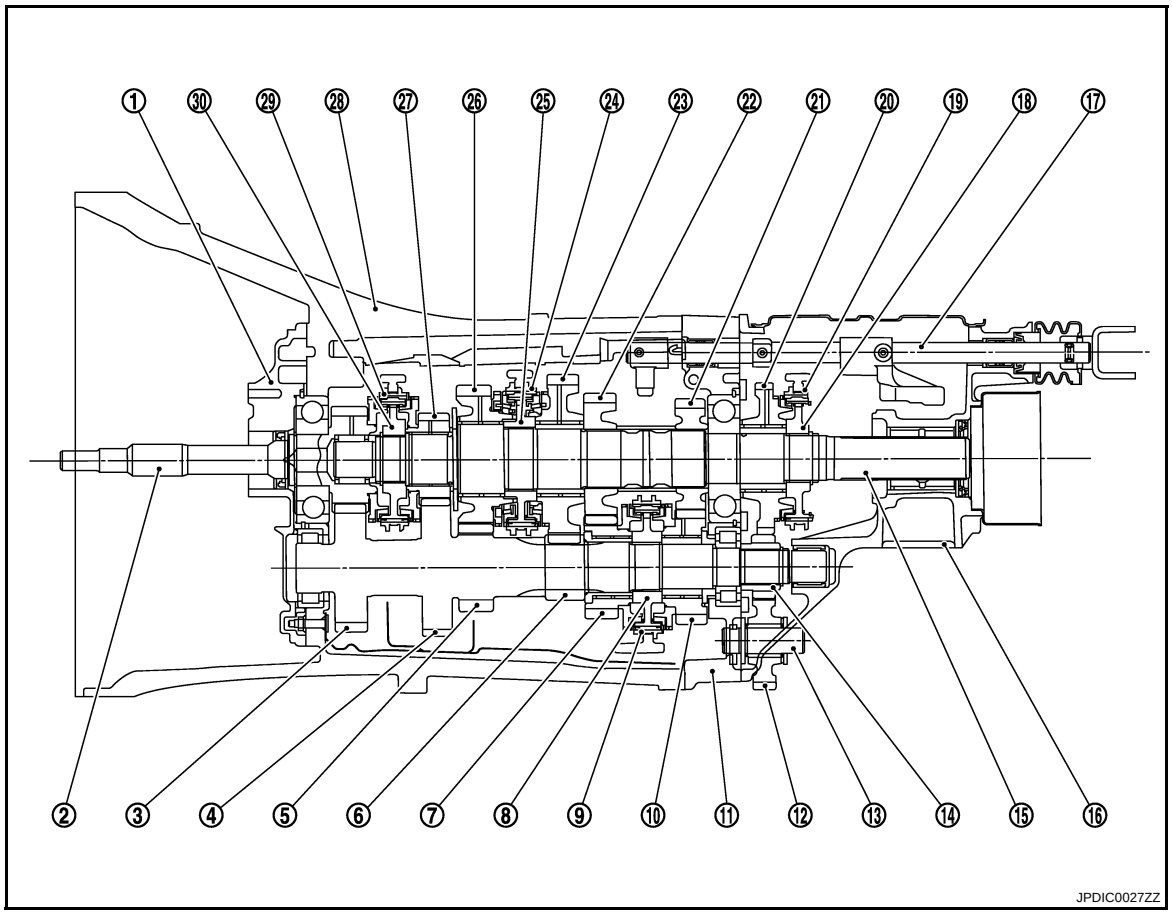
SYSTEM DESCRIPTION

M/T SYSTEM

System Diagram

INFOID:0000000004243172

CROSS-SECTIONAL VIEW



1. Front cover
2. Main drive gear
3. Counter shaft
4. 6th counter gear
5. 2nd counter gear
6. 1st counter gear
7. 3rd counter gear
8. 3rd-4th synchronizer hub
9. 3rd-4th coupling sleeve
10. 4th counter gear
11. Adapter plate
12. Reverse idler gear
13. Reverse idler shaft
14. Reverse counter gear
15. Mainshaft
16. Rear extension
17. Striking rod
18. Reverse synchronizer hub
19. Reverse coupling sleeve
20. Reverse main gear
21. 4th main gear
22. 3rd main gear
23. 1st main gear
24. 1st-2nd coupling sleeve
25. 1st-2nd synchronizer hub
26. 2nd main gear
27. 6th main gear
28. Transmission case
29. 5th-6th coupling sleeve
30. 5th-6th synchronizer hub

System Description

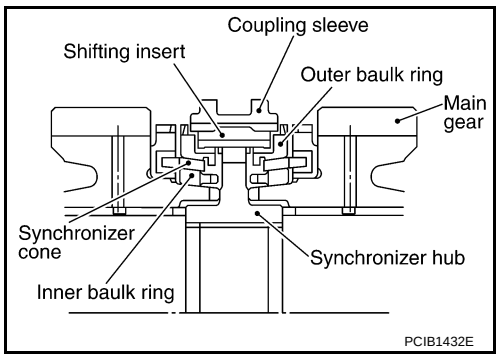
INFOID:0000000004243173

DOUBLE-CONE SYNCHRONIZER

The 4th gear is equipped with a double-cone synchronizer to reduce the operating force of the control lever.

TRIPLE-CONE SYNCHRONIZER

The 1st, 2nd and 3rd gears are equipped with a triple-cone synchronizer to reduce the operating force of the control lever.

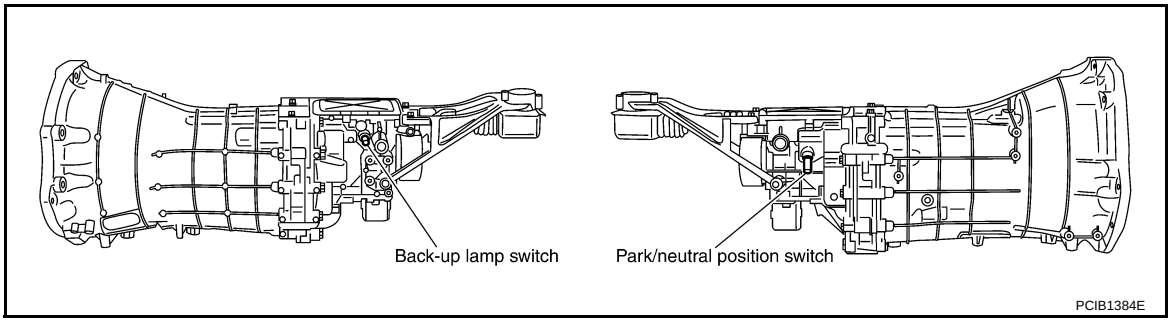


DTC/CIRCUIT DIAGNOSIS

BACK-UP LAMP SWITCH

Component Parts Location

INFOID:0000000004243174



Component Inspection

INFOID:0000000004243175

1. CHECK BACK-UP LAMP SWITCH

Check continuity between back-up lamp switch terminals with control lever turned to 1st to 6th and reverse position.

Terminal		Gear position	Continuity
1	2	Reverse	Existed
		Except reverse	Not existed

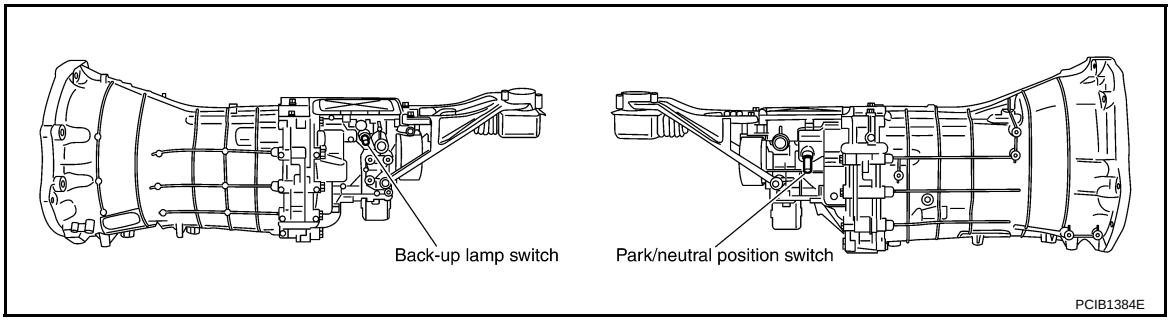
Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace back-up lamp switch. Refer to TM-30, "Exploded View".

PARK/NEUTRAL POSITION SWITCH

Component Parts Location

INFOID:0000000004243176



Component Inspection

INFOID:0000000004243177

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH

Check continuity between park/neutral position (PNP) switch terminals with control lever turned to 1st to 6th and reverse position.

Terminal		Gear position	Continuity
1	2	Neutral	Existed
		Except neutral	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace park/neutral position (PNP) switch. Refer to TM-30, "Exploded View".

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000004243178

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.

SUSPECTED PARTS (Possible cause)		OIL (Oil level is low)	OIL (Wrong oil)	OIL (Oil level is high)	GASKET (Damaged)	OIL SEAL (Worn or damaged)	SHIFT CONTROL LINKAGE (Worn)	CHECK PLUG RETURN SPRING AND CHECK BALL (Worn or damaged)	SHIFT FORK (Worn)	GEAR (Worn or damaged)	BEARING (Worn or damaged)	BAULK RING (Worn or damaged)	INSERT SPRING (Damaged)
Reference			TM-16		TM-30		TM-18	TM-30		TM-30			
Symptoms	Noise	1	2							3	3		
	Oil leakage		3	1	2	2							
	Hard to shift or will not shift		1	1			2					2	2
	Jumps out of gear						1	1	2	2			

PRECAUTION

PRECAUTIONS

Service Notice or Precautions for Manual Transmission

INFOID:0000000004243179

CAUTION:

- **Never reuse CSC (Concentric Slave Cylinder) body and CSC tube. Because CSC slides back to the original position every time when removing transmission assembly. At this timing, dust on the sliding parts may damage a seal of CSC and may cause clutch fluid leakage. Refer to CL-15, "Removal and Installation".**
- **Never reuse transmission gear oil, once it has been drained.**
- **Check oil level or replace oil with vehicle on level ground.**
- **During removal or installation, keep inside of transmission clear of dust or dirt.**
- **Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they never interfere with the function of the parts they are applied.**
- **In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.**
- **Never damage sliding surfaces and mating surfaces.**
- **Never hold control lever housing to prevent the bushing of control lever housing from deformation when moving transmission assembly.**

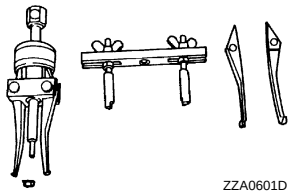
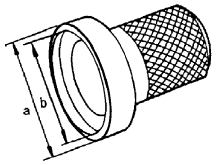
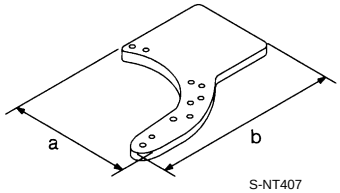
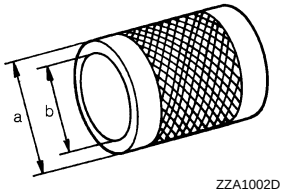
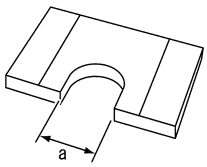
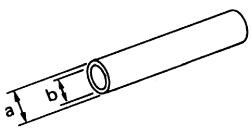
PREPARATION

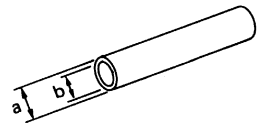
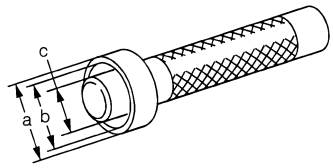
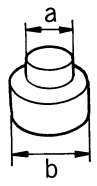
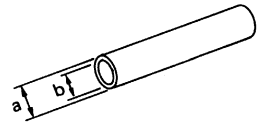
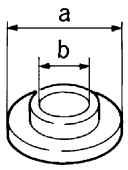
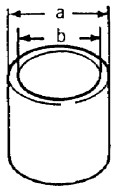
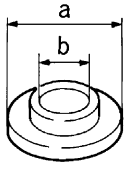
PREPARATION

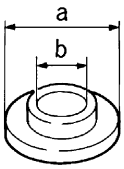
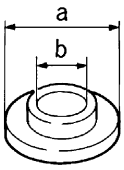
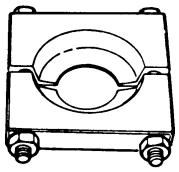
Special Service Tools

INFOID:0000000004243180

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

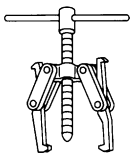
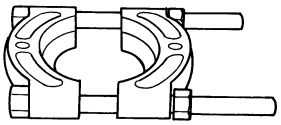
Tool number (Kent-Moore No.) Tool name	Description
KV381054S0 (J-34286) Puller  ZZA0601D	Removing rear oil seal
ST33400001 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.  ZZA0814D	Installing rear oil seal
ST22490000 (-) Adapter setting plate a: 156 mm (6.14 in) b: 220 mm (8.66 in)  S-NT407	Holding an adapter plate
ST33200000 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 44.5 mm (1.752 in) dia.  ZZA1002D	Installing counter rear bearing
KV32103300 (J-46529) Press plate a: 73 mm (2.87 in)  PCIB0165J	Installing reverse synchronizer hub assembly
ST01530000 (-) Drift a: 50 mm (1.97 in) dia. b: 41 mm (1.61 in) dia.  ZZA0534D	Installing reverse synchronizer hub assembly

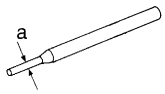
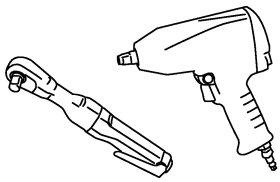
Tool number (Kent-Moore No.) Tool name	Description
ST23860000 (-) Drift a: 38 mm (1.50 in) dia. b: 33 mm (1.30 in) dia.  ZZA0534D	Installing reverse counter gear
KV38102100 (J-25803-01) Drift a: 44 mm (1.73 in) dia. b: 36 mm (1.42 in) dia. c: 24.5 mm (0.965 in) dia.  ZZA1046D	Installing front cover oil seal
ST33061000 (J-8107-2) Drift a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.  ZZA1023D	Installing striking rod oil seal
KV32102700 (-) Drift a: 48.6 mm (1.913 in) dia. b: 41.6 mm (1.638 in) dia.  ZZA0534D	Installing main drive gear bearing
ST30911000 (-) Inserter a: 98 mm (3.86 in) dia. b: 40.5 mm (1.594 in) dia.  ZZA0920D	• Installing 5th-6th synchronizer hub assembly • Installing mainshaft bearing • Installing reverse main gear bushing • Installing 3rd gear bushing • Installing 3rd-4th synchronizer hub assembly
ST27861000 (-) Support ring a: 62 mm (2.44 in) dia. b: 52 mm (2.05 in) dia.  ZZA0832D	• Installing 1st-2nd synchronizer hub assembly • Installing 1st gear bushing
ST30022000 (-) Inserter a: 110 mm (4.33 in) dia. b: 46 mm (1.81 in) dia.  ZZA0920D	• Installing 3rd main gear • Installing 4th main gear

Tool number (Kent-Moore No.) Tool name	Description
KV40100630 (J-26092) Inserter a: 67.5 mm (2.657 in) dia. b: 38.5 mm (1.516 in) dia.  ZZA0920D	Installing 4th counter gear thrust washer
ST30032000 (J-26010-01) Inserter a: 80 mm (3.15 in) dia. b: 31 mm (1.22 in) dia.  ZZA0920D	Installing counter rear bearing inner race
ST30031000 (J-22912-01) Puller  ZZA0537D	Measuring wear of inner baulk ring

Commercial Service Tools

INFOID:0000000004243181

Tool name	Description
Puller  NT077	• Removing reverse main gear • Removing reverse synchronizer hub assembly • Removing reverse counter gear
Puller  ZZB0823D	Removing each bearing, gear and bushing

Tool name	Description
Pin punch a: 6 mm (0.24 in) dia.  NT410	Removing and installing each retaining pin
Power tool  PBIC0190E	Loosening bolts and nuts

PERIODIC MAINTENANCE

GEAR OIL

Draining

INFOID:0000000004243183

1. Start the engine and let it run to warm up transmission.
2. Stop the engine. Remove drain plug and then drain gear oil.
3. Set a gasket on drain plug and install it to transmission case.
   CAUTION:
   Never reuse gasket.
4. Tighten drain plug to the specified torque. Refer to TM-30, "Exploded View".

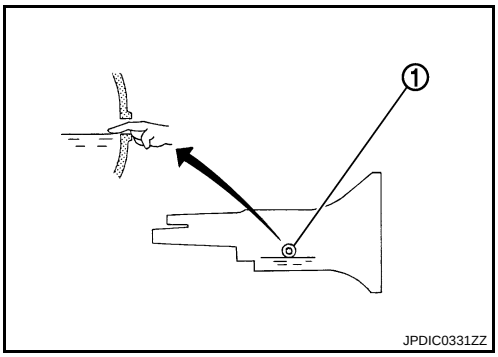
Refilling

INFOID:0000000004243184

1. Remove filler plug (1). Fill with new gear oil to transmission as shown in the figure.

   Oil grade and viscosity : Refer to MA-10, "Fluids and Lubricants".

   Oil capacity : Refer to TM-98, "General Specifications".



2. After refilling gear oil, check oil level. Refer to TM-16, "Inspection".
3. Set a gasket on filler plug and then install it to transmission case.
   CAUTION:
   Never reuse gasket.
4. Tighten filler plug to the specified torque. Refer to TM-30, "Exploded View".

Inspection

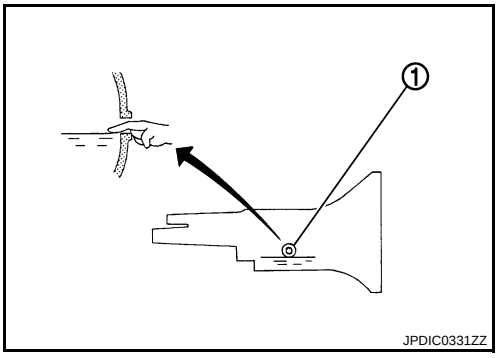
INFOID:0000000004243185

LEAKAGE

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

LEVEL

1. Remove filler plug (1).
2. Check oil level from filler plug mounting hole as shown in the figure.
   CAUTION:
   Never start engine while checking oil level.
3. Set a gasket on filler plug and then install it to transmission case.
   CAUTION:
   Never reuse gasket.
4. Tighten filler plug to the specified torque. Refer to TM-30, "Exploded View".



REMOVAL AND INSTALLATION

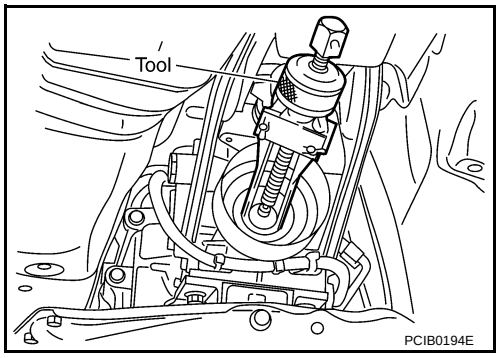
REAR OIL SEAL

Removal and Installation

INFOID:0000000004243187

REMOVAL

1. Separate propeller shaft assembly. Refer to DLN-90, "Removal and Installation".
2. Remove rear oil seal using the puller [SST: KV381054S0 (J-34286)].
   CAUTION:
   Never damage rear extension.

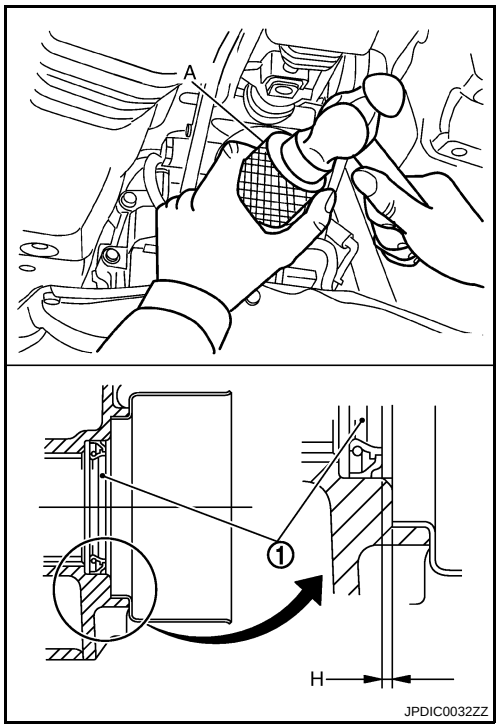


INSTALLATION

1. Apply multi-purpose grease to lip of rear oil seal (1). Drive in rear oil seal to rear extension using the drift (A) [SST: ST33400001 (J-26082)].

   Dimension "H" : 1.2 – 2.2 mm (0.047 – 0.087 in)

   CAUTION:
   - **Never reuse rear oil seal.**
   - **When installing, never incline rear oil seal.**
2. Install propeller shaft assembly. Refer to DLN-90, "Removal and Installation".



Inspection

INFOID:0000000004559451

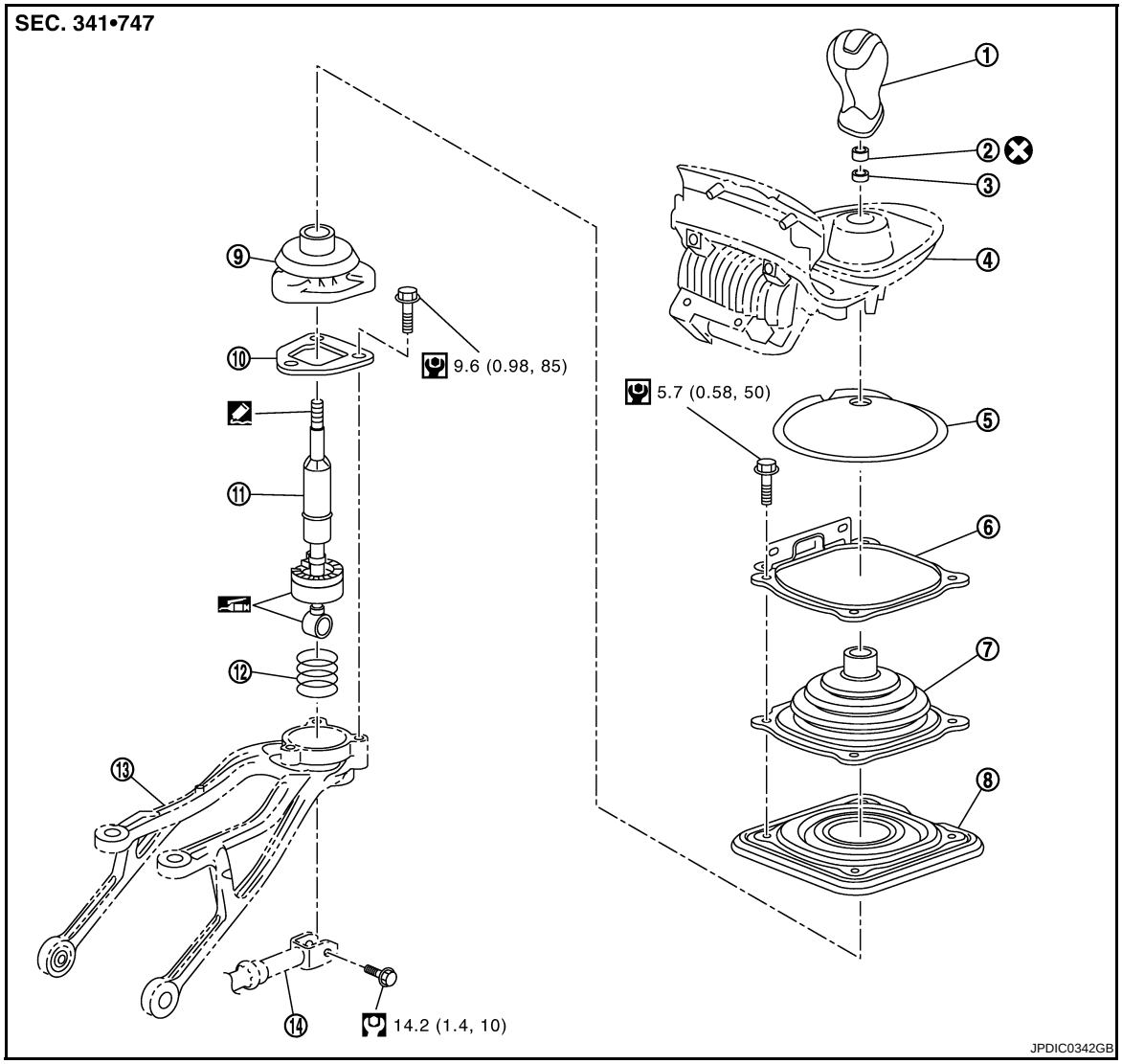
INSPECTION AFTER INSTALLATION

Check oil level. Refer to TM-16, "Inspection".

SHIFT CONTROL

Exploded View

INFOID:0000000004243188



1. Shift knob
2. Insulator
3. Seat
4. Console finisher assembly
5. Felt
6. Hole cover
7. Control lever boot B
8. Hole insulator
9. Control lever boot A
10. Guide plate
11. Control lever assembly
12. Control lever spring
13. Control lever housing
14. Control rod

: Apply multi-purpose grease.

: Apply Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".

Refer to GI-4, "Components" for symbols not described on the above.

Removal and Installation

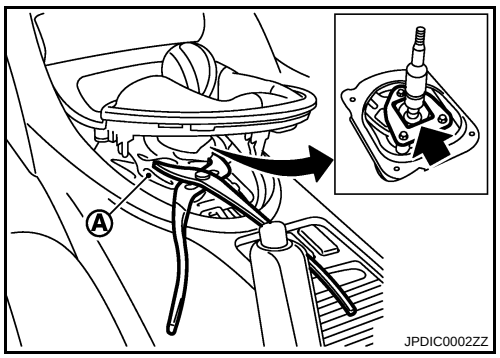
INFOID:0000000004243189

REMOVAL

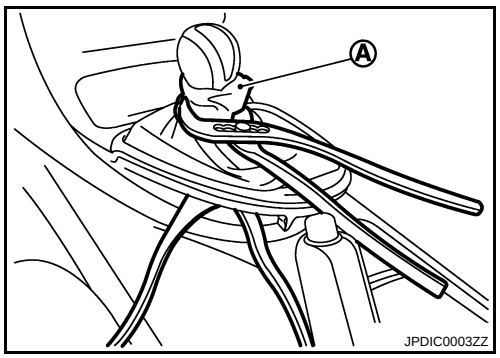
1. Remove shift knob with the following procedure.

a. Release metal clips on console finisher assembly. Refer to IP-24, "Removal and Installation".

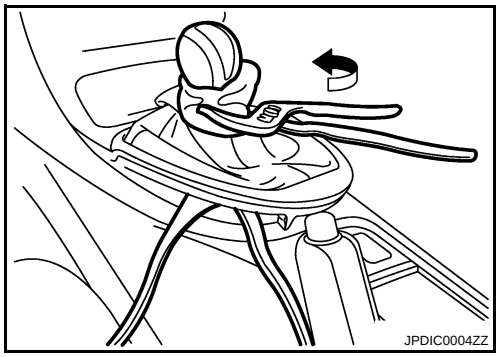
b. Lift console finisher assembly and then set a suitable pliers to control lever assembly.
CAUTION:
Put waste cloth (A) between a suitable pliers and control lever assembly to avoid damaging control lever assembly.



c. Set a suitable pliers to shift knob.
CAUTION:
Put waste cloth (A) between a suitable pliers and shift knob to avoid damaging shift knob.

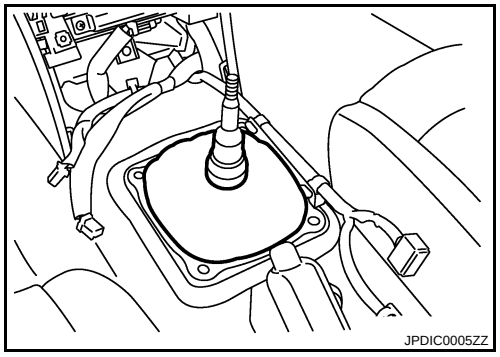


d. Keeping control lever assembly in place with a suitable pliers, loosen shift knob with a suitable pliers.
NOTE:
Remove shift knob from control lever assembly keeping a suitable pliers in place because a certain power to turn shift knob is still necessary even after adhesive is peeled.

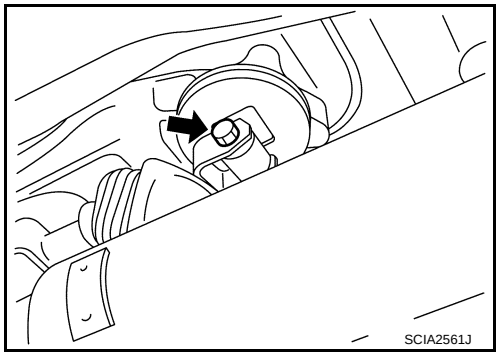


e. Remove shift knob from control lever assembly.
2. Remove insulator and seat from control lever assembly.
3. Remove console finisher assembly.
4. Remove center console assembly. Refer to IP-24, "Removal and Installation".

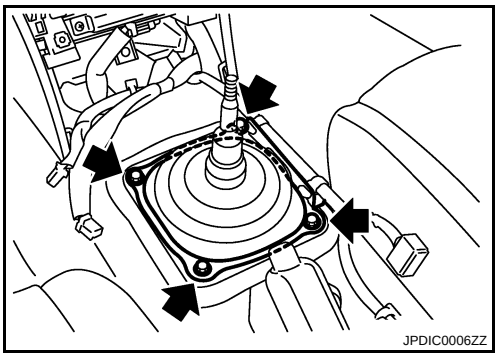
5. Remove felt.



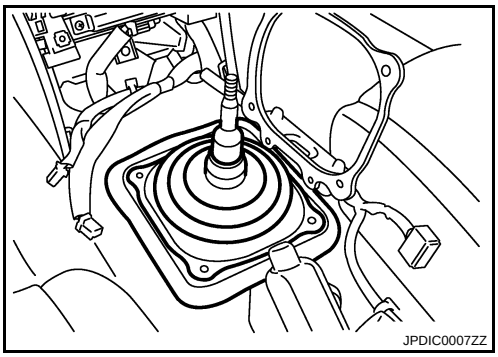
6. Release boot from control lever housing. Then remove control rod mounting bolt and then separate control lever assembly and control rod.



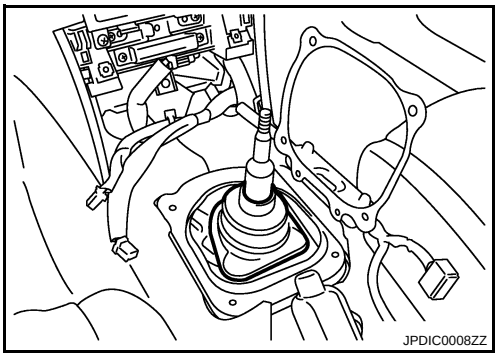
7. Remove hole cover mounting bolts and then remove hole cover.



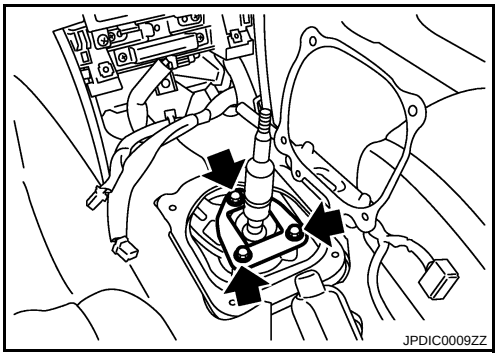
8. Remove control lever boot B and hole insulator.



9. Remove control lever boot A.



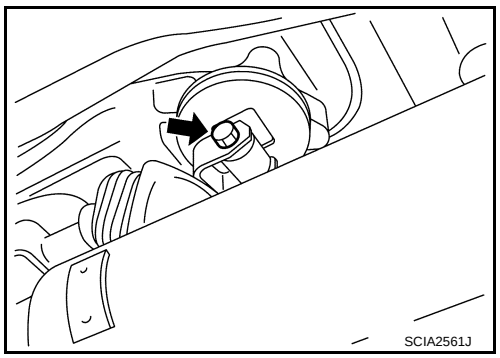
10. Remove guide plate mounting bolts and then remove guide plate, control lever assembly, and control lever spring from control lever housing.
CAUTION:
Restrain guide plate while doing this because there is a danger control lever assembly will fly out of control lever housing.



INSTALLATION

1. Apply multi-purpose grease to control lever assembly.
2. Set control lever spring, control lever assembly, and guide plate to control lever housing and then temporarily tightening guide plate mounting bolts.
CAUTION:
Restrain guide plate while doing this because there is a danger control lever assembly will fly out of control lever housing.

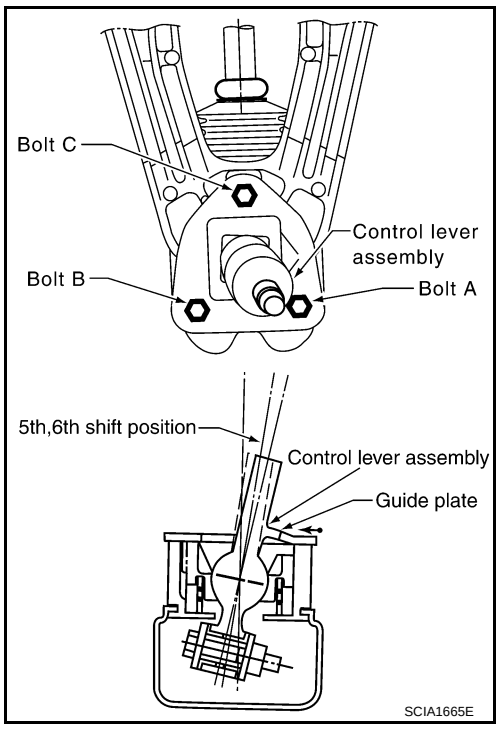
3. Install control lever assembly to control rod and then tighten bolt to the specified torque.
4. Install boot to control lever housing.
CAUTION:
Fit the boot to the groove on the control lever housing.



5. Install guide plate with the following procedure.

a. After shifting control lever assembly into 6th gear, press it toward reverse gear (to the right) until it comes to a stop.

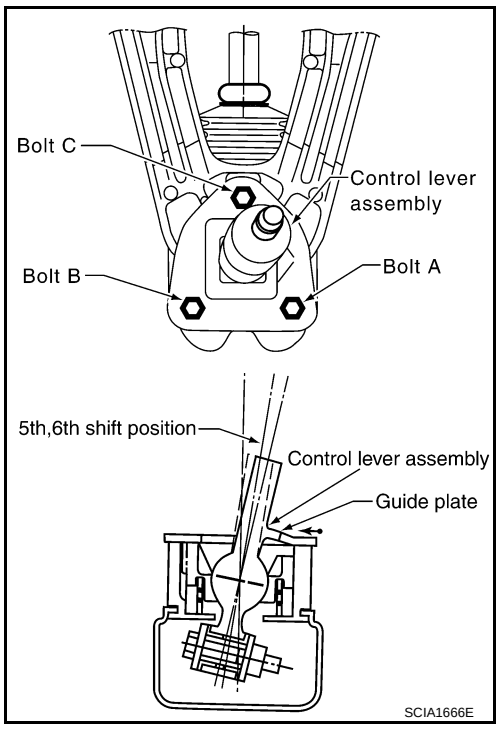
b. At the point where control lever assembly stops, bring guide plate closer until guide plate stopper contacts control lever assembly claw and then temporarily tighten mounting bolt A.



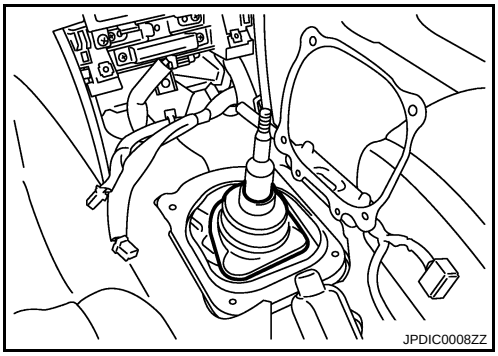
c. After shifting control lever assembly into 5th gear, press it toward reverse gear (to the right) until it comes to a stop.

d. At the point where control lever assembly stops, bring guide plate closer until guide plate stopper contacts control lever assembly claw and then tighten mounting bolt C to the specified torque.

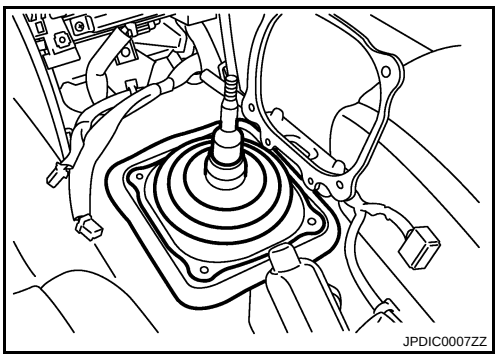
e. Tighten guide plate mounting bolts A and B to the specified torque.



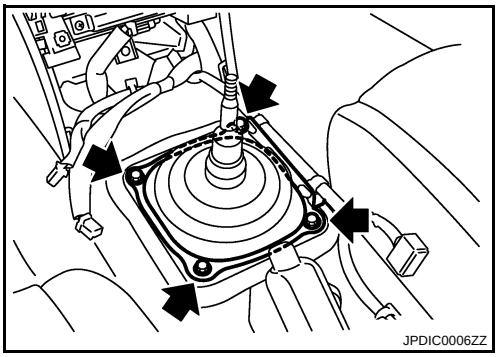
6. Install control lever boot A.
CAUTION:
Fit the control lever boot A to the groove on the control lever housing.



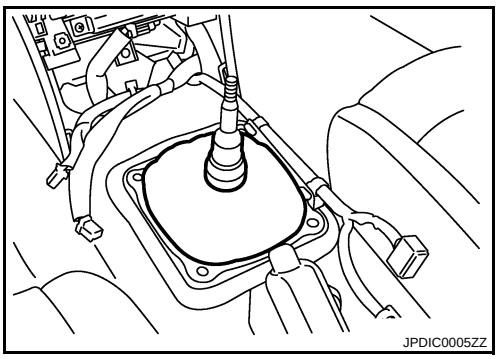
7. Install hole insulator and control lever boot B.



8. Install hole cover and then tighten hole cover mounting bolts to the specified torque.



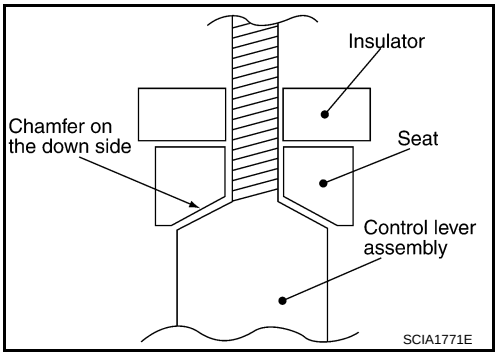
9. Install felt.
10. Install center console assembly. Refer to IP-24, "Removal and Installation".
11. Install console finisher assembly. Refer to IP-24, "Removal and Installation".



12. Install seat and insulator to control lever assembly.
CAUTION:
- **Be careful with the orientation of seat.**
- **Never reuse insulator.**

13. Apply thread locking sealant to control lever assembly threads and then install shift knob.
- **Use Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

CAUTION:



Remove the remaining adhesive on control lever assembly and shift knob threads.

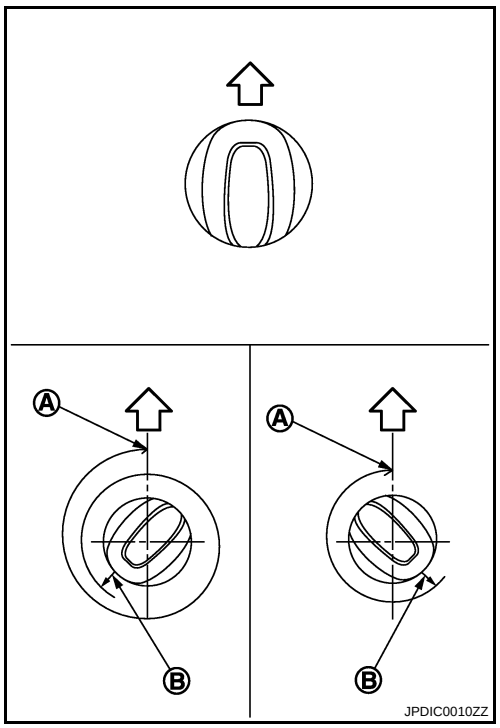
14. Put shift knob in the correct position as the following indicates.

a. When tightening shift knob, if shift knob comes to the proper position within 1/2 turn from the position at which resistance begins to be felt, tighten it 1 more turn to set it in the proper position.

A : Proper position
B : Start position on reaction force
⇦ : Vehicle front

b. If it takes more than 1/2 turn from the position at which resistance begins to be felt, tighten it to set it in the proper position.

CAUTION:
- **Never adjust shift knob with loosing.**
- **After adjusting to the proper position, until 30 minutes pass, never operate the shift intensely such as screwing or turning shift knob to opposite direction since a locking sealant because stiff.**



Inspection

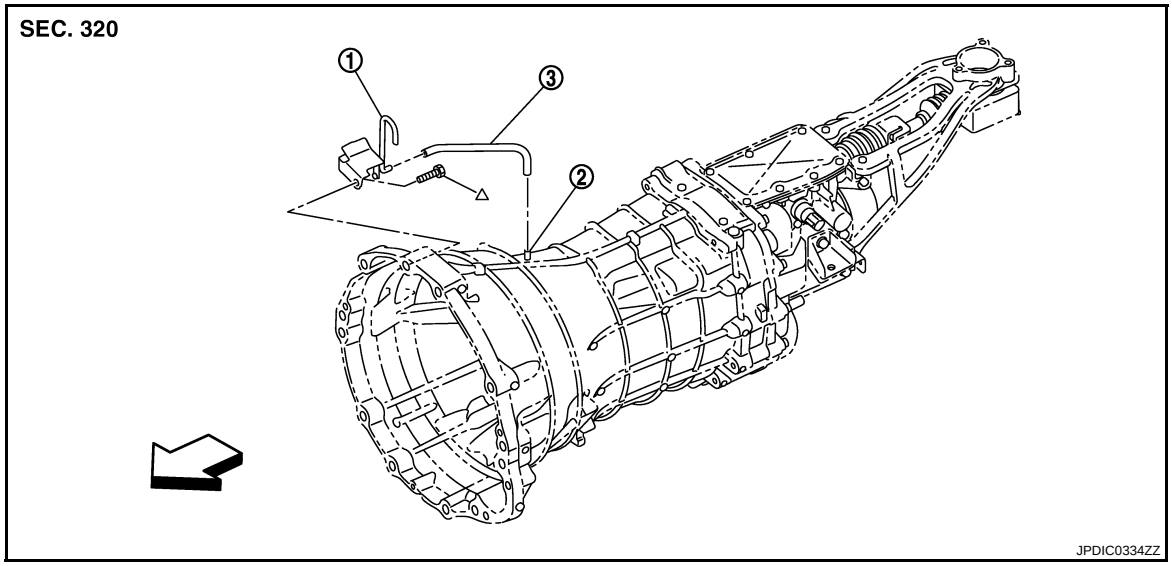
INFOID:0000000004243190

After installing, confirm the following items:
- When control lever assembly is shifted to each position, make sure there is no binding or disconnection in each boot.
- When shifted to each position, make sure there is no noise, binding, and backlash. Especially when control lever assembly is shifted to 5th, 6th without pressing downward, check for binding.
- When control lever assembly is shifted to 1st-2nd side and 5th-6th side, confirm control lever assembly returns to neutral position smoothly.
- In any position other than reverse, confirm that control lever assembly can be pressed downward.
- With control lever assembly pressed downward, confirm that it can be shifted to reverse.
- When shifted from reverse to neutral position, confirm control lever assembly returns to neutral position smoothly with spring power.
- Without control lever assembly pressed downward, confirm that it cannot be shifted to reverse.

AIR BREATHER HOSE

Exploded View

INFOID:0000000004243191



1. Air breather tube
2. Breather tube
3. Air breather hose

⇦: Vehicle front

△: For the tightening torque, refer to TM-26, "Removal and Installation".

Removal and Installation

INFOID:0000000004243192

REMOVAL

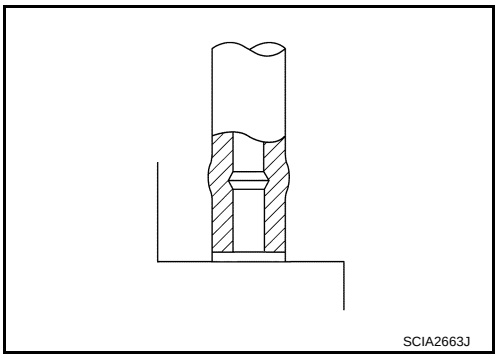
Refer to TM-24, "Exploded View" for removal procedure.

INSTALLATION

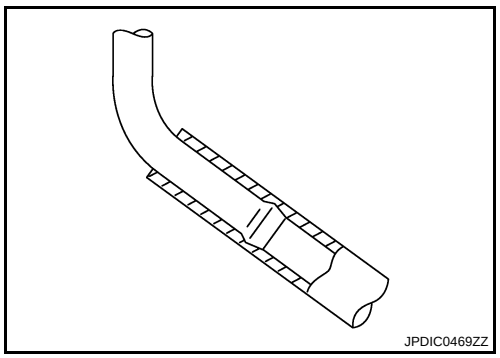
Refer to TM-24, "Exploded View" for installation procedure.

CAUTION:

- **Make sure there are no pinched or restricted areas on the air breather hose caused by bending or winding when installing it.**
- **Be sure to insert air breather hose into breather tube until hose end reaches the tube's base.**



- **Be sure to insert air breather hose into air breather tube until hose end reaches the radius curve end.**

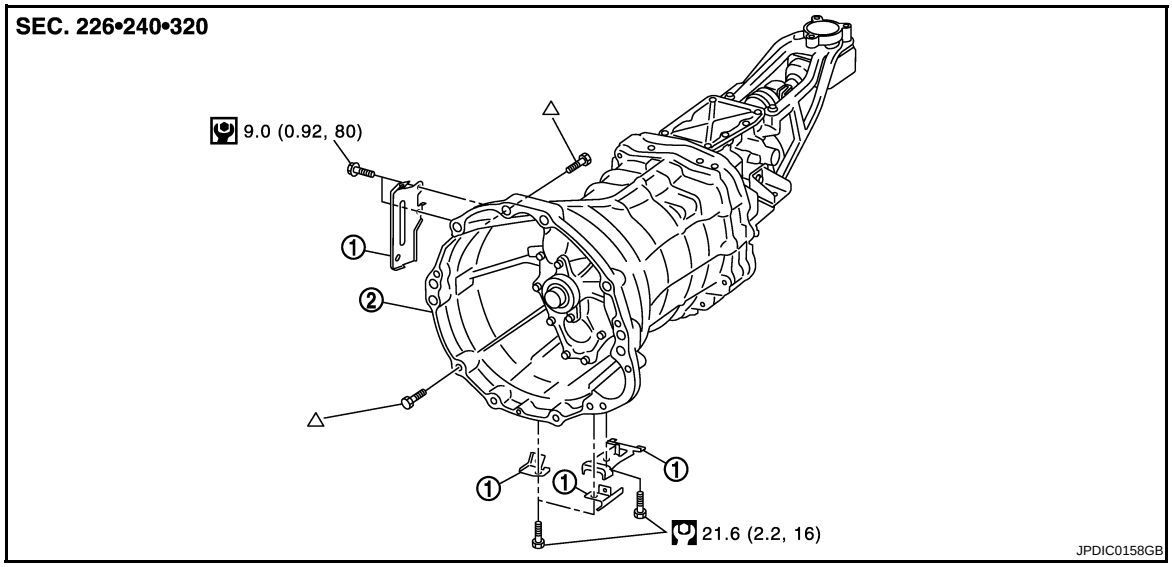


UNIT REMOVAL AND INSTALLATION

TRANSMISSION ASSEMBLY

Exploded View

INFOID:0000000004243193



1. Harness bracket
2. Transmission assembly

△: For the bolt mounting positions, refer to TM-26, "Removal and Installation".

Refer to GI-4, "Components" for symbols not described on the above.

CAUTION:

Never reuse CSC (Concentric Slave Cylinder) body and CSC tube. Because CSC slides back to the original position every time when removing transmission assembly. At this timing, dust on the sliding parts may damage a seal of CSC and may cause clutch fluid leakage. Refer to CL-15, "Removal and Installation".

Removal and Installation

INFOID:0000000004243194

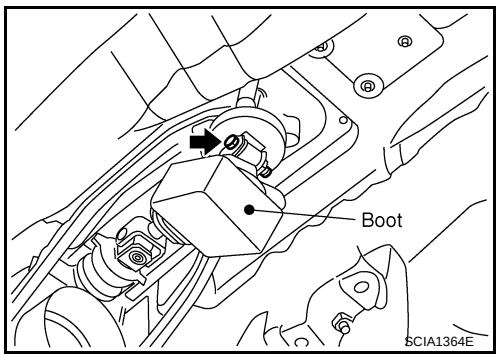
CAUTION:

Never reuse CSC (Concentric Slave Cylinder) body and CSC tube. Because CSC slides back to the original position every time when removing transmission assembly. At this timing, dust on the sliding parts may damage a seal of CSC and may cause clutch fluid leakage. Refer to CL-15, "Removal and Installation".

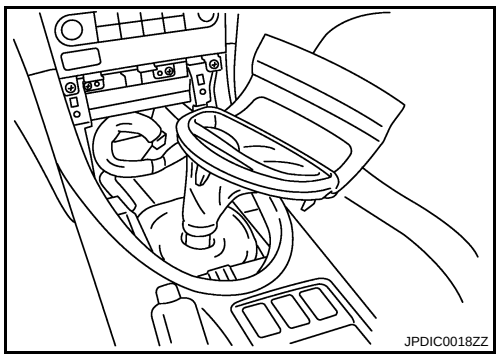
REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Remove exhaust mounting bracket. Refer to EX-6, "Removal and Installation".
3. Remove suspension member stay. Refer to FSU-22, "Removal and Installation".
4. Remove exhaust front tube, center muffler, main muffler (RH), and main muffler (LH). Refer to EX-6, "Removal and Installation".
5. Separate propeller shaft assembly. Refer to DLN-90, "Removal and Installation".
   NOTE:
   Insert a suitable plug into rear oil seal of transmission assembly after separating propeller shaft assembly.
6. Remove control lever assembly with the following procedure.

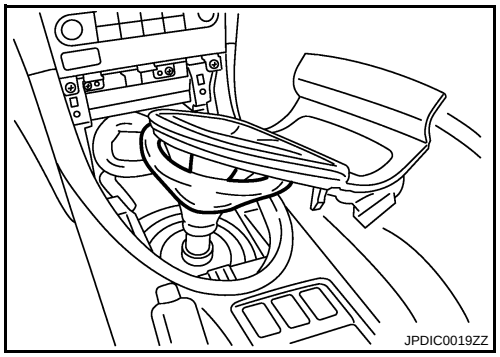
a. Remove control rod mounting bolt and then separate control lever assembly from control rod.



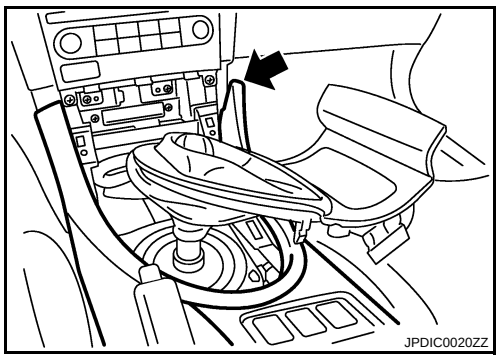
b. Remove console finisher assembly as shown in the figure. Refer to IP-24, "Removal and Installation".



c. Remove felt as shown in the figure.

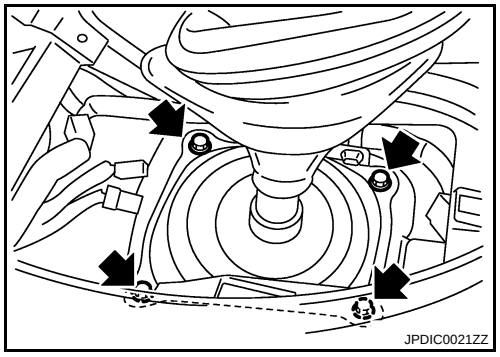


d. Remove center console assembly to remove hole cover as shown in the figure. Refer to IP-24, "Removal and Installation".



e. Remove hole cover.

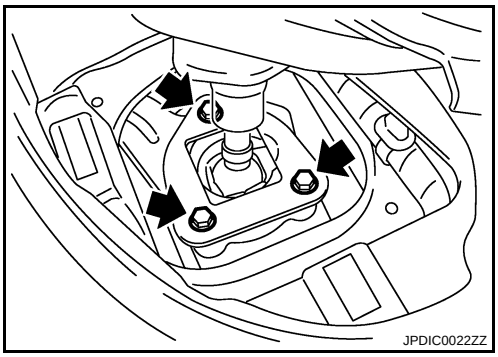
f. Remove control lever boot B, hole insulator, and control lever boot A.



g. Remove guide plate mounting bolts and then remove guide plate, control lever assembly, and control lever spring from control lever housing.

CAUTION:

Restrain guide plate while doing this because there is a danger control lever assembly will fly out of control lever housing.



7. Remove clutch tube (1), clutch hose (2), and lock plate (3). Refer to CL-14, "Removal and Installation".

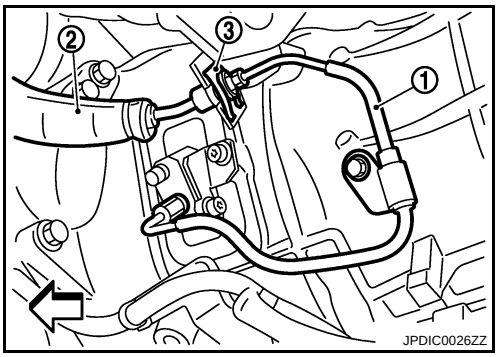
⇦ : Vehicle front

CAUTION:

- **Keep painted surface on the body or other parts free of clutch fluid. If it spills, wipe up immediately and wash the affected area with water.**
- **Never depress clutch pedal during removal procedure.**

NOTE:

Insert a suitable plug into clutch hose and CSC (Concentric Slave Cylinder) tube after removing clutch tube.

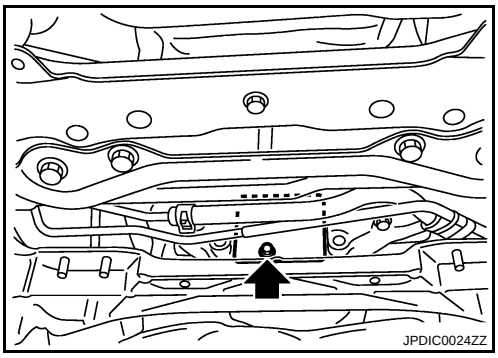


8. Remove crankshaft position sensor. Refer to EM-121, "Exploded View".

CAUTION:

- **Handle carefully to avoid dropping and shocks.**
- **Never disassemble.**
- **Never allow metal powder to adhere to magnetic part at sensor tip.**
- **Never place sensors in a location where they are exposed to magnetism.**

9. Remove starter motor. Refer to STR-16, "Removal and Installation".
10. Remove rear plate cover. Refer to EM-44, "Removal and Installation".
11. Disconnect park/neutral position (PNP) switch connector.
12. Disconnect heated oxygen sensor 2 (bank 1) and heated oxygen sensor 2 (bank 2) connectors. Refer to EX-6, "Removal and Installation".
13. Remove harness brackets.



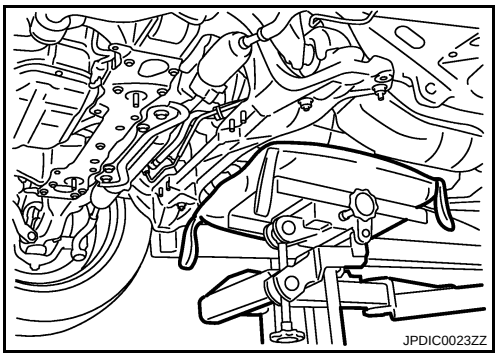
14. Set a suitable jack to the transmission assembly.

CAUTION:

When setting a suitable jack, be careful so that it does not contact with the switch.

15. Remove engine mounting insulator (rear) mounting nuts. Refer to EM-69, "2WD : Removal and Installation".
16. Remove rear engine mounting member. Refer to EM-69, "2WD : Removal and Installation".
17. Remove engine and transmission mounting bolts with power tool.
18. Lower a suitable jack to the position where the back-up lamp switch connector can be disconnect. Then disconnect back-up lamp switch connector.
19. Remove transmission assembly from the engine.

CAUTION:



- **Secure transmission assembly to a suitable jack while removing it.**
- **The transmission assembly must not interfere with the three way catalyst (right bank) and three way catalyst (left bank).**
- **The transmission assembly must not interfere with the wire harnesses and clutch hose.**
- **Never hold control lever housing to prevent the bushing of control lever housing from deformation when moving transmission assembly.**

20. Remove CSC (Concentric Slave Cylinder) body and CSC tube. Refer to CL-15, "Removal and Installation".

CAUTION:
Never reuse CSC (Concentric Slave Cylinder) body and CSC tube. Because CSC slides back to the original position every time when removing transmission assembly. At this timing, dust on the sliding parts may damage a seal of CSC and may cause clutch fluid leakage. Refer to CL-15, "Removal and Installation".

21. Remove dynamic damper. Refer to EM-69, "2WD : Removal and Installation".

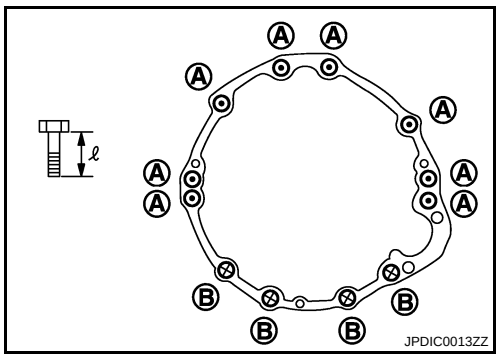
INSTALLATION

Note the following, and install in the reverse order of removal.

- Tighten transmission assembly mounting bolts to the specified torque. The figure is the view from the vehicle forward.

: Transmission to engine

: Engine to transmission



Bolt symbol	A	B
Quantity	8	4
Bolt length "ℓ" mm (in)	65 (2.56)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7, 55)	46.6 (4.8, 34)

CAUTION:
- **The transmission assembly must not interfere with the three way catalyst (right bank) and three way catalyst (left bank).**
- **The transmission assembly must not interfere with the wire harnesses and clutch hose.**
- **When installing transmission assembly, never bring main drive gear into contact with clutch cover.**
- **Never hold control lever housing to prevent the bushing of control lever housing from deformation when moving transmission assembly.**
- Refer to CL-15, "Removal and Installation" for CSC (Concentric Slave Cylinder) body and CSC tube installation procedure.
- Refer to CL-14, "Removal and Installation" for clutch tube and clutch hose installation procedure.
- Refer to TM-18, "Removal and Installation" for control lever assembly installation procedure.
- If flywheel is removed, align dowel pin with the smallest hole of flywheel. Refer to EM-122, "Disassembly and Assembly".

Inspection and Adjustment

INFOID:0000000004561984

INSPECTION AFTER INSTALLATION

- Check the shift control. Refer to TM-23, "Inspection".
- Check oil leakage and oil level. Refer to TM-16, "Inspection".
- Check clutch fluid leakage and clutch fluid level. Refer to CL-6, "Inspection".

ADJUSTMENT AFTER INSTALLATION

Bleed the air from the clutch hydraulic system. Refer to CL-6, "Air Bleeding Procedure".

UNIT DISASSEMBLY AND ASSEMBLY

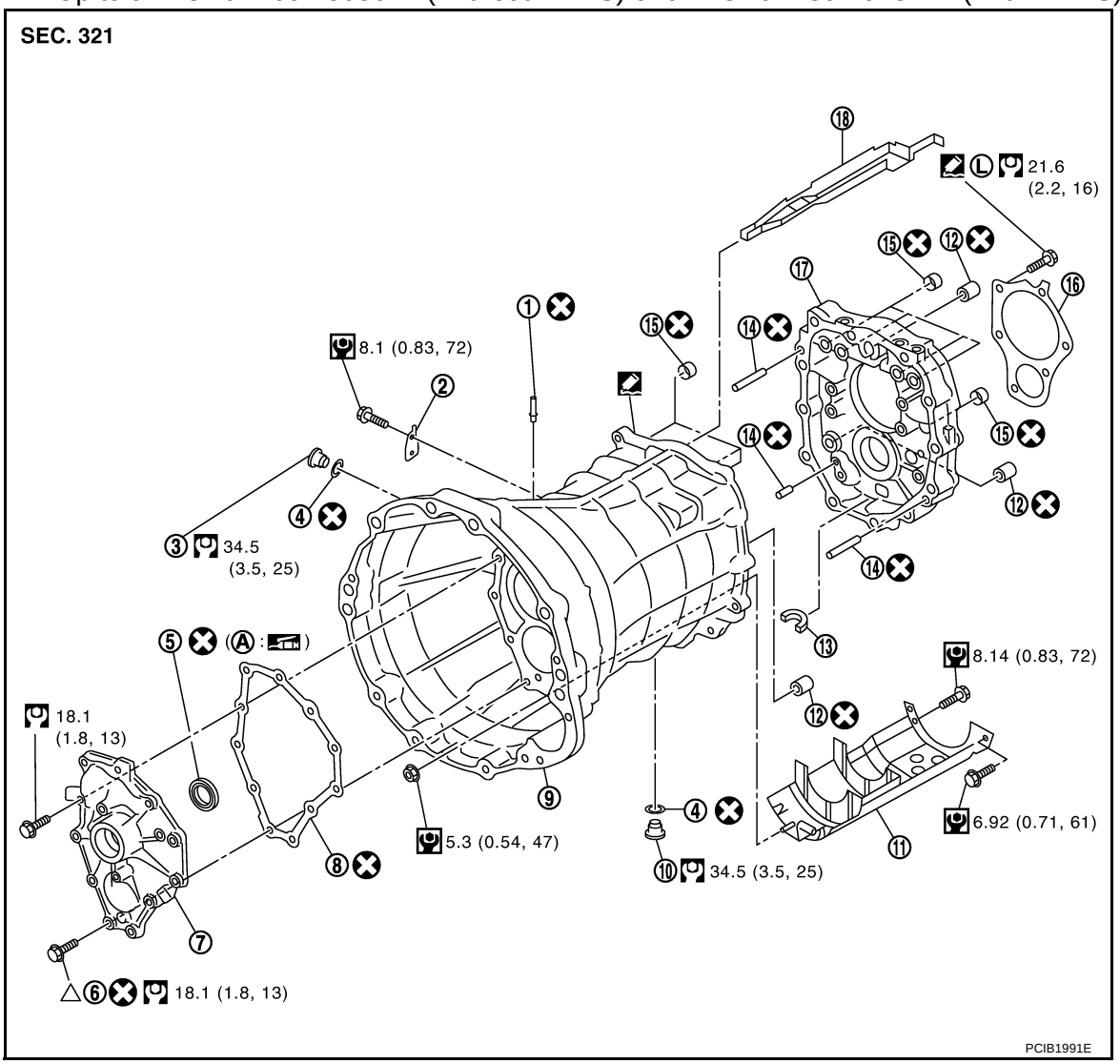
TRANSMISSION ASSEMBLY

Exploded View

INFOID:0000000004243195

CASE AND EXTENSION

VIN: Up to JNKCV61E69M303072 (Without 4WAS) or JNKCV61E89M013724 (With 4WAS)



1. Breather tube
2. Bracket
3. Filler plug
4. Gasket
5. Front cover oil seal
6. Sealing bolt
7. Front cover
8. Front cover gasket
9. Transmission case
10. Drain plug
11. Baffle plate
12. Sliding ball bearing
13. Magnet
14. Dowel pin
15. Bushing
16. Mainshaft bearing retainer
17. Adapter plate
18. Oil gutter

A. Seal lip

: Apply multi-purpose grease.

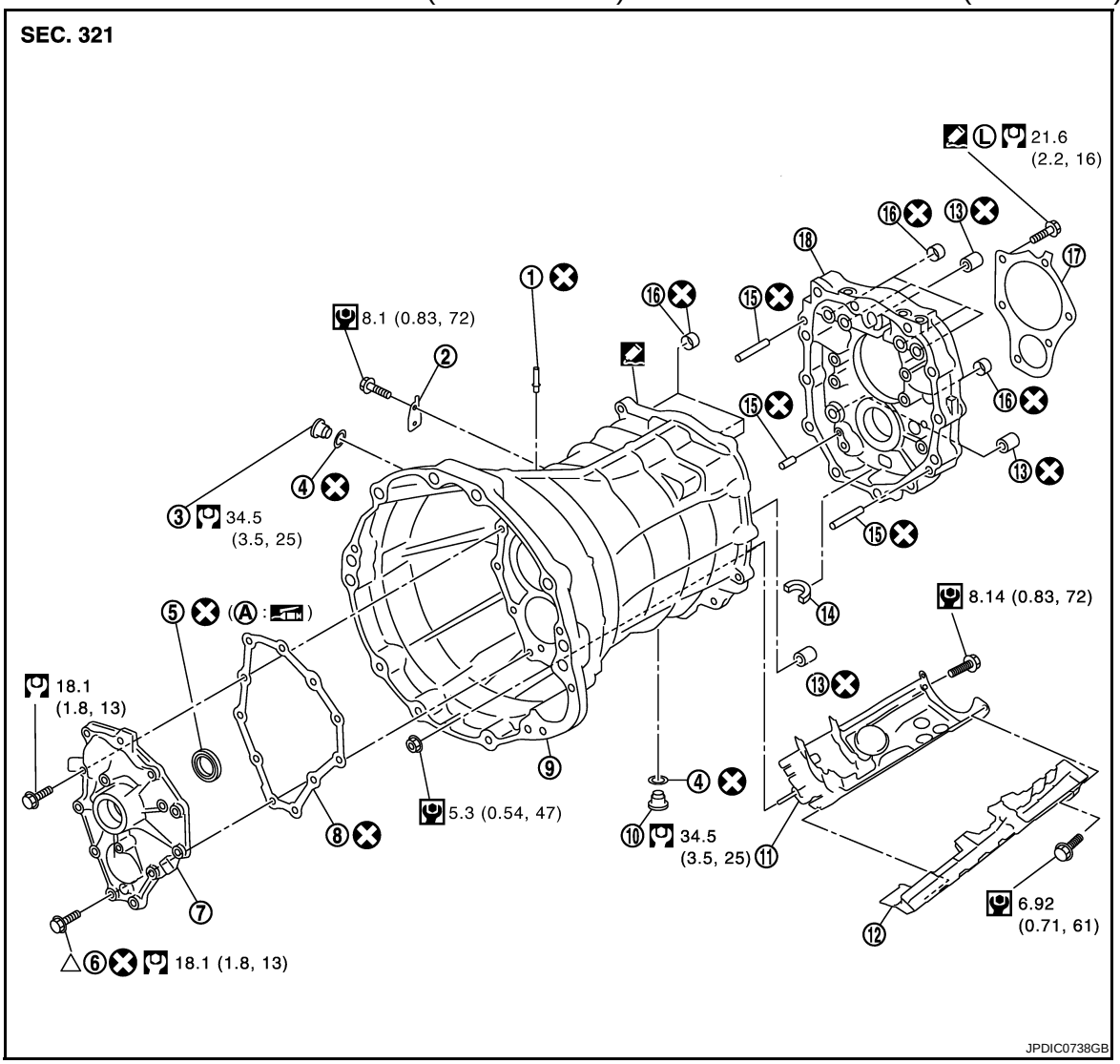
: Apply Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".

Ⓛ: Apply Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".

△: For the bolt mounting positions, refer to TM-51, "Assembly".

Refer to GI-4, "Components" for symbols not described on the above.

VIN: From JNKCV61E69M303073 (Without 4WAS) or JNKCV61E89M013725 (With 4WAS)



1. Breather tube	2. Bracket	3. Filler plug
4. Gasket	5. Front cover oil seal	6. Sealing bolt
7. Front cover	8. Front cover gasket	9. Transmission case
10. Drain plug	11. Baffle plate	12. Oil gutter
13. Sliding ball bearing	14. Magnet	15. Dowel pin
16. Bushing	17. Mainshaft bearing retainer	18. Adapter plate
A. Seal lip		

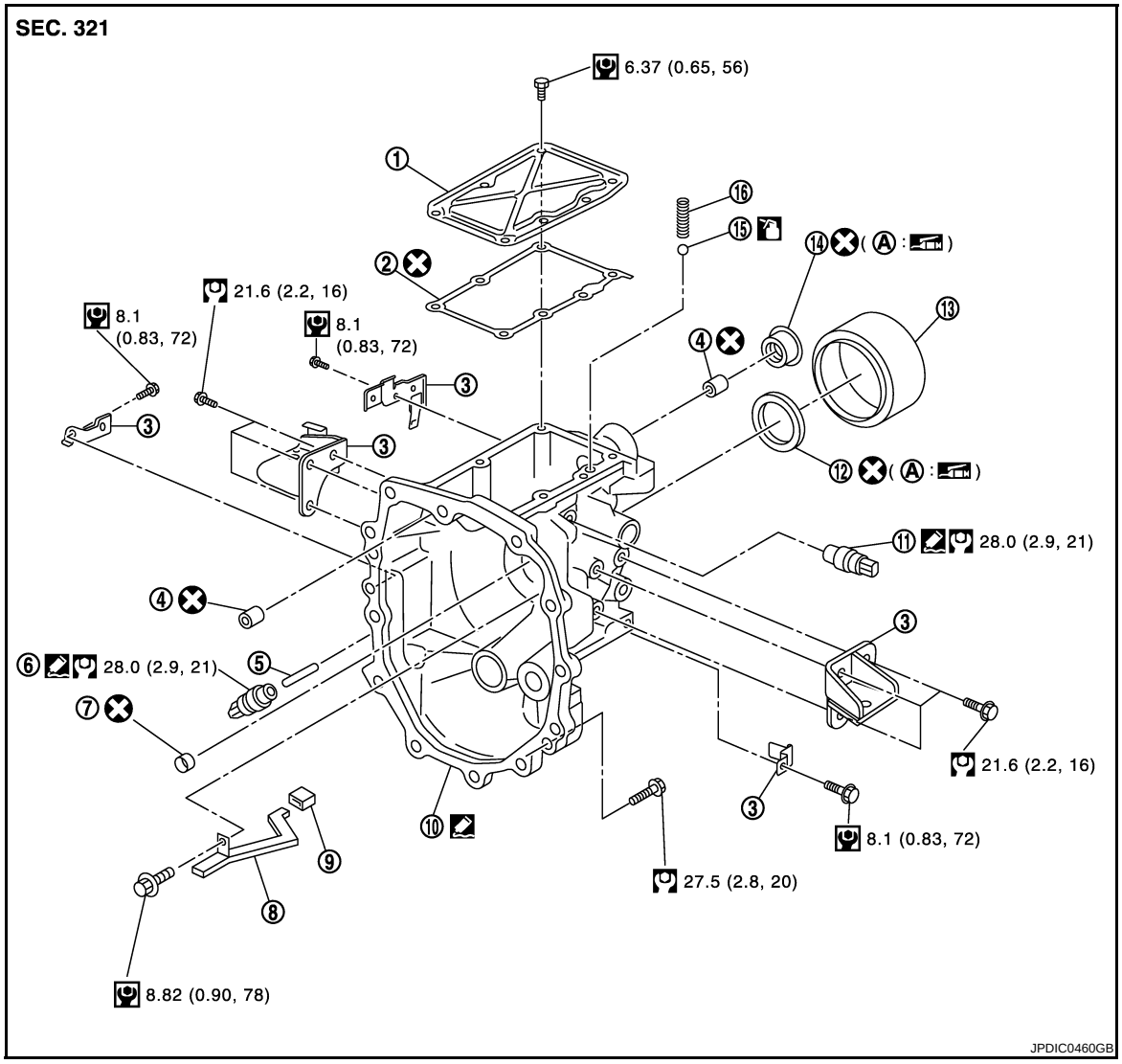
: Apply multi-purpose grease.

: Apply Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".

Ⓛ: Apply Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".

△: For the bolt mounting positions, refer to TM-51, "Assembly".

Refer to GI-4, "Components" for symbols not described on the above.



1. Rear extension upper cover
2. Rear extension upper cover gasket
3. Bracket
4. Sliding ball bearing
5. Plunger
6. Park/Neutral position (PNP) switch
7. Bushing
8. Rear extension oil gutter
9. Cap
10. Rear extension
11. Back-up lamp switch
12. Rear oil seal
13. Rear extension dust cover
14. Striking rod oil seal
15. Check ball
16. Check select spring

A. Seal lip

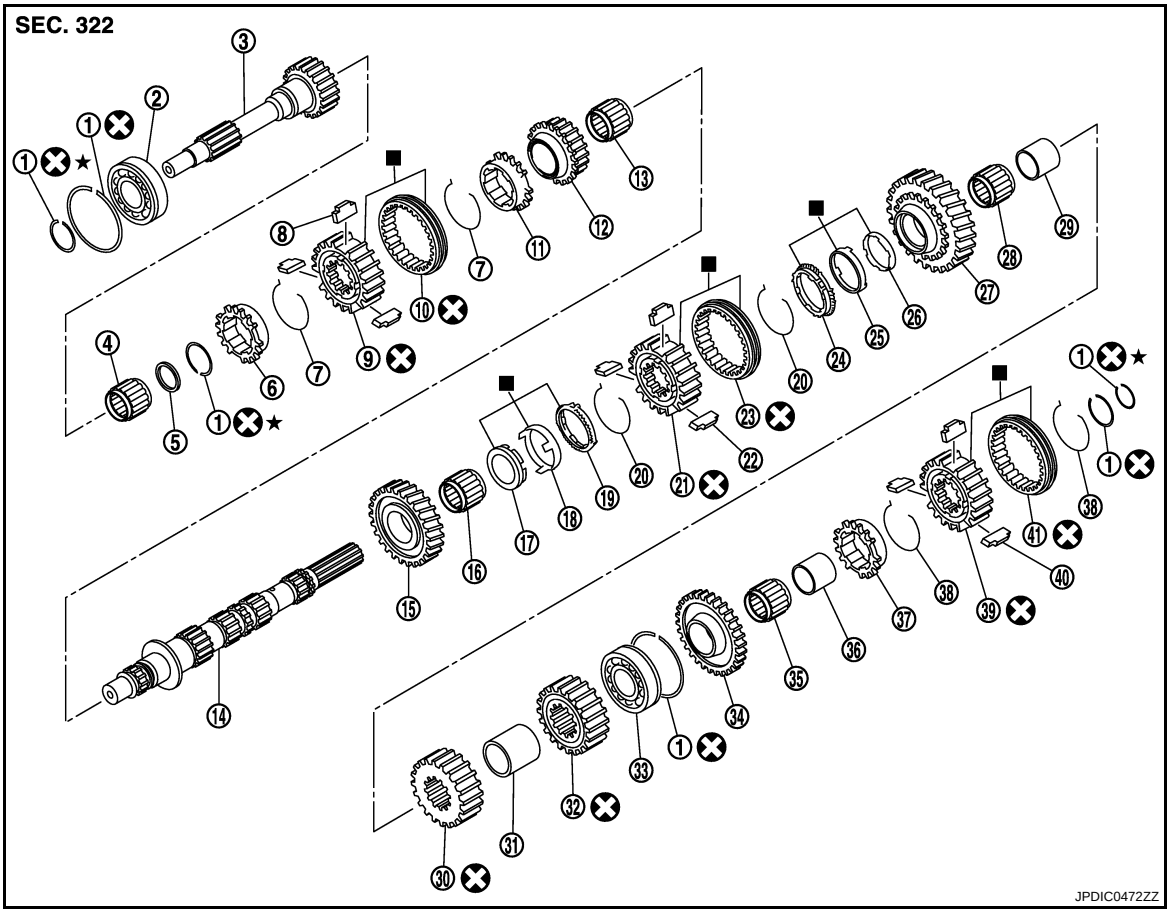
: Apply gear oil.

: Apply multi-purpose grease.

: Apply Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".

Refer to GI-4, "Components" for symbols not described on the above.

SHAFT AND GEAR



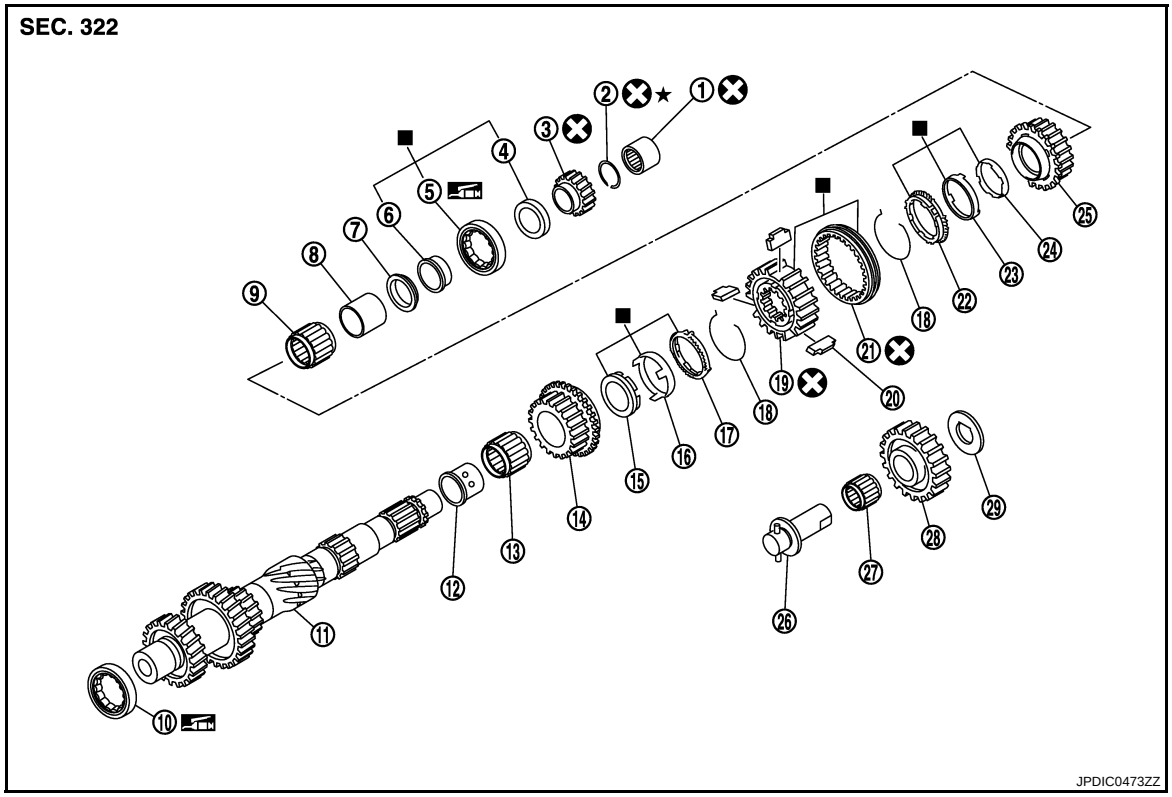
1. Snap ring
2. Main drive gear bearing
3. Main drive gear
4. Main pilot bearing
5. Pilot bearing spacer
6. 5th baulk ring
7. 5th-6th spread spring
8. 5th-6th shifting insert
9. 5th-6th synchronizer hub
10. 5th-6th coupling sleeve
11. 6th baulk ring
12. 6th main gear
13. 6th needle bearing
14. Mainshaft
15. 2nd main gear
16. 2nd needle bearing
17. 2nd inner baulk ring
18. 2nd synchronizer cone
19. 2nd outer baulk ring
20. 1st-2nd spread spring
21. 1st-2nd synchronizer hub
22. 1st-2nd shifting insert
23. 1st-2nd coupling sleeve
24. 1st outer baulk ring
25. 1st synchronizer cone
26. 1st inner baulk ring
27. 1st main gear
28. 1st needle bearing
29. 1st gear bushing
30. 3rd main gear
31. 3rd-4th main spacer
32. 4th main gear
33. Mainshaft bearing
34. Reverse main gear
35. Reverse main needle bearing
36. Reverse main gear bushing
37. Reverse baulk ring
38. Reverse spread spring
39. Reverse synchronizer hub
40. Reverse shifting insert
41. Reverse coupling sleeve

■: Replace the parts as a set.

Refer to GI-4, "Components" for symbols not described on the above.

- Apply gear oil to gears, shafts, synchronizers, and bearings when assembly.

SEC. 322



1. Counter end bearing
2. Snap ring
3. Reverse counter gear
4. Counter rear bearing spacer
5. Counter rear bearing
6. Counter rear bearing inner race
7. 4th counter gear thrust washer
8. 4th gear bushing
9. 4th needle bearing
10. Counter front bearing
11. Counter shaft
12. 3rd gear bushing
13. 3rd needle bearing
14. 3rd counter gear
15. 3rd inner baulk ring
16. 3rd synchronizer cone
17. 3rd outer baulk ring
18. 3rd-4th spread spring
19. 3rd-4th synchronizer hub
20. 3rd-4th shifting insert
21. 3rd-4th coupling sleeve
22. 4th outer baulk ring
23. 4th synchronizer cone
24. 4th inner baulk ring
25. 4th counter gear
26. Reverse idler shaft
27. Reverse idler needle bearing
28. Reverse idler gear
29. Reverse idler thrust washer

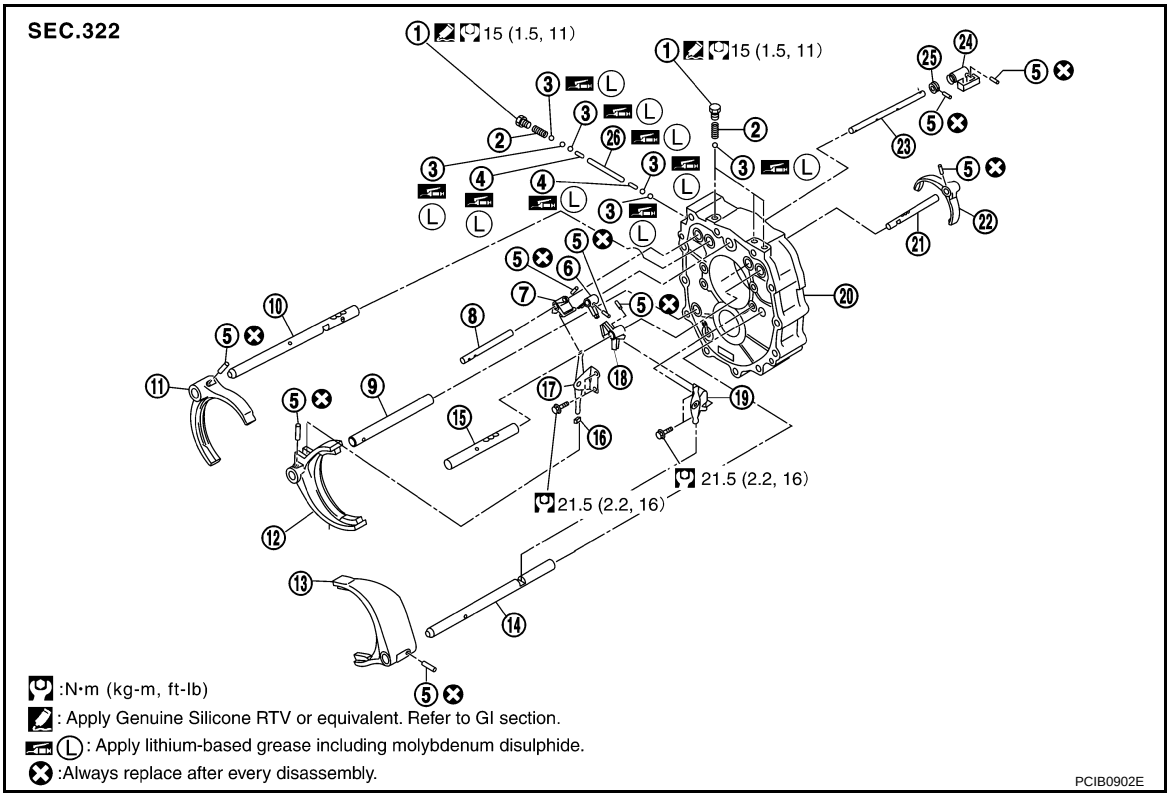
■: Replace the parts as a set.

: Apply lithium-based grease including molybdenum disulphide.

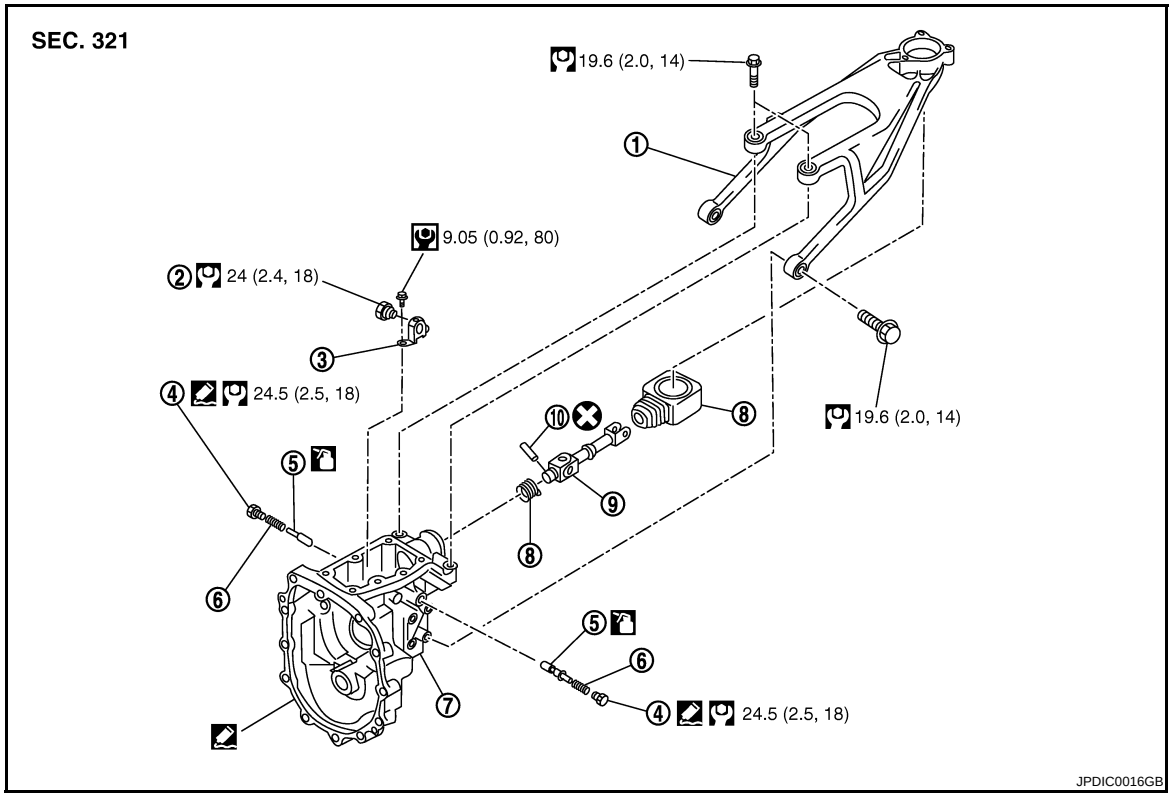
Refer to GI-4, "Components" for symbols not described on the above.

- Apply gear oil to gears, shafts, synchronizers, and bearings when assembly.

SHIFT FORK AND FORK ROD



1. Check ball plug
2. Check ball spring
3. Check ball
4. Interlock pin
5. Retaining pin
6. Striking lever
7. 3rd-4th fork rod bracket
8. 3rd-4th fork rod
9. 3rd-4th fork rod (reversal side)
10. 1st-2nd fork rod
11. 1st-2nd shift fork
12. 3rd-4th shift fork
13. 5th-6th shift fork
14. 5th-6th fork rod (reversal side)
15. 5th-6th fork rod
16. Shifter cap
17. 3rd-4th control lever
18. 5th-6th fork rod bracket
19. 5th-6th control lever
20. Adapter plate
21. Reverse fork rod
22. Reverse shift fork
23. Striking rod
24. Low/high control lever
25. Stopper ring
26. Interlock plunger



1. Control lever housing
2. Check shift pin
3. Control bracket
4. Return spring plug
5. Return spring plunger
6. Return spring
7. Rear extension
8. Boot
9. Control rod
10. Retaining pin

: Apply gear oil.

: Apply Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".

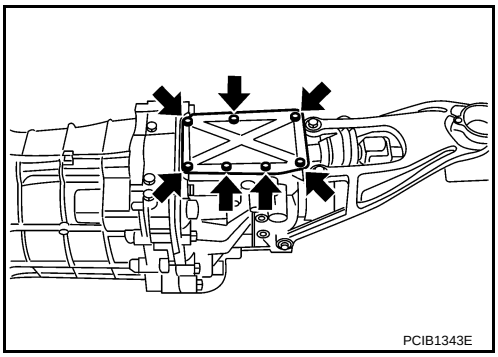
Refer to GI-4, "Components" for symbols not described on the above.

Disassembly

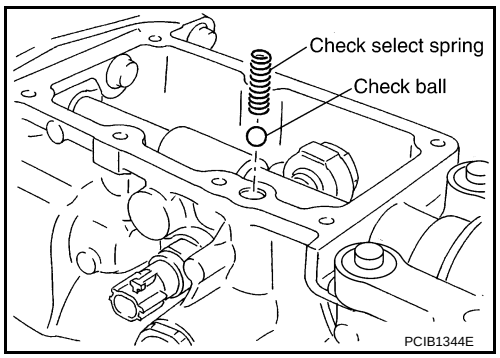
INFOID:0000000004243196

CASE AND EXTENSION [VIN: Up to JNKCV61E69M303072 (Without 4WAS) or JNKCV61E89M013724 (With 4WAS)]

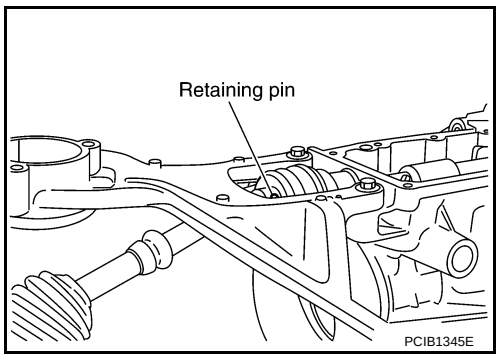
1. Remove drain plug and gasket from transmission case and then drain gear oil.
2. Remove filler plug and gasket from transmission case.
3. Remove rear extension upper cover mounting bolts.
4. Remove rear extension upper cover and rear extension upper cover gasket from rear extension.



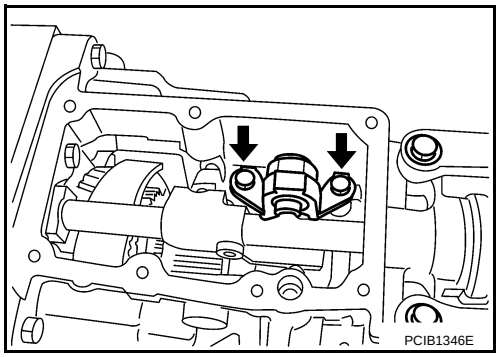
5. Remove check select spring and check ball from rear extension.



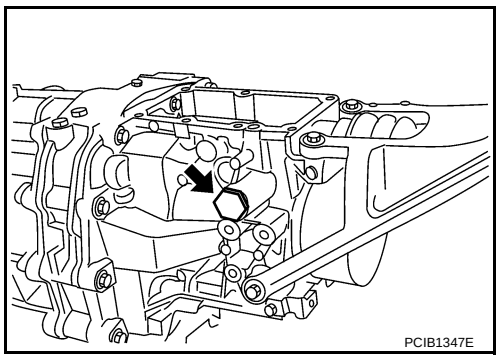
6. Remove retaining pin using a pin punch [Commercial service tool] and then remove control rod and boots.
7. Remove park/neutral position (PNP) switch, plunger, and back-up lamp switch from rear extension.



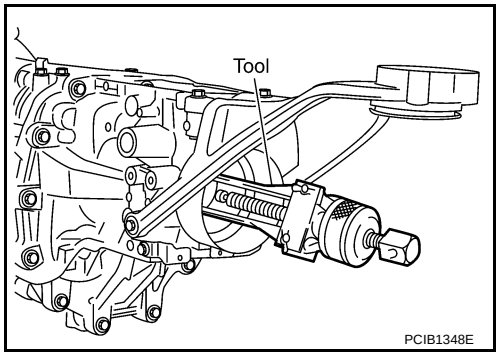
8. Remove control bracket mounting bolts and then remove check shift pin and control bracket as one unit from rear extension.



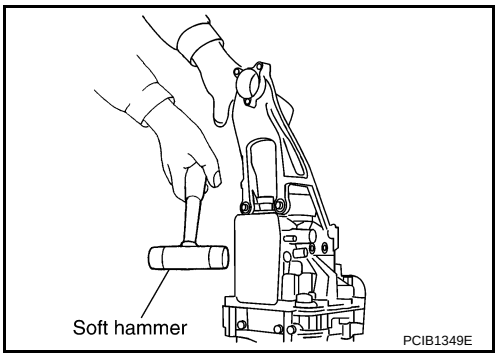
9. Remove right and left return spring plugs and then remove return springs and return spring plungers from rear extension.
CAUTION:
Return spring and return spring plunger have different lengths for right and left sides. Identify right and left side and then store.
10. Remove bracket mounting bolts and then remove brackets from rear extension.

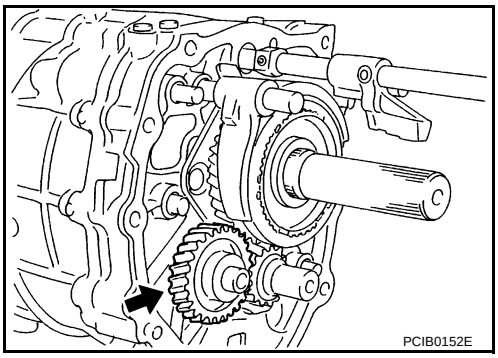


11. Remove rear oil seal from rear extension using the puller [SST: KV381054S0 (J-34286)].
CAUTION:
Never damage rear extension.

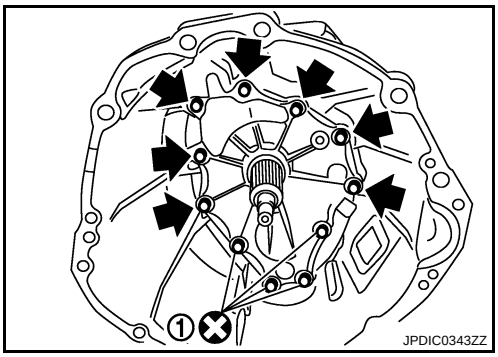


12. Remove rear extension mounting bolts and then remove rear extension assembly using a soft hammer.
CAUTION:
Never hold control lever housing to prevent the bushing of control lever housing from deformation when moving transmission assembly.
13. Remove control lever housing mounting bolts and then remove control lever housing from rear extension.
14. Remove striking rod oil seal from rear extension.
CAUTION:
Never damage rear extension.
15. Remove rear extension dust cover from rear extension.
16. Remove rear extension oil gutter and cap from rear extension.
17. Remove counter end bearing from rear extension.
18. Remove reverse idler thrust washer, reverse idler gear and reverse idler needle bearing from reverse idler shaft.
19. Remove reverse idler shaft from adapter plate.

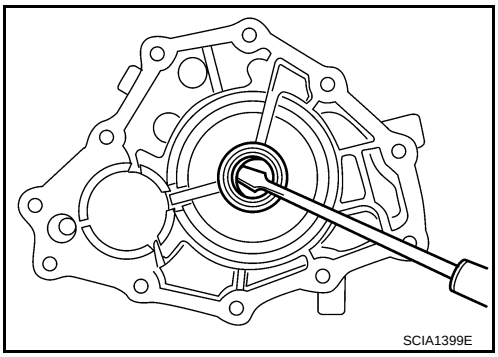




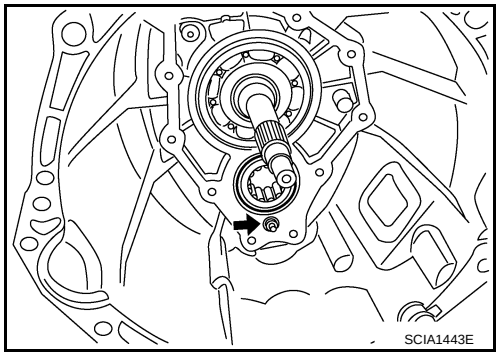
20. Remove front cover mounting bolts (⬅) and sealing bolts (1).
21. Remove front cover and front cover gasket from transmission case.



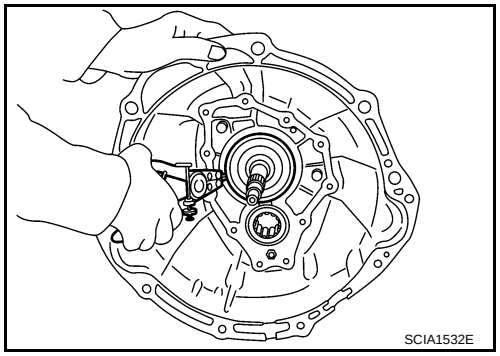
22. Remove front cover oil seal from front cover using a flat-bladed screwdriver.
CAUTION:
Never damage front cover mating surface.



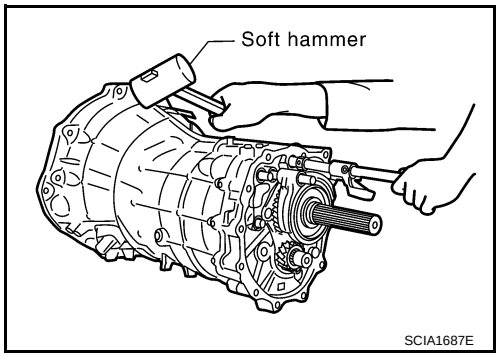
23. Remove baffle plate mounting nut from transmission case.



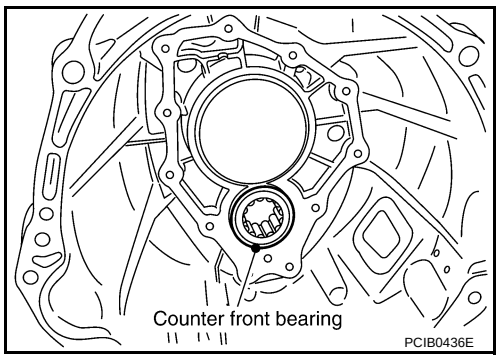
24. Remove snap ring from main drive gear bearing using a snap ring pliers.



25. Using a soft hammer to carefully tap mainshaft and counter shaft from transmission case side and then separate adapter plate and transmission case.



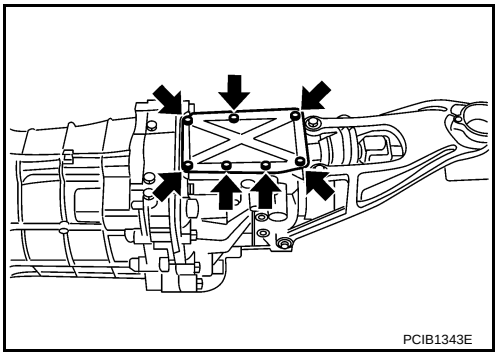
26. Remove counter front bearing from transmission case.
27. Remove oil gutter and breather tube from transmission case.
28. Remove bracket mounting bolt and then remove bracket from transmission case.



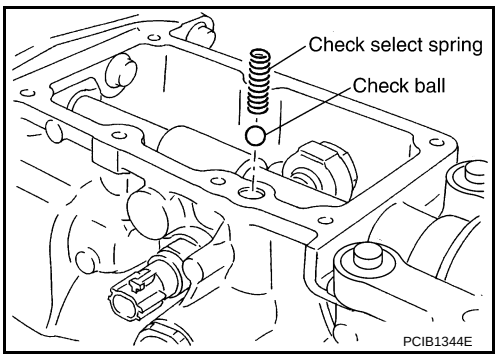
CASE AND EXTENSION [VIN: From JNKCV61E69M303073 (Without 4WAS) or JNKCV61E89M013725 (With 4WAS)]

1. Remove drain plug and gasket from transmission case and then drain gear oil.
2. Remove filler plug and gasket from transmission case.

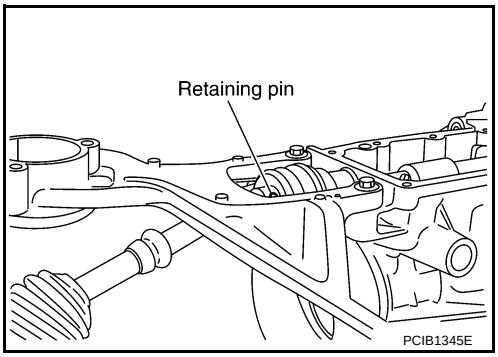
3. Remove rear extension upper cover mounting bolts.
4. Remove rear extension upper cover and rear extension upper cover gasket from rear extension.



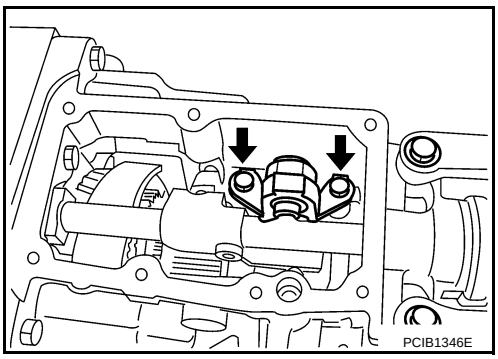
5. Remove check select spring and check ball from rear extension.



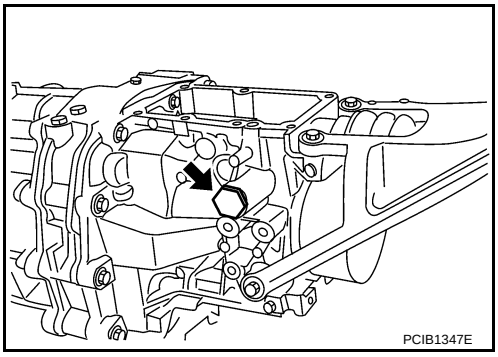
6. Remove retaining pin using a pin punch [Commercial service tool] and then remove control rod and boots.
7. Remove park/neutral position (PNP) switch, plunger, and back-up lamp switch from rear extension.



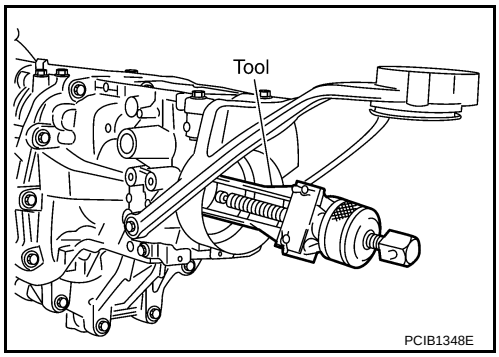
8. Remove control bracket mounting bolts and then remove check shift pin and control bracket as one unit from rear extension.



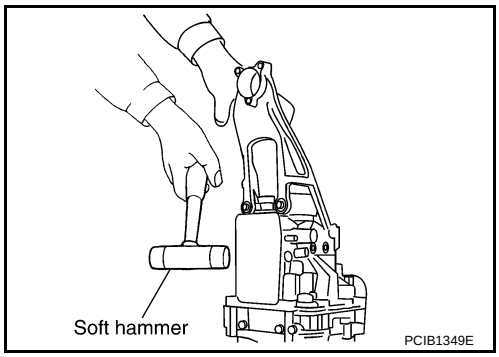
9. Remove right and left return spring plugs and then remove return springs and return spring plungers from rear extension.
CAUTION:
Return spring and return spring plunger have different lengths for right and left sides. Identify right and left side and then store.
10. Remove bracket mounting bolts and then remove brackets from rear extension.



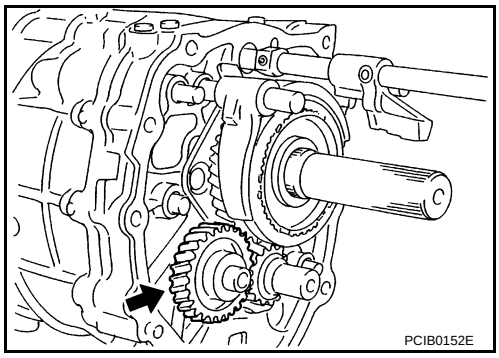
11. Remove rear oil seal from rear extension using the puller [SST: KV381054S0 (J-34286)].
CAUTION:
Never damage rear extension.



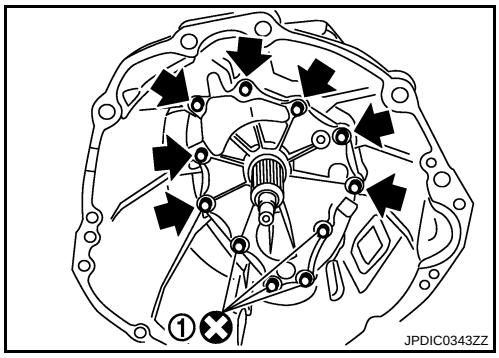
12. Remove rear extension mounting bolts and then remove rear extension assembly using a soft hammer.
CAUTION:
Never hold control lever housing to prevent the bushing of control lever housing from deformation when moving transmission assembly.
13. Remove control lever housing mounting bolts and then remove control lever housing from rear extension.
14. Remove striking rod oil seal from rear extension.
CAUTION:
Never damage rear extension.
15. Remove rear extension dust cover from rear extension.
16. Remove rear extension oil gutter and cap from rear extension.
17. Remove counter end bearing from rear extension.



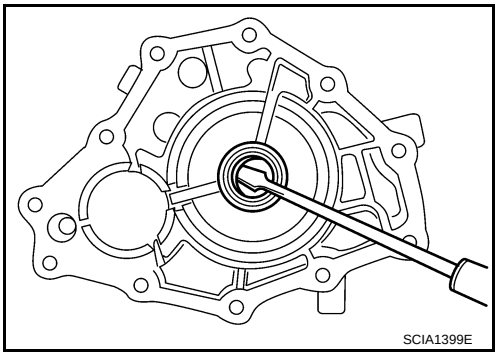
18. Remove reverse idler thrust washer, reverse idler gear and reverse idler needle bearing from reverse idler shaft.
19. Remove reverse idler shaft from adapter plate.



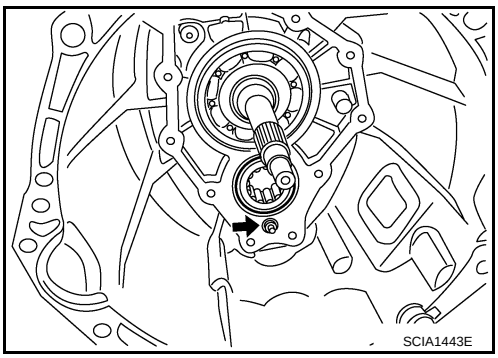
20. Remove front cover mounting bolts (⬅) and sealing bolts (1).
21. Remove front cover and front cover gasket from transmission case.



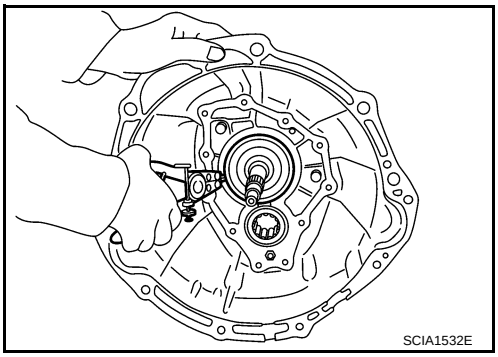
22. Remove front cover oil seal from front cover using a flat-bladed screwdriver.
CAUTION:
Never damage front cover mating surface.


SCIA1399E

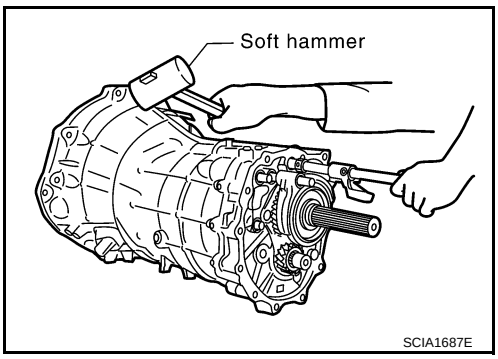
23. Remove baffle plate mounting nut from transmission case.


SCIA1443E

24. Remove snap ring from main drive gear bearing using a snap ring pliers.

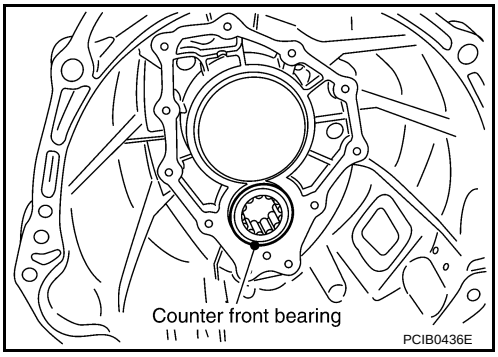

SCIA1532E

25. Using a soft hammer to carefully tap mainshaft and counter shaft from transmission case side and then separate adapter plate and transmission case.



SCIA1687E

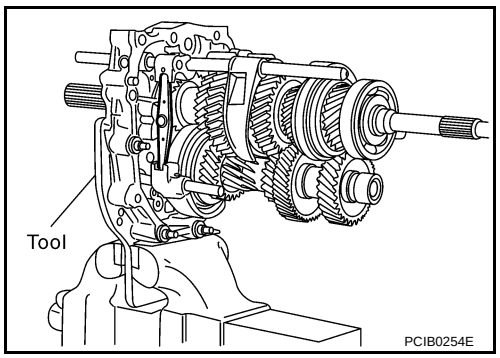
26. Remove counter front bearing from transmission case.
27. Remove breather tube from transmission case.
28. Remove bracket mounting bolt and then remove bracket from transmission case.



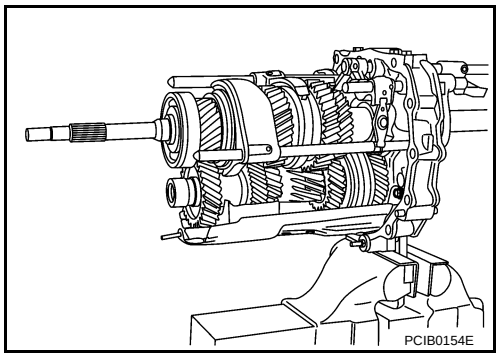
PCIB0436E

SHIFT FORK AND FORK ROD [VIN: Up to JNKCV61E69M303072 (Without 4WAS) or JNKCV61E89M013724 (With 4WAS)]

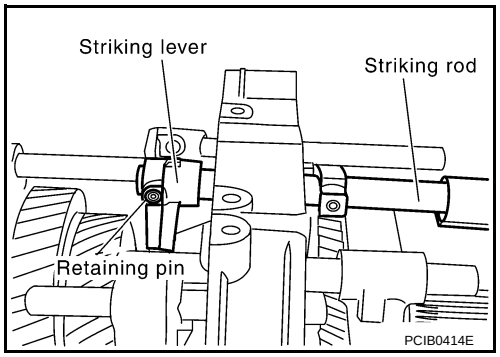
1. Install adapter setting plate [SST: ST22490000 (-)] to adapter plate and then fixing in adapter setting plate using a vise.
CAUTION:
Never directly secure the surface in a vise.



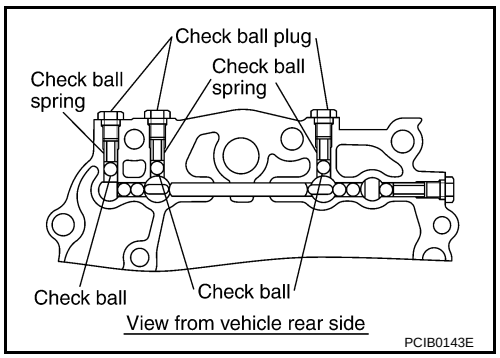
2. Remove baffle plate mounting bolts and then remove baffle plate from adapter plate.



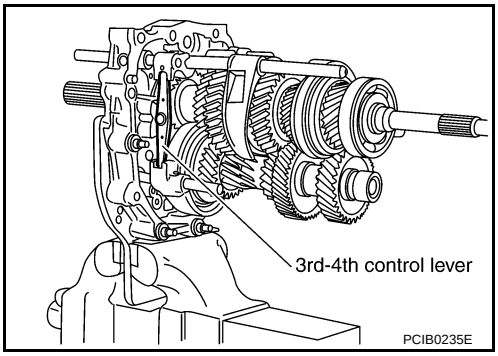
3. Remove retaining pin using a pin punch [Commercial service tool] and then remove striking lever and striking rod.
4. Remove retaining pin using a pin punch [Commercial service tool] and then remove stopper ring from striking rod.
5. Remove retaining pin using a pin punch [Commercial service tool] and then remove low/high control lever from striking rod.



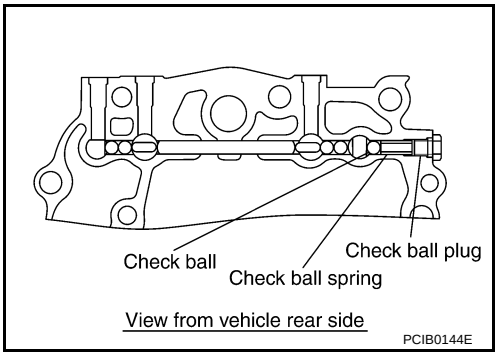
6. Remove check ball plugs and then remove check ball springs and check balls from adapter plate.



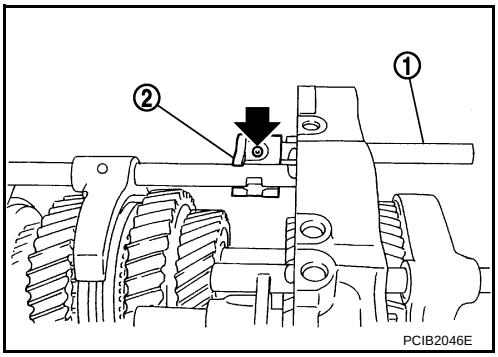
7. Remove 3rd-4th control lever mounting bolts and then remove 3rd-4th control lever and shifter cap.
CAUTION:
Never lose shifter cap.



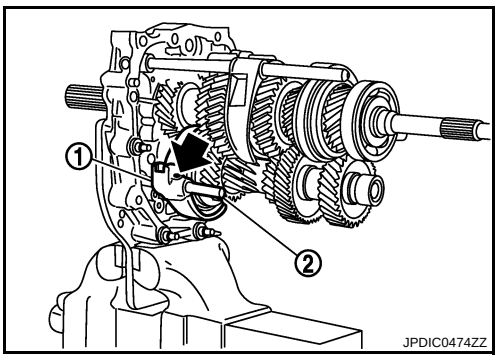
8. Remove check ball plug and then remove check ball spring and check ball from adapter plate.



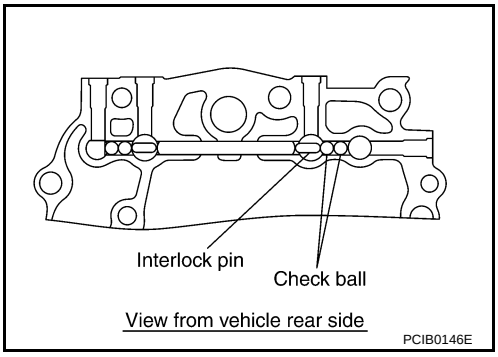
9. Remove retaining pin (⬅) using a pin punch [Commercial service tool] and then remove 3rd-4th fork rod bracket (2) and 3rd-4th fork rod (1).



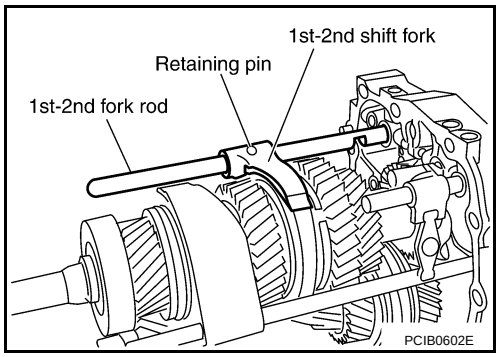
10. Remove retaining pin (⬅) using a pin punch [Commercial service tool] and then remove 3rd-4th shift fork (1) and 3rd-4th fork rod (reversal side) (2).



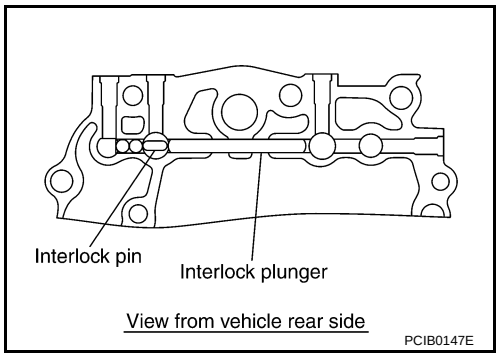
11. Remove check balls and interlock pin from adapter plate.



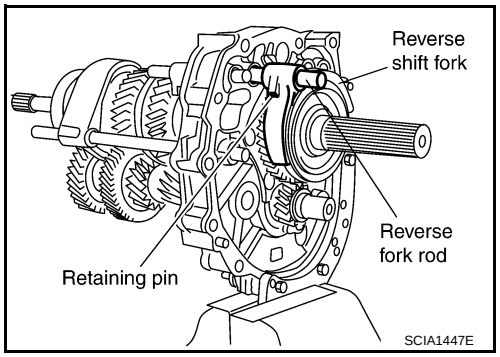
12. Remove retaining pin using a pin punch [Commercial service tool] and then remove 1st-2nd shift fork and 1st-2nd fork rod.



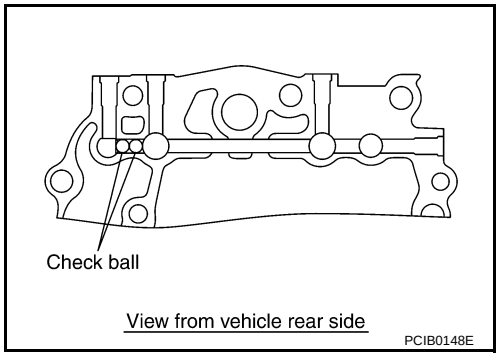
13. Remove interlock plunger and interlock pin from adapter plate.



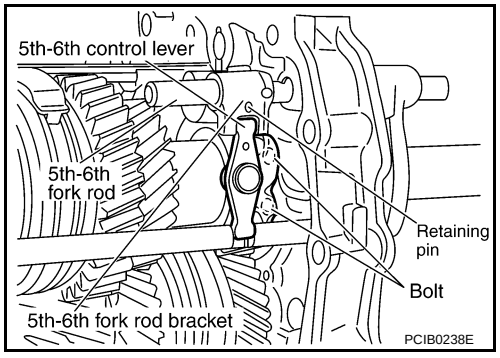
14. Remove retaining pin using a pin punch [Commercial service tool] and then remove reverse shift fork and reverse fork rod.



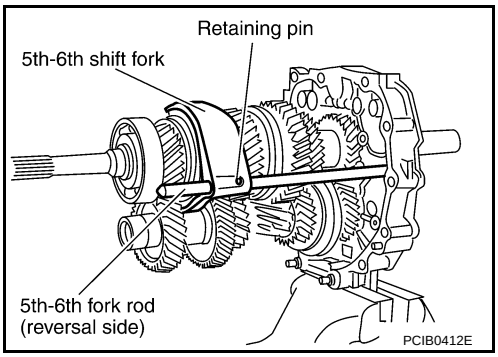
15. Remove check balls from adapter plate.



16. Remove 5th-6th control lever mounting bolts and then remove 5th-6th control lever from adapter plate.
17. Remove retaining pin using a pin punch [Commercial service tool] and then remove 5th-6th fork rod bracket and 5th-6th fork rod.

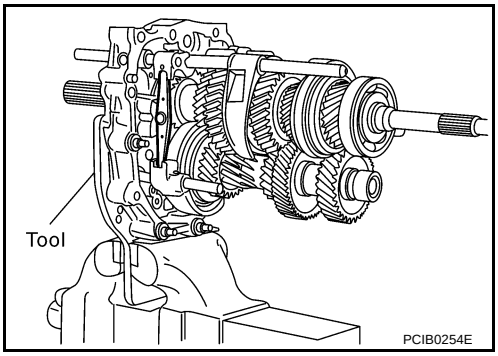


18. Remove retaining pin using a pin punch [Commercial service tool] and then remove 5th-6th fork rod (reversal side) and 5th-6th shift fork.

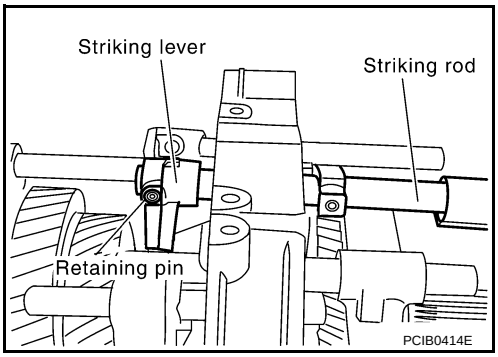


SHIFT FORK AND FORK ROD [VIN: From JNKCV61E69M303073 (Without 4WAS) or JNKCV61E89M013725 (With 4WAS)]

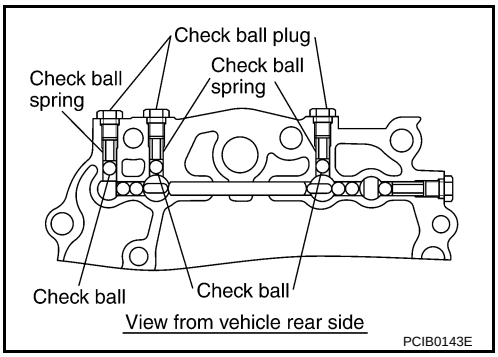
1. Install adapter setting plate [SST: ST22490000 (-)] to adapter plate and then fixing in adapter setting plate using a vise.
   CAUTION:
   Never directly secure the surface in a vise.
2. Remove baffle plate and oil gutter from adapter plate.



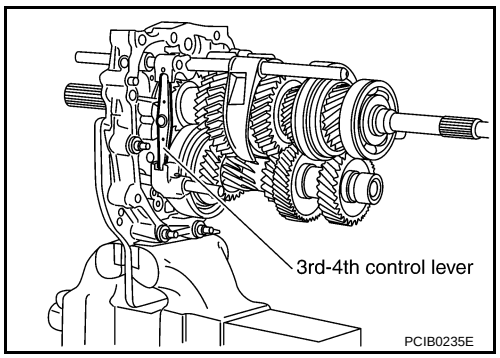
3. Remove retaining pin using a pin punch [Commercial service tool] and then remove striking lever and striking rod.
4. Remove retaining pin using a pin punch [Commercial service tool] and then remove stopper ring from striking rod.
5. Remove retaining pin using a pin punch [Commercial service tool] and then remove low/high control lever from striking rod.



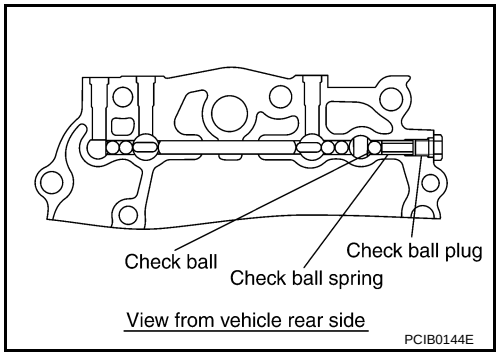
6. Remove check ball plugs and then remove check ball springs and check balls from adapter plate.



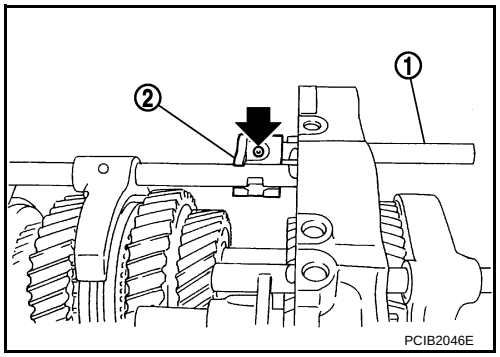
7. Remove 3rd-4th control lever mounting bolts and then remove 3rd-4th control lever and shifter cap.
CAUTION:
Never lose shifter cap.



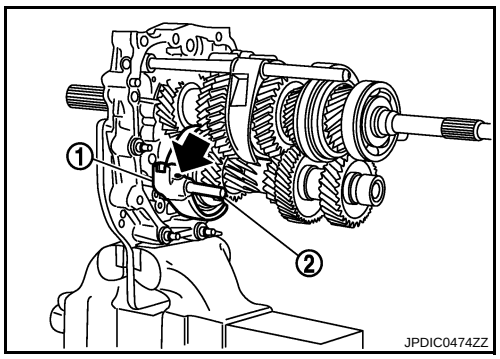
8. Remove check ball plug and then remove check ball spring and check ball from adapter plate.



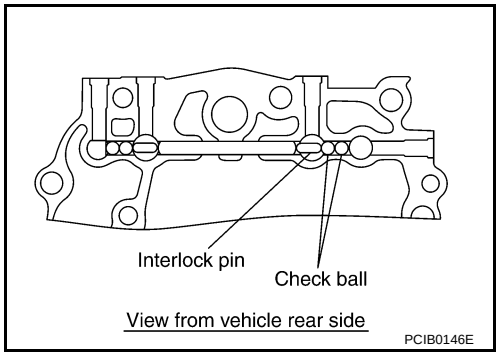
9. Remove retaining pin (⬅) using a pin punch [Commercial service tool] and then remove 3rd-4th fork rod bracket (2) and 3rd-4th fork rod (1).



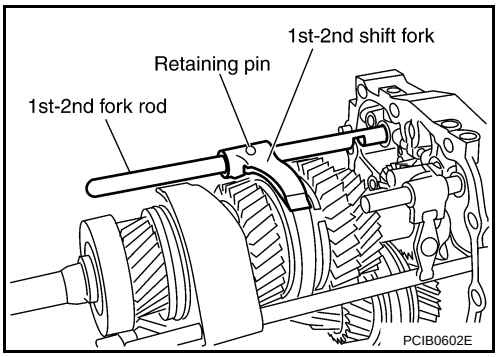
10. Remove retaining pin (⬅) using a pin punch [Commercial service tool] and then remove 3rd-4th shift fork (1) and 3rd-4th fork rod (reversal side) (2).



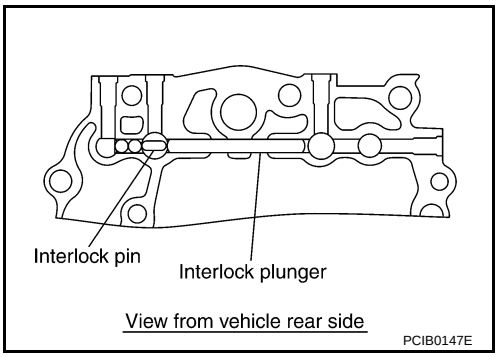
11. Remove check balls and interlock pin from adapter plate.



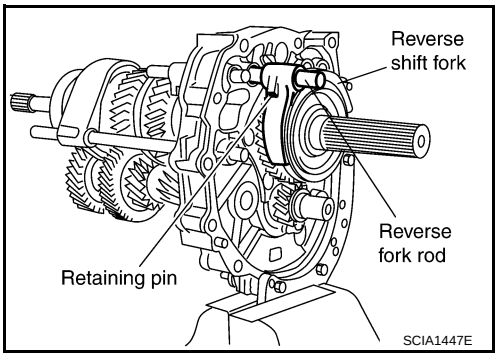
12. Remove retaining pin using a pin punch [Commercial service tool] and then remove 1st-2nd shift fork and 1st-2nd fork rod.



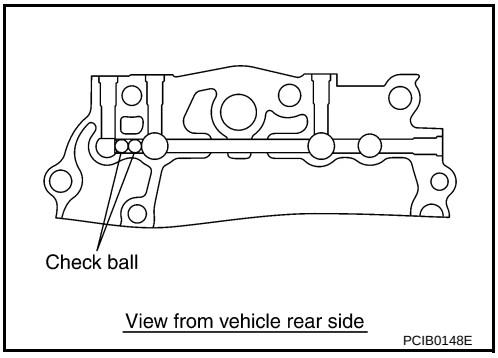
13. Remove interlock plunger and interlock pin from adapter plate.



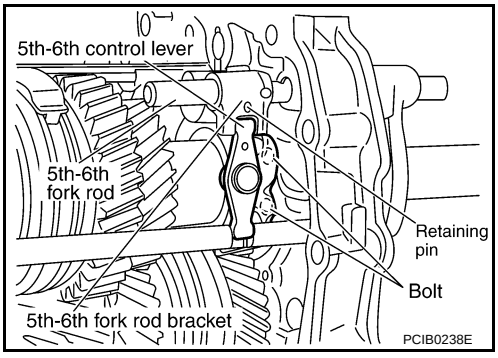
14. Remove retaining pin using a pin punch [Commercial service tool] and then remove reverse shift fork and reverse fork rod.



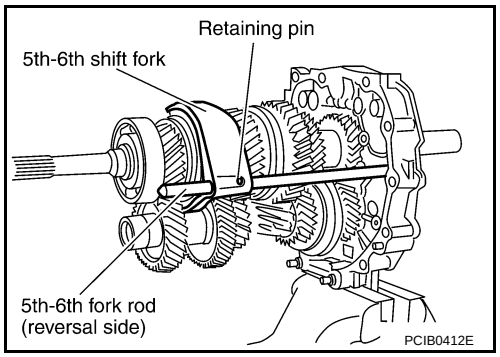
15. Remove check balls from adapter plate.



16. Remove 5th-6th control lever mounting bolts and then remove 5th-6th control lever from adapter plate.
17. Remove retaining pin using a pin punch [Commercial service tool] and then remove 5th-6th fork rod bracket and 5th-6th fork rod.



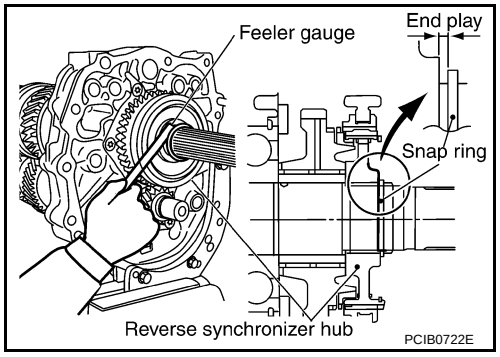
18. Remove retaining pin using a pin punch [Commercial service tool] and then remove 5th-6th fork rod (reversal side) and 5th-6th shift fork.



SHAFT AND GEAR

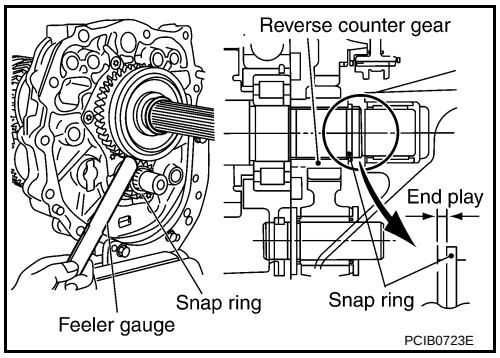
1. Before disassembly, measure end play for each position. If the end play is outside the specifications, disassemble and inspect.
   - Mainshaft

End play standard value : Refer to TM-99, "End Play".

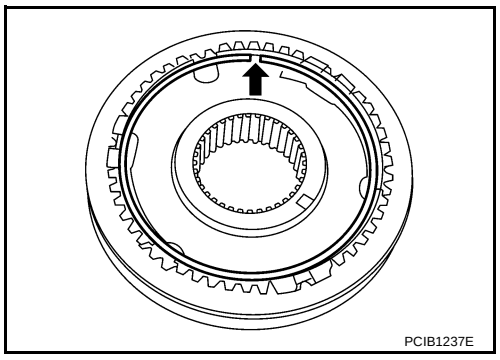


   - Counter shaft

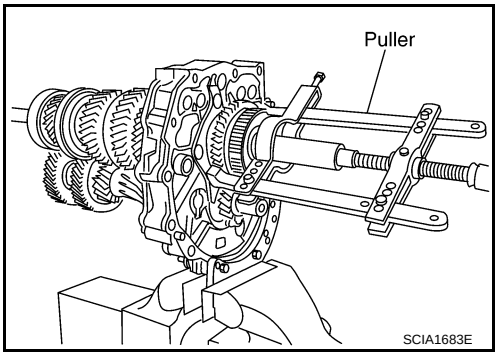
End play standard value : Refer to TM-99, "End Play".



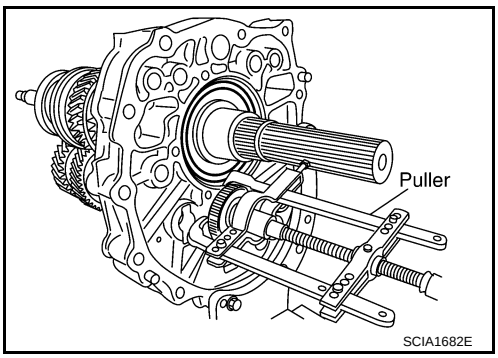
2. Remove snap ring from mainshaft.
3. Remove snap ring from reverse synchronizer hub.
4. Remove reverse spread springs, reverse shifting inserts, and reverse coupling sleeve from reverse synchronizer hub.



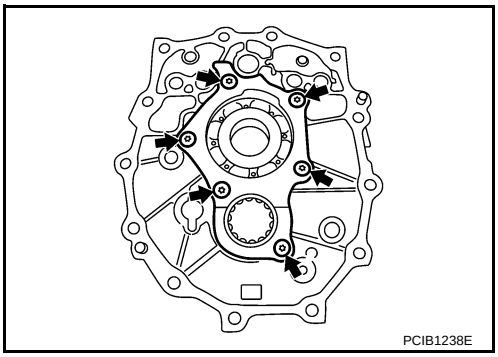
5. Remove reverse main gear, reverse baulk ring, and reverse synchronizer hub assembly using a puller [Commercial service tool].
6. Remove reverse main needle bearing.



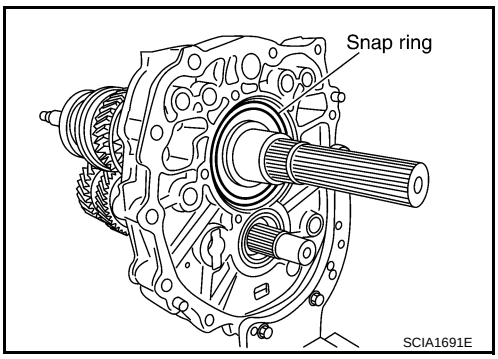
7. After removing snap ring, using a puller [Commercial service tool] to remove reverse counter gear and counter rear bearing spacer.



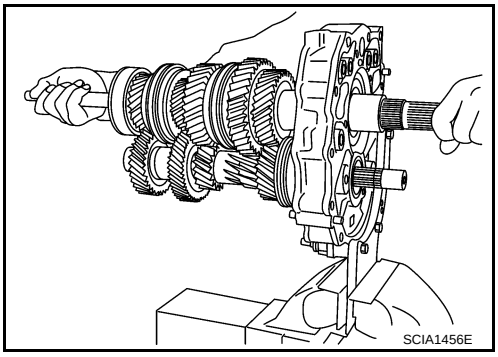
8. Remove mainshaft bearing retainer mounting bolts and then remove mainshaft bearing retainer.



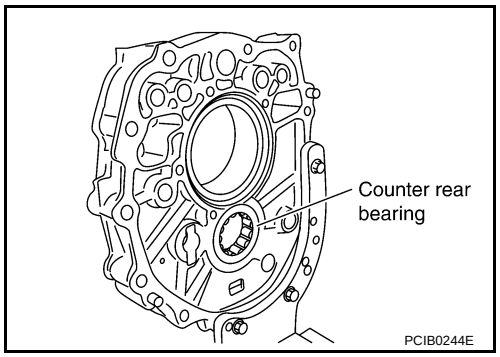
9. Remove snap ring from mainshaft bearing.



10. Carefully tap mainshaft with a plastic hammer and then remove mainshaft assembly, main drive gear assembly and counter shaft assembly from adapter plate.



11. Remove counter rear bearing from adapter plate.
12. Remove magnet from adapter plate.

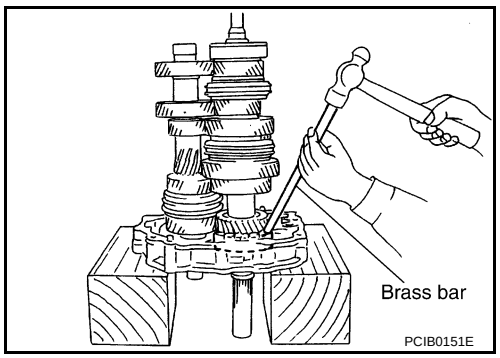


Assembly

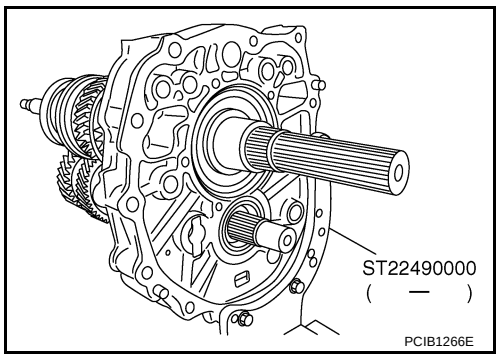
INFOID:0000000004243197

SHAFT AND GEAR

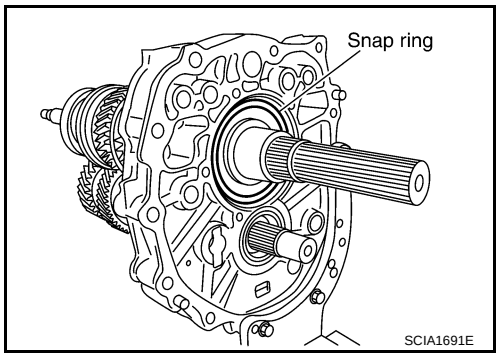
1. Install main drive gear assembly, mainshaft assembly, and counter shaft assembly combined in one unit to adapter plate using a brass bar.



2. Install the adapter setting plate [SST] to adapter plate and then fixing in adapter setting plate using a vise.
   CAUTION:
   Never directly secure the surface in a vise.
3. Install magnet to adapter plate.



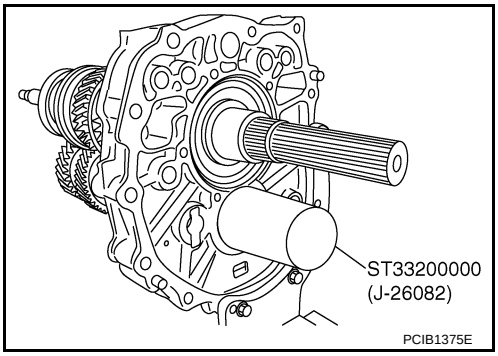
4. Install snap ring to mainshaft bearing.
   CAUTION:
   Never reuse snap ring.
5. Apply recommended grease to counter rear bearing.



6. Install counter rear bearing onto adapter plate using the drift [SST].

CAUTION:

Replace counter rear bearing inner race, counter rear bearing and counter rear bearing spacer as a set.

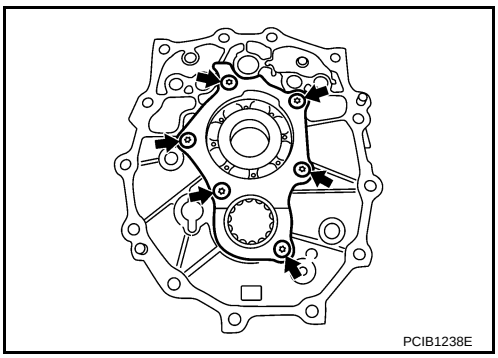


7. Apply thread locking sealant to the end of bolts (first 3 to 4 threads).
   - **Use Genuine Medium Strength Thread Locking Sealant or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

CAUTION:

Remove old sealant and oil adhering to threads.

8. Install mainshaft bearing retainer to adapter plate and tighten bolts to the specified torque.



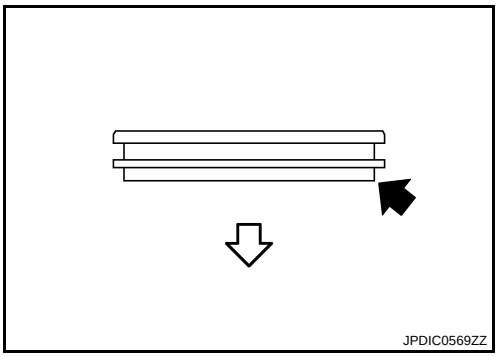
9. Install reverse coupling sleeve and reverse shifting inserts into reverse synchronizer hub.

CAUTION:

- **Be careful with the orientation of reverse coupling sleeve.**

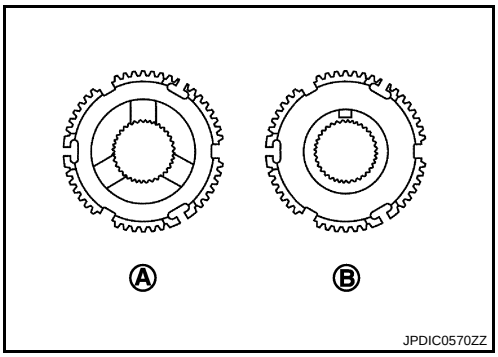
⇦ : Reverse main gear side

- **Never reuse reverse coupling sleeve and reverse synchronizer hub.**
- **Replace reverse coupling sleeve and reverse synchronizer hub as a set.**

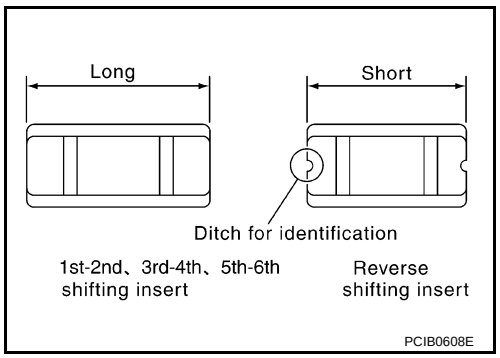


- **Be careful with the orientation of reverse synchronizer hub.**

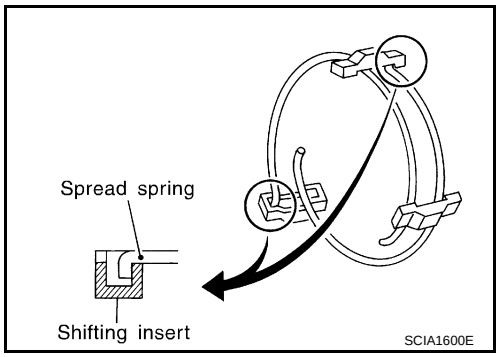
A : Reverse main gear side
B : Snap ring side



- **Be careful with the shape of 1st-2nd, 3rd-4th and 5th-6th shifting insert to avoid misassembly.**

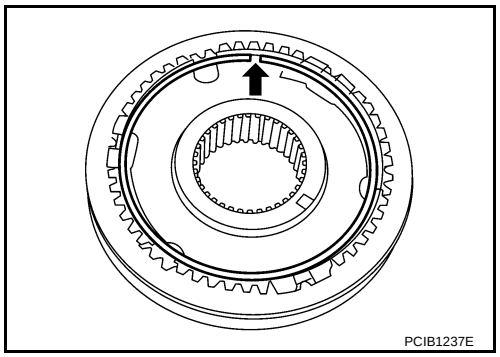


10. Install reverse spread springs to reverse shifting inserts.
CAUTION:
Never install reverse spread spring hook onto the same reverse shifting insert.

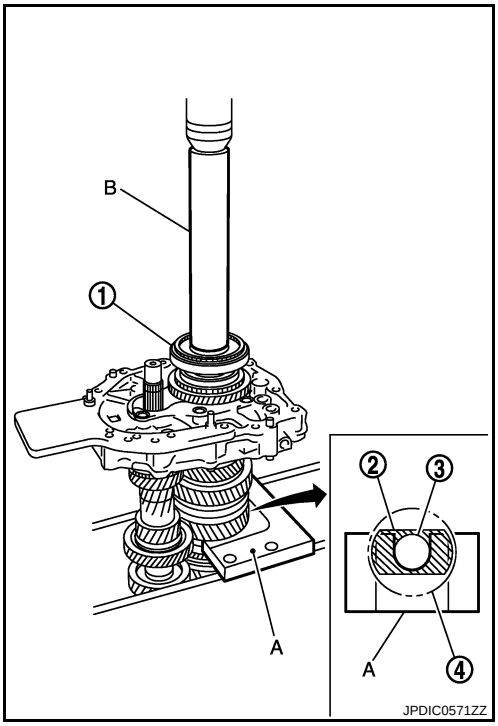


11. Install snap ring to reverse synchronizer hub.
CAUTION:
- **Never align snap ring notch with synchronizer hub groove when assembling.**
- **Never reuse snap ring.**

12. Apply gear oil to reverse main needle bearing and reverse baulk ring.

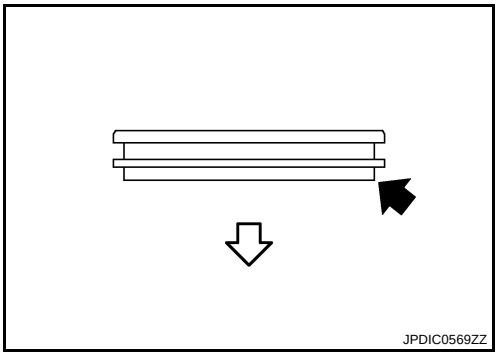


13. After installing reverse main gear bushing, reverse main needle bearing, reverse main gear and reverse baulk ring onto mainshaft using the press plate (A) [SST: KV32103300 (J-46529)], the drift (B) [SST: ST01530000 (-)], and a press to press-fit reverse synchronizer hub assembly (1).



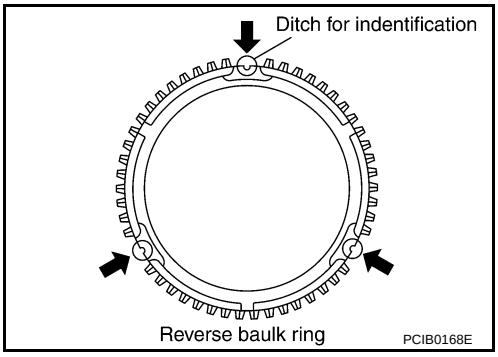
2 : Collar of mainshaft
3 : 6th main gear
4 : 2nd main gear

CAUTION:
Be careful with the orientation of reverse coupling sleeve.



⇦ : Reverse main gear side

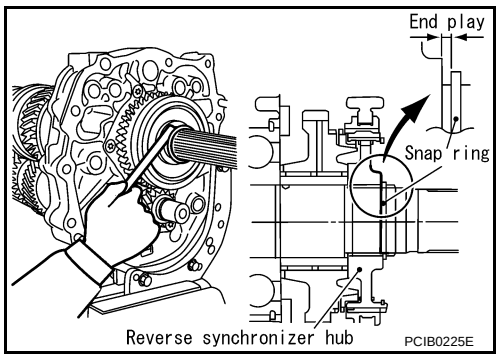
NOTE:
Reverse baulk ring has three spaces that two gear teeth are missing, and each space has small ditch for identification as shown in the figure.



14. Select and install a snap ring so that the end play comes within the standard value.

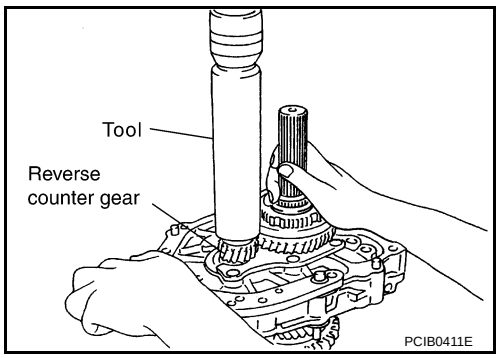
End play standard value : Refer to TM-99, "End Play".

CAUTION:
Never reuse snap ring.



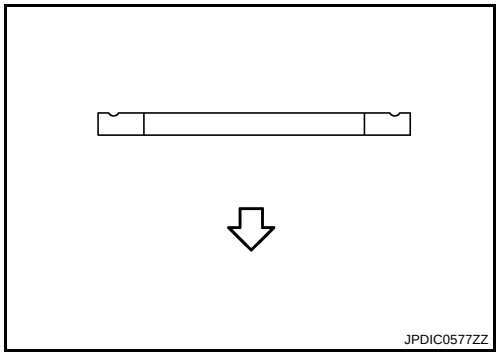
15. After installing counter rear bearing spacer, press and fit reverse counter gear onto counter shaft with drift [SST: ST23860000 (-)] and press.

CAUTION:
- **Never reuse reverse counter gear.**
- **Replace counter rear bearing inner race, counter rear bearing and counter rear bearing spacer as a set.**



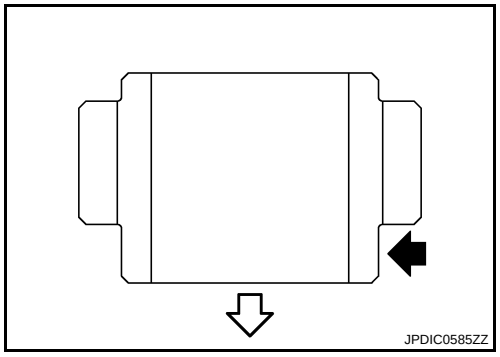
- **Be careful with the orientation of counter rear bearing spacer.**

⇦ : Counter rear bearing side



- **Be careful with the orientation of reverse counter gear.**

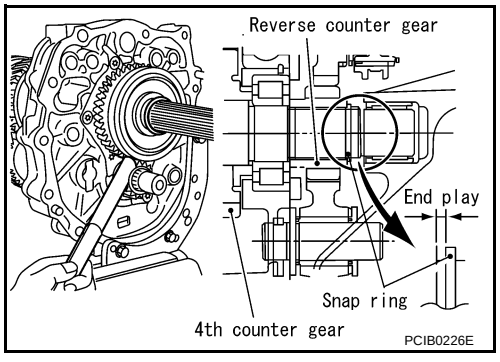
⇦ : Counter rear bearing side



16. Select and install a snap ring so that the end play comes within the standard value.

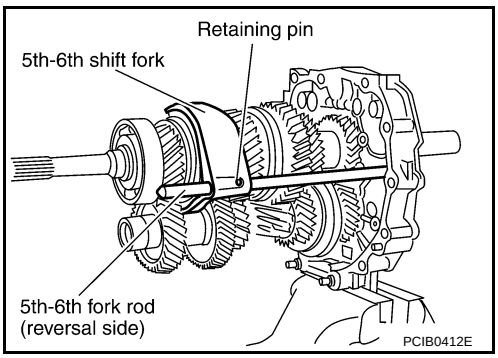
End play standard value : Refer to TM-99, "End Play".

CAUTION:
Never reuse snap ring.

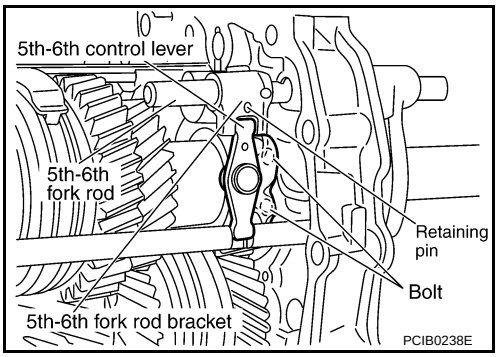


SHIFT FORK AND FORK ROD [VIN: Up to JNKCV61E69M303072 (Without 4WAS) or JNKCV61E89M013724 (With 4WAS)]

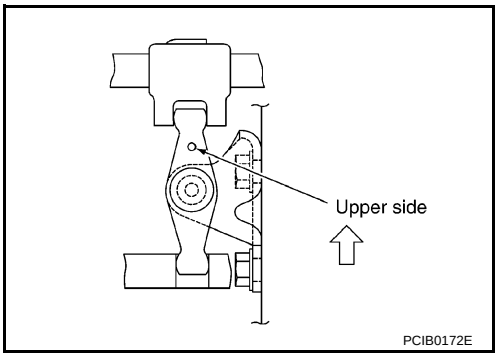
1. Install 5th-6th shift fork to 5th-6th coupling sleeve.
2. Install 5th-6th fork rod (reversal side) to 5th-6th shift fork.
3. Using a pin punch [Commercial service tool] to tap retaining pin into 5th-6th shift fork.
   CAUTION:
   Never reuse retaining pin.



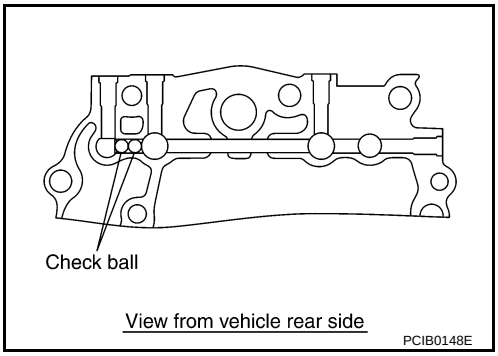
4. Install 5th-6th fork rod to adapter plate.
5. Install 5th-6th fork rod bracket to 5th-6th fork rod.
6. Using a pin punch [Commercial service tool] to tap retaining pin into 5th-6th fork rod bracket.
   CAUTION:
   Never reuse retaining pin.



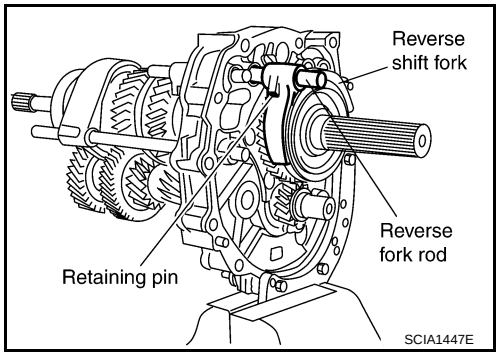
7. Install 5th-6th control lever to adapter plate and then tighten mounting bolts to the specified torque.
   CAUTION:
   Set the projection upward.



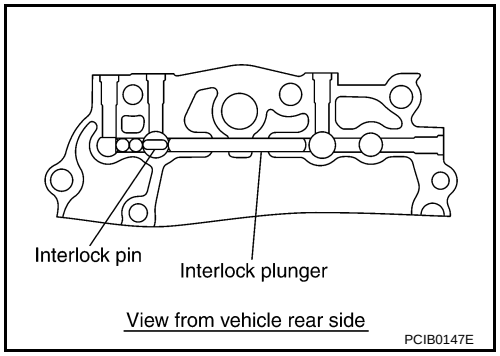
8. Apply recommended grease check balls and then install check balls to adapter plate.



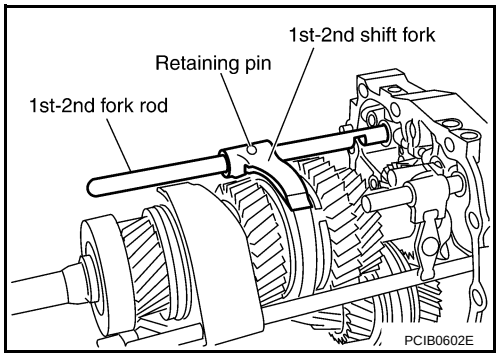
9. Install reverse shift fork to reverse coupling sleeve.
10. Install reverse fork rod to reverse shift fork.
11. Using a pin punch [Commercial service tool] to tap retaining pin into reverse shift fork.
    CAUTION:
    Never reuse retaining pin.



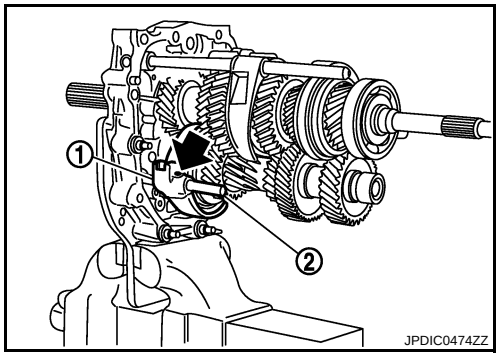
12. Apply recommended grease to interlock pin and interlock plunger.
13. Install interlock pin and interlock plunger to adapter plate.



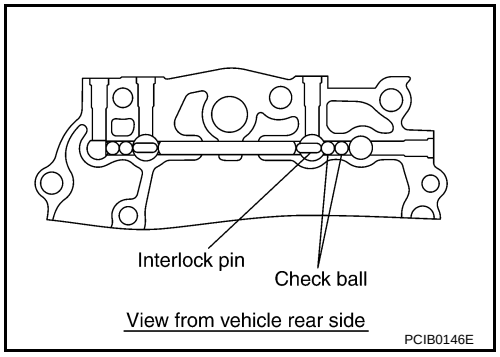
14. Install 1st-2nd shift fork to 1st-2nd coupling sleeve.
15. Install 1st-2nd fork rod to 1st-2nd shift fork.
16. Using a pin punch [Commercial service tool] to tap retaining pin into 1st-2nd shift fork.
    CAUTION:
    Never reuse retaining pin.



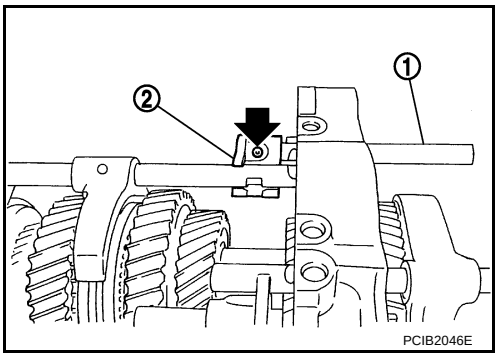
17. Install 3rd-4th shift fork (1) to 3rd-4th coupling sleeve.
18. Install 3rd-4th fork rod (reversal side) (2) to 3rd-4th shift fork.
19. Using a pin punch [Commercial service tool] to tap retaining pin (⬅) into 3rd-4th shift fork (reversal side).
    CAUTION:
    Never reuse retaining pin.



20. Apply recommended grease to interlock pin and check balls.
21. Install interlock pin and check balls to adapter plate.

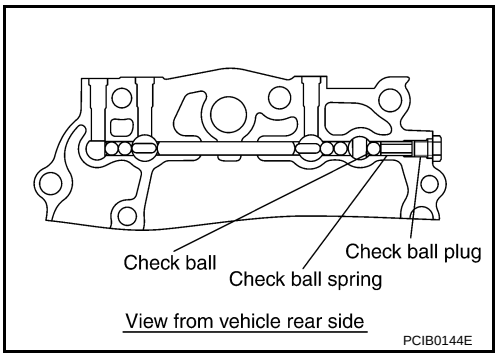


22. Install 3rd-4th fork rod (1) to adapter plate.
23. Install 3rd-4th fork rod bracket (2) to 3rd-4th fork rod.
24. Using a pin punch [Commercial service tool] to tap retaining pin (⬅) into 3rd-4th fork rod bracket.
    CAUTION:
    Never reuse retaining pin.

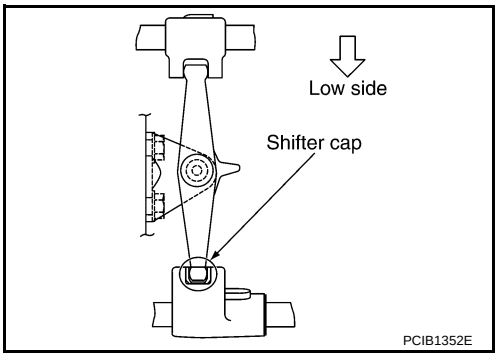


25. Apply recommended grease to check ball and then install check ball and check ball spring into adapter plate.
26. Apply recommended sealant to threads of check ball plugs and then tighten check ball plug to the specified torque.
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

    CAUTION:
    Remove old sealant and oil adhering to threads.

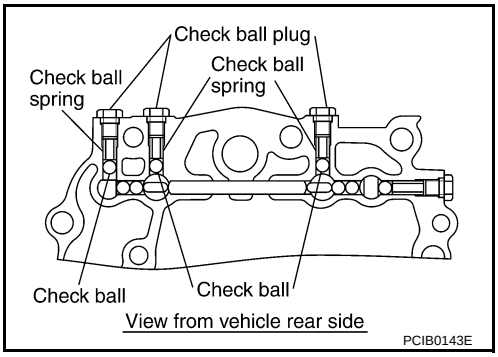


27. Install shifter cap to 3rd-4th control lever.
28. Install 3rd-4th control lever to adapter plate and then tighten mounting bolts to the specified torque.
    CAUTION:
    - **Make sure the top and bottom are oriented correctly.**
    - **Never drop shifter cap.**



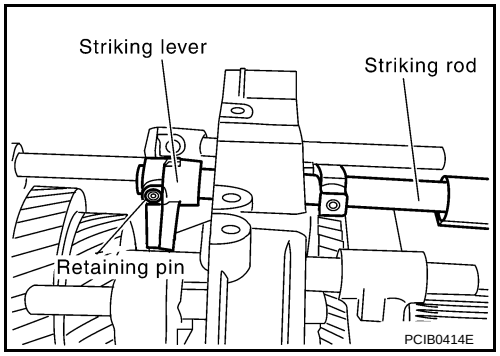
29. Apply recommended grease to check ball and then install check balls and check ball springs into adapter plate.
30. Apply recommended sealant to threads of check ball plugs and then tighten check ball plugs to the specified torque.
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

    CAUTION:
    Remove old sealant and oil adhering to threads.

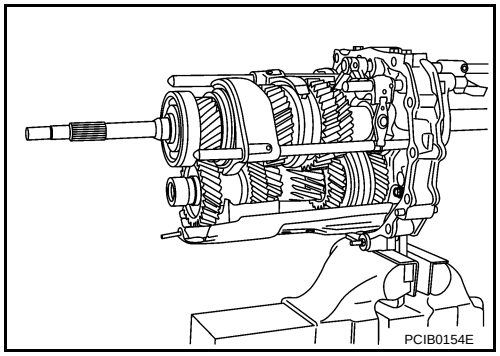


31. Install low/high control lever to striking rod.
32. Using a pin punch [Commercial service tool] to tap retaining pin into low/high control lever.
    CAUTION:
    Never reuse retaining pin.
33. Install stopper ring to striking rod.
34. Using a pin punch [Commercial service tool] to tap retaining pin into stopper ring.
    CAUTION:
    Never reuse retaining pin.

35. Install striking rod to adapter plate.
36. Install striking lever to striking rod.
37. Using a pin punch [Commercial service tool] to tap retaining pin into striking lever.
    CAUTION:
    Never reuse retaining pin.

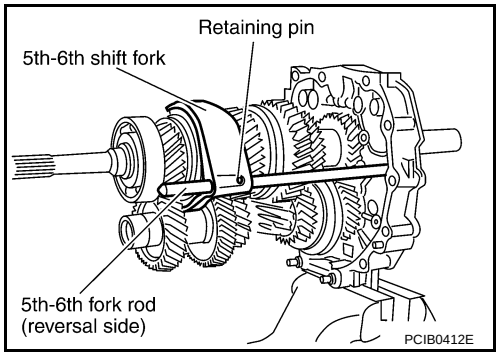


38. Install baffle plate to adapter plate and then tighten mounting bolts to the specified torque.

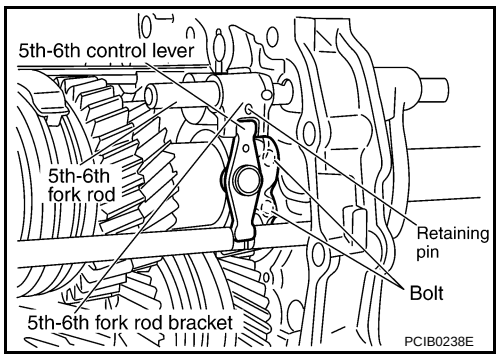


SHIFT FORK AND FORK ROD [VIN: From JNKCV61E69M303073 (Without 4WAS) or JNKCV61E89M013725 (With 4WAS)]

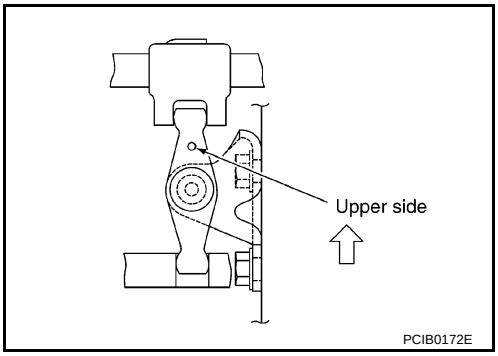
1. Install 5th-6th shift fork to 5th-6th coupling sleeve.
2. Install 5th-6th fork rod (reversal side) to 5th-6th shift fork.
3. Using a pin punch [Commercial service tool] to tap retaining pin into 5th-6th shift fork.
   CAUTION:
   Never reuse retaining pin.



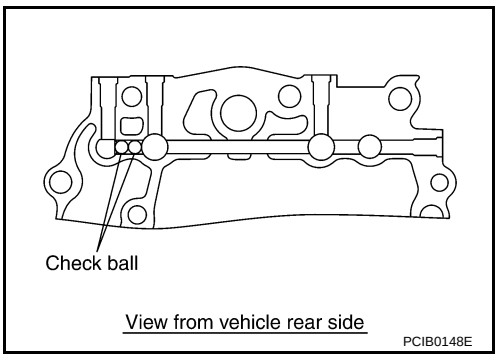
4. Install 5th-6th fork rod to adapter plate.
5. Install 5th-6th fork rod bracket to 5th-6th fork rod.
6. Using a pin punch [Commercial service tool] to tap retaining pin into 5th-6th fork rod bracket.
   CAUTION:
   Never reuse retaining pin.



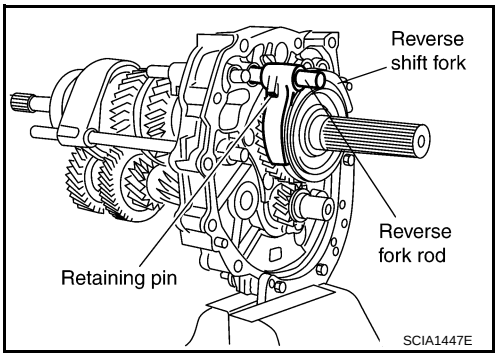
7. Install 5th-6th control lever to adapter plate and then tighten mounting bolts to the specified torque.
   CAUTION:
   Set the projection upward.



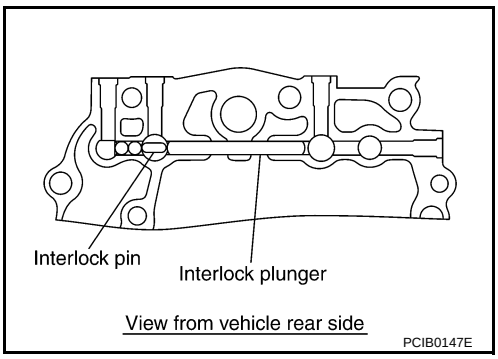
8. Apply recommended grease check balls and then install check balls to adapter plate.



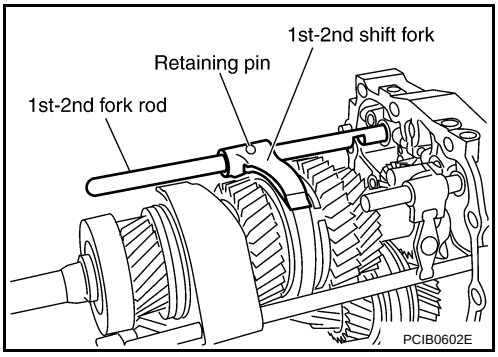
9. Install reverse shift fork to reverse coupling sleeve.
10. Install reverse fork rod to reverse shift fork.
11. Using a pin punch [Commercial service tool] to tap retaining pin into reverse shift fork.
    CAUTION:
    Never reuse retaining pin.



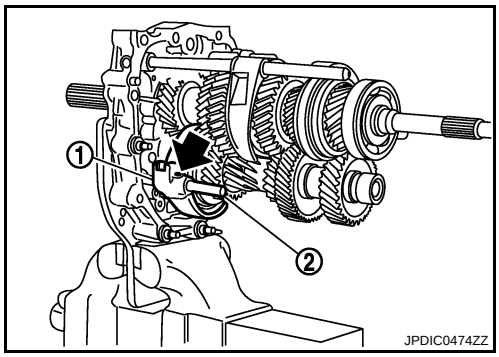
12. Apply recommended grease to interlock pin and interlock plunger.
13. Install interlock pin and interlock plunger to adapter plate.



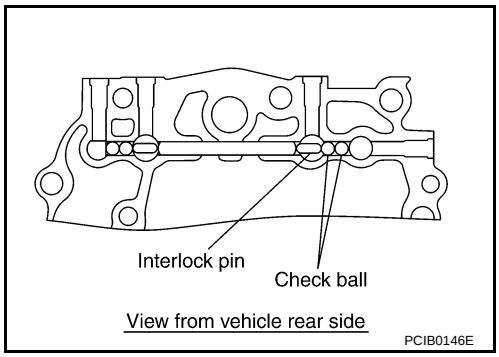
14. Install 1st-2nd shift fork to 1st-2nd coupling sleeve.
15. Install 1st-2nd fork rod to 1st-2nd shift fork.
16. Using a pin punch [Commercial service tool] to tap retaining pin into 1st-2nd shift fork.
    CAUTION:
    Never reuse retaining pin.



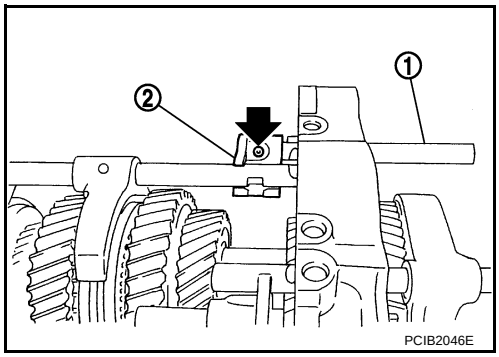
17. Install 3rd-4th shift fork (1) to 3rd-4th coupling sleeve.
18. Install 3rd-4th fork rod (reversal side) (2) to 3rd-4th shift fork.
19. Using a pin punch [Commercial service tool] to tap retaining pin (⬅) into 3rd-4th shift fork (reversal side).
    CAUTION:
    Never reuse retaining pin.



20. Apply recommended grease to interlock pin and check balls.
21. Install interlock pin and check balls to adapter plate.

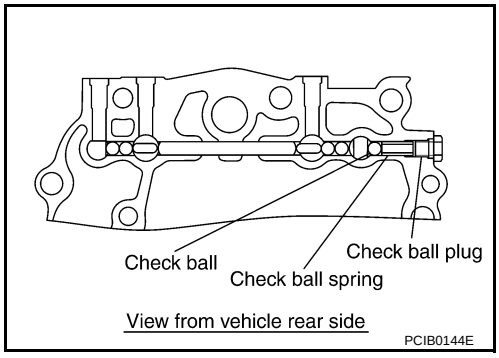


22. Install 3rd-4th fork rod (1) to adapter plate.
23. Install 3rd-4th fork rod bracket (2) to 3rd-4th fork rod.
24. Using a pin punch [Commercial service tool] to tap retaining pin (⬅) into 3rd-4th fork rod bracket.
    CAUTION:
    Never reuse retaining pin.

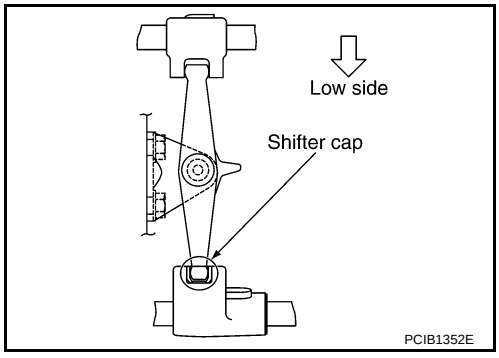


25. Apply recommended grease to check ball and then install check ball and check ball spring into adapter plate.
26. Apply recommended sealant to threads of check ball plugs and then tighten check ball plug to the specified torque.
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

    CAUTION:
    Remove old sealant and oil adhering to threads.

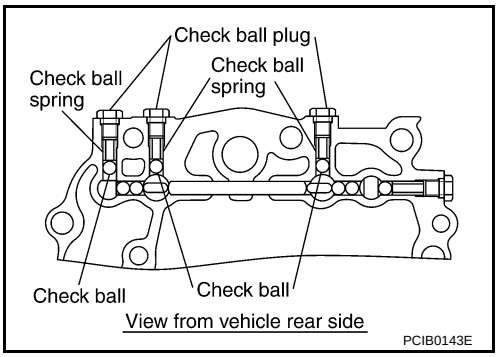


27. Install shifter cap to 3rd-4th control lever.
28. Install 3rd-4th control lever to adapter plate and then tighten mounting bolts to the specified torque.
    CAUTION:
    - **Make sure the top and bottom are oriented correctly.**
    - **Never drop shifter cap.**



29. Apply recommended grease to check ball and then install check balls and check ball springs into adapter plate.
30. Apply recommended sealant to threads of check ball plugs and then tighten check ball plugs to the specified torque.
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

    CAUTION:
    Remove old sealant and oil adhering to threads.

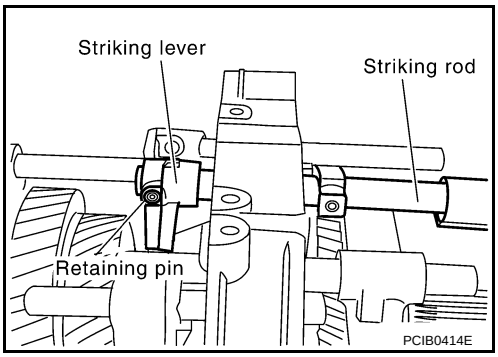


31. Install low/high control lever to striking rod.
32. Using a pin punch [Commercial service tool] to tap retaining pin into low/high control lever.

    CAUTION:
    Never reuse retaining pin.
33. Install stopper ring to striking rod.
34. Using a pin punch [Commercial service tool] to tap retaining pin into stopper ring.

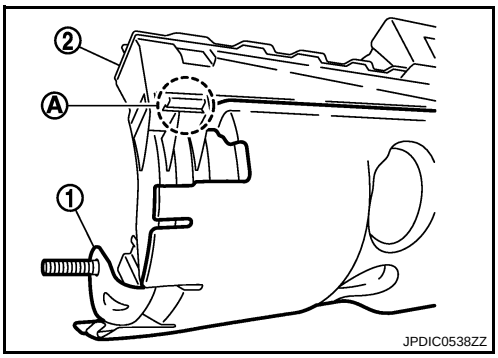
    CAUTION:
    Never reuse retaining pin.
35. Install striking rod to adapter plate.
36. Install striking lever to striking rod.
37. Using a pin punch [Commercial service tool] to tap retaining pin into striking lever.

    CAUTION:
    Never reuse retaining pin.

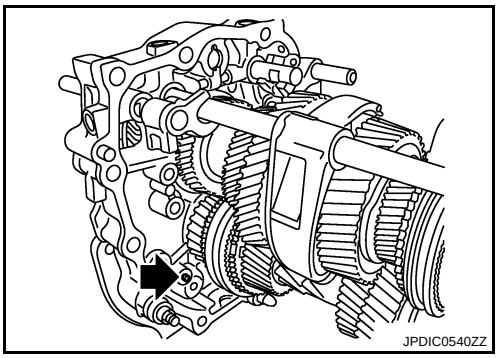


38. Install baffle plate with the following procedure.

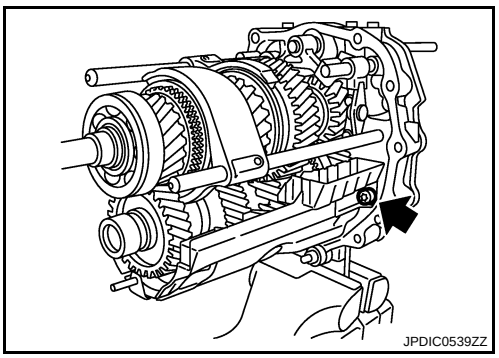
a. Insert baffle plate (1) until its projection contacts groove (A) of oil gutter (2).



b. Align baffle plate hole to adapter plate dowel pin (⬅).



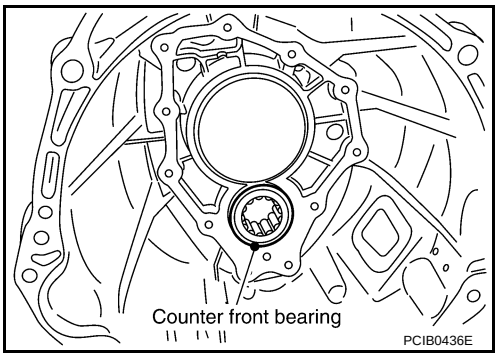
c. Install baffle plate mounting bolt (⬅) to adapter plate and then tighten baffle plate mounting bolt to the specified torque.



CASE AND EXTENSION [VIN: Up to JNKCV61E69M303072 (Without 4WAS) or JNKCV61E89M013724 (With 4WAS)]

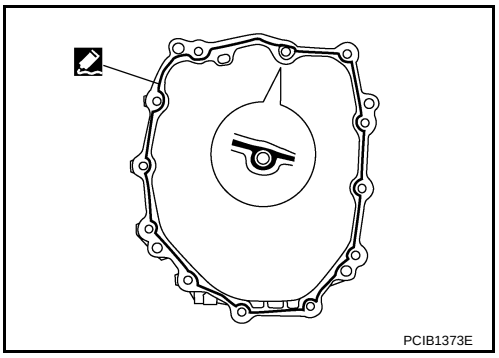
1. Apply recommended grease to roller of counter front bearing.
2. Install counter front bearing to transmission case.
3. Install oil gutter to transmission case.
4. Install breather tube to transmission case.

CAUTION:
Never reuse breather tube.

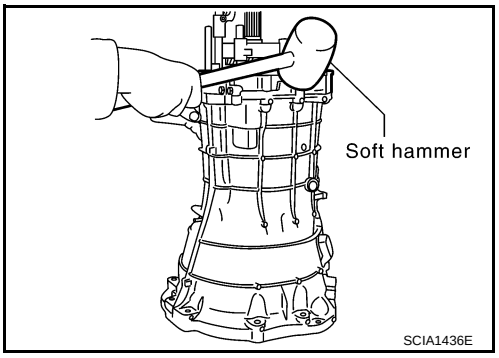


5. Apply recommended sealant to transmission case adapter plate mounting surface as shown in the figure.
   - **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

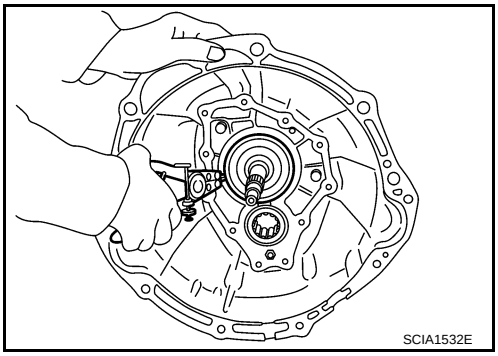
CAUTION:
Remove old sealant adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to both mounting surfaces.



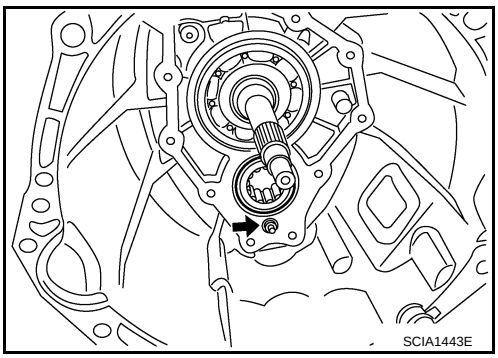
6. Place adapter plate in transmission case using a soft hammer to tap adapter plate to install it into transmission case.



7. Install snap ring to main drive gear bearing using a snap ring pliers.
CAUTION:
Never reuse snap ring.



8. Tighten baffle plate mounting nut to the specified torque.
9. Apply multi-purpose grease to lip of front cover oil seal.



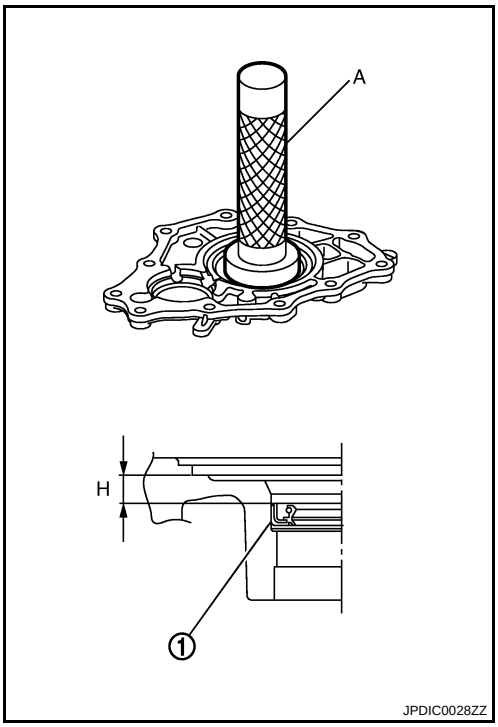
10. Install front cover oil seal (1) to front cover using the drift (A) [SST: KV38102100 (J-25803-01)].

Dimension "H" : 8.55 – 9.55 mm (0.3366 – 0.3760 in)

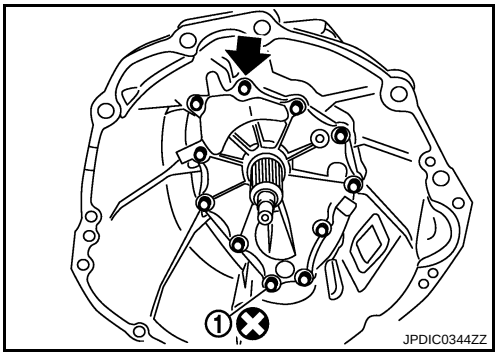
CAUTION:
- **Never reuse front cover oil seal.**
- **When installing, never incline front cover oil seal.**

11. Install front cover according to the following.

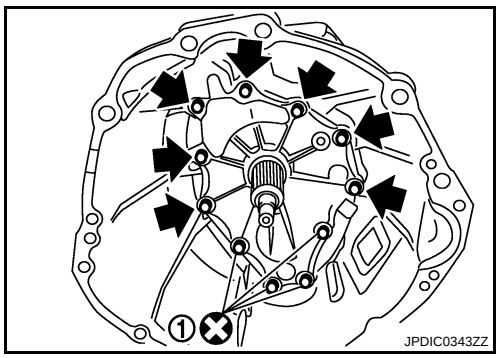
a. Install front cover gasket and front cover to transmission case.
CAUTION:
- **Never reuse front cover gasket.**
- **Never damage front cover oil seal.**
- **Remove any moisture, oil, or foreign material adhering to both mating surfaces.**



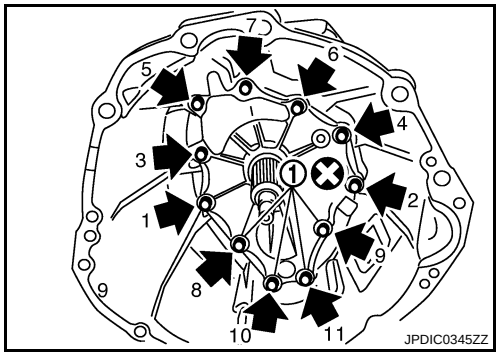
b. Temporary tightening mounting bolt (⬅) and sealing bolt (1).



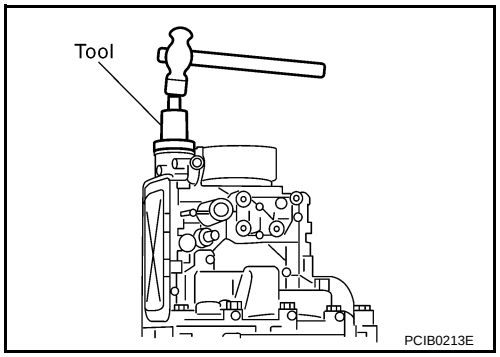
c. Temporary tightening remaining mounting bolts (⬅) and sealing bolts (1).



d. Tighten mounting bolts (⬅) and sealing bolts (1) to the specified torque in order as shown on the figure.



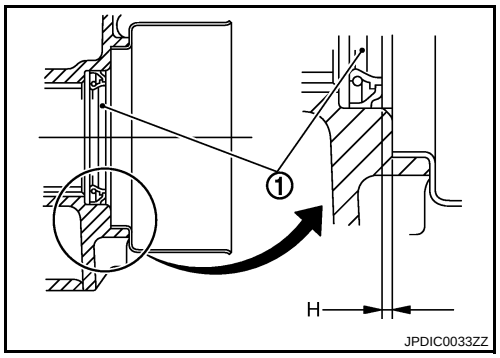
12. Apply gear oil to counter end bearing.
13. Install counter end bearing to rear extension.
CAUTION:
Never reuse counter end bearing.
14. Install rear extension oil gutter and cap to rear extension and then tighten mounting bolt to specified torque.
15. Install rear extension dust cover to rear extension.
16. Install bracket to transmission case and then tighten mounting bolt to specified torque.
17. Apply gear oil to reverse idler needle bearing.
18. Install reverse idler shaft, reverse idler needle bearing, reverse idler gear and reverse idler thrust washer to adapter plate.
19. Apply multi-purpose grease to striking rod oil seal lip.
CAUTION:
Never reuse striking rod oil seal.
20. Install striking rod oil seal to rear extension using the drift [SST: ST33061000 (J-8107-2)].
CAUTION:
When installing, never incline striking rod oil seal.
21. Apply multi-purpose grease to lip of rear oil seal.
CAUTION:
Never reuse rear oil seal.



22. Install rear oil seal (1) to rear extension using the drift [SST: ST33400001 (J-26082)].

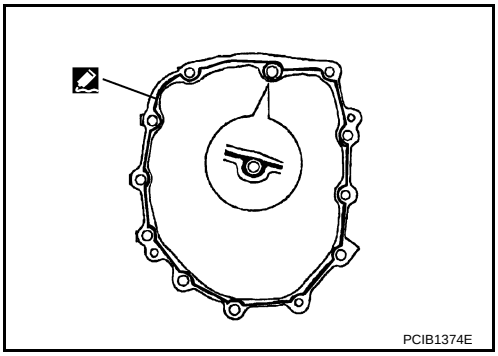
Dimension "H" : 1.2 – 2.2 mm (0.047 – 0.087 in)

CAUTION:
When installing, never incline rear oil seal.



23. Apply recommended sealant to adapter plate rear extension mounting surface as shown in the figure.
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

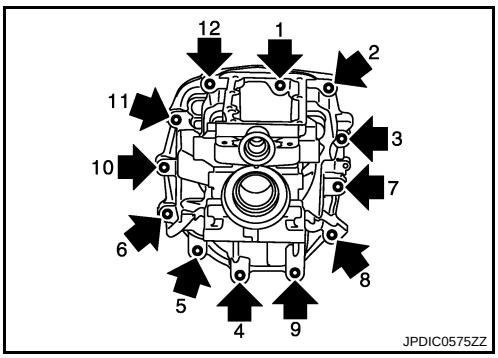
    CAUTION:
    Remove old sealant adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to both mounting surfaces.


PCIB1374E

24. Install rear extension to adapter plate and then tighten mounting bolts to the specified torque in order as shown in the figure.

    CAUTION:
    Never damage rear oil seal and striking rod oil seal.
25. Install control lever housing to rear extension and then tighten mounting bolts to the specified torque.

    CAUTION:
    Never hold control lever housing to prevent the bushing of control lever housing from deformation when moving transmission assembly.

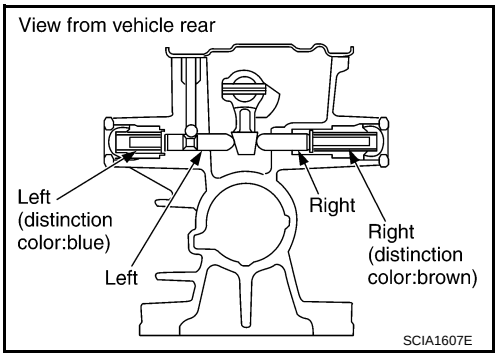


JPDIC0575ZZ

26. Apply gear oil to return spring plungers.
27. Install return spring plungers and return springs into rear extension.

Region	Return spring identification mark	Plunger groove
RH	Brown	No
LH	Blue	Yes

CAUTION:
The right and left return springs and return spring plungers are different, so make sure they are installed correctly.

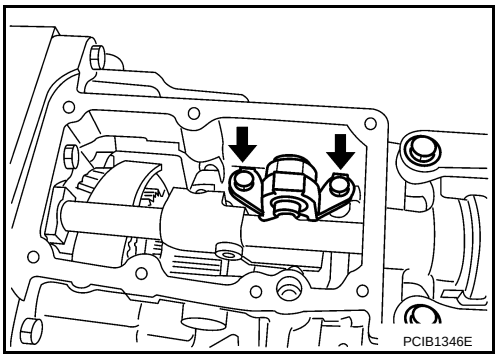


SCIA1607E

28. Apply recommended sealant to threads of return spring plugs and then tighten return spring plugs to the specified torque.
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

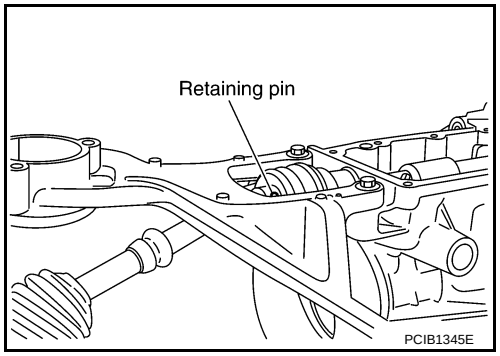
    CAUTION:
    Remove old sealant and oil adhering to threads.
29. Install check shift pin as a one unit with control bracket to rear extension and then tighten mounting bolts to the specified torque.
30. Install plunger to rear extension and then screwing park/neutral position (PNP) switch and back-up lamp switch to rear extension with 1 - 2 pitches.
31. Apply recommended sealant to threads of switches and tighten switches to the specified torque.
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

    CAUTION:
    Remove old sealant and oil adhering to threads.

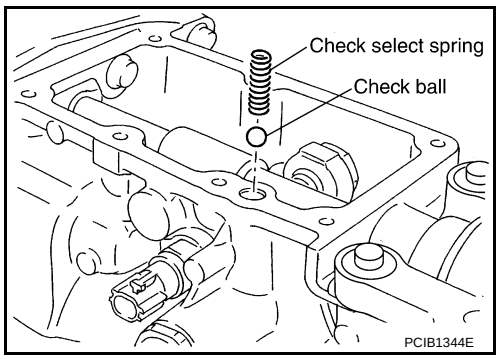

PCIB1346E

32. Install brackets to rear extension and then tighten bracket mounting bolts to the specified torque.

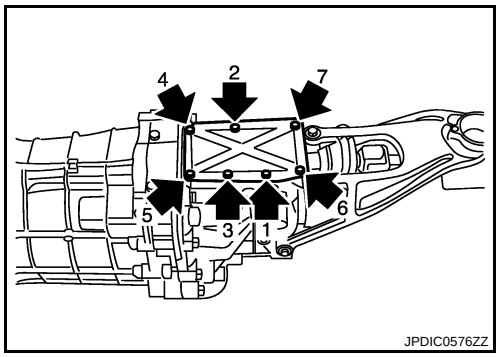
33. Install boot and control rod to striking rod.
34. Install the retaining pin into the control rod using a pin punch [Commercial service tool]. Then fit the boot to the striking rod oil seal and the groove on the control rod.
    CAUTION:
    Never reuse retaining pin.
35. Install boot to control rod.
    CAUTION:
    Fit the boot to the groove on the control rod.



36. Apply gear oil to check ball.
37. Install check ball and check select spring into rear extension.
38. Install rear extension upper cover gasket and rear extension upper cover to rear extension.
    CAUTION:
    - **Never reuse rear extension upper cover gasket.**
    - **Avoid tangling check select spring.**

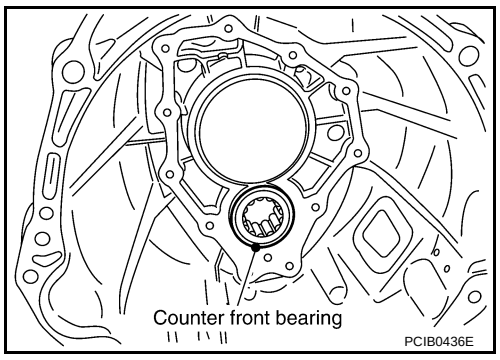


39. Tighten rear extension upper cover bolts to the specified torque in order as shown on the figure.
40. Install gasket to drain plug and then install it to transmission case. Tighten drain plug to the specified torque.
    CAUTION:
    Never reuse gasket.
41. Install gasket to filler plug and then install it to transmission case. Tighten filler plug to the specified torque.
    CAUTION:
    - **Never reuse gasket.**
    - **After oil is filled, tighten filler plug to specified torque.**



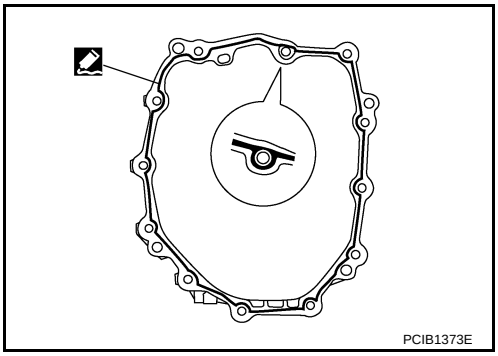
CASE AND EXTENSION [VIN: From JNKCV61E69M303073 (Without 4WAS) or JNKCV61E89M013725 (With 4WAS)]

1. Apply recommended grease to roller of counter front bearing.
2. Install counter front bearing to transmission case.
3. Install breather tube to transmission case.
   CAUTION:
   Never reuse breather tube.

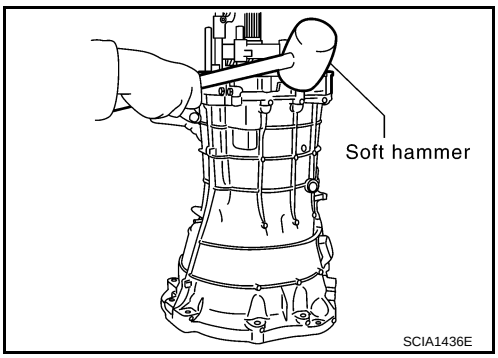


4. Apply recommended sealant to transmission case adapter plate mounting surface as shown in the figure.
   - **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

   CAUTION:
   Remove old sealant adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to both mounting surfaces.

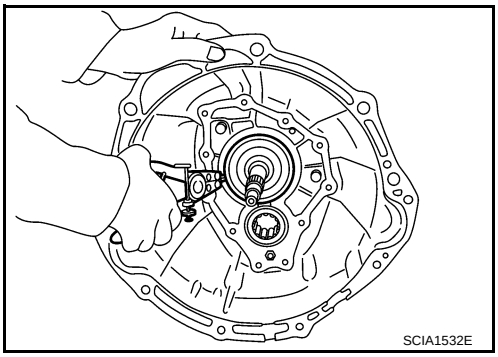


5. Place adapter plate in transmission case using a soft hammer to tap adapter plate to install it into transmission case.



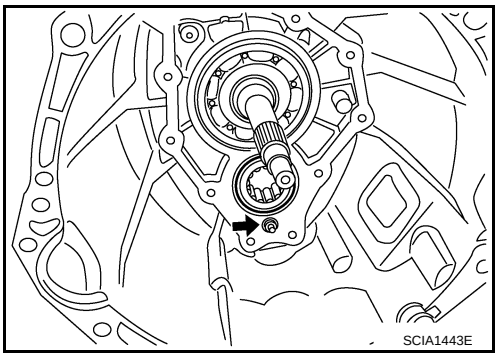
6. Install snap ring to main drive gear bearing using a snap ring pliers.

   CAUTION:
   Never reuse snap ring.



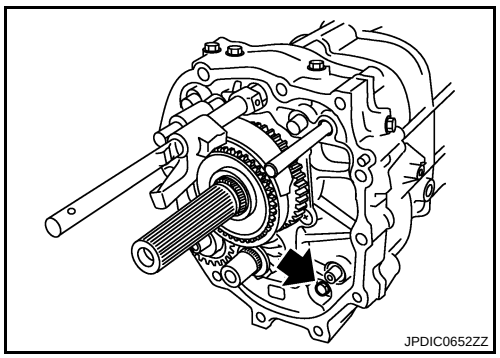
7. Install baffle plate with the following procedure.

a. Tighten baffle plate mounting nut (⬅) to the specified torque.



b. Install baffle plate mounting bolt (⬅) to adapter plate and then tighten baffle plate mounting bolt to the specified torque.

8. Apply multi-purpose grease to lip of front cover oil seal.



9. Install front cover oil seal (1) to front cover using the drift (A) [SST: KV38102100 (J-25803-01)].

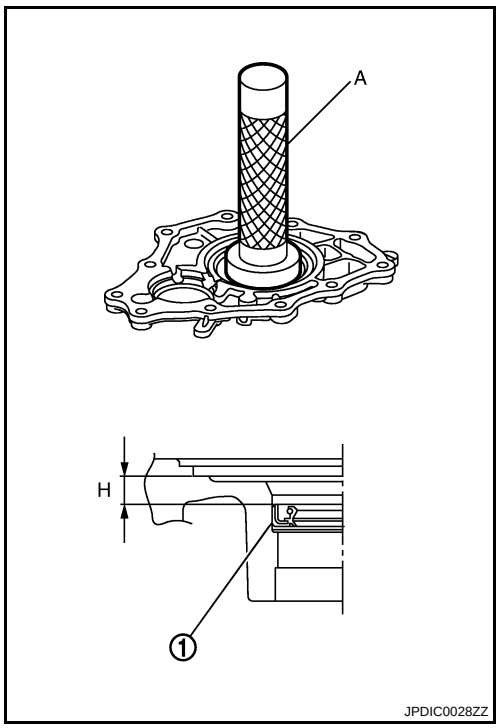
Dimension "H" : 8.55 – 9.55 mm (0.3366 – 0.3760 in)

CAUTION:
- **Never reuse front cover oil seal.**
- **When installing, never incline front cover oil seal.**

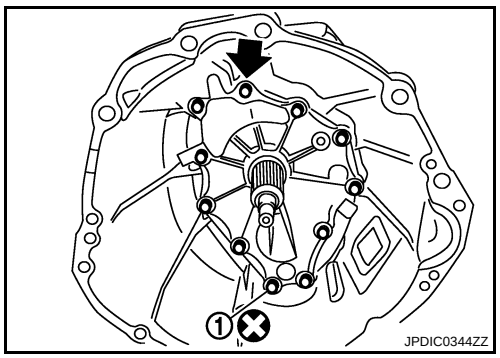
10. Install front cover according to the following.

a. Install front cover gasket and front cover to transmission case.

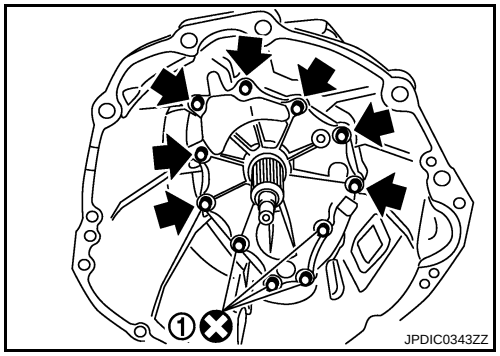
CAUTION:
- **Never reuse front cover gasket.**
- **Never damage front cover oil seal.**
- **Remove any moisture, oil, or foreign material adhering to both mating surfaces.**



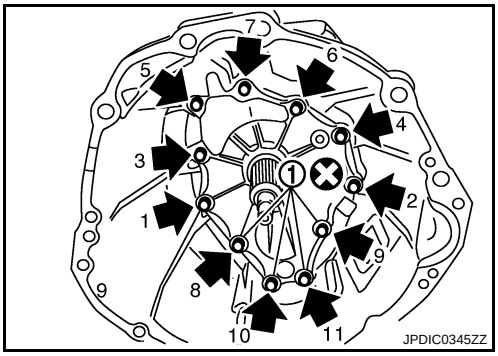
b. Temporary tightening mounting bolt (⬅) and sealing bolt (1).



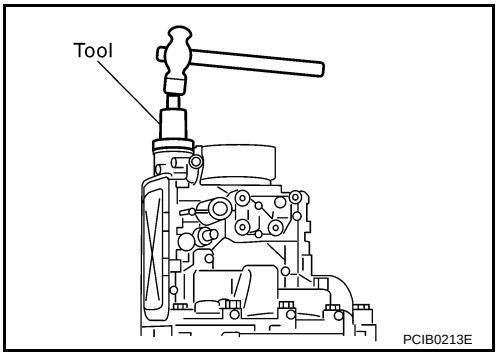
c. Temporary tightening remaining mounting bolts (⬅) and sealing bolts (1).



d. Tighten mounting bolts (⬅) and sealing bolts (1) to the specified torque in order as shown on the figure.



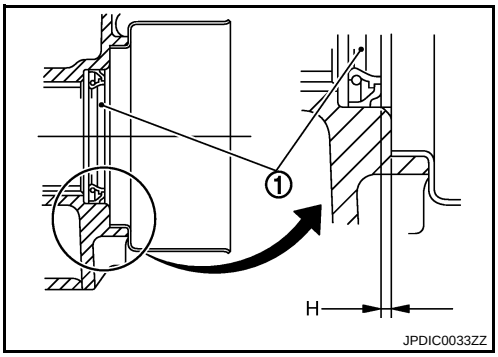
11. Apply gear oil to counter end bearing.
12. Install counter end bearing to rear extension.
    CAUTION:
    Never reuse counter end bearing.
13. Install rear extension oil gutter and cap to rear extension and then tighten mounting bolt to specified torque.
14. Install rear extension dust cover to rear extension.
15. Install bracket to transmission case and then tighten mounting bolt to specified torque.
16. Apply gear oil to reverse idler needle bearing.
17. Install reverse idler shaft, reverse idler needle bearing, reverse idler gear and reverse idler thrust washer to adapter plate.
18. Apply multi-purpose grease to striking rod oil seal lip.
    CAUTION:
    Never reuse striking rod oil seal.
19. Install striking rod oil seal to rear extension using the drift [SST: ST33061000 (J-8107-2)].
    CAUTION:
    When installing, never incline striking rod oil seal.



20. Apply multi-purpose grease to lip of rear oil seal.
    CAUTION:
    Never reuse rear oil seal.
21. Install rear oil seal (1) to rear extension using the drift [SST: ST33400001 (J-26082)].

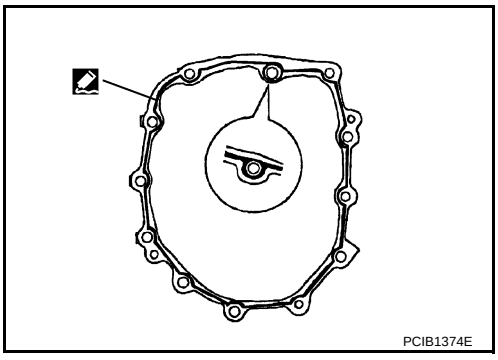
    Dimension "H" : 1.2 – 2.2 mm (0.047 – 0.087 in)

    CAUTION:
    When installing, never incline rear oil seal.

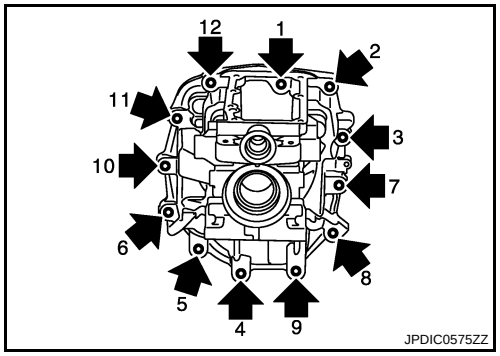


22. Apply recommended sealant to adapter plate rear extension mounting surface as shown in the figure.
    - **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

    CAUTION:
    Remove old sealant adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to both mounting surfaces.



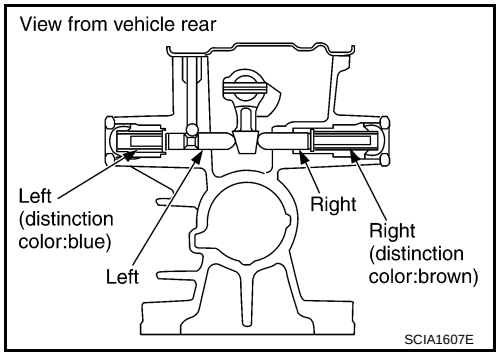
23. Install rear extension to adapter plate and then tighten mounting bolts to the specified torque in order as shown in the figure.
CAUTION:
Never damage rear oil seal and striking rod oil seal.



24. Install control lever housing to rear extension and then tighten mounting bolts to the specified torque.
CAUTION:
Never hold control lever housing to prevent the bushing of control lever housing from deformation when moving transmission assembly.

25. Apply gear oil to return spring plungers.
26. Install return spring plungers and return springs into rear extension.

Region	Return spring identification mark	Plunger groove
RH	Brown	No
LH	Blue	Yes



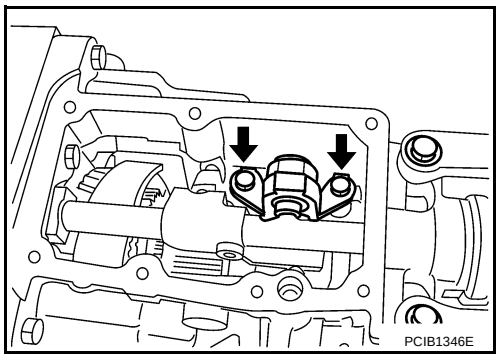
CAUTION:
The right and left return springs and return spring plungers are different, so make sure they are installed correctly.

27. Apply recommended sealant to threads of return spring plugs and then tighten return spring plugs to the specified torque.
- **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

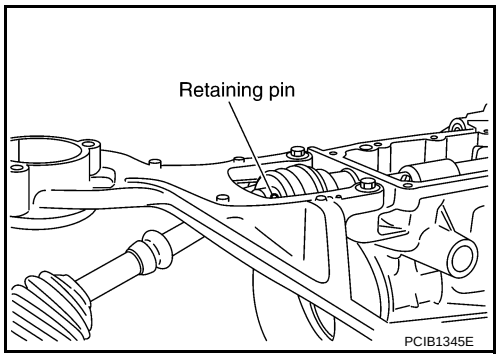
CAUTION:
Remove old sealant and oil adhering to threads.

28. Install check shift pin as a one unit with control bracket to rear extension and then tighten mounting bolts to the specified torque.
29. Install plunger to rear extension and then screwing park/neutral position (PNP) switch and back-up lamp switch to rear extension with 1 - 2 pitches.
30. Apply recommended sealant to threads of switches and tighten switches to the specified torque.
- **Use Genuine Silicone RTV or an equivalent. Refer to GI-17, "Recommended Chemical Products and Sealants".**

CAUTION:
Remove old sealant and oil adhering to threads.

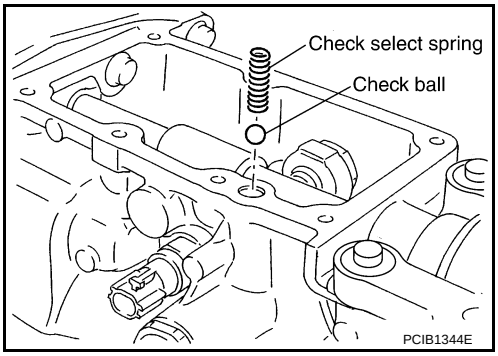


31. Install brackets to rear extension and then tighten bracket mounting bolts to the specified torque.
32. Install boot and control rod to striking rod.
33. Install the retaining pin into the control rod using a pin punch [Commercial service tool]. Then fit the boot to the striking rod oil seal and the groove on the control rod.
CAUTION:
Never reuse retaining pin.
34. Install boot to control rod.
CAUTION:
Fit the boot to the groove on the control rod.

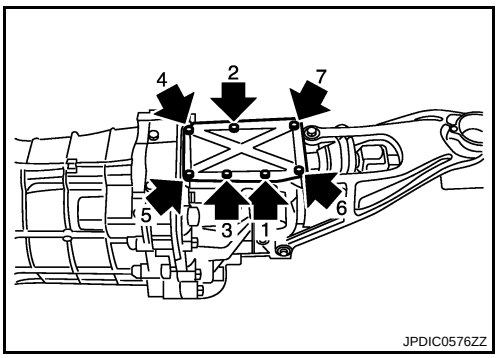


35. Apply gear oil to check ball.

36. Install check ball and check select spring into rear extension.
37. Install rear extension upper cover gasket and rear extension upper cover to rear extension.
    CAUTION:
    - **Never reuse rear extension upper cover gasket.**
    - **Avoid tangling check select spring.**



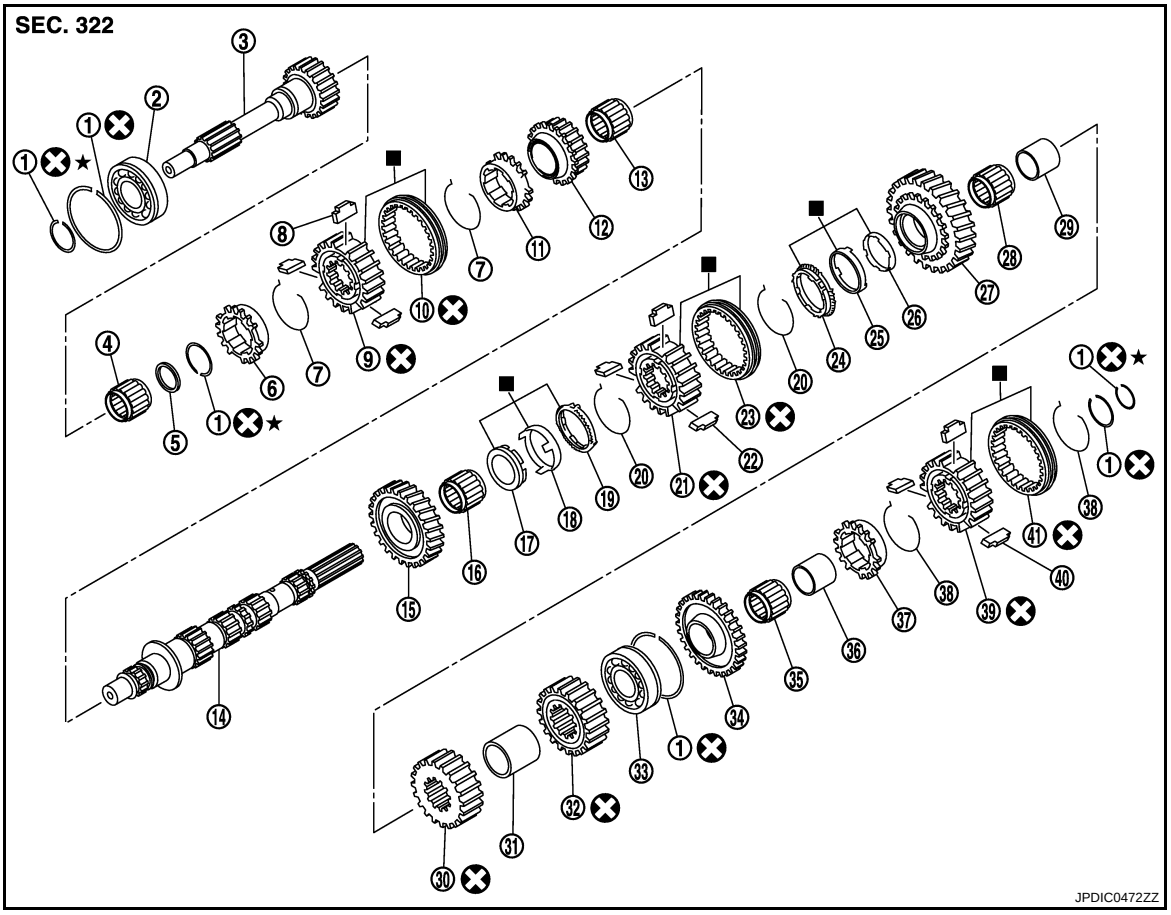
38. Tighten rear extension upper cover bolts to the specified torque in order as shown on the figure.
39. Install gasket to drain plug and then install it to transmission case. Tighten drain plug to the specified torque.
    CAUTION:
    Never reuse gasket.
40. Install gasket to filler plug and then install it to transmission case. Tighten filler plug to the specified torque.
    CAUTION:
    - **Never reuse gasket.**
    - **After oil is filled, tighten filler plug to specified torque.**



MAIN DRIVE GEAR

Exploded View

INFOID:0000000005782531



1. Snap ring
2. Main drive gear bearing
3. Main drive gear
4. Main pilot bearing
5. Pilot bearing spacer
6. 5th baulk ring
7. 5th-6th spread spring
8. 5th-6th shifting insert
9. 5th-6th synchronizer hub
10. 5th-6th coupling sleeve
11. 6th baulk ring
12. 6th main gear
13. 6th needle bearing
14. Mainshaft
15. 2nd main gear
16. 2nd needle bearing
17. 2nd inner baulk ring
18. 2nd synchronizer cone
19. 2nd outer baulk ring
20. 1st-2nd spread spring
21. 1st-2nd synchronizer hub
22. 1st-2nd shifting insert
23. 1st-2nd coupling sleeve
24. 1st outer baulk ring
25. 1st synchronizer cone
26. 1st inner baulk ring
27. 1st main gear
28. 1st needle bearing
29. 1st gear bushing
30. 3rd main gear
31. 3rd-4th main spacer
32. 4th main gear
33. Mainshaft bearing
34. Reverse main gear
35. Reverse main needle bearing
36. Reverse main gear bushing
37. Reverse baulk ring
38. Reverse spread spring
39. Reverse synchronizer hub
40. Reverse shifting insert
41. Reverse coupling sleeve

■: Replace the parts as a set.

Refer to GI-4, "Components" for symbols not described on the above.

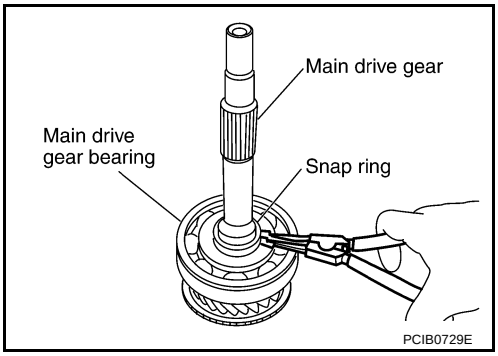
- Apply gear oil to gears, shafts, synchronizers, and bearings when assembly.

Disassembly

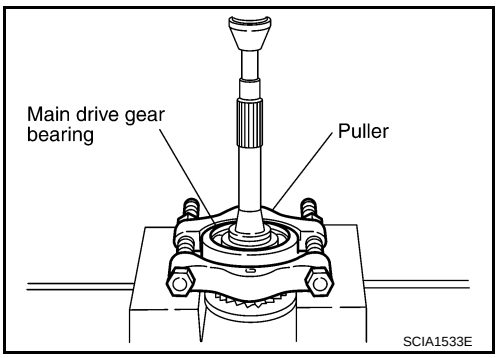
INFOID:0000000004243199

1. Remove 5th baulk ring, pilot bearing spacer, and main pilot bearing from main drive gear.

2. Remove snap ring from main drive gear using a snap ring pliers.



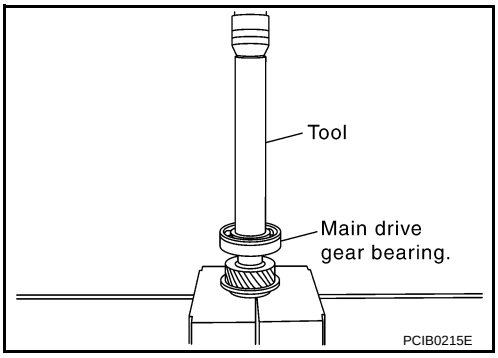
3. Set a puller [Commercial service tool] on main drive gear bearing, and remove main drive gear bearing from main drive gear using a press.



Assembly

INFOID:0000000004243200

1. Using the drift [SST: KV32102700 (-)] and a press to press- fit main drive gear bearing onto main drive gear.

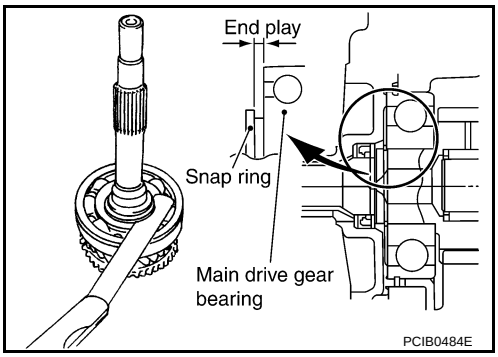


2. Select and install a snap ring to main drive gear so that the end play comes within the standard value.

End play standard value : Refer to TM-99, "End Play".

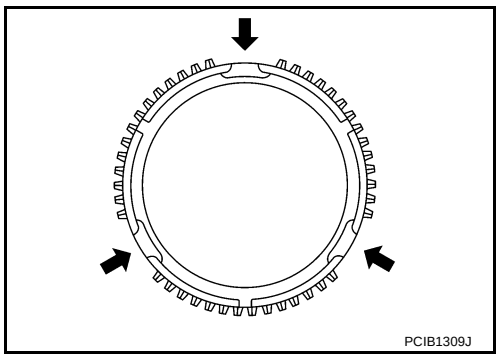
CAUTION:
Never reuse snap ring.

3. Apply gear oil to main pilot bearing and 5th baulk ring.



4. Install main pilot bearing, pilot bearing spacer, and 5th baulk ring to main drive gear.
NOTE:

5th and 6th baulk rings have three spaces that four gear teeth are missing as shown in the figure.



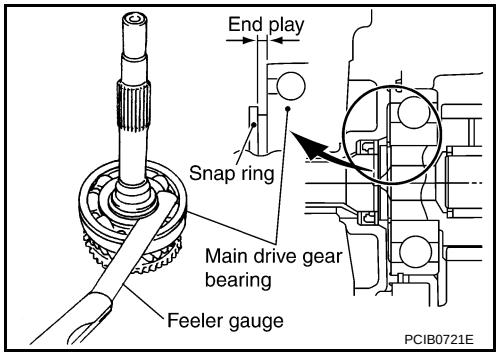
Inspection

INFOID:0000000004243201

INSPECTION BEFORE DISASSEMBLY

Before disassembly, measure end play. If the end play is outside the specifications, disassembly and inspect.

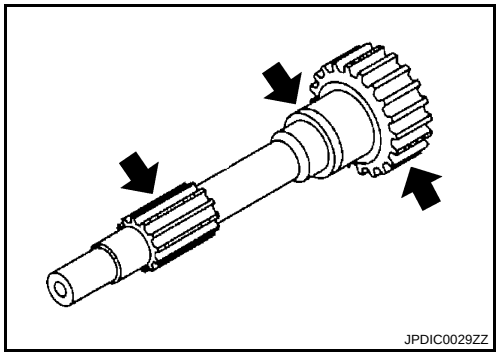
End play standard value : Refer to TM-99, "End Play".



INSPECTION AFTER DISASSEMBLY

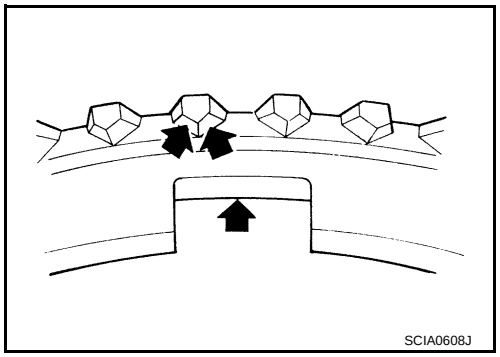
Gear

If the contact surface on main drive gear, etc. has damage, peeling, abrasion, dent, bent, or any other damage, replace the components.



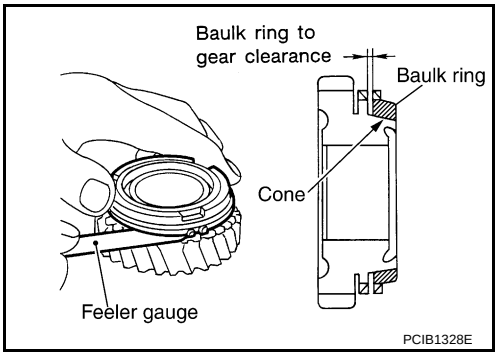
Baulk Ring

If the cam surface on baulk ring or contact surface on insert has damage or excessive wear, replace with a new one.



Baulk Ring Clearance for Single Cone Synchronizer (5th)

Press baulk ring on the cone, and measure the clearance between baulk ring and cone. If the measurement is below limit, replace it with a new one.

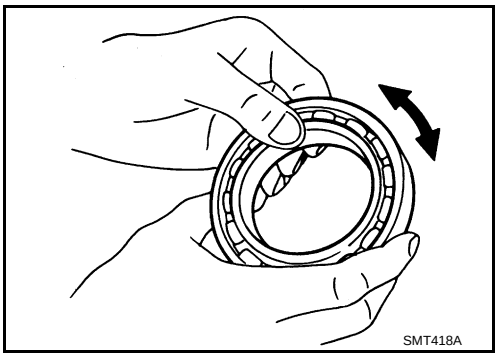


Clearance

Standard value	**: Refer to TM-99, "Baulk Ring Clearance".**
Limit value	**: Refer to TM-99, "Baulk Ring Clearance".**

Bearing

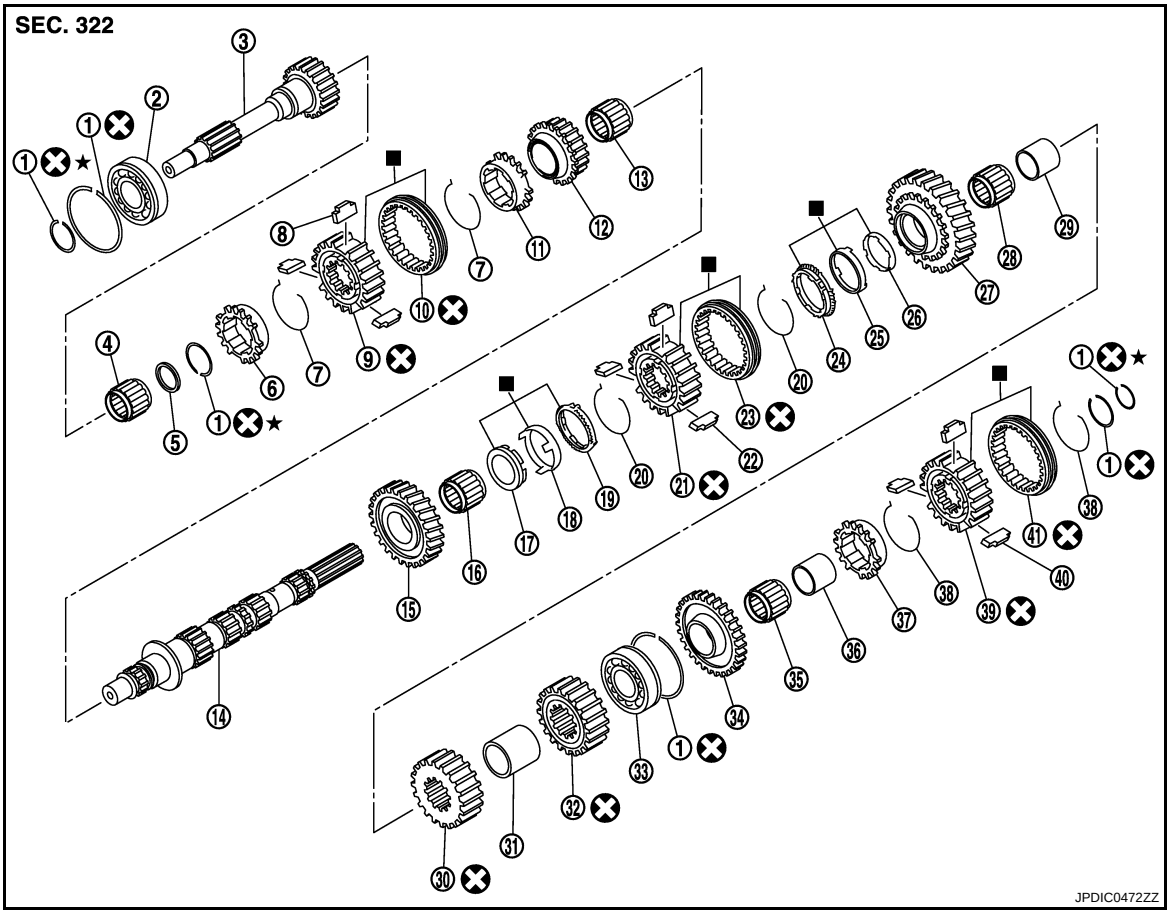
If the bearing does not rotate smoothly or the contact surface on ball or race is damaged or peeled, replace with new ones.



MAINSHAFT AND GEAR

Exploded View

INFOID:0000000005782541



1. Snap ring	2. Main drive gear bearing	3. Main drive gear
4. Main pilot bearing	5. Pilot bearing spacer	6. 5th baulk ring
7. 5th-6th spread spring	8. 5th-6th shifting insert	9. 5th-6th synchronizer hub
10. 5th-6th coupling sleeve	11. 6th baulk ring	12. 6th main gear
13. 6th needle bearing	14. Mainshaft	15. 2nd main gear
16. 2nd needle bearing	17. 2nd inner baulk ring	18. 2nd synchronizer cone
19. 2nd outer baulk ring	20. 1st-2nd spread spring	21. 1st-2nd synchronizer hub
22. 1st-2nd shifting insert	23. 1st-2nd coupling sleeve	24. 1st outer baulk ring
25. 1st synchronizer cone	26. 1st inner baulk ring	27. 1st main gear
28. 1st needle bearing	29. 1st gear bushing	30. 3rd main gear
31. 3rd-4th main spacer	32. 4th main gear	33. Mainshaft bearing
34. Reverse main gear	35. Reverse main needle bearing	36. Reverse main gear bushing
37. Reverse baulk ring	38. Reverse spread spring	39. Reverse synchronizer hub
40. Reverse shifting insert	41. Reverse coupling sleeve	

■: Replace the parts as a set.

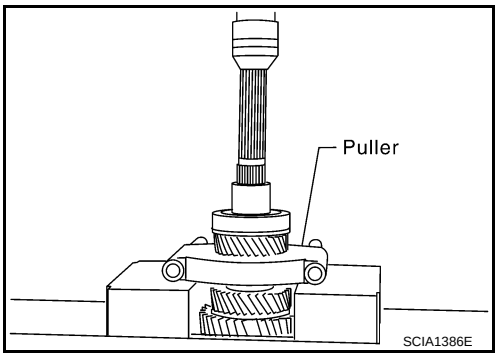
Refer to GI-4, "Components" for symbols not described on the above.

- Apply gear oil to gears, shafts, synchronizers, and bearings when assembly.

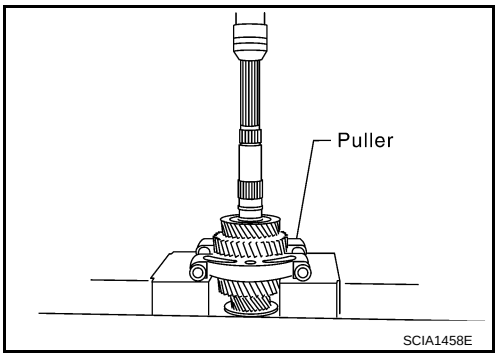
Disassembly

INFOID:0000000004243203

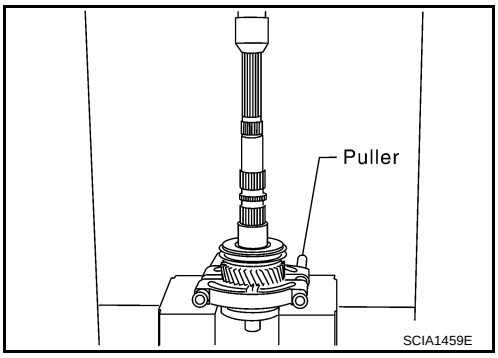
1. Using a press to remove reverse main gear bushing, mainshaft bearing, and 4th main gear.
2. Remove 3rd-4th main spacer.



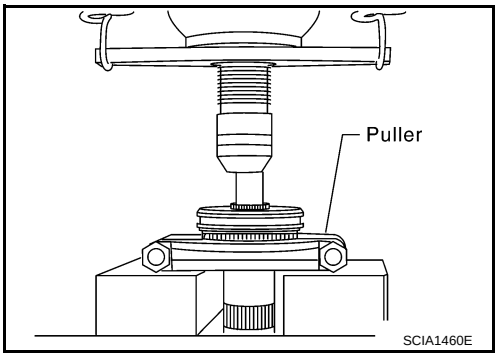
3. Using a press to remove 1st main gear and 3rd main gear.
   CAUTION:
   Never damage baulk ring.
4. Remove 1st outer baulk ring, 1st synchronizer cone, 1st inner baulk ring, and 1st needle bearing.



5. Using a press to remove 1st gear bushing, 1st-2nd synchronizer hub assembly, 2nd outer baulk ring, 2nd synchronizer cone, 2nd inner baulk ring, and 2nd main gear.
   CAUTION:
   Be aware that when using the press, if mainshaft gear positioner catches on the V-block, etc., mainshaft could be damaged.
6. Remove 2nd needle bearing.
7. Remove 1st-2nd spread springs, 1st-2nd shifting inserts, 1st-2nd coupling sleeve from 1st-2nd synchronizer hub.
8. Remove snap ring from mainshaft.



9. Using a press to remove 6th main gear, 6th baulk ring, and 5th-6th synchronizer hub assembly.
10. Remove 6th needle bearing.
11. Remove 5th-6th spread springs, 5th-6th shifting inserts, and 5th-6th coupling sleeve from 5th-6th synchronizer hub.



Assembly

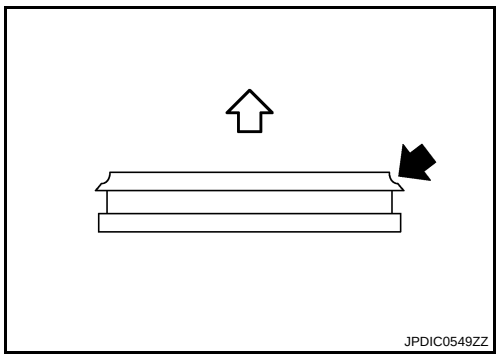
INFOID:0000000004243204

1. Install 5th-6th coupling sleeve and 5th-6th shifting inserts to 5th-6th synchronizer hub.
   CAUTION:

- **Be careful with the orientation of 5th-6th coupling sleeve.**

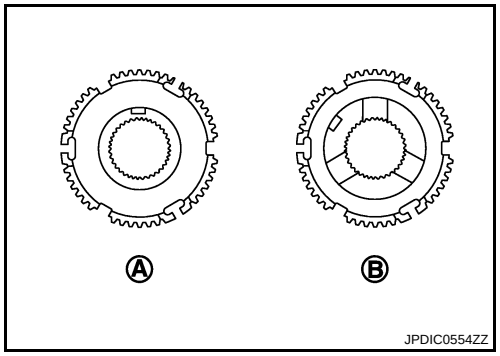
  ⇦ : 6th main gear side

- **Never reuse 5th-6th coupling sleeve and 5th-6th synchronizer hub.**
- **Replace 5th-6th coupling sleeve and 5th-6th synchronizer hub as a set.**

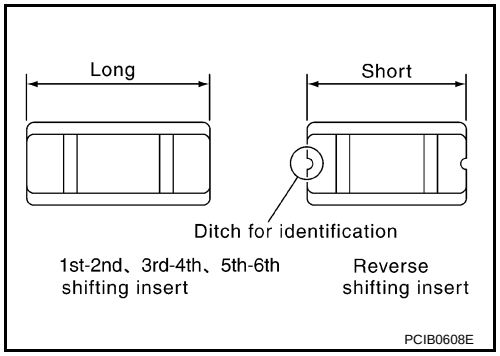


- **Be careful with the orientation of 5th-6th synchronizer hub.**

  A : 5th main gear side
  B : 6th main gear side

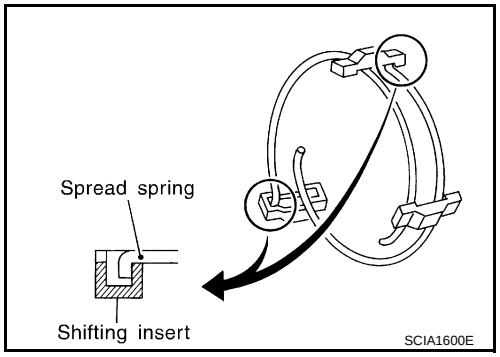


- **Be careful with the shape of reverse shifting insert to avoid misassembly.**

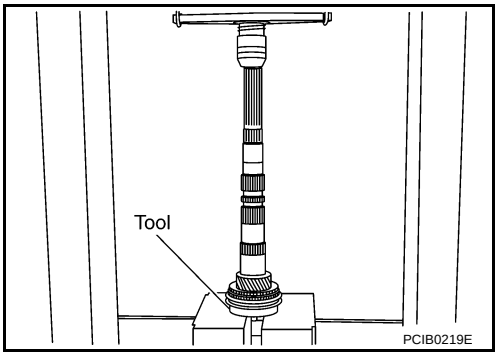


2. Install 5th-6th spread springs to 5th-6th shifting inserts.

CAUTION:
Never install 5th-6th spread spring hook onto the same 5th-6th shifting insert.

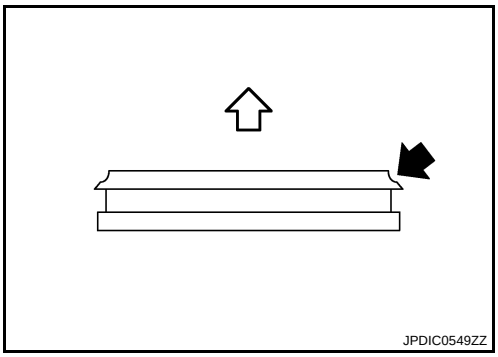


3. Apply gear oil to 6th needle bearing and 6th baulk ring.
4. Install 6th needle bearing, 6th main gear, and 6th baulk ring on mainshaft and then using the inserter [SST: ST30911000 (-)] and a press to press-fit 5th-6th synchronizer hub assembly.

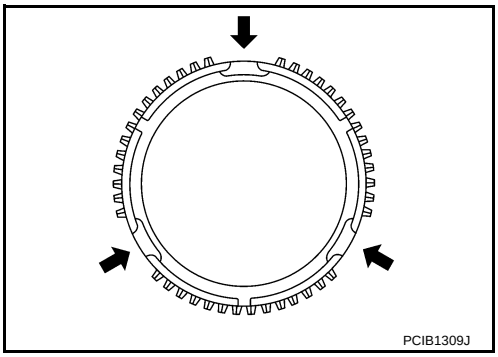


CAUTION:
Be careful with the orientation of 5th-6th coupling sleeve.

⇦ : 6th main gear side



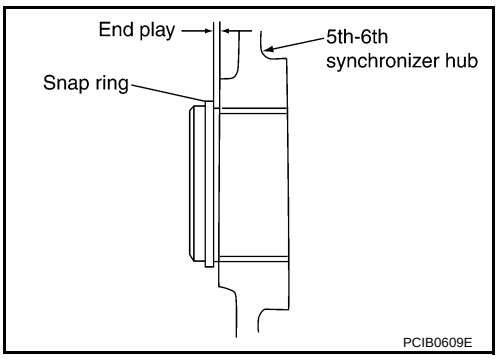
NOTE:
5th and 6th baulk rings have three spaces that four gear teeth are missing as shown in the figure.



5. Select and install a snap ring so that the end play comes within the standard value.

End play standard value : Refer to TM-99, "End Play".

CAUTION:
Never reuse snap ring.

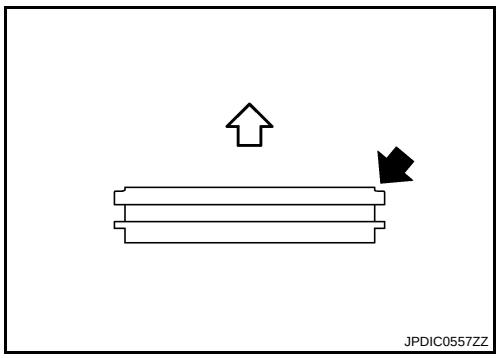


6. Install 1st-2nd coupling sleeve and 1st-2nd shifting inserts to 1st-2nd synchronizer hub.
CAUTION:

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

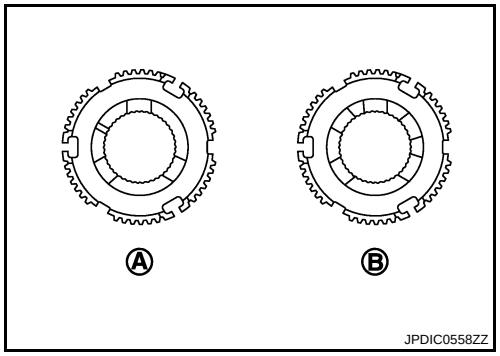
  ⇦ : 2nd main gear side

- **Never reuse 1st-2nd coupling sleeve and 1st-2nd synchronizer hub.**
- **Replace 1st-2nd coupling sleeve and 1st-2nd synchronizer hub as a set.**

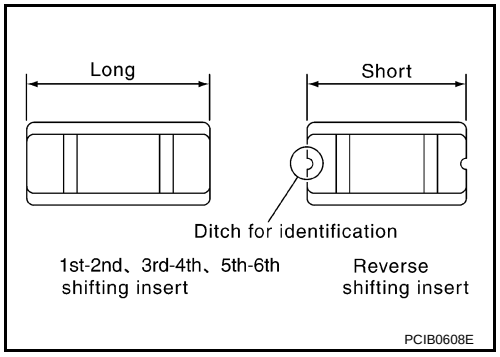


- **Be careful with the orientation of 1st-2nd synchronizer hub.**

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

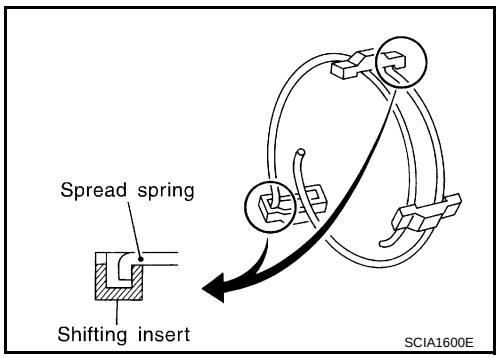


- **Be careful with the shape of reverse shifting insert to avoid misassembly.**



7. Install 1st-2nd spread springs to 1st-2nd shifting inserts.

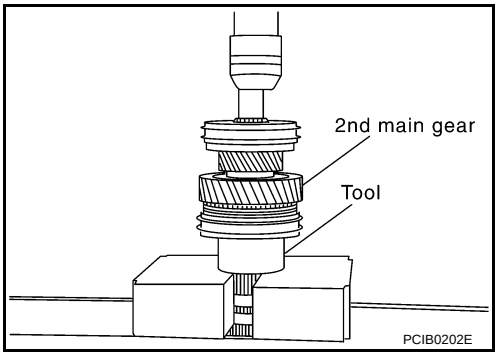
CAUTION:
Never install 1st-2nd spread spring hook onto the same 1st-2nd shifting insert.



8. Apply gear oil to 2nd needle bearing, 2nd inner baulk ring, 2nd synchronizer cone, and 2nd outer baulk ring.
9. Install 2nd main gear, 2nd needle bearing, 2nd inner baulk ring, 2nd synchronizer cone, and 2nd outer baulk ring on mainshaft and then using the support ring [SST: ST27861000 (-)] and a press to press-fit 1st-2nd synchronizer hub assembly.

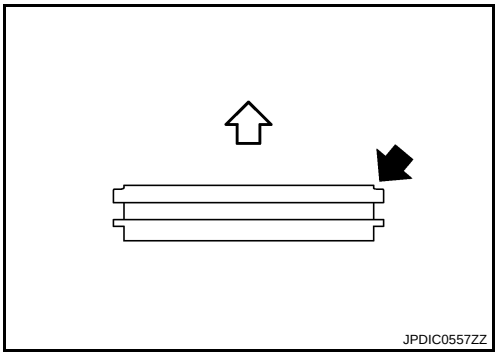
CAUTION:

- **Replace 2nd inner baulk ring, 2nd synchronizer cone and 2nd outer baulk ring as a set.**



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

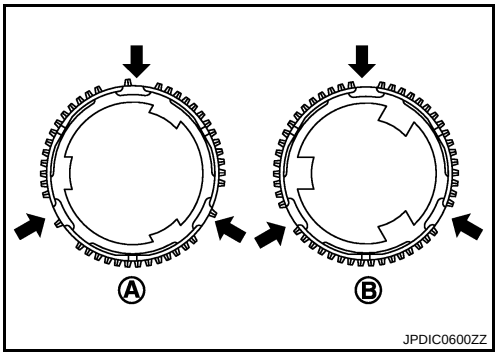
⇦ : 2nd main gear side



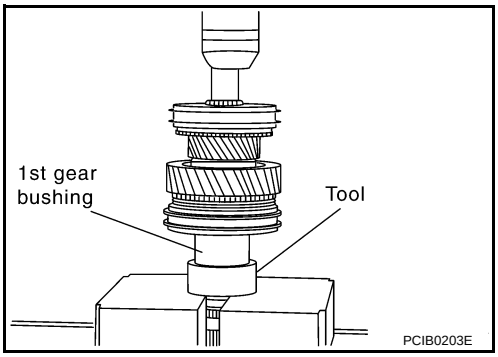
NOTE:

1st outer baulk ring has three spaces that four gear tooth is missing and 2nd outer baulk ring has three spaces that two gear teeth are missing.

A : 1st outer baulk ring
B : 2nd outer baulk ring



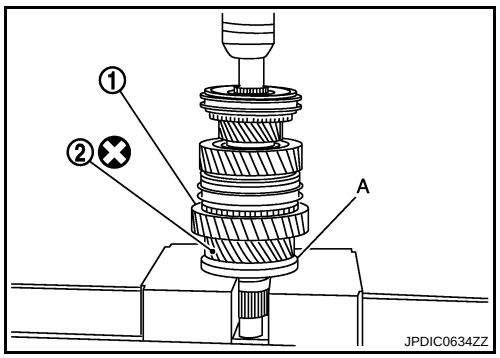
10. Using the support ring [SST: ST27861000 (-)] and a press to press-fit 1st gear bushing.
11. Apply gear oil to 1st needle bearing, 1st outer baulk ring, 1st synchronizer cone and 1st inner baulk ring.



12. Install 1st outer baulk ring, 1st synchronizer cone, 1st inner baulk ring, 1st needle bearing and 1st main gear (1) on mainshaft and then using the inserter (A) [SST: ST30022000 (-)] and a press to press-fit 3rd main gear (2).

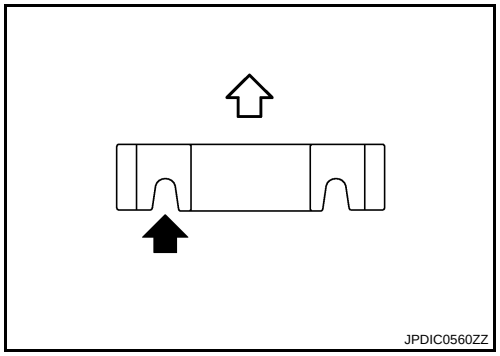
CAUTION:

- **Replace 1st outer baulk ring, 1st synchronizer cone and 1st inner baulk ring as a set.**



- **Be careful with the orientation of 3rd main gear.**

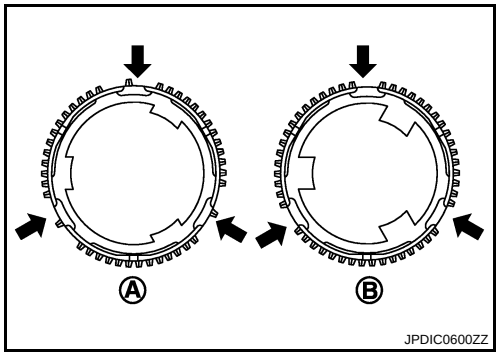
⇦ : 1st main gear side



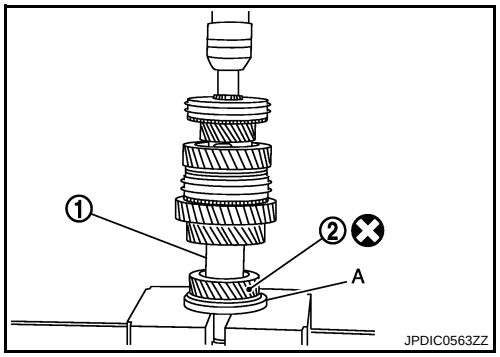
NOTE:

1st outer baulk ring has three spaces that four gear tooth is missing and 2nd outer baulk ring has three spaces that two gear teeth are missing.

A : 1st outer baulk ring
B : 2nd outer baulk ring



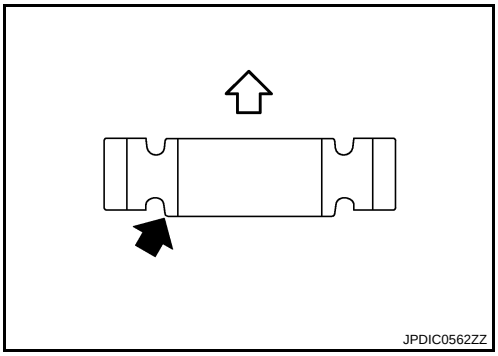
13. Install 3rd-4th main spacer (1) on mainshaft and then using the inserter (A) [SST: ST30022000 (-)] and a press to press-fit 4th main gear (2).



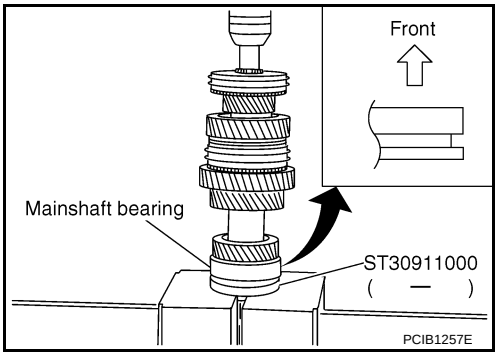
CAUTION:

Be careful with the orientation of 4th main gear.

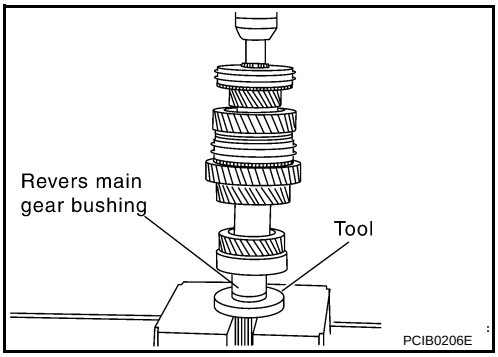
⇦ : 3rd-4th main spacer side



14. Using the inserter [SST] and a press to press-fit mainshaft bearing onto mainshaft.



15. Using the inserter [SST: ST30911000 (-)] and a press to press-fit reverse main gear bushing onto mainshaft.

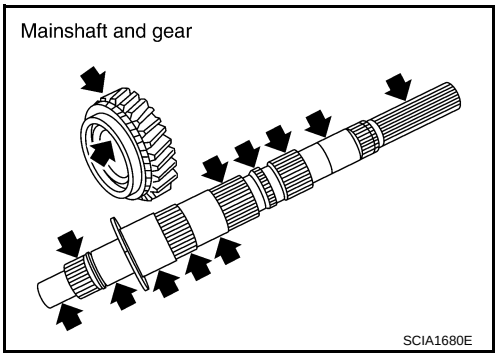


Inspection

INFOID:0000000004243205

MAINSHAFT AND GEAR

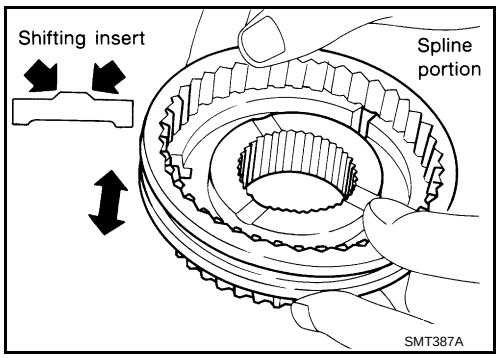
If the contact surface on each gear and mainshaft. has damage, peeling, abrasion, dent, bent, or any other damage, replace the components.



SYNCHRONIZER

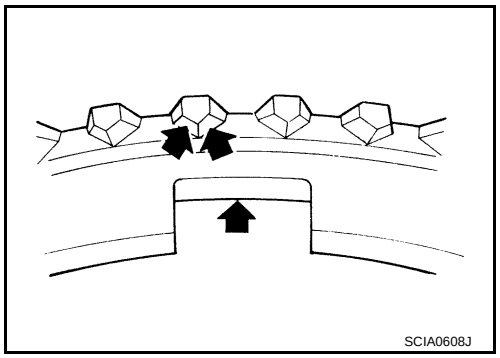
Synchronizer Hub and Coupling Sleeve

- If the contact surface on coupling sleeve, synchronizer hub and shifting insert has damage or abrasion, replace the components.
- Coupling sleeve and synchronizer hub shall move smoothly.



Baulk Ring and Spread Spring

- If the cam surface on baulk ring or contact surface on insert has damage or excessive wear, replace with a new one.
- If spread spring is damaged, replace with a new one.

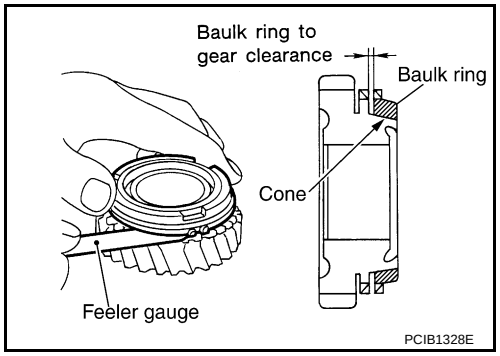


Baulk Ring Clearance for Single Cone Synchronizer (6th and Reverse)

Press baulk ring on the cone and measure the clearance between baulk ring and cone. If the measurement is below limit, replace it with a new one.

Clearance

Standard value	**: Refer to TM-99, "Baulk Ring Clearance".**
Limit value	**: Refer to TM-99, "Baulk Ring Clearance".**

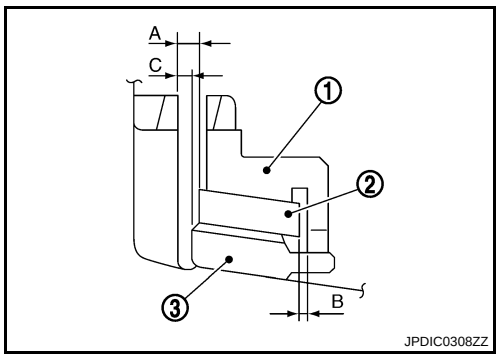


Baulk Ring Clearance for Triple Cone Synchronizer (1st and 2nd)

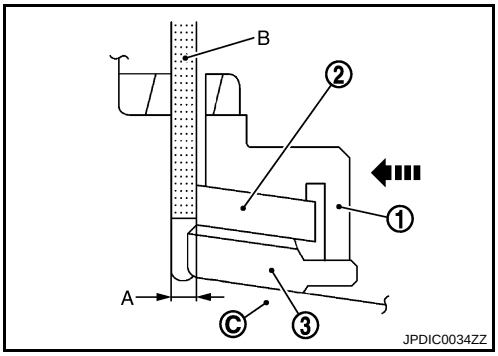
Check the clearance between outer baulk ring (1), synchronizer cone (2), and inner baulk ring (3) as follows.

CAUTION:

The clearances “A”, “B” and “C” are controlled with outer baulk ring, synchronizer cone, and inner baulk ring as a set. Replace them as a set if the clearances are outside the limit value.



1. Measure the clearance “A” at 2 points or more diagonally opposite using a feeler gauge (B) when pressing outer baulk ring (1), synchronizer cone (2), and inner baulk ring (3) toward gear taper cone (C). And then calculate mean value.

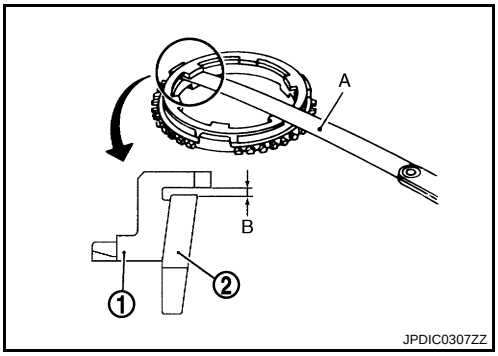


Clearance “A”

Standard value	**: Refer to TM-99, "Baulk Ring Clearance".**
Limit value	**: Refer to TM-99, "Baulk Ring Clearance".**

2. Measure the clearance “B” at 2 points or more diagonally opposite using a feeler gauge (A). And then calculate mean value.

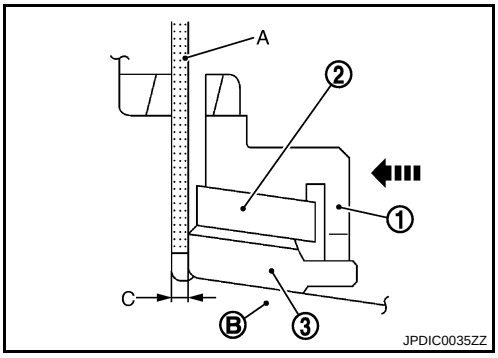
1 : Outer baulk ring
2 : Synchronizer cone



Clearance “B”

Standard value	**: Refer to TM-99, "Baulk Ring Clearance".**
Limit value	**: Refer to TM-99, "Baulk Ring Clearance".**

3. Measure the clearance “C” at 2 points or more diagonally opposite using a feeler gauge (A) when pressing outer baulk ring (1), synchronizer cone (2), and inner baulk ring (3) toward gear taper cone (B). And then calculate mean value.

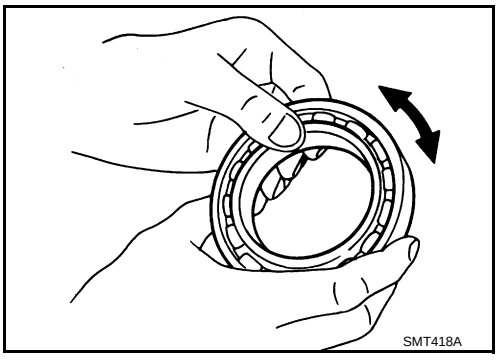


Clearance “C”

Standard value	**: Refer to TM-99, "Baulk Ring Clearance".**
Limit value	**: Refer to TM-99, "Baulk Ring Clearance".**

Bearing

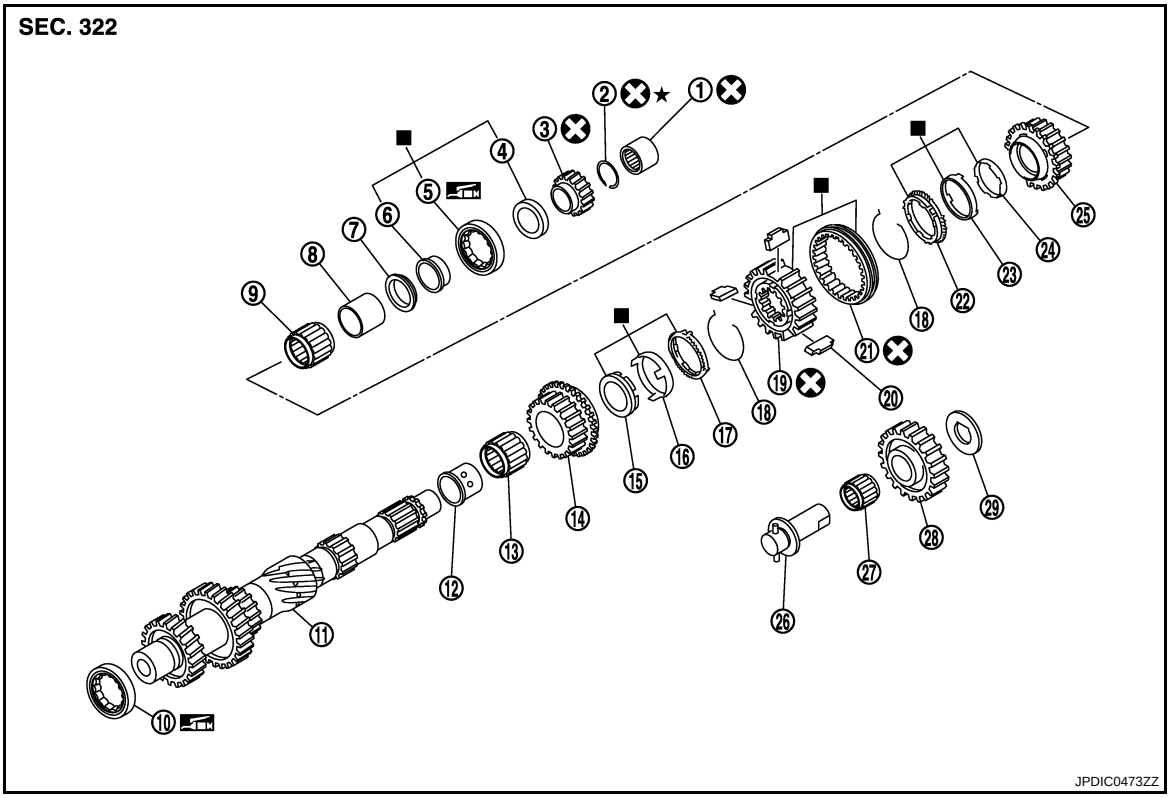
If the bearing does not rotate smoothly or the contact surface on ball or race is damaged or peeled, replace with new ones.



COUNTER SHAFT AND GEAR

Exploded View

INFOID:0000000005782533



1. Counter end bearing
2. Snap ring
3. Reverse counter gear
4. Counter rear bearing spacer
5. Counter rear bearing
6. Counter rear bearing inner race
7. 4th counter gear thrust washer
8. 4th gear bushing
9. 4th needle bearing
10. Counter front bearing
11. Counter shaft
12. 3rd gear bushing
13. 3rd needle bearing
14. 3rd counter gear
15. 3rd inner baulk ring
16. 3rd synchronizer cone
17. 3rd outer baulk ring
18. 3rd-4th spread spring
19. 3rd-4th synchronizer hub
20. 3rd-4th shifting insert
21. 3rd-4th coupling sleeve
22. 4th outer baulk ring
23. 4th synchronizer cone
24. 4th inner baulk ring
25. 4th counter gear
26. Reverse idler shaft
27. Reverse idler needle bearing
28. Reverse idler gear
29. Reverse idler thrust washer

: Replace the parts as a set.

: Apply lithium-based grease including molybdenum disulphide.

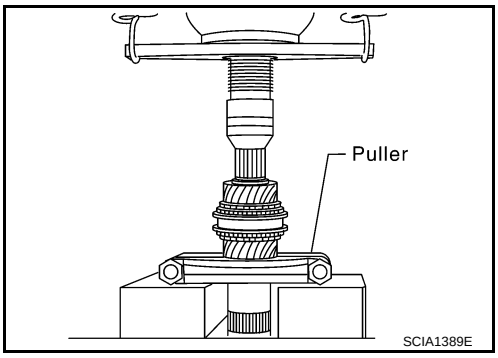
Refer to GI-4, "Components" for symbols not described on the above.

- Apply gear oil to gears, shafts, synchronizers, and bearings when assembly.

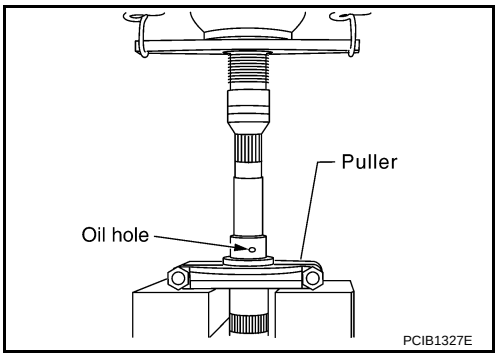
Disassembly

INFOID:0000000004243207

1. Using a press to remove 3rd counter gear, 3rd outer baulk ring, 3rd synchronizer cone, 3rd inner baulk ring, 3rd-4th synchronizer hub assembly, 4th outer baulk ring, 4th synchronizer cone, 4th inner baulk ring, 4th counter gear, 4th needle bearing, 4th gear bushing, 4th counter gear thrust washer, and counter rear bearing inner race.
2. Remove 3rd needle bearing.
3. Remove 3rd-4th spread springs, 3rd-4th shifting inserts, and 3rd-4th coupling sleeve from 3rd-4th synchronizer hub.



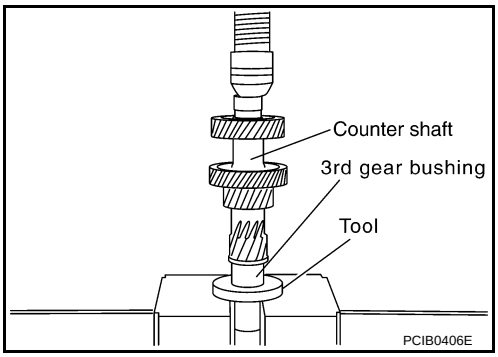
4. Using a press to remove 3rd gear bushing.
   CAUTION:
   Never use oil hole of 3rd gear bushing when press out.



Assembly

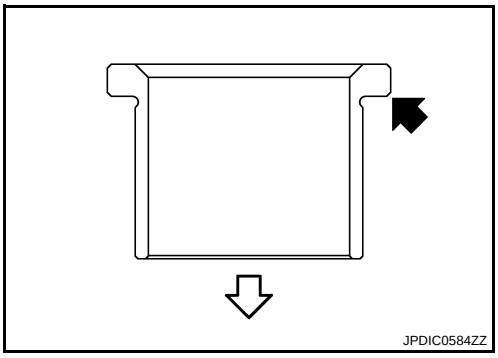
INFOID:0000000004243208

1. Using the inserter [SST: ST30911000 (-)] and a press to press-fit 3rd gear bushing onto counter shaft.



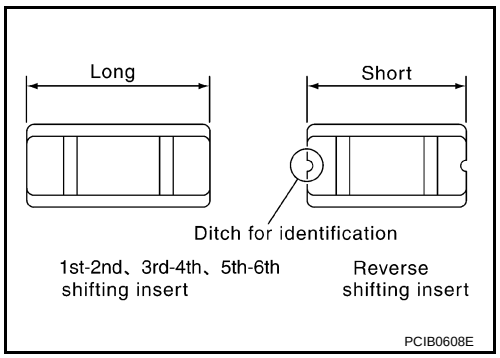
CAUTION:
Be careful with the orientation of 3rd gear bushing.

⇦ : 4th counter gear side

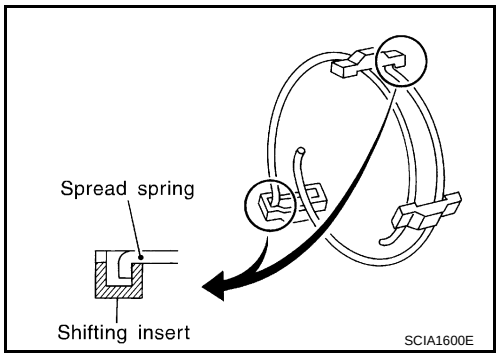


2. Install 3rd-4th coupling sleeve and 3rd-4th shifting inserts into 3rd-4th synchronizer hub.
   CAUTION:

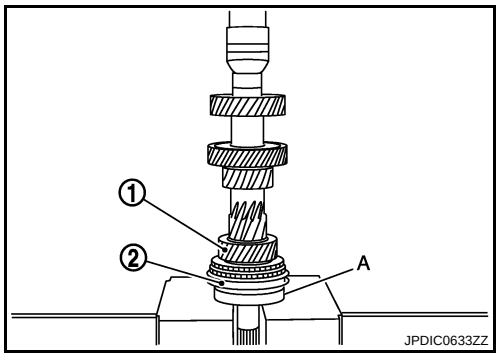
- **Be careful with the shape of reverse shifting insert to avoid misassembly.**
- **Never reuse 3rd-4th coupling sleeve and 3rd-4th synchronizer hub.**
- **Replace 3rd-4th coupling sleeve and 3rd-4th synchronizer hub as a set.**



3. Install 3rd-4th spread springs to 3rd-4th shifting inserts.
CAUTION:
Never install 3rd-4th spread spring hook onto the same 3rd-4th shifting insert.
4. Apply gear oil to 3rd needle bearing, 3rd inner baulk ring, 3rd synchronizer cone and 3rd outer baulk ring.
5. Apply gear oil to the hole spline press fitting side of 3rd-4th synchronizer hub.

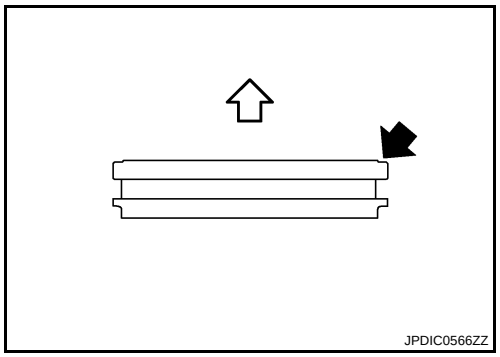


6. Install 3rd needle bearing, 3rd counter gear (1), 3rd inner baulk ring, 3rd synchronizer cone and 3rd outer baulk ring on counter shaft and then using the inserter (A) [SST: ST30911000 (-)] and a press to press-fit 3rd-4th synchronizer hub assembly (2).
CAUTION:
- **Replace 3rd inner baulk ring, 3rd synchronizer cone and 3rd outer baulk ring as a set.**



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

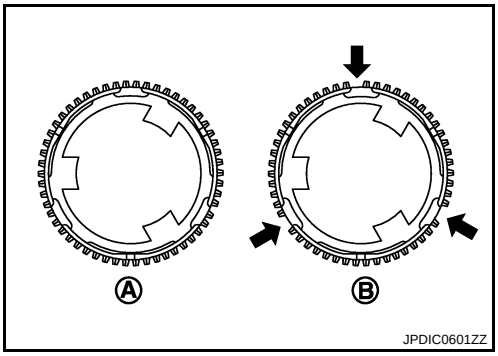
⇦ : 3rd counter gear side



NOTE:

4th outer baulk ring has three spaces that one gear tooth is missing but 3rd outer baulk ring doesn't.

A : 3rd outer baulk ring
B : 4th outer baulk ring

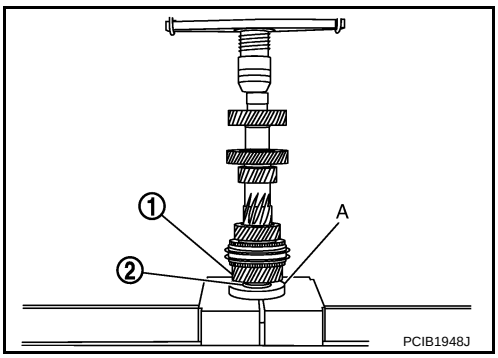


7. Apply gear oil to 4th needle bearing, 4th outer baulk ring, 4th synchronizer cone and 4th inner baulk ring.

8. Install 4th outer baulk ring, 4th synchronizer cone, 4th inner baulk ring, 4th needle bearing and 4th counter gear (1) onto counter shaft and then using the inserter (A) [SST: KV40100630 (J-26092)] and a press to press-fit 4th gear bushing and 4th counter gear thrust washer (2).

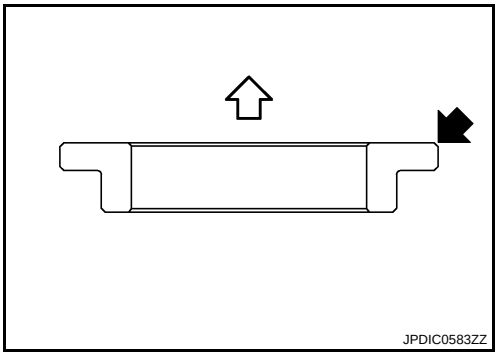
CAUTION:

- **Replace 4th outer baulk ring, 4th synchronizer cone and 4th inner baulk ring as a set.**



- **Be careful with the orientation of 4th counter gear thrust washer.**

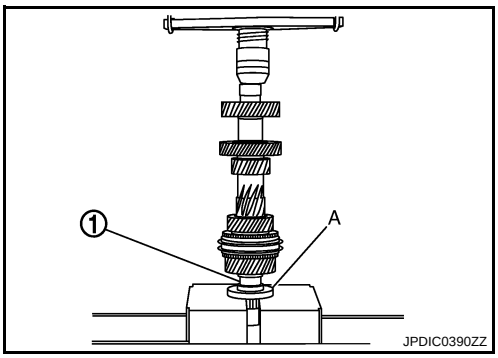
⇦ : 4th counter gear side



9. Using the inserter (A) [SST: ST30032000 (J-26010-01)] and a press to press-fit counter rear bearing inner race (1) onto counter shaft.

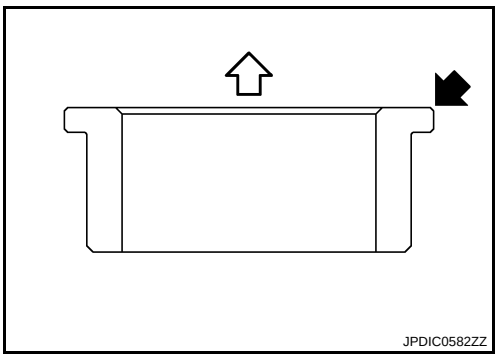
CAUTION:

- **Replace counter rear bearing inner race, counter rear bearing and counter rear bearing spacer as a set.**



- **Be careful with the orientation of counter rear bearing inner race.**

⇦ : 4th counter gear side

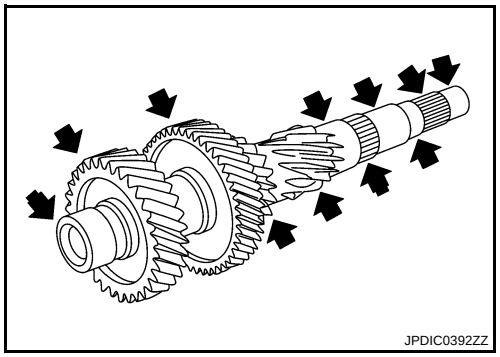


Inspection

INFOID:0000000004243209

COUNTER SHAFT AND GEAR

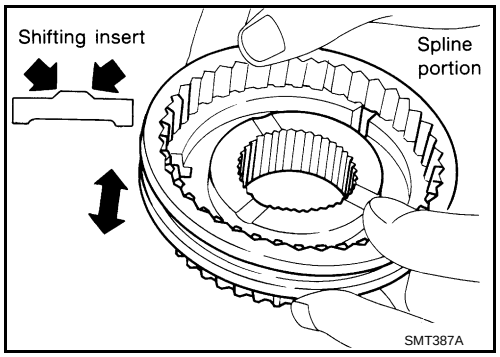
If the contact surface on each gear and counter shaft. has damage, peeling, abrasion, dent, bent, or any other damage, replace the components.


JPDIC0392ZZ

SYNCHRONIZER

Synchronizer Hub and Coupling Sleeve

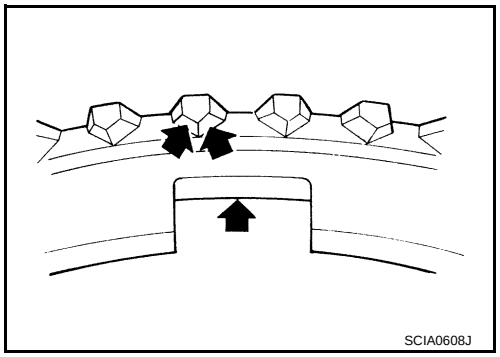
- If the contact surface on coupling sleeve, synchronizer hub, and shifting insert has damage or abrasion, replace the components.
- Coupling sleeve and synchronizer hub shall move smoothly.



SMT387A

Baulk Ring and Spread Spring

- If the cam surface on baulk ring or contact surface on insert has damage or excessive wear, replace with a new one.
- If spread spring is damaged, replace with a new one.

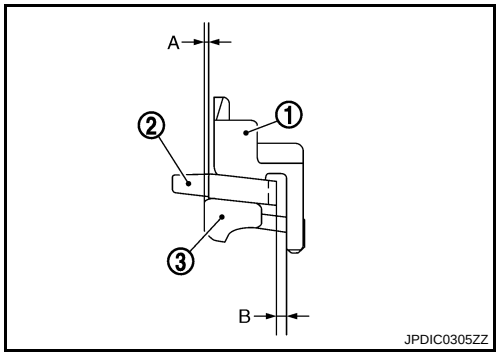

SCIA0608J

Baulk Ring Clearance for Double Cone Synchronizer (4th)

Check the clearance between outer baulk ring (1), synchronizer cone (2), and inner baulk ring (3) as follows.

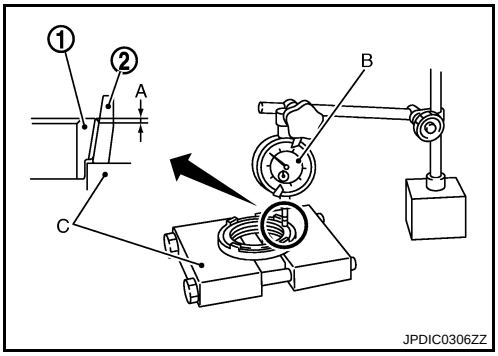
CAUTION:

The clearances “A” and “B” are controlled with outer baulk ring, synchronizer cone, and inner baulk ring as a set. Replace them as a set if the clearances are outside the limit value.



JPDIC0305ZZ

1. Measure the clearance “A” at 2 points or more diagonally opposite using a dial indicator (B) and the puller (C) [SST: ST30031000 (J-22912-01)]. And then calculate mean value.

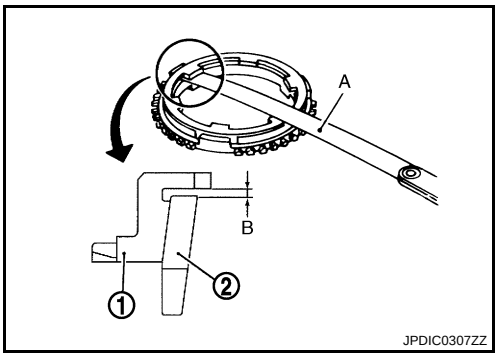


1 : Inner baulk ring
2 : Synchronizer cone

Clearance “A”

Standard value	**: Refer to TM-99, "Baulk Ring Clearance".**
Limit value	**: Refer to TM-99, "Baulk Ring Clearance".**

2. Measure the clearance “B” at 2 points or more diagonally opposite using a feeler gauge (A). And then calculate mean value.



1 : Outer baulk ring
2 : Synchronizer cone

Clearance “B”

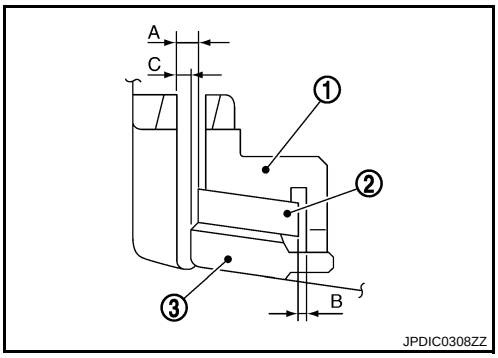
Standard value	**: Refer to TM-99, "Baulk Ring Clearance".**
Limit value	**: Refer to TM-99, "Baulk Ring Clearance".**

Baulk Ring Clearance for Triple Cone Synchronizer (3rd)

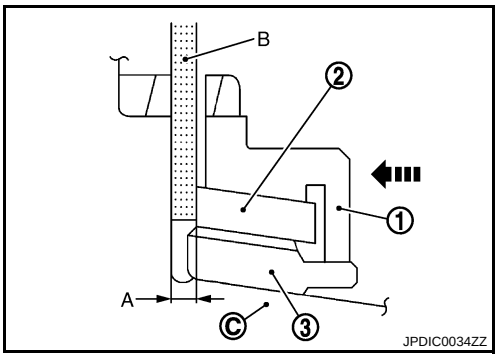
Check the clearance between outer baulk ring (1), synchronizer cone (2), and inner baulk ring (3) as follows.

CAUTION:

The clearances “A”, “B” and “C” are controlled with outer baulk ring, synchronizer cone, and inner baulk ring as a set. Replace them as a set if the clearances are outside the limit value.



1. Measure the clearance “A” at 2 points or more diagonally opposite using a feeler gauge (B) when pressing outer baulk ring (1), synchronizer cone (2), and inner baulk ring (3) toward gear taper cone (C). And then calculate mean value.

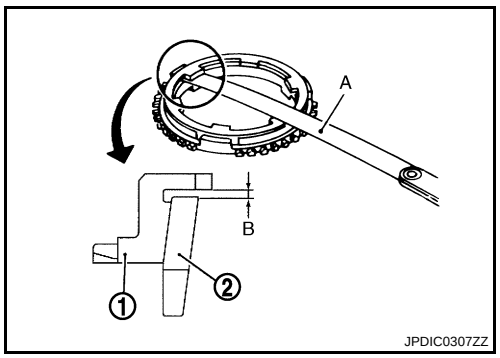


Clearance “A”

Standard value	**: Refer to TM-99, "Baulk Ring Clearance".**
Limit value	**: Refer to TM-99, "Baulk Ring Clearance".**

2. Measure the clearance “B” at 2 points or more diagonally opposite using a feeler gauge (A). And then calculate mean value.

1 : Outer baulk ring
2 : Synchronizer cone

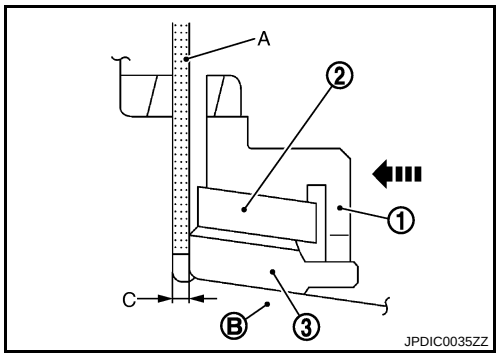


Clearance “B”

Standard value : **Refer to TM-99, "Baulk Ring Clearance".**

Limit value : **Refer to TM-99, "Baulk Ring Clearance".**

3. Measure the clearance “C” at 2 points or more diagonally opposite using a feeler gauge (A) when pressing outer baulk ring (1), synchronizer cone (2), and inner baulk ring (3) toward gear taper cone (B). And then calculate mean value.



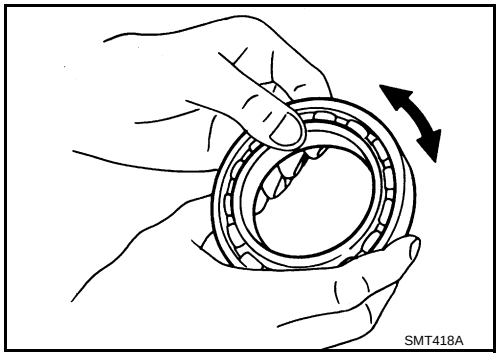
Clearance “C”

Standard value : **Refer to TM-99, "Baulk Ring Clearance".**

Limit value : **Refer to TM-99, "Baulk Ring Clearance".**

BEARING

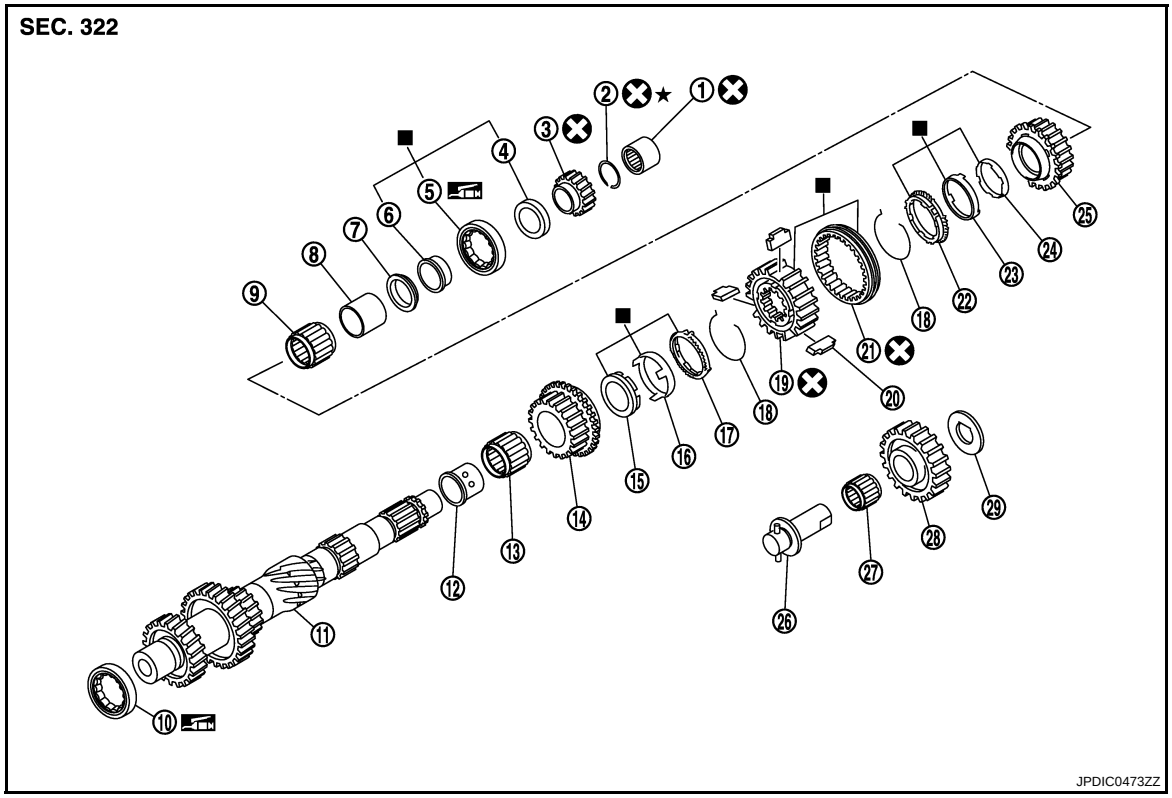
If the bearing does not rotate smoothly or the contact surface on ball or race is damaged or peeled, replace with new ones.



REVERSE IDLER SHAFT AND GEAR

Exploded View

INFOID:0000000005782618



1. Counter end bearing
2. Snap ring
3. Reverse counter gear
4. Counter rear bearing spacer
5. Counter rear bearing
6. Counter rear bearing inner race
7. 4th counter gear thrust washer
8. 4th gear bushing
9. 4th needle bearing
10. Counter front bearing
11. Counter shaft
12. 3rd gear bushing
13. 3rd needle bearing
14. 3rd counter gear
15. 3rd inner baulk ring
16. 3rd synchronizer cone
17. 3rd outer baulk ring
18. 3rd-4th spread spring
19. 3rd-4th synchronizer hub
20. 3rd-4th shifting insert
21. 3rd-4th coupling sleeve
22. 4th outer baulk ring
23. 4th synchronizer cone
24. 4th inner baulk ring
25. 4th counter gear
26. Reverse idler shaft
27. Reverse idler needle bearing
28. Reverse idler gear
29. Reverse idler thrust washer

■: Replace the parts as a set.

: Apply lithium-based grease including molybdenum disulphide.

Refer to GI-4, "Components" for symbols not described on the above.

- Apply gear oil to gears, shafts, synchronizers, and bearings when assembly.

Disassembly

INFOID:0000000004243211

Refer to TM-36, "Disassembly" for disassembly procedure.

Assembly

INFOID:0000000004243212

Note the following, and refer to TM-51, "Assembly" for assembly procedure.

CAUTION:

Apply gear oil to reverse idler needle bearing.

Inspection

INFOID:0000000004243213

REVERSE IDLER SHAFT AND GEAR

If the contact surface on reverse idler gear and reverse idler shaft has damage, peeling, abrasion, dent, bent, or any other damage, replace the components.

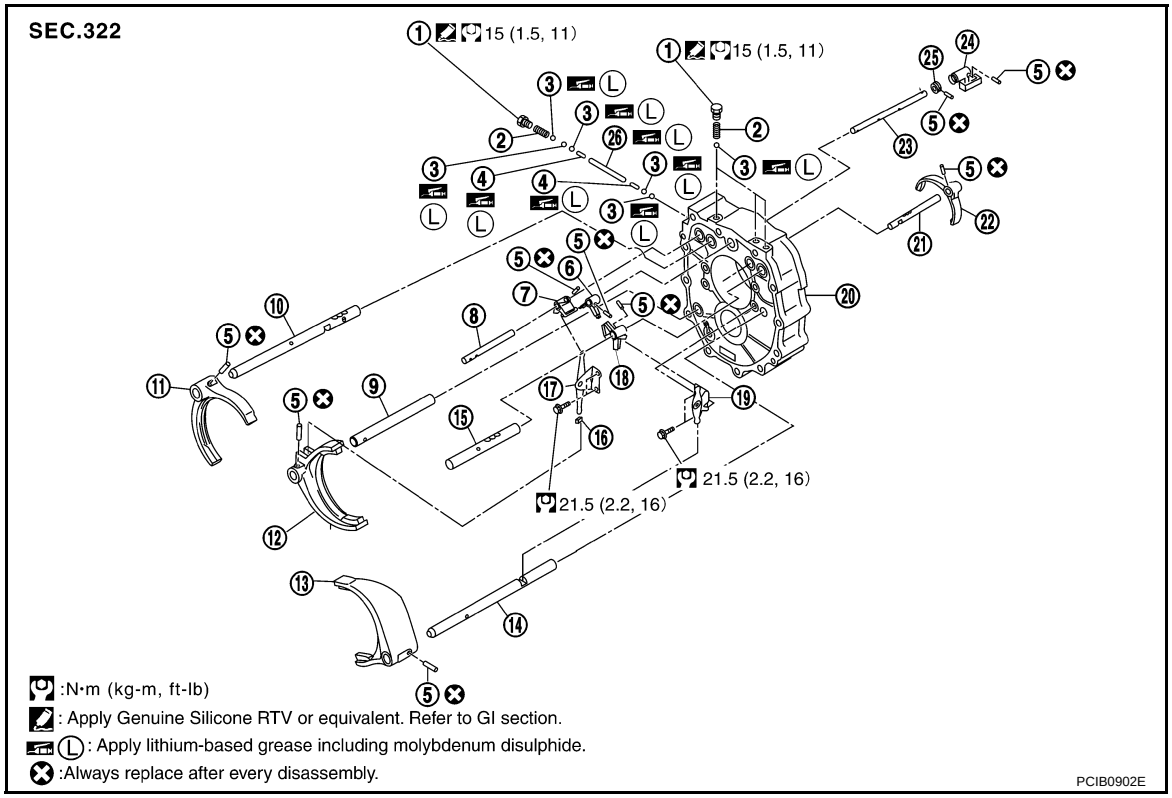
BEARING

If the bearing does not rotate smoothly or the contact surface on roller or race is damaged or peeled, replace with new ones.

SHIFT FORK AND FORK ROD

Exploded View

INFOID:0000000005782535



1. Check ball plug
2. Check ball spring
3. Check ball
4. Interlock pin
5. Retaining pin
6. Striking lever
7. 3rd-4th fork rod bracket
8. 3rd-4th fork rod
9. 3rd-4th fork rod (reversal side)
10. 1st-2nd fork rod
11. 1st-2nd shift fork
12. 3rd-4th shift fork
13. 5th-6th shift fork
14. 5th-6th fork rod (reversal side)
15. 5th-6th fork rod
16. Shifter cap
17. 3rd-4th control lever
18. 5th-6th fork rod bracket
19. 5th-6th control lever
20. Adapter plate
21. Reverse fork rod
22. Reverse shift fork
23. Striking rod
24. Low/high control lever
25. Stopper ring
26. Interlock plunger

Disassembly

INFOID:0000000004243215

Refer to TM-36, "Disassembly" for disassembly procedure.

Assembly

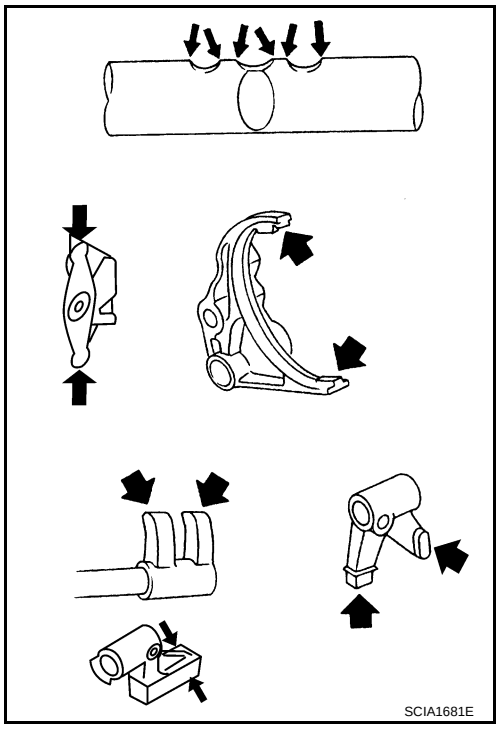
INFOID:0000000004243216

Refer to TM-51, "Assembly" for assembly procedure.

Inspection

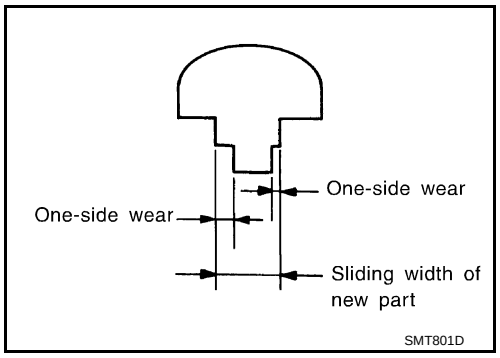
INFOID:0000000004243217

- Check the contact surface of each forks, rods, levers, and brackets for excessive wear, uneven wear, bend, and damage. Replace if necessary.



- Check if the width of shift fork hook (sliding area with coupling sleeve) is within allowable specification below.

One-side wear specification	**: Refer to TM-99, "Shift Fork".**
Sliding width of new part	**: Refer to TM-99, "Shift Fork".**

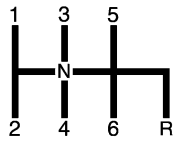


SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000004243218

Transmission type			FS6R31A	
Engine type			VQ37VHR	
Axle type			2WD	
VIN			UP to JNKCV61E69M303072 (Without 4WAS) or JNKCV61E89M013724 (With 4WAS)	From JNKCV61E69M303073 (Without 4WAS) or JNKCV61E89M013725 (With 4WAS)
Number of speed			6	
Shift pattern			 SCIA0955E	
Synchromesh type			Warner	
Gear ratio	1st		3.794	
	2nd		2.324	
	3rd		1.624	
	4th		1.271	
	5th		1.000	
	6th		0.794	
	Reverse		3.446	
Number of teeth	Main gear	Drive	26	
		1st	37	
		2nd	34	
		3rd	33	
		4th	31	
		6th	31	
		Reverse	42	
	Counter gear	Drive	32	
		1st	12	
		2nd	18	
		3rd	25	
		4th	30	
		6th	48	
		Reverse	15	
	Reverse idler gear		26	
Oil capacity	ℓ (US pt, Imp pt)		Approx. 2.93 (6-1/4, 5-1/8)	Approx. 2.83 (6, 5)
Remarks	Reverse synchronizer		Installed	
	Double cone synchronizer		4th	
	Triple cone synchronizer		1st, 2nd, and 3rd	

End Play

INFOID:0000000004243219

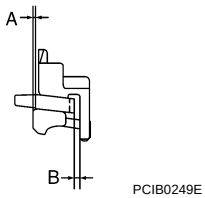
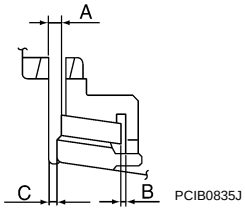
Unit: mm (in)

Item	Standard value
Counter shaft	0 – 0.1 (0 – 0.004)
Main drive gear	0 – 0.1 (0 – 0.004)
Mainshaft	0 – 0.1 (0 – 0.004)

Baulk Ring Clearance

INFOID:0000000004243220

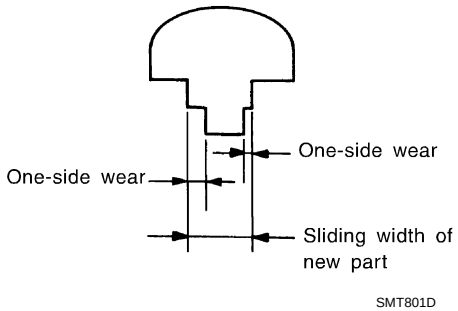
Unit: mm (in)

Measurement point		Standard value	Limit value
4th (Double-cone synchronizer)  PCIB0249E	Clearance between synchronizer cone and inner baulk ring end face “A”	0.50 – 0.70 (0.020 – 0.028)	0.3 (0.012)
	Clearance between outer baulk ring pawl and synchronizer cone “B”	0.85 – 1.35 (0.033 – 0.053)	0.7 (0.028)
1st, 2nd, and 3rd (Triple-cone synchronizer)  PCIB0835J	Clearance between synchronizer cone and clutch gear end face “A”	1st: 0.65 – 1.25 (0.026 – 0.049) 2nd: 0.60 – 1.30 (0.024 – 0.051) 3rd: 0.60 – 1.30 (0.024 – 0.051)	0.3 (0.012) 0.3 (0.012) 0.3 (0.012)
	Clearance between outer baulk ring pawl and synchronizer cone “B”	0.85 – 1.35 (0.033 – 0.053)	0.7 (0.028)
	Clearance between inner baulk ring and clutch gear end face “C”	1st: 0.80 – 1.2 (0.031 – 0.047) 2nd: 0.75 – 1.25 (0.030 – 0.049) 3rd: 0.75 – 1.25 (0.030 – 0.049)	0.3 (0.012) 0.3 (0.012) 0.3 (0.012)
5th and 6th		0.70 – 1.35 (0.028 – 0.053)	0.5 (0.020)
Reverse		0.75 – 1.20 (0.030 – 0.047)	0.5 (0.020)

Shift Fork

INFOID:0000000005782835

Unit: mm (in)

Measurement point		One-side wear specification	Sliding width of new part
 SMT801D	1st-2nd	0.2 (0.008)	7.80 – 7.93 (0.3071 – 0.3122)
	3rd-4th	0.2 (0.008)	7.80 – 7.93 (0.3071 – 0.3122)
	5th-6th	0.2 (0.008)	7.80 – 7.93 (0.3071 – 0.3122)
	Reverse	0.2 (0.008)	7.80 – 7.93 (0.3071 – 0.3122)

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Diagnosis Flow

INFOID:0000000004279077

1.OBTAIN INFORMATION ABOUT SYMPTOM

1. Refer to TM-101, "Question sheet" and interview the customer to obtain the malfunction information (conditions and environment when the malfunction occurred) as much as possible when the customer brings in the vehicle.
2. Check the following:

- Service history
- Harnesses and connectors malfunction. Refer to GI-41, "Intermittent Incident".

>> GO TO 2.

2.CHECK DTC

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

- Record the DTC and freeze frame data. (Print out the data using CONSULT-III and affix them to the Work Order Sheet.)
- Erase DTCs.
- Check the relationship between the cause that is clarified with DTC and the malfunction information described by the customer. TM-259, "Symptom Table" is effective.

3. Check the information of related service bulletins and others also.

Do malfunction information and DTC exist?

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

3.REPRODUCE MALFUNCTION SYMPTOM

Check any malfunction described by a customer, except those with DTC on the vehicle.
Also investigate whether the symptom is a fail-safe or normal operation. Refer to TM-253, "Fail-Safe".
When a malfunction symptom is reproduced, the question sheet is effective. Refer to TM-101, "Question sheet".
Verify the relationship between the symptom and the conditions in which the malfunction described by the customer occurs.

>> GO TO 5.

4.REPRODUCE MALFUNCTION SYMPTOM

Check the malfunction described by the customer on the vehicle.
Also investigate whether the symptom is a fail-safe or normal operation. Refer to TM-253, "Fail-Safe".
When a malfunction symptom is reproduced, the question sheet is effective. Refer to TM-101, "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-257, "DTC Inspection Priority Chart" when multiple DTCs are detected, and then determine the order for performing the diagnosis.

NOTE:
If no DTC is detected, refer to the freeze frame data.

Is any DTC detected?

YES >> GO TO 7.

NO >> Check according to GI-41, "Intermittent Incident".

6. IDENTIFY MALFUNCTIONING SYSTEM WITH “DIAGNOSIS CHART BY SYMPTOM”

Use TM-259, "Symptom Table" from the symptom inspection result in step 4. Then identify where to start performing the diagnosis based on possible causes and symptoms.

>> GO TO 8.

7. REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the detected malfunctioning parts.
Reconnect parts or connector after repairing or replacing, and then erase DTC if necessary.

>> GO TO 8.

8. FINAL CHECK

Perform “DTC CONFIRMATION PROCEDURE” again to make sure that the repair is correctly performed.
Check that malfunctions are not reproduced when obtaining the malfunction information from the customer, referring to the symptom inspection result in step 3 or 4.

Is DTC or malfunction symptom reproduced?

YES-1 >> DTC is reproduced: GO TO 5.
YES-2 >> Malfunction symptom is reproduced: GO TO 6.
NO >> Before delivering the vehicle to the customer, make sure that DTC is erased.

Question sheet

INFOID:0000000004279078

DESCRIPTION

There are many operating conditions that may cause a malfunction of the transmission parts. By understanding those conditions properly, a quick and exact diagnosis can be achieved.
In general, customers have their own criteria for a problem. Therefore, it is important to understand the symptom and status well enough by asking the customer about the concerns carefully. In order to systemize all the information for the diagnosis, prepare the question sheet referring to the question points.

KEY POINTS

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

SEF907L

WORKSHEET SAMPLE

Question Sheet					
Customer name MR/MS		Engine #		Manuf. Date	
		Incident Date		VIN	
		Model & Year		In Service Date	
		Trans.		Mileage	km / Mile

Question Sheet						
Symptoms		☐ Vehicle does not move (☐ Any position ☐ Particular position)				
		☐ No up-shift (☐ 1GR → 2GR ☐ 2GR → 3GR ☐ 3GR → 4GR ☐ 4GR → 5GR ☐ 5GR → 6GR ☐ 6GR → 7GR)				
		☐ No down-shift (☐ 7GR → 6GR ☐ 6GR → 5GR ☐ 5GR → 4GR ☐ 4GR → 3GR ☐ 3GR → 2GR ☐ 2GR → 1GR)				
		☐ Lock-up malfunction				
		☐ Shift point too high or too low				
		☐ Shift shock or slip				
		☐ Noise or vibration				
		☐ No kick down				
		☐ No pattern select				
		☐ Others				
Frequency		☐ All the time	☐ Under certain conditions	☐ Sometimes (times a day)		
Weather conditions		☐ Not affected				
	Weather	☐ Fine	☐ Clouding	☐ Raining	☐ Snowing	☐ Other ( )
	Temp.	☐ Hot	☐ Warm	☐ Cool	☐ Cold	☐ Temp. [Approx. °C (°F)]
	Humidity	☐ High	☐ Middle	☐ Low		
Transmission conditions		☐ Not affected				
		☐ Cold	☐ During warm-up	☐ After warm-up		
		☐ Engine speed (rpm)				
Road conditions		☐ Not affected				
		☐ In town	☐ In suburbs	☐ Freeway	☐ Off road (Up / Down)	
Driving conditions		☐ Not affected				
		☐ At starting	☐ While idling	☐ While engine racing	☐ At racing	☐ While cruising
		☐ While accelerating	☐ While decelerating	☐ While turning (Right / Left)		
		☐ Vehicle speed [km/h (MPH)]				
Other conditions						

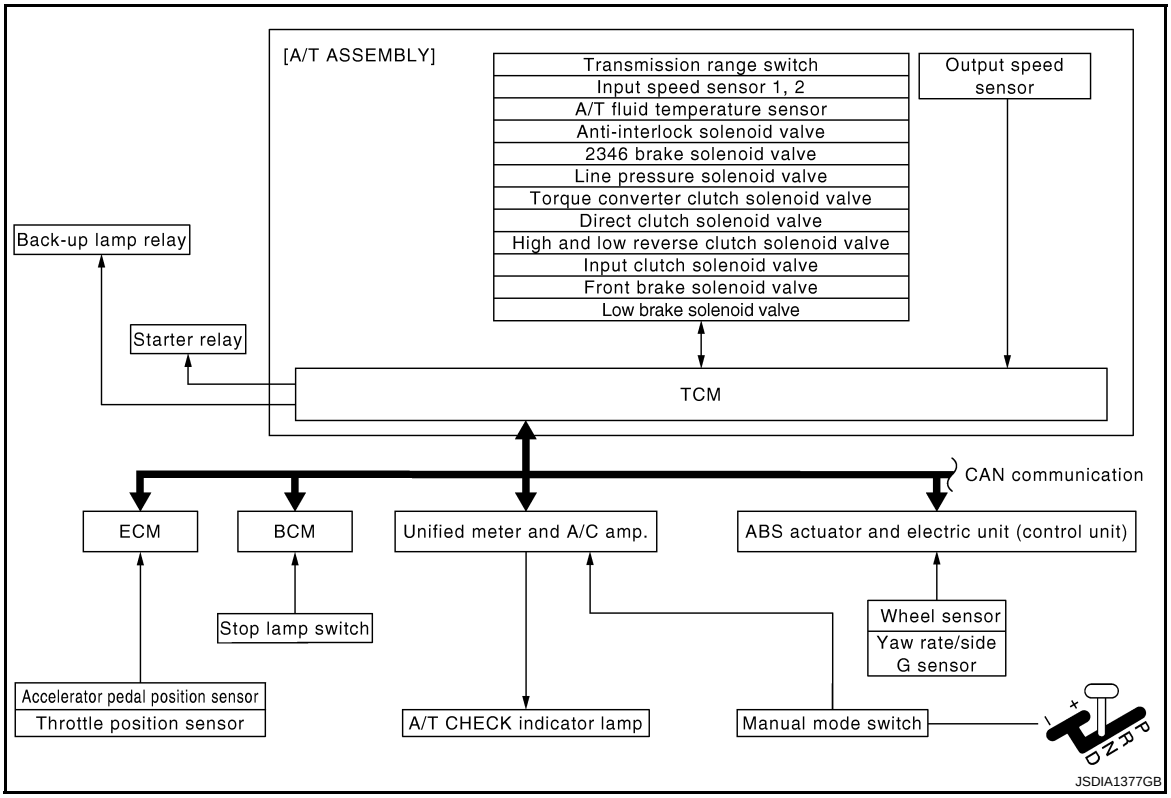
SYSTEM DESCRIPTION

A/T CONTROL SYSTEM

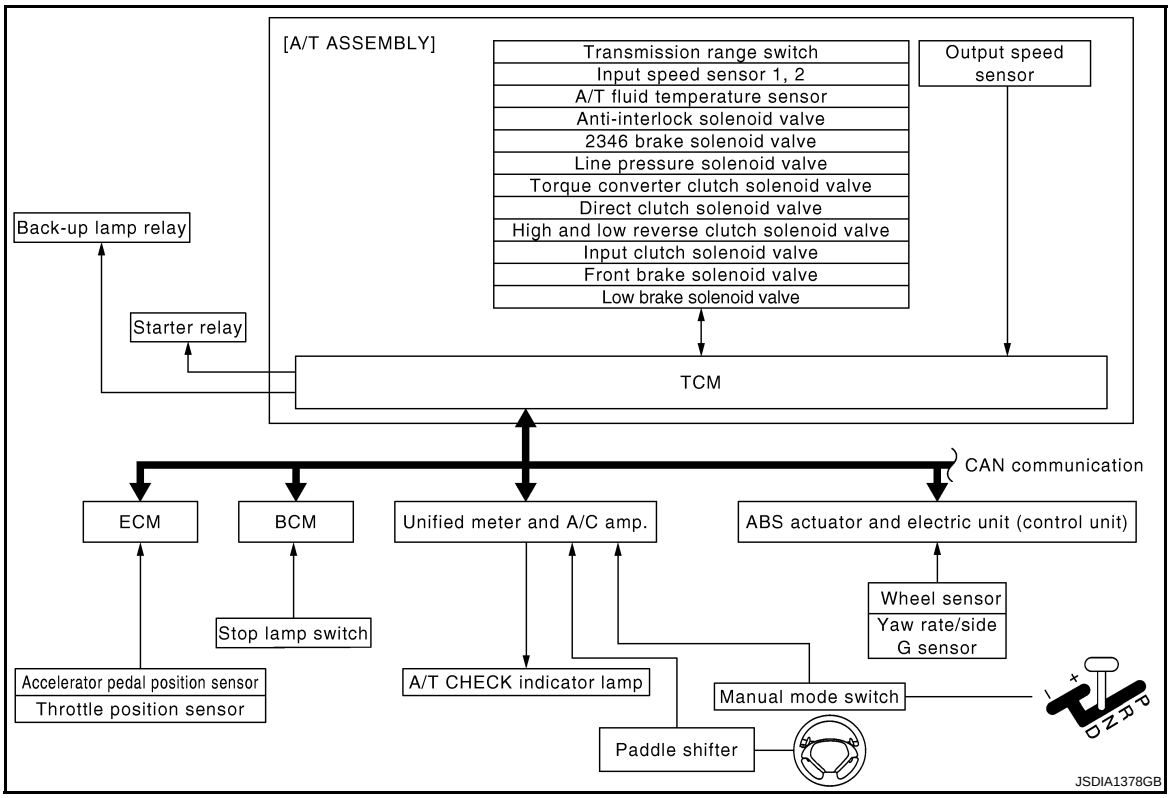
System Diagram

INFOID:0000000004279079

Without Paddle Shifter



With Paddle Shifter



System Description

INFOID:0000000004279080

INPUT/OUTPUT SIGNAL CHART

Sensor (or signal)		TCM function		Actuator
Transmission range switch Accelerator pedal position signal Closed throttle position signal Wide open throttle position signal Engine speed signal A/T fluid temperature sensor Output speed sensor Vehicle speed signal Manual mode switch signal Stop lamp switch signal Side G sensor signal Input speed sensor 1, 2	⇒	Line pressure control (TM-108) Shift change control (TM-113) Shift pattern control • ASC (Adaptive shift control) (TM-119) • Manual mode (TM-124) Lock-up control (TM-129) Fail-safe control (TM-253) Self-diagnosis (TM-166) CONSULT-III communication line (TM-166) CAN communication line (TM-173)	⇒	Input clutch solenoid valve Direct clutch solenoid valve Front brake solenoid valve High and low reverse clutch solenoid valve Low brake solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve Anti-interlock solenoid valve 2346 brake solenoid valve A/T CHECK indicator lamp Back-up lamp relay Starter relay

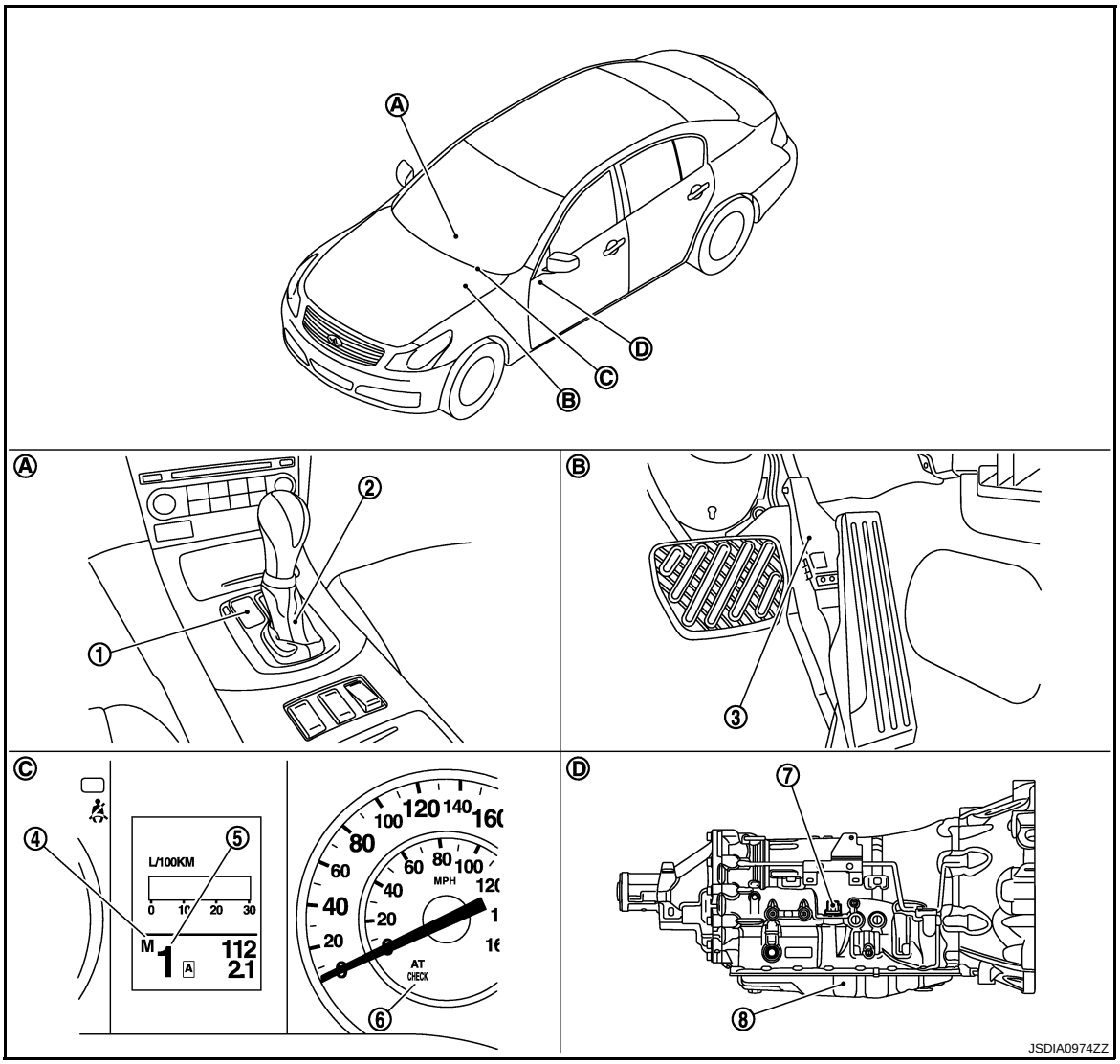
SYSTEM DESCRIPTION

- The A/T senses vehicle operating conditions through various sensors or signals. It always controls the optimum shift position and reduces shifting and lock-up shocks.
- Receive input signals transmitted from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, etc.
- Transmit required output signals to the respective solenoids.

Component Parts Location

INFOID:0000000004279081

Without Paddle Shifter



1. Selector lever position indicator
2. A/T shift selector assembly
3. Accelerator pedal position sensor
4. Manual mode indicator
5. Shift position indicator
6. A/T CHECK indicator lamp
7. A/T assembly connector
8. Control valve with TCM*
- A. Center console
- B. Accelerator pedal
- C. Combination meter
- D. A/T assembly

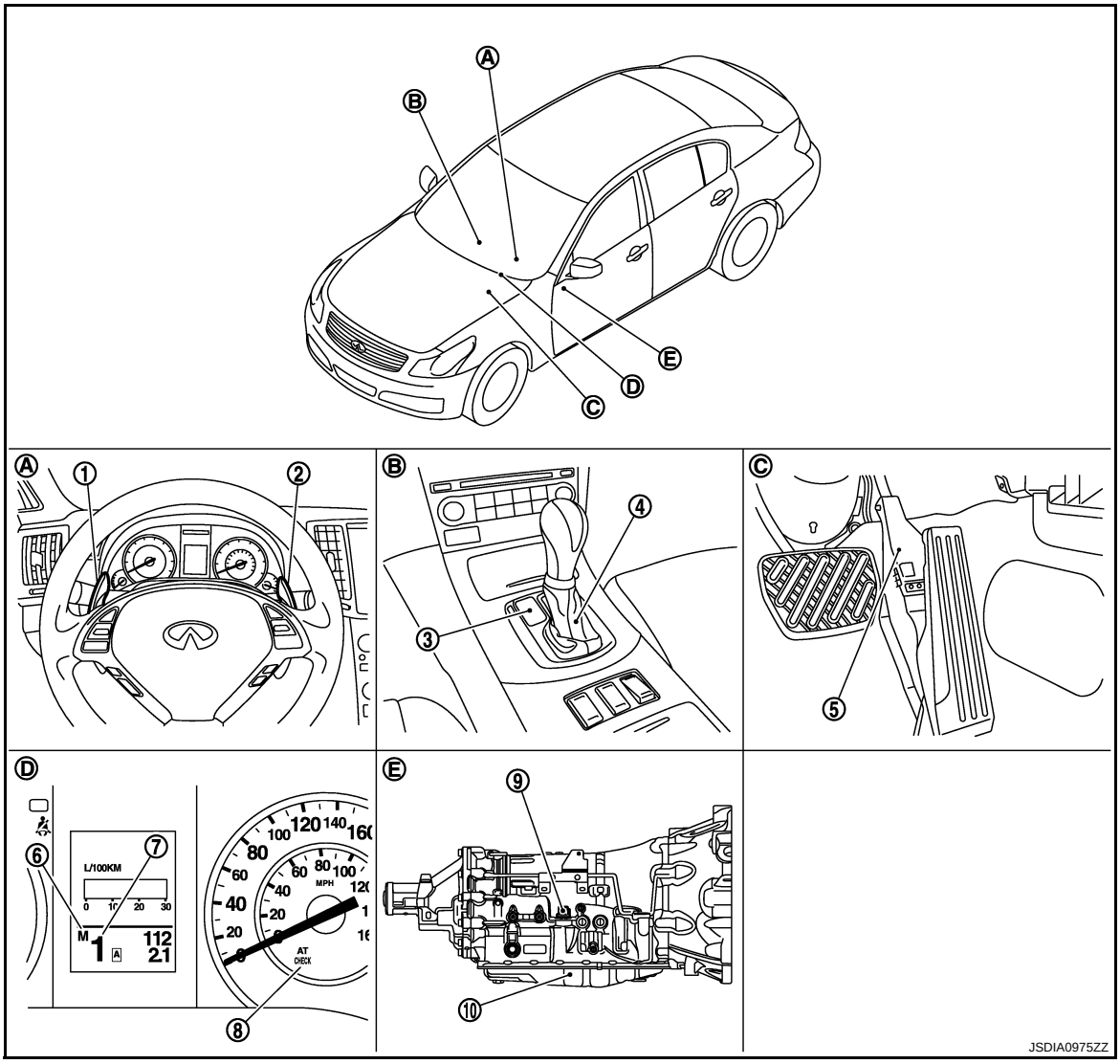
*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (2).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch
- The following components are included in control valve with TCM (8).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve

- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

With Paddle Shifter



1. Paddle shifter (shift-down)	2. Paddle shifter (shift-up)	3. Selector lever position indicator
4. A/T shift selector assembly	5. Accelerator pedal position sensor	6. Manual mode indicator
7. Shift position indicator	8. A/T CHECK indicator lamp	9. A/T assembly connector
10. Control valve with TCM*		
A. Steering wheel	B. Center console	C. Accelerator pedal
D. Combination meter	E. A/T assembly	

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (4).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch

- The following components are included in control valve with TCM (10).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

Component Description

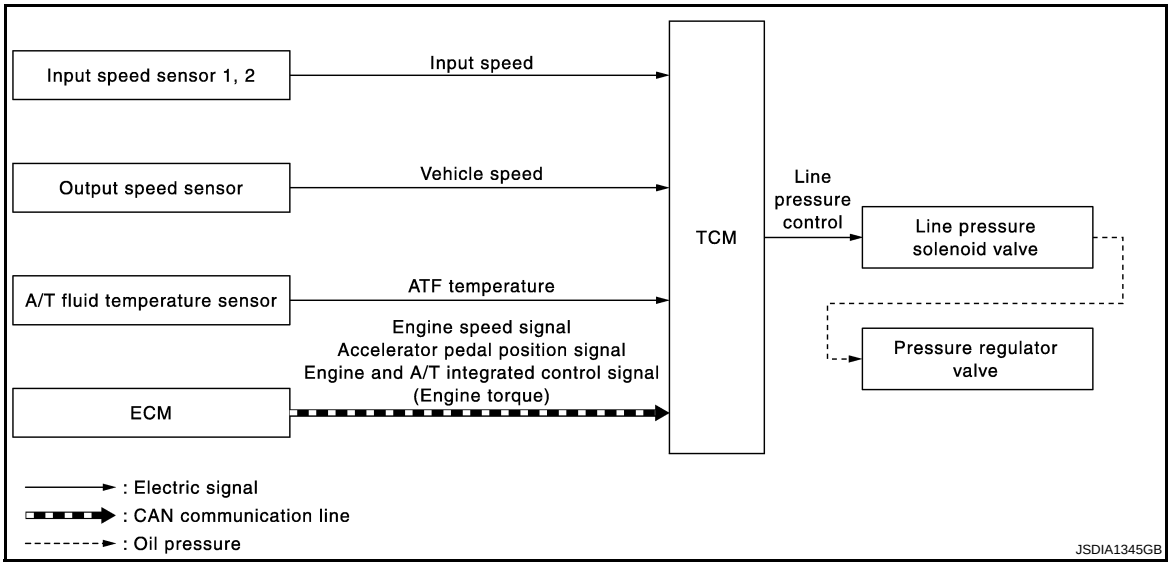
INFOID:0000000004279082

Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Transmission range switch	TM-176, "Description"
Output speed sensor	TM-181, "Description"
Input speed sensor 1	TM-179, "Description"
Input speed sensor 2	
A/T fluid temperature sensor	TM-177, "Description"
Input clutch solenoid valve	TM-205, "Description"
Front brake solenoid valve	TM-209, "Description"
Direct clutch solenoid valve	TM-227, "Description"
High and low reverse clutch solenoid valve	TM-224, "Description"
Low brake solenoid valve	TM-225, "Description"
Anti-interlock solenoid valve	TM-203, "Description"
2346 brake solenoid valve	TM-226, "Description"
Torque converter clutch solenoid valve	TM-199, "Description"
Line pressure solenoid valve	TM-202, "Description"
Accelerator pedal position sensor	TM-210, "Description"
Throttle position sensor	
Manual mode switch	TM-218, "Description"
Paddle shifter	TM-218, "Description"
Starter relay	TM-174, "Description"
A/T CHECK indicator lamp	When the ignition switch is pushed to the ON position, the light comes on for 2 seconds.
Stop lamp switch	TM-230, "Description"
ECM	EC-25, "System Description"
BCM	BCS-4, "System Description"
Unified meter and A/C amp.	MWI-6, "METER SYSTEM : System Description"
ABS actuator and electric unit (control unit)	BRC-18, "System Description"
Wheel sensor	BRC-31, "Description"
Yaw rate/side G sensor	BRC-61, "Description"

LINE PRESSURE CONTROL

System Diagram

INFOID:0000000004279083



System Description

INFOID:0000000004279084

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to TCM	TCM function	Actuator
Input speed sensor 1, 2	Input speed	Line pressure control	Line pressure solenoid valve ↓ Pressure regulator valve
Output speed sensor	Vehicle speed		
A/T fluid temperature sensor	ATF temperature		
ECM	Engine speed signal*		
	Accelerator pedal position signal*		
	Engine and A/T integrated control signal (Engine torque)*		

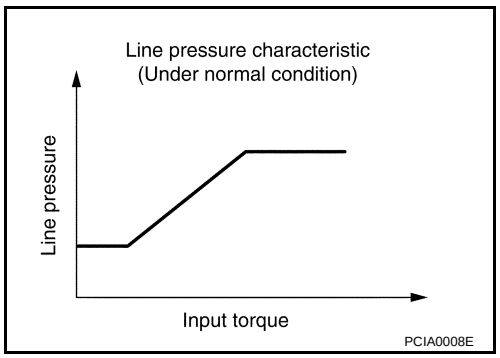
*: This signal is transmitted via CAN communication line.

SYSTEM DESCRIPTION

- When an engine and A/T integrated control signal (engine torque) equivalent to the engine drive force is transmitted from the ECM to the TCM, the TCM controls the line pressure solenoid valve.
  This line pressure solenoid controls the pressure regulator valve as the signal pressure and adjusts the pressure of the operating oil discharged from the oil pump to the line pressure most appropriate to the driving state.
- The TCM has stored in memory a number of patterns for the optimum line pressure characteristic for the driving state.
- In order to obtain the most appropriate line pressure characteristic to meet the current driving state, the TCM controls the line pressure solenoid current value and thus controls the line pressure.

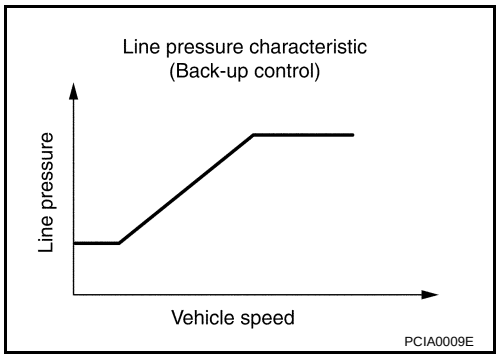
Normal Control

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



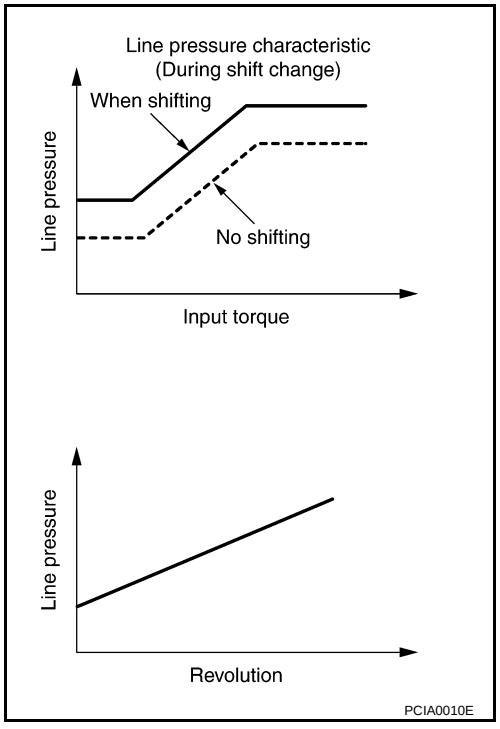
Back-up Control (Engine Brake)

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



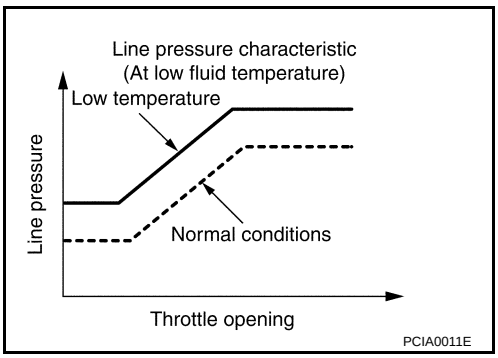
During Shift Change

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



At Low Fluid Temperature

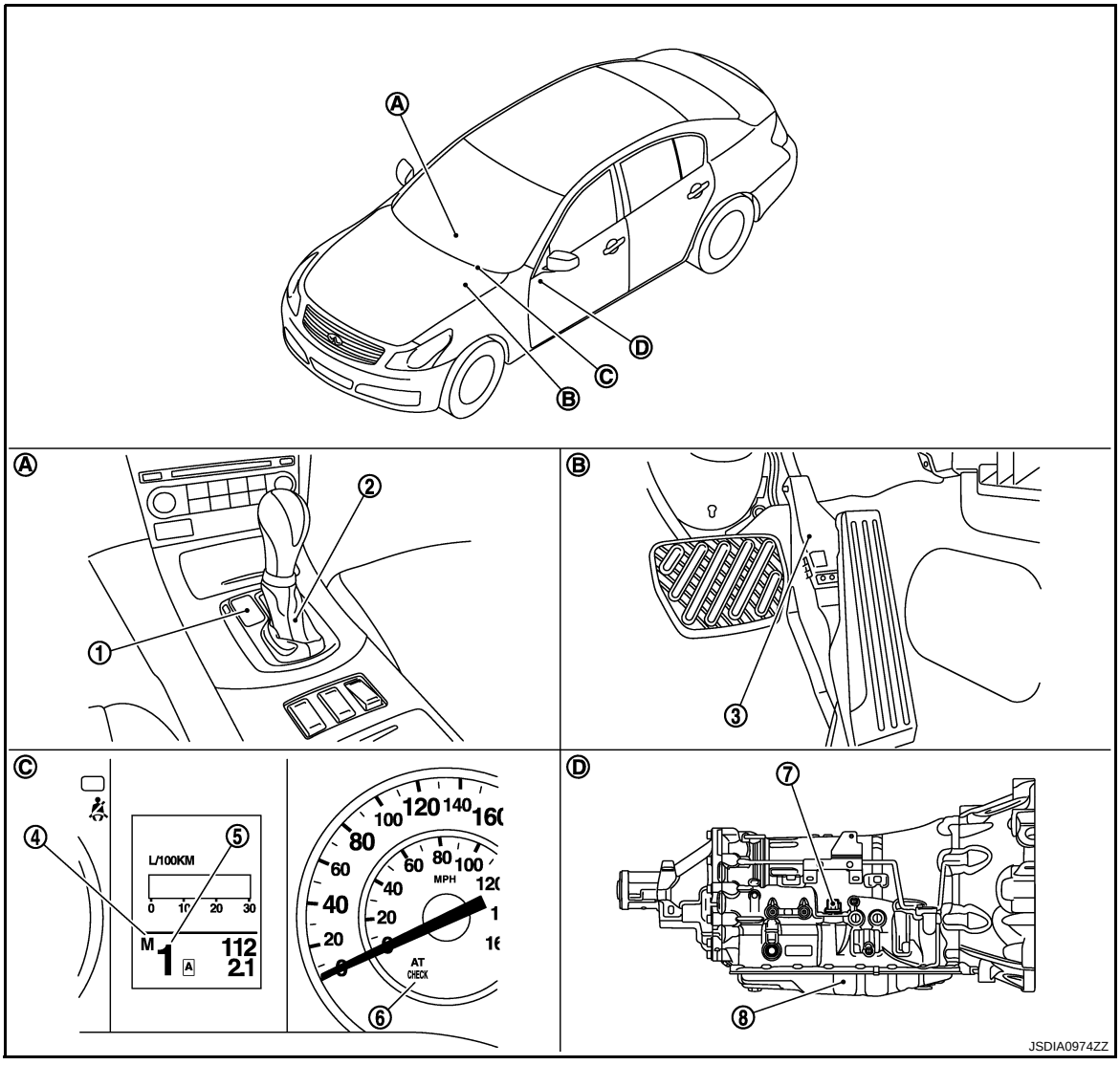
When the A/T fluid temperature drops below the prescribed temperature, in order to speed up the action of each friction element, the line pressure is set higher than the normal line pressure characteristic.



Component Parts Location

INFOID:0000000004437760

Without Paddle Shifter



1. Selector lever position indicator
2. A/T shift selector assembly
3. Accelerator pedal position sensor
4. Manual mode indicator
5. Shift position indicator
6. A/T CHECK indicator lamp
7. A/T assembly connector
8. Control valve with TCM*
A. Center console
B. Accelerator pedal
C. Combination meter
D. A/T assembly

*: Control valve with TCM is included in A/T assembly.

NOTE:

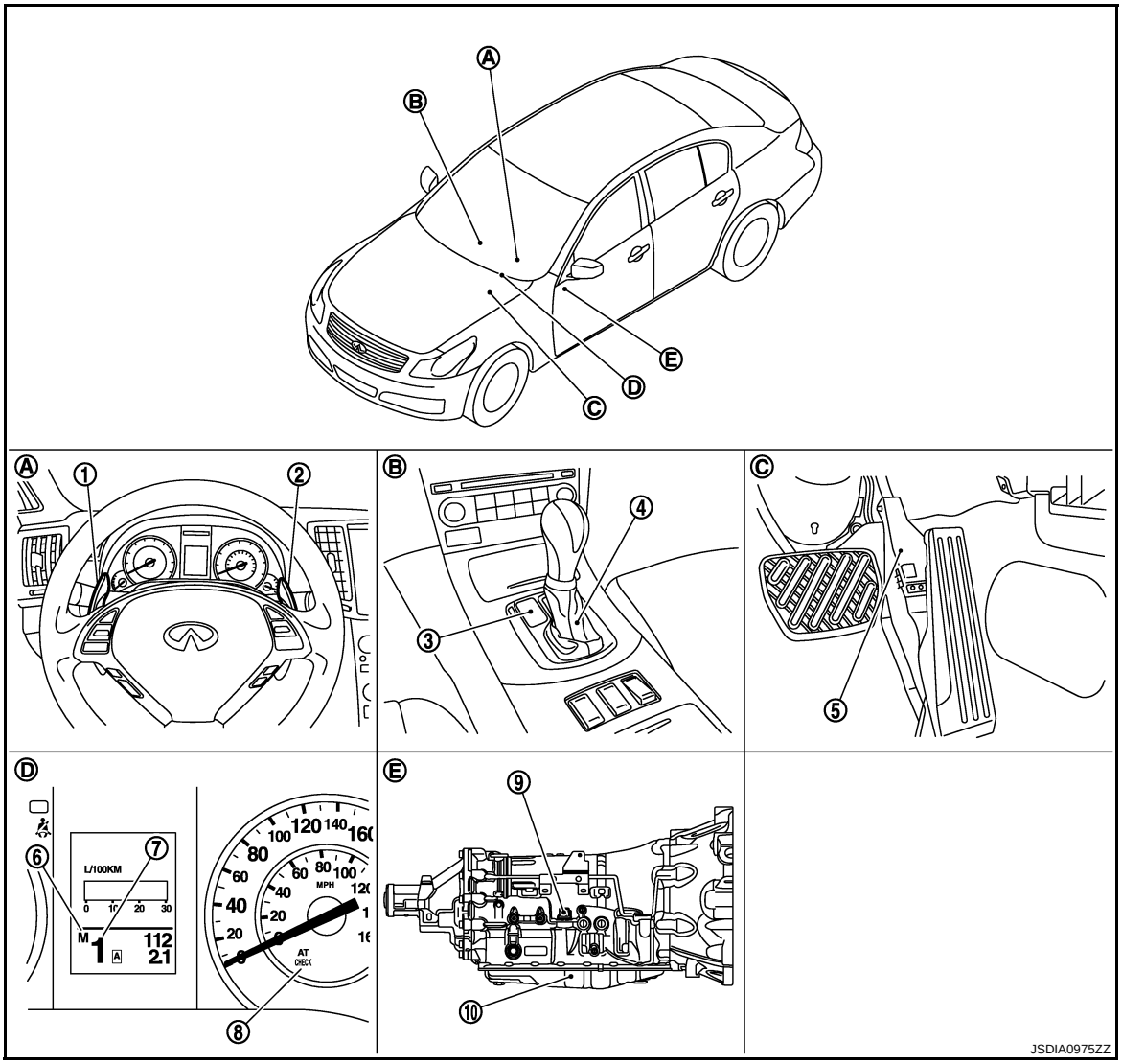
- The following components are included in A/T shift selector assembly (2).

- Manual mode select switch
- Manual mode position select switch
- Shift position switch

• The following components are included in control valve with TCM (8).

- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

With Paddle Shifter



1. Paddle shifter (shift-down)
2. Paddle shifter (shift-up)
3. Selector lever position indicator
4. A/T shift selector assembly
5. Accelerator pedal position sensor
6. Manual mode indicator

7. Shift position indicator 8. A/T CHECK indicator lamp 9. A/T assembly connector
10. Control valve with TCM*
A. Steering wheel B. Center console C. Accelerator pedal
D. Combination meter E. A/T assembly

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (4).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch
- The following components are included in control valve with TCM (10).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

Component Description

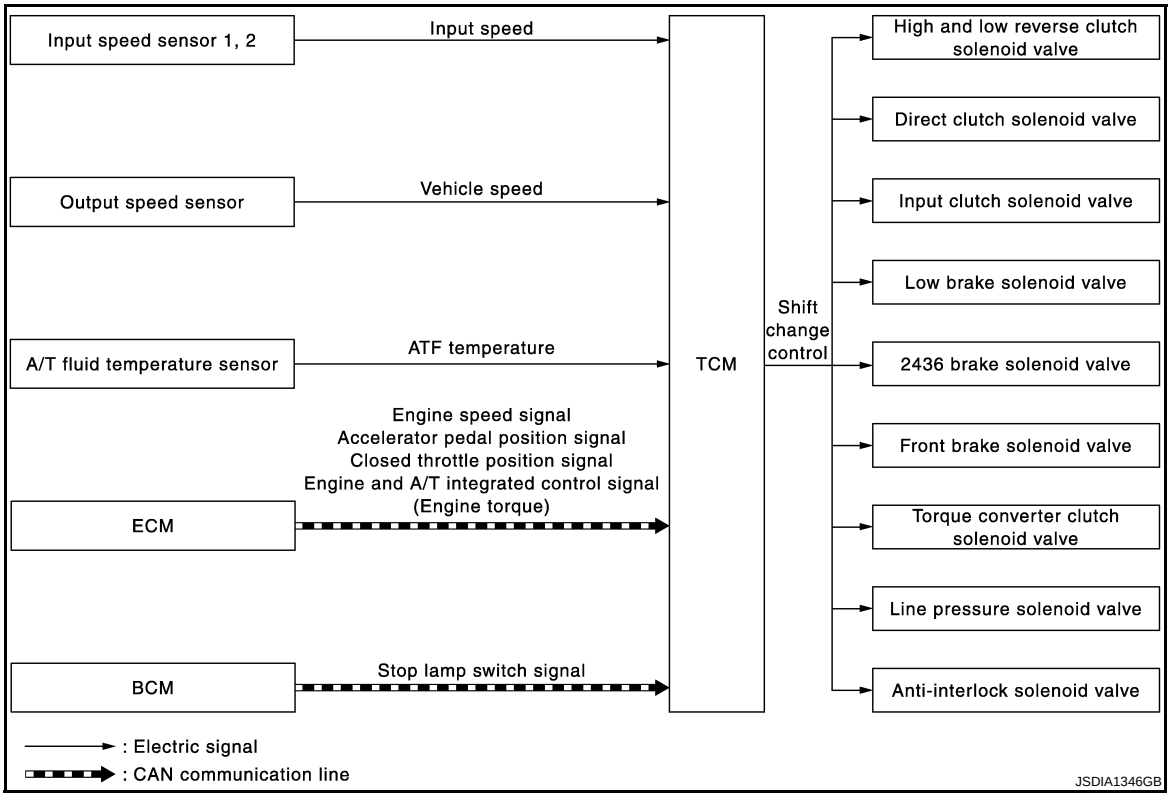
INFOID:0000000004279086

Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Output speed sensor	TM-181, "Description"
Input speed sensor 1	TM-179, "Description"
Input speed sensor 2	
A/T fluid temperature sensor	TM-177, "Description"
Line pressure solenoid valve	TM-202, "Description"
Pressure regulator valve	Adjusts the oil discharged from the oil pump to the optimum pressure (line pressure) for the driving state.
ECM	EC-25, "System Description"

SHIFT CHANGE CONTROL

System Diagram

INFOID:0000000004279087



System Description

INFOID:0000000004279088

INPUT/OUTPUT SIGNAL CHART

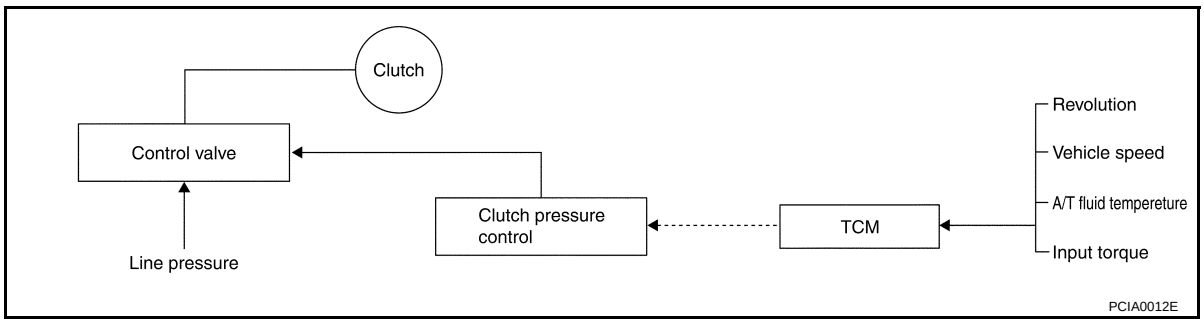
Sensor	Input signal to TCM	TCM function	Actuator
Input speed sensor 1, 2	Input speed	Shift change control	• High and low reverse clutch solenoid valve • Direct clutch solenoid valve • Input clutch solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Front brake solenoid valve • Torque converter clutch solenoid valve • Line pressure solenoid valve • Anti-interlock solenoid valve
Output speed sensor	Vehicle speed		
A/T fluid temperature sensor	ATF temperature		
ECM	Engine speed signal*		
	Accelerator pedal position signal*		
	Closed throttle position signal*		
	Engine and A/T integrated control signal (Engine torque)*		
BCM	Stop lamp switch signal*		

*: This signal is transmitted via communication line.

SYSTEM DESCRIPTION

The clutch pressure control solenoid is controlled by the signals from the switches and sensors. Thus, the clutch pressure is adjusted to be appropriate to the engine load state and vehicle driving state. It becomes

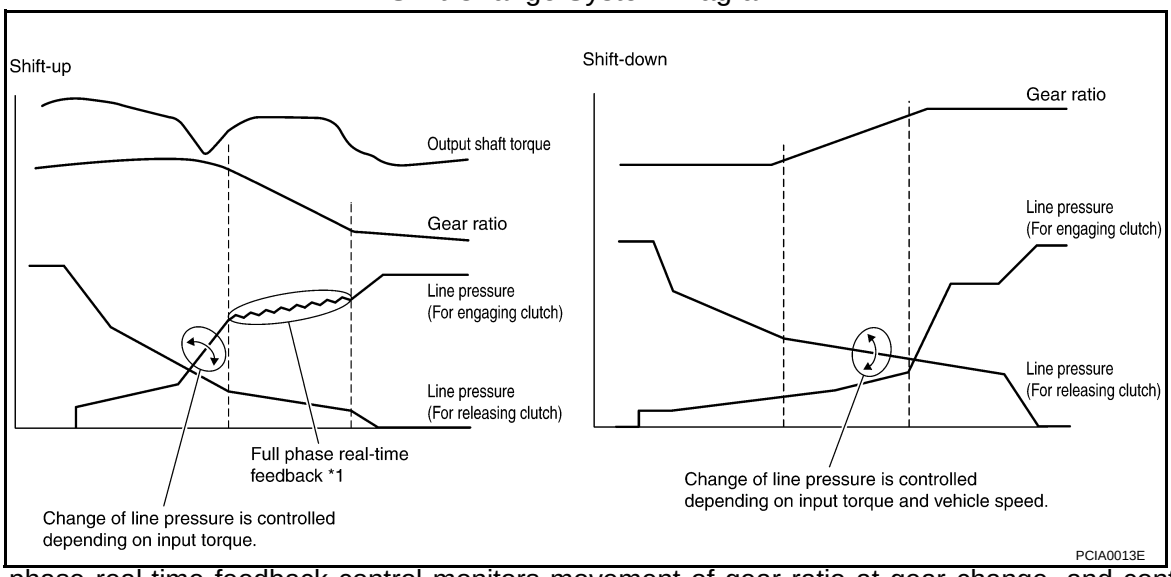
possible to finely control the clutch hydraulic pressure with high precision and a smoother shift change characteristic is attained.



Shift Change

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

Shift Change System Diagram

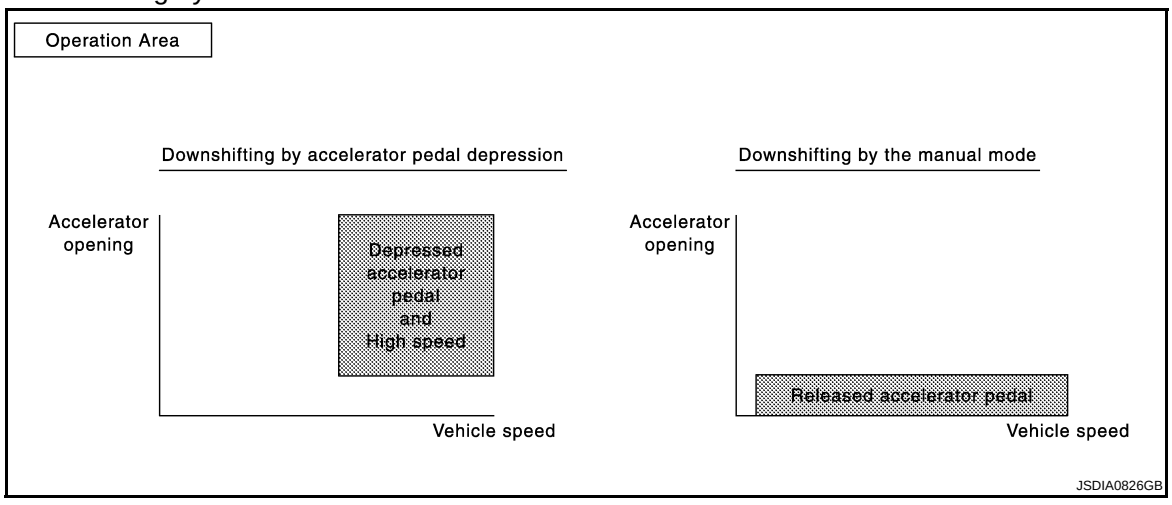


*1: Full phase real-time feedback control monitors movement of gear ratio at gear change, and controls oil pressure in real-time to achieve the best gear ratio.

Blipping Control

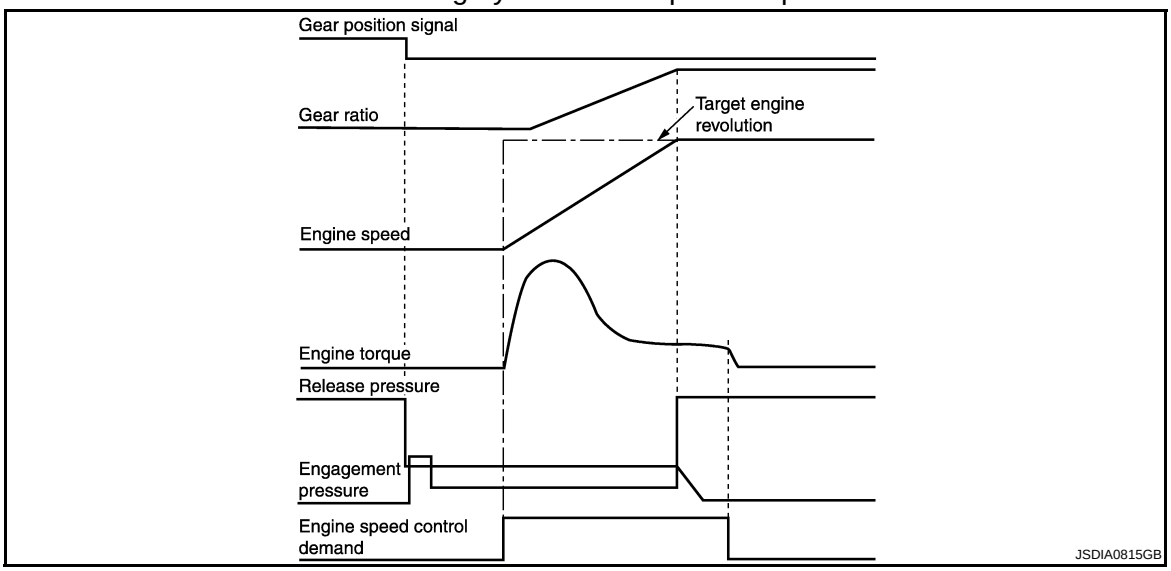
This system makes transmission clutch engage readily by controlling (synchronizing) engine revolution according to the (calculation of) engine revolution after shifting down.

• “BLIPPING CONTROL” functions.
- When downshifting by accelerator pedal depression.
- When downshifting by the manual mode.

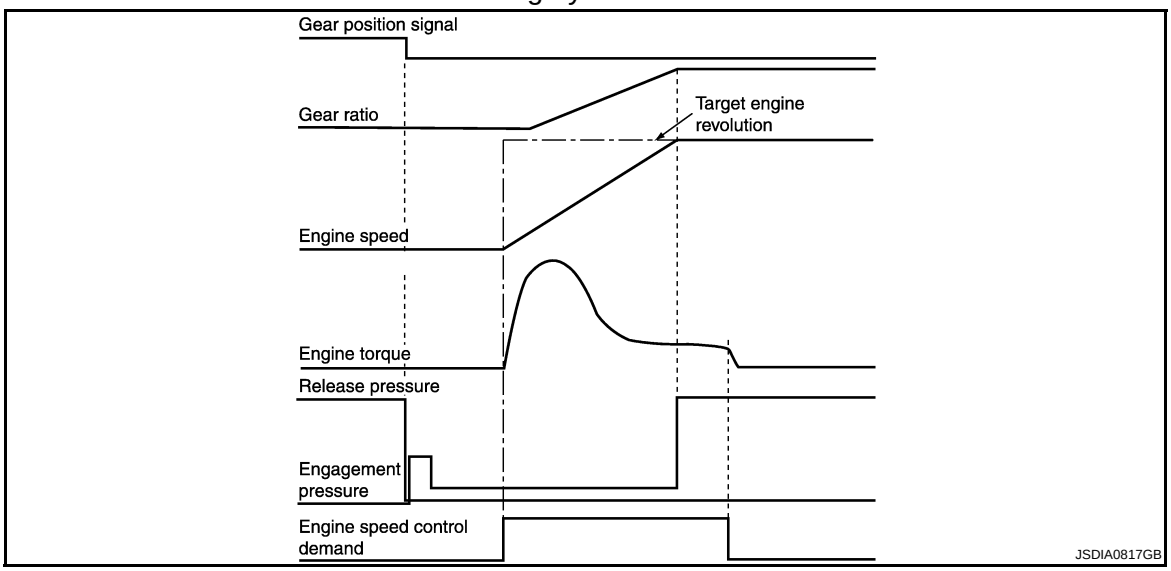


- TCM selects “BLIPPING CONTROL” or “NORMAL SHIFT CONTROL” according to the gear position, the selector lever position, the engine torque and the speed when accelerating by pedal depression.
- Engine speed control demand signal is transmitted from TCM to ECM under “BLIPPING CONTROL”.
- ECM synchronizes the engine speed according to the engine speed control demand signal.

Downshifting by accelerator pedal depression



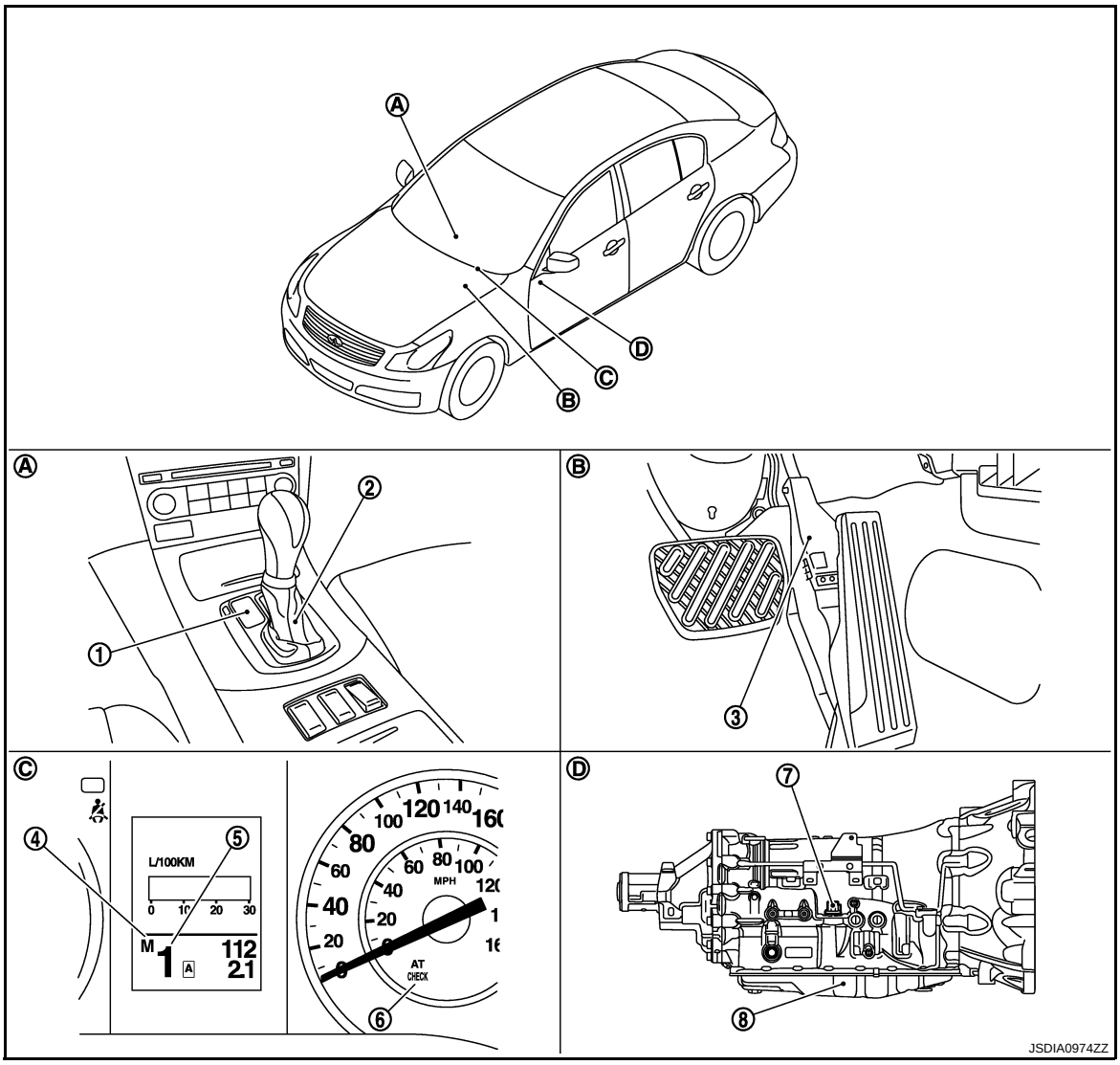
Downshifting by the manual mode



Component Parts Location

INFOID:0000000004437761

Without Paddle Shifter



1. Selector lever position indicator
2. A/T shift selector assembly
3. Accelerator pedal position sensor
4. Manual mode indicator
5. Shift position indicator
6. A/T CHECK indicator lamp
7. A/T assembly connector
8. Control valve with TCM*
- A. Center console
- B. Accelerator pedal
- C. Combination meter
- D. A/T assembly

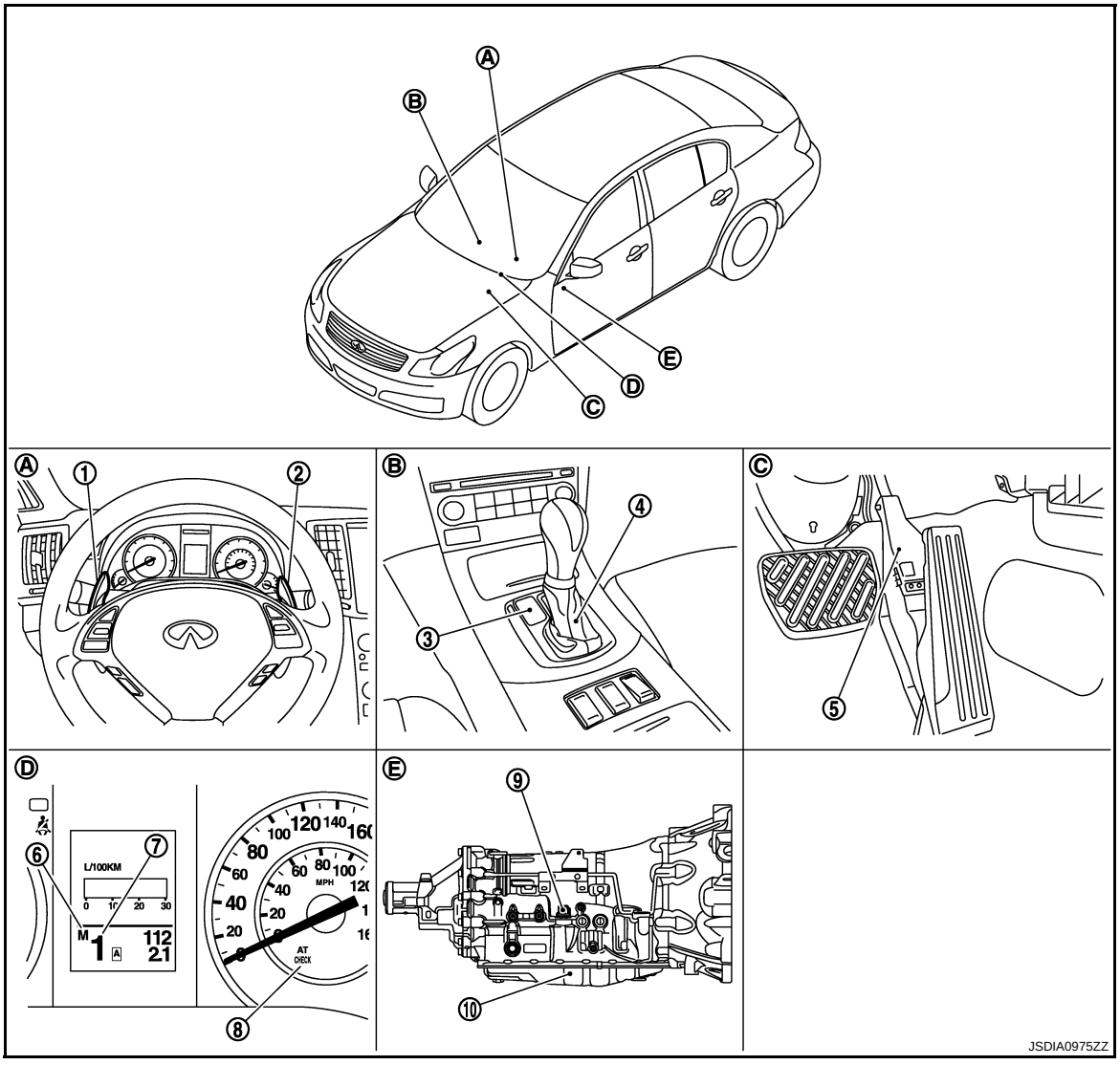
*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (2).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch
- The following components are included in control valve with TCM (8).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve

- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

With Paddle Shifter



1. Paddle shifter (shift-down)
2. Paddle shifter (shift-up)
3. Selector lever position indicator
4. A/T shift selector assembly
5. Accelerator pedal position sensor
6. Manual mode indicator
7. Shift position indicator
8. A/T CHECK indicator lamp
9. A/T assembly connector
10. Control valve with TCM*

A. Steering wheel
B. Center console
C. Accelerator pedal
D. Combination meter
E. A/T assembly

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (4).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch

- The following components are included in control valve with TCM (10).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

Component Description

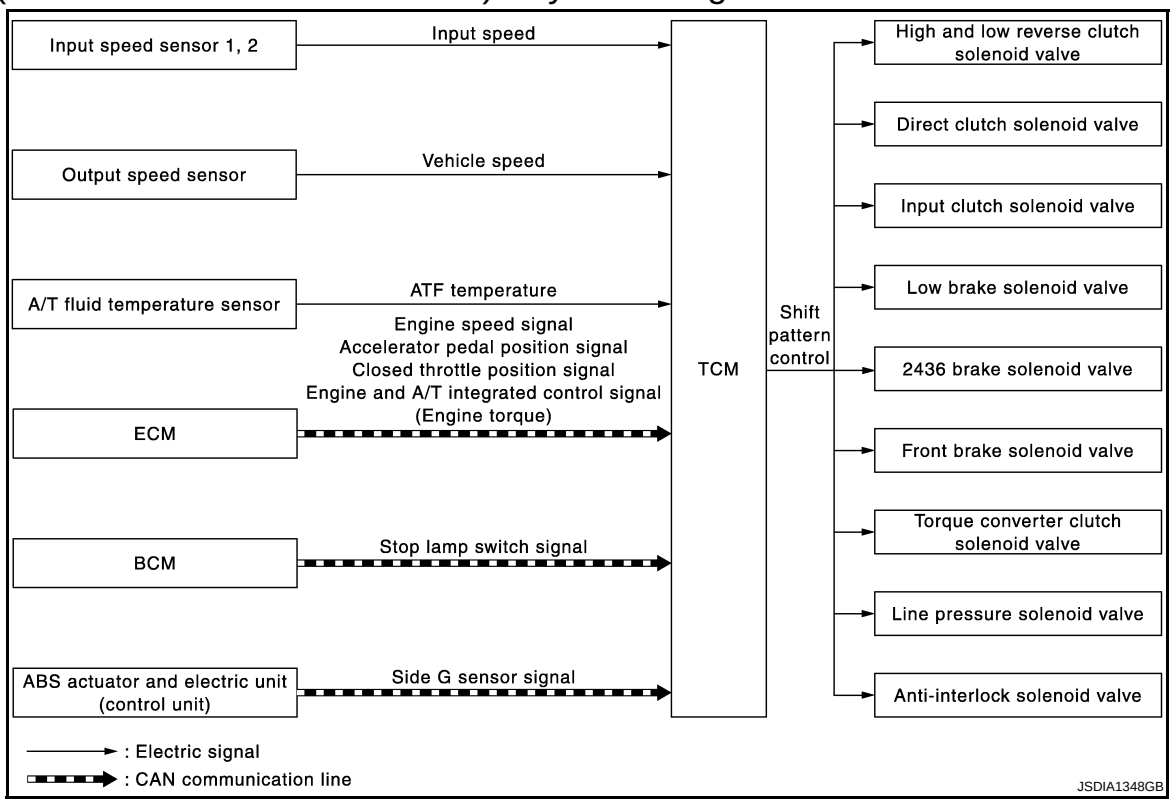
INFOID:0000000004279090

Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Output speed sensor	TM-181, "Description"
Input speed sensor 1	TM-179, "Description"
Input speed sensor 2	
A/T fluid temperature sensor	TM-177, "Description"
Input clutch solenoid valve	TM-205, "Description"
Front brake solenoid valve	TM-209, "Description"
Direct clutch solenoid valve	TM-227, "Description"
High and low reverse clutch solenoid valve	TM-224, "Description"
Low brake solenoid valve	TM-225, "Description"
Anti-interlock solenoid valve	TM-203, "Description"
2346 brake solenoid valve	TM-226, "Description"
Line pressure solenoid valve	TM-202, "Description"
Torque converter clutch solenoid valve	TM-199, "Description"
ECM	EC-25, "System Description"
BCM	BCS-4, "System Description"

SHIFT PATTERN CONTROL
ASC (ADAPTIVE SHIFT CONTROL)

ASC (ADAPTIVE SHIFT CONTROL) : System Diagram

INFOID:0000000004279091



ASC (ADAPTIVE SHIFT CONTROL) : System Description

INFOID:0000000004279092

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to TCM	TCM function	Actuator
Input speed sensor 1, 2	Input speed	Shift pattern control	• High and low reverse clutch solenoid valve • Direct clutch solenoid valve • Input clutch solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Front brake solenoid valve • Torque converter clutch solenoid valve • Line pressure solenoid valve • Anti-interlock solenoid valve
Output speed sensor	Vehicle speed		
A/T fluid temperature sensor	ATF temperature		
ECM	Engine speed signal*		
	Accelerator pedal position signal*		
	Closed throttle position signal*		
	Engine and A/T integrated control signal (engine torque)*		
ABS actuator and electric unit (control unit)	Side G sensor signal*		
BCM	Stop lamp switch signal*		

*: This signal is transmitted via CAN communication line.

SYSTEM DESCRIPTION

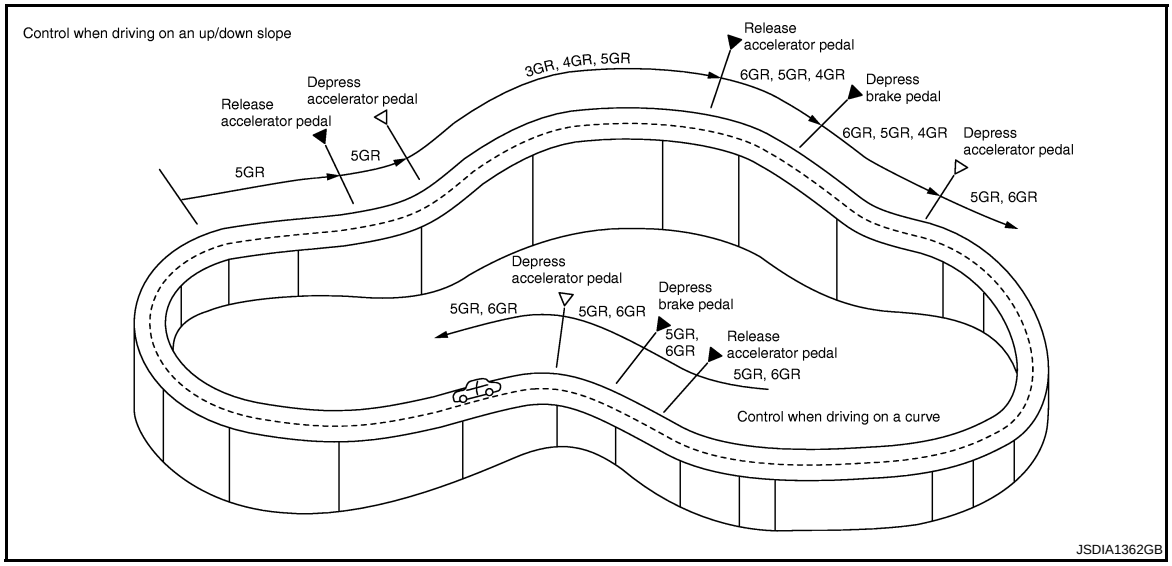
It automatically selects the shift pattern (such as road environment and driving style) suitable for the various situations so as to allow the vehicle to be driven efficiently and smoothly.

For example.....

- When driving on an up/down slope
  ASC judges up/down slope according to engine torque data transmitted from the ECM and vehicle speed. Fixing at 4GR, 5GR or 6GR on an up-slope prevents shift hunting and controls the vehicle to gain optimum

driving force. On a down-slope, automatic shift-down to 4GR, 5GR or 6GR controls to gain optimum engine brake.

- When driving on a curve
  TCM receives the side G sensor signal from the ABS actuator and electric unit (control unit). It locks to 4GR, 5GR or 6GR position in moderate cornering or to 3GR position in sharp cornering based on this signal. This prevents any upshift and kickdown during cornering, maintaining smooth vehicle travel.



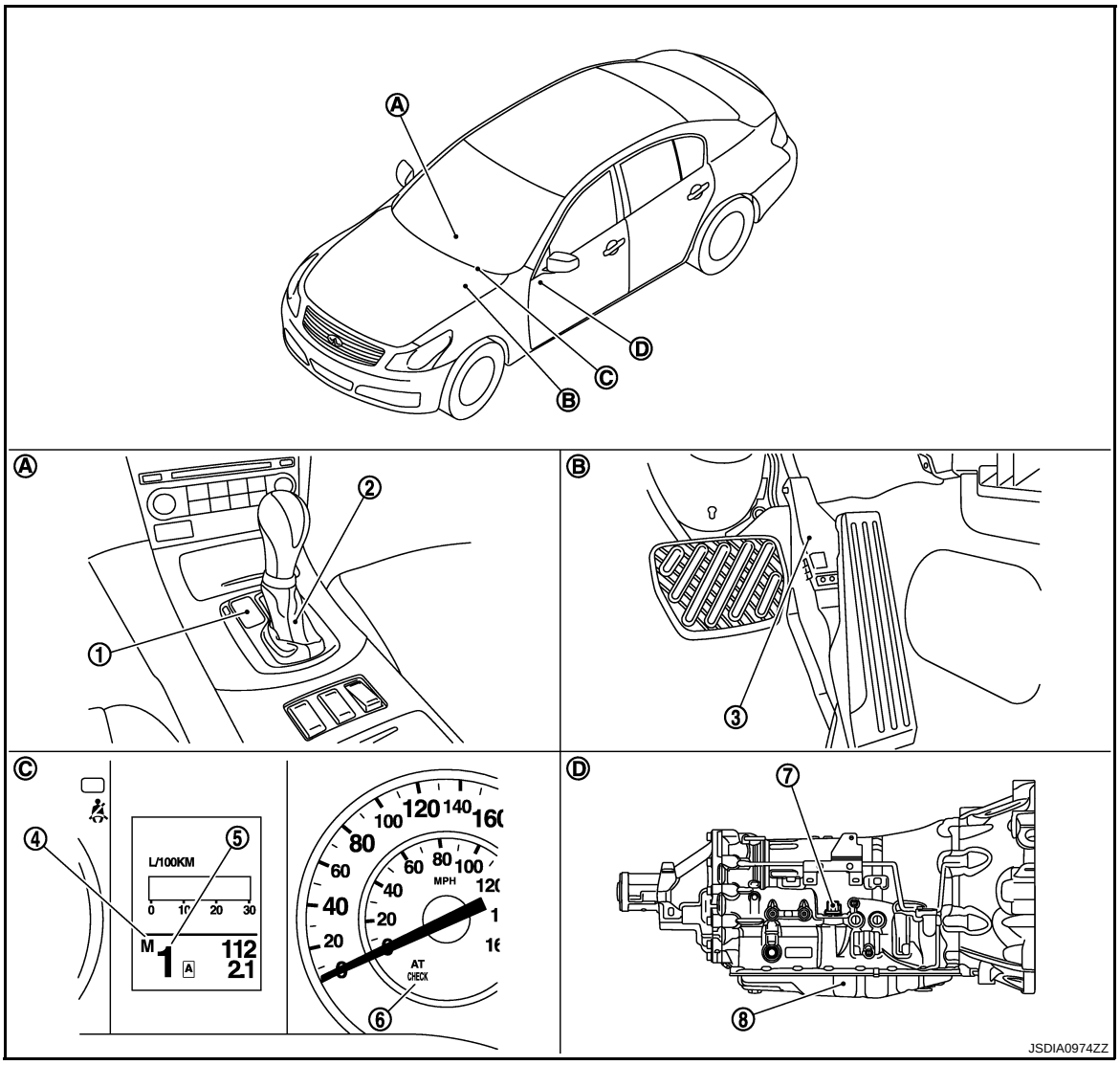
DS Mode

- Changes to the shift schedule that mainly utilizes the high engine speed zone when ASC is active.
- DS mode can be switched according to the following method.
- When the selector lever is in the “D” position, shifting the selector lever to manual shift gate enables switching to DS mode.
- When in DS mode, shifting the selector lever to the main gate enables to cancel DS mode.
- After switching to manual mode with paddle shifter, switching to DS mode can not be enabled even when the selector lever is shifted to the manual gate. (With paddle shifter)

ASC (ADAPTIVE SHIFT CONTROL) : Component Parts Location

INFOID:0000000004437762

Without Paddle Shifter



1. Selector lever position indicator
2. A/T shift selector assembly
3. Accelerator pedal position sensor
4. Manual mode indicator
5. Shift position indicator
6. A/T CHECK indicator lamp
7. A/T assembly connector
8. Control valve with TCM*
- A. Center console
- B. Accelerator pedal
- C. Combination meter
- D. A/T assembly

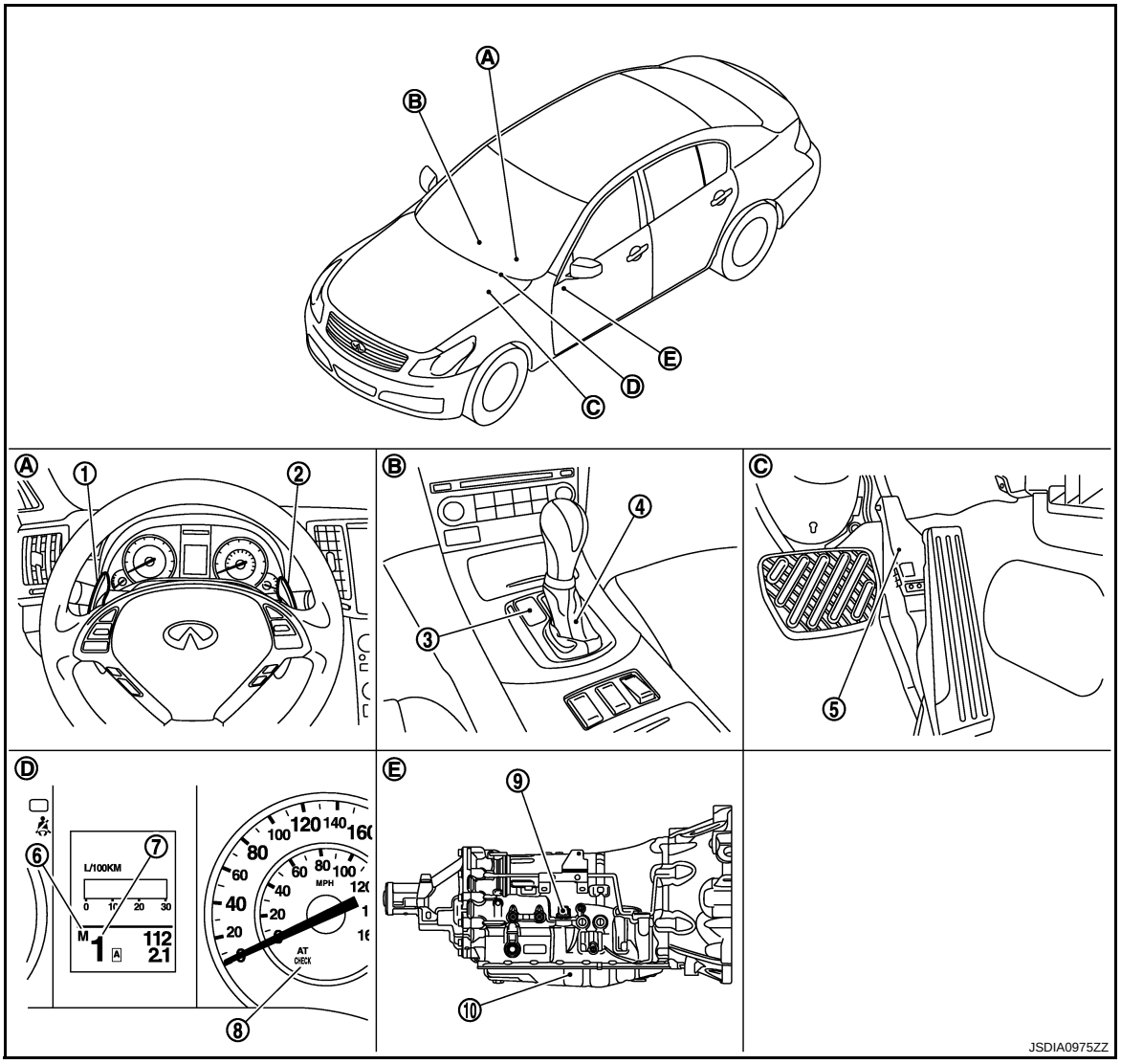
*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (2).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch
- The following components are included in control valve with TCM (8).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve

- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

With Paddle Shifter



1. Paddle shifter (shift-down)
2. Paddle shifter (shift-up)
3. Selector lever position indicator
4. A/T shift selector assembly
5. Accelerator pedal position sensor
6. Manual mode indicator
7. Shift position indicator
8. A/T CHECK indicator lamp
9. A/T assembly connector
10. Control valve with TCM*

A. Steering wheel
B. Center console
C. Accelerator pedal
D. Combination meter
E. A/T assembly

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (4).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch

- The following components are included in control valve with TCM (10).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

ASC (ADAPTIVE SHIFT CONTROL) : Component Description

INFOID:0000000004279094

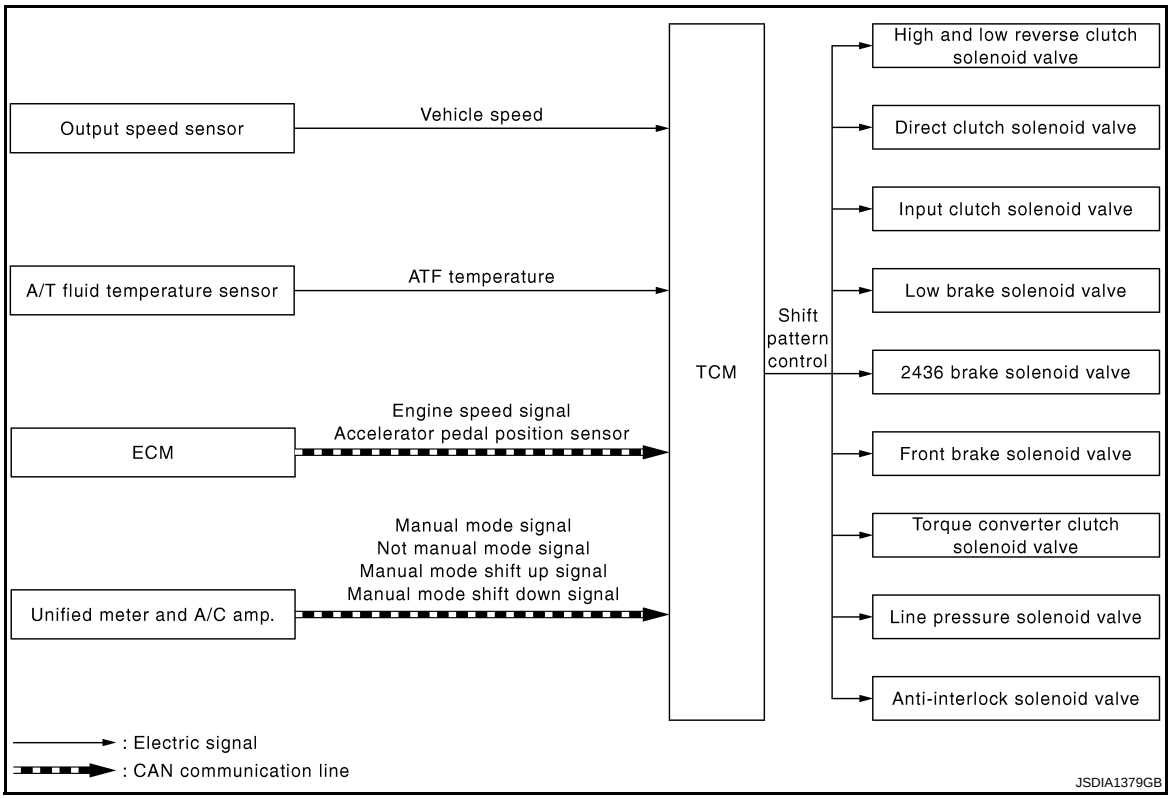
Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Output speed sensor	TM-181, "Description"
Input speed sensor 1	TM-179, "Description"
Input speed sensor 2	
A/T fluid temperature sensor	TM-177, "Description"
Input clutch solenoid valve	TM-205, "Description"
Front brake solenoid valve	TM-209, "Description"
Direct clutch solenoid valve	TM-227, "Description"
High and low reverse clutch solenoid valve	TM-224, "Description"
Low brake solenoid valve	TM-225, "Description"
Anti-interlock solenoid valve	TM-203, "Description"
2346 brake solenoid valve	TM-226, "Description"
Line pressure solenoid valve	TM-202, "Description"
Torque converter clutch solenoid valve	TM-199, "Description"
ECM	EC-25, "System Description"
BCM	BCS-4, "System Description"
ABS actuator and electric unit (control unit)	BRC-18, "System Description"

MANUAL MODE

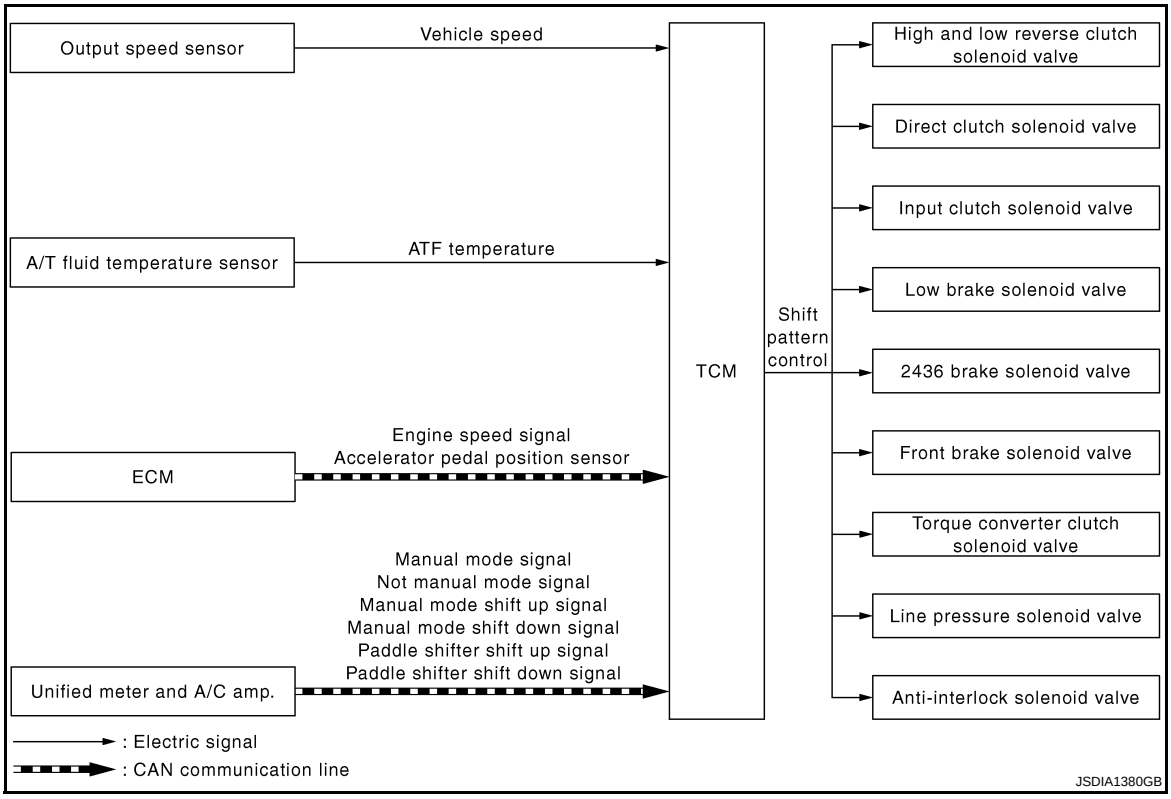
MANUAL MODE : System Diagram

INFOID:0000000004279095

Without Paddle Shifter



With Paddle Shifter



MANUAL MODE : System Description

INFOID:0000000004279096

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to TCM	TCM function	Actuator
Output speed sensor	Vehicle speed	Shift pattern control	• High and low reverse clutch solenoid valve • Direct clutch solenoid valve • Input clutch solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Front brake solenoid valve • Torque converter clutch solenoid valve • Line pressure solenoid valve • Anti-interlock solenoid valve
A/T fluid temperature sensor	ATF temperature		
ECM	Engine speed signal*1		
	Accelerator pedal position signal*1		
Unified meter and A/C amp.	Manual mode signal*1		
	Not manual mode signal*1		
	Manual mode shift up signal*1		
	Manual mode shift down signal*1		
	Paddle shifter shift up signal*1, *2		
	Paddle shifter shift down signal*1, *2		

*1: This signal is transmitted via CAN communication line.

*2: With paddle shifter

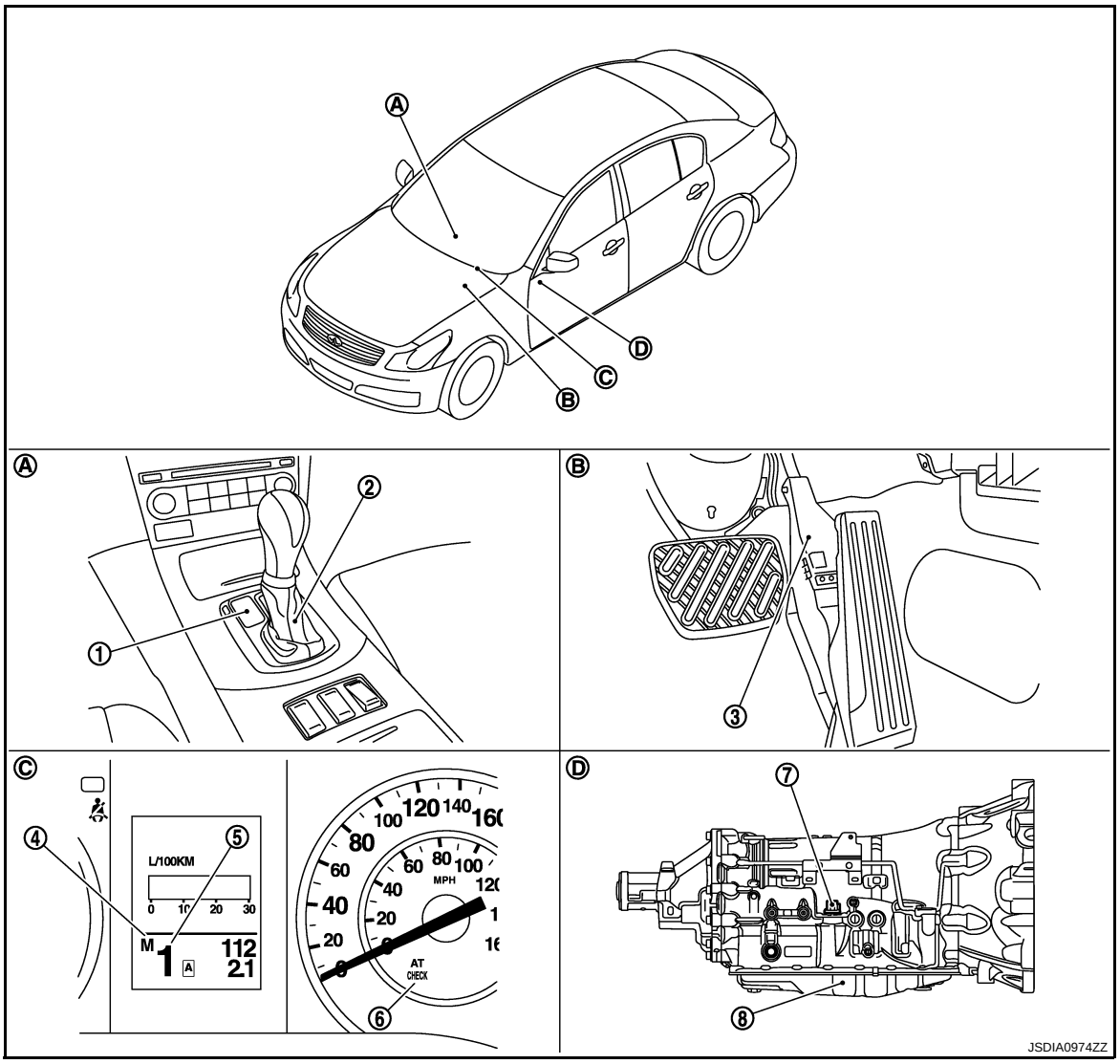
SYSTEM DESCRIPTION

- The TCM receives the manual mode signal, not manual mode signal, manual mode shift up signal, manual mode shift down signal, paddle shifter shift up signal* and paddle shifter shift down signal* from unified meter and A/C amp. via CAN communication line. The TCM shifts shift pattern control to the manual mode based on these signals, and then shifts the A/T by operating each solenoid valve according to the shift operation of the driver.
  *: With paddle shifter
- The TCM prohibits the manual mode while being in fail-safe mode due to an A/T malfunction, etc. Refer to TM-253, "Fail-Safe".

MANUAL MODE : Component Parts Location

INFOID:0000000004437763

Without Paddle Shifter



1. Selector lever position indicator
2. A/T shift selector assembly
3. Accelerator pedal position sensor
4. Manual mode indicator
5. Shift position indicator
6. A/T CHECK indicator lamp
7. A/T assembly connector
8. Control valve with TCM*
- A. Center console
- B. Accelerator pedal
- C. Combination meter
- D. A/T assembly

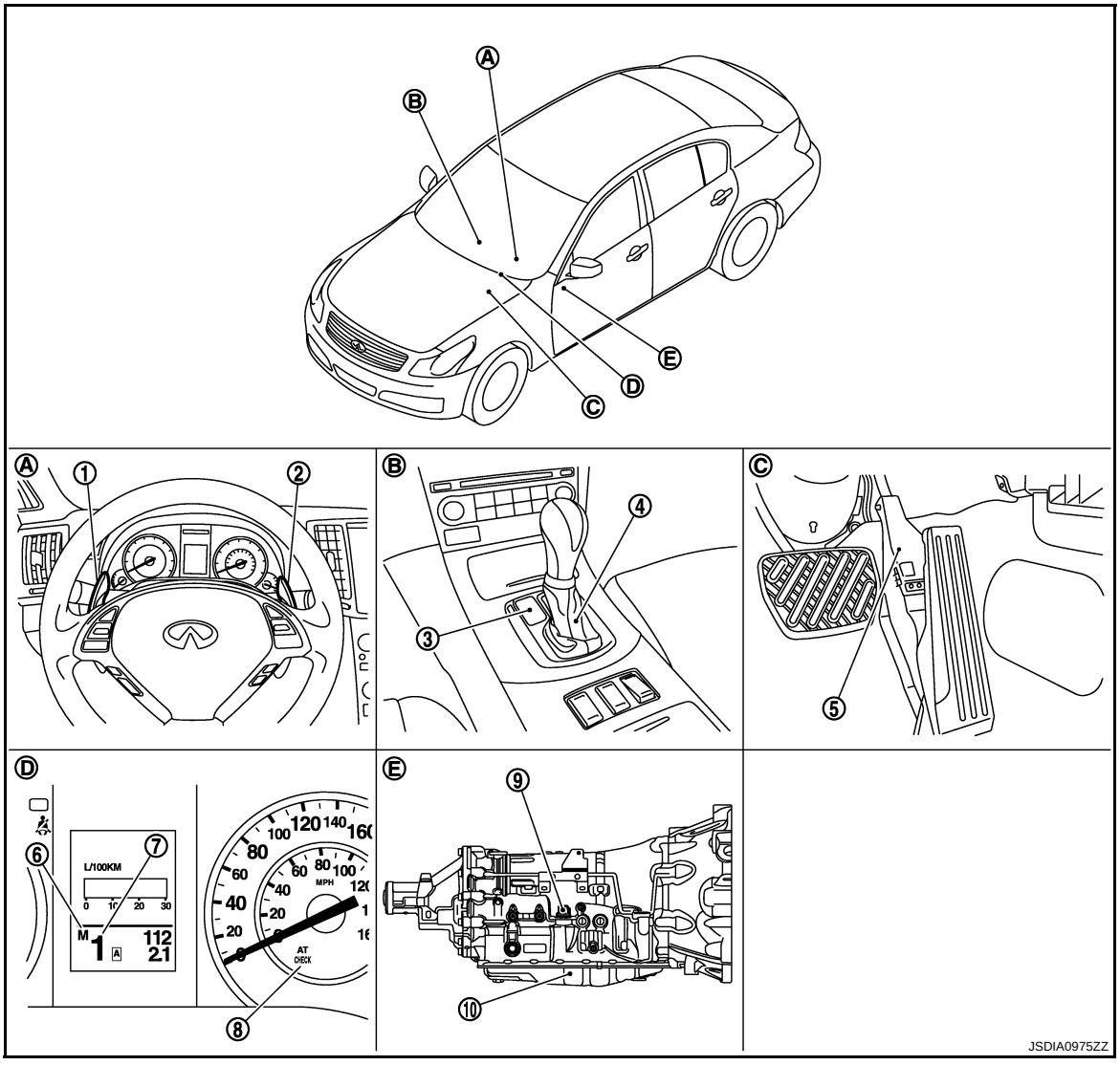
*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (2).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch
- The following components are included in control valve with TCM (8).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve

- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

With Paddle Shifter



1. Paddle shifter (shift-down)
2. Paddle shifter (shift-up)
3. Selector lever position indicator
4. A/T shift selector assembly
5. Accelerator pedal position sensor
6. Manual mode indicator
7. Shift position indicator
8. A/T CHECK indicator lamp
9. A/T assembly connector
10. Control valve with TCM*

A. Steering wheel
B. Center console
C. Accelerator pedal
D. Combination meter
E. A/T assembly

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (4).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch

• The following components are included in control valve with TCM (10).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

MANUAL MODE : Component Description

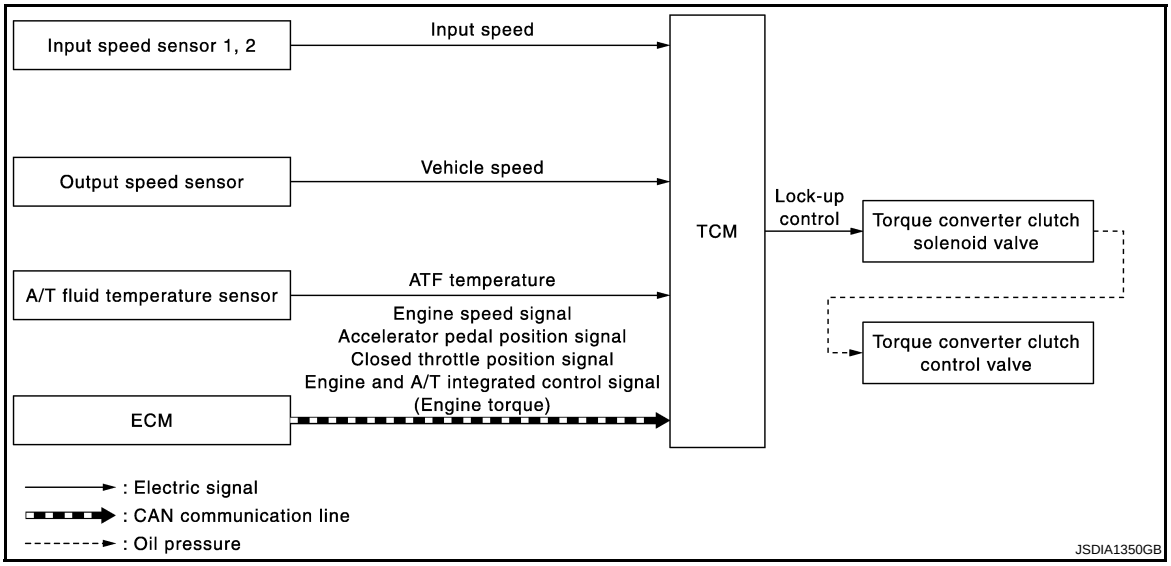
INFOID:0000000004279098

Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Output speed sensor	TM-181, "Description"
A/T fluid temperature sensor	TM-177, "Description"
Input clutch solenoid valve	TM-205, "Description"
Front brake solenoid valve	TM-209, "Description"
Direct clutch solenoid valve	TM-227, "Description"
High and low reverse clutch solenoid valve	TM-224, "Description"
Low brake solenoid valve	TM-225, "Description"
Anti-interlock solenoid valve	TM-203, "Description"
2346 brake solenoid valve	TM-226, "Description"
Line pressure solenoid valve	TM-202, "Description"
Torque converter clutch solenoid valve	TM-199, "Description"
ECM	EC-25, "System Description"
Unified meter and A/C amp.	MWI-6, "METER SYSTEM : System Description"

LOCK-UP CONTROL

System Diagram

INFOID:0000000004279099



System Description

INFOID:0000000004279100

INPUT/OUTPUT SIGNAL CHART

Sensor	Input signal to TCM	TCM function	Actuator
Input speed sensor 1, 2	Input speed	Lock-up control	Torque converter clutch solenoid valve ↓ Torque converter clutch control valve
Output speed sensor	Vehicle speed		
A/T fluid temperature sensor	ATF temperature		
ECM	Engine speed signal*		
	Accelerator pedal position signal*		
	Closed throttle position signal*		
	Engine and A/T integrated control signal (Engine torque)*		

*: This signal is transmitted via CAN communication line.

SYSTEM DESCRIPTION

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

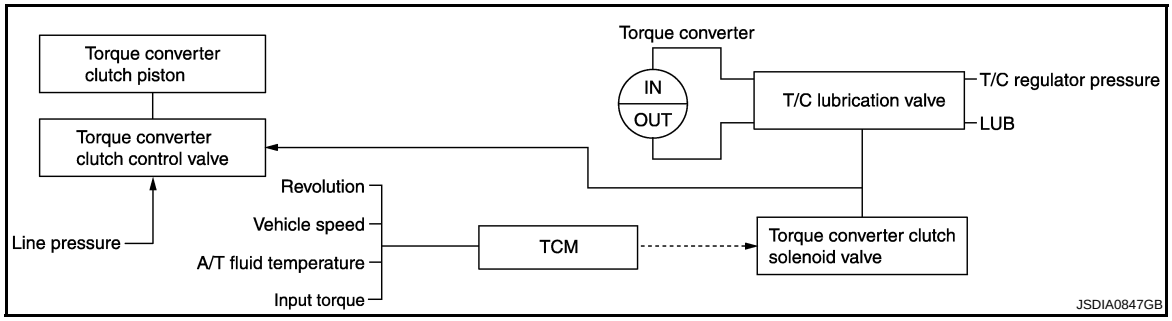
The torque converter clutch control valve operation is controlled by the torque converter clutch solenoid valve, which is controlled by a signal from TCM, and the torque converter clutch control valve engages or releases the torque converter clutch piston.

Lock-up operation condition table

Selector lever	"D" position						"M" position					
Gear position	7	6	5	4	3	2	7	6	5	4	3	2
Lock-up	×	–	–	–	–	–	×	×	×	×	×	×
Slip lock-up	×	×	×	×	×	×	×	×	×	×	×	×

Torque Converter Clutch Control Valve Control

Lock-up control system diagram



Lock-up released
- In the lock-up released state, the torque converter clutch control valve is set into the unlocked state by the torque converter clutch solenoid and the lock-up apply pressure is drained.
  in this way, the torque converter clutch piston is not coupled.

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

Smooth Lock-up Control

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

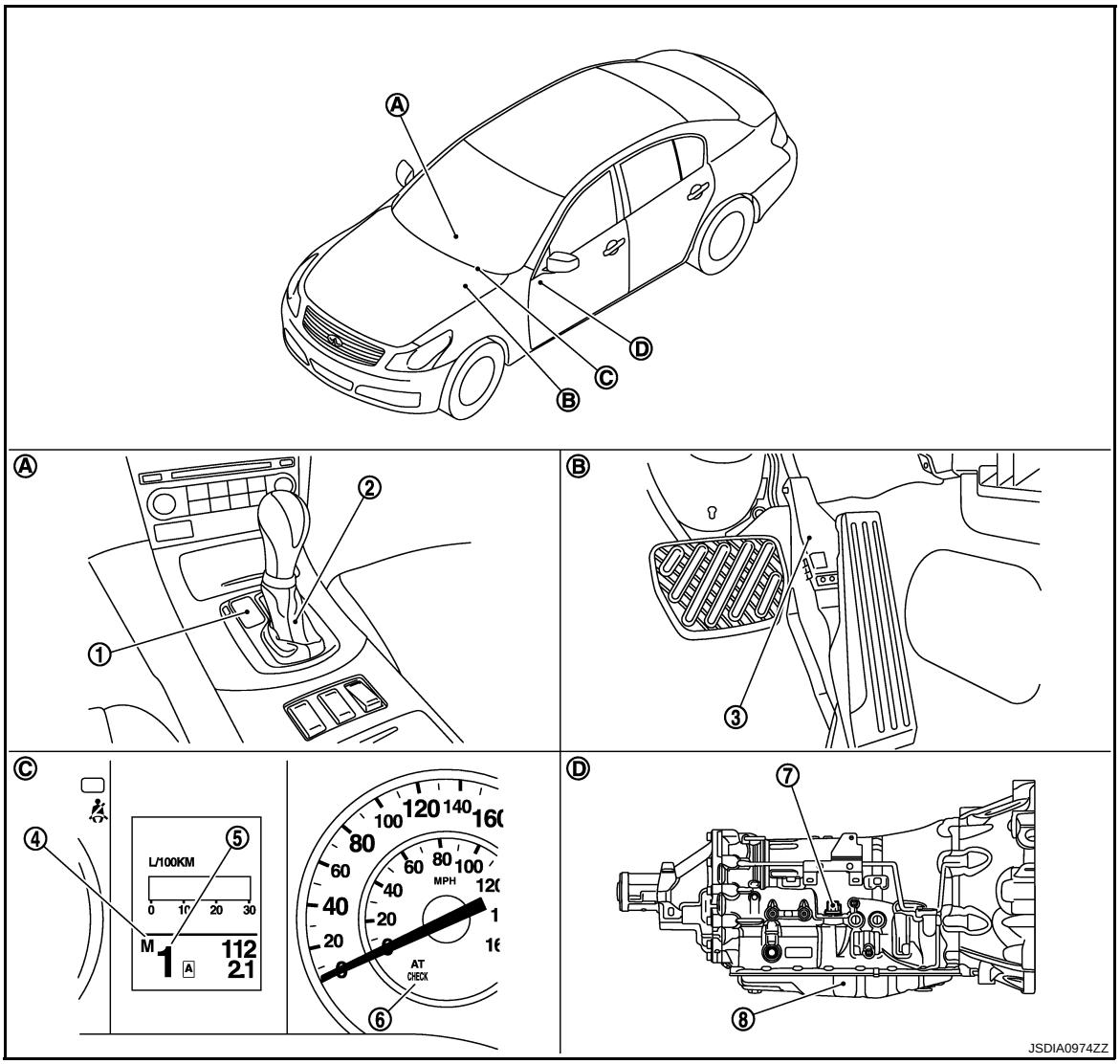
Half-clutched State
- The current output from the TCM to the torque converter clutch solenoid is varied to steadily increase the torque converter clutch solenoid pressure.
  In this way, the lock-up apply pressure gradually rises and while the torque converter clutch piston is put into half-clutched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

Slip Lock-up Control
- In the slip region, the torque converter clutch solenoid current is controlled with the TCM to put it into the half-clutched state. This absorbs the engine torque fluctuation and lock-up operates from low speed.
  This raises the fuel efficiency for 2GR, 3GR, 4GR 5GR, 6GR and 7GR.

Component Parts Location

INFOID:0000000004437764

Without Paddle Shifter



1. Selector lever position indicator
2. A/T shift selector assembly
3. Accelerator pedal position sensor
4. Manual mode indicator
5. Shift position indicator
6. A/T CHECK indicator lamp
7. A/T assembly connector
8. Control valve with TCM*
- A. Center console
- B. Accelerator pedal
- C. Combination meter
- D. A/T assembly

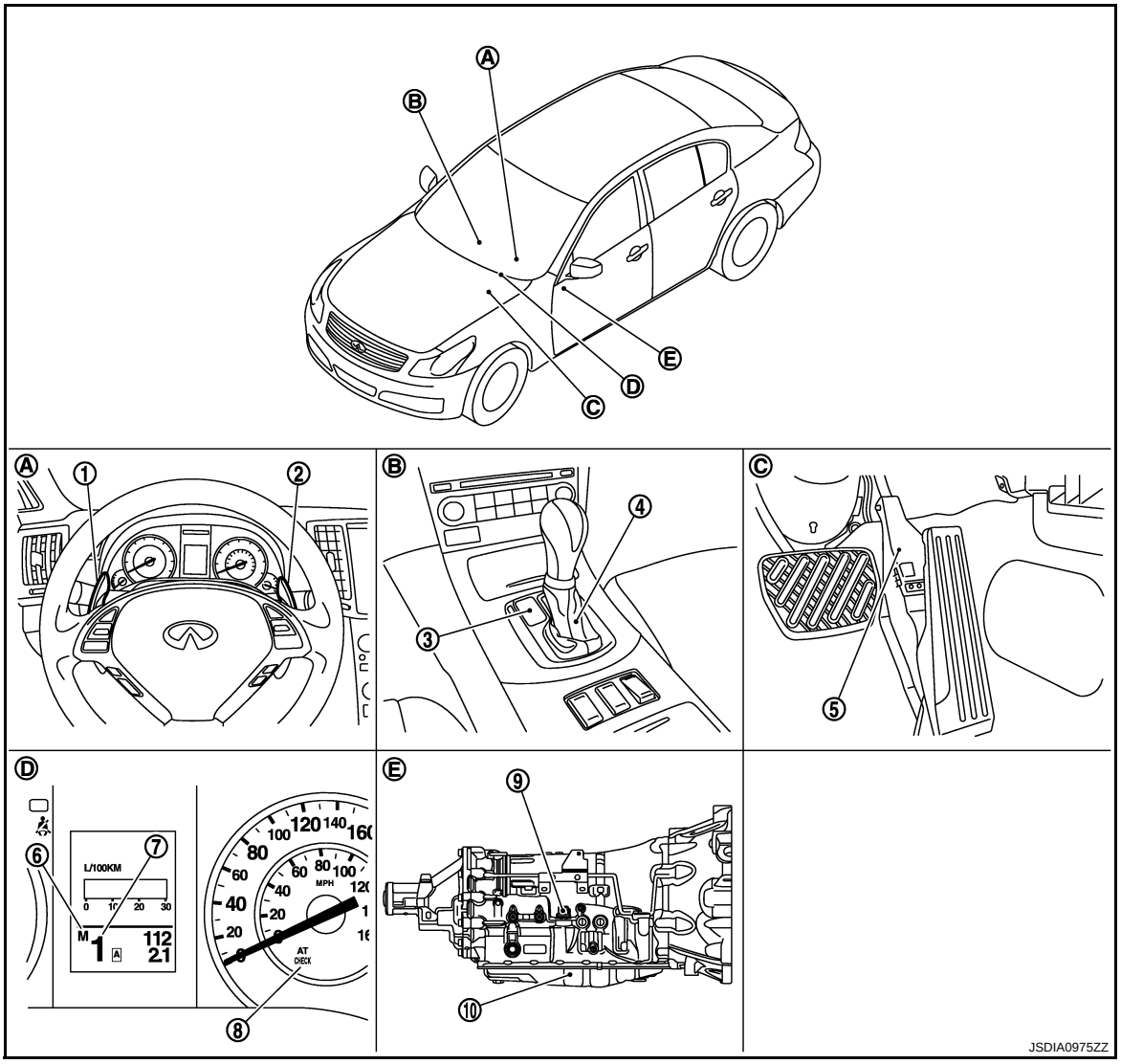
*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (2).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch
- The following components are included in control valve with TCM (8).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve

- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

With Paddle Shifter



1. Paddle shifter (shift-down)
2. Paddle shifter (shift-up)
3. Selector lever position indicator
4. A/T shift selector assembly
5. Accelerator pedal position sensor
6. Manual mode indicator
7. Shift position indicator
8. A/T CHECK indicator lamp
9. A/T assembly connector
10. Control valve with TCM*

A. Steering wheel
B. Center console
C. Accelerator pedal
D. Combination meter
E. A/T assembly

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (4).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch

- The following components are included in control valve with TCM (10).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

Component Description

INFOID:0000000004279102

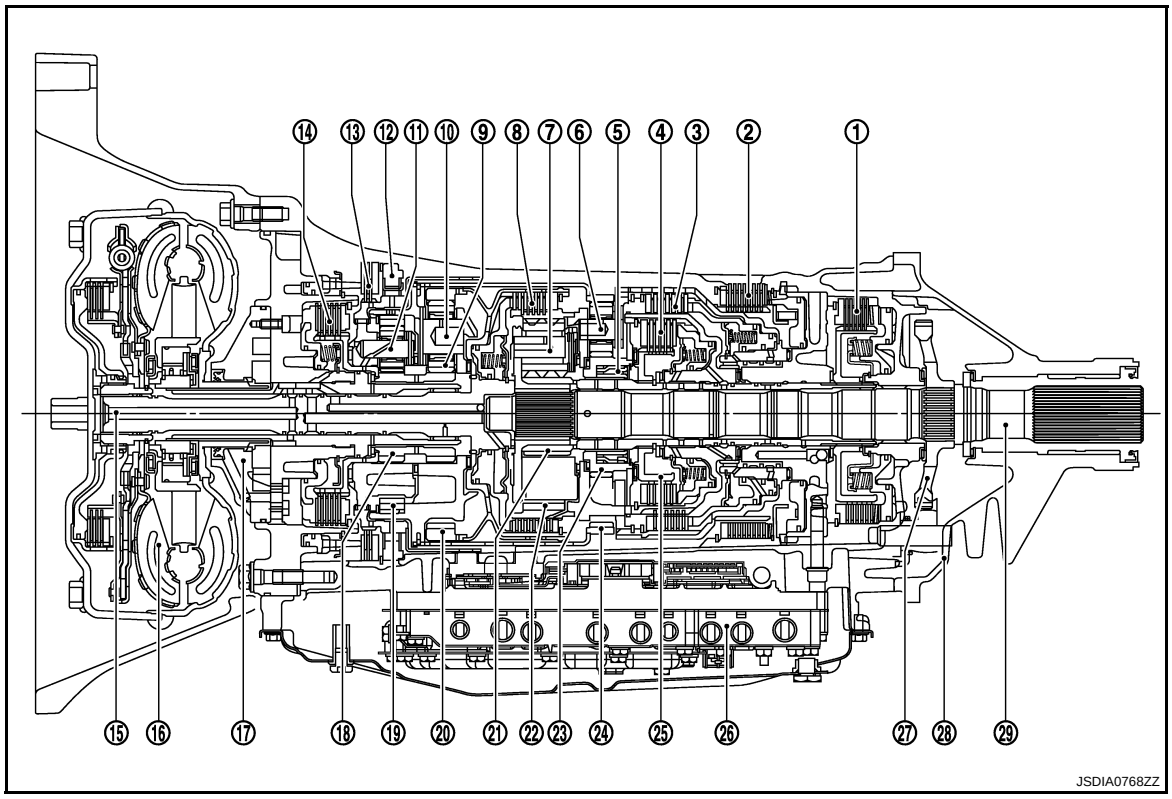
Name	Function
TCM	The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
Output speed sensor	TM-181, "Description"
Input speed sensor 1	TM-179, "Description"
Input speed sensor 2	
A/T fluid temperature sensor	TM-177, "Description"
Torque converter clutch solenoid valve	TM-199, "Description"
Torque converter clutch control valve	Switches the lock-up to operating or released. Also, by performing the lock-up operation transiently, lock-up smoothly.
ECM	EC-25, "System Description"

SHIFT MECHANISM

Cross-Sectional View

INFOID:0000000004279103

2WD MODELS



1.	Low brake	2.	Reverse brake	3.	Direct clutch
4.	High and low reverse clutch	5.	2nd one-way clutch	6.*1	Rear carrier
7.	Mid carrier	8.	Input clutch	9.*2	Front sun gear
10.*3	Front carrier	11.	Under drive carrier	12.	1st one-way clutch
13.	Front brake	14.	2346 brake	15.*4	Input shaft
16.	Torque converter	17.	Oil pump	18.*2	Under drive sun gear
19.*3	Under drive internal gear	20.*4	Front internal gear	21.	Mid sun gear
22.*1	Mid internal gear	23.	Rear sun gear	24.	Rear internal gear
25.	High and low reverse clutch hub	26.	Control valve with TCM	27.	Parking gear
28.	Rear extension	29.	Output shaft		

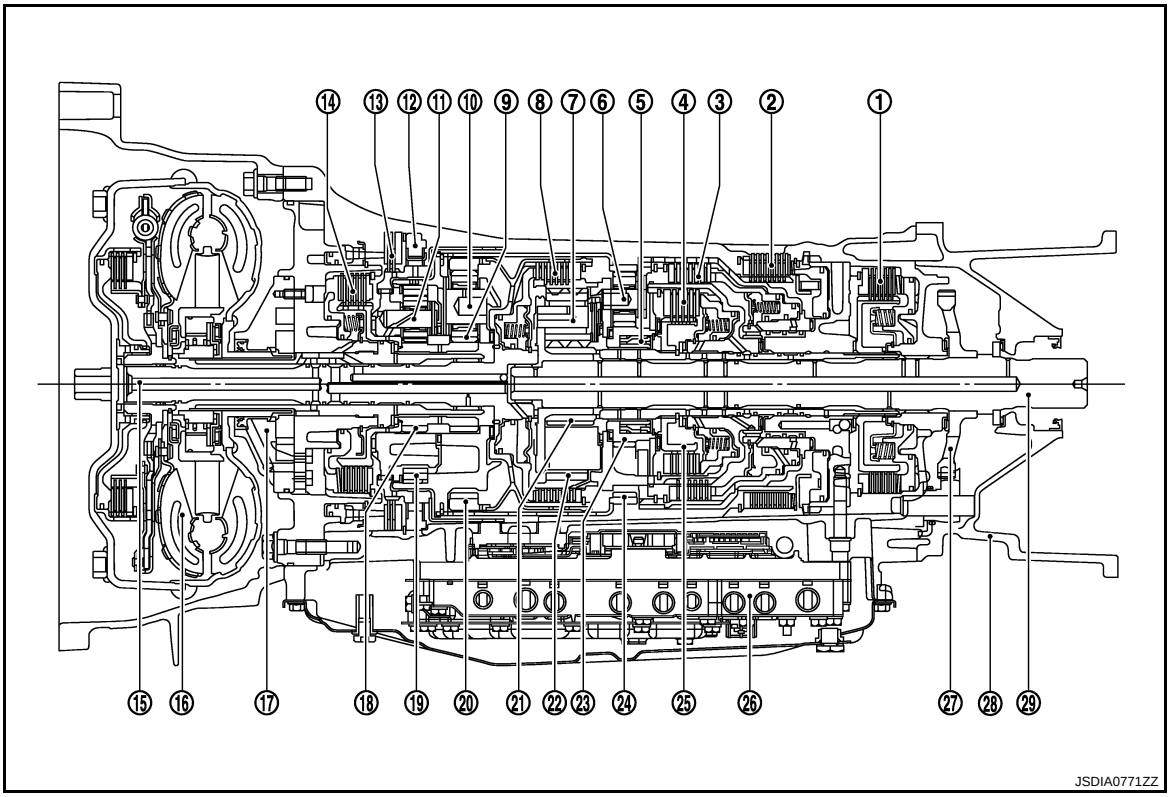
*1: 6 and 22 are one unit.

*2: 9 and 18 are one unit.

*3: 10 and 19 are one unit.

*4: 15 and 20 are one unit.

AWD MODELS

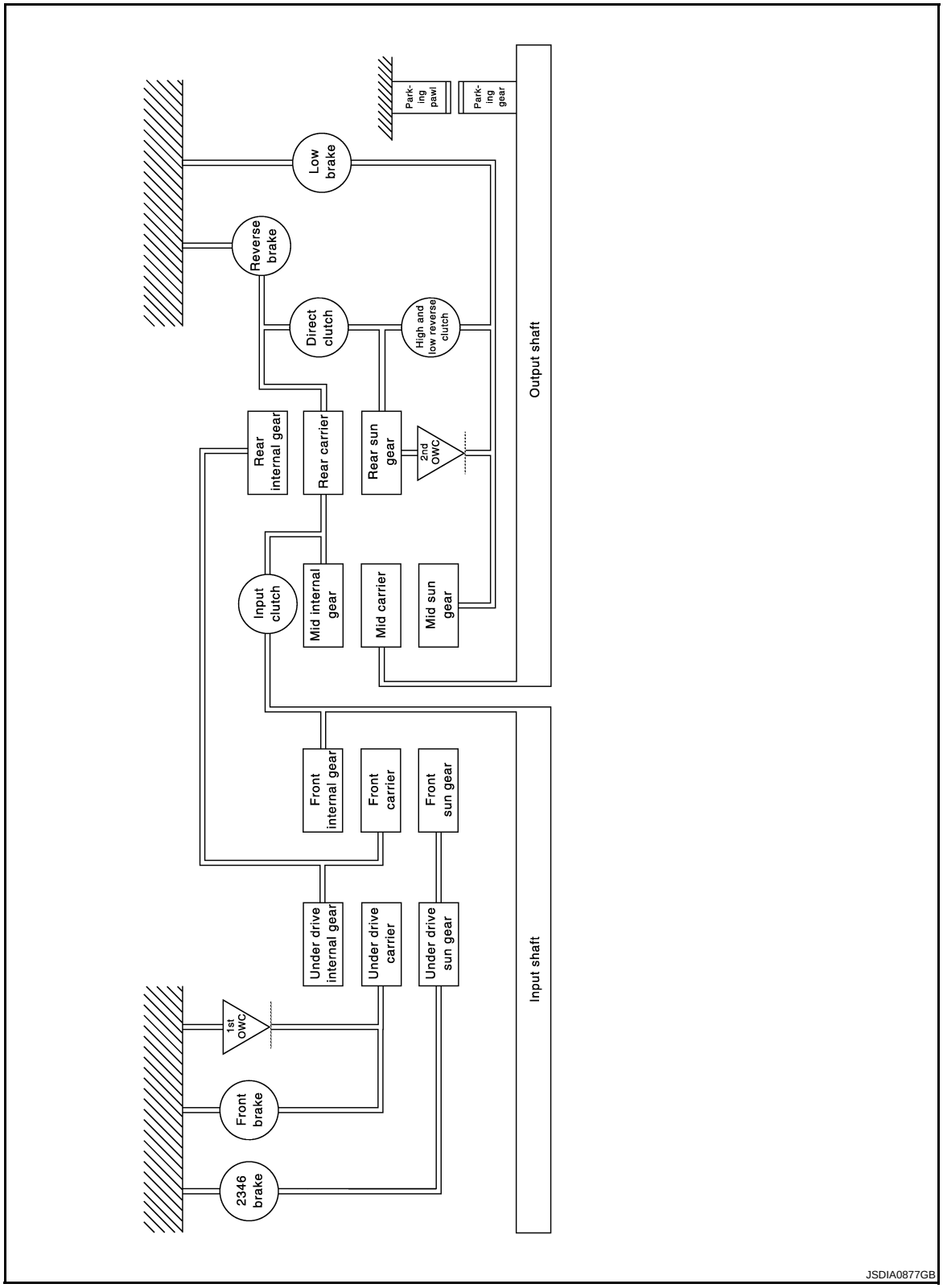


1.	Low brake	2.	Reverse brake	3.	Direct clutch
4.	High and low reverse clutch	5.	2nd one-way clutch	6.*1	Rear carrier
7.	Mid carrier	8.	Input clutch	9.*2	Front sun gear
10.*3	Front carrier	11.	Under drive carrier	12.	1st one-way clutch
13.	Front brake	14.	2346 brake	15.*4	Input shaft
16.	Torque converter	17.	Oil pump	18.*2	Under drive sun gear
19.*3	Under drive internal gear	20.*4	Front internal gear	21.	Mid sun gear
22.*1	Mid internal gear	23.	Rear sun gear	24.	Rear internal gear
25.	High and low reverse clutch hub	26.	Control valve with TCM	27.	Parking gear
28.	Adapter case	29.	Output shaft		

*1: 6 and 22 are one unit.
*2: 9 and 18 are one unit.
*3: 10 and 19 are one unit.
*4: 15 and 20 are one unit.

System Diagram

INFOID:0000000004279104



System Description

INFOID:0000000004279105

DESCRIPTION

With the use of 4 sets of planetary gears, A/T enables 7-speed transmission for forward and 1-speed transmission for backward, depending on the combination of 3 sets of multiple-disc clutches, 4 sets of multiple-disc brakes and 2 sets of one-way clutches.

CLUTCH AND BAND CHART

Name of the part / Shift position		I/C	D/C		H&LR/C	F/B	L/B		2346/B	REV/B	1st OWC	2nd OWC	Remarks
			FRONT	REAR			INNER	OUTER					
P					△	△							Park position
R					◇	◇				○	◎	◎	Reverse position
N					△	△							Neutral position
D, DS	1st				☆	☆	○	○			◎	◎	Automatic shift 1⇔2⇔3⇔4⇔5⇔6⇔7
	2nd						○	○	○			◎	
	3rd		○	○			○		○				
	4th		○	○	○				○				
	5th	○		○	○								
	6th	○			○				○				
	7th	○			○	○							
7M	7th	○			○	○							Locks* (held stationary) in 7GR
6M	6th	○			○				○				Locks* (held stationary) in 6GR
5M	5th	○		○	○								Locks* (held stationary) in 5GR
4M	4th		○	○	○				○				Locks* (held stationary) in 4GR
3M	3rd		○	○			○		○				Locks* (held stationary) in 3GR
2M	2nd				◇		○	○	○			◎	Locks* (held stationary) in 2GR
1M	1st				◇	◇	○	○			◎	◎	Locks (held stationary) in 1GR

*: Down shift automatically according to the vehicle speed.

○ – Operates
◎ – Operates during “progressive” acceleration.
◇ – Operates and affects power transmission while coasting.
△ – Line pressure is applied but does not affect power transmission.
☆ – Operates at the fixed speed or less.

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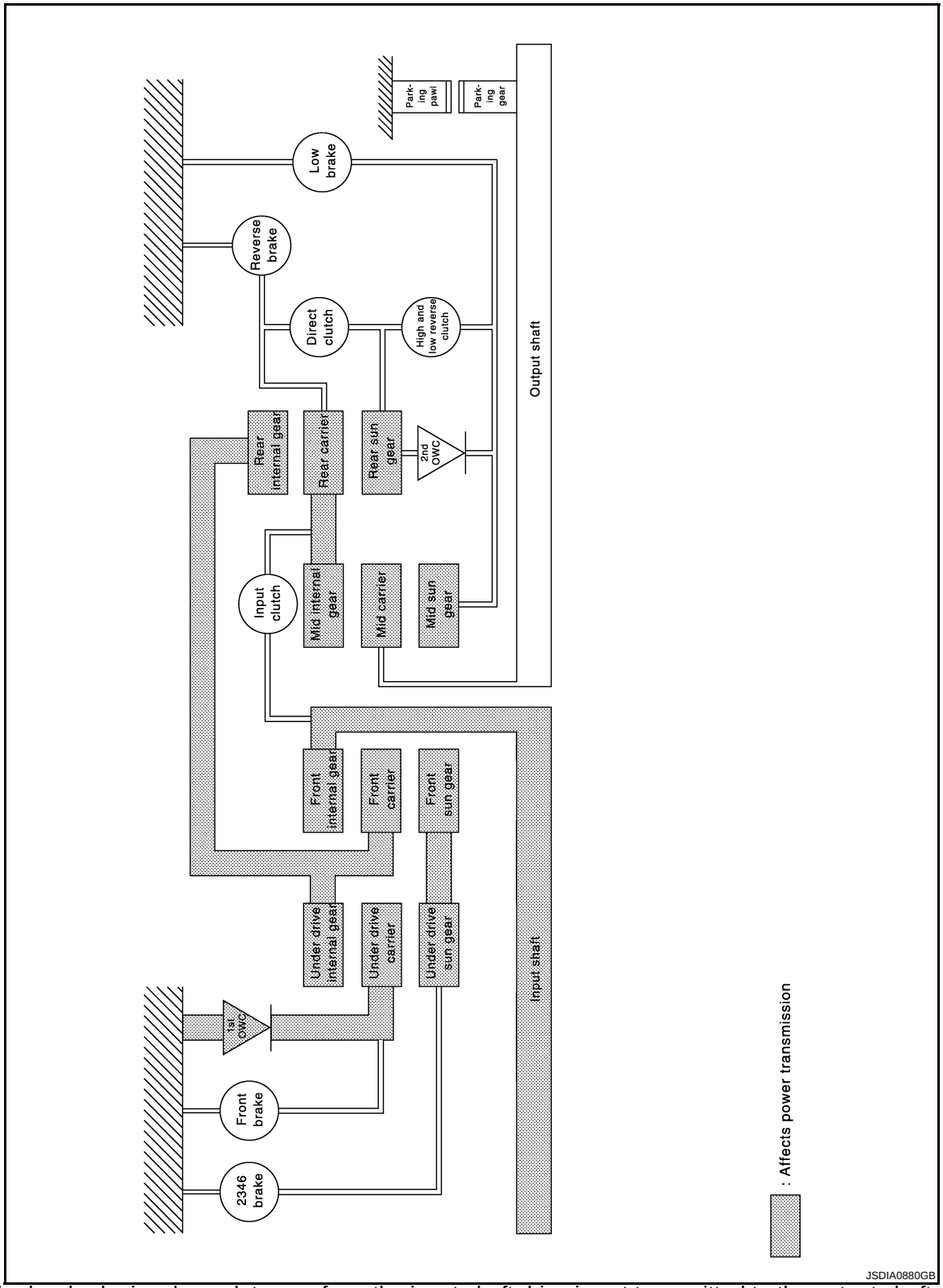
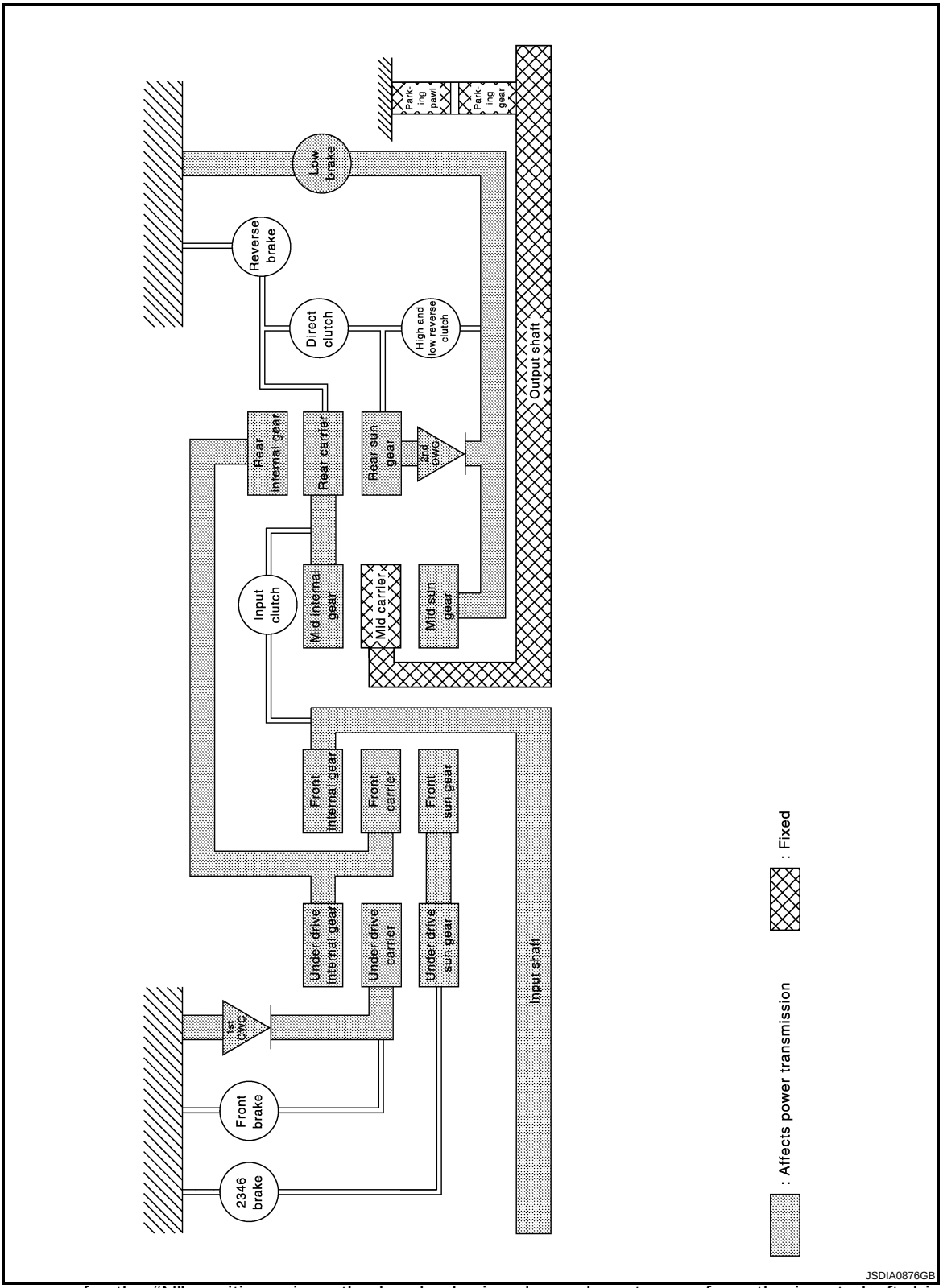
POWER TRANSMISSION

“N” Position



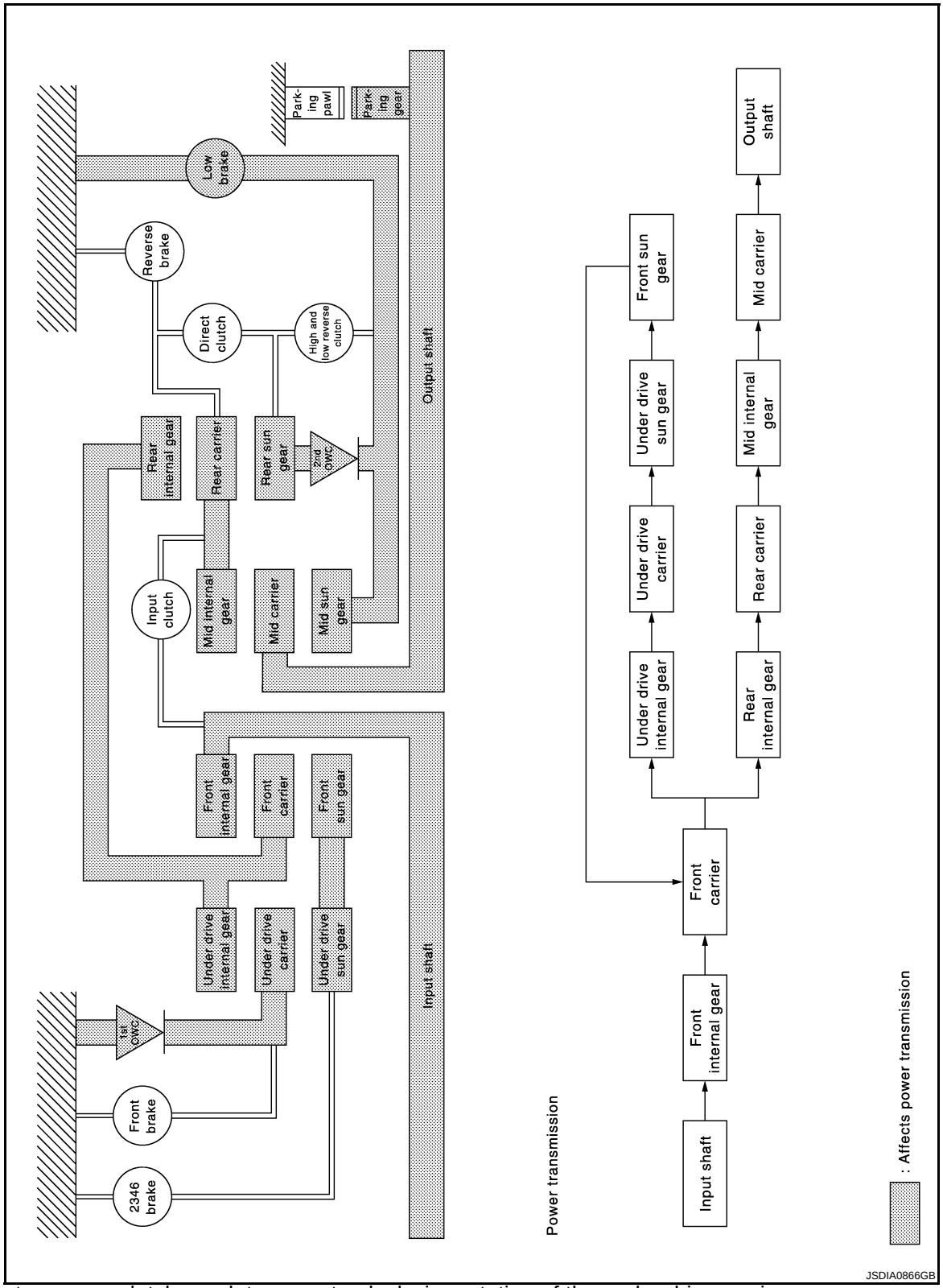
Since the low brake is released, torque from the input shaft drive is not transmitted to the output shaft.

“P” Position



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

“D1” and “DS1” Positions



- The 1st one-way clutch regulates counterclockwise rotation of the under drive carrier.
- The 2nd one-way clutch regulates counterclockwise rotation of the rear sun gear.
- The mid sun gear is fixed by the low brake.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	—	Output	Input
Direction of rotation	Counterclockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Deceleration from front internal gear	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	—	Fixed	Input/Output
Direction of rotation	Counterclockwise revolution	—	Clockwise revolution
Number of revolutions	Acceleration from under drive internal gear	—	Same number of revolution as the front carrier

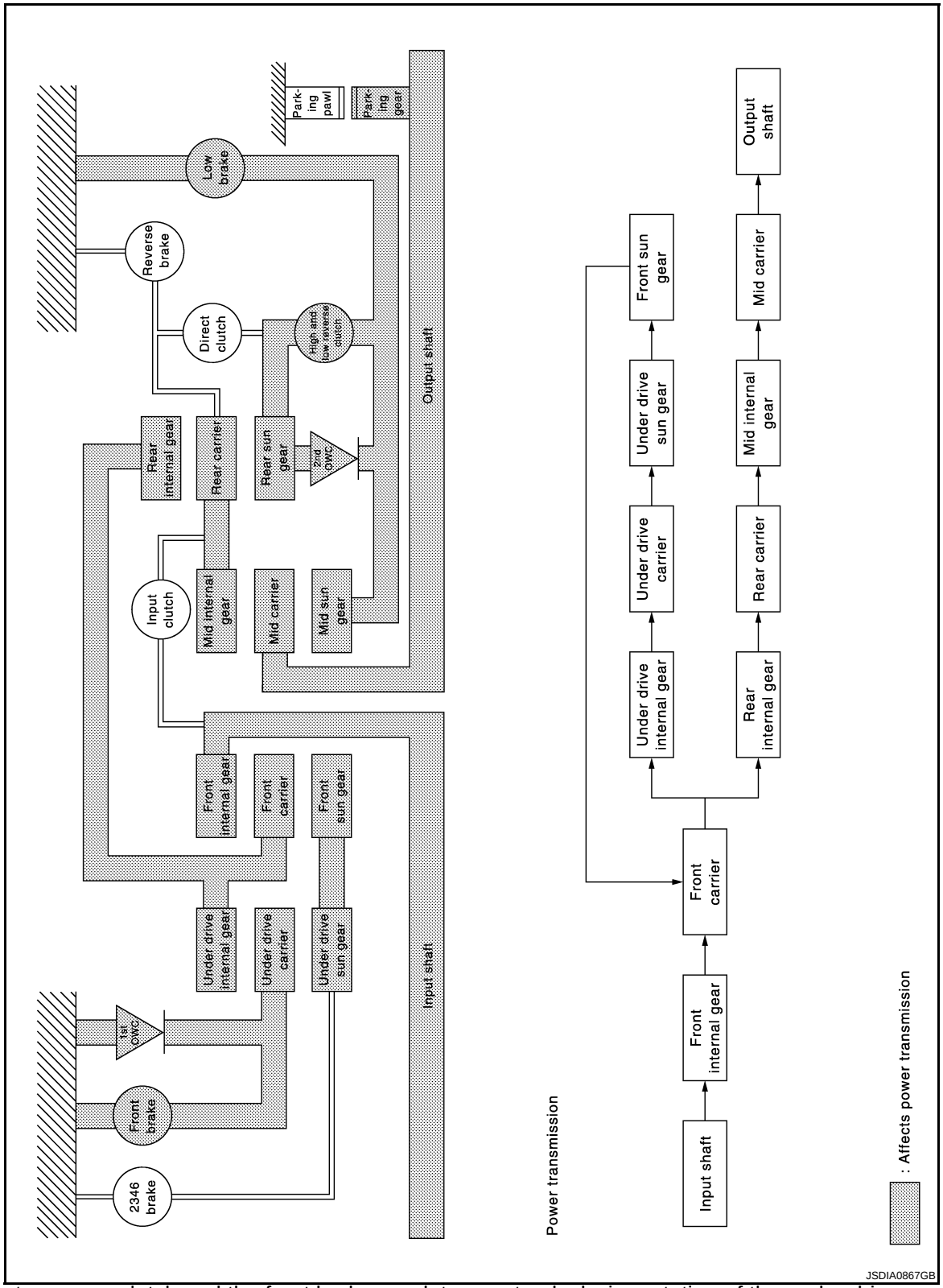
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from mid internal gear	Same number of revolution as the rear carrier

“M1” Position



- The 1st one-way clutch and the front brake regulate counterclockwise rotation of the under drive carrier.
  NOTE:
  The front brake operates only while coasting.
- The 2nd one-way clutch and the high and low reverse clutch regulate counterclockwise rotation of the rear sun gear.
  NOTE:
  The high and low reverse clutch operates only while coasting.
- The mid sun gear is fixed by the low brake.

• Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	—	Output	Input
Direction of rotation	Counterclockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Deceleration from front internal gear	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	—	Fixed	Input/Output
Direction of rotation	Counterclockwise revolution	—	Clockwise revolution
Number of revolutions	Acceleration from under drive internal gear	—	Same number of revolution as the front carrier

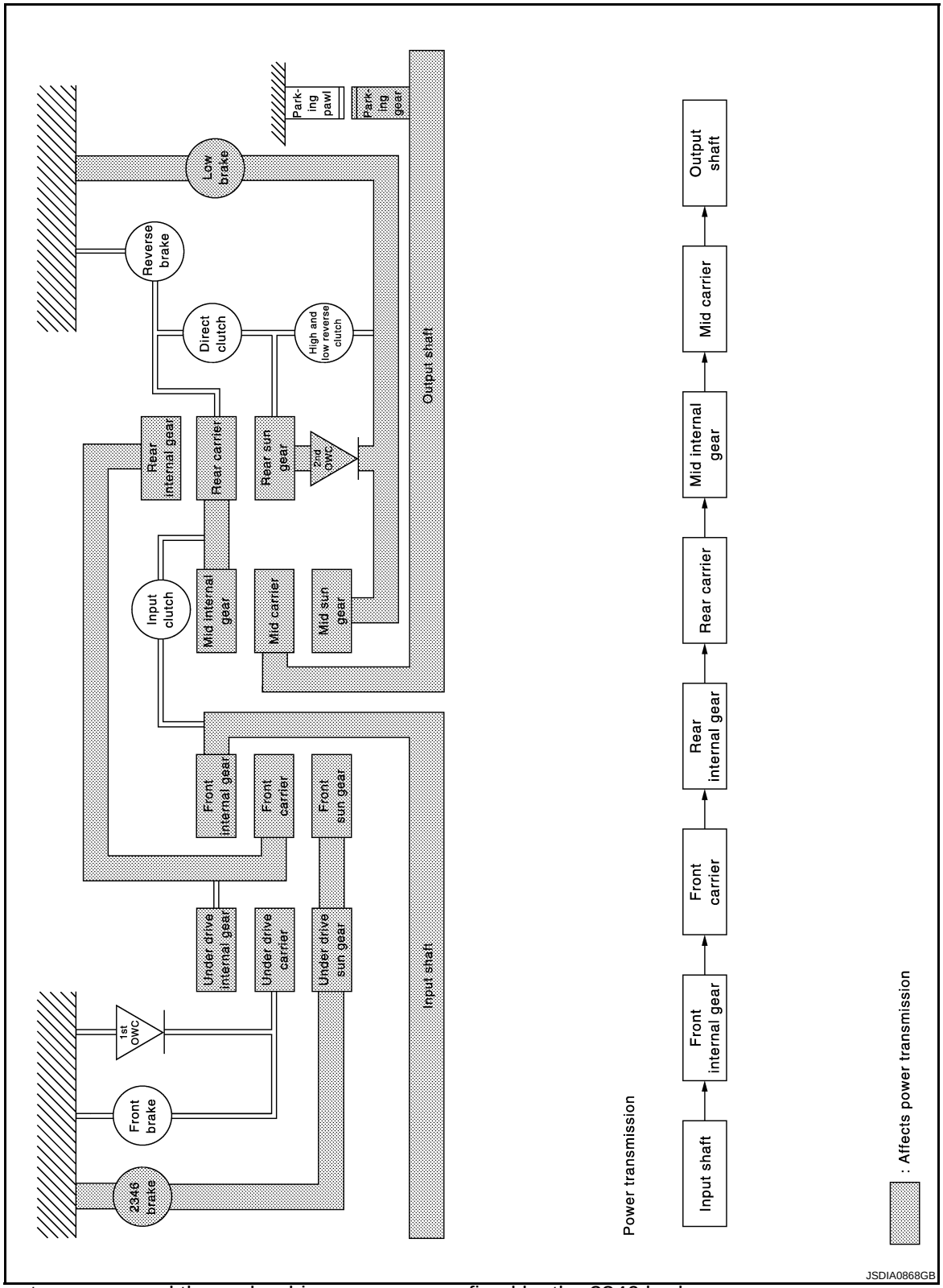
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from mid internal gear	Same number of revolution as the rear carrier

“D2” and “DS2” Positions



- The front sun gear and the under drive sun gear are fixed by the 2346 brake.
- The 2nd one-way clutch regulates counterclockwise rotation of the rear sun gear.
- The mid sun gear is fixed by the low brake.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	Fixed	—	Input/Output
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from under drive internal gear	Same number of revolution as the front carrier

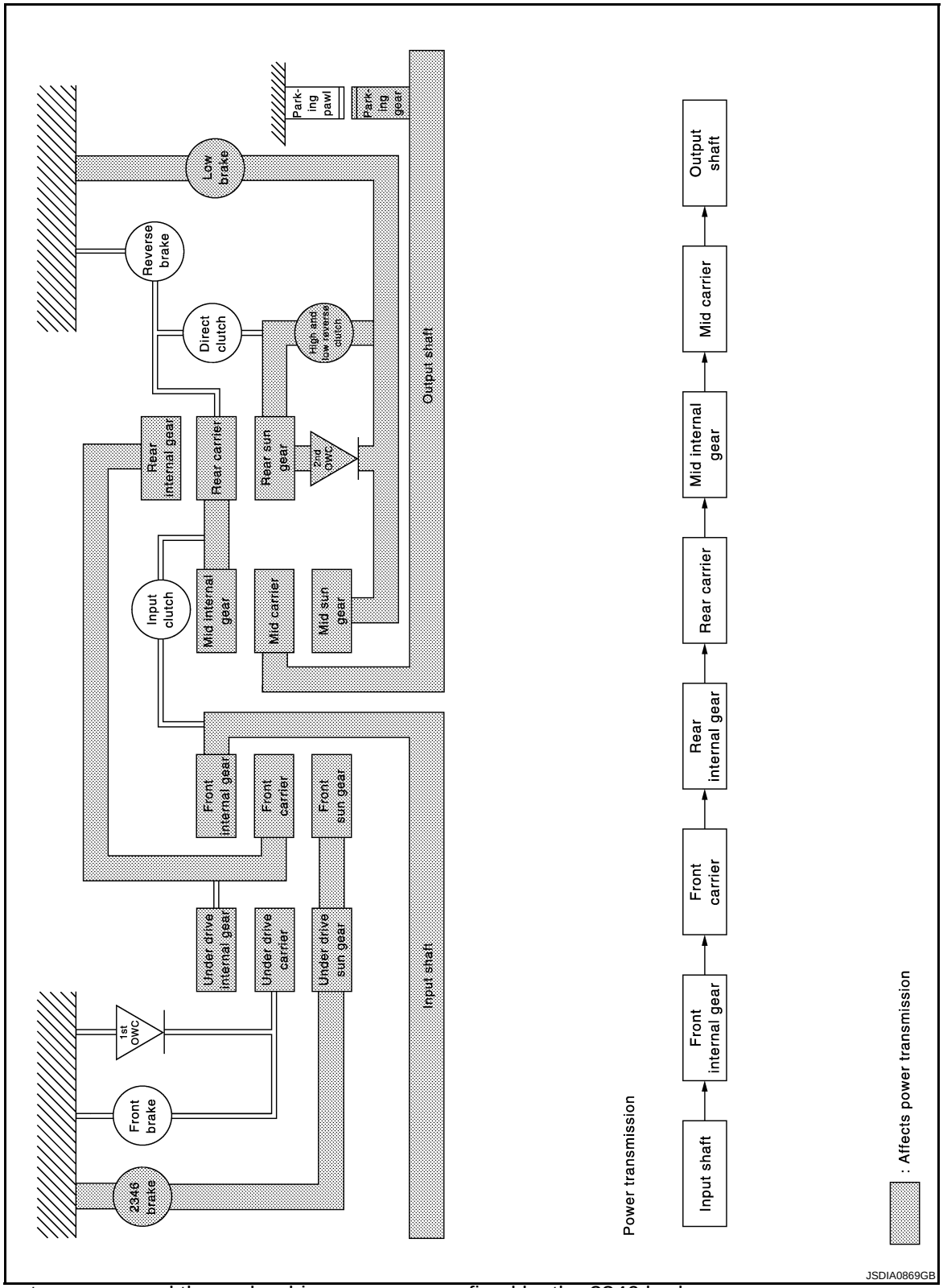
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from mid internal gear	Same number of revolution as the rear carrier

“M2” Position



- The front sun gear and the under drive sun gear are fixed by the 2346 brake.
- The 2nd one-way clutch and the high and low reverse clutch regulate counterclockwise rotation of the rear sun gear.

  NOTE:

  The high and low reverse clutch operates only while coasting.
- The mid sun gear is fixed by the low brake.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	Fixed	—	Input/Output
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from under drive internal gear	Same number of revolution as the front carrier

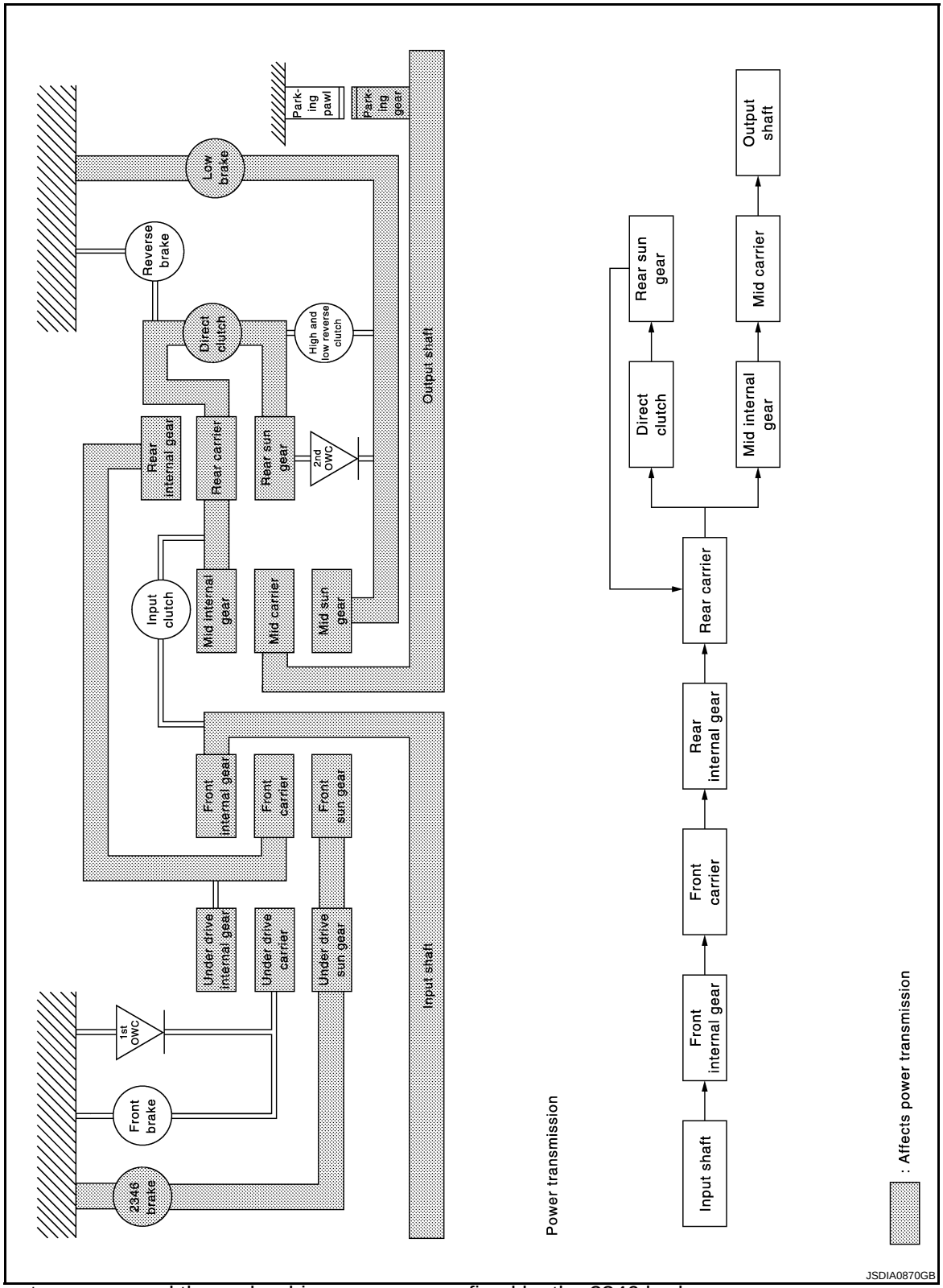
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from mid internal gear	Same number of revolution as the rear carrier

“D3”, “DS3” and “M3” Positions



- The front sun gear and the under drive sun gear are fixed by the 2346 brake.
- The direct clutch gets engaged and connects the rear sun gear with the rear carrier.
- The mid sun gear is fixed by the low brake.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	Fixed	—	Input/Output
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from under drive internal gear	Same number of revolution as the front carrier

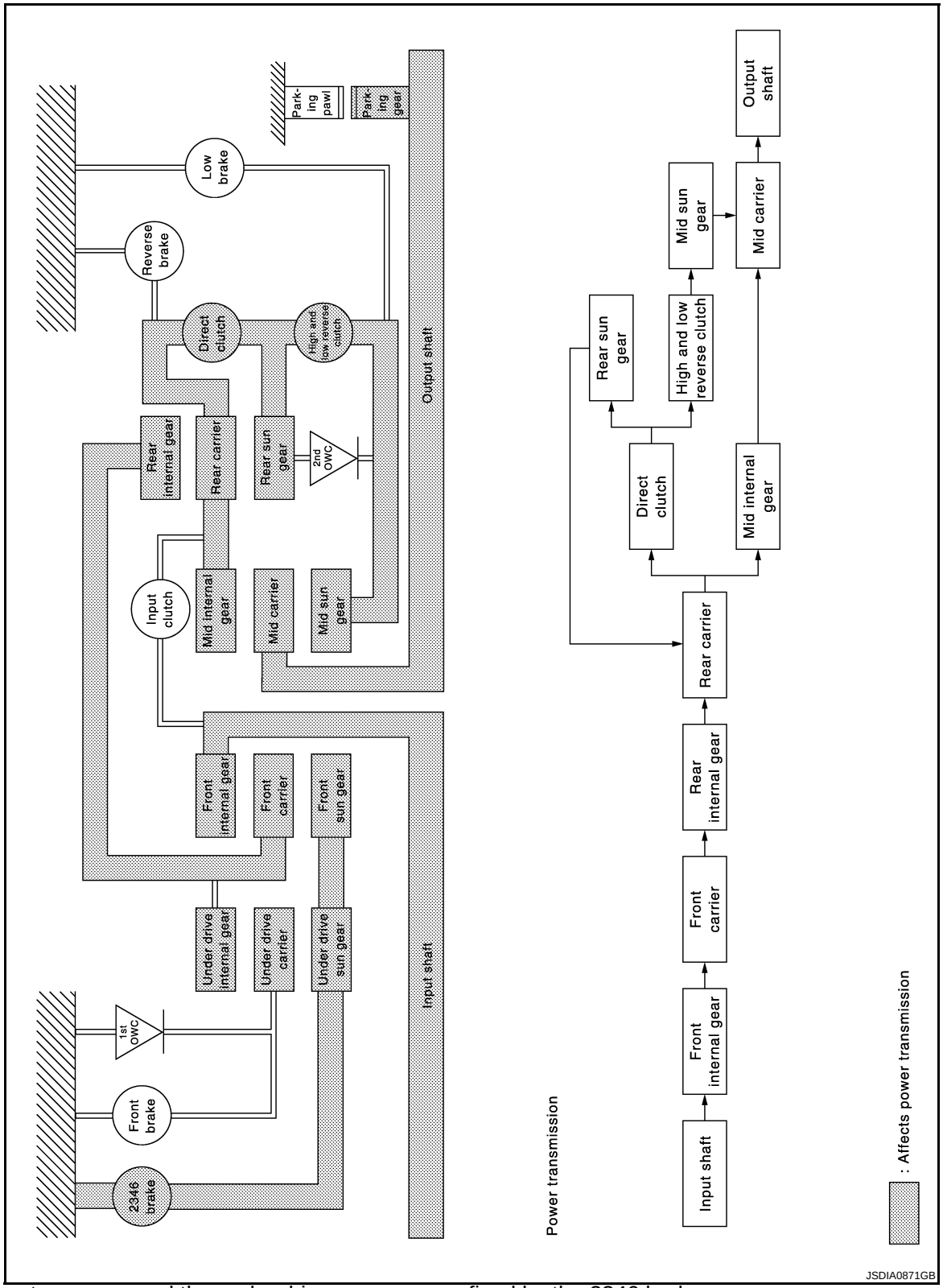
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Same number of revolution as the rear internal gear	Same number of revolution as the rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from mid internal gear	Same number of revolution as the rear carrier

“D4”, “DS4” and “M4” Positions



- The front sun gear and the under drive sun gear are fixed by the 2346 brake.
- The direct clutch gets engaged and connects the rear sun gear with the rear carrier.
- The high and low reverse clutch gets engaged and connects the rear sun gear with the mid sun gear.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	Fixed	—	Input/Output
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from under drive internal gear	Same number of revolution as the front carrier

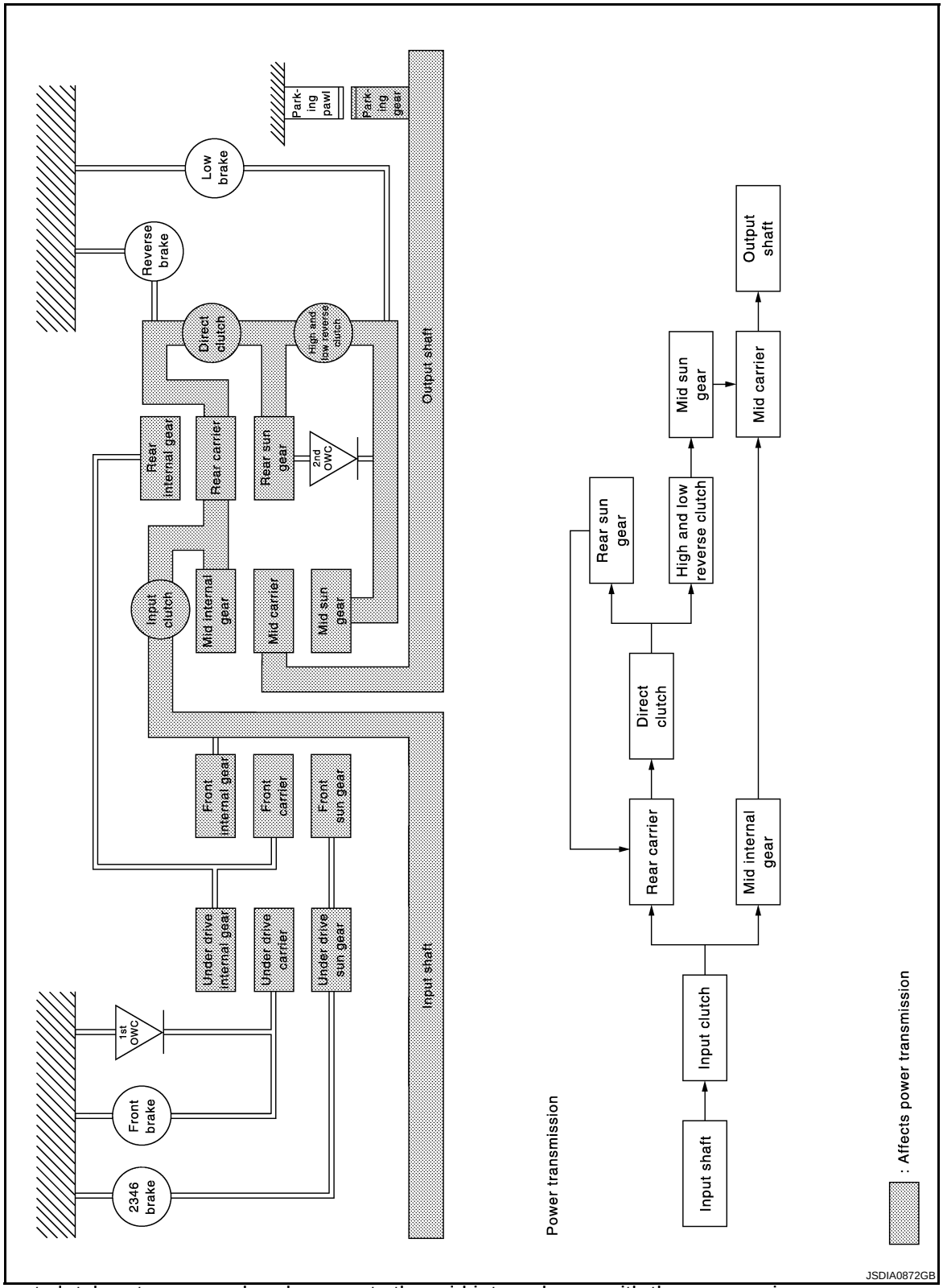
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Same number of revolution as the rear internal gear	Same number of revolution as the rear internal gear	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Same number of revolution as the mid internal gear	Same number of revolution as the mid internal gear	Same number of revolution as the rear carrier

“D5”, “DS5” and “M5” Positions



- The input clutch gets engaged and connects the mid internal gear with the rear carrier.
- The direct clutch gets engaged and connects the rear sun gear with the rear carrier.
- The high and low reverse clutch gets engaged and connects the rear sun gear with the mid sun gear.
- Each planetary gear enters the state described below.

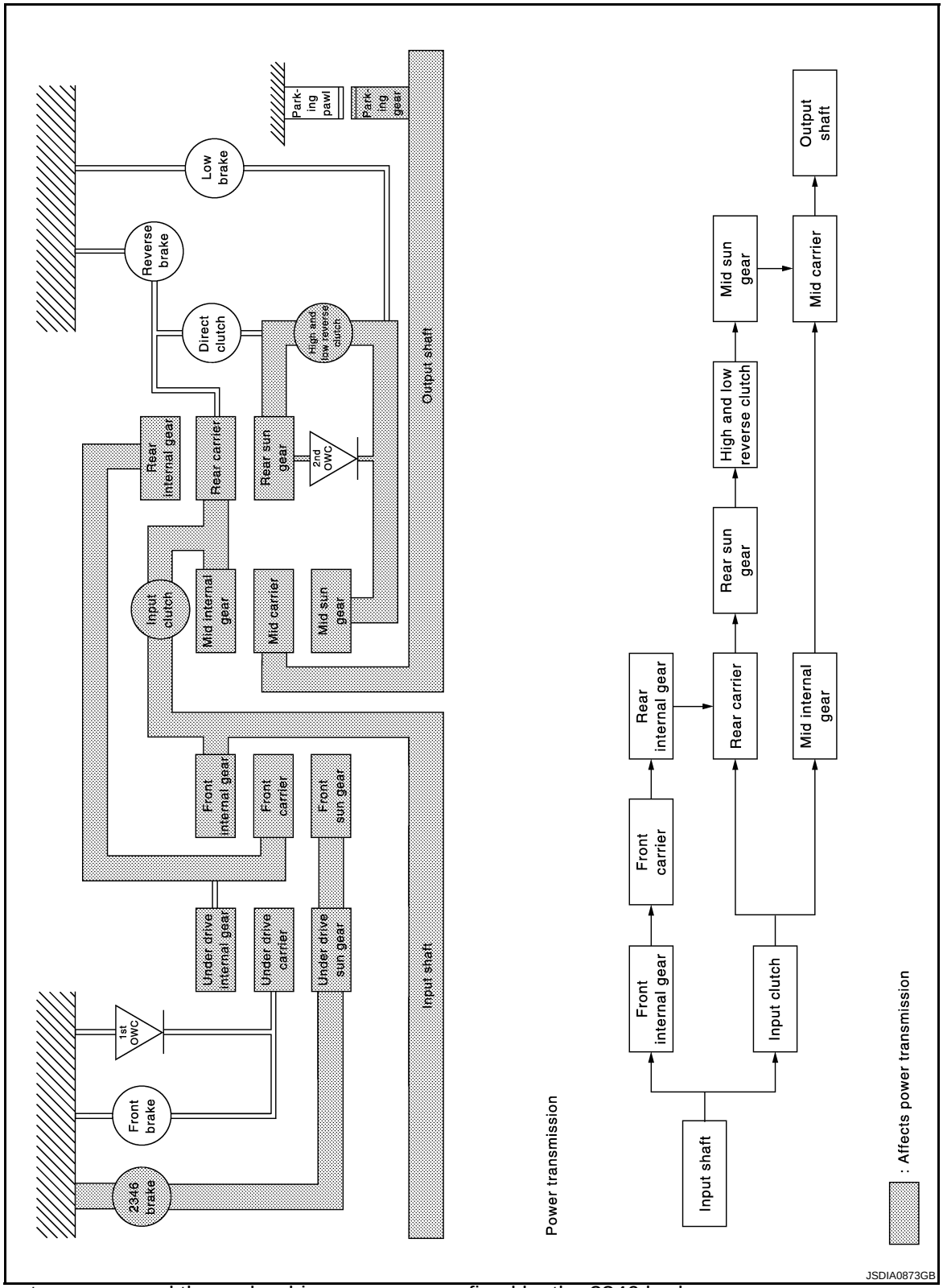
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	—	input/Output	—
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Same number of revolution as the rear carrier	Same number of revolution as the input shaft	Same number of revolution as the rear carrier

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Same number of revolution as the mid internal gear	Same number of revolution as the mid internal gear	Same number of revolution as the input shaft

“D6”, “DS6” and “M6” Positions



- The front sun gear and the under drive sun gear are fixed by the 2346 brake.
- The input clutch gets engaged and connects the mid internal gear with the rear carrier.
- The high and low reverse clutch gets engaged and connects the rear sun gear with the mid sun gear.
- Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	Fixed	Output	Input
Direction of rotation	—	Clockwise revolution	Clockwise revolution
Number of revolutions	—	Deceleration from front internal gear	Same number of revolution as the input shaft

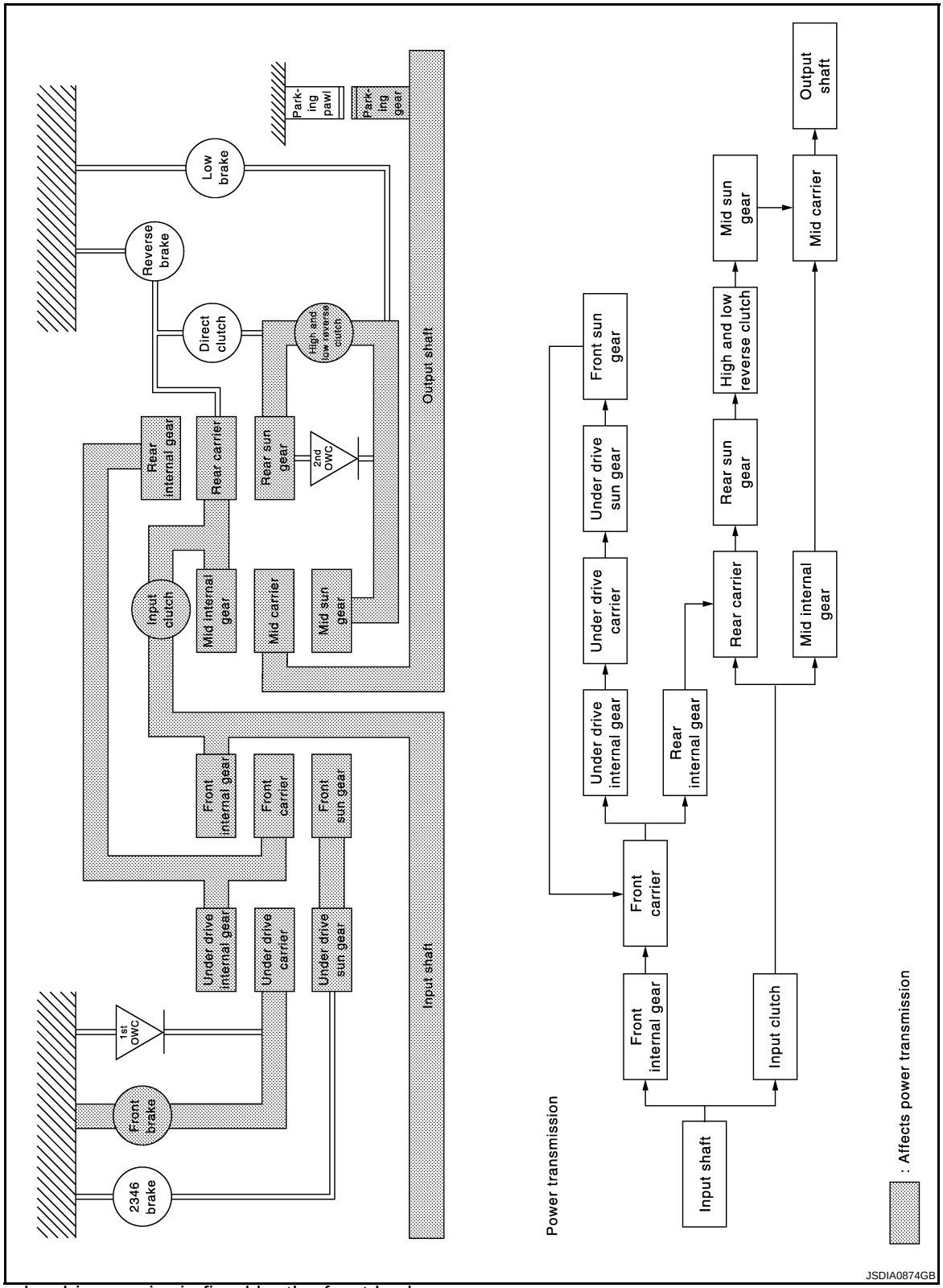
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	—	Input/Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Acceleration from rear carrier	Same number of revolution as the input shaft	Same number of revolution as the front carrier

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Acceleration from mid internal gear	Acceleration from mid internal gear	Same number of revolution as the input shaft

“D7”, “DS7” and “M7” Positions



- The under drive carrier is fixed by the front brake.
- The input clutch gets engaged and connects the mid internal gear with the rear carrier.
- The high and low reverse clutch gets engaged and connects the rear sun gear with the mid sun gear.
- Each planetary gear enters state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	—	Output	Input
Direction of rotation	Counterclockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Deceleration from front internal gear	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	—	Fixed	Input/Output
Direction of rotation	Counterclockwise revolution	—	Clockwise revolution
Number of revolutions	Acceleration from under drive internal gear	—	Same number of revolution as the front carrier

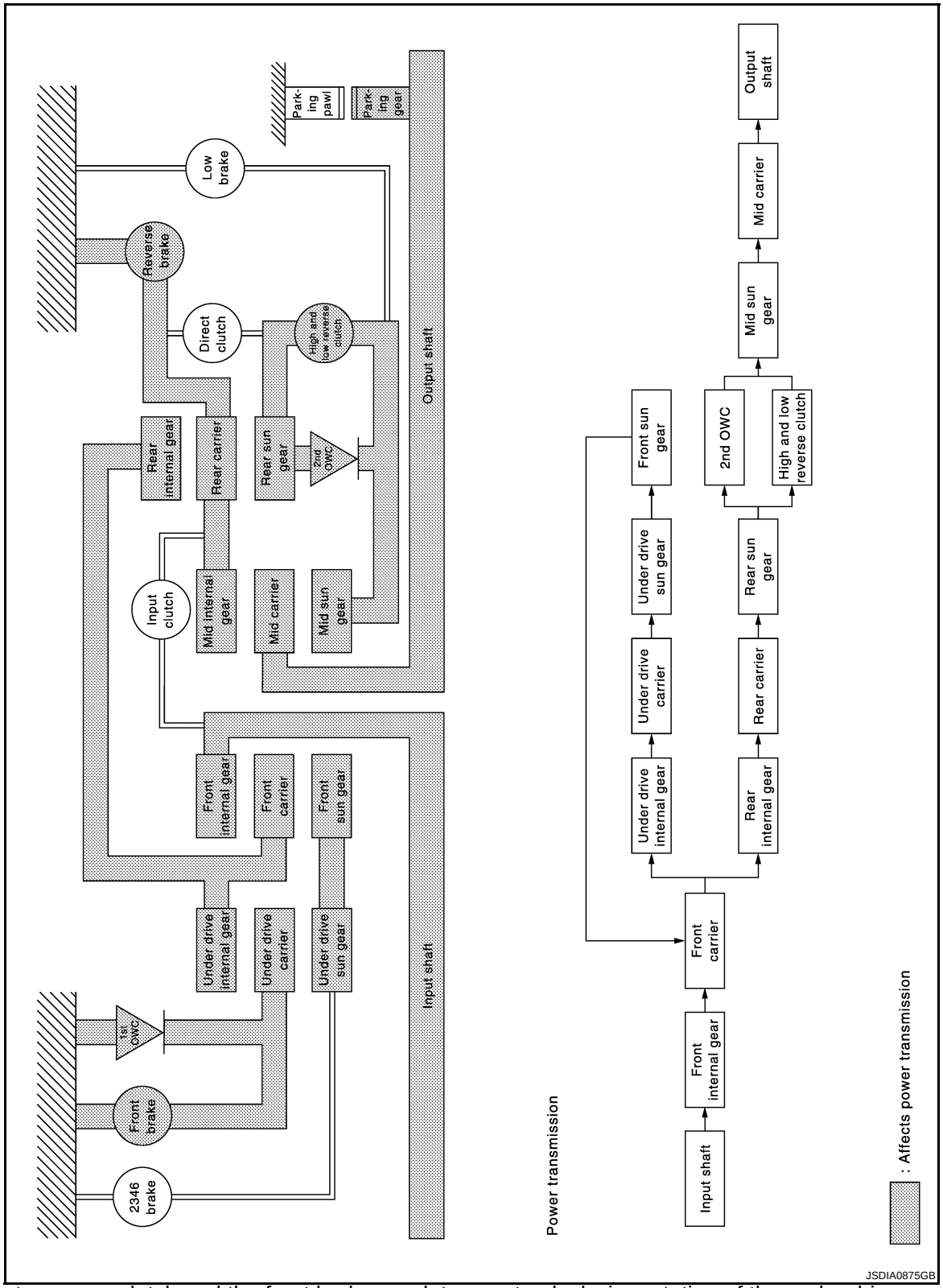
Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	—	Input/Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Acceleration from rear carrier	Same number of revolution as the input shaft	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	—	Output	Input
Direction of rotation	Clockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Acceleration from mid internal gear	Acceleration from mid internal gear	Same number of revolution as the input shaft

“R” Position



- The 1st one-way clutch and the front brake regulate counterclockwise rotation of the under drive carrier.
  NOTE:
  The front brake operates at the fixed speed or less.
- The rear carrier and the mid internal gear are fixed by the reverse brake.
- The mid sun gear rotates at the same speed as the rear sun gear by operation of the 2nd one-way clutch and the high and low reverse clutch.
  NOTE:
  The high and low reverse clutch operates at the fixed speed or less.

• Each planetary gear enters the state described below.

Front planetary gear

Name	Front sun gear	Front carrier	Front internal gear
Condition	—	Output	Input
Direction of rotation	Counterclockwise revolution	Clockwise revolution	Clockwise revolution
Number of revolutions	Deceleration from front internal gear	Deceleration from front internal gear	Same number of revolution as the input shaft

Under drive planetary gear

Name	Under drive sun gear	Under drive carrier	Under drive internal gear
Condition	—	Fixed	Input/Output
Direction of rotation	Counterclockwise revolution	—	Clockwise revolution
Number of revolutions	Acceleration from under drive internal gear	—	Same number of revolution as the front carrier

Rear planetary gear

Name	Rear sun gear	Rear carrier	Rear internal gear
Condition	Output	Fixed	Input
Direction of rotation	Counterclockwise revolution	—	Clockwise revolution
Number of revolutions	Acceleration from rear internal gear	—	Same number of revolution as the under drive internal gear

Mid planetary gear

Name	Mid sun gear	Mid carrier	Mid internal gear
Condition	Input	Output	Fixed
Direction of rotation	Counterclockwise revolution	Counterclockwise revolution	—
Number of revolutions	Same number of revolution as the rear sun gear	Deceleration from mid sun gear	—

Component Parts Location

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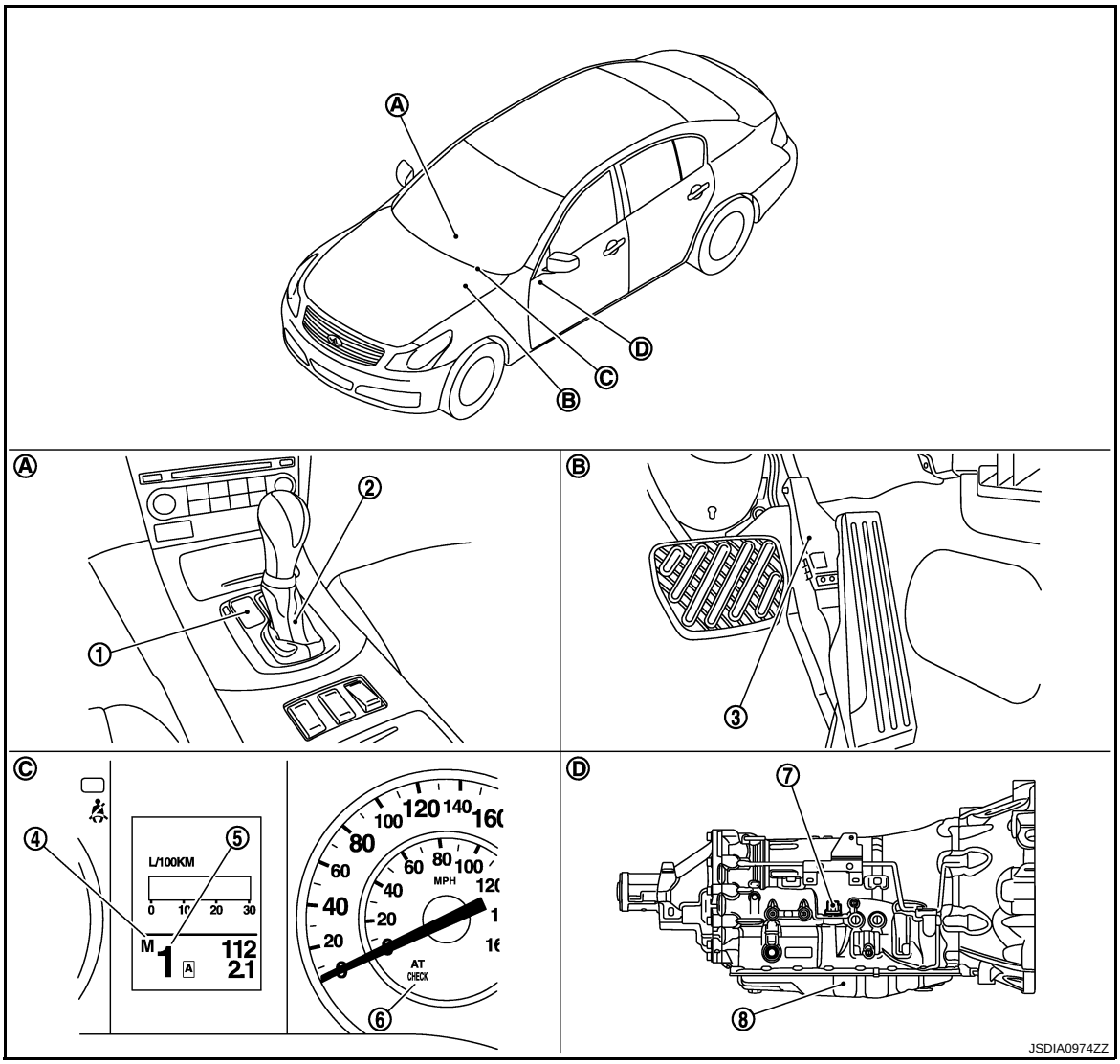
Without Paddle Shifter



1. Selector lever position indicator
2. A/T shift selector assembly
3. Accelerator pedal position sensor
4. Manual mode indicator
5. Shift position indicator
6. A/T CHECK indicator lamp
7. A/T assembly connector
8. Control valve with TCM*
- A. Center console
- B. Accelerator pedal
- C. Combination meter
- D. A/T assembly

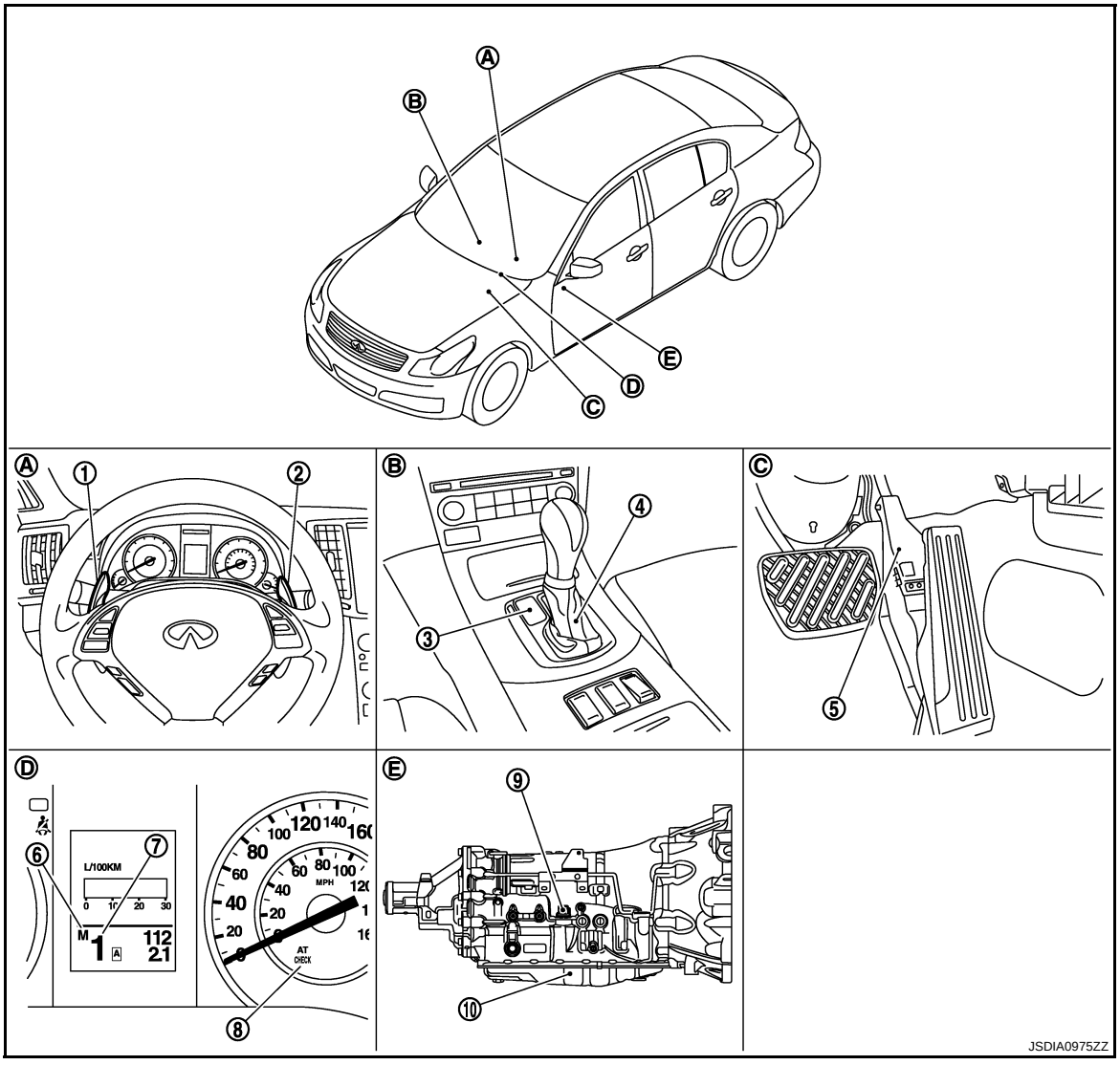
*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (2).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch
- The following components are included in control valve with TCM (8).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve

- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

With Paddle Shifter



1. Paddle shifter (shift-down)	2. Paddle shifter (shift-up)	3. Selector lever position indicator
4. A/T shift selector assembly	5. Accelerator pedal position sensor	6. Manual mode indicator
7. Shift position indicator	8. A/T CHECK indicator lamp	9. A/T assembly connector
10. Control valve with TCM*		
A. Steering wheel	B. Center console	C. Accelerator pedal
D. Combination meter	E. A/T assembly	

*: Control valve with TCM is included in A/T assembly.

NOTE:

- The following components are included in A/T shift selector assembly (4).
- Manual mode select switch
- Manual mode position select switch
- Shift position switch

- The following components are included in control valve with TCM (10).
- TCM
- Input speed sensor 1, 2
- Output speed sensor
- A/T fluid temperature sensor
- Transmission range switch
- Direct clutch solenoid valve
- High and low reverse clutch solenoid valve
- Input clutch solenoid valve
- Front brake solenoid valve
- Low brake solenoid valve
- Anti-interlock solenoid valve
- 2346 brake solenoid valve
- Line pressure solenoid valve
- Torque converter clutch solenoid valve

Component Description

INFOID:0000000004279107

Name of the Part (Abbreviation)	Function
Front brake (FR/B)	Fastens the under drive carrier.
Input clutch (I/C)	Connects the input shaft, the mid internal gear and the rear carrier.
Direct clutch (D/C)	Connects the rear carrier and the rear sun gear.
High and low reverse clutch (HLR/C)	Connects the rear sun gear and the mid sun gear.
Reverse brake (R/B)	Fastens the rear carrier.
Low brake (L/B)	Fastens the mid sun gear.
2346 brake (2346/B)	Fastens the under drive sun gear.
1st one-way clutch (1st OWC)	Allows the under drive carrier to turn freely in the forward direction but fastens it for reverse rotation.
2nd one-way clutch (2nd OWC)	Allows the rear sun gear to turn freely in the forward direction but fastens it for reverse rotation.
Torque converter	Amplifies driving force the engine, and transmits it to transmission input shaft.
Oil pump	Driven by the engine, oil pump supplies oil to torque converter, control valve assembly, and each lubricating system.

SHIFT LOCK SYSTEM

System Description

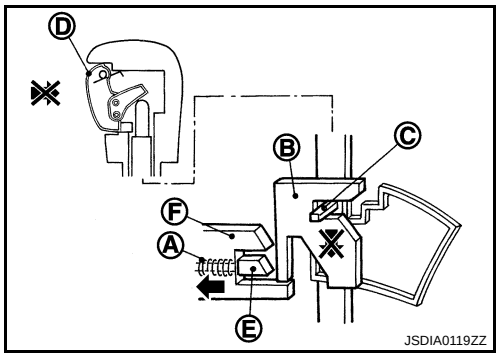
INFOID:0000000004279108

The selector lever cannot be shifted from the “P” position unless the brake pedal is depressed while the ignition switch is ON.
The shift lock is unlocked by the shift lock unit that is activated when the ignition switch is ON and the stop lamp switch is turned ON (brake pedal is depressed).
Therefore, the shift lock unit receives no ON signal and the shift lock remains locked if the above conditions are not fulfilled. (However, a shift operation is allowed if the shift lock release button is pressed.)

SHIFT LOCK OPERATION AT “P” POSITION

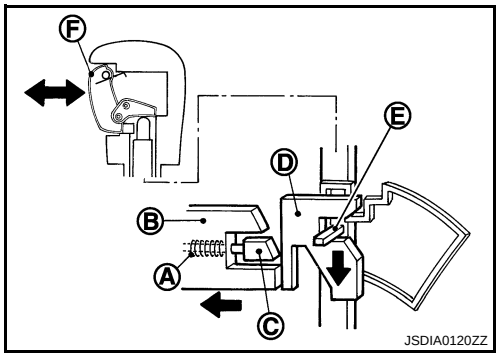
When Brake Pedal Is Not Depressed (No Shift Operation Allowed)

The shift lock solenoid (A) inside the shift lock unit is not energized if the brake pedal is not depressed while the ignition switch is ON.
The lock plate (B) lowers according to the downward movement of the position pin (C) when the selector button (D) is pressed, and presses only slider B (E) into the shift lock unit. Slider A (F) located below the lock plate prevents the downward movement of the lock plate with the spring force. The selector lever cannot be shifted from the “P” position for this reason.
However, slider A is forcibly pressed into the shift lock unit, allowing the selector lever to shift if the shift lock release button is pressed.



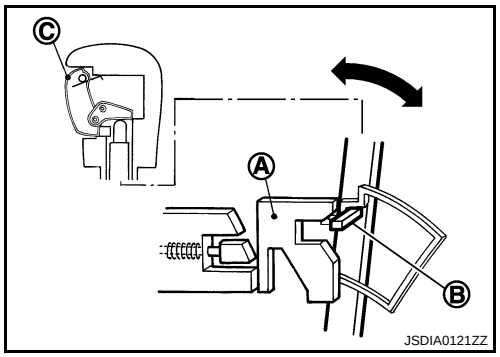
When Brake Pedal Is Depressed (Shift Operation Allowed)

The shift lock solenoid (A) inside the shift lock unit is energized and the relative positions of sliders A (B) and B (C) are maintained when the brake pedal is depressed while the ignition switch is ON.
The lock plate (D) lowers according to the downward movement of the position pin (E), thrusting away sliders A and B, when the selector button (F) is pressed.
The position pin lowers to the position that allows shift operation for this reason. As a result, the selector lever can be shifted out of the P position.



OPERATION AT OTHER THAN “P” POSITION

The shift lock function will not operate at any position other than “P” because the lock plate (A) is only set for the “P” position. Accordingly, the selector lever can be shifted to any position regardless of the brake operation.
The position pin (B) enters the “P” position thrusting away the lock plate when the selector lever is shifted to the “P” position. Then, the shift mechanism is locked when the selector button (C) is released.



“P” POSITION RETAINING MECHANISM (IGNITION SWITCH LOCK)

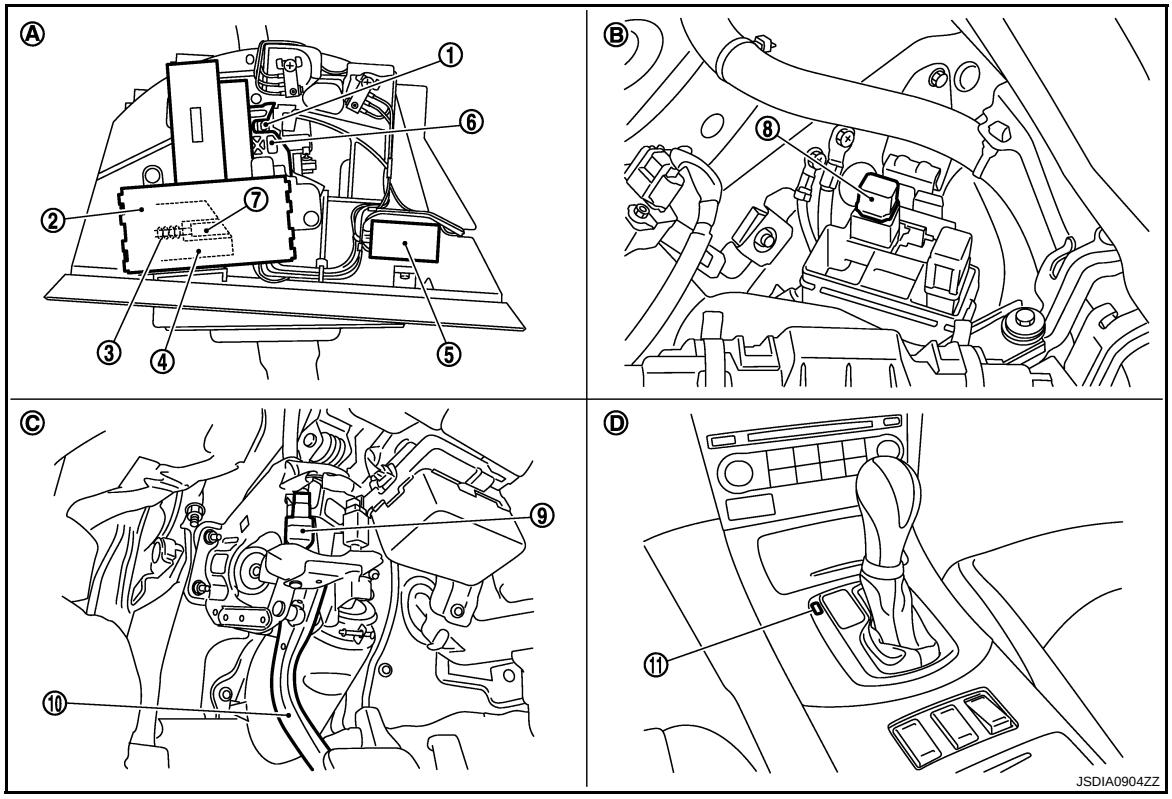
When ignition switch is not in the ON position, power is not applied to the shift lock solenoid in the shift lock unit. This causes shift lock state, and then “P” position is retained.
When an actuating system in the shift lock unit has a malfunction, selector lever is unable to operate from the “P” position even when pressing the brake pedal with the ignition switch ON. However, when pressing the shift lock release button, slider A is forcibly pressed into the shift lock unit. This allows shift lock to be released and selector lever enables the select operation from the “P” position.

CAUTION:

Never use the shift lock release button except when the select lever is inoperative even when pressing the brake pedal with the ignition switch ON.

Component Parts Location

INFOID:0000000004279109



1. Position pin
2. Shift lock unit
3. Shift lock solenoid
4. Slider A
5. A/T shift selector harness connector
6. Lock plate
7. Slider B
8. Shift lock relay
9. Stop lamp switch
10. Brake pedal
11. Shift lock cover *
- A. A/T shift selector assembly
- B. Engine room LH
- C. Brake pedal, upper
- D. Center console

*: Shift lock release button becomes operative by removing shift lock cover.

Component Description

INFOID:0000000004279110

Component			Function
A/T shift selector assembly	Shift lock unit	Shift lock solenoid	TM-230, "Description"
		Lock plate	The lock plate restricts the position pin stroke by selector button operation according to the shift lock unit status.
		Shift lock release button	Pressing the shift lock release button cancels the shift lock forcibly.
	Position pin		The position pin, linking with the selector button, restricts the selector lever movement.
Shift lock relay			TM-230, "Description"
Stop lamp switch			TM-230, "Description"

ON BOARD DIAGNOSTIC (OBD) SYSTEM

Diagnosis Description

INFOID:0000000004279111

The A/T system has two self-diagnostic systems.
The first is the emission-related on board diagnostic system (OBD-II) performed by the TCM in combination with the ECM. A malfunction is indicated by the MIL (malfunction indicator lamp) and is stored as a DTC in the ECM memory and in the TCM memory.
The second is the TCM original self-diagnosis indicated by the TCM. A malfunction history is stored in the TCM memory. The detected items are overlapped with OBD-II self-diagnostic items. For details, refer to EC-564, "DTC Index".

OBD FUNCTION

The ECM provides emission-related on board diagnostic (OBD-II) functions for the A/T system.
One function is to receive a signal from the TCM used with OBD-related parts of the A/T system. The signal is sent to the ECM when a malfunction occurs in the corresponding OBD-related part.
The other function is to indicate a diagnostic result by means of the MIL (malfunction indicator lamp) on the instrument panel. Sensors, switches and solenoid valves are used as sensing elements.
The MIL automatically illuminates in “One or Two Trip Detection Logic” when a malfunction is sensed in relation to A/T system parts. For details, refer to EC-112, "Diagnosis Description".

DIAGNOSIS SYSTEM (TCM)

CONSULT-III Function (TRANSMISSION)

INFOID:0000000004279112

CONSULT-III APPLICATION ITEMS

Diagnostic test mode	Function
Self Diagnostic Results	Retrieve DTC from ECU and display diagnostic items.
Data Monitor	Monitor the input/output signal of the control unit in real time.
CAN Diagnosis	This mode displays a network diagnosis result about CAN by a diagram.
CAN Diagnostic Support Monitor	It monitors the starts of CAN communication.
DTC & SRT confirmation	The status of system monitoring tests and the self-diagnosis status/result can be confirmed.
ECU Identification	Display the ECU identification number (part number etc.) of the selected system.
Function Test*	This mode can show results of self-diagnosis of ECU with either “OK” or “NG”. For engine, more practical tests regarding sensors/switches and/or actuators are available.
Special Function*	Other results or histories, etc. that are recorded in ECU are displayed.

*: Although “Function Test” and “Special Function” are selectable, do not use its.

SELF DIAGNOSTIC RESULTS

Refer to TM-257, "DTC Index".

DATA MONITOR

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

Monitored item (Unit)		Monitor Item Selection			Remarks
		ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
VHCL/S SE-A/T	(km/h)	X	X	▼	Displays the vehicle speed calculated by the TCM from the output shaft revolution.
ESTM VSP SIG	(km/h)	X	—	▼	Displays the vehicle speed signal received via CAN communication.
OUTPUT REV	(rpm)	X	X	▼	Displays the output shaft revolution calculated from the pulse signal of output speed sensor.
INPUT SPEED	(rpm)	X	X	▼	Displays the input speed calculated from front sun gear revolution and front carrier revolution.
F SUN GR REV	(rpm)	—	—	▼	Displays the front sun gear revolution calculated from the pulse signal of input speed sensor 1.
F CARR GR REV	(rpm)	—	—	▼	Displays the front carrier gear revolution calculated from the pulse signal of input speed sensor 2.
ENGINE SPEED	(rpm)	X	X	▼	Displays the engine speed received via CAN communication.
TC SLIP SPEED	(rpm)	—	X	▼	Displays the revolution difference between input speed and engine speed.
ACCELE POSI	(0.0/8)	X	—	▼	Displays the accelerator position estimated value received via CAN communication.
THROTTLE POSI	(0.0/8)	X	X	▼	Displays the throttle position received via CAN communication.
ATF TEMP 1	(°C)	X	X	▼	Displays the ATF temperature of oil pan calculated from the signal voltage of A/T fluid temperature sensor.

Monitored item (Unit)		Monitor Item Selection			Remarks
		ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
ATF TEMP 2	(°C)	X	X	▼	Displays the ATF temperature estimated value of torque converter outlet calculated from the signal voltage of A/T fluid temperature sensor.
ATF TEMP SE 1	(V)	—	—	▼	Displays the signal voltage of A/T fluid temperature sensor.
BATTERY VOLT	(V)	X	—	▼	Displays the power supply voltage of TCM.
LINE PRES SOL	(A)	—	X	▼	Displays the command current from TCM to the line pressure solenoid.
TCC SOLENOID	(A)	—	X	▼	Displays the command current from TCM to the torque converter clutch solenoid.
L/B SOLENOID	(A)	—	X	▼	Displays the command current from TCM to the low brake solenoid.
FR/B SOLENOID	(A)	—	X	▼	Displays the command current from TCM to the front brake solenoid.
HLR/C SOL	(A)	—	X	▼	Displays the command current from TCM to the high and low reverse clutch solenoid.
I/C SOLENOID	(A)	—	X	▼	Displays the command current from TCM to the input clutch solenoid.
D/C SOLENOID	(A)	—	X	▼	Displays the command current from TCM to the direct clutch solenoid.
2346/B SOL	(A)	—	X	▼	Displays the command current from TCM to the 2346 brake solenoid.
L/P SOL MON	(A)	—	—	▼	Monitors the command current from TCM to the line pressure solenoid, and displays the monitor value.
TCC SOL MON	(A)	—	—	▼	Monitors the command current from TCM to the torque converter clutch solenoid, and displays the monitor value.
L/B SOL MON	(A)	—	—	▼	Monitors the command current from TCM to the low brake solenoid, and displays the monitor value.
FR/B SOL MON	(A)	—	—	▼	Monitors the command current from TCM to the front brake solenoid, and displays the monitor value.
HLR/C SOL MON	(A)	—	—	▼	Monitors the command current from TCM to the high and low reverse clutch solenoid, and displays the monitor value.
I/C SOL MON	(A)	—	—	▼	Monitors the command current from TCM to the input clutch solenoid, and displays the monitor value.
D/C SOL MON	(A)	—	—	▼	Monitors the command current from TCM to the direct clutch solenoid, and displays the monitor value.
2346/B SOL MON	(A)	—	—	▼	Monitors the command current from TCM to the 2346 brake solenoid, and displays the monitor value.
GEAR RATIO		—	X	▼	Displays the gear ratio calculated from input speed and output revolution.
ENGINE TORQUE	(Nm)	—	—	▼	Displays the engine torque estimated value received via CAN communication.

Monitored item (Unit)		Monitor Item Selection			Remarks
		ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
ENG TORQUE D	(Nm)	—	—	▼	Displays the engine torque estimated value reflected the requested torque of each control unit received via CAN communication.
INPUT TRQ S	(Nm)	—	—	▼	Displays the input torque using for the oil pressure calculation process of shift change control.
INPUT TRQ L/P	(Nm)	—	—	▼	Displays the input torque using for the oil pressure calculation process of line pressure control.
TRGT PRES L/P	(kPa)	—	—	▼	Displays the target oil pressure value of torque converter clutch solenoid valve calculated by the oil pressure calculation process of lock-up control.
TRGT PRES TCC	(kPa)	—	—	▼	Displays the target oil pressure value of torque converter clutch solenoid valve calculated by the oil pressure calculation process of shift change control.
TRGT PRES L/B	(kPa)	—	—	▼	Displays the target oil pressure value of low brake solenoid valve calculated by the oil pressure calculation process of shift change control.
TRGT PRE FR/B	(kPa)	—	—	▼	Displays the target oil pressure value of front brake solenoid valve calculated by the oil pressure calculation process of shift change control.
TRG PRE HLR/C	(kPa)	—	—	▼	Displays the target oil pressure value of high and low reverse clutch solenoid valve calculated by the oil pressure calculation process of shift change control.
TRGT PRES I/C	(kPa)	—	—	▼	Displays the target oil pressure value of input clutch solenoid valve calculated by the oil pressure calculation process of shift change control.
TRGT PRES D/C	(kPa)	—	—	▼	Displays the target oil pressure value of direct clutch solenoid valve calculated by the oil pressure calculation process of shift change control.
TRG PRE 2346/B	(kPa)	—	—	▼	Displays the target oil pressure value of 2346 brake solenoid valve calculated by the oil pressure calculation process of shift change control.
SHIFT PATTERN		—	—	▼	Displays the gear change data using the shift pattern control.
VEHICLE SPEED	(km/h)	—	—	▼	Displays the vehicle speed for control using the control of TCM.
RANGE SW 4	(ON/OFF)	X	—	▼	Displays the operation status of transmission range switch 4.
RANGE SW 3	(ON/OFF)	X	—	▼	Displays the operation status of transmission range switch 3.
RANGE SW 2	(ON/OFF)	X	—	▼	Displays the operation status of transmission range switch 2.
RANGE SW 1	(ON/OFF)	X	—	▼	Displays the operation status of transmission range switch 1.
SFT DWN ST SW	(ON/OFF)	X	—	▼	Displays the operation status of paddle shifter (down switch).
SFT UP ST SW	(ON/OFF)	X	—	▼	Displays the operation status of paddle shifter (up switch).
DOWN SW LEVER	(ON/OFF)	X	—	▼	Displays the operation status of selector lever (down switch).

Monitored item (Unit)		Monitor Item Selection			Remarks
		ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
UP SW LEVER	(ON/OFF)	X	—	▼	Displays the operation status of selector lever (up switch).
NON M-MODE SW	(ON/OFF)	X	—	▼	Displays whether the selector lever is in any position other than manual shift gate position.
MANU MODE SW	(ON/OFF)	X	—	▼	Displays whether the selector lever is in the manual shift gate position.
DS RANGE	(ON/OFF)	—	—	▼	Displays whether it is the DS mode.
1 POSITION SW	(ON/OFF)	X	—	▼	• Displays the reception status of 1 position switch signal received via CAN communication. • Not mounted but displayed.
OD CONT SW	(ON/OFF)	X	—	▼	• Displays the reception status of overdrive control switch signal received via CAN communication. • Not mounted but displayed.
BRAKESW	(ON/OFF)	X	—	▼	Displays the reception status of stop lamp switch signal received via CAN communication.
POWERSHIFT SW	(ON/OFF)	X	—	▼	• Displays the reception status of POWER mode signal received via CAN communication. • Not mounted but displayed.
ASCD-OD CUT	(ON/OFF)	X	—	▼	Displays the reception status of ASCD OD cancel request signal received via CAN communication.
ASCD-CRUISE	(ON/OFF)	X	—	▼	Displays the reception status of ASCD operation signal received via CAN communication.
ABS SIGNAL	(ON/OFF)	X	—	▼	Displays the reception status of ABS operation signal received via CAN communication.
TCS GR/P KEEP	(ON/OFF)	X	—	▼	Displays the reception status of TCS gear keep request signal received via CAN communication.
TCS SIGNAL 2	(ON/OFF)	X	—	▼	Displays whether the reception value of A/T shift schedule change demand signal received via CAN communication is “cold”.
TCS SIGNAL 1	(ON/OFF)	X	—	▼	Displays whether the reception value of A/T shift schedule change demand signal received via CAN communication is “warm”.
LOW/B PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of low brake.
HC/IC/FRB PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of high and low reversed clutch, input clutch or front brake.
IC/FRB PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of input clutch or front brake.
HLR/C PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of high and low reversed clutch.
W/O THL POS	(ON/OFF)	X	—	▼	Displays the kickdown condition signal status received via CAN communication.
CLSD THL POS	(ON/OFF)	X	—	▼	Displays the idling status signal status received via CAN communication.

Monitored item (Unit)		Monitor Item Selection			Remarks
		ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
DRV CST JUDGE	(DRIVE/COAST)	—	—	▼	Displays the judgment results of “driving” or “coasting” judged by TCM.
SHIFT IND SIGNAL		—	—	▼	Displays the transmission value of shift position signal transmitted via CAN communication.
STARTER RELAY	(ON/OFF)	—	—	▼	Displays the command status from TCM to starter relay.
F-SAFE IND/L	(ON/OFF)	—	—	▼	Displays the transmission status of A/T CHECK indicator lamp signal transmitted via CAN communication.
ATF WARN LAMP	(ON/OFF)	—	—	▼	• Displays the transmission status of ATF temperature signal transmitted via CAN communication. • Not mounted but displayed.
MANU MODE IND	(ON/OFF)	—	—	▼	Displays the transmission status of manual mode signal transmitted via CAN communication.
ON OFF SOL MON	(ON/OFF)	—	—	▼	Monitors the command value from TCM to the anti-interlock solenoid, and displays the monitor status.
START RLY MON	(ON/OFF)	—	—	▼	Monitors the command value from TCM to the starter relay, and displays the monitor status.
ON OFF SOL	(ON/OFF)	—	—	▼	Displays the command status from TCM to anti-interlock solenoid.
SLCT LVR POSI		—	X	▼	Displays the shift positions recognized by TCM.
GEAR		—	X	▼	Displays the current transmission gear position recognized by TCM.
NEXT GR POSI		—	—	▼	Displays the target gear position of gear change that is calculated based on the vehicle speed information and throttle information.
SHIFT MODE		—	—	▼	Displays the transmission driving mode recognized by TCM.
D/C PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of direct clutch.
FR/B PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of front brake.
2346/B PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of 2346 brake.
2346B/DC PARTS	(FAIL/NOTFAIL)	—	—	▼	Displays whether the identified malfunction point judged by TCM is the related parts of 2346 brake or direct clutch.

DTC & SRT CONFIRMATION

Item	Description	Check item
1ST GR FNCTN P0731	Following items for “1GR incorrect ratio” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	• Input clutch solenoid valve • Front brake solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit
2ND GR FNCTN P0732	Following items for “2GR incorrect ration” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
3RD GR FNCTN P0733	Following items for “3GR incorrect ratio” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
4TH GR FNCTN P0734	Following items for “4GR incorrect ratio” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
5TH GR FNCTN P0735	Following items for “5GR incorrect ratio” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
6TH GR FNCTN P0729	Following items for “6GR incorrect ratio” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
7TH GR FNCTN P1734	Following items for “7GR incorrect ratio” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	
TCC SOL FUNCTN CHECK	Following items for “TCC solenoid function” can be confirmed. • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG)	• Harness or connectors • Torque converter clutch solenoid valve • Torque converter • Input speed sensor 1, 2 • Hydraulic control circuit

IGN COUNTER

IGN counter indicates the number of items that ignition switch is turned ON after DTC is detected.

- The number is 0 when a malfunction is detected now.
- The number increases like 1 → 2 → 3...38 → 39 after returning to the normal condition whenever ignition switch OFF → ON.
- The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.

DTC/CIRCUIT DIAGNOSIS

U0300 CAN COMMUNICATION DATA

Description

INFOID:0000000005775496

The amount of data transmitted from each control unit is read.

DTC Logic

INFOID:0000000005775497

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
U0300	Internal Control Module Software Incompatibility	When the amount of data transmitted from each control unit is smaller than the specified amount.	Control units other than TCM.

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Turn ignition switch ON and wait 2 seconds or more.
2. Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is “U0300” detected?

YES >> Go to TM-172, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000005775498

1. CHECK CONTROL UNIT

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

Is the number of replaced control units one?

YES >> Since the replaced control unit may be out of specifications, check the part number and specifications.
NO >> GO TO 2.

2. INSPECTION CONTROL UNIT

With CONSULT-III

1. Remove one of the replaced control units.
2. Install the previous control unit mounted before replacement.
3. Turn ignition switch ON and wait 2 seconds or more.
4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is “U0300” detected?

YES >> Turn OFF the ignition switch to check the other control units in the same method.
NO >> Since the removed control unit may be out of specifications, check the part number and specifications.

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000004279113

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:0000000004279114

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
U1000	CAN Communication Line	TCM is not transmitting or receiving CAN communication signal for 2 seconds or more.	• Harness or connectors (CAN communication line is open or shorted.) • TCM

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Run engine for at least 2 consecutive seconds at idle speed.
3. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”

Is “U1000” detected?

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

Diagnosis Procedure

INFOID:0000000004279115

Go to LAN-19, "Trouble Diagnosis Flow Chart".

P0615 STARTER RELAY

Description

INFOID:0000000004279116

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

DTC Logic

INFOID:0000000004279117

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0615	Starter Relay Circuit	The starter monitor value is OFF when the ignition switch is ON at the “P” and “N” positions.	• Harness or connectors (Starter relay and TCM circuit is open or shorted.) • Starter relay circuit

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Shift the selector lever to “P” and “N” positions.
2. Turn ignition switch ON and wait 2 seconds or more.
3. Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is “P0615” detected?

YES >> Go to TM-174, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279118

1.CHECK STARTER RELAY SIGNAL

1. Turn ignition switch ON.
2. Check voltage between IPDM E/R connector terminal and ground.

IPDM E/R connector		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E5	30		Selector lever in “P” and “N” positions.	Battery voltage
			Selector lever in other positions.	0 V

Is the inspection result normal?

YES >> Check starter relay circuit. Refer to STR-9, "Wiring Diagram - STARTING SYSTEM -".
NO >> GO TO 2.

2. CHECK HARNESS BETWEEN A/T ASSEMBLY AND IPDM E/R (PART 1)

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

A/T assembly vehicle side harness connector		IPDM E/R vehicle side harness connector		Continuity
Connector	Terminal	Connector	Terminal	
F51	9	E5	30	Existed

Is the inspection result normal?

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

3. CHECK HARNESS BETWEEN A/T ASSEMBLY AND IPDM E/R (PART 2)

Check continuity between A/T assembly vehicle side harness connector terminal and ground.

A/T assembly vehicle side harness connector		Ground	Continuity
Connector	Terminal		
F51	9		Not existed

Is the inspection result normal?

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

4. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0705 TRANSMISSION RANGE SWITCH A

Description

INFOID:0000000004279119

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

DTC Logic

INFOID:0000000004279120

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0705	Transmission Range Sensor A Circuit (PRNDL Input)	Transmission range switch signals input with impossible pattern.	• Harness or connectors (Transmission range switches 1, 2, 3, 4 and TCM circuit is open or shorted.) • Transmission range switches 1, 2, 3 and 4

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “ACCELE POSI” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Shift the selector lever throughout the entire shift position from “P” to “D”. (Hold the selector lever at each position for 2 seconds or more)
4. Drive vehicle and maintain the following conditions for 2 seconds or more.

ACCELE POSI	: More than 1.0/8
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

5. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0705” detected?

YES >> Go to TM-176, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279121

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0710 TRANSMISSION FLUID TEMPERATURE SENSOR A

Description

INFOID:0000000004279122

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

DTC Logic

INFOID:0000000004279123

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...		Possible cause
P0710	Transmission Fluid Temperature Sensor A Circuit	The A/T fluid temperature sensor is –40°C (–40°F) or less for 5 seconds while driving the vehicle at the vehicle speed 10 km/h (7 MPH) or more.		• Harness or connectors (Sensor circuit is open.) • A/T fluid temperature sensor
		The A/T fluid temperature sensor is 180°C (356°F) or more for 5 seconds.		• Harness or connectors (Sensor circuit is short.) • A/T fluid temperature sensor
		The A/T fluid temperature sensor is in the following conditions while driving the vehicle at the vehicle speed 10 km/h (7 MPH) or more.		• Harness or connectors (Sensor circuit is stuck.) • A/T fluid temperature sensor
		For 4 minutes	: 15°C – 20°C (59°F – 68°F)	
			: 10°C – 15°C (50°F – 59°F)	
			: 5°C – 10°C (41°F – 50°F)	
			: 0°C – 5°C (32°F – 41°F)	
		For 7 minutes	: –5°C – 0°C (23°F – 32°F)	
			: –10°C – –5°C (14°F – 23°F)	
			: –15°C – –10°C (5°F – 14°F)	
			: –20°C – –15°C (–4°F – 5°F)	
		For 14 minutes	: –40°C – –20°C (–40°F – –4°F)	

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “SLCT LVR POSI” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 14 minutes or more.

SLCT LVR POSI	: D
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0710” detected?

YES >> Go to TM-178, "Diagnosis Procedure".

NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279124

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).

NO >> Repair or replace damaged parts.

P0717 INPUT SPEED SENSOR A

Description

INFOID:0000000004279125

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

DTC Logic

INFOID:0000000004279126

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0717	Input/Turbine Speed Sensor A Circuit No Signal	The revolution of input speed sensor 1 and/or 2 is 270 rpm or less.	• Harness or connectors (Sensor circuit is open.) • Input speed sensor 1 and/or 2

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “SLCT LVR POSI”, “GEAR”, “VHCL/S SE-A/T”, “CLSD THL POS” and “ENGINE SPEED” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.
   CAUTION:
   Keep the same gear position.
   NOTE:
   Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

SLCT LVR POSI	: D
GEAR	: 2nd, 3rd, 4th, 5th or 6th
VHCL/S SE-A/T	: More than 40 km/h (25 MPH)
CLSD THL POS	: OFF
ENGINE SPEED	: More than 1,500 rpm

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0717” detected?

YES >> Go to TM-179, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279127

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).

NO >> Repair or replace damaged parts.

P0720 OUTPUT SPEED SENSOR

Description

INFOID:0000000004279128

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

DTC Logic

INFOID:0000000004279129

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0720	Output Speed Sensor Circuit	• The vehicle speed detected by the output speed sensor is 5 km/h (3MPH) or less when the vehicle speed transmitted from the unified meter and A/C amp. to TCM is 20 km/h or more. (Only when starts after the ignition switch is turned ON.) • The vehicle speed transmitted from the unified meter and A/C amp. to TCM does not decrease despite the 36 km/h (23 MPH) or more of deceleration in vehicle speed detected by the output speed sensor. when the vehicle speed detected by the output speed sensor is 36 km/h (23 MPH) or more and the vehicle speed transmitted from the unified meter and A/C amp. to TCM is 24 (15 MPH) or more.	• Harness or connectors (Sensor circuit is open.) • Output speed sensor

DTC CONFIRMATION PROCEDURE

CAUTION:

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

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “ESTM VSP SIG” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 60 seconds or more.

ESTM VSP SIG : 40 km/h (25 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0720” detected?

YES >> Go to TM-182, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279130

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).

NO >> Repair or replace damaged parts.

P0725 ENGINE SPEED

Description

INFOID:0000000004279131

The engine speed signal is transmitted from the ECM to the TCM via CAN communication line.

DTC Logic

INFOID:0000000004279132

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0725	Engine Speed Input Circuit	• TCM does not receive the CAN communication signal from the ECM. • The engine speed is more less 150 rpm even if the vehicle speed is more than 10 km/h (7 MPH).	Harness or connectors (ECM to TCM circuit is open or shorted.)

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “SLCT LVR POSI” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

SLCT LVR POSI	: D
VHCL/S SE-A/T	: More than 10 km/h (7 MPH)

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0725” detected?

YES >> Go to TM-183, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279133

1. CHECK DTC OF ECM

With CONSULT-III

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Results” in “ENGINE”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to EC-564, "DTC Index".
NO >> GO TO 2.

2. CHECK DTC OF TCM

With CONSULT-III

Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is any DTC other than “P0725” detected?

YES >> Check DTC detected item. Refer to TM-257, "DTC Index".
NO >> GO TO 3.

3.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0729 6GR INCORRECT RATIO

Description

INFOID:0000000004279134

This malfunction is detected when the A/T does not shift into 6GR position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

DTC Logic

INFOID:0000000004279135

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0729	Gear 6 Incorrect Ratio	The gear ratio is: • 0.914 or more • 0.810 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"TM-186, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

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

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "6TH GR FNCTN P0729" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 6th
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0729” is detected, check the DTC. Refer to TM-166, "CONSULT-III Function (TRANSMISSION)".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 6th
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0729” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to TM-186, "Diagnosis Procedure".
YES-4 >> “P0729” is detected: Go to TM-186, "Diagnosis Procedure".
NO >> GO TO 4.

4. CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279136

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0730 INCORRECT GEAR RATIO

Description

INFOID:0000000004279137

- TCM detects a high-rpm state of the under drive sun gear.
- The number of revolutions of the under drive sun gear is calculated with the input speed sensor 1 and 2.

DTC Logic

INFOID:0000000004279138

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0730	Incorrect Gear Ratio	The revolution of under drive sun gear is 8,000 rpm or more. **NOTE:** Not detected when in “P” or “N” position and during a shift to “P” or “N” position.	• 2346 brake solenoid valve • Front brake solenoid valve • Input speed sensor 1, 2

DTC CONFIRMATION PROCEDURE

CAUTION:

- **“TM-187, "Diagnosis Procedure"” must be performed before starting “DTC CONFIRMATION PROCEDURE”.**
- **Never perform “DTC CONFIRMATION PROCEDURE” before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “Self Diagnostic Results” in “ENGINE”.
3. Drive vehicle under the similar conditions to (1st trip) Freeze Frame Data for 10 minutes. Refer to the table below.
   Hold the accelerator pedal as steady as possible.

ENGINE SPEED	Same value as the Freeze Frame Data.
VEHICLE SPEED	Same value as the Freeze Frame Data.
B/FUEL SCHDL	Same value as the Freeze Frame Data.

4. Check 1st trip DTC.

With GST

Follow the procedure “With CONSULT-III”.

Is 1st trip DTC detected?

YES >> Go to TM-187, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279139

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).

NO >> Repair or replace damaged parts.

P0731 1GR INCORRECT RATIO

Description

INFOID:0000000004279140

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

DTC Logic

INFOID:0000000004279141

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0731	Gear 1 Incorrect Ratio	The gear ratio is: • 5.219 or more • 4.629 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"TM-190, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

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

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "1ST GR FNCTN P0731" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 1st
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0731” is detected, check the DTC. Refer to TM-166, "CONSULT-III Function (TRANSMISSION)".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 1st
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0731” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to TM-190, "Diagnosis Procedure".
YES-4 >> “P0731” is detected: Go to TM-190, "Diagnosis Procedure".
NO >> GO TO 4.

4. CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279142

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0732 2GR INCORRECT RATIO

Description

INFOID:0000000004279143

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

DTC Logic

INFOID:0000000004279144

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0732	Gear 2 Incorrect Ratio	The gear ratio is: • 3.386 or more • 3.002 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"TM-192, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

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

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "2ND GR FNCTN P0732" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 2nd
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0732” is detected, check the DTC. Refer to TM-166, "CONSULT-III Function (TRANSMISSION)".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 2nd
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0732” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to TM-192, "Diagnosis Procedure".
YES-4 >> “P0732” is detected: Go to TM-192, "Diagnosis Procedure".
NO >> GO TO 4.

4. CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279145

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0733 3GR INCORRECT RATIO

Description

INFOID:0000000004279146

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

DTC Logic

INFOID:0000000004279147

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0733	Gear 3 Incorrect Ratio	The gear ratio is: • 2.166 or more • 1.920 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"TM-194, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in T"RANSMISSION".
3. Check ATF temperature is in the following range.

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

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "3RD GR FNCTN P0733" in "DTC & SRT confirmation" in T"RANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 3rd
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0733” is detected, check the DTC. Refer to TM-166, "CONSULT-III Function (TRANSMISSION)".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 3rd
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0733” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to TM-194, "Diagnosis Procedure".
YES-4 >> “P0733” is detected: Go to TM-194, "Diagnosis Procedure".
NO >> GO TO 4.

4. CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279148

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0734 4GR INCORRECT RATIO

Description

INFOID:0000000004279149

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

DTC Logic

INFOID:0000000004279150

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0734	Gear 4 Incorrect Ratio	The gear ratio is: • 1.497 or more • 1.327 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"TM-196, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

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

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "4TH GR FNCTN P0734" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 4th
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0734” is detected, check the DTC. Refer to TM-166, "CONSULT-III Function (TRANSMISSION)".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 4th
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0734” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to TM-196, "Diagnosis Procedure".
YES-4 >> “P0734” is detected: Go to TM-196, "Diagnosis Procedure".
NO >> GO TO 4.

4. CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279151

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0735 5GR INCORRECT RATIO

Description

INFOID:0000000004279152

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

DTC Logic

INFOID:0000000004279153

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0735	Gear 5 Incorrect Ratio	The gear ratio is: • 1.060 or more • 0.940 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"TM-198, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

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

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "5TH GR FNCTN P0735" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 5th
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P0735” is detected, check the DTC. Refer to TM-166, "CONSULT-III Function (TRANSMISSION)".

With GST

1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 5th
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P0735” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to TM-198, "Diagnosis Procedure".
YES-4 >> “P0735” is detected: Go to TM-198, "Diagnosis Procedure".
NO >> GO TO 4.

4. CHECK SYMPTOM (PART 2)

With CONSULT-III

1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279154

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD). TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0740 TORQUE CONVERTER

Description

INFOID:0000000004279155

- The torque converter clutch solenoid valve is activated, with the gear in D2, D3, D4, D5, D6, D7, M2, M3, M4, M5, M6 and M7 by the TCM in response to signals transmitted from the output speed sensor and accelerator pedal position sensor (throttle position sensor). Torque converter clutch piston operation will then be controlled.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- When the accelerator pedal is depressed (less than 1.0/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.

DTC Logic

INFOID:0000000004279156

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0740	Torque Converter Clutch Circuit/Open	The torque converter clutch solenoid valve monitor value is 0.4 A or less when the torque converter clutch solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Torque converter clutch solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VEHICLE SPEED” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 30 seconds or more.
   NOTE:
   Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 2nd
VEHICLE SPEED	: 40 km/h (25 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0740” detected?

YES >> Go to TM-199, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279157

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).

NO >> Repair or replace damaged parts.

P0744 TORQUE CONVERTER

Description

INFOID:0000000004279158

This malfunction is detected when the A/T does not lock-up. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

DTC Logic

INFOID:0000000004279159

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0744	Torque Converter Clutch Circuit Intermittent	The lock-up is not performed in spite of within the lock-up area.	• Harness or connectors • Torque converter clutch solenoid valve • Torque converter • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “MANU MODE SW”, “GEAR” and “VEHICLE SPEED” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 10 seconds or more.
   NOTE:
   Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

MANU MODE SW	: ON
GEAR	: 2nd
VEHICLE SPEED	: 40 km/h (25 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0744” detected?

YES >> Go to TM-201, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279160

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0745 PRESSURE CONTROL SOLENOID A

Description

INFOID:0000000004279161

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

DTC Logic

INFOID:0000000004279162

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0745	Pressure Control Solenoid A	The line pressure solenoid valve monitor value is 0.4 A or less when the line pressure solenoid valve command value is more than 0.75 A.	• Harness or connectors (Sensor valve circuit is open or shorted.) • Line pressure solenoid valve

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT” and “SLCT LVR POSI” in “Data Monitor” in “TRANSMISSION”.
3. Shift the selector lever to “N” position.
4. Maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
SLCT LVR POSI	: N/P

5. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0745” detected?

YES >> Go to TM-202, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279163

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0750 SHIFT SOLENOID A

Description

INFOID:0000000004279164

- Anti-interlock solenoid valve prevents the simultaneous activation of the input clutch and the low brake.
- The anti-interlock solenoid valve is an ON/OFF type solenoid valve.

DTC Logic

INFOID:0000000004279165

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0750	Shift Solenoid A	• The anti-interlock solenoid valve monitor value is ON when the anti-interlock solenoid valve command value is OFF. • The anti-interlock solenoid valve monitor value is OFF when the anti-interlock solenoid valve command value is ON.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Anti-interlock solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 1st
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0750” detected?

YES >> Go to TM-203, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279166

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).

NO >> Repair or replace damaged parts.

P0775 PRESSURE CONTROL SOLENOID B

Description

INFOID:0000000004279167

- The Input clutch solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The Input clutch solenoid valve controls the input clutch control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000004279168

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0775	Pressure Control Solenoid B	The input clutch solenoid valve monitor value is 0.4 A or less when the input clutch solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Input clutch solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 1st
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0775” detected?

YES >> Go to TM-205, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279169

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0780 SHIFT

Application Notice

INFOID:0000000005803273

Check the TCM part number in “ECU Identification” in “TRANSMISSION” with CONSULT-III to confirm the service information in “P0780 SHIFT”.

TCM part number	Service information	Reference
31039-1XJ4A, 31039-1XJ4B	TYPE 1	TM-206, "TYPE 1 : DTC Logic"
Other than the above	TYPE 2	TM-207, "TYPE 2 : DTC Logic"

TYPE 1

TYPE 1 : Description

INFOID:0000000004279170

- TCM detects the malfunction of low brake solenoid valve.
- TCM measures the downshift time from 4GR to 3GR during “D” position, and detects the malfunction if the shifting time is excessively short.

TYPE 1 : DTC Logic

INFOID:0000000004279171

CAUTION:
Since DTC DETECTION LOGIC and DTC CONFIRMATION PROCEDURE depend on TCM part number, Check TCM part number before starting diagnosis. Refer to TM-206, "Application Notice".

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0780	Shift Error	The shift change time from 4GR to 3GR is 0.2 second or less.	• Anti-interlock solenoid valve • Low brake solenoid valve • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:
Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III
1. Start the engine.
2. Select “GEAR” in “Data Monitor” in “TRANSMISSION”.
3. Shift the selector lever to “D” position.
4. Accelerate until “4th” appears on “GEAR”, then release the accelerator pedal.
5. Decelerate until “3rd” appears on “GEAR” by depressing the brake pedal gradually.
   CAUTION:
   The brake pedal must be depressed slowly.
6. Then repeat steps 4 to 5 three more times.
7. Stop the vehicle, and then turn the ignition switch OFF.
8. Perform steps 1 to 7 again.
9. Perform “Self Diagnostic Results” in “TRANSMISSION”.

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

Is “P0780” detected?

YES >> Go to TM-207, "TYPE 1 : Diagnosis Procedure".
NO >> INSPECTION END

TYPE 1 : Diagnosis Procedure

INFOID:0000000004279172

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).

NO >> Repair or replace damaged parts.

TYPE 2

TYPE 2 : Description

INFOID:0000000005803274

The TCM detects the malfunction of low brake solenoid valve. This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

TYPE 2 : DTC Logic

INFOID:0000000005803275

CAUTION:

Since DTC DETECTION LOGIC and DTC CONFIRMATION PROCEDURE depend on TCM part number, Check TCM part number before starting diagnosis. Refer to TM-206, "Application Notice".

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0780	Shift Error	• TCM judges that the gear ratio is not switched to that of 4GR (1.412) while shifting from 3GR to 4GR in “D” position. • TCM judges that the engine speed is more than the specified one while shifting from 5GR to 6GR or from 6GR to 7GR in “D” position.	• Anti-interlock solenoid valve • Low brake solenoid valve • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **“TM-208, "TYPE 2 : Diagnosis Procedure"” must be performed before starting “DTC CONFIRMATION PROCEDURE”.**
- **Never perform “DTC CONFIRMATION PROCEDURE” before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “SLCT LVR POSI”, “ACCELE POSI” and “GEAR” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions.

SLCT LVR POSI	: D
ACCELE POSI	: More than 1.0/8
GEAR	: 3rd → 4th

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0780” detected?

YES >> Go to TM-208, "TYPE 2 : Diagnosis Procedure".
NO >> INSPECTION END

TYPE 2 : Diagnosis Procedure

INFOID:0000000005803287

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P0795 PRESSURE CONTROL SOLENOID C

Description

INFOID:0000000004279173

- The front brake solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The front brake solenoid valve controls the front brake control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000004279174

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0795	Pressure Control Solenoid C	The front brake solenoid valve monitor value is 0.4 A or less when the front brake solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Front brake solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 7th
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P0795” detected?

YES >> Go to TM-209, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279175

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P1705 TP SENSOR

Description

INFOID:0000000004279176

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

DTC Logic

INFOID:0000000004279177

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1705	Accelerator Pedal Position Sensor Signal Circuit	TCM detects the difference between two accelerator pedal position signals received from ECM via CAN communication.	Harness or connectors (Sensor circuit is open or shorted.)

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “SLCT LVR POSI” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

SLCT LVR POSI	: D
VHCL/S SE-A/T	: 5 km/h (3 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is “P1705” detected?

YES >> Go to TM-210, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279178

1.CHECK DTC OF ECM

With CONSULT-III

1. Turn ignition switch ON.
2. Perform “Self Diagnostic Results” in “ENGINE”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to EC-564, "DTC Index".
NO >> GO TO 2.

2.CHECK DTC OF TCM

With CONSULT-III

Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is any DTC other than “P1705” detected?

YES >> Check DTC detected item. Refer to TM-257, "DTC Index".
NO >> GO TO 3.

3.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).

NO >> Repair or replace damaged parts.

P1721 VEHICLE SPEED SIGNAL

Description

INFOID:0000000004279179

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

DTC Logic

INFOID:0000000004279180

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1721	Vehicle Speed Signal Circuit	• The vehicle speed transmitted from the unified meter and A/C amp. to TCM is 5 km/h (3MPH) or less when the vehicle speed detected by the output speed sensor is 20 km/h or more. (Only when starts after the ignition switch is turned ON.) • The vehicle speed detected by the output speed sensor does not decrease despite the 36 km/h (23 MPH) or more of deceleration in vehicle speed received from the unified meter and A/C amp. when the vehicle speed transmitted from the unified meter and A/C amp. to TCM is 36 km/h (23 MPH) or more and the vehicle speed detected by the output speed sensor is 24 (15 MPH) or more.	Harness or connectors (Sensor circuit is open or shorted.)

DTC CONFIRMATION PROCEDURE

CAUTION:

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

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “ESTM VSP SIG” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 60 seconds or more.

ESTM VSP SIG	: 40 km/h (25 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is “P1721” detected?

YES >> Go to TM-213, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279181

1. CHECK DTC OF ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT).

With CONSULT-III

Perform “Self Diagnostic Results” in “ABS”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to BRC-88, "DTC No. Index".
NO >> GO TO 2.

2. CHECK DTC OF UNIFIED METER AND A/C AMP.

With CONSULT-III

Perform “Self Diagnostic Results” in “METER/M&A”.

Is any DTC detected?

YES >> Check DTC detected item. Refer to MWI-101, "DTC Index".
NO >> GO TO 3.

3. CHECK DTC OF TCM

With CONSULT-III

Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is any DTC other than “P1721” detected?

YES >> Check DTC detected item. Refer to TM-257, "DTC Index".
NO >> GO TO 4.

4. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P1730 INTERLOCK

Description

INFOID:0000000004279182

Fail-safe function to detect interlock conditions.

DTC Logic

INFOID:0000000004279183

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1730	Interlock	The output speed sensor sensor detects the deceleration of 12 km/h (7 MPH) or more for 1 second.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Hydraulic control circuit

NOTE:
When the vehicle is driven fixed in 2GR, a input speed sensor malfunction is displayed, but this is not a input speed sensor malfunction.

DTC CONFIRMATION PROCEDURE

CAUTION:
- **"TM-215, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III
1. Start the engine.
2. Select "SLCT LVR POSI" and "GEAR" in "Data Monitor" in "TRANSMISSION".
3. Drive vehicle the following condition.

SLCT LVR POSI	: D
GEAR	: 1st through 7th

4. Perform "Self Diagnostic Results" in "TRANSMISSION".

With GST
Follow the procedure "With CONSULT-III".

Is "P1730" detected?

YES >> Go to TM-215, "Diagnosis Procedure".
NO >> INSPECTION END

Judgment of A/T Interlock

INFOID:0000000004279184

Refer to TM-253, "Fail-Safe".

Diagnosis Procedure

INFOID:0000000004279185

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).

NO >> Repair or replace damaged parts.

P1734 7GR INCORRECT RATIO

Description

INFOID:0000000004279186

This malfunction is detected when the A/T does not shift into 7GR position as instructed by TCM. This is not only caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

DTC Logic

INFOID:0000000004279187

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1734	Gear 7 Incorrect Ratio	The gear ratio is: • 0.818 or more • 0.728 or less	• Input clutch solenoid valve • Direct clutch solenoid valve • High and low reverse clutch solenoid valve • Front brake solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Anti-interlock solenoid valve • Each clutch and brake • Output speed sensor • Input speed sensor 1, 2 • Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"TM-217, "Diagnosis Procedure"" must be performed before starting "DTC CONFIRMATION PROCEDURE".**
- **Never perform "DTC CONFIRMATION PROCEDURE" before completing the repair, which may cause secondary malfunction.**
- **Always drive vehicle at a safe speed.**

1. PRECONDITIONING

If "DTC CONFIRMATION PROCEDURE" is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK ATF TEMPERATURE

With CONSULT-III

1. Start the engine.
2. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
3. Check ATF temperature is in the following range.

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

With GST

1. Start the engine.
2. Drive vehicle for approximately 5 minutes in urban areas.

Is ATF temperature within specified range?

YES >> GO TO 3.
NO >> Drive vehicle to warm ATF or stop engine to cool ATF.

3. CHECK SYMPTOM (PART 1)

With CONSULT-III

1. Select "7TH GR FNCTN P1734" in "DTC & SRT confirmation" in "TRANSMISSION".
2. Drive vehicle with manual mode and maintain the following conditions.

GEAR	: 7
ACCELE POSI	: 0.7/8 or more
VEHICLE SPEED	: 10 km/h (7 MPH) or more

3. Keep the current driving status for 2 seconds or more if CONSULT-III screen changes from “OUT OF CONDITION” to “TESTING”.
CAUTION:
When “TESTING” is not indicated on CONSULT-III for a long time, check “Self Diagnostic Results” in “TRANSMISSION”. When a DTC other than “P1734” is detected, check the DTC. Refer to TM-166, "CONSULT-III Function (TRANSMISSION)".

With GST
1. Drive vehicle and maintain the following conditions for 2 seconds or more.

Selector lever	: “M” position
Gear position	: 7th
Accelerator pedal opening	: 0.7/8 or more
Vehicle speed	: 10 km/h (7 MPH) or more

2. Check DTC.

Is “OUT OF CONDITION”, “STOP VEHICLE” or “COMPLETED RESULT NG” displayed? / Is “P1734” detected?

YES-1 >> “OUT OF CONDITION”: Perform “Step 3” again.
YES-2 >> “STOP VEHICLE”: GO TO 4.
YES-3 >> “COMPLETED RESULT NG”: Go to TM-217, "Diagnosis Procedure".
YES-4 >> “P1734” is detected: Go to TM-217, "Diagnosis Procedure".
NO >> GO TO 4.

4. CHECK SYMPTOM (PART 2)

With CONSULT-III
1. Stop vehicle.
2. Drive vehicle in “D” position allowing it to shift from 1GR to 7GR and check shift timing and shift shock.

>> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279188

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P1815 M-MODE SWITCH

Description

INFOID:0000000004279189

Manual mode switch is installed in A/T shift selector assembly. It transmits manual mode switch, shift up and shift down switch signals to unified meter and A/C amp. Then unified meter and A/C amp. transmits signals to TCM via CAN communication.
Paddle shifter transmits shift up and shift down switch signals to unified meter and A/C amp. Then unified meter and A/C amp. transmits signals to TCM via CAN communication. (With paddle shifter)
TCM transmits the switch signals to unified meter and A/C amp. via CAN communication line. Then manual mode switch position is indicated on the shift position indicator. For inspection, refer to TM-229.

DTC Logic

INFOID:0000000004279190

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1815	Manual Mode Switch Circuit	• TCM monitors manual mode, non manual mode, up or down switch signal, and detects as irregular when impossible input pattern occurs 2 second or more. • Shift up/down signal of paddle shifter continuously remains ON for 60 seconds.*	• Harness or connectors (These switches circuit is open or shorted.) • Manual mode select switch (Into A/T shift selector assembly) • Manual mode position select switch (Into A/T shift selector assembly) • Paddle shifter*

*: With paddle shifter

DTC CONFIRMATION PROCEDURE

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Turn ignition switch ON.
2. Select “SLCT LVR POSI” and “MANU MODE SW” in “Data Monitor” in “TRANSMISSION”.
3. Maintain the following each conditions more than 60 seconds.

SLCT LVR POSI	: D
MANU MODE SW	: ON

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

Is “P1815” detected?

YES >> Go to TM-218, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279191

1.CHECK MANUAL MODE SWITCH CIRCUIT

With CONSULT-III

1. Turn ignition switch ON.
2. Select “MANU MODE SW”, “NON M MODE SW”, “UP SW LEVER”, “DOWN SW LEVER”, “SFT UP ST SW”* and “SFT DWN ST SW”* in “Data Monitor” in “TRANSMISSION”.
3. Check the ON/OFF operations of each monitor item.

Item	Monitor Item	Condition	Status
Manual mode switch	MANU MODE SW	Selector lever is shifted to manual shift gate side	ON
		Other than the above	OFF
	NON M-MODE SW	Selector lever is shifted to manual shift gate side	OFF
		Other than the above	ON
	UP SW LEVER	Selector lever is shifted to + side	ON
		Other than the above	OFF
	DOWN SW LEVER	Selector lever is shifted to – side	ON
		Other than the above	OFF
Paddle shifter*	SFT UP ST SW	Paddle shifter (shift-up) is pulled	ON
		Other than the above	OFF
	SFT DWN ST SW	Paddle shifter (shift-down) is pulled	ON
		Other than the above	OFF

*: With paddle shifter

Without CONSULT-III

Drive the vehicle in the manual mode, and then check that the indication of the shift position indicator matches with the actual gear position.

1. Shift the selector lever to UP side, and then accelerate from 1GR to 7GR.
2. Shift the selector lever to DOWN side, and then decelerate from 7GR to 1GR.
3. *Shift the paddle shifter to UP side, and then accelerate from 1GR to 7GR.
4. *Shift the paddle shifter to DOWN side, and then decelerate from 7GR to 1GR.

*: With paddle shifter

Which item is abnormal?

Manual mode switch>>GO TO 2.
Paddle shifter>>GO TO 8.

2.CHECK MANUAL MODE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T shift selector connector.
3. Turn ignition switch ON.
4. Check voltage between A/T shift selector vehicle side harness connector terminals.

A/T shift selector vehicle side harness connector			Voltage (Approx.)
Connector	Terminal		
	+	–	
M137	1	4	Battery voltage
	2		
	3		
	5		

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 5.

3.CHECK MANUAL MODE SWITCH

Check manual mode switch. Refer to TM-222, "Component Inspection (Manual Mode Switch)".

Is the inspection result normal?

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

4.CHECK MALFUNCTIONING ITEM

Check the following.
- Check terminals of A/T shift selector harness connector and harness cladding for damage.
- Check connector for loose connection.

Is the inspection result normal?

YES >> GO TO 14.
NO >> Repair or replace damaged parts.

5.CHECK GROUND CIRCUIT

Check continuity between A/T shift selector vehicle side harness connector terminal and ground.

A/T shift selector vehicle side harness connector		Ground	Continuity
Connector	Terminal		
M137	4		Existed

Is the inspection result normal?

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

6.CHECK HARNESS BETWEEN A/T SHIFT SELECTOR AND UNIFIED METER AND A/C AMP. (PART 1)

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between A/T shift selector vehicle side harness connector terminals and unified meter and A/C amp. vehicle side harness connector terminals.

A/T shift selector vehicle side harness connector		Unified meter and A/C amp. vehicle side harness connector		Continuity
Connector	Terminal	Connector	Terminal	
M137	1	M66	10	Existed
	2		25	
	3		5	
	5		11	

Is the inspection result normal?

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

7.CHECK HARNESS BETWEEN A/T SHIFT SELECTOR AND UNIFIED METER AND A/C AMP. (PART 2)

Check continuity between A/T shift selector vehicle side harness connector terminals and ground.

A/T shift selector vehicle side harness connector		Ground	Continuity
Connector	Terminal		
M137	1	Ground	Not existed
	2		
	3		
	5		

Is the inspection result normal?

YES >> GO TO 14.
NO >> Repair or replace damaged parts.

8.CHECK PADDLE SHIFTER CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect paddle shifter connectors.
3. Turn ignition switch ON.
4. Check voltage between paddle shifter vehicle side harness connector terminals.

Paddle shifter vehicle side harness connector			Voltage (Approx.)
Connector	Terminal		
	+	–	
M32	3	1	Battery voltage
M39	3	1	

Is the inspection result normal?

YES >> GO TO 9.
NO >> GO TO 11.

9.CHECK PADDLE SHIFTER

Check paddle shifter. Refer to TM-223, "Component Inspection [Paddle Shifter (Shift-up)]", TM-223, "Component Inspection [Paddle Shifter (Shift-down)]".

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair or replace damaged parts.

10.CHECK MALFUNCTIONING ITEM

Check the following.
- Check terminals of paddle shifter connector for damage.
- Check connector for loose connection.

Is the inspection result normal?

YES >> GO TO 14.
NO >> Repair or replace damaged parts.

11.CHECK GROUND CIRCUIT

Check continuity between paddle shifter vehicle side harness connector terminals and ground.

Paddle shifter vehicle side harness connector		Ground	Continuity
Connector	Terminal		
M32	1		Existed
M39	1		

Is the inspection result normal?

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

12.CHECK HARNESS BETWEEN PADDLE SHIFTER AND UNIFIED METER AND A/C AMP. (PART 1)

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between paddle shifter vehicle side harness connector terminals and unified meter and A/C amp. vehicle side harness connector terminals.

Paddle shifter vehicle side harness connector		Unified meter and A/C amp. vehicle side harness connector		Continuity
Connector	Terminal	Connector	Terminal	
M32	3	M66	26	Existed
M39	3	M66	6	

Is the inspection result normal?

YES >> GO TO 13.
NO >> Repair or replace damaged parts.

13.CHECK HARNESS BETWEEN PADDLE SHIFTER AND UNIFIED METER AND A/C AMP. (PART 2)

Check continuity between paddle shifter vehicle side harness connector terminals and ground.

Paddle shifter vehicle side harness connector		Ground	Continuity
Connector	Terminal		
M32	3		Not existed
M39	3		

Is the inspection result normal?

YES >> GO TO 14.
NO >> Repair or replace damaged parts.

14.CHECK MALFUNCTIONING ITEM

Check the following.
- Check terminals of unified meter and A/C amp. connector for damage.
- Check connector for loose connection.

Is the inspection result normal?

YES >> GO TO 15.
NO >> Repair or replace damaged parts.

15.CHECK UNIFIED METER AND A/C AMP.

1. Reconnect all the connectors.
2. Turn ignition switch ON.
3. Select “M RANGE SW”, “NM RANGE SW”, “AT SFT UP SW”, “AT SFT DWN SW”, “ST SFT UP SW”* and “ST SFT DWN SW”* in “Data Monitor” in “METER/M&A”, and check the ON/OFF operations of each monitor item. Refer to MWI-83, "Reference Value".
   *: With paddle shifter

Is the inspection result normal?

YES >> GO TO 16.
NO >> Replace unified meter and A/C amp. Refer to MWI-128, "Exploded View".

16.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

Component Inspection (Manual Mode Switch)

INFOID:0000000004279192

1.CHECK MANUAL MODE SWITCH

Check continuity between A/T shift selector harness connector terminals.

A/T shift selector harness connector			Condition	Continuity
Connector	Terminal			
M137	1	4	Selector lever is shifted to manual shift gate side	Existed
			Other than the above	Not existed
	2		Selector lever is shifted to – side	Existed
			Other than the above	Not existed
	3		Selector lever is shifted to+ side	Existed
			Other than the above	Not existed
	5		Selector lever is shifted to manual shift gate side	Not existed
			Other than the above	Existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace damaged parts. Refer to TM-276, "2WD : Exploded View" (2WD), TM-278, "AWD : Exploded View" (AWD).

Component Inspection [Paddle Shifter (Shift-up)]

INFOID:0000000004292449

1.CHECK PADDLE SHIFTER

Check continuity between paddle shifter (shift-up) connector terminals.

Paddle shifter (shift-up) connector			Condition	Continuity
Connector	Terminal			
M39	1	3	Paddle shifter (shift-up) is pulled.	Existed
			Other than the above	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace damaged parts. Refer to TM-281, "Exploded View".

Component Inspection [Paddle Shifter (Shift-down)]

INFOID:0000000004279193

1.CHECK PADDLE SHIFTER

Check continuity between paddle shifter (shift-down) connector terminals.

Paddle shifter (shift-down) connector			Condition	Continuity
Connector	Terminal			
M32	1	3	Paddle shifter (shift-down) is pulled.	Existed
			Other than the above	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace damaged parts. Refer to TM-281, "Exploded View".

P2713 PRESSURE CONTROL SOLENOID D

Description

INFOID:0000000004279194

- The high and low reverse clutch solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The high and low reverse clutch solenoid valve controls the high and low reverse clutch control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000004279195

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P2713	Pressure Control Solenoid D	The high and low reverse clutch solenoid valve monitor value is 0.4 A or less when the high and low reverse clutch solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • High and low reverse clutch solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive the vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 3rd
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P2713” detected?

YES >> Go to TM-224, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279196

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P2722 PRESSURE CONTROL SOLENOID E

Description

INFOID:0000000004279197

- The low brake solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The low brake solenoid valve controls the low brake control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000004279198

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P2722	Pressure Control Solenoid E	The low brake solenoid valve monitor value is 0.4 A or less when the low brake solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Low brake solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 1st
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P2722” detected?

YES >> Go to TM-225, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279199

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P2731 PRESSURE CONTROL SOLENOID F

Description

INFOID:0000000004279200

- The 2346 brake solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The 2346 brake solenoid valve controls the 2346 brake control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000004279201

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P2731	Pressure Control Solenoid F	The 2346 brake solenoid valve monitor value is 0.4 A or less when the 2346 brake solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • 2346 brake solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1.PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2.CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 2nd
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P2731” detected?

YES >> Go to TM-226, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279202

1.CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

P2807 PRESSURE CONTROL SOLENOID G

Description

INFOID:0000000004279203

- The direct clutch solenoid valve is controlled by the TCM in response to signals transmitted from the transmission range switch, output speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.
- The direct clutch solenoid valve controls the direct clutch control valve in response to a signal transmitted from the TCM.

DTC Logic

INFOID:0000000004279204

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected is...	Possible cause
P2807	Pressure Control Solenoid G	The direct clutch solenoid valve monitor value is 0.4 A or less when the direct clutch solenoid valve command value is more than 0.75 A.	• Harness or connectors (Solenoid valve circuit is open or shorted.) • Direct clutch solenoid valve

DTC CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

1. PRECONDITIONING

If “DTC CONFIRMATION PROCEDURE” is previously conducted, always turn ignition switch OFF and wait at least 10 seconds before performing the next test.

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT-III

1. Start the engine.
2. Select “BATTERY VOLT”, “MANU MODE SW”, “GEAR” and “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

BATTERY VOLT	: 9 V or more
MANU MODE SW	: ON
GEAR	: 1st
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more

4. Perform “Self Diagnostic Results” in “TRANSMISSION”.

With GST

Follow the procedure “With CONSULT-III”.

Is “P2807” detected?

YES >> Go to TM-227, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000004279205

1. CHECK INTERMITTENT INCIDENT

Refer to GI-41, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).
NO >> Repair or replace damaged parts.

MAIN POWER SUPPLY AND GROUND CIRCUIT

Description

INFOID:0000000004279206

Supply power to TCM.

Diagnosis Procedure

INFOID:0000000004279207

1.CHECK TCM POWER SOURCE

1. Turn ignition switch OFF.
2. Disconnect A/T assembly connector.
3. Check voltage between A/T assembly vehicle side harness connector terminals and ground.

A/T assembly vehicle side harness connector		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
F51	1, 6		Turn ignition switch ON	Battery voltage
			Turn ignition switch OFF	0 V
	2		Always	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check the following. If NG, repair or replace damaged parts.
- Harness for short or open between battery and A/T assembly vehicle side harness connector terminal 2.
- Harness for short or open between push-button ignition switch and IPDM E/R.
- Harness for short or open between IPDM E/R vehicle side harness connector terminal 58 and A/T assembly vehicle side harness connector terminal 1, 6.
- 10A fuse (No. 36, located in the fuse, fusible link and relay box)
- 10A fuse (No. 43, located in the IPDM E/R)
- Push-button ignition switch.

2.CHECK TCM GROUND CIRCUIT

Check continuity between A/T assembly vehicle side harness connector terminals and ground.

A/T assembly vehicle side harness connector		Ground	Continuity
Connector	Terminal		
F51	5		Existed
	10		

Is the inspection result normal?

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

3.DETECT MALFUNCTIONING ITEM

Check the following.
- Check terminals of A/T assembly connector for damage.
- Check connector for loose connection.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace damaged parts.

SHIFT POSITION INDICATOR CIRCUIT

Description

INFOID:0000000004279208

TCM transmit the switch signals to unified meter and A/C amp. via CAN communication line. Then manual mode switch position is indicated on the shift position indicator.

Component Function Check

INFOID:0000000004279209

1. CHECK A/T INDICATOR

CAUTION:
Always drive vehicle at a safe speed.

1. Start the engine.
2. Check the actual selector lever position (“P”, “R”, “N”, “D” and “DS”) and the indication of the shift position indicator mutually coincide.
3. Drive vehicle in the manual mode, and then check that the actual gear position and the indication of the shift position indicator mutually coincide when the selector lever is shifted to “UP (+ side)” or “DOWN (– side)” side (1GR ⇔ 7GR).

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to TM-229, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000004279210

1. CHECK INPUT SIGNALS

With CONSULT-III

1. Start the engine.
2. Select “SLCT LVR POSI” in “Data Monitor” in “TRANSMISSION”.
3. Check the actual selector lever position (“P”, “R”, “N”, “D” and “DS”) and the indication of the “SLCT LVR POSI” mutually coincide. Refer to TM-242, "Reference Value".
4. Drive vehicle in the manual mode, and then check that the actual gear position and the indication of the “SLCT LVR POSI” mutually coincide when the selector lever is shifted to the “UP (+ side)” or “DOWN (– side)” side (1GR ⇔ 7GR). Refer to TM-242, "Reference Value".

Is the inspection result normal?

YES >> INSPECTION END
NO-1 >> The actual gear position does not change, or shifting into the manual mode is not possible (no gear shifting in the manual mode possible). Or the shift position indicator is not indicated.
- Check manual mode switch. Refer to TM-222, "Component Inspection (Manual Mode Switch)".
- Check A/T main system (Fail-safe function actuated).
  - Perform “Self Diagnostic Results” in “TRANSMISSION”. Refer to TM-166, "CONSULT-III Function (TRANSMISSION)".

NO-2 >> The actual gear position changes, but the shift position indicator is not indicated.
- Perform “Self Diagnostic Results” in “TRANSMISSION”. Refer to TM-166, "CONSULT-III Function (TRANSMISSION)".

NO-3 >> The actual gear position and the indication on the shift position indicator do not coincide.
- Perform “Self Diagnostic Results” in “TRANSMISSION”. Refer to TM-166, "CONSULT-III Function (TRANSMISSION)".

NO-4 >> Only a specific position or positions is/are not indicated on the shift position indicator.
- Check the unified meter and A/C amp. Refer to MWI-4, "Work flow".

SHIFT LOCK SYSTEM

Description

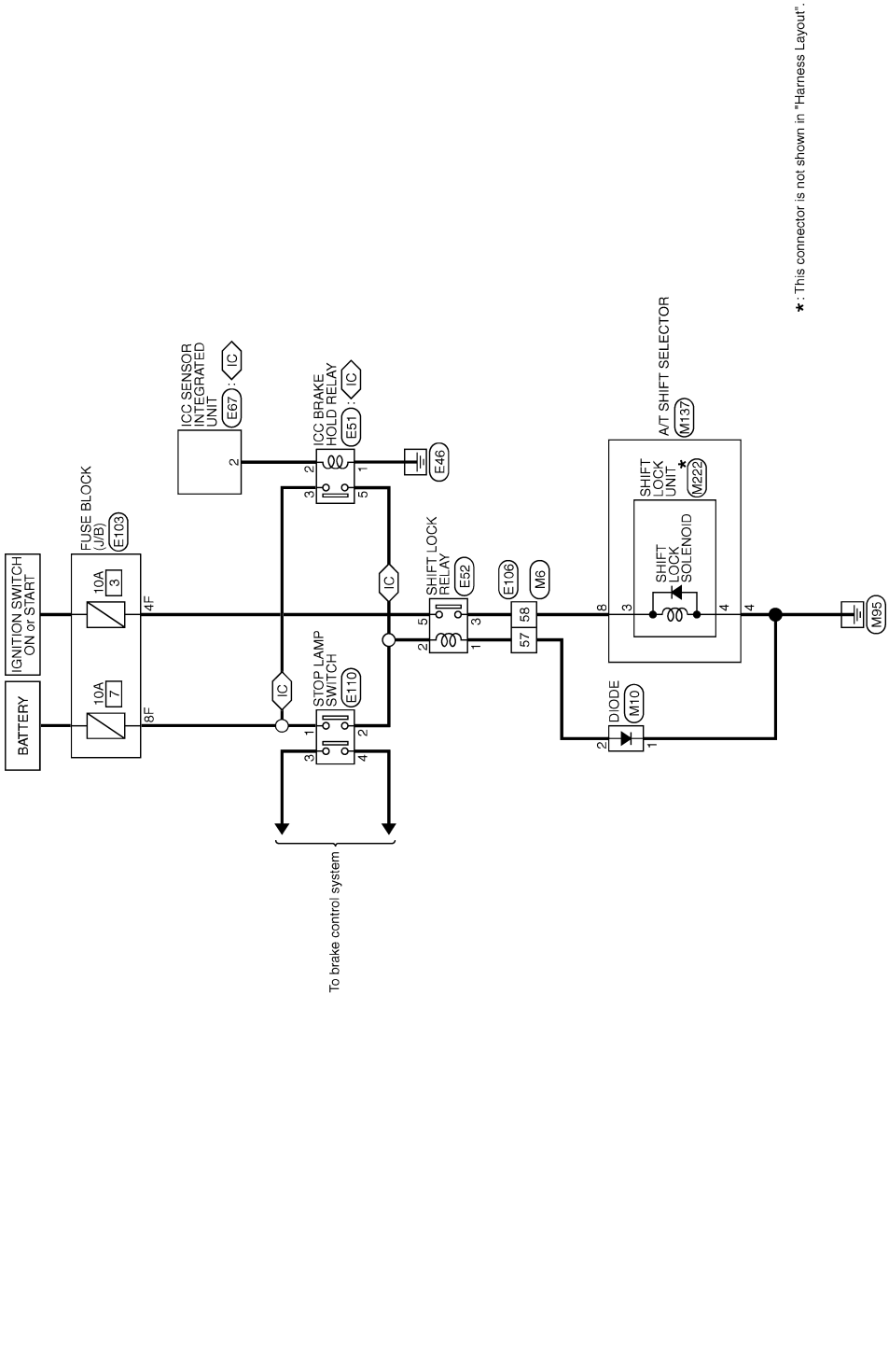
INFOID:0000000004279211

Shift lock system circuit consists of the following part.

Component	Function
Shift lock solenoid	Activated by the ignition switch and stop lamp signals, it holds the relative positions of sliders A and B.
Shift lock relay	Current flow to stop lamp switch allows shift lock relay contact ON, and then power is applied to shift lock solenoid.
Stop lamp switch	Depressing the brake pedal turns ON the stop lamp switch and energizes the shift lock solenoid.

Wiring Diagram - A/T SHIFT LOCK SYSTEM -

INFOID:0000000004279212



A/T SHIFT LOCK SYSTEM

Connector No.	E51
Connector Name	ICC BRAKE HOLD RELAY
Connector Type	MS02FL-M2

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	B	–
2	SB	–
3	L	–
5	W	–

Connector No.	E52
Connector Name	SHIFT LOCK RELAY
Connector Type	MS02FL-M2

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	GR	–
2	W	–
3	V	–
5	G	–

Connector No.	E67
Connector Name	ICC SENSOR INTEGRATED UNIT
Connector Type	RS06FB-PR

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
2	SB	BRAKE HOLD RLY DRIVE SIGNAL

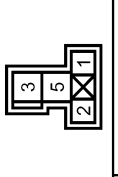
Connector No.	E103
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
4F	G	–
8F	L	–

Connector No.	E106
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
57	GR	–
58	V	–

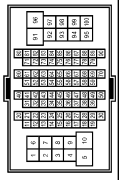
Connector No.	E110
Connector Name	STOP LAMP SWITCH
Connector Type	M04FW-LC

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	L	–
2	W	–
3	L	–
4	SB	–

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4

H.S.



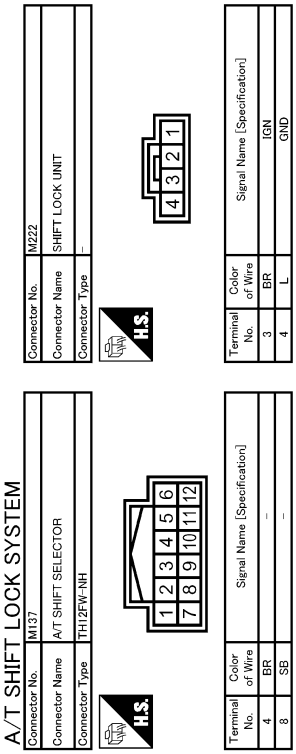
Terminal No.	Color of Wire	Signal Name [Specification]
57	O	–
58	SB	–

Connector No.	M10
Connector Name	DIODE
Connector Type	24335 C9902

H.S.

Terminal No.	Color of Wire	Signal Name [Specification]
1	B	–
2	O	–

JCDWA0347GE



JCDWA0348GE

Component Function Check

INFOID:0000000004279213

1. CHECK A/T SHIFT LOCK OPERATION (PART 1)

1. Turn ignition switch ON.
2. Shift the selector lever to “P” position.
3. Attempt to shift the selector lever to any other position with the brake pedal released.

Can the selector lever be shifted to any other position?

YES >> Go to TM-234, "Diagnosis Procedure".
NO >> GO TO 2.

2.CHECK A/T SHIFT LOCK OPERATION (PART 2)

Attempt to shift the selector lever to any other position with the brake pedal depressed.

Can the selector lever be shifted to any other position?

YES >> INSPECTION END
NO >> Go to TM-234, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000004279214

1.CHECK SELECTOR LEVER POSITION

Check the selector lever position for damage. Refer to TM-274, "2WD : Inspection and Adjustment" (2WD), TM-274, "AWD : Inspection and Adjustment" (AWD).

Is the inspection result normal?

YES >> GO TO 2.
NO >> Adjust control linkage. Refer to TM-274, "2WD : Inspection and Adjustment" (2WD), TM-274, "AWD : Inspection and Adjustment" (AWD).

2.CHECK POWER SOURCE

1. Turn ignition switch OFF.
2. Disconnect shift lock relay.
3. Check voltage between shift lock relay harness connector terminal and ground.

Shift lock relay harness connector		Ground	Condition	Voltage (Approx.)
Connector	Terminal			
E52	2		Depressed brake pedal.	Battery voltage
			Released brake pedal.	0 V

Is the inspection result normal?

YES >> GO TO 7.
NO-1 >> When pressing the brake pedal, the voltage is 0 V: GO TO 3.
NO-2 >> When releasing the brake pedal, the voltage is battery voltage: GO TO 5.

3.CHECK POWER SOURCE

1. Disconnect stop lamp switch connector.
2. Check voltage between stop lamp switch vehicle side harness connector terminal and ground.

Stop lamp switch vehicle side harness connector		Ground	Voltage (Approx.)
Connector	Terminal		
E110	1		Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Check the following. If NG, repair or replace damaged parts.
- 10A fuse [No. 7, located in the fuse block (J/B)]
- Harness for short to ground or open between battery and fuse block (J/B).
- Harness for short to ground or open between fuse block (J/B) vehicle side harness connector terminal 8F and stop lamp switch vehicle side harness connector terminal 1.
- Harness for short to ground between fuse block (J/B) vehicle side harness connector terminal 8F and ICC brake hold relay vehicle side harness connector terminal 3. [With ICC (Full Speed Range) System]

4.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to TM-237, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES >> Check the following. If NG, repair or replace damaged parts.

- Harness for short to ground or open between stop lamp switch vehicle side harness connector terminal 2 and shift lock relay vehicle side harness connector terminal 2.
- Harness for short to ground between ICC brake hold relay vehicle side harness connector terminal 5 and shift lock relay vehicle side harness connector 2. [With ICC (Full Speed Range) System]

NO >> Repair or replace damaged parts.

5.CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to TM-237, "Component Inspection (Stop Lamp Switch)".

Is the inspection result normal?

YES-1 >> Without ICC (Full Speed Range) System: Repair or replace harness between stop lamp switch and shift lock relay.
YES-2 >> With ICC (Full Speed Range) System: GO TO 6.
NO >> Repair or replace damaged parts.

6.CHECK DTC WITH ICC (FULL SPEED RANGE) SYSTEM

With CONSULT-III

Perform “Self Diagnostic Results” in “ICC”.

Is any malfunction detected?

YES >> Check the DTC detected item. Refer to CCS-113, "DTC Index".
NO >> Repair or replace harness between stop lamp switch and shift lock relay.

7.CHECK GROUND CIRCUIT

Check continuity between shift lock relay vehicle side harness connector terminal and ground.

Shift lock relay vehicle side harness connector		Ground	Continuity
Connector	Terminal		
E52	1		Existed

Is the inspection result normal?

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

8.CHECK SHIFT LOCK RELAY

Check shift lock relay. Refer to TM-236, "Component Inspection (Shift Lock Relay)".

Is the inspection result normal?

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

9.CHECK POWER SOURCE

1. Turn ignition switch ON.
2. Check voltage between shift lock relay vehicle side harness connector terminal and ground.

Shift lock relay vehicle side harness connector		Ground	Voltage (Approx.)
Connector	Terminal		
E52	5		Battery voltage

Is the inspection result normal?

YES >> GO TO 10.
NO >> Check the following. If NG, repair or replace damaged parts.
- 10A fuse [No. 3, located in the fuse block (J/B)]
- Harness for short to ground or open between push-button ignition switch and fuse block (J/B).
- Harness for short to ground or open between fuse block (J/B) vehicle side harness connector terminal 4F and shift lock relay vehicle side harness connector terminal 5.

10.CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/T shift selector connector.
3. Check continuity between A/T shift selector vehicle side harness connector terminal and ground.

A/T shift selector vehicle side harness connector		Ground	Continuity
Connector	Terminal		
M137	4		Existed

Is the inspection result normal?

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

11. CHECK SHIFT LOCK SOLENOID

Check shift lock solenoid. Refer to TM-236, "Component Inspection (Shift Lock Solenoid)".

Is the inspection result normal?

YES >> Check the following. If NG, repair or replace damaged parts.
- Harness for short to ground, short to power or open between shift lock relay vehicle side harness connector terminal 3 and A/T shift selector vehicle side harness connector terminal 8.
- Harness for short to ground, short to power or open between A/T shift selector harness connector terminal 8 and shift lock unit harness connector terminal 3.
- Harness for open between A/T shift selector harness connector terminal 4 and shift lock unit harness connector terminal 4.

NO >> Repair or replace damaged parts.

Component Inspection (Shift Lock Solenoid)

INFOID:0000000004279215

1. CHECK SHIFT LOCK SOLENOID

1. Remove shift lock unit. Refer to TM-276, "2WD : Exploded View" (2WD), TM-278, "AWD : Exploded View" (AWD).
2. Apply voltage to terminals 3 and 4 of shift lock unit connector, and then check that shift lock solenoid is activated.
   CAUTION:
   Connect the fuse between the terminals when applying the voltage.

Shift lock unit connector			Condition	Status
Connector	Terminal			
	+ (fuse)	–		
M222	3	4	Apply 12 V direct current between terminals 3 and 4.	Shift lock solenoid operates

Can the lock plate be moved up and down?

YES >> INSPECTION END
NO >> Replace shift lock unit. Refer to TM-276, "2WD : Exploded View" (2WD), TM-278, "AWD : Exploded View" (AWD).

Component Inspection (Shift Lock Relay)

INFOID:0000000004279216

1. CHECK SHIFT LOCK RELAY

Check continuity between shift lock relay terminals.
CAUTION:
Connect the fuse between the terminals when applying the voltage.

Shift lock relay connector			Condition	Continuity
Connector	Terminal			
E52	3	5	Apply 12 V direct current between terminals 1 and 2.	Existed
			OFF	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace shift lock relay.

Component Inspection (Stop Lamp Switch)

INFOID:0000000004279217

1.CHECK STOP LAMP SWITCH

Check continuity between stop lamp switch connector terminals.

Stop lamp switch connector			Condition	Continuity
Connector	Terminal			
E110	1	2	Depressed brake pedal.	Existed
			Released brake pedal.	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace stop lamp switch. Refer to BR-18, "Exploded View".

SELECTOR LEVER POSITION INDICATOR

Description

INFOID:0000000004279218

Indicates selector lever position.

Component Function Check

INFOID:0000000004279219

1.CHECK SELECTOR LEVER POSITION INDICATOR (PART 1)

1. Turn ignition switch ON.
2. Check that each position indicator lamp of the selector lever position indicator turns on when shifting the selector lever from “P” to “M” position.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Go to TM-238, "Diagnosis Procedure".

2.CHECK SELECTOR LEVER POSITION INDICATOR (PART 2)

Check that the night illumination of the selector lever position indicator turns on when setting the lighting switch in 1st position.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Go to TM-238, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000004279220

1.CHECK MALFUNCTIONING ITEM

Which item is abnormal?

Position indicator lamp>> GO TO 2.
Illumination lamp>> GO TO 10.

2.CHECK POWER SOURCE

1. Turn ignition switch OFF.
2. Disconnect A/T shift selector connector.
3. Turn ignition switch ON.
4. Check voltage between A/T shift selector vehicle side harness connector terminals.

A/T shift selector vehicle side harness connector			Voltage (Approx.)
Connector	Terminal		
	+	–	
M137	10	4	Battery voltage

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 3.

3.CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between A/T shift selector vehicle side harness connector terminal and ground.

A/T shift selector vehicle side harness connector		Ground	Continuity
Connector	Terminal		
M137	4		Existed

Is the inspection result normal?

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

4. CHECK HARNESS BETWEEN A/T SHIFT SELECTOR AND BCM (PART 1)

1. Disconnect BCM connector.
2. Check continuity between A/T shift selector vehicle side harness connector terminal and BCM vehicle side harness connector terminal.

A/T shift selector vehicle side harness connector		BCM vehicle side harness connector		Continuity
Connector	Terminal	Connector	Terminal	
M137	10	M122	96	Existed

Is the inspection result normal?

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

5. CHECK HARNESS BETWEEN A/T SHIFT SELECTOR AND BCM (PART 2)

Check continuity between A/T shift selector vehicle side harness connector terminal and ground.

A/T shift selector vehicle side harness connector		Ground	Continuity
Connector	Terminal		
M137	10		Not existed

Is the inspection result normal?

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

6. CHECK MALFUNCTIONING ITEM

Check the following.
- Check terminals of BCM connector and A/T shift selector connector for damage.
- Check connector for loose connection.

Is the inspection result normal?

YES >> Check BCM input/output signal. Refer to BCS-44, "Reference Value".
NO >> Repair or replace damaged parts.

7. CHECK SHIFT POSITION SWITCH

1. Disconnect selector lever position indicator connector.
2. Check continuity between A/T shift selector harness connector terminals and selector lever position indicator connector terminals.

A/T shift selector harness connector		Selector lever position indicator connector		Condition	Continuity
Connector	Terminal	Connector	Terminal		
M137	4	M221	7	Selector lever in “D” position.	Existed
			2, 3, 4, 5, 6, 9, 10, 11		Not existed
			9	Selector lever in “M” position.	Existed
			2, 3, 4, 5, 6, 7, 10, 11		Not existed
	10		2, 6	Selector lever in “N” and “M” position.	Existed
			3, 4, 5, 7, 9, 10, 11		Not existed
			3, 6	Selector lever in “D” position.	Existed
			2, 4, 5, 7, 9, 10, 11		Not existed
			4, 6	Selector lever in “R” position.	Existed
			2, 3, 5, 7, 9, 10, 11		Not existed
			5, 6	Selector lever in “P” position.	Existed
			2, 3, 4, 7, 9, 10, 11		Not existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace damaged parts. Refer to TM-276, "2WD : Exploded View" (2WD), TM-278, "AWD : Exploded View" (AWD).

8.CHECK SELECTOR LEVER POSITION INDICATOR

Check selector lever position indicator. Refer to TM-240, "Component Inspection (Selector Lever Position Indicator)".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Replace damaged parts.

9.CHECK MALFUNCTIONING ITEM

Check the following.
- Check terminals of A/T shift selector connector, shift position switch connector and selector lever position indicator connector for damage.
- Check connector for loose connection.

Is the inspection result normal?

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

10.CHECK POWER SOURCE

1. Turn ignition switch OFF.
2. Disconnect A/T shift selector connector.
3. Turn ignition switch ON.
4. Check voltage between A/T shift selector vehicle side harness connector terminals.

A/T shift selector vehicle side harness connector			Condition	Voltage (Approx.)
Connector	Terminal			
	+	–		
M137	7	9	Lighting switch 1ST	Battery voltage

Is the inspection result normal?

YES >> GO TO 11.
NO >> Check illumination circuit. Refer to INL-38, "Wiring Diagram - ILLUMINATION -".

11.CHECK SHIFT POSITION SWITCH

1. Disconnect selector lever position indicator connector.
2. Check continuity between A/T shift selector harness connector terminals and selector lever position indicator connector terminals.

A/T shift selector harness connector		Selector lever position indicator connector		Continuity
Connector	Terminal	Connector	Terminal	
M137	7	M221	10	Existed
			2, 3, 4, 5, 6, 7, 9, 11	Not existed
	9		11	Existed
			2, 3, 4, 5, 6, 7, 9, 10	Not existed

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair or replace damaged parts. Refer to TM-276, "2WD : Exploded View" (2WD), TM-278, "AWD : Exploded View" (AWD).

Component Inspection (Selector Lever Position Indicator)

INFOID:0000000004279221

1.CHECK SELECTOR LEVER POSITION INDICATOR

Check that selector lever position indicator lamps turn on.

CAUTION:
Connect the fuse between the terminals when applying the voltage.

Selector lever position indicator connector			Condition	Status
Connector	Terminal			
	+ (fuse)	–		
M221	2	7	Apply 12 V direct current between terminals 2 and 7.	“N” position indicator lamp turns on.
	3		Apply 12 V direct current between terminals 3 and 7.	“D” position indicator lamp turns on.
	4		Apply 12 V direct current between terminals 4 and 7.	“R” position indicator lamp turns on.
	5		Apply 12 V direct current between terminals 5 and 7.	“P” position indicator lamp turns on.
	6	9	Apply 12 V direct current between terminals 6 and 9.	“M” mode indicator lamp turns on.
	10	11	Apply 12 V direct current between terminals 10 and 11.	Illumination lamp turns on.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace the selector lever position indicator. Refer to TM-276, "2WD : Exploded View" (2WD), TM-278, "AWD : Exploded View" (AWD).

ECU DIAGNOSIS INFORMATION

TCM

Reference Value

INFOID:0000000004279222

VALUES ON DIAGNOSIS TOOL

NOTE:

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

- Actual shift schedule has more or less tolerance or allowance
- Shift schedule in Service Manual refers to the point where shifting starts
- Gear position on CONSULT-III indicates the point where shifting completes

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

CONSULT-III MONITOR ITEM

Item name	Condition	Value / Status (Approx.)
VHCL/S SE-A/T	During driving	Approximately equals the speedometer reading.
ESTM VSP SIG	During driving	Approximately equals the speedometer reading.
OUTPUT REV	During driving (lock-up ON)	Tachometer / Gear ratio
INPUT SPEED	During driving (lock-up ON)	Approximately equals the engine speed.
F SUN GR REV	During driving	Revolution of front sun gear is indicated.
F CARR GR REV	During driving	Revolution of front carrier is indicated.
ENGINE SPEED	Engine running	Closely equals the tachometer reading.
TC SLIP SPEED	During driving	Engine speed – Input speed
ACCELE POSI	Accelerator pedal is released	0.0/8
	Accelerator pedal is fully depressed	8.0/8
THROTTLE POSI	Accelerator pedal is released	0.0/8
	Accelerator pedal is fully depressed	8.0/8
ATF TEMP 1	Ignition switch ON	Temperature of ATF in the oil pan is indicated.
ATF TEMP 2	Ignition switch ON	Temperature of ATF at the exit of torque converter.
ATF TEMP SE 1	0°C (32° F) – 20°C (68°F) – 80°C (176°F)	3.3 – 2.7 – 0.9 V
BATTERY VOLT	Ignition switch ON	Battery voltage (11 V – 14 V)
LINE PRES SOL	During driving	0.2 – 0.6 A
TCC SOLENOID	Slip lock-up is active	0.2 – 0.8 A
	Lock-up is active	0.8 A
	Other than the above	0 A
L/B SOLENOID	Low brake is engaged	0.6 – 0.8 A
	Low brake is disengaged	0 – 0.05 A

Item name	Condition	Value / Status (Approx.)
FR/B SOLENOID	Front brake is engaged	0.6 – 0.8 A
	Front brake is disengaged	0 – 0.05 A
HLR/C SOL	High and low reverse clutch is disengaged	0.6 – 0.8 A
	High and low reverse clutch is engaged	0 – 0.05 A
I/C SOLENOID	Input clutch is disengaged	0.6 – 0.8 A
	Input clutch is engaged	0 – 0.05 A
D/C SOLENOID	Direct clutch is disengaged	0.6 – 0.8 A
	Direct clutch is engaged	0 – 0.05 A
2346/B SOL	2346 brake is engaged	0.6 – 0.8 A
	2346 brake is disengaged	0 – 0.05 A
L/P SOL MON	During driving	0.2 – 0.6 A
TCC SOL MON	Slip lock-up is active	0.2 – 0.8 A
	Lock-up is active	0.8 A
	Other than the above	0 A
L/B SOL MON	Low brake is engaged	0.6 – 0.8 A
	Low brake is disengaged	0 – 0.05 A
FR/B SOL MON	Front brake is engaged	0.6 – 0.8 A
	Front brake is disengaged	0 – 0.05 A
HLR/C SOL MON	High and low reverse clutch is disengaged	0.6 – 0.8 A
	High and low reverse clutch is engaged	0 – 0.05 A
I/C SOL MON	Input clutch is disengaged	0.6 – 0.8 A
	Input clutch is engaged	0 – 0.05 A
D/C SOL MON	Direct clutch is disengaged	0.6 – 0.8 A
	Direct clutch is engaged	0 – 0.05 A
2346/B SOL MON	2346 brake is engaged	0.6 – 0.8 A
	2346 brake is disengaged	0 – 0.05 A
GEAR RATIO	Driving with 1GR	4.924
	Driving with 2GR	3.194
	Driving with 3GR	2.043
	Driving with 4GR	1.412
	Driving with 5GR	1.000
	Driving with 6GR	0.862
	Driving with 7GR	0.772
ENGINE TORQUE	During driving	Changes the value according to the acceleration or deceleration.
ENG TORQUE D	During driving	Changes the value according to the acceleration or deceleration.
INPUT TRQ S	During driving	Changes the value according to the acceleration or deceleration.
INPUT TRQ L/P	During driving	Changes the value according to the acceleration or deceleration.
TRGT PRES L/P	Selector lever in “P” and “N” positions	490 kPa
	Other than the above	490 – 1370 kPa
TRGT PRES TCC	Slip lock-up is active	0 – 600 kPa
	Lock-up is active	600 kPa
	Other than the above	0 kPa

Item name	Condition	Value / Status (Approx.)
TRGT PRES L/B	Low brake is engaged	1370 kPa
	Low brake is disengaged	0 kPa
TRGT PRES FR/B	Front brake is engaged	1370 kPa
	Front brake is disengaged	0 kPa
TRG PRE HLR/C	High and low reverse clutch is disengaged	1370 kPa
	High and low reverse clutch is engaged	0 kPa
TRGT PRES I/C	Input clutch is disengaged	1370 kPa
	Input clutch is engaged	0 kPa
TRGT PRES D/C	Direct clutch is disengaged	1370 kPa
	Direct clutch is engaged	0 kPa
TRG PRE 2346/B	2346 brake is engaged	1370 kPa
	2346 brake is disengaged	0 kPa
SHIFT PATTERN	During normal driving (without shift changes)	FF
VEHICLE SPEED	During driving	Approximately equals the speedometer reading.
RANGE SW 4	Selector lever in “P” and “N” positions	OFF
	Other than the above	ON
RANGE SW 3	Selector lever in “P”, “R” and “N” positions	OFF
	Other than the above	ON
RANGE SW 2	Selector lever in “P” and “R” positions	OFF
	Other than the above	ON
RANGE SW 1	Selector lever in “P” position	OFF
	Other than the above	ON
SFT DWN ST SW	Paddle shifter (shift-down) is pulled.	ON
	Other than the above	OFF
SFT UP ST SW	Paddle shifter (shift-up) is pulled.	ON
	Other than the above	OFF
DOWN SW LEVER	Selector lever is shifted to – side	ON
	Other than the above	OFF
UP SW LEVER	Selector lever is shifted to + side	ON
	Other than the above	OFF
NON M-MODE SW	Selector lever is shifted to manual shift gate side	OFF
	Other than the above	ON
MANU MODE SW	Selector lever is shifted to manual shift gate side	ON
	Other than the above	OFF
DS RANGE	Driving with DS mode	ON
	Other than the above	OFF
1 POSITION SW*	Selector lever in “1” position	ON
	Other than the above	OFF
OD CONT SW*	When overdrive control switch is depressed	ON
	When overdrive control switch is released	OFF
BRAKESW	Brake pedal is depressed	ON
	Brake pedal is released	OFF
POWERSHIFT SW*	Power mode	ON
	Other than the above	OFF

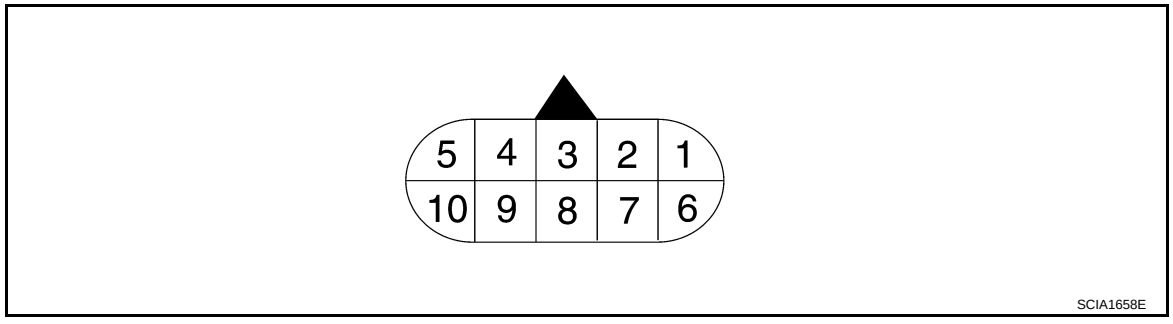
Item name	Condition	Value / Status (Approx.)
ASCD-OD CUT	When TCM receives ASCD OD cancel request signal	ON
	Other than the above	OFF
ASCD-CRUISE	ASCD operate	ON
	Other than the above	OFF
ABS SIGNAL	ABS operate	ON
	Other than the above	OFF
TCS GR/P KEEP	When TCM receives TCS gear keep request signal	ON
	Other than the above	OFF
TCS SIGNAL 2	When the reception value of A/T shift schedule change demand signal is “cold”	ON
	Other than the above	OFF
TCS SIGNAL 1	When the reception value of A/T shift schedule change demand signal is “warm”	ON
	Other than the above	OFF
LOW/B PARTS	At 4 - 5 - 6 gear shift control	FAIL
	Other than the above	NOTFAIL
HC/IC/FRB PARTS	At 1 - 2 - 3 gear shift control	FAIL
	Other than the above	NOTFAIL
IC/FRB PARTS	At 4 - 5 - 6 gear shift control	FAIL
	Other than the above	NOTFAIL
HLR/C PARTS	At 4 - 5 - 6 gear shift control	FAIL
	Other than the above	NOTFAIL
W/O THL POS	Accelerator pedal is fully depressed	ON
	Accelerator pedal is released	OFF
CLSD THL POS	Accelerator pedal is released	ON
	Accelerator pedal is fully depressed	OFF
DRV CST JUDGE	Accelerator pedal is depressed	DRIVE
	Accelerator pedal is released	COAST

Item name	Condition	Value / Status (Approx.)
SHIFT IND SIGNAL	When the selector lever is positioned in between each position.	OFF
	Selector lever in “P” position	P
	Selector lever in “R” position	R
	Selector lever in “N” position	N
	Selector lever in “D” position	D
	Selector lever in “D” position: 7GR	
	Selector lever in “D” position: 6GR	6
	Selector lever in “D” position: 5GR	5
	Selector lever in “D” position: 4GR	4
	Selector lever in “D” position: 3GR	3
	Selector lever in “D” position: 2GR	2
	Selector lever in “D” position: 1GR	1
	Selector lever in “M” position: 1GR	M1
	Selector lever in “M” position: 2GR	M2
	Selector lever in “M” position: 3GR	M3
	Selector lever in “M” position: 4GR	M4
	Selector lever in “M” position: 5GR	M5
	Selector lever in “M” position: 6GR	M6
	Selector lever in “M” position: 7GR	M7
	Driving with DS mode	DS
STARTER RELAY	Selector lever in “P” and “N” positions	ON
	Other than the above	OFF
F-SAFE IND/L	For 2 seconds after the ignition switch is turned ON	ON
	Other than the above	OFF
ATF WARN LAMP*	When TCM transmits the ATF indicator lamp signal	ON
	Other than the above	OFF
MANU MODE IND	Driving with manual mode	ON
	Other than the above	OFF
ON OFF SOL MON	Selector lever in “P” and “N” positions	ON
	Driving with 1GR to 3GR	
	Other than the above	OFF
START RLY MON	Selector lever in “P” and “N” positions	ON
	Other than the above	OFF
ON OFF SOL	Selector lever in “P” and “N” positions	ON
	Driving with 1GR to 3GR	
	Other than the above	OFF

Item name	Condition	Value / Status (Approx.)
SLCT LVR POSI	Selector lever in “N” and “P” positions	N/P
	Selector lever in “R” position	R
	Selector lever in “D” and “DS” positions	D
	Selector lever in “M” position: 7GR	
	Selector lever in “M” position: 6GR	6
	Selector lever in “M” position: 5GR	5
	Selector lever in “M” position: 4GR	4
	Selector lever in “M” position: 3GR	3
	Selector lever in “M” position: 2GR	2
	Selector lever in “M” position: 1GR	1
GEAR	During driving	1st, 2nd, 3rd, 4th, 5th, 6th, 7th
NEXT GR POSI	During driving	1st, 2nd, 3rd, 4th, 5th, 6th, 7th
SHIFT MODE	Driving with the D position	0 or 3
	Driving with the manual mode	4 or 8
D/C PARTS	At 1 - 2 gear shift control	FAIL
	Other than the above	NOTFAIL
FR/B PARTS	At control fixed to 1GR	FAIL
	Other than the above	NOTFAIL
2346/B PARTS	At control fixed to 1GR	FAIL
	Other than the above	NOTFAIL
2346B/DC PARTS	At 2 - 3 - 4 gear shift control	FAIL
	Other than the above	NOTFAIL

*: Not mounted but always display as OFF

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
1 (Y)	Ground	Power supply	Input	Ignition switch ON	Battery voltage
				Ignition switch OFF	0 V
2 (R)	Ground	Power supply (Memory back-up)	Input	Always	Battery voltage
3 (L)	—	CAN-H	Input/ Output	—	—

Terminal (Wire color)		Description		Condition		Value (Approx.)
+	−	Signal name	Input/ Output			
4 (V)	—	K-line	Input/ Output	—		—
5 (B)	Ground	Ground	Output	Always		0 V
6 (G)	Ground	Power supply	Input	Ignition switch ON		Battery voltage
				Ignition switch OFF		0 V
7 (R)	Ground	Back-up lamp relay	Input	Ignition switch ON	Selector lever in “R” position.	0 V
					Selector lever in other than above.	Battery voltage
8 (P)	—	CAN-L	Input/ Output	—		—
9 (GR)	Ground	Starter relay	Output	Ignition switch ON	Selector lever in “N” and “P” positions.	Battery voltage
					Selector lever in other than above.	0 V
10 (B)	Ground	Ground	Output	Always		0 V

Wiring Diagram - A/T CONTROL SYSTEM -

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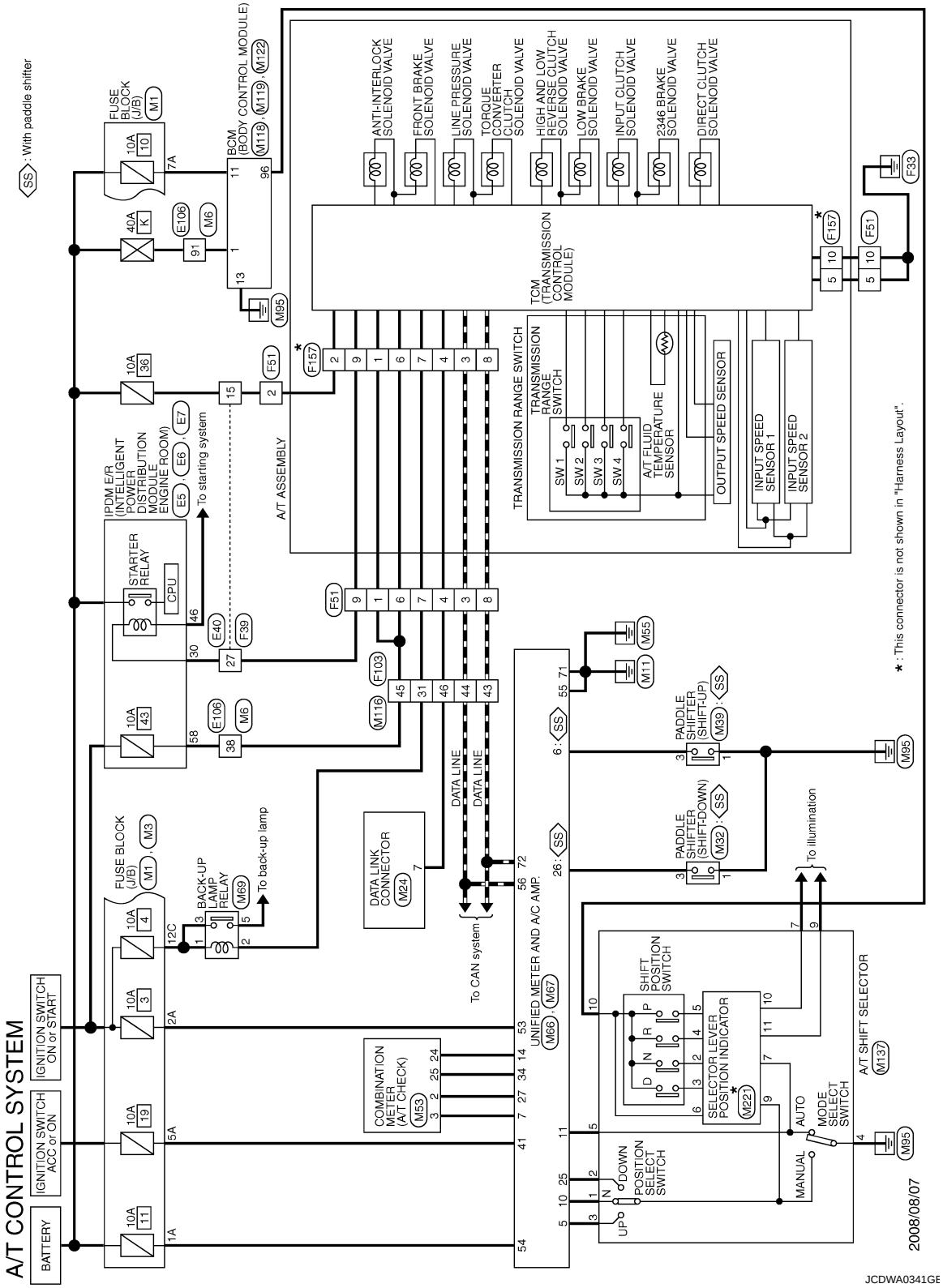
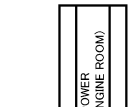


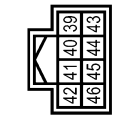
A/T CONTROL SYSTEM

Connector No.	E5
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH20FW-CS12-M4-IV



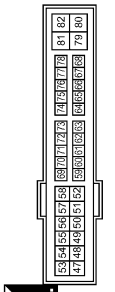
Terminal No.	Color of Wire	Signal Name [Specification]
30	GR	–

Connector No.	E6
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH08FW-NH



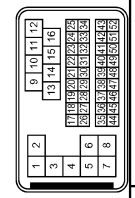
Terminal No.	Color of Wire	Signal Name [Specification]
46	SB	–

Connector No.	E7
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH20FW-CS12-M4



Terminal No.	Color of Wire	Signal Name [Specification]
58	GR	–

Connector No.	E40
Connector Name	WIRE TO WIRE
Connector Type	SAA36MB-RS8-SHZ8



Terminal No.	Color of Wire	Signal Name [Specification]
15	V	–
27	GR	–

Connector No.	E106
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

Terminal No.	Color of Wire	Signal Name [Specification]
38	GR	–
91	W	–

Connector No.	F39
Connector Name	WIRE TO WIRE
Connector Type	SAA36FB-RS8-SH28

Terminal No.	Color of Wire	Signal Name [Specification]
15	R	–
27	GR	–

Connector No.	F51
Connector Name	A/T ASSEMBLY
Connector Type	RK10FG-DGY

Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	–
2	R	–
3	L	–
4	V	–
5	B	–
6	G	–
7	R	–
8	P	–
9	GR	–
10	B	–

Connector No.	F103
Connector Name	WIRE TO WIRE
Connector Type	TK36FW-NS10

Terminal No.	Color of Wire	Signal Name [Specification]
31	R	–
43	P	–
44	L	–
45	G	–
46	V	–

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A/T CONTROL SYSTEM

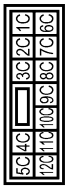
Connector No.	F157
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Type	SP10FG

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	VIGN
2	B	BATT
3	R	CAN-H
4	O	K-LINE
5	G	GND
6	GR	VIGN
7	L	REV LAMP RLY
8	BR	CAN-L
9	Y	STARTER RLY
10	W/B	GND

Connector No.	M1
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS06FW-M2

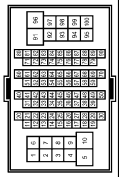
Terminal No.	Color of Wire	Signal Name [Specification]
1A	V	–
2A	G	–
5A	L	–
7A	R	–

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS12FW-CS



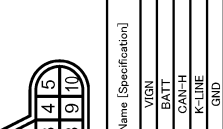
Terminal No.	Color of Wire	Signal Name [Specification]
12C	R	–

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4



Terminal No.	Color of Wire	Signal Name [Specification]
38	Y	–
91	W	–

Connector No.	M24
Connector Name	DATA LINK CONNECTOR
Connector Type	BD16FW-P



Terminal No.	Color of Wire	Signal Name [Specification]
7	V	–

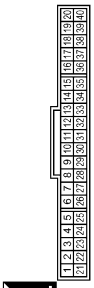
Connector No.	M32
Connector Name	PADDLE SHIFTER (SHIFT-DOWN)
Connector Type	A03FW

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	–
3	G	–

Connector No.	M39
Connector Name	PADDLE SHIFTER (SHIFT-UP)
Connector Type	A04FW

Terminal No.	Color of Wire	Signal Name [Specification]
1	P	–
3	O	–

Connector No.	M53
Connector Name	COMBINATION METER
Connector Type	SAB40FW



Terminal No.	Color of Wire	Signal Name [Specification]
2	LG	COMMUNICATION SIGNAL (METER->AMP.)
3	GR	COMMUNICATION SIGNAL (AMP.->METER)
24	BR	COMMUNICATION SIGNAL (LCD->AMP.)
25	Y	COMMUNICATION SIGNAL (AMP.->LCD)

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A/T CONTROL SYSTEM

Connector No.	M66
Connector Name	UNIFIED METER AND A/C AMP.
Connector Type	TH40FW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
5	L	MANUAL MODE SHIFT UP SIGNAL
6	O	PADDLE SHIFTER UP SIGNAL
7	GR	COMMUNICATION SIGNAL (AMP.->METER)
10	W	MANUAL MODE SIGNAL
11	G	NOT MANUAL MODE SIGNAL
14	BR	COMMUNICATION SIGNAL (LCD->AMP.)
25	V	MANUAL MODE SHIFT DOWN SIGNAL
26	G	PADDLE SHIFTER DOWN SIGNAL
27	LG	COMMUNICATION SIGNAL (METER->AMP.)
34	Y	COMMUNICATION SIGNAL (AMP.->LCD)

Connector No.	M67
Connector Name	UNIFIED METER AND A/C AMP.
Connector Type	TH32FW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
41	L	ACC POWER SUPPLY
53	W	IGNITION POWER SUPPLY
54	Y	BATTERY POWER SUPPLY
55	B	GROUND
56	L	CAN-H
71	GR	GROUND
72	P	CAN-L

Connector No.	M69
Connector Name	BACK-UP LAMP RELAY
Connector Type	MS02FL-M2-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	R	–
2	W	–
3	LG	–
5	O	–

Connector No.	M116
Connector Name	WIRE TO WIRE
Connector Type	TK36MW-NS10

Terminal No.	Color of Wire	Signal Name [Specification]
31	W	–
43	P	–
44	L	–
45	Y	–
46	V	–

Connector No.	M118
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	M03FB-LC

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	BAT (F/L)

Connector No.	M119
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	NS16FW-CS

Terminal No.	Color of Wire	Signal Name [Specification]
11	R	BAT (FUSE)
13	B	GND

Connector No.	M122
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FB-NH

Terminal No.	Color of Wire	Signal Name [Specification]
96	GR	A/T SHIFT SELECTOR POWER SUPPLY

Connector No.	M137
Connector Name	A/T SHIFT SELECTOR
Connector Type	TH12FW-NH

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	–
2	V	–
3	L	–
4	BR	–
5	G	–
7	Y	–
9	B	–
10	GR	–

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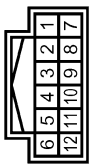
A/T CONTROL SYSTEM

Connector No.	M221
Connector Name	SELECTOR LEVER POSITION INDICATOR
Connector Type	TH12FW

H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
2	L	N
3	BR	D
4	G	R
5	P	P
6	V	M
7	O	AT
9	Y	MT
10	R	ILL
11	B	GND

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Fail-Safe

INFOID:0000000004279224

TCM has the electrical fail-safe mode. The mode is divided into a maximum of 3 phases (1st fail-safe, 2nd fail-safe and final fail-safe) and functions so that the operation can be continued even if the signal circuit of the main electronically controlled input/output parts is damaged.
Even if the electronic circuit is normal, the fail-safe mode may start under special conditions (such as when the brake pedal is depressed suddenly from a hard wheel spin status to stop the rotation of wheels). In this case, turn the ignition switch OFF and back to ON after 5 seconds to resume the normal shift pattern.

Consequently, the customer's vehicle may already return to the normal condition. Refer to TM-100, "Diagnosis Flow".

1st fail-safe	The mode that the vehicle can stop safely, to prompt the driver to stop if the malfunction occurs and to shift to 2nd fail-safe early. It shifts to 2nd fail-safe or final fail-safe after the vehicle stopped.
2nd fail-safe	The mode that the vehicle shifts to final fail-safe without changing the behavior, by identifying the malfunctioning parts in the condition that the driving force required for the driving is secured.
Final fail-safe	• Selects the shifting pattern that the malfunctioning parts identified at 1st and 2nd fail-safe are not used, and then secure the driving force that is required for the driving. • The mode that the shifting performance does not decrease by normal shift control.

FAIL-SAFE FUNCTION

DTC	Vehicle condition	Vehicle behavior for 1st fail-safe	Vehicle behavior for 2nd fail-safe	Vehicle behavior for final fail-safe
P0615	—	Starter is disabled	—	Starter is disabled
P0705	—	• Fixed in the “D” position (The shifting can be performed) • 30 km/h (19MPH) or less • Lock-up is prohibited • The shifting between the gears of 3 - 4 - 5 - 6 - 7 can be performed • Manual mode is prohibited • Shift position indicator is switched OFF • Starter relay is switched OFF (starter is disabled) • Back-up lamp is OFF • Large shift shock	—	• Fixed in the “D” position (The shifting can be performed) • 30 km/h (19 MPH) or less • Lock-up is prohibited • The shifting between the gears of 3 - 4 - 5 - 6 - 7 can be performed • Manual mode is prohibited • Shift position indicator is switched OFF • Starter relay is switched OFF (starter is disabled) • Back-up lamp is OFF • Large shift shock
P0710	Between the gears of 1 - 2 - 3	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	—	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	• Fix the gear while driving • Manual mode is prohibited	—	
P0717	Between the gears of 1 - 2 - 3	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	—	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	• Fix the gear while driving • Manual mode is prohibited	—	
P0720	Between the gears of 1 - 2 - 3	• Only downshift can be performed • Manual mode is prohibited • Treat the vehicle speed that the vehicle speed signal receives as positive	—	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	• Fix the gear at driving • Manual mode is prohibited • Treat the vehicle speed that the vehicle speed signal receives as positive	—	

DTC	Vehicle condition	Vehicle behavior for 1st fail-safe	Vehicle behavior for 2nd fail-safe	Vehicle behavior for final fail-safe
P0729 P0731 P0732 P0733 P0734 P0735 P1734	Neutral malfunction between the gears of 1 - 2 - 3 and 7	• Locks in 4GR • Manual mode is prohibited • Neutral	—	• Locks in 1GR • The shifting between the gears of 1 - 2 can be performed • The shifting between the gears of 1 - 2 - 3 can be performed • The shifting between the gears of 4 - 5 - 6 can be performed • Manual mode is prohibited
	Between the gears of 3 - 4 - 5 - 6 - 7	• Fix the gear while driving • Manual mode is prohibited	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	• Locks in 1GR • The shifting between the gears of 1 - 2 can be performed • The shifting between the gears of 2 - 3 - 4 can be performed • The shifting between the gears of 3 - 4 can be performed • The shifting between the gears of 4 - 5 - 6 can be performed • Manual mode is prohibited
	Other than the above	• Driving with the gear ratio between 2GR and 3GR • Locks in 3GR • Manual mode is prohibited • Neutral		
P0730	—	• Manual mode is prohibited • Neutral	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	• Locks in 1GR • The shifting between the gears of 1 - 2 can be performed • The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
P0740	—	• Lock-up is prohibited • Slip lock-up is prohibited	—	• Lock-up is prohibited • Slip lock-up is prohibited
P0744	—	• Lock-up is prohibited • Slip lock-up is prohibited	—	• Lock-up is prohibited • Slip lock-up is prohibited
P0750 P0775 P0795 P2713 P2722 P2731 P2807	—	• Locks in 2GR, 3GR, 4GR, 5GR, 6GR or 7GR • Manual mode is prohibited	—	• Locks in 1GR • The shifting between the gears of 1 - 2 - 3 can be performed • The shifting between the gears of 3 - 4 - 5 can be performed • The shifting between the gears of 4 - 5 - 6 can be performed • The shifting between the gears of 1 - 2 - 3 - 4 - 5 - 6 can be performed • Manual mode is prohibited
P0780	—	Manual mode is prohibited	—	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
P1705	—	• Downshift when accelerator pedal is depressed is prohibited • Upshift when accelerator pedal is released is prohibited • Manual mode is prohibited	• Downshift when accelerator pedal is depressed is prohibited • Upshift when accelerator pedal is released is prohibited • Manual mode is prohibited	• Downshift when accelerator pedal is depressed is prohibited • Upshift when accelerator pedal is released is prohibited • Manual mode is prohibited
P1730	—	• Neutral • Driving with the gear ratio between 2GR and 3GR • Locks in 5GR, 6GR or 7GR • Manual mode is prohibited	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	• Locks in 1GR • The shifting between the gears of 2 - 3 - 4 can be performed • The shifting between the gears of 3 - 4 can be performed • The shifting between the gears of 4 - 5 - 6 can be performed • Manual mode is prohibited

DTC	Vehicle condition	Vehicle behavior for 1st fail-safe	Vehicle behavior for 2nd fail-safe	Vehicle behavior for final fail-safe
P1815	Gate switch malfunction	Only the gate switch is prohibited	—	Only the gate switch is prohibited
	Paddle switch malfunction	Only the paddle switch is prohibited	—	Only the paddle switch is prohibited
	Malfunction of both switches	Manual mode is prohibited	—	Manual mode is prohibited
U0300 U1000	Between the gears of 1 - 2 - 3	• The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited	—	• The shifting between the gears of 1 - 2 - 3 can be performed • Line pressure is set to the maximum hydraulic pressure • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	• Fix the gear at driving • Manual mode is prohibited	—	
P0720 and P1721	—	Locks in 5GR	—	Locks in 5GR

Protection Control

INFOID:0000000004279225

The TCM becomes the protection control status temporarily to protect the safety when the safety of TCM and transmission is lost. It automatically returns to the normal status if the safety is secured.
The TCM has the following protection control.

REVERSE INHIBIT CONTROL

Intercepts the torque transmission and shift to the neutral status if the selector lever is shifted to “R” position while the vehicle moves forward at the vehicle speed 10 km/h (7 MPH) or more.

Malfunction detection condition	Vehicle speed: 10 km/h (7 MPH) or more
Control at malfunction	Neutral
Normal return condition	• Vehicle speed: 8 km/h (5 MPH) or less and • Engine speed: 2,200 rpm or less
Vehicle behavior	• The torque transmission cannot be performed • There is a shock just before a vehicle stop

1ST ENGINE BRAKE PROTECTION CONTROL

Controls the engine brake so as not to make effective by turning the front brake solenoid output to OFF when each solenoid becomes the electricity pattern of 1st engine brake during driving at the vehicle speed 25 km/h or more in any positions other than “R” position and 1GR.

Malfunction detection condition	• Select lever and gear: Any position other than “R” position and 1GR and • Vehicle speed: More than 25 km/h (16 MPH)
Control at malfunction	Front brake solenoid output signal; OFF
Normal return condition	Other than detection condition of malfunction
Vehicle behavior	Does not exist

TCM HIGH TEMPERATURE PROTECTION CONTROL

Limit the accelerator opening and forcibly control the vehicle to the low torque driving when the electronic substrate in TCM reaches the high temperature.

Malfunction detection condition	TCM electronic substrate temperature • 145°C (293°F) and 120 seconds or • 150°C (302°F)
Control at malfunction	Accelerator opening: 0.5/8 or less
Normal return condition	• TCM electronic substrate temperature: Less than 140°C (284°F) and • Vehicle speed: 5 km/h (3 MPH) or less
Vehicle behavior	Accelerator opening: output torque of approximately 0.5/8

DTC Inspection Priority Chart

INFOID:0000000004279226

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

Priority	Detected items (DTC)
1	• U1000 CAN COMM CIRCUIT
2	• P0615 STARTER RELAY • P0705 T/M RANGE SWITCH A • P0710 FLUID TEMP SENSOR A • P0717 INPUT SPEED SENSOR A • P0720 OUTPUT SPEED SENSOR • P0740 TORQUE CONVERTER • P0745 PC SOLENOID A • P0750 SHIFT SOLENOID A • P0775 PC SOLENOID B • P0795 PC SOLENOID C • P2713 PC SOLENOID D • P2722 PC SOLENOID E • P2731 PC SOLENOID F • P2807 PC SOLENOID G
3	• P0729 6GR INCORRECT RATIO • P0730 INCORRECT GR RATIO • P0731 1GR INCORRECT RATIO • P0732 2GR INCORRECT RATIO • P0733 3GR INCORRECT RATIO • P0734 4GR INCORRECT RATIO • P0735 5GR INCORRECT RATIO • P0744 TORQUE CONVERTER • P0780 SHIFT • P1730 INTERLOCK • P1734 7GR INCORRECT RATIO
4	• U0300 CAN COMM DATA • P0725 ENGINE SPEED • P1705 TP SENSOR • P1721 VEHICLE SPEED SIGNAL • P1815 M-MODE SWITCH

DTC Index

INFOID:0000000004279227

NOTE:
If some DTCs are displayed at the same time, perform inspections one by one based on the priority as per the following list. Refer to TM-257, "DTC Inspection Priority Chart".

Items (CONSULT-III screen terms)	DTC*2		Reference
	MIL*1, “ENGINE” with CONSULT-III or GST	CONSULT-III only “TRANSMISSION”	
STARTER RELAY	—	P0615	TM-174, "DTC Logic"
T/M RANGE SWITCH A	P0705	P0705	TM-176, "DTC Logic"

Items (CONSULT-III screen terms)	DTC*2		Reference
	MIL*1, “ENGINE” with CONSULT-III or GST	CONSULT-III only “TRANSMISSION”	
FLUID TEMP SENSOR A	P0710	P0710	TM-177, "DTC Logic"
INPUT SPEED SENSOR A	P0717	P0717	TM-179, "DTC Logic"
OUTPUT SPEED SENSOR	P0720	P0720	TM-181, "DTC Logic"
ENGINE SPEED	—	P0725	TM-183, "DTC Logic"
6GR INCORRECT RATIO	P0729	P0729	TM-185, "DTC Logic"
INCORRECT GR RATIO	P0730	P0730	TM-187, "DTC Logic"
1GR INCORRECT RATIO	P0731	P0731	TM-189, "DTC Logic"
2 GR INCORRECT RATIO	P0732	P0732	TM-191, "DTC Logic"
3GR INCORRECT RATIO	P0733	P0733	TM-193, "DTC Logic"
4GR INCORRECT RATIO	P0734	P0734	TM-195, "DTC Logic"
5GR INCORRECT RATIO	P0735	P0735	TM-197, "DTC Logic"
TORQUE CONVERTER	P0740	P0740	TM-199, "DTC Logic"
TORQUE CONVERTER	P0744	P0744	TM-201, "DTC Logic"
PC SOLENOID A	P0745	P0745	TM-202, "DTC Logic"
SHIFT SOLENOID A	P0750	P0750	TM-203, "DTC Logic"
PC SOLENOID B	P0775	P0775	TM-205, "DTC Logic"
SHIFT	P0780	P0780	TM-206, "TYPE 1 : DTC Logic" (TYPE 1) *3 TM-207, "TYPE 2 : DTC Logic" (TYPE 2) *3
PC SOLENOID C	P0795	P0795	TM-209, "DTC Logic"
TP SENSOR	—	P1705	TM-210, "DTC Logic"
VEHICLE SPEED SIGNAL	—	P1721	TM-212, "DTC Logic"
INTERLOCK	P1730	P1730	TM-214, "DTC Logic"
7 GR INCORRECT RATIO	P1734	P1734	TM-216, "DTC Logic"
M-MODE SWITCH	—	P1815	TM-218, "DTC Logic"
PC SOLENOID D	P2713	P2713	TM-224, "DTC Logic"
PC SOLENOID E	P2722	P2722	TM-225, "DTC Logic"
PC SOLENOID F	P2731	P2731	TM-226, "DTC Logic"
PC SOLENOID G	P2807	P2807	TM-227, "DTC Logic"
CAN COMM DATA	—	U0300	TM-172, "DTC Logic"
CAN COMM CIRCUIT	U1000	U1000	TM-173, "DTC Logic"

*1: Refer to TM-165, "Diagnosis Description".

*2: These numbers are prescribed by SAE J2012.

*3: Since “DTC Logic” depend on TCM part number, check TCM part number before starting diagnosis. Refer to TM-206, "Application Notice".

SYMPTOM DIAGNOSIS

SYSTEM SYMPTOM

Symptom Table

INFOID:0000000004279228

The diagnostics item numbers show the sequence for inspection. Inspect in order from item 1.

CAUTION:

If any malfunction occurs in the RE7R01A transmission, replace the A/T assembly.

Symptom				Diagnostic item																		
				Control linkage	Output speed sensor	Vehicle speed signal	Accelerator pedal position sensor	Engine speed sensor	Input speed sensor	A/T fluid temperature sensor	Transmission range switch	Line pressure solenoid valve	Torque converter solenoid valve	Low brake solenoid valve	Front brake solenoid valve	High and low reverse clutch solenoid valve	Input clutch solenoid valve	Direct clutch solenoid valve	2346 brake solenoid valve	Anti-interlock solenoid valve	CAN communication
				TM-274 (2WD) TM-274 (AWD)	TM-181	TM-212	TM-210	TM-183	TM-179	TM-177	TM-176	TM-202	TM-199	TM-225	TM-209	TM-224	TM-205	TM-227	TM-226	TM-203	TM-173
Poor performance	Driving performance	Shift point is high in “D” position.			1		2			3											
		Shift point is low in “D” position.			1		2														
		Large shock	When shifting gears	→ “D” position	3			6	5		5	4	2		1						2	5
				→ “R” position	3			6	5		5	4	2						1			5
				1GR ⇔ 2GR		3		1	5	3	3									2		4
				2GR ⇔ 3GR		3		1	5	3	3								2			4
				3GR ⇔ 4GR		3		1	5	3	3				2		2					4
				4GR ⇔ 5GR		3		1	5	3	3							2		2		4
				5GR ⇔ 6GR		3		1	5	3	3								2	2		4
				6GR ⇔ 7GR		3		1	5	3	3					2				2		4
				Downshift when accelerator pedal is depressed		2		1	4	2	2											3
				Upshift when accelerator pedal is released		2		1	4	2	2											3
				Lock-up		3		1	3	3	3			2								4
		Judder		Lock-up				2	1	1	4			3								
	Strange noise			In “R” position		2			1													
				In “N” position		2			1													
				In “D” position		2			1													
				Engine at idle		2			1													

Symptom				Diagnostic item																	
				Output speed sensor TM-181	Engine speed sensor TM-183	Input speed sensor TM-179	A/T fluid temperature sensor TM-177	Battery voltage TM-228	Transmission range switch TM-176	Manual mode switch TM-218	Stop lamp switch TM-237	Line pressure solenoid valve TM-202	Torque converter solenoid valve TM-199	Low brake solenoid valve TM-225	Front brake solenoid valve TM-209	High and low reverse clutch solenoid valve TM-224	Input clutch solenoid valve TM-205	Direct clutch solenoid valve TM-227	2346 brake solenoid valve TM-226	Anti-interlock solenoid valve TM-203	CAN communication TM-173
Function trouble	Gear does no change	"D" position	Locks in 1GR	1											1		1		1		
			Locks in 5GR					1													
			1st → 2GR	1											1		1		1		
			2nd → 3GR															1			
			3rd → 4GR	1		1	1							1	1	1	1				1
			4th → 5GR															1	1		
			5th → 6GR															1			
			6th → 7GR											1	1	1	1			1	
			5th → 4GR														1				
			4th → 3GR											1		1				1	
			3rd → 2GR						1									1			
			2nd → 1GR						1									1	1		
			Does not lock-up	1	1	1	1	3	4		2	1	1	1	1	1	1	1	1	1	1
		"M" position	1GR ⇔ 2GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2
			2GR ⇔ 3GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2
			3GR ⇔ 4GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2
			4GR ⇔ 5GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2
			5GR ⇔ 6GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2
			6GR ⇔ 7GR	2		2	2		2	1		2	2	2	2	2	2	2	2	2	2

Symptom					Diagnostic item																	
					Control linkage	Output speed sensor	Engine speed sensor	Input speed sensor	A/T fluid temperature sensor	Transmission range switch	Manual mode switch	Line pressure solenoid valve	Torque converter clutch solenoid valve	Low brake solenoid valve	Front brake solenoid valve	High and low reverse clutch solenoid valve	Input clutch solenoid valve	Direct clutch solenoid valve	2346 brake solenoid valve	Anti-interlock solenoid valve	CAN communication
					TM-274 (2WD) TM-274 (AWD)	TM-181	TM-183	TM-179	TM-177	TM-176	TM-218	TM-202	TM-199	TM-225	TM-209	TM-224	TM-205	TM-227	TM-226	TM-203	TM-173
Function trouble	Poor shifting	Slip	When shifting gears	1GR ⇔ 2GR		3	3	3	4			1							1		2
				2GR ⇔ 3GR		3	3	3	4			1						1			2
				3GR ⇔ 4GR		3	3	3	4			1		1		1				1	2
				4GR ⇔ 5GR		3	3	3	4			1					1		1		2
				5GR ⇔ 6GR		3	3	3	4			1						1	1		2
				6GR ⇔ 7GR		3	3	3	4			1			1				1		2
		Engine brake does not work	“D” position → “M” position			4	4	4	5	3	1	2									3
			“M” position	7th → 6GR		4	4	4	5	3	1	2			2				2		3
				6th → 5GR		4	4	4	5	3	1	2						2	2		3
				5th → 4GR		4	4	4	5	3	1	2					2		2		3
				4th → 3GR		4	4	4	5	3	1	2		2		2				2	3
				3rd → 2GR		4	4	4	5	3	1	2						2			3
				2nd → 1GR		4	4	4	5	3	1	2							2		3

Symptom				Diagnostic item																
				Control linkage	Output speed sensor	Engine speed sensor	Input speed sensor	A/T fluid temperature sensor	Transmission range switch	Manual mode switch	Line pressure solenoid valve	Torque converter clutch solenoid valve	Low brake solenoid valve	Front brake solenoid valve	High and low reverse clutch solenoid valve	Input clutch solenoid valve	Direct clutch solenoid valve	2346 brake solenoid valve	Anti-interlock solenoid valve	CAN communication
				TM-274 (2WD) TM-274 (AWD)	TM-181	TM-183	TM-179	TM-177	TM-176	TM-218	TM-202	TM-199	TM-225	TM-209	TM-224	TM-205	TM-227	TM-226	TM-203	TM-173
Function trouble	Poor power transmission	Slip	With selector lever in “D” position, acceleration is extremely poor.	5	3	3	3	4			1		1						1	2
			With selector lever in “R” position, acceleration is extremely poor.	5	3	3	3	4			1						1		1	2
			While starting off by accelerating in 1GR, engine races.		3	3	3	4			1		1						1	2
			While accelerating in 2GR, engine races.		3	3	3	4			1		1					1	1	2
			While accelerating in 3GR, engine races.		3	3	3	4			1		1				1	1		2
			While accelerating in 4GR, engine races.		3	3	3	4			1				1		1	1		2
			While accelerating in 5GR, engine races.		3	3	3	4			1				1	1	1		1	2
	Poor power transmission	Slip	While accelerating in 6GR, engine races.		3	3	3	4			1				1	1		1	1	2
			While accelerating in 7GR, engine races.		3	3	3	4			1			1	1	1			1	2
			Lock-up		3	3	3	4			1	1								2
			No creep at all.								1	1	1	1	1	1	1	1	1	
			Extremely large creep.			1														

Symptom			Diagnostic item																
			Control linkage TM-274 (2WD) TM-274 (AWD)	Output speed sensor TM-181	Accelerator pedal position sensor TM-210	Engine speed sensor TM-183	Battery voltage TM-228	Transmission range switch TM-176	Stop lamp switch TM-237	Line pressure solenoid valve TM-202	Torque converter clutch solenoid valve TM-199	Low brake solenoid valve TM-225	Front brake solenoid valve TM-209	High and low reverse clutch solenoid valve TM-224	Input clutch solenoid valve TM-205	Direct clutch solenoid valve TM-227	2346 brake solenoid valve TM-226	Anti-interlock solenoid valve TM-203	Starter relay TM-174
Function trouble	Power transmission cannot be performed	Vehicle cannot run in all position.	3					2		1	1	1	1	1	1	1	1	1	
		Driving is not possible in “D” position.	3					2		1	1	1	1	1	1	1	1	1	
		Driving is not possible in “R” position.	3					2		1						1		1	
		Engine stall		3	4	4	5		2		1								
		Engine stalls when selector lever shifted “N” → “D” or “R”.		3	4	4		2			1								
		Engine does not start in “N” or “P” position.	3				1	2											1
		Engine starts in position other than “N” or “P”.	3					2											1
	Poor operation	Vehicle does not enter parking condition.	1					2											
		Parking condition is not cancelled.	1					2											
		Vehicle runs with A/T in “P” position.	1					2											
		Vehicle moves forward with the “R” position.	1					2											
		Vehicle runs with A/T in “P” position.	1					2											
		Vehicle moves backward with the “D” position.	1					2											

PRECAUTION

PRECAUTIONS

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

INFOID:0000000004519853

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

WARNING:

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

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

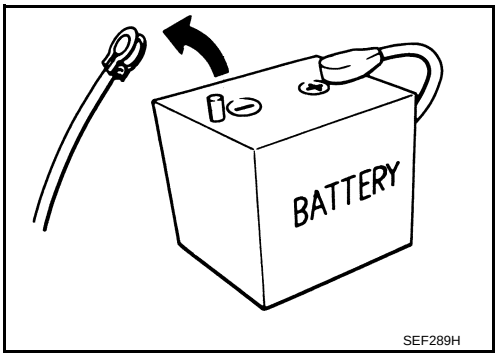
WARNING:

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

General Precautions

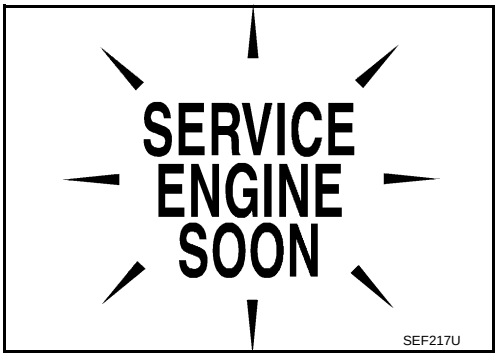
INFOID:0000000004279230

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



SEF289H

- **Perform “DTC (Diagnostic Trouble Code) CONFIRMATION PROCEDURE” after performing each TROUBLE DIAGNOSIS. If the repair is completed DTC should not be displayed in the “DTC CONFIRMATION PROCEDURE”.**
- Always use the specified brand of ATF. Refer to MA-10, "Fluids and Lubricants".
- Use lint-free paper not cloth rags during work.
- Dispose of the waste oil using the methods prescribed by law, ordinance, etc. after replacing the ATF.
- Before proceeding with disassembly, thoroughly clean the outside of the transmission. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.



SEF217U

- Disassembly should be done in a clean work area.
- Use lint-free paper or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transmission.
- Place disassembled parts in order for easier and proper assembly.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the A/T is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Never use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- Clean or replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer. Refer to TM-265, "Service Notice or Precaution".
- When the A/T drain plug is removed, only some of the ATF is drained. Old ATF will remain in torque converter and ATF cooling system.
  Always follow the procedures under “Changing” when changing ATF. Refer to TM-267, "Changing".
- Occasionally, the parking gear may be locked with the torque insufficiently released, when stopping the vehicle by shifting the selector lever from “D” or “R” to “P” position with the brake pedal depressed.
  In this case, the shock with a thud caused by the abrupt release of torque may occur when shifting the selector lever from “P” position to other positions.
  However, this symptom is not a malfunction which results in the damage of parts.

Service Notice or Precaution

INFOID:0000000004279231

ATF COOLER SERVICE

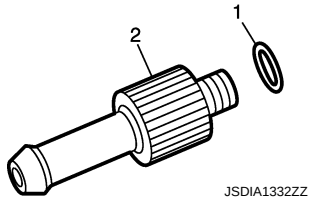
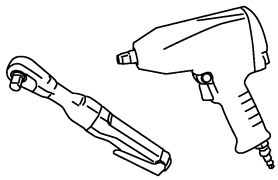
If ATF contains frictional material (clutches, bands, etc.), or if an A/T is repaired, overhauled, or replaced, inspect and clean the A/T fluid cooler mounted in the radiator or replace the radiator. Flush cooler lines using cleaning solvent and compressed air after repair. For A/T fluid cooler cleaning procedure, refer to TM-270, "Cleaning". For radiator replacement, refer to CO-13, "Exploded View".

PREPARATION

PREPARATION

Commercial Service Tool

INFOID:0000000004279232

Tool number Tool name		Description
1. 315268E000* O-ring 2. 310811EA5A* Charging pipe	 JSDIA1332ZZ	A/T fluid changing and adjustment
Power tool	 PBIC0190E	Loosening bolts and nuts

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

PERIODIC MAINTENANCE

A/T FLUID

Changing

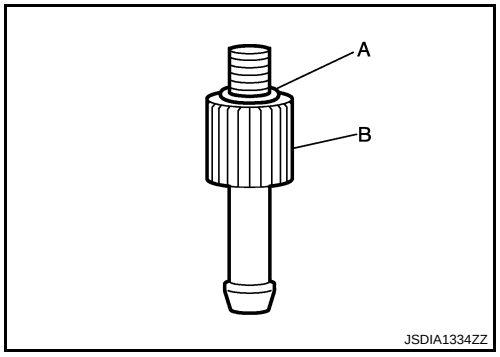
INFOID:0000000004279233

ATF	: Refer to TM-299, "General Specification".
Fluid capacity	: Refer to TM-299, "General Specification".

CAUTION:
- **Use only Genuine NISSAN Matic S ATF. Never mix with other ATF.**
- **Using ATF other than Genuine NISSAN Matic S ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**
- **When filling ATF, be careful not to scatter heat generating parts such as exhaust.**

1. Step 1

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



2. Step 2

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

b. Lift up the vehicle.

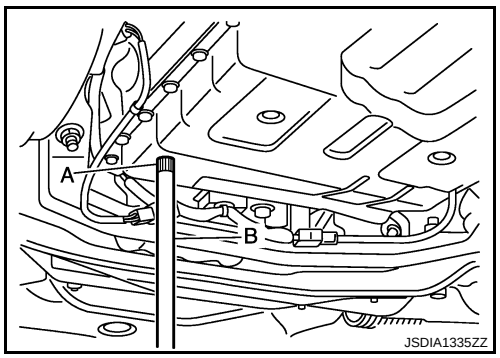
c. Remove the drain plug from the oil pan, and then drain the ATF.

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

e. Remove overflow plug from oil pan.

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

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



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

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

j. Lift down the vehicle.

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

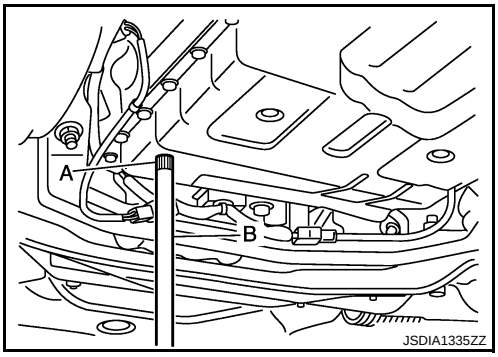
l. Stop the engine.

3. Step 3

a. Repeat “Step 2”.

4. Final Step

a. Use CONSULT-III to check that the ATF temperature is 40°C (104°F) or less.
b. Lift up the vehicle.
c. Remove the drain plug from the oil pan, and then drain the ATF.
d. When the ATF starts to drop, tighten the drain plug to the oil pan to the specified torque. Refer to TM-282, "Exploded View".
CAUTION:
Never reuse drain plug and drain plug gasket.
e. Remove overflow plug from oil pan.
f. Install the charging pipe (A) to the overflow plug hole.
CAUTION:
Tighten the charging pipe by hand.
g. Install the bucket pump hose (B) to the charging pipe.
CAUTION:
Insert the bucket pump hose all the way to the end of the charging pipe.
h. Fill approximately 3 liters (3-1/8 US qt, 2-5/8 lmp qt) of the ATF.
i. Remove the bucket pump hose to remove the charging pipe, and then temporarily tighten the overflow plug to the oil pan.
CAUTION:
Quickly perform the procedure to avoid ATF leakage from the oil pan.



j. Lift down the vehicle.
k. Start the engine.
l. Make the ATF temperature approximately 40°C (104°F).
NOTE:
The ATF level is greatly affected by the temperature. Always check the ATF temperature on “ATF TEMP 1” of “Data Monitor” using CONSULT-III.
m. Park vehicle on level surface and set parking brake.
n. Shift the selector lever through each gear position. Leave selector lever in “P” position.
o. Lift up the vehicle when the ATF temperature reaches 40°C (104°F), and then remove the overflow plug from the oil pan.
p. When the ATF starts to drop, tighten the overflow plug to the oil pan to the specified torque. Refer to TM-282, "Exploded View".
CAUTION:
Never reuse overflow plug.

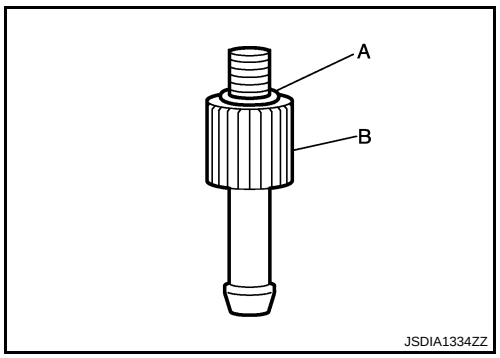
Adjustment

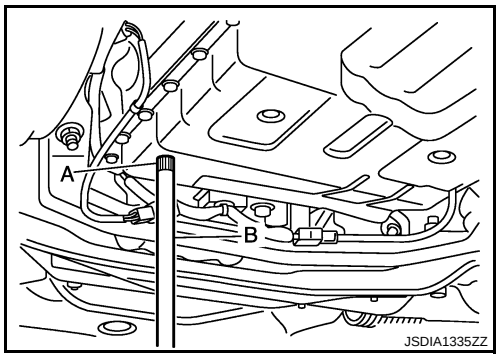
INFOID:0000000004279234

ATF	: Refer to TM-299, "General Specification".
Fluid capacity	: Refer to TM-299, "General Specification".

CAUTION:
- **Use only Genuine NISSAN Matic S ATF. Never mix with other ATF.**
- **Using ATF other than Genuine NISSAN Matic S ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**
- **When filling ATF, be careful not to scatter heat generating parts such as exhaust.**

1. Install the O-ring (315268E000) (A) to the charging pipe (310811EA5A) (B).
2. Start the engine.
3. Make the ATF temperature approximately 40°C (104°F).
   NOTE:
   The ATF level is greatly affected by the temperature. Always check the ATF temperature on “ATF TEMP 1” of “Data Monitor” using CONSULT-III.
4. Park vehicle on level surface and set parking brake.
5. Shift the selector lever through each gear position. Leave selector lever in “P” position.
6. Lift up the vehicle.
7. Check the ATF leakage from transmission.
8. Remove overflow plug from oil pan.
9. Install the charging pipe (A) to the overflow plug hole.
   CAUTION:
   Tighten the charging pipe by hand.
10. Install the bucket pump hose (B) to the charging pipe.
    CAUTION:
    Insert the bucket pump hose all the way to the end of the charging pipe.
11. Fill approximately 0.5 liters (1/2 US qr, 1/2 lmp qt) of the ATF.
12. Check that the ATF leaks when removing the charging pipe and the bucket pump hose. If the ATF does not leak, refill the ATF.
13. When the ATF starts to drop, tighten the overflow plug to the oil pan to the specified torque. Refer to TM-282, "Exploded View".
    CAUTION:
    Never reuse overflow plug.





A/T FLUID COOLER

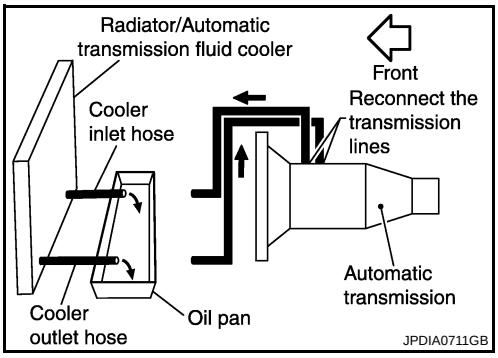
Cleaning

INFOID:0000000004279235

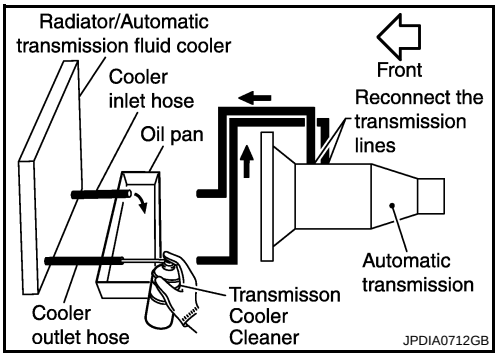
Whenever an A/T is replaced, the A/T fluid cooler mounted in the radiator must be inspected and cleaned.
Metal debris and friction material, if present, can become trapped in the A/T fluid cooler. This debris can contaminate the newly serviced A/T or, in severe cases, can block or restrict the flow of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

CLEANING PROCEDURE

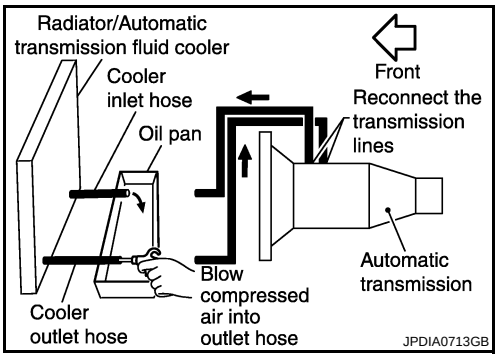
1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Identify the inlet and outlet fluid cooler hoses.
3. Disconnect the A/T fluid cooler inlet and outlet rubber hoses from the steel cooler tubes or by-pass valve.
   NOTE:
   Replace the cooler hoses if rubber material from the hose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



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



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

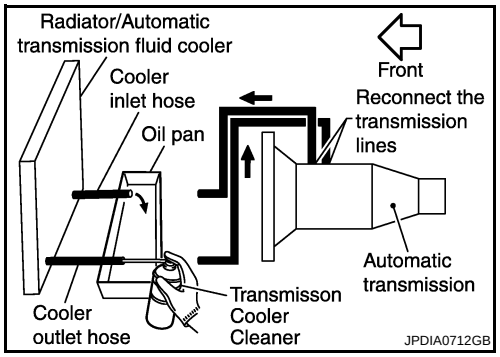


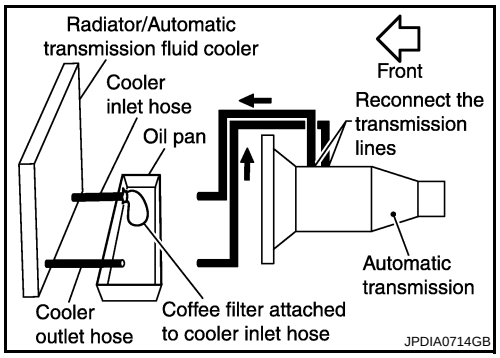
13. Flush each steel line from the cooler side back toward the A/T by spraying Transmission Cooler Cleaner in a continuous stream for 5 seconds.
14. Blow compressed air regulated to 5 to 9 kg/cm^2 (71 to 128 psi) through each steel line from the cooler side back toward the A/T for 10 seconds to force out any remaining ATF.
15. Ensure all debris is removed from the steel cooler lines.
16. Ensure all debris is removed from the banjo bolts and fittings.
17. Perform “DIAGNOSIS PROCEDURE”.

DIAGNOSIS PROCEDURE

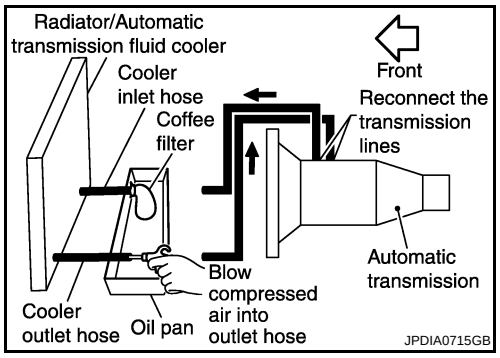
NOTE:
Insufficient cleaning of the cooler inlet hose exterior may lead to inaccurate debris identification.

1. Position an oil pan under the A/T inlet and outlet cooler hoses.
2. Clean the exterior and tip of the cooler inlet hose.
3. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.
   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray Transmission Cooler Cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Never breathe vapors or spray mist.**
4. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until ATF flows out of the cooler inlet hose for 5 seconds.
5. Tie a common white, basket-type coffee filter to the end of the cooler inlet hose.





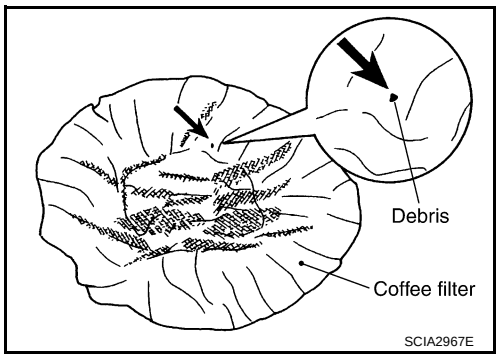
6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 to 9 kg/cm^2 (71 to 128 psi) through the cooler outlet hose to force any remaining ATF into the coffee filter.
9. Remove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



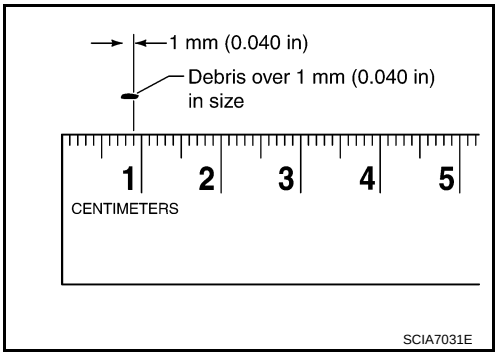
INSPECTION PROCEDURE

1. Inspect the coffee filter for debris.

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



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



Inspection

INFOID:0000000004279236

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

STALL TEST

Inspection and Judgment

INFOID:0000000004279237

INSPECTION

1. Inspect the amount of engine oil. Replenish the engine oil if necessary.
2. Drive for about 10 minutes to warm up the vehicle so that the A/T fluid temperature is 50 to 80°C (122 to 176°F). Inspect the amount of ATF. Replenish if necessary.
3. Securely engage the parking brake so that the tires do not turn.
4. Start the engine, apply foot brake, and place selector lever in “D” position.
5. Gradually press down the accelerator pedal while holding down the foot brake.
6. Quickly read off the stall speed, then quickly release the accelerator pedal.
   CAUTION:
   Never hold down the accelerator pedal for more than 5 seconds during this test.

   Stall speed : Refer to TM-300, "Stall Speed".
7. Shift the selector lever to “N” position.
8. Cool down the ATF.
   CAUTION:
   Run the engine at idle for at least 1 minute.
9. Repeat steps 5 through 8 with selector lever in “R” position.

JUDGMENT OF STALL TEST

	Selector lever position		Possible location of malfunction
	“D” and “M”	“R”	
Stall speed	H	O	• Low brake • 1st one-way clutch • 2nd one-way clutch
	O	H	• Reverse brake • 1st one-way clutch • 2nd one-way clutch
	L	L	• Engine and torque converter one-way clutch
	H	H	• Line pressure low

O: Stall speed within standard value position

H: Stall speed higher than standard value

L: Stall speed lower than standard value

Stall test standard value position

Does not shift-up “D” or “M” position 1 → 2	Slipping in 2GR, 3GR 4GR or 6GR	2346 brake slippage
Does not shift-up “D” or “M” position 2 → 3	Slipping in 3GR, 4GR or 5GR	Direct clutch slippage
Does not shift-up “D” or “M” position 3 → 4	Slipping in 4GR, 5GR, 6GR or 7GR	High and low reverse clutch slippage
Does not shift-up “D” or “M” position 4 → 5	Slipping in 5GR, 6GR or 7GR	Input clutch slippage
Does not shift-up “D” or “M” position 5 → 6	Slipping in 2GR, 3GR, 4GR or 6GR	2346 brake slippage
Does not shift-up “D” or “M” position 6 → 7	Slipping in 7GR	Front brake slippage

A/T POSITION

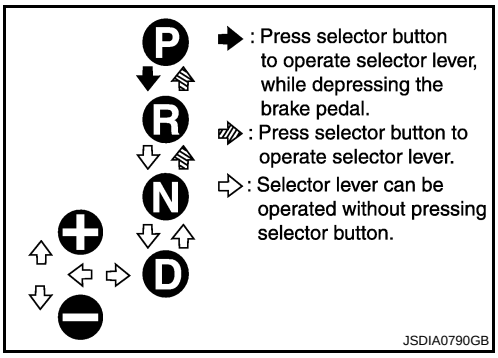
2WD

2WD : Inspection and Adjustment

INFOID:0000000004279238

INSPECTION

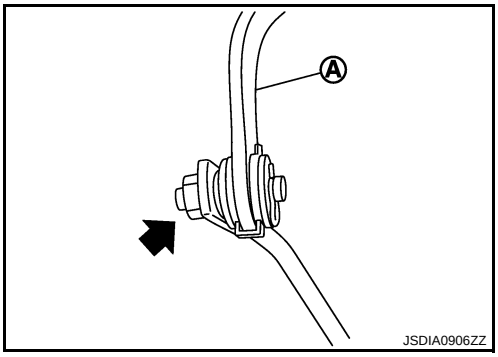
1. Place selector lever in “P” position, and turn ignition switch ON (engine stop).
2. Check that selector lever can be shifted to other than “P” position when brake pedal is depressed. Also check that selector lever can be shifted from “P” position only when brake pedal is depressed.
3. Shift the selector lever and check for excessive effort, sticking, noise or rattle.
4. Confirm that the selector lever stops at each position by feeling the engagement when it is moved through all the positions. Check whether or not the actual position the selector lever matches the position shown by the shift position indicator and the A/T body.
5. The method of operating the lever to individual positions correctly is shown in the figure.



6. When selector button is pressed in “P”, “R”, or “N” position without applying forward/backward force to selector lever, check button operation for sticking.
7. Confirm that the back-up lamps illuminate only when lever is placed in the “R” position. Confirm that the back-up lamps do not illuminate when selector lever is pushed against “R” position in the “P” or “N” position.
8. Confirm that the engine can only be started with the selector lever in the “P” and “N” positions. (With selector lever in the “P” position, engine can be started even when selector lever is moved forward and backward.)
9. Make sure that A/T is locked completely in “P” position.
10. DS mode must be indicated on the combination meter when the selector lever is shifted to the manual shift gate. When the selector lever is shifted to the “+” or “–” side in the DS mode, manual mode should be indicated on the combination meter.
    In addition, a set shift position must be changed when the selector lever is shifted to the “+” or “–” side in the manual mode. (Only while driving.)

ADJUSTMENT

1. Loosen nut (⬅).
2. Place manual lever and selector lever in “P” position.
3. While pressing lower lever (A) toward rear of vehicle (in “P” position direction), tighten nut to specified torque. Refer to TM-276, "2WD : Exploded View".



CAUTION:
Be careful not to touch the control rod while pressing lower lever of A/T shift selector assembly.
NOTE:
Press lower lever of A/T shift selector assembly with a force of approximately 1 kg (9.8 N).

AWD

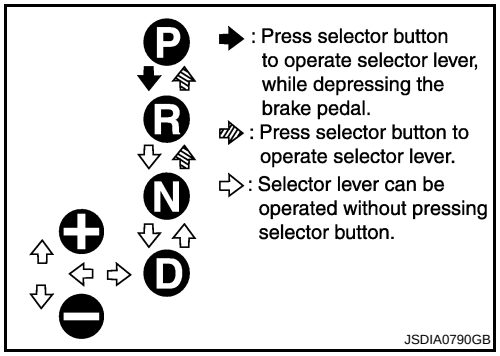
AWD : Inspection and Adjustment

INFOID:0000000004279239

INSPECTION

1. Place selector lever in “P” position, and turn ignition switch ON (engine stop).
2. Check that selector lever can be shifted to other than “P” position when brake pedal is depressed. Also check that selector lever can be shifted from “P” position only when brake pedal is depressed.
3. Shift the selector lever and check for excessive effort, sticking, noise or rattle.

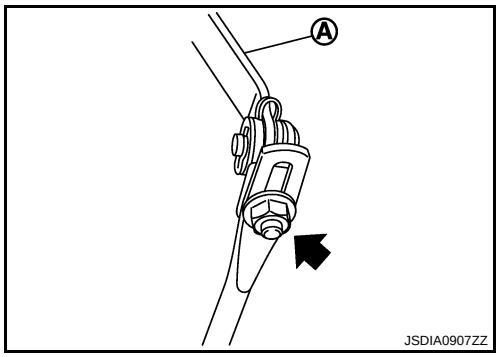
4. Confirm that the selector lever stops at each position by feeling the engagement when it is moved through all the positions. Check whether or not the actual position the selector lever matches the position shown by the shift position indicator and the A/T body.
5. The method of operating the lever to individual positions correctly is shown in the figure.
6. When selector button is pressed in “P”, “R”, or “N” position without applying forward/backward force to selector lever, check button operation for sticking.
7. Confirm that the back-up lamps illuminate only when lever is placed in the “R” position. Confirm that the back-up lamps do not illuminate when selector lever is pushed against “R” position in the “P” or “N” position.
8. Confirm that the engine can only be started with the selector lever in the “P” and “N” positions. (With selector lever in the “P” position, engine can be started even when selector lever is moved forward and backward.)



9. Make sure that A/T is locked completely in “P” position.
10. DS mode must be indicated on the combination meter when the selector lever is shifted to the manual shift gate. When the selector lever is shifted to the “+” or “–” side in the DS mode, manual mode should be indicated on the combination meter.
    In addition, a set shift position must be changed when the selector lever is shifted to the “+” or “–” side in the manual mode. (Only while driving.)

ADJUSTMENT

1. Loosen nut (⬅).
2. Place manual lever and selector lever in “P” position.
3. While pressing lower lever (A) toward rear of vehicle (in “P” position direction), tighten nut to specified torque. Refer to TM-278, "AWD : Exploded View".



CAUTION:
Be careful not to touch the control rod while pressing lower lever of A/T shift selector assembly.
NOTE:
Press lower lever of A/T shift selector assembly with a force of approximately 1 kg (9.8 N).

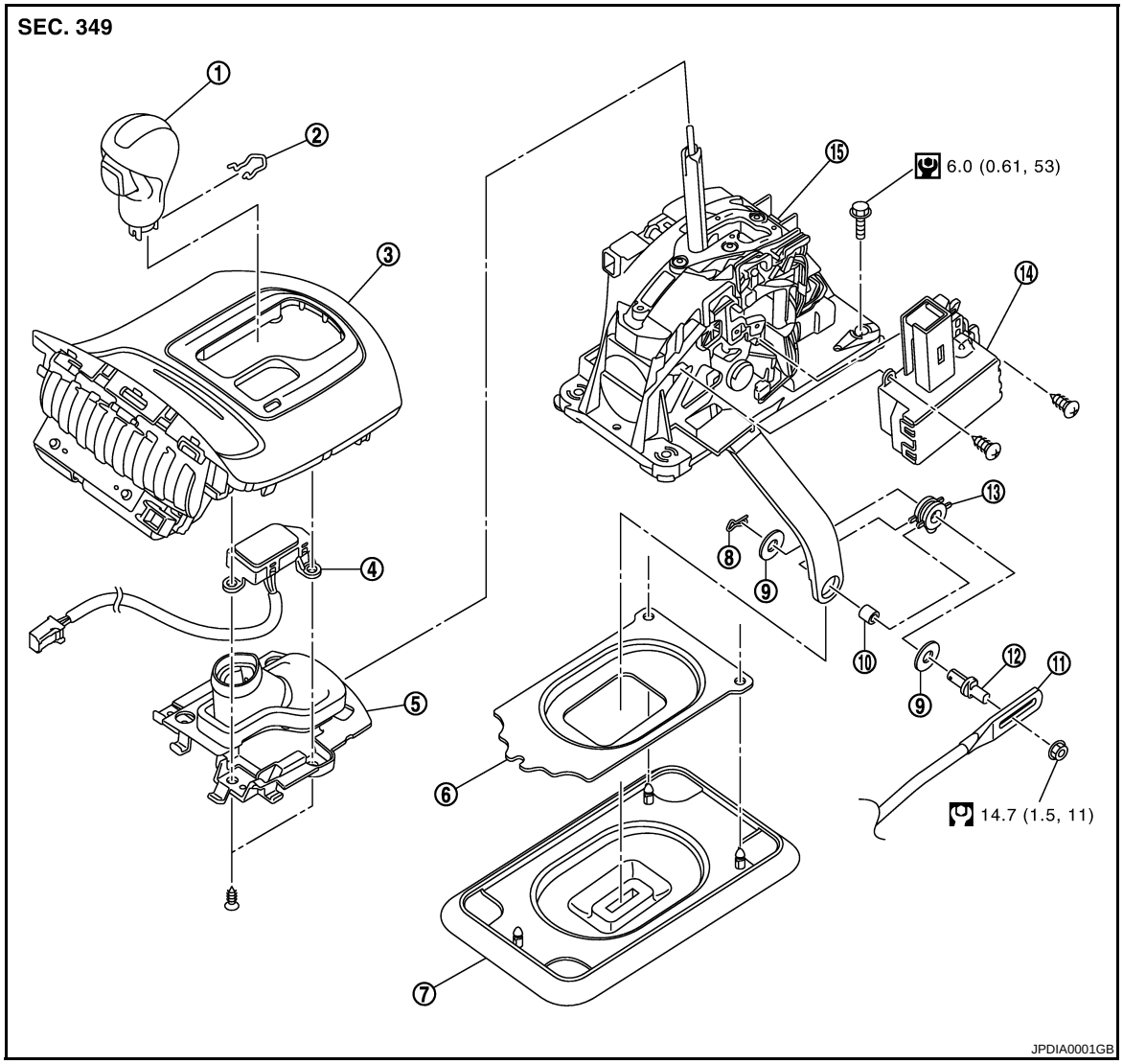
REMOVAL AND INSTALLATION

CONTROL DEVICE

2WD

2WD : Exploded View

INFOID:0000000004279240



1.	Selector lever knob	2.	Lock pin	3.	Console finisher
4.	Selector lever position indicator	5.	Insert finisher	6.	Dust cover plate
7.	Dust cover	8.	Snap pin	9.	Washer
10.	Collar	11.	Control rod	12.	Pivot pin
13.	Insulator	14.	Shift lock unit	15.	A/T shift selector assembly

Refer to GI-4, "Components" for symbols in the figure.

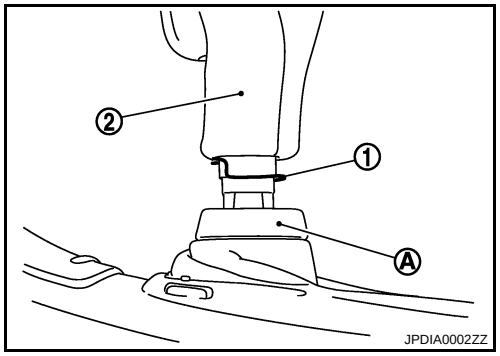
2WD : Removal and Installation

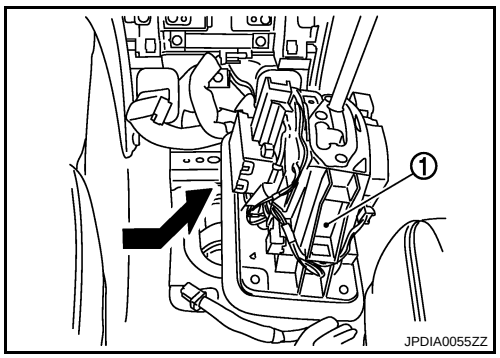
INFOID:0000000004279241

REMOVAL

1. Shift the selector lever to “P” position.
2. Remove control rod from control device.
3. Shift the selector lever to “N” position.

4. Remove knob cover (A) below selector lever downward.
5. Pull lock pin (1) out of selector lever knob (2).
6. Remove selector lever knob.
7. Remove center console assembly. Refer to IP-23, "Exploded View".
   CAUTION:
   When disconnecting selector lever position indicator connector from shift position switch, never twist or apply an excessive load to the connector.
8. Remove rear ventilator duct 2. Refer to VTL-10, "Exploded View".
9. Disconnect control device connector and harness clips.
10. Move passenger's seat to the end.
11. Shift the selector lever to "P" position.
12. Remove control device assembly mounting bolts.
13. Slightly lift the control device assembly (1) and slide it rightward. Then pull it out in the diagonally right direction.
14. Remove snap pin, washers, insulator, collar and pivot pin from control device assembly.
15. Remove dust cover and dust cover plate from control device assembly.
16. Remove dust cover from dust cover plate.
17. Remove shift lock unit from control device assembly.

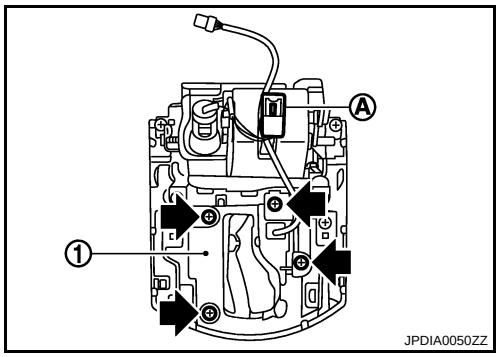




18. Remove selector lever position indicator from console finisher assembly.
    1. Remove cigarette lighter connector (A) from the console finisher assembly.

       ⬅ : Screw

    2. Remove insert finisher (1) from console finisher assembly.
    3. Remove selector lever position indicator.



INSTALLATION

Note the following, and install in the reverse order of removal.

- Refer to the followings when installing selector lever knob to control device assembly.

1. Insert lock pin to selector lever knob.
2. Install selector lever knob over selector lever until a click is felt.
   CAUTION:
   - **Install it straight, and never tap or apply any shock to install it.**
   - **Never press selector button.**

- When installing control rod to control device assembly, refer to "ADJUSTMENT". Refer to TM-274, "2WD : Inspection and Adjustment".

2WD : Inspection

INFOID:0000000004279242

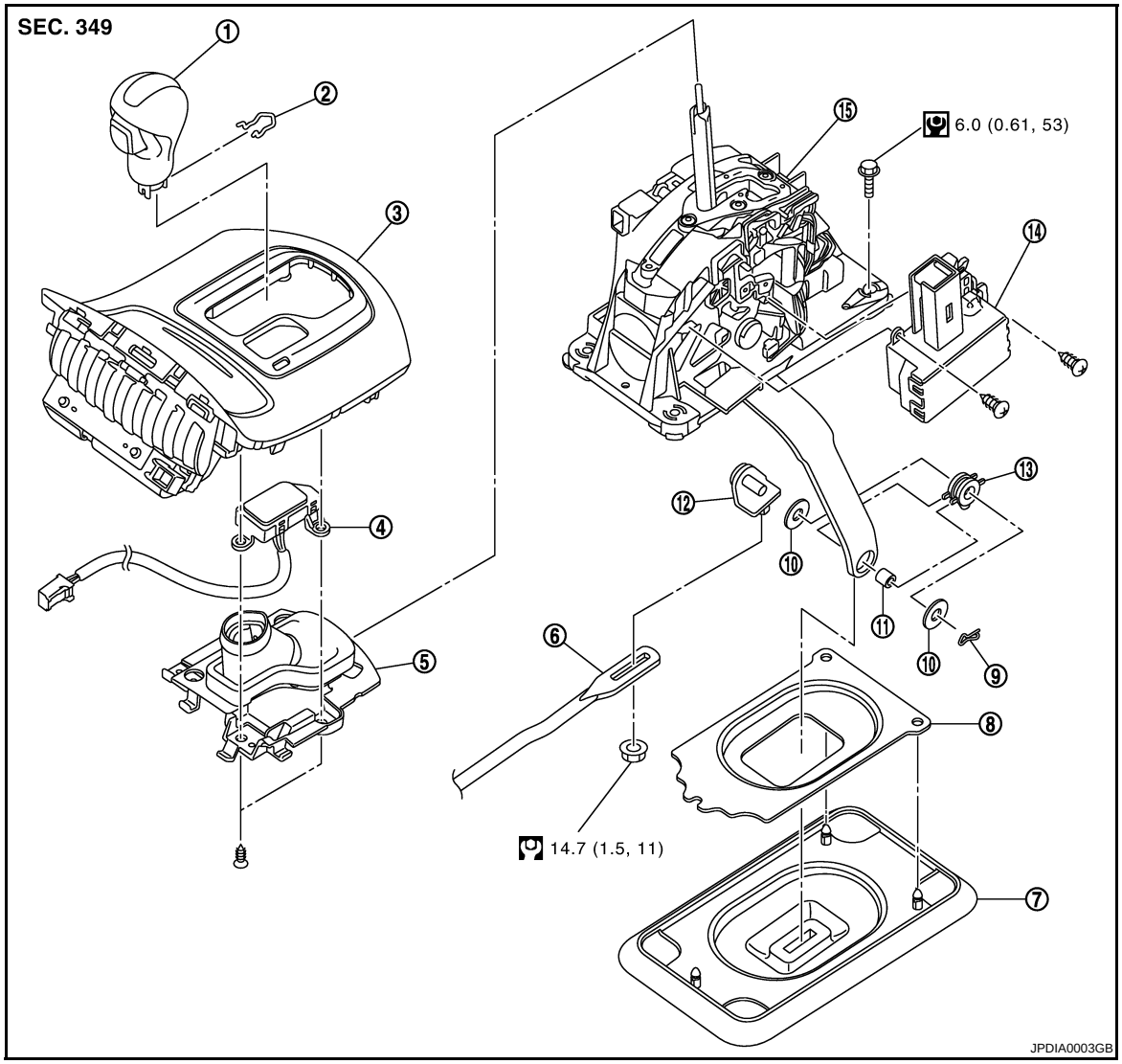
INSPECTION AFTER INSTALLATION

Check A/T positions. Refer to TM-274, "2WD : Inspection and Adjustment".

AWD

AWD : Exploded View

INFOID:0000000004279243



1.	Selector lever knob	2.	Lock pin	3.	Console finisher
4.	Selector lever position indicator	5.	Insert finisher	6.	Control rod
7.	Dust cover	8.	Dust cover plate	9.	Snap pin
10.	Washer	11.	Collar	12.	Pivot pin
13.	Insulator	14.	Shift lock unit	15.	A/T shift selector assembly

Refer to GI-4, "Components" for symbols in the figure.

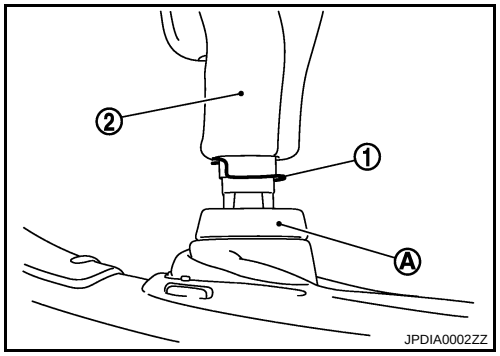
AWD : Removal and Installation

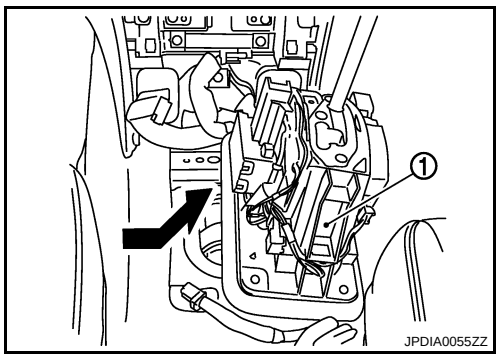
INFOID:0000000004279244

REMOVAL

1. Shift the selector lever to “P” position.
2. Remove control rod from control device.
3. Shift the selector lever to “N” position.

4. Remove knob cover (A) below selector lever downward.
5. Pull lock pin (1) out of selector lever knob (2).
6. Remove selector lever knob.
7. Remove center console assembly. Refer to IP-23, "Exploded View".
   CAUTION:
   When disconnecting selector lever position indicator connector from shift position switch, never twist or apply an excessive load to the connector.
8. Remove rear ventilator duct 2. Refer to VTL-10, "Exploded View".
9. Disconnect control device connector and harness clips.
10. Move passenger's seat to the end.
11. Shift the selector lever to "P" position.
12. Remove control device assembly mounting bolts.
13. Slightly lift the control device assembly (1) and slide it rightward. Then pull it out in the diagonally right direction.
14. Remove snap pin, washers, insulator, collar and pivot pin from control device assembly.
15. Remove dust cover and dust cover plate from control device assembly.
16. Remove dust cover from dust cover plate.
17. Remove shift lock unit from control device assembly.

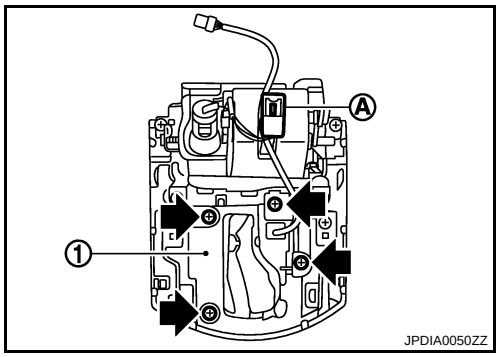




18. Remove selector lever position indicator from console finisher assembly.
    1. Remove cigarette lighter connector (A) from the console finisher assembly.

       ⬅ : Screw

    2. Remove insert finisher (1) from console finisher assembly.
    3. Remove selector lever position indicator.



INSTALLATION

Note the following, and install in the reverse order of removal.

- Refer to the followings when installing selector lever knob to control device assembly.

1. Insert lock pin to selector lever knob.
2. Install selector lever knob over selector lever until a click is felt.
   CAUTION:
   - **Install it straight, and never tap or apply any shock to install it.**
   - **Never press selector button.**

- When installing control rod to control device assembly, refer to "ADJUSTMENT". Refer to TM-274, "AWD : Inspection and Adjustment".

AWD : Inspection

INFOID:0000000004279245

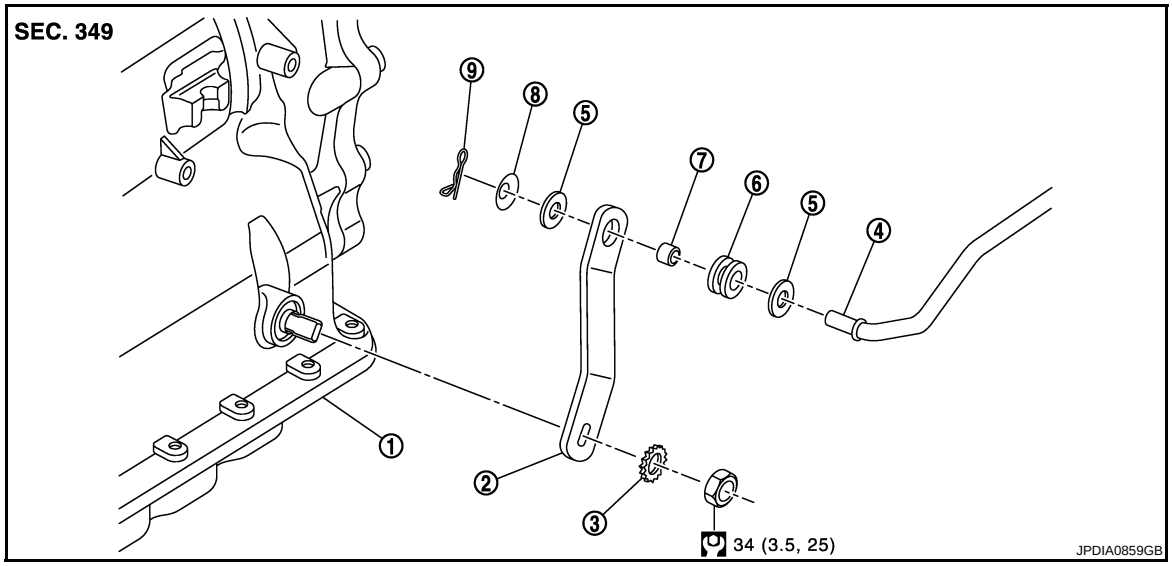
INSPECTION AFTER INSTALLATION

Check A/T positions. Refer to TM-274, "AWD : Inspection and Adjustment".

CONTROL ROD

Exploded View

INFOID:0000000004279246



1. A/T assembly
2. Manual lever
3. Lock washer
4. Control rod
5. Washer
6. Insulator
7. Collar
8. Conical washer
9. Snap pin

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000004279247

REMOVAL

1. Shift the selector lever to “P” position.
2. Remove control rod from A/T shift selector assembly. Refer to TM-276, "2WD : Exploded View" (2WD), TM-278, "AWD : Exploded View" (AWD).
3. Remove manual lever from A/T assembly.
4. Remove control rod from manual lever.

INSTALLATION

Note the following, and install in the reverse order of removal.

- When installing control rod to A/T shift selector assembly, refer to “ADJUSTMENT”. Refer to TM-274, "2WD : Inspection and Adjustment" (2WD), TM-274, "AWD : Inspection and Adjustment" (AWD).

Inspection

INFOID:0000000004279248

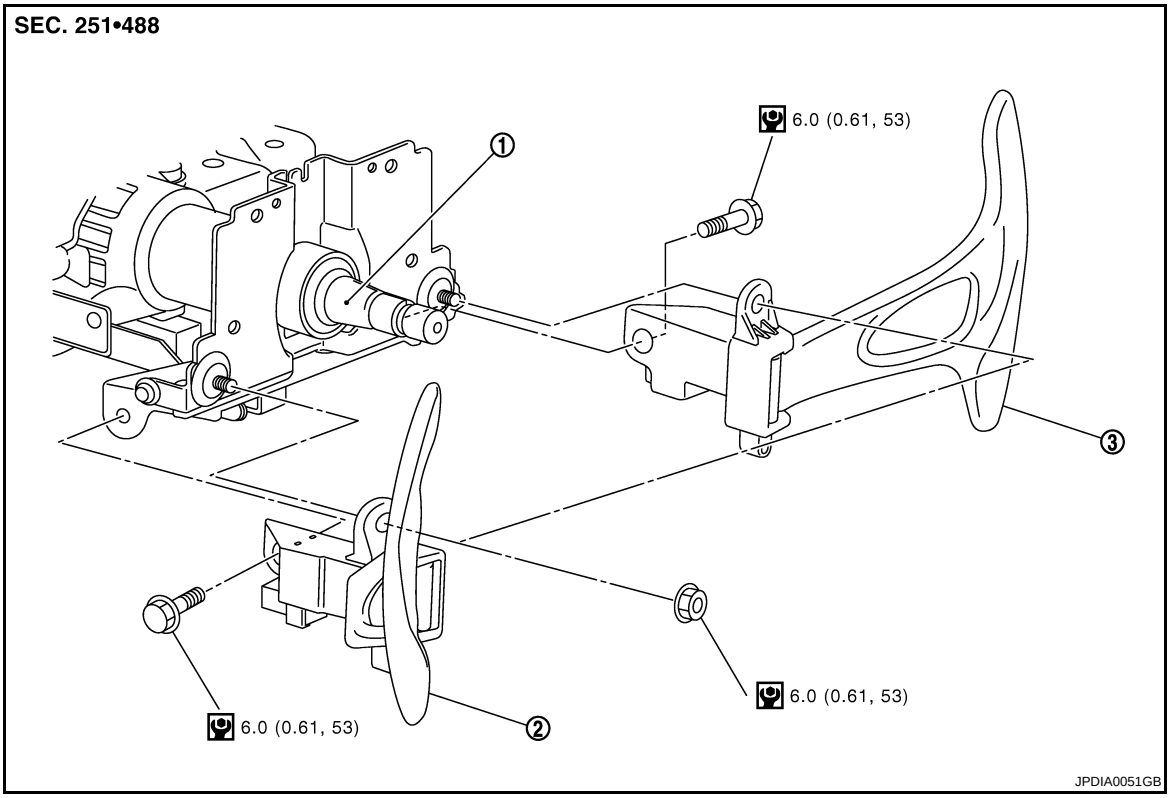
INSPECTION AFTER INSTALLATION

Check A/T positions. Refer to TM-274, "2WD : Inspection and Adjustment" (2WD), TM-274, "AWD : Inspection and Adjustment" (AWD).

PADDLE SHIFTER

Exploded View

INFOID:0000000004279249



1. Steering column assembly
2. Paddle shifter (shift-down)
3. Paddle shifter (shift-up)

Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000004279250

REMOVAL

1. Remove column cover. Refer to IP-11, "Exploded View".
2. Disconnect paddle shifter connectors from each paddle shifter.
3. Remove paddle shifter mounting bolts and nuts.
4. Remove each paddle shifter from steering column assembly.

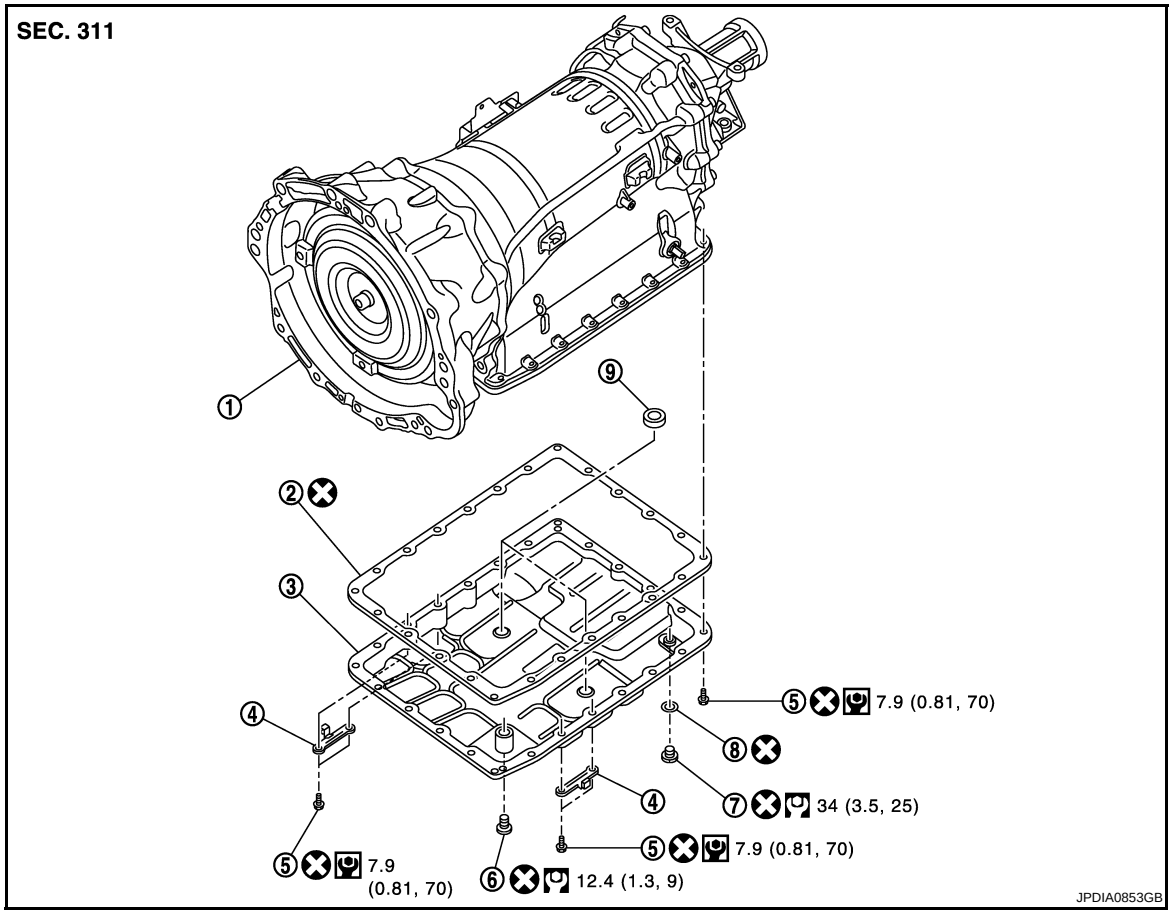
INSTALLATION

Install in the reverse order of removal.

OIL PAN

Exploded View

INFOID:0000000004279251



1. A/T
2. Oil pan gasket
3. Oil pan
4. Clip
5. Oil pan mounting bolt
6. Overflow plug
7. Drain plug
8. Drain plug gasket
9. Magnet

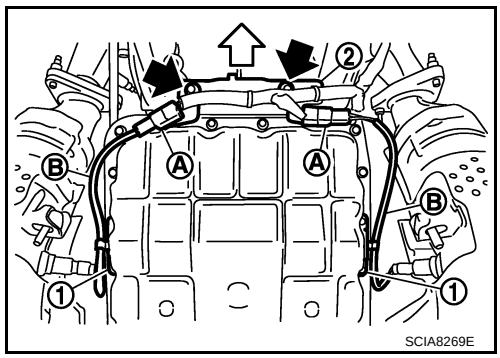
Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation

INFOID:0000000004279252

REMOVAL

1. Drain ATF through drain plug.
2. Remove exhaust mounting bracket with a power tool. Refer to EX-5, "Exploded View".
3. Disconnect heated oxygen sensor 2 connectors (A).



⇦ : Vehicle front

⬅ : Bolt

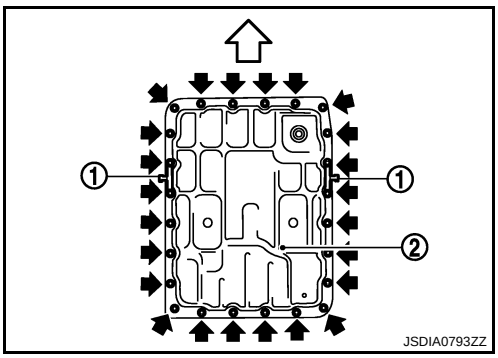
4. Remove heated oxygen sensor 2 harness (B) from clips (1).
5. Remove bracket (2) from A/T assembly. Refer to TM-293, "2WD : Exploded View" (2WD), TM-296, "AWD : Exploded View" (AWD).

6. Remove clips (1).

⇦ : Vehicle front

⬅ : Oil pan mounting bolt

7. Remove oil pan (2) and oil pan gasket.
8. Remove magnets from oil pan.



INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

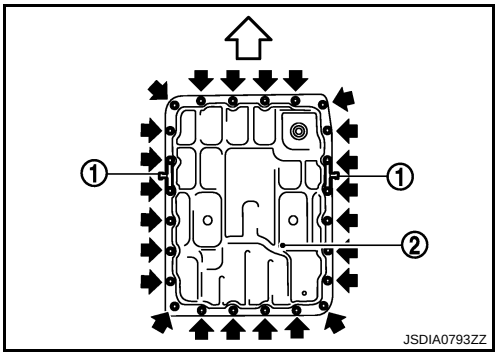
- **Never reuse drain plug and drain plug gasket.**
- **Clean foreign materials (gear wear particles) that adhere on the inside of the oil pan and on the magnet, and then assembly.**
- Refer to the followings when installing oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

⇦ : Vehicle front

⬅ : Oil pan mounting bolt

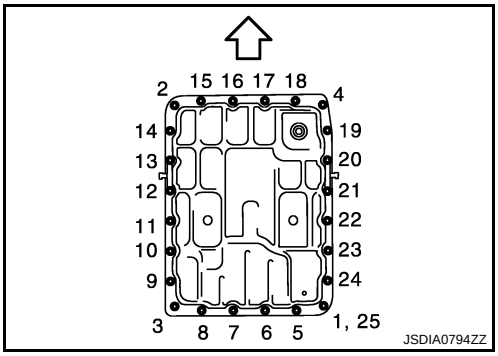
CAUTION:

- **Never reuse oil pan gasket and oil pan mounting bolts.**
- **Completely remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface of transmission case and oil pan.**
- **Install oil pan gasket in the direction to align hole position.**



- Tighten oil pan mounting bolts to the specified torque in the numerical order as shown in the figure after temporarily tightening them.

⇦ : Vehicle front



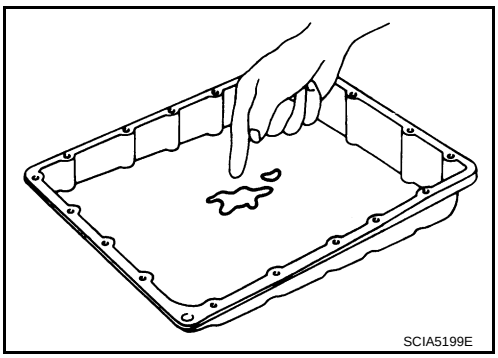
Inspection and Adjustment

INFOID:0000000004279253

INSPECTION AFTER REMOVAL

Check foreign materials in oil pan to help determine causes of malfunction. If the ATF is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.

- **If frictional material is detected, perform A/T fluid cooler cleaning. Refer to TM-270, "Cleaning".**



ADJUSTMENT AFTER INSTALLATION

Adjust A/T fluid level. Refer to TM-268, "Adjustment".

INSPECTION AFTER INSTALLATION

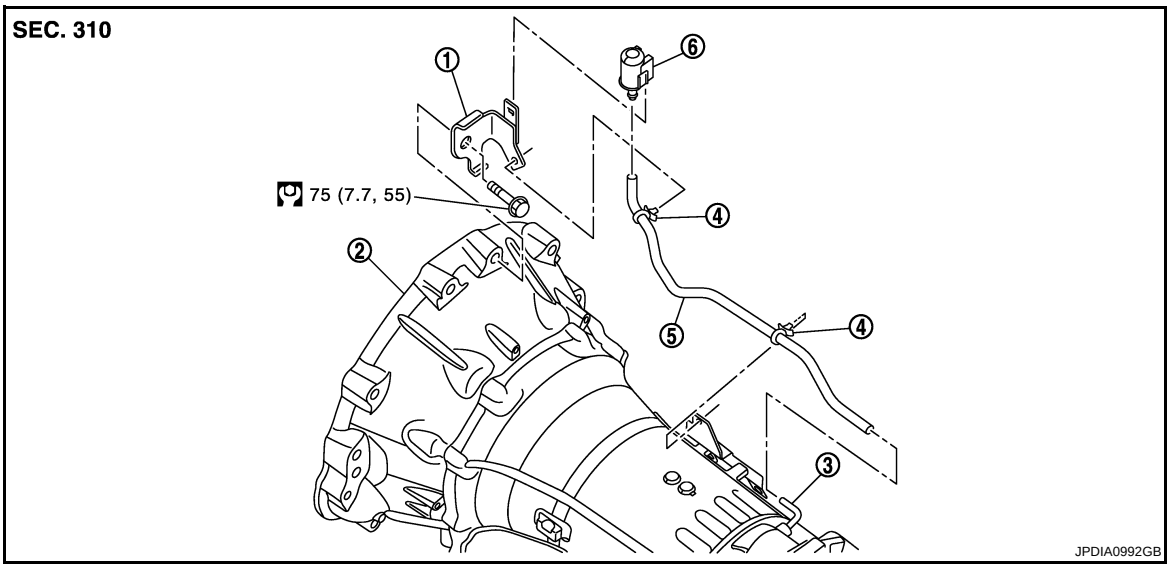
Check A/T fluid leakage.

AIR BREATHER HOSE

2WD

2WD : Exploded View

INFOID:0000000004279254



1. Bracket
2. A/T assembly
3. Air breather tube
4. Clip
5. Air breather hose
6. Air breather box

Refer to GI-4, "Components" for symbols in the figure.

2WD : Removal and Installation

INFOID:0000000004279255

REMOVAL

1. Remove clips from brackets.
2. Remove air breather box from bracket.
3. Remove air breather box from air breather hose.
4. Remove air breather hose.
5. Separate propeller shaft assembly (rear). Refer to DLN-97, "Exploded View".
6. Remove control rod from A/T shift selector assembly. Refer to TM-276, "2WD : Exploded View".
7. Support A/T assembly with a transmission jack.
   CAUTION:
   When setting the transmission jack, be careful not to allow it to collide against the drain plug and overflow plug.
8. Remove rear engine mounting member with a power tool. Refer to EM-69, "2WD : Exploded View".
9. Remove bolt fixing A/T assembly to engine assembly with a power tool.
10. Remove bracket.

INSTALLATION

Note the following, and install in the reverse order of removal.

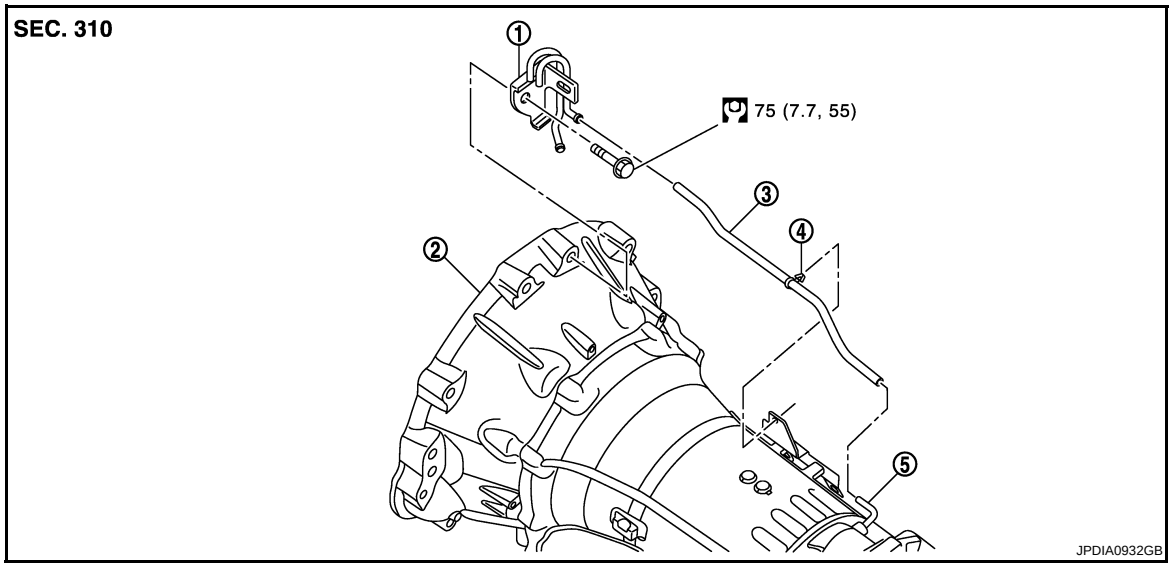
CAUTION:

- **When installing air breather hose, be careful not to be crushed or blocked by folding or bending the hose.**
- **When inserting air breather hose to air breather tube, be sure to insert it fully until its end reaches the radius curve end.**
- **When inserting air breather hose to air breather box, be sure to insert it fully until its end reaches the stop.**
- **Install air breather hose to air breather box so that the paint mark is facing backward.**
- **Ensure clips are securely installed to brackets when installing air breather hose to brackets.**

AWD

AWD : Exploded View

INFOID:0000000004279256



1. Air breather vent
2. A/T assembly
3. Air breather hose
4. Clip
5. Air breather tube

Refer to GI-4, "Components" for symbols in the figure.

AWD : Removal and Installation

INFOID:0000000004279257

REMOVAL

1. Separate propeller shaft assembly (front). Refer to DLN-83, "Exploded View".
2. Remove air breather hose.
3. Separate propeller shaft assembly (rear). Refer to DLN-105, "Exploded View".
4. Remove control rod from A/T shift selector assembly. Refer to TM-278, "AWD : Exploded View".
5. Support A/T assembly with a transmission jack.
   CAUTION:
   When setting the transmission jack, be careful not to allow it to collide against the drain plug and overflow plug.
6. Remove rear engine mounting member with a power tool. Refer to EM-73, "AWD : Exploded View".
7. Remove bolt fixing A/T assembly to engine assembly with a power tool.
8. Remove air breather vent.

INSTALLATION

Note the following, and install in the reverse order of removal.

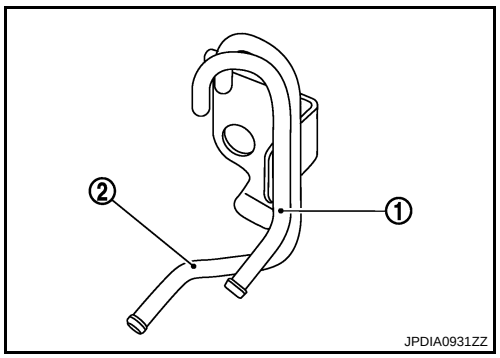
CAUTION:

- **When installing air breather hose, be careful not to be crushed or blocked by folding or bending the hose.**
- **When inserting air breather hose to air breather tube, be sure to insert it fully until its end reaches the radius curve end.**

- **When inserting air breather hose to air breather vent (for A/T) (1), be sure to insert it fully until its end reaches the radius curve end.**

  2 : Air breather vent (for transfer)

- **Install air breather hose to air breather vent (for A/T) so that the paint mark is facing upward.**
- **Ensure clips are securely installed to brackets when installing air breather hose to brackets.**

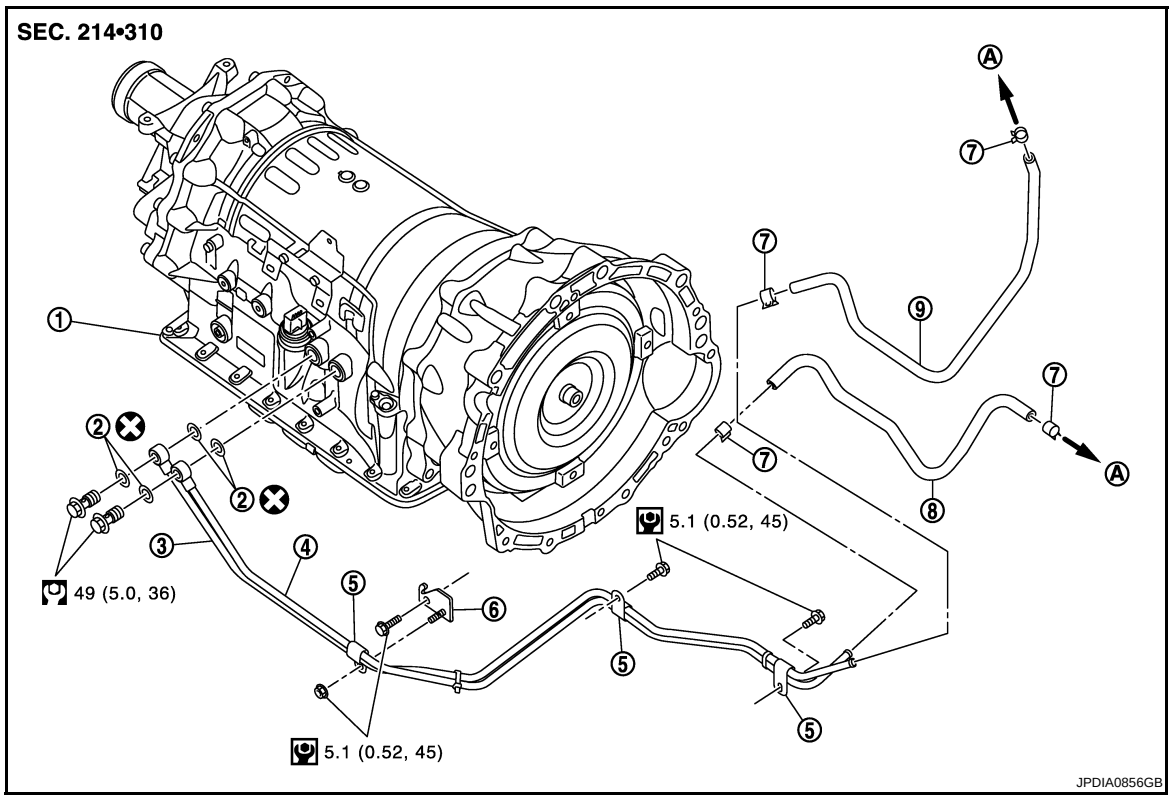


FLUID COOLER SYSTEM

2WD

2WD : Exploded View

INFOID:0000000004279258



1. A/T assembly
2. Copper washer
3. A/T fluid cooler tube
4. A/T fluid cooler tube
5. Clip
6. Bracket
7. Hose clamp
8. A/T fluid cooler hose B
9. A/T fluid cooler hose A

A. To radiator

Refer to GI-4, "Components" for symbols in the figure.

2WD : Removal and Installation

INFOID:0000000004279259

REMOVAL

1. Remove air cleaner case (LH). Refer to EM-27, "Exploded View".
2. Remove engine lower cover with a power tool. Refer to EXT-28, "Exploded View".
3. Remove A/T fluid cooler hose A and A/T fluid cooler hose B.
4. Remove front suspension member. Refer to FSU-21, "Exploded View".
5. Remove A/T fluid cooler tubes from A/T assembly and engine assembly.
   CAUTION:
   Be careful not to bend A/T fluid cooler tubes.
6. Plug up opening such as the A/T fluid cooler tube holes.
7. Remove clips and brackets.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:
Never reuse copper washers.

- Refer to the following when installing A/T fluid cooler hoses.

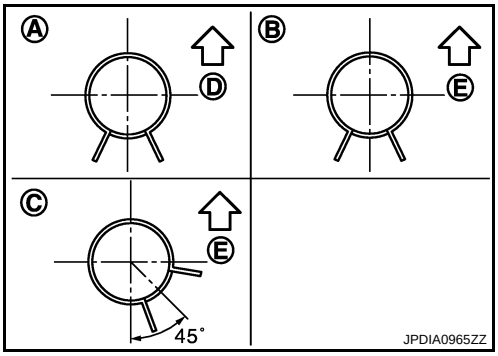
Hose name	Hose end	Paint mark	Position of hose clamp*
A/T fluid cooler hose A	Radiator assembly side	Facing backward	A
	A/T fluid cooler tube side	Facing downward	B
A/T fluid cooler hose B	Radiator assembly side	Facing downward	C
	A/T fluid cooler tube side	Facing downward	B

*: Refer to the illustrations for the specific position each hose clamp tab.

- The illustrations indicate the view from the hose ends.

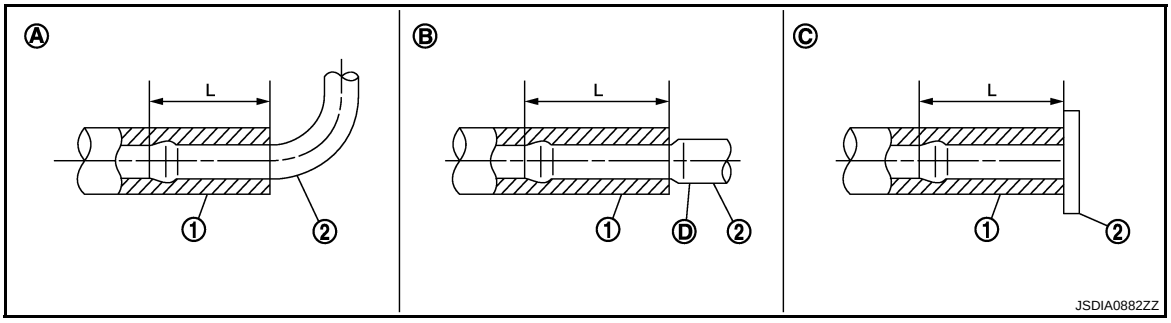
⇦D : Vehicle front
⇦E : Vehicle upper

- When installing hose clamps center line of each hose clamp tab should be positioned as shown in the figure.



- Insert A/T fluid cooler hoses according to dimension (L) described below.

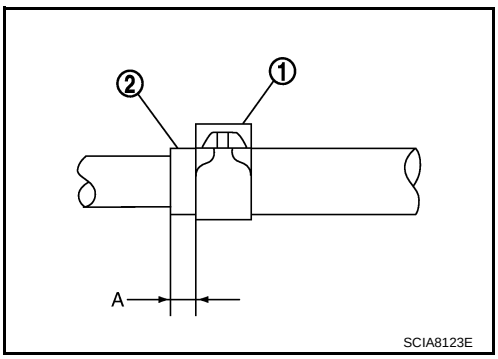
(1)	(2)	Tube type	Dimension (L)
A/T fluid cooler hose A	Radiator assembly side	A	End reaches the radius curve end.
	A/T fluid cooler tube side	B	30 mm (1.18 in) [End reaches the 2-stage bulge (D).]
A/T fluid cooler hose B	Radiator assembly side	C	Insert the hose until the hose touches the radiator.
	A/T fluid cooler tube side	B	30 mm (1.18 in) [End reaches the 2-stage bulge (D).]



- Set hose clamps (1) at the both ends of A/T fluid cooler hoses (2) with dimension (A) from the hose edge.

Dimension A : 5 – 9 mm (0.20 – 0.35 in)

- Hose clamp should not interfere with the bulge of fluid cooler tube.



2WD : Inspection and Adjustment

INFOID:0000000004279260

ADJUSTMENT AFTER INSTALLATION

Adjust A/T fluid level. Refer to TM-268, "Adjustment".

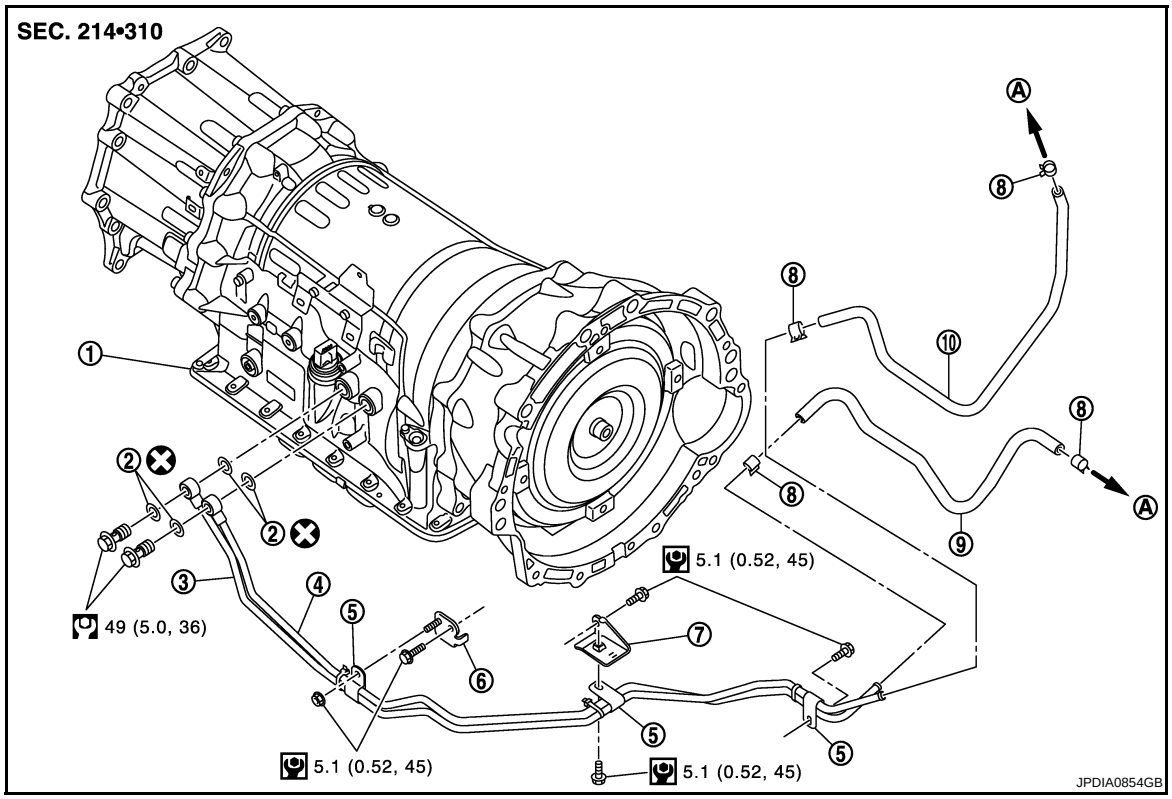
INSPECTION AFTER INSTALLATION

Check A/T fluid leakage.

AWD

AWD : Exploded View

INFOID:0000000004279261



1. A/T assembly
2. Copper washer
3. A/T fluid cooler tube
4. A/T fluid cooler tube
5. Clip
6. Bracket
7. Bracket
8. Hose clamp
9. A/T fluid cooler hose B
10. A/T fluid cooler hose A
A. To radiator

Refer to GI-4, "Components" for symbols in the figure.

AWD : Removal and Installation

INFOID:0000000004279262

REMOVAL

1. Remove air cleaner case (LH). Refer to EM-27, "Exploded View".
2. Remove engine lower cover with a power tool. Refer to EXT-28, "Exploded View".
3. Remove A/T fluid cooler hose A and A/T fluid cooler hose B.
4. Remove front propeller shaft. Refer to DLN-83, "Exploded View".
5. Remove front suspension member. Refer to FSU-43, "Exploded View".
6. Remove A/T fluid cooler tubes from A/T assembly and engine assembly.
   CAUTION:
   Be careful not to bend A/T fluid cooler tubes.
7. Plug up opening such as the A/T fluid cooler tube holes.
8. Remove clips and brackets.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

Never reuse copper washers.

- Refer to the following when installing A/T fluid cooler hoses.

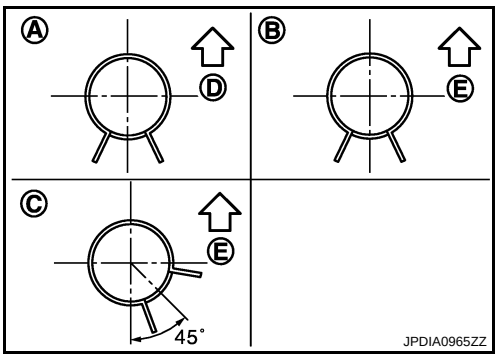
Hose name	Hose end	Paint mark	Position of hose clamp*
A/T fluid cooler hose A	Radiator assembly side	Facing backward	A
	A/T fluid cooler tube side	Facing downward	B
A/T fluid cooler hose B	Radiator assembly side	Facing downward	C
	A/T fluid cooler tube side	Facing downward	B

*: Refer to the illustrations for the specific position each hose clamp tab.

- The illustrations indicate the view from the hose ends.

⇦D : Vehicle front

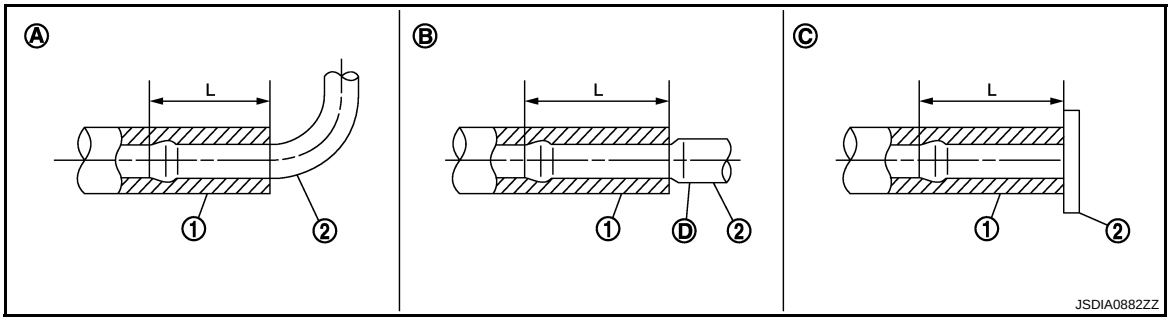
⇦E : Vehicle upper



- When installing hose clamps center line of each hose clamp tab should be positioned as shown in the figure.

- Insert A/T fluid cooler hose according to dimension (L) described below.

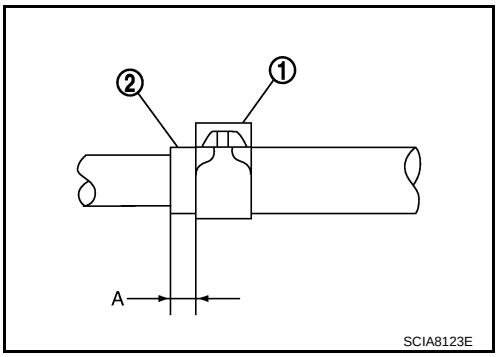
(1)	(2)	Tube type	Dimension (L)
A/T fluid cooler hose A	Radiator assembly side	A	End reaches the radius curve end.
	A/T fluid cooler tube side	B	30 mm (1.18 in) [End reaches the 2-stage bulge (D).]
A/T fluid cooler hose B	Radiator assembly side	C	Insert the hose until the hose touches the radiator.
	A/T fluid cooler tube side	B	30 mm (1.18 in) [End reaches the 2-stage bulge (D).]



- Set hose clamps (1) at the both ends of A/T fluid cooler hoses (2) with dimension (A) from the hose edge.

Dimension A : 5 – 9 mm (0.20 – 0.35 in)

- Hose clamp should not interfere with the bulge of fluid cooler tube.



AWD : Inspection and Adjustment

INFOID:0000000004279263

ADJUSTMENT AFTER INSTALLATION

Adjust A/T fluid level. Refer to TM-268, "Adjustment".

INSPECTION AFTER INSTALLATION

Check A/T fluid leakage.

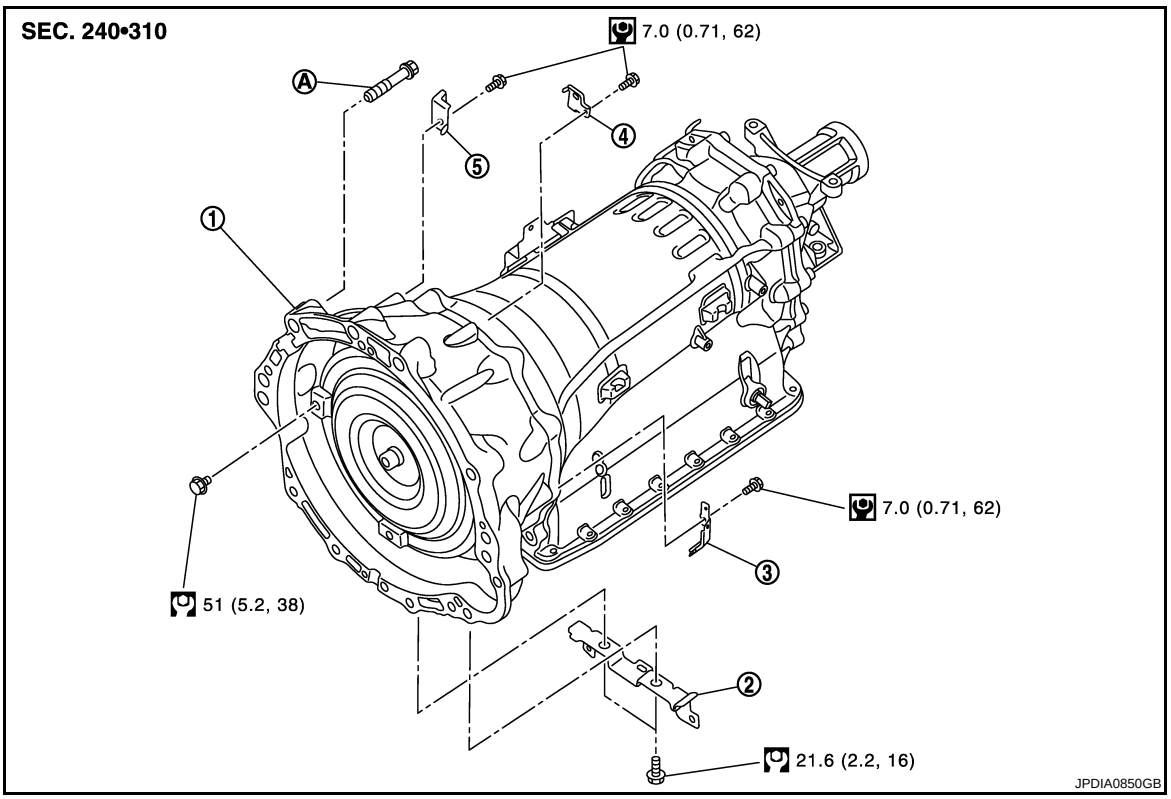
UNIT REMOVAL AND INSTALLATION

TRANSMISSION ASSEMBLY

2WD

2WD : Exploded View

INFOID:0000000004279264



1. A/T assembly
2. Harness bracket
3. Harness bracket
4. Harness bracket
5. Harness bracket

A. For tightening torque, Refer to TM-293, "2WD : Removal and Installation".

Refer to GI-4, "Components" for symbols in the figure.

2WD : Removal and Installation

INFOID:0000000004279265

REMOVAL

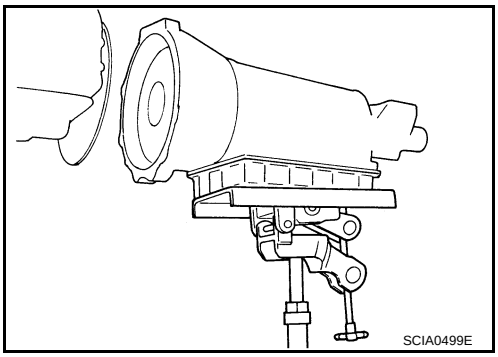
CAUTION:

- **When removing the A/T assembly from engine, first remove the crankshaft position sensor (POS) from the A/T assembly.**
- **Be careful not to damage sensor edge.**

1. Shift the selector lever to “P” position, and then release the parking brake.
2. Disconnect the battery cable from the negative terminal.
3. Remove manual lever. Refer to TM-280, "Exploded View".
4. Separate propeller shaft assembly. Refer to DLN-97, "Exploded View".
5. Remove engine lower cover with a power tool. Refer to EXT-28, "Exploded View".
6. Remove suspension member stay. Refer to FSU-21, "Exploded View".
7. Remove crankshaft position sensor (POS) from A/T assembly. Refer to EM-121, "Exploded View".
   CAUTION:
   - **Never subject it to impact by dropping or hitting it.**
   - **Never disassemble.**
   - **Never allow metal filings, etc. to get on the sensor's front edge magnetic area.**

- **Never place in an area affected by magnetism.**

8. Remove starter motor. Refer to STR-15, "Exploded View".
9. Remove rear plate cover. Refer to EM-43, "Exploded View (2WD)".
10. Turn crankshaft, and remove the four tightening bolts for drive plate and torque converter.
    CAUTION:
    When turning the crankshaft, turn it clockwise as viewed from the front of the engine.
11. Remove A/T fluid cooler tubes from A/T assembly. Refer to TM-288, "2WD : Exploded View".
12. Plug up openings such as the A/T fluid cooler tube hole.
13. Support A/T assembly with a transmission jack.
    CAUTION:
    When setting the transmission jack, be careful not to allow it to collide against the drain plug and overflow plug.
14. Remove rear engine mounting member and engine mounting insulator (rear) with a power tool. Refer to EM-69, "2WD : Exploded View".
15. Disconnect A/T assembly connector.
16. Remove harness and harness brackets.
17. Remove bolts fixing A/T assembly to engine assembly with a power tool.
18. Remove air breather hose, air breather box and bracket. Refer to TM-285, "2WD : Exploded View".
19. Remove A/T assembly from the vehicle.
    CAUTION:
    - **Secure torque converter to prevent it from dropping.**
    - **Secure A/T assembly to a transmission jack.**
20. Remove dynamic damper. Refer to EM-69, "2WD : Exploded View".

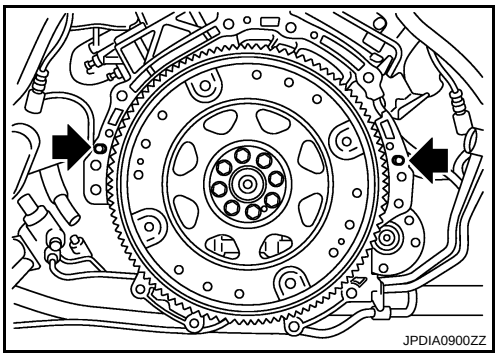

SCIA0499E

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

Check fitting of dowel pin (⬅) when installing A/T assembly to engine assembly.

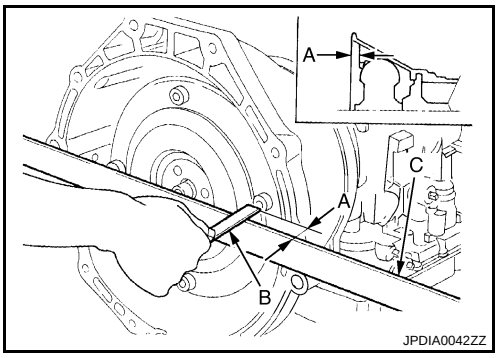

JPDIA0900ZZ

- When installing A/T assembly to the engine assembly, be sure to check dimension (A) to ensure it is within the reference value limit.

B : Scale

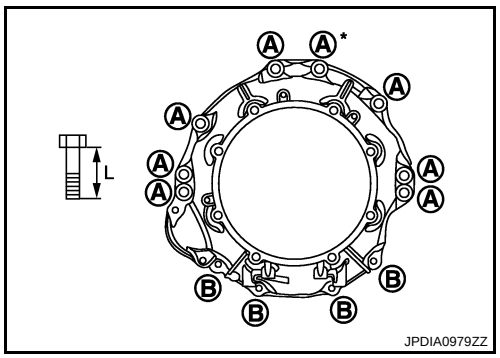
C : Straightedge

Dimension (A) : Refer to TM-300, "Torque Converter".



JPDIA0042ZZ

- When installing A/T assembly to the engine assembly, attach the fixing bolts in accordance with the following standard.



JPDIA0979ZZ

Bolt symbol	A	B
Insertion direction	A/T assembly to engine assembly	Engine assembly to A/T assembly
Number of bolts	8	4
Bolt length (L) mm (in)	65 (2.56)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7, 55)	46.6 (4.8, 34)

*: Tightening the bolt with bracket.

- Align the positions of tightening bolts for drive plate with those of the torque converter, and temporarily tighten the bolts. Then, tighten the bolts with the specified torque.

CAUTION:

- **When turning crankshaft, turn it clockwise as viewed from the front of the engine.**
- **When tightening the tightening bolts for the torque converter after fixing the crankshaft pulley bolts, be sure to confirm the tightening torque of the crankshaft pulley mounting bolts. Refer to EM-50, "Exploded View".**
- **Rotate crankshaft several turns and check to be sure that A/T rotates freely without binding after converter is installed to drive plate.**

2WD : Inspection and Adjustment

INFOID:0000000004279266

ADJUSTMENT AFTER INSTALLATION

Adjust A/T fluid level. Refer to TM-268, "Adjustment".

INSPECTION AFTER INSTALLATION

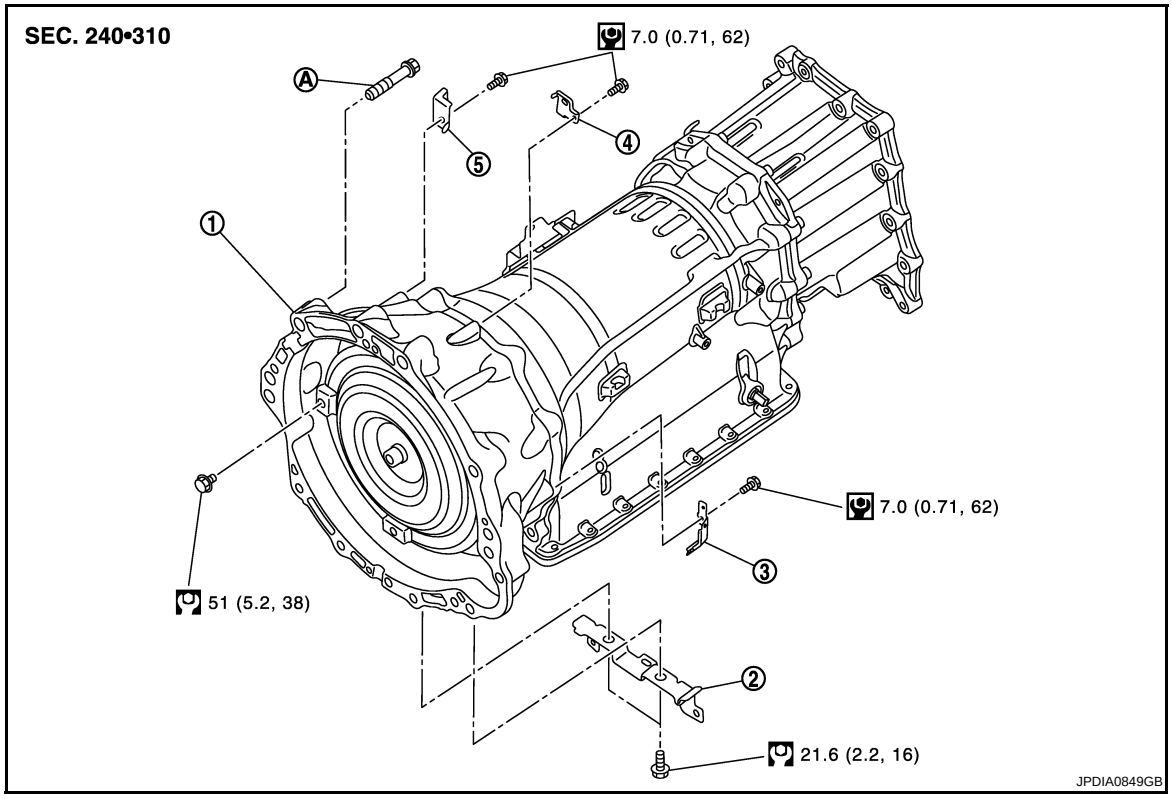
Check the following items.

- A/T fluid leakage.
- A/T position. Refer to TM-274, "2WD : Inspection and Adjustment".

AWD

AWD : Exploded View

INFOID:0000000004279267



1. A/T assembly
2. Harness bracket
3. Harness bracket
4. Harness bracket
5. Harness bracket

A. For tightening torque, Refer to TM-296, "AWD : Removal and Installation".

Refer to GI-4, "Components" for symbols in the figure.

AWD : Removal and Installation

INFOID:0000000004279268

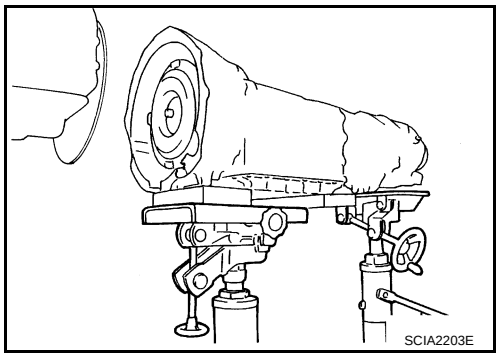
REMOVAL

CAUTION:

- **When removing the A/T assembly from engine, first remove the crankshaft position sensor (POS) from the A/T assembly.**
- **Be careful not to damage sensor edge.**

1. Shift the selector lever to “P” position, and then release the parking brake.
2. Disconnect the battery cable from the negative terminal.
3. Remove manual lever. Refer to TM-280, "Exploded View".
4. Separate propeller shaft assembly (rear). Refer to DLN-105, "Exploded View".
5. Separate propeller shaft assembly (front). Refer to DLN-83, "Exploded View".
6. Remove crankshaft position sensor (POS) from A/T assembly. Refer to EM-121, "Exploded View".
   CAUTION:
   - **Never subject it to impact by dropping or hitting it.**
   - **Never disassemble.**
   - **Never allow metal filings, etc. to get on the sensor's front edge magnetic area.**
   - **Never place in an area affected by magnetism.**
7. Remove starter motor. Refer to STR-15, "Exploded View".
8. Remove rear plate cover. Refer to EM-44, "Exploded View (AWD)".
9. Turn crankshaft, and remove the four tightening bolts for drive plate and torque converter.
   CAUTION:
   When turning the crankshaft, turn it clockwise as viewed from the front of the engine.

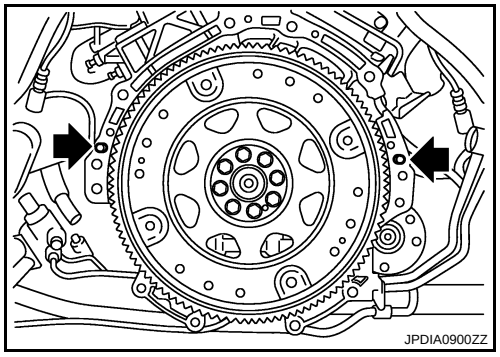
10. Remove A/T fluid cooler tubes from A/T assembly. Refer to TM-290, "AWD : Exploded View".
11. Plug up openings such as the A/T fluid cooler tube hole.
12. Support A/T assembly with a transmission jack.
    CAUTION:
    When setting the transmission jack, be careful not to allow it to collide against the drain plug and overflow plug.
13. Remove rear engine mounting member and engine mounting insulator (rear) with a power tool. Refer to EM-73, "AWD : Exploded View".
14. Disconnect A/T assembly connector and AWD solenoid connector.
15. Remove harness and harness brackets.
16. Remove bolts fixing A/T assembly to engine assembly with a power tool.
17. Remove air breather hose and air breather vent. Refer to TM-286, "AWD : Exploded View".
18. Remove A/T assembly with transfer assembly from the vehicle.
    CAUTION:
    - **Secure torque converter to prevent it from dropping.**
    - **Secure A/T assembly to a transmission jack.**
19. Remove transfer assembly from A/T assembly with a power tool. Refer to DLN-58, "Exploded View".


SCIA2203E

INSTALLATION

Note the following, and install in the reverse order of removal.

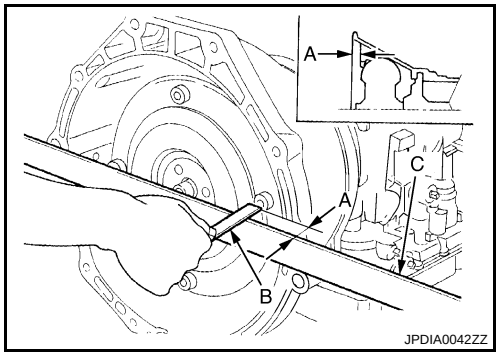
CAUTION:
Check fitting of dowel pin (⬅) when installing A/T assembly to engine assembly.


JPDIA0900ZZ

- When installing A/T assembly to the engine assembly, be sure to check dimension (A) to ensure it is within the reference value limit.

  B : Scale
  C : Straightedge

  Dimension (A) : Refer to TM-300, "Torque Converter".

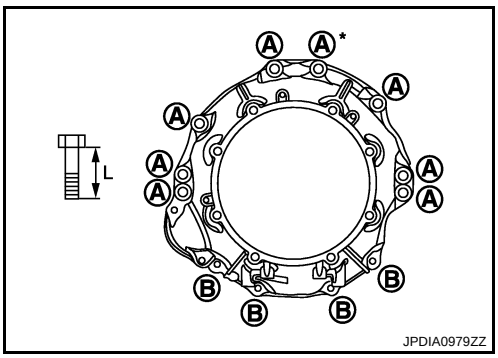


JPDIA0042ZZ

- When installing A/T assembly to the engine assembly, attach the fixing bolts in accordance with the following standard.

Bolt symbol	A	B
Insertion direction	A/T assembly to engine assembly	Engine assembly to A/T assembly
Number of bolts	8	4
Bolt length (L) mm (in)	65 (2.56)	35 (1.38)
Tightening torque N·m (kg-m, ft-lb)	75 (7.7, 55)	46.6 (4.8, 34)

*: Tightening the bolt with air breather vent.



JPDIA0979ZZ

- Align the positions of tightening bolts for drive plate with those of the torque converter, and temporarily tighten the bolts. Then, tighten the bolts with the specified torque.

CAUTION:

- **When turning crankshaft, turn it clockwise as viewed from the front of the engine.**
- **When tightening the tightening bolts for the torque converter after fixing the crankshaft pulley bolts, be sure to confirm the tightening torque of the crankshaft pulley mounting bolts. Refer to EM-50, "Exploded View".**
- **Rotate crankshaft several turns and check to be sure that A/T rotates freely without binding after converter is installed to drive plate.**

AWD : Inspection and Adjustment

INFOID:0000000004279269

ADJUSTMENT AFTER INSTALLATION

Adjust A/T fluid level. Refer to TM-268, "Adjustment".

INSPECTION AFTER INSTALLATION

Check the following items.

- A/T fluid leakage.
- A/T position. Refer to TM-274, "AWD : Inspection and Adjustment".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:0000000004279270

Applied model		2WD	AWD
Transmission model code number		1XJ4A, 3RX0C	1XJ4B, 3RX0D
Stall torque ratio		1.92 : 1	
Transmission gear ratio	1st	4.924	
	2nd	3.194	
	3rd	2.043	
	4th	1.412	
	5th	1.000	
	6th	0.862	
	7th	0.772	
	Reverse	3.972	
Recommended fluid		Genuine NISSAN Matic S ATF*1	
Fluid capacity		9.2 liter (9-3/4 US qt, 8-1/8 Imp qt)*2	

CAUTION:
- **Use only Genuine NISSAN Matic S ATF. Never mix with other ATF.**
- **Using ATF other than Genuine NISSAN Matic S ATF will cause deterioration driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**

- *1: Refer to MA-10, "Fluids and Lubricants".
- *2: The fluid capacity is the reference value.

Vehicle Speed at Which Gear Shifting Occurs

INFOID:0000000004279271

Unit: km/h (MPH)

Gear position	Throttle position	
	Full throttle	Half throttle
$D_1 \rightarrow D_2$	51 – 55 (32 – 34)	42 – 46 (27 – 28)
$D_2 \rightarrow D_3$	80 – 88 (50 – 54)	62 – 70 (39 – 43)
$D_3 \rightarrow D_4$	126 – 136 (79 – 84)	97 – 107 (61 – 66)
$D_4 \rightarrow D_5$	184 – 194 (115 – 120)	141 – 151 (88 – 93)
$D_5 \rightarrow D_6$	250 – 260 (156 – 161)	179 – 189 (112 – 117)
$D_6 \rightarrow D_7$	250 – 260 (156 – 161)	215 – 225 (134 – 139)
$D_7 \rightarrow D_6$	240 – 250 (150 – 155)	114 – 124 (71 – 77)
$D_6 \rightarrow D_5$	240 – 250 (150 – 155)	114 – 124 (71 – 77)
$D_5 \rightarrow D_4$	158 – 168 (99 – 104)	69 – 79 (43 – 49)
$D_4 \rightarrow D_3$	111 – 121 (69 – 75)	39 – 49 (25 – 30)
$D_3 \rightarrow D_2$	53 – 61 (33 – 37)	14 – 18 (9 – 11)
$D_2 \rightarrow D_1$	7 – 11 (5 – 6)	7 – 11 (5 – 6)

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

Vehicle Speed at Which Lock-up Occurs/Releases

INFOID:0000000004279272

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up ON	Lock-up OFF
Closed throttle	48 – 56 (30 – 34)	45 – 53 (28 – 32)
Half throttle	58 – 66 (37 – 41)	55 – 63 (35 – 39)

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

Stall Speed

INFOID:0000000004279273

Stall speed	2,475 – 2,775 rpm

Torque Converter

INFOID:0000000004279274

Dimension between end of converter housing and torque converter	25.0 mm (0.98 in)