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TM

SECTION

TRANSAXLE & TRANSMISSION

TM

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PRECAUTION

PRECAUTIONS

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

INFOID:000000009012065

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

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 "SRS AIR BAG".**
- **Never 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:

Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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.**

Precautions for Removing of Battery Terminal

INFOID:00000000988884

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

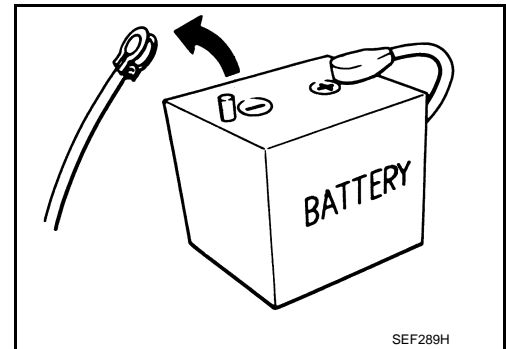
NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

The removal of 12V battery may cause a DTC detection error.



PRECAUTIONS

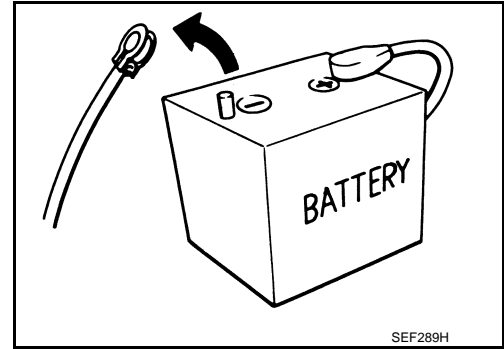
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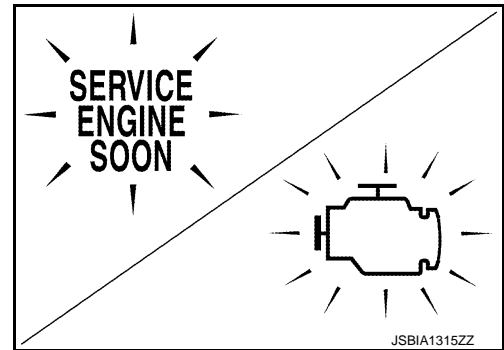
General Precautions

INFOID:000000009012066

- 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.



- 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-15. "FOR NORTH AMERICA : Fluids and Lubricants"](#) (For North America) or [MA-16. "FOR MEXICO : Fluids and Lubricants"](#) (For Mexico).
- 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.
- 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.
- 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-182. "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.



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

INFOID:000000009012067

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

CAUTION:

- Always turn the ignition switch OFF and disconnect the negative battery cable before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to illuminate.

PRECAUTIONS

< PRECAUTION >

[7AT: RE7R01B]

- Always connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to illuminate due to the open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)
- Certain systems and components, especially those related to OBD, may use a new style slide-locking type harness connector. For description and how to disconnect, refer to [PG-5, "Harness Connector"](#).
- Always route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MIL to illuminate due to the short circuit.
- Always connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to illuminate due to the malfunction of the EVAP system or fuel injection system, etc.
- Always erase the unnecessary malfunction information (repairs completed) from the ECM and TCM (Transmission control module) before returning the vehicle to the customer.

Service Notice or Precaution

INFOID:000000009012068

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-98, "Cleaning"](#). For radiator replacement, refer to [CO-14, "Exploded View"](#).

PREPARATION

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[7AT: RE7R01B]

PREPARATION

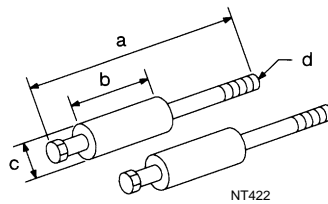
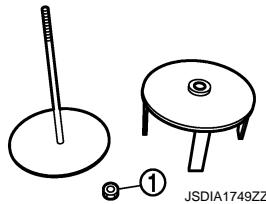
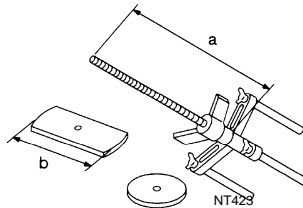
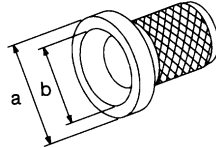
PREPARATION

Special Service Tool

INFOID:000000009012069

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
ST33400001 (J-26082) Drift a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.	<ul style="list-style-type: none"> Installing rear oil seal (2WD) Installing oil pump housing oil seal
KV31102400 (J-34285 and J-34285-87) Clutch spring compressor a: 320 mm (12.60 in) b: 174 mm (6.85 in)	<ul style="list-style-type: none"> Installing reverse brake return spring retainer Removing and installing 2346 brake spring retainer
KV31103800 (—) Clutch spring compressor 1. M12×1.75P	Removing and installing front brake spring retainer
ST25850000 (J-25721-A) Sliding hammer a: 179 mm (7.05 in) b: 70 mm (2.76 in) c: 40 mm (1.57 in) d: M12X1.75P	Remove oil pump assembly



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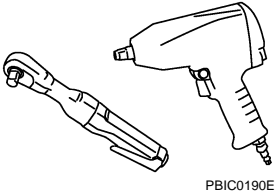
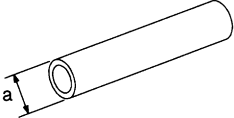
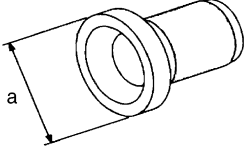
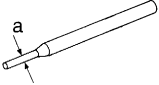
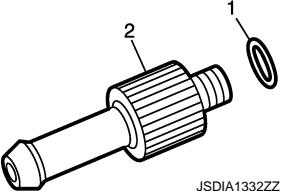
PREPARATION

< PREPARATION >

[7AT: RE7R01B]

Commercial Service Tool

INFOID:000000009012070

Tool name	Description
<p>Power tool</p>  <p>PBIC0190E</p>	<p>Loosening bolts and nuts</p>
<p>Drift a: 22 mm (0.87 in) dia.</p>  <p>NT083</p>	<p>Installing manual shaft oil seals</p>
<p>Drift a: 64 mm (2.52 in) dia.</p>  <p>SCIA5338E</p>	<p>Installing rear oil seal (4WD)</p>
<p>Pin punch a: 4 mm (0.16 in) dia.</p>  <p>NT410</p>	<p>Remove retaining pin</p>
<p>1. 315268E000* O-ring 2. 310811EA5A* Charging pipe</p>  <p>JSDIA1332ZZ</p>	<p>A/T fluid changing and adjustment</p>

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

COMPONENT PARTS

< SYSTEM DESCRIPTION >

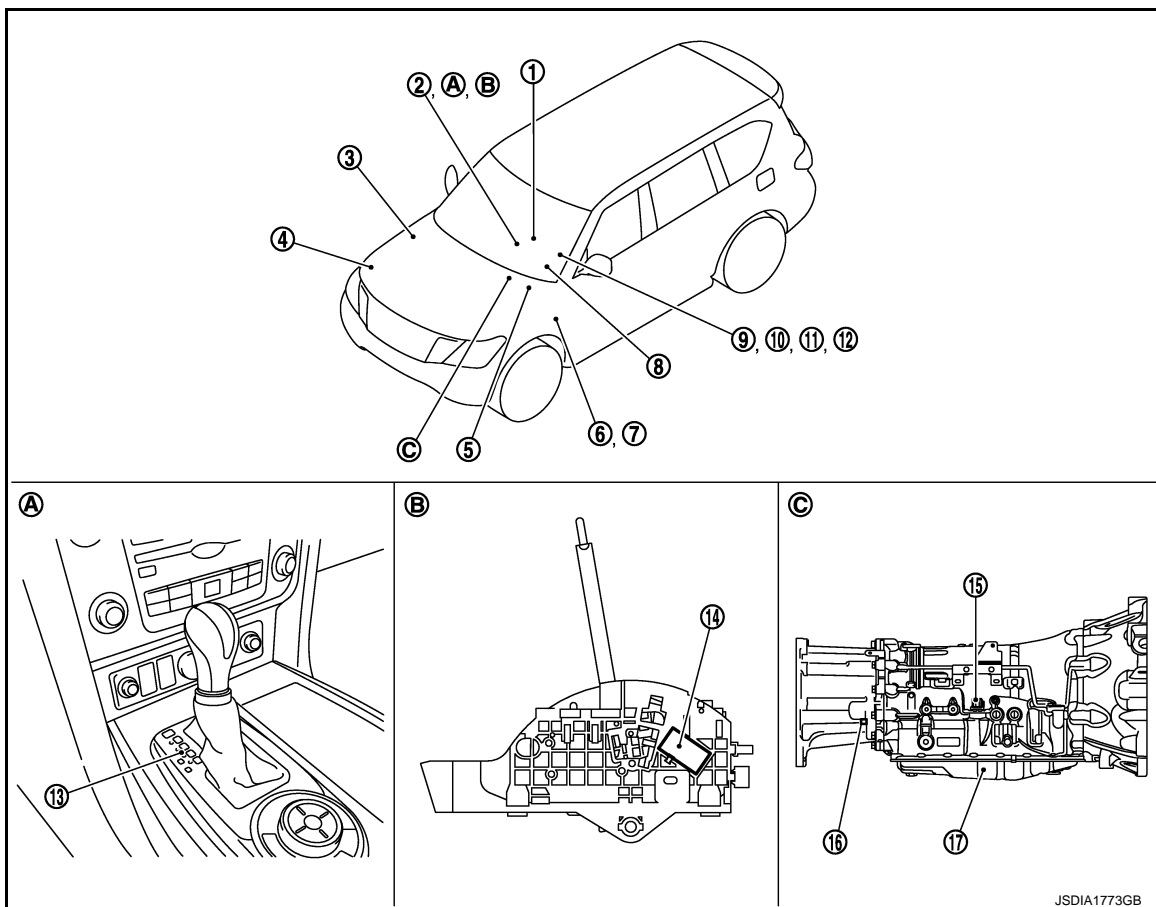
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SYSTEM DESCRIPTION

COMPONENT PARTS A/T CONTROL SYSTEM

A/T CONTROL SYSTEM : Component Parts Location

INFOID:000000009012071



- | | | |
|---|--|--|
| 1. Yaw rate/side/decel G sensor
Refer to BRC-9, "Component Parts Location" . | 2. Tow mode switch*1 | 3. IPDM E/R
Refer to PCS-4, "Component Parts Location" . |
| 4. ECM
Refer to EC-23, "Component Parts Location" . | 5. ABS actuator and electric unit (control unit)
Refer to BRC-9, "Component Parts Location" . | 6. Accelerator pedal position sensor
Refer to EC-23, "Component Parts Location" . |
| 7. Stop lamp switch
Refer to BRC-9, "Component Parts Location" . | 8. BCM
Refer to BCS-4, "BODY CONTROL SYSTEM : Component Parts Location" . | 9. Combination meter
Refer to MWI-6, "METER SYSTEM : Component Parts Location" . |
| 10. Shift position indicator
(In the information display in the combination meter) | 11. A/T CHECK indicator lamp
(On the combination meter) | 12. Tow mode indicator lamp |
| 13. Selector lever position indicator | 14. Manual mode switch | 15. Joint connector |
| 16. Output speed sensor*2 | 17. Control valve & TCM*3 | |
| A. Center console | B. A/T shift selector assembly | C. A/T assembly |

*1 : Tow mode switch is integrated in to SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models).

*2 : Output speed sensor is installed in A/T assembly.

*3 : Control valve & TCM is installed in A/T assembly.

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

NOTE:

The following components are included in the control valve & TCM (17).

- TCM
- Input speed sensor 1, 2
- 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

A/T CONTROL SYSTEM : Component Description

INFOID:000000009012072

Name	Function
TCM	TM-13, "A/T CONTROL SYSTEM : TCM"
Transmission range switch	TM-13, "A/T CONTROL SYSTEM : Transmission Range Switch"
Output speed sensor	TM-13, "A/T CONTROL SYSTEM : Output Speed Sensor"
Input speed sensor 1	TM-13, "A/T CONTROL SYSTEM : Input Speed Sensor"
Input speed sensor 2	
A/T fluid temperature sensor	TM-13, "A/T CONTROL SYSTEM : A/T Fluid Temperature Sensor"
Input clutch solenoid valve	TM-13, "A/T CONTROL SYSTEM : Input Clutch Solenoid Valve"
Front brake solenoid valve	TM-13, "A/T CONTROL SYSTEM : Front Brake Solenoid Valve"
Direct clutch solenoid valve	TM-13, "A/T CONTROL SYSTEM : Direct Clutch Solenoid Valve"
High and low reverse clutch solenoid valve	TM-14, "A/T CONTROL SYSTEM : High and Low Reverse Clutch Solenoid Valve"
Low brake solenoid valve	TM-14, "A/T CONTROL SYSTEM : Low Brake Solenoid Valve"
Anti-interlock solenoid valve	TM-14, "A/T CONTROL SYSTEM : Anti-interlock Solenoid Valve"
2346 brake solenoid valve	TM-14, "A/T CONTROL SYSTEM : 2346 Brake Solenoid Valve"
Torque converter clutch solenoid valve	TM-14, "A/T CONTROL SYSTEM : Torque Converter Clutch Solenoid Valve"
Line pressure solenoid valve	TM-14, "A/T CONTROL SYSTEM : Line Pressure Solenoid Valve"
Accelerator pedal position sensor	TM-14, "A/T CONTROL SYSTEM : Accelerator Pedal Position Sensor"
Manual mode switch	TM-14, "A/T CONTROL SYSTEM : Manual Mode Switch"
Tow mode switch	TM-15, "A/T CONTROL SYSTEM : Tow Mode Switch"
A/T CHECK indicator lamp	TM-15, "A/T CONTROL SYSTEM : A/T CHECK Indicator Lamp"
Tow mode indicator lamp	TM-15, "A/T CONTROL SYSTEM : Tow Mode Indicator Lamp"
Selector lever position indicator	TM-15, "A/T CONTROL SYSTEM : Selector Lever Position Indicator"
Stop lamp switch	BRC-14, "Stop Lamp Switch"
Yaw rate/side G sensor	BRC-14, "Yaw Rate/Side/Decel G sensor"
Starter relay	STR-5, "System Description"
ECM	EC-42, "ENGINE CONTROL SYSTEM : System Description"
BCM	BCS-6, "BODY CONTROL SYSTEM : System Description"
Combination meter	MWI-9, "METER SYSTEM : System Description"
ABS actuator and electric unit (control unit)	BRC-15, "System Description"

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

A/T CONTROL SYSTEM : TCM

INFOID:000000009012073

- The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.
- The TCM is integral with the control valve assembly and built into the A/T assembly.

A/T CONTROL SYSTEM : Transmission Range Switch

INFOID:000000009012074

- The transmission range switch incorporates four contact switches. Each contact switch transmits an ON/OFF signal to the TCM.
- The TCM judges a select lever position from a combination of ON/OFF signals transmitted from each contact switch.

Select lever position	Transmission range switch			
	SW1	SW2	SW3	SW4
P	OFF	OFF	OFF	OFF
R	ON	OFF	OFF	ON
N	ON	ON	OFF	OFF
D and M	ON	ON	ON	ON

A/T CONTROL SYSTEM : Input Speed Sensor

INFOID:000000009012075

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.

A/T CONTROL SYSTEM : Output Speed Sensor

INFOID:000000009012076

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.

A/T CONTROL SYSTEM : A/T Fluid Temperature Sensor

INFOID:000000009012077

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

A/T CONTROL SYSTEM : Input Clutch Solenoid Valve

INFOID:000000009012078

- 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. 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.

A/T CONTROL SYSTEM : Front Brake Solenoid Valve

INFOID:000000009012079

- 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. 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.

A/T CONTROL SYSTEM : Direct Clutch Solenoid Valve

INFOID:000000009012080

- 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. 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.

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

A/T CONTROL SYSTEM : High and Low Reverse Clutch Solenoid Valve

INFOID:000000009012081

- 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. 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.

A/T CONTROL SYSTEM : Low Brake Solenoid Valve

INFOID:000000009012082

- 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. 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.

A/T CONTROL SYSTEM : Anti-interlock Solenoid Valve

INFOID:000000009012083

- 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.

A/T CONTROL SYSTEM : 2346 Brake Solenoid Valve

INFOID:000000009012084

- 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. 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.

A/T CONTROL SYSTEM : Torque Converter Clutch Solenoid Valve

INFOID:000000009012085

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. Torque converter clutch piston operation will then be controlled.

A/T CONTROL SYSTEM : Line Pressure Solenoid Valve

INFOID:000000009012086

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.

A/T CONTROL SYSTEM : Accelerator Pedal Position Sensor

INFOID:000000009012087

- The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly.
- The accelerator pedal position sensor detects the accelerator position.
- The accelerator pedal position sensor transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. Then, the TCM receives accelerator pedal position signal from the ECM via CAN communication.

A/T CONTROL SYSTEM : Manual Mode Switch

INFOID:000000009012088

- The manual mode switch [mode select switch and position select switch (shift-up/shift-down)] is installed in the A/T shift selector assembly.
- The mode select switch detects the position (the main shift gate side or manual shift gate side) of the selector lever and transmits a manual mode signal or a not manual mode signal to the combination meter. Then, the TCM receives a manual mode signal or non-manual mode signal from the combination meter.
- The position select switch (shift-up) detects that the selector lever is shifted to the shift-up side of the manual shift gate and transmits a manual mode shift up signal to the combination meter. Then, the TCM receives a manual mode shift up signal from the combination meter.
- The position select switch (shift-down) detects that the selector lever is shifted to the shift-down side of the manual shift gate and transmits a manual mode shift down signal to the combination meter. Then, the TCM receives a manual mode shift down signal from the combination meter.

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

A/T CONTROL SYSTEM : Tow Mode Switch

INFOID:000000009012089

- Tow mode switch is integrated in to SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models).
- When tow mode switch is pressed while tow mode indicator lamp on combination meter is OFF, the tow mode turns ON and tow mode indicator lamp turns ON.
- When tow mode switch is pressed while tow mode indicator lamp on combination meter is ON, the tow mode turns OFF and tow mode indicator lamp turns OFF.

A/T CONTROL SYSTEM : A/T CHECK Indicator Lamp

INFOID:000000009012090

A/T CHECK INDICATOR LAMP

Turns ON when ignition switch turns ON and turns OFF when the system is normal, for bulb check purposes.

Condition (status)	A/T CHECK indicator lamp
Ignition switch OFF	OFF
For approx. 2 seconds after the ignition switch is turned ON	ON
Approx. 2 seconds after ignition switch is turned ON	OFF
A/T is malfunctioning	OFF

A/T CONTROL SYSTEM : Tow Mode Indicator Lamp

INFOID:000000009012091

TOW MODE INDICATOR LAMP

Turns ON when tow mode is switched to operational status (ON) by tow mode switch.

Condition (status)	Tow mode indicator lamp
Ignition switch OFF	OFF
When ignition switch turns ON	OFF
Press tow mode switch while tow mode indicator lamp is OFF.	ON
Press tow mode switch while tow mode indicator lamp is ON.	OFF

A/T CONTROL SYSTEM : Selector Lever Position Indicator

INFOID:000000009012092

Indicates selector lever position.

A/T SHIFT LOCK SYSTEM

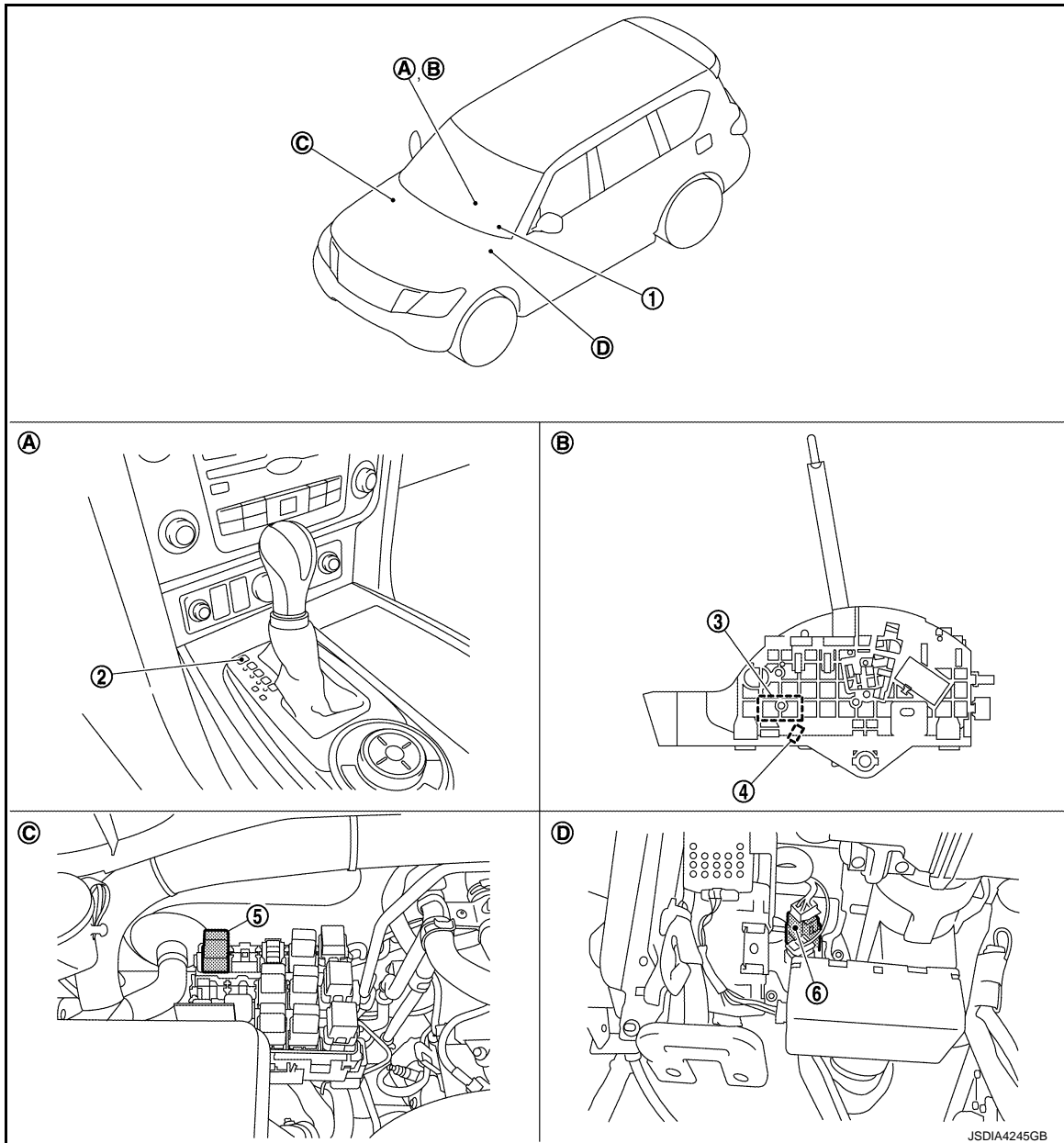
COMPONENT PARTS

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

A/T SHIFT LOCK SYSTEM : Component Parts Location

INFOID:000000009012093



- | | | |
|--|--------------------------------|------------------------|
| 1. BCM
Refer to BCS-4. "BODY CONTROL SYSTEM : Component Parts Location" . | 2. Shift lock cover * | 3. Shift lock solenoid |
| 4. Park position switch | 5. Remote engine start relay | 6. Stop lamp switch |
| A. Center console | B. A/T shift selector assembly | C. Engine room, RH |
| D. Brake pedal, upper | | |

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

A/T SHIFT LOCK SYSTEM : Component Description

INFOID:000000009012094

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

Component	Function
Shift lock solenoid	Shift lock solenoid operates according to the signal from the remote engine start relay and moves the lock lever.
Park position switch	Park position switch detects that the selector lever is in "P" position.
Shift lock release button	Shift lock release button moves the lock lever forcibly.
Remote engine start relay	<ul style="list-style-type: none"> • Remote engine start relay is controlled by the BCM. • When the remote engine start relay turns ON, power is applied to shift lock unit.
BCM	BCM controls ON/OFF of the remote engine start relay.
Stop lamp switch	<ul style="list-style-type: none"> • Stop lamp switch turns ON when the brake pedal is depressed. • When the stop lamp switch turns ON, the BCM is energized.

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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

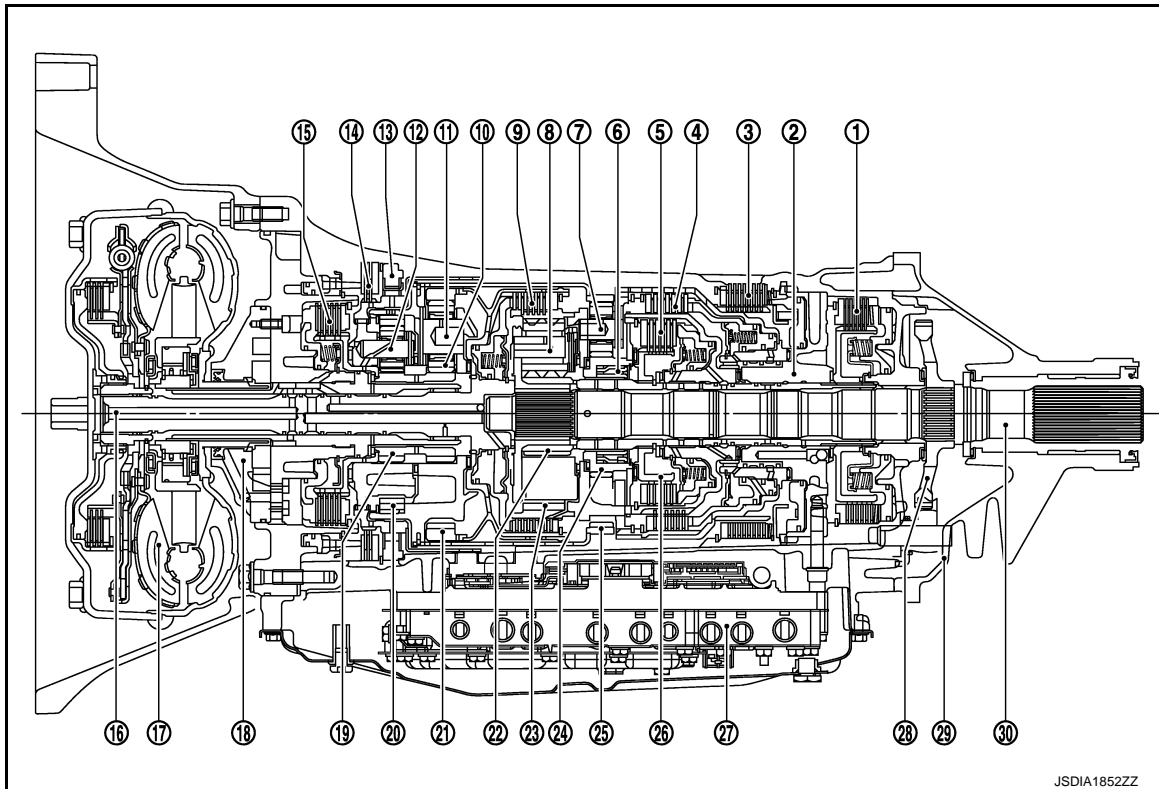
[7AT: RE7R01B]

STRUCTURE AND OPERATION TRANSMISSION

TRANSMISSION : Cross-Sectional View

INFOID:000000009012095

2WD MODELS



- | | | |
|--|---|---------------------------------------|
| 1. Low brake | 2. Drum support | 3. Reverse brake |
| 4. Direct clutch | 5. High and low reverse clutch | 6. 2nd one-way clutch |
| 7.* ¹ Rear carrier | 8. Mid carrier | 9. Input clutch |
| 10.* ² Front sun gear | 11.* ³ Front carrier | 12. Under drive carrier |
| 13. 1st one-way clutch | 14. Front brake | 15. 2346 brake |
| 16.* ⁴ Input shaft | 17. Torque converter | 18. Oil pump |
| 19.* ² Under drive sun gear | 20.* ³ Under drive internal gear | 21.* ⁴ Front internal gear |
| 22. Mid sun gear | 23.* ¹ Mid internal gear | 24. Rear sun gear |
| 25. Rear internal gear | 26. High and low reverse clutch hub | 27. Control valve & TCM |
| 28. Parking gear | 29. Rear extension | 30. Output shaft |

*1: 7 and 23 are one unit.

*2: 10 and 19 are one unit.

*3: 11 and 20 are one unit.

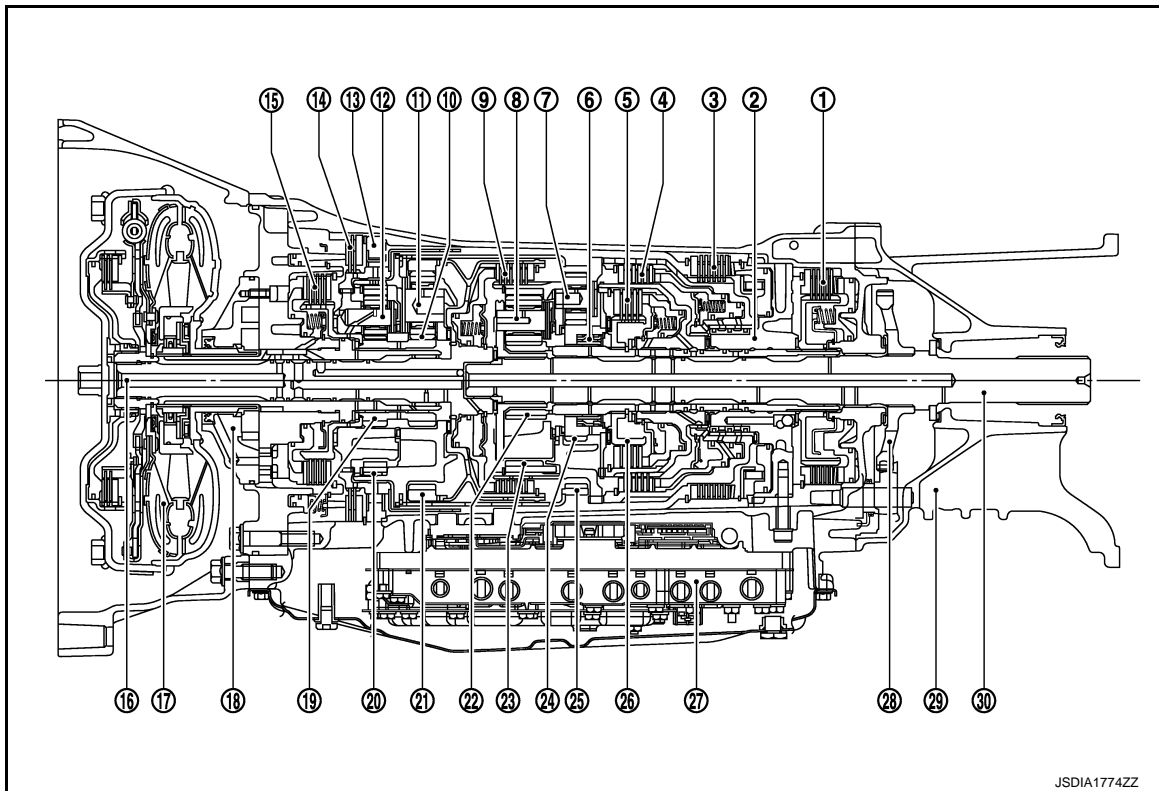
*4: 16 and 21 are one unit.

4WD MODELS

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- | | | |
|--|---|---------------------------------------|
| 1. Low brake | 2. Drum support | 3. Reverse brake |
| 4. Direct clutch | 5. High and low reverse clutch | 6. 2nd one-way clutch |
| 7.* ¹ Rear carrier | 8. Mid carrier | 9. Input clutch |
| 10.* ² Front sun gear | 11.* ³ Front carrier | 12. Under drive carrier |
| 13. 1st one-way clutch | 14. Front brake | 15. 2346 brake |
| 16.* ⁴ Input shaft | 17. Torque converter | 18. Oil pump |
| 19.* ² Under drive sun gear | 20.* ³ Under drive internal gear | 21.* ⁴ Front internal gear |
| 22. Mid sun gear | 23.* ¹ Mid internal gear | 24. Rear sun gear |
| 25. Rear internal gear | 26. High and low reverse clutch hub | 27. Control valve & TCM |
| 28. Parking gear | 29. Adapter case | 30. Output shaft |

*1: 7 and 23 are one unit.

*2: 10 and 19 are one unit.

*3: 11 and 20 are one unit.

*4: 16 and 21 are one unit.

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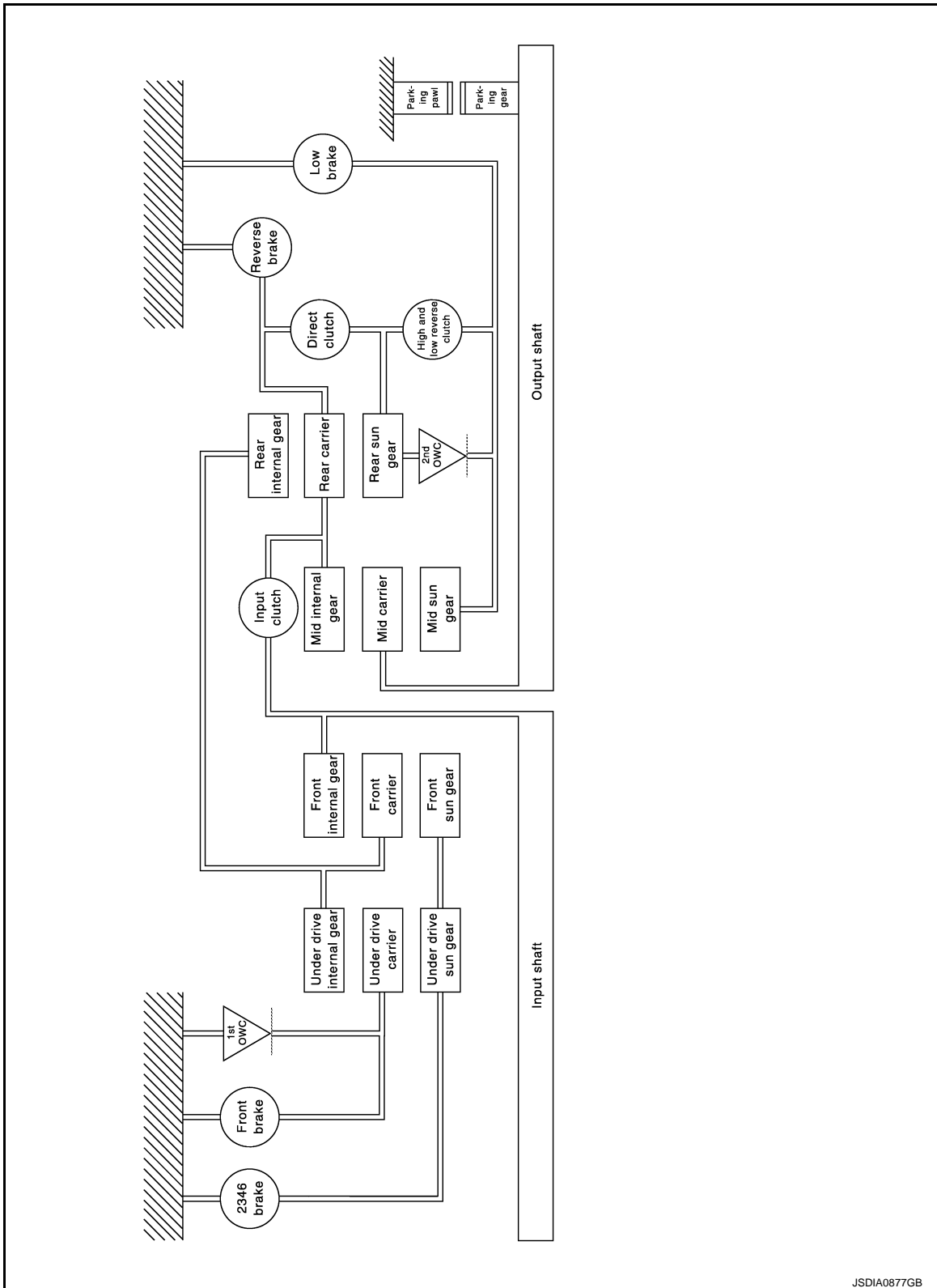
STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

TRANSMISSION : System Diagram

INFOID:000000009012096



JSDIA0877GB

TRANSMISSION : System Description

INFOID:000000009012097

DESCRIPTION

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

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 BRAKE 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	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

- - 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.

*: Down shift automatically according to the vehicle speed.

JSDIA1455GB

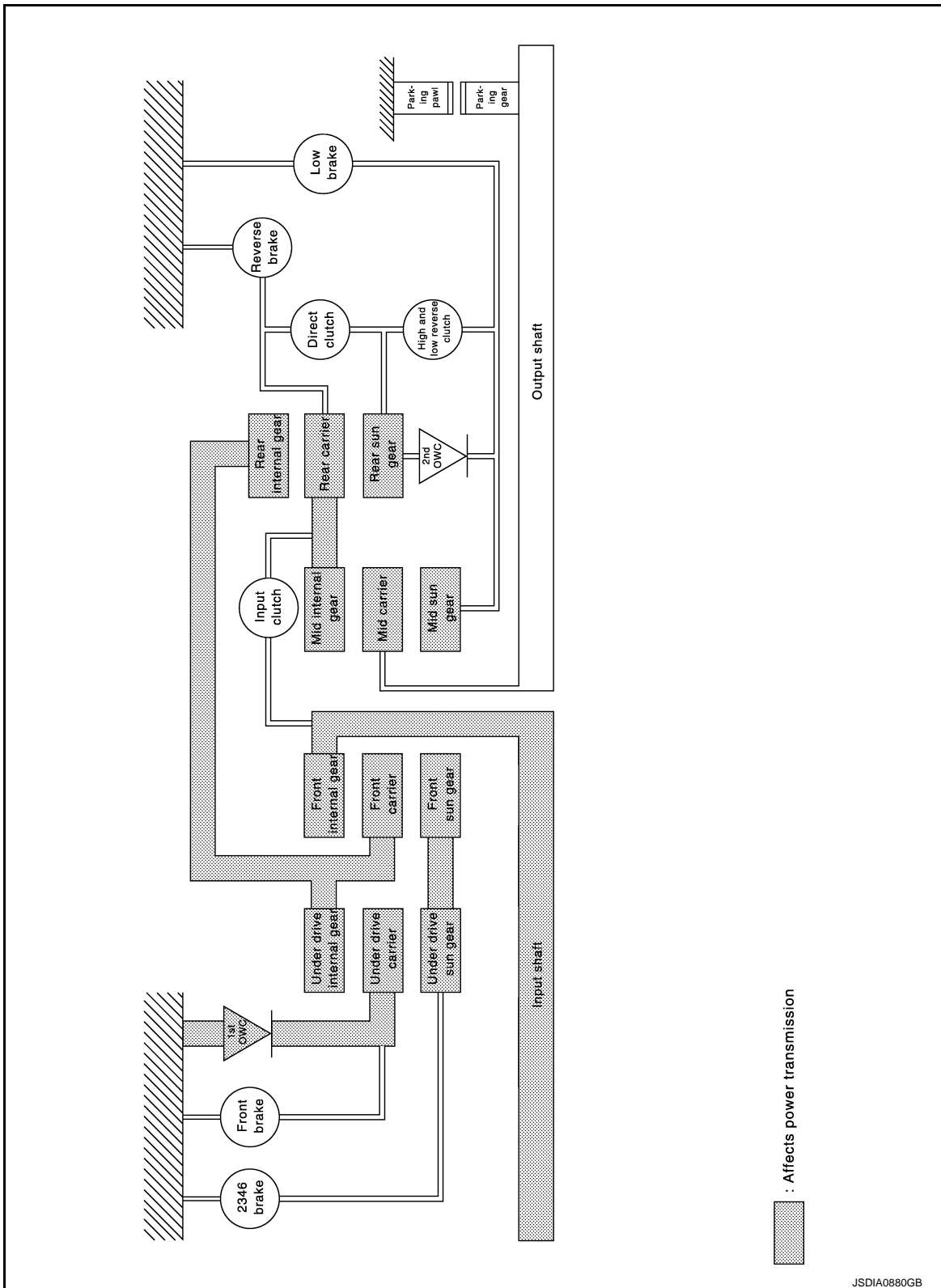
POWER TRANSMISSION

"N" Position

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



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

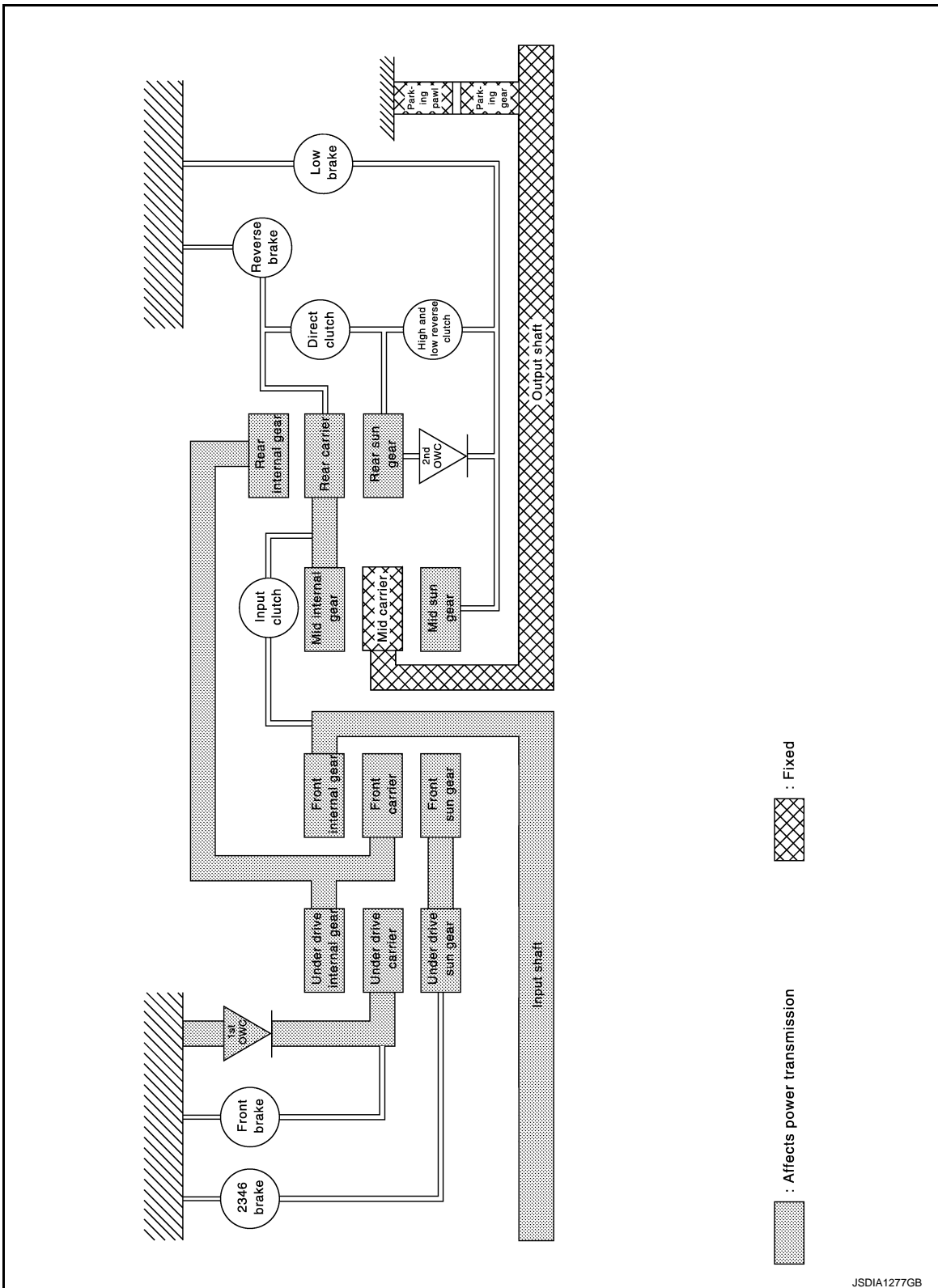
"P" Position

JSDIA0880GB

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- 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.

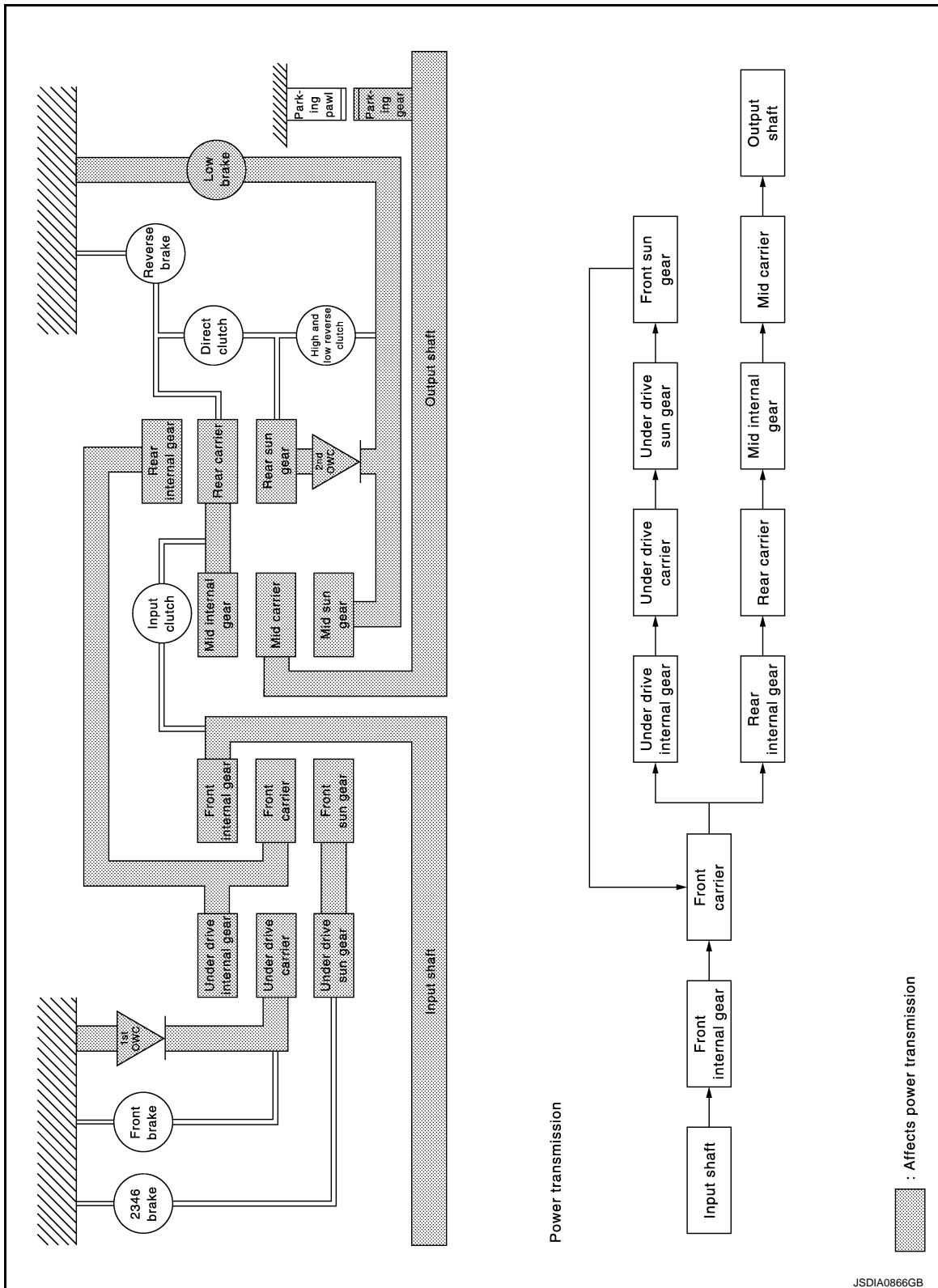
“D1” Position

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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- 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.

JSDIA0866GB

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

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

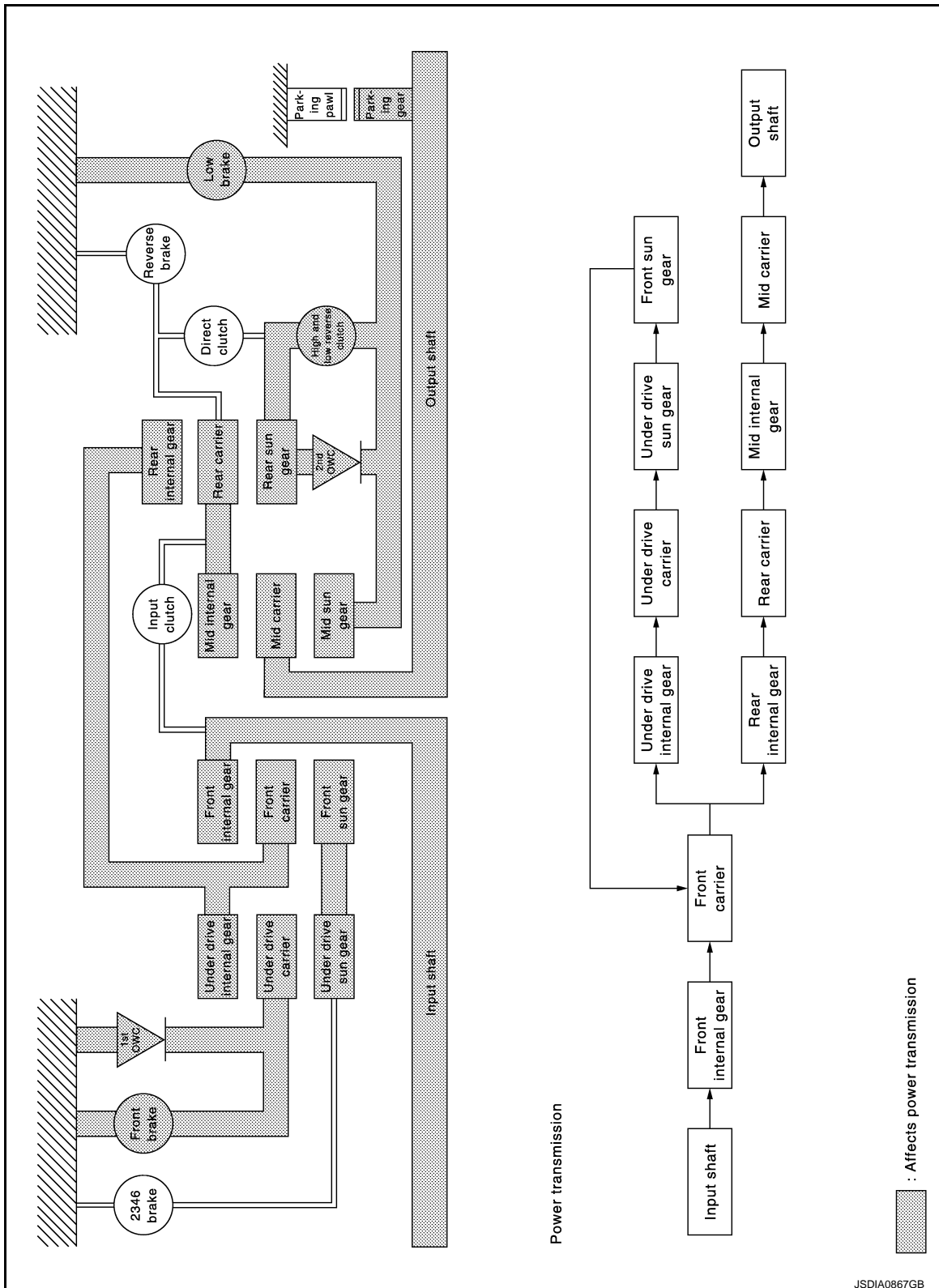
"M1" Position

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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- 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.

JSDIA0867GB

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

- 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

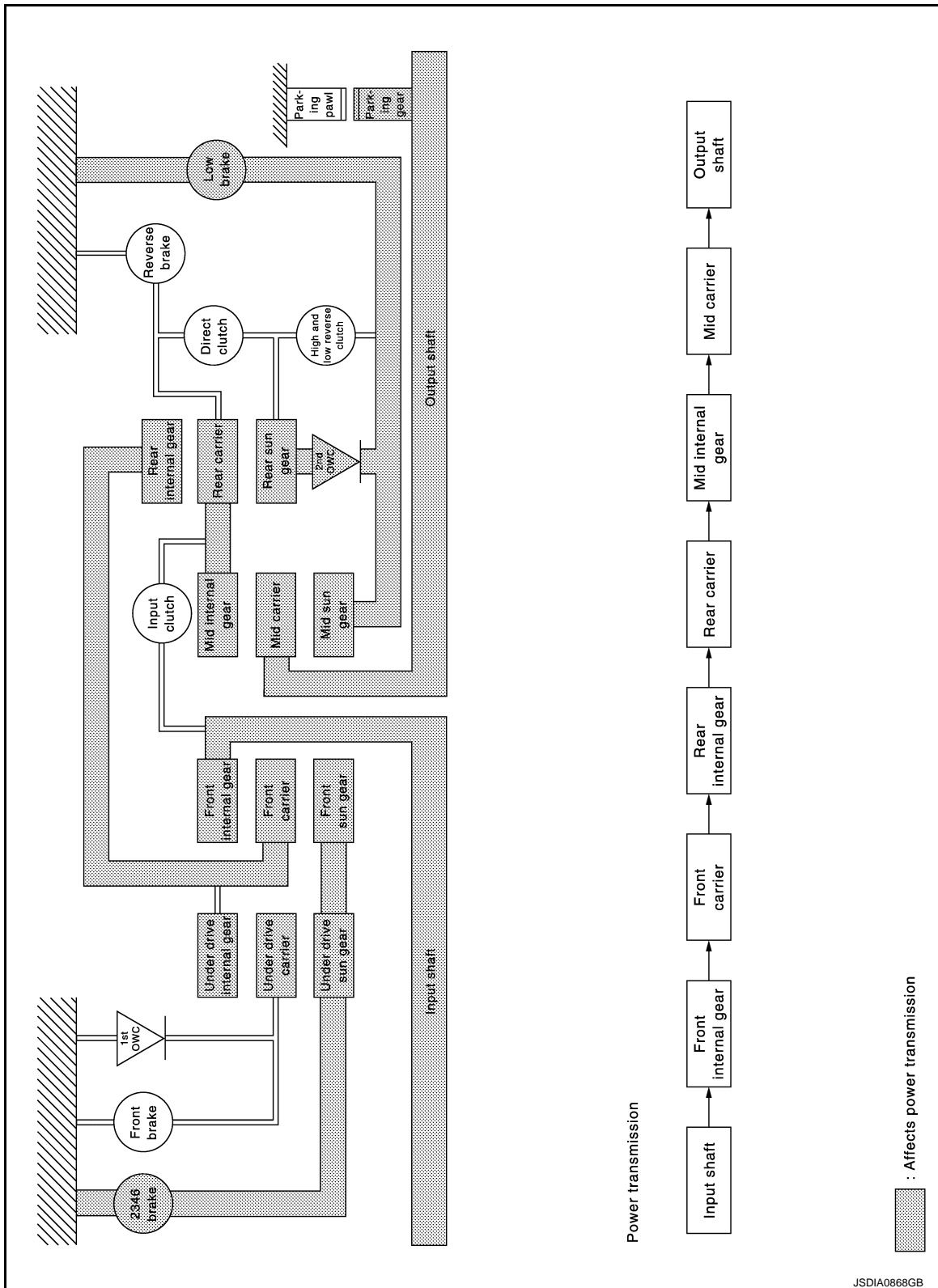
“D2” Position

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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- 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.

JSDIA0868GB

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

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

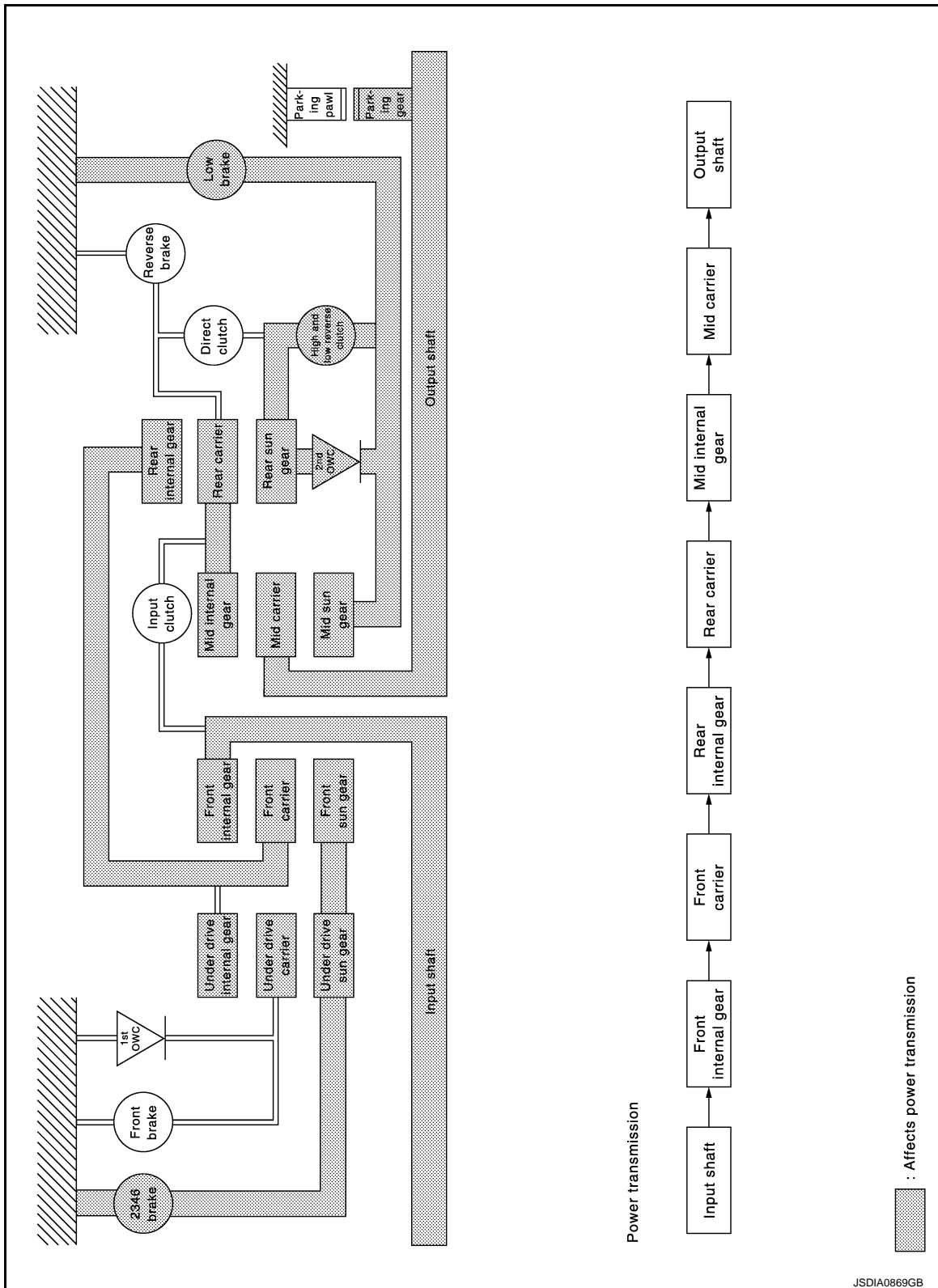
"M2" Position

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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- 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.

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

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

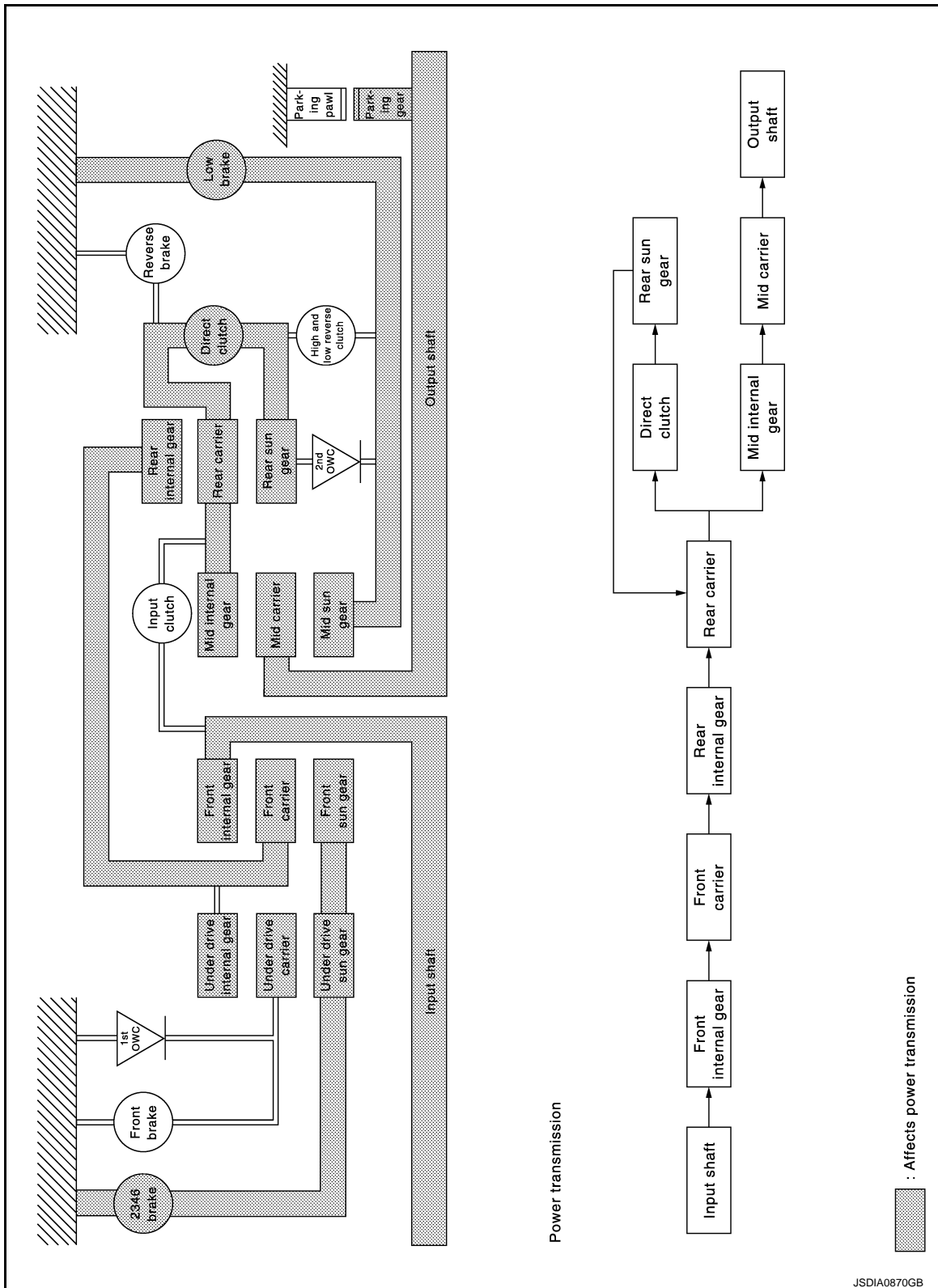
“D3” and “M3” Positions

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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- 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.

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

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

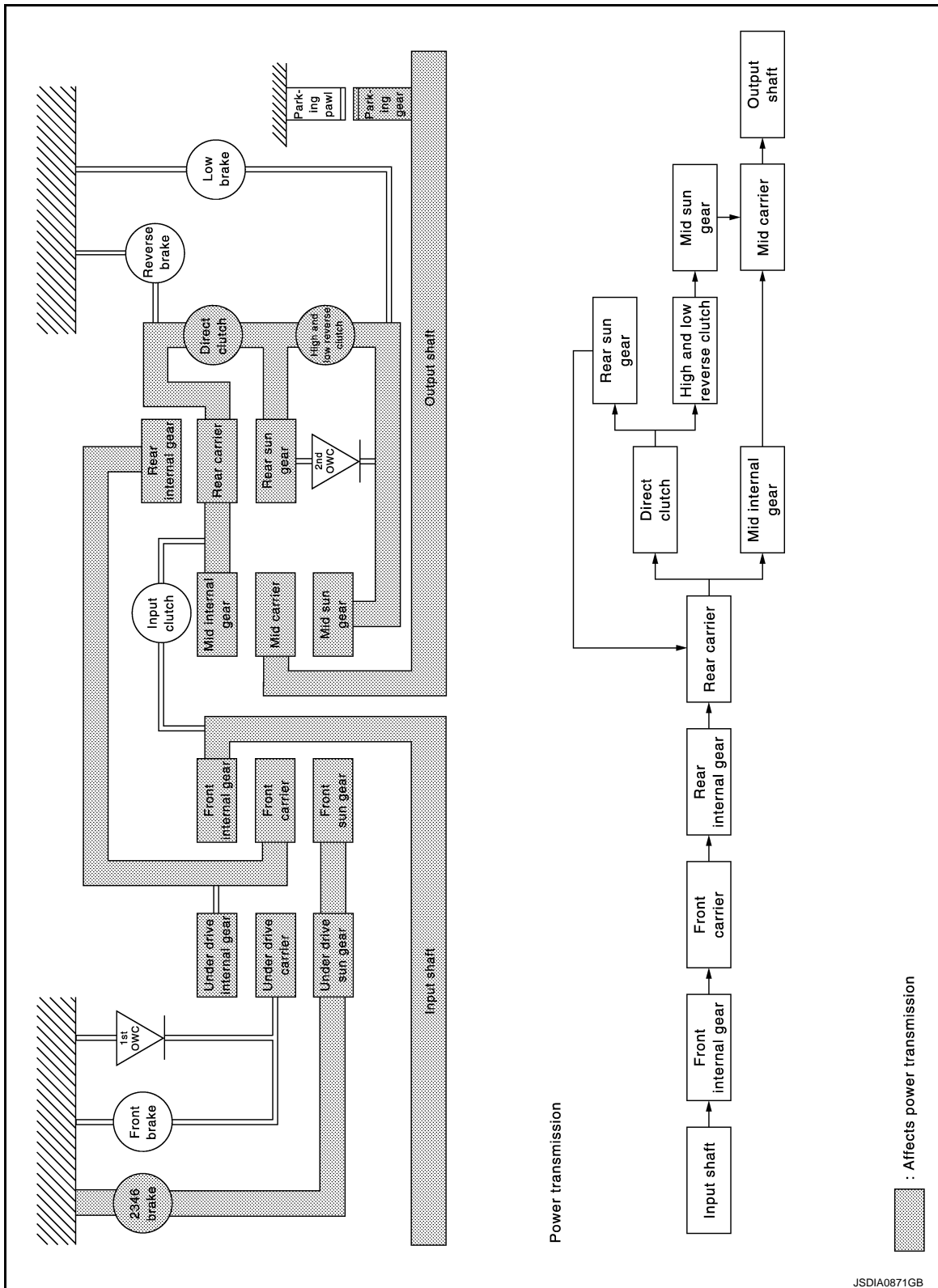
“D4” and “M4” Positions

A
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TM
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P

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- 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.

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

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

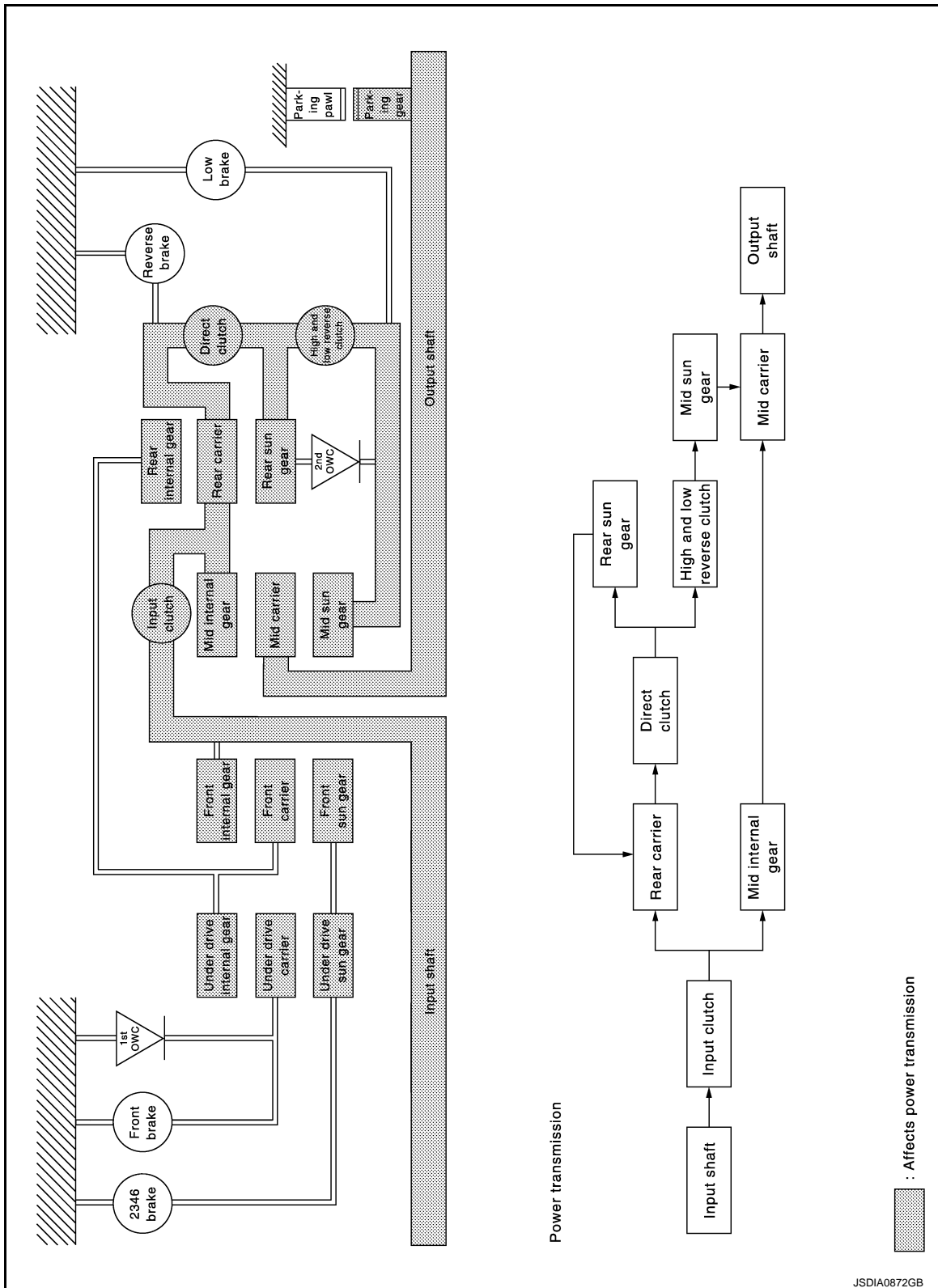
“D5” and “M5” Positions

A
B
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TM
E
F
G
H
I
J
K
L
M
N
O
P

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- 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.

JSDIA0872GB

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

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

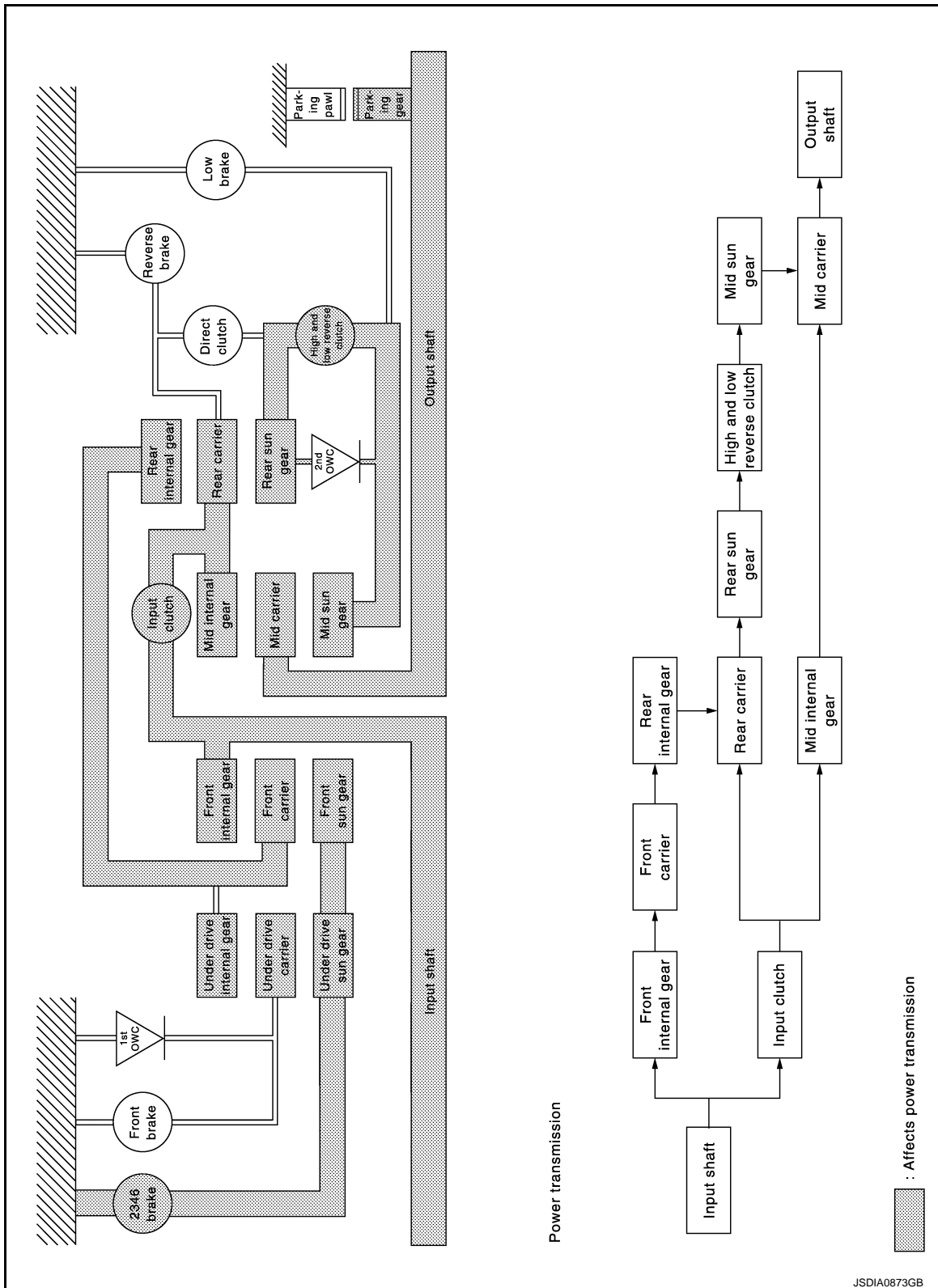
"D6" and "M6" Positions

A
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C
TM
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P

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- 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.

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

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

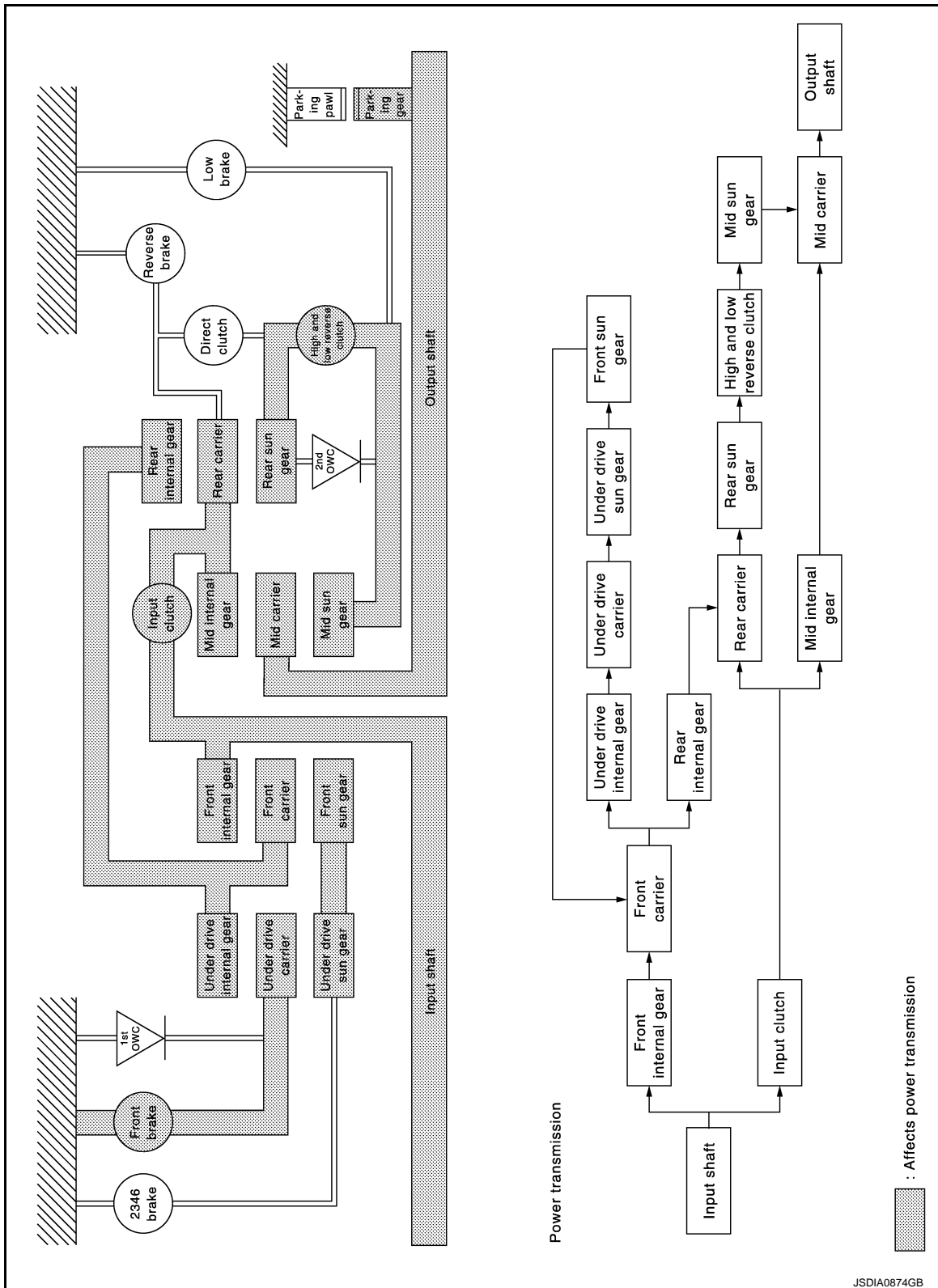
“D7” and “M7” Positions

A
B
C
TM
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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- 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.

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

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

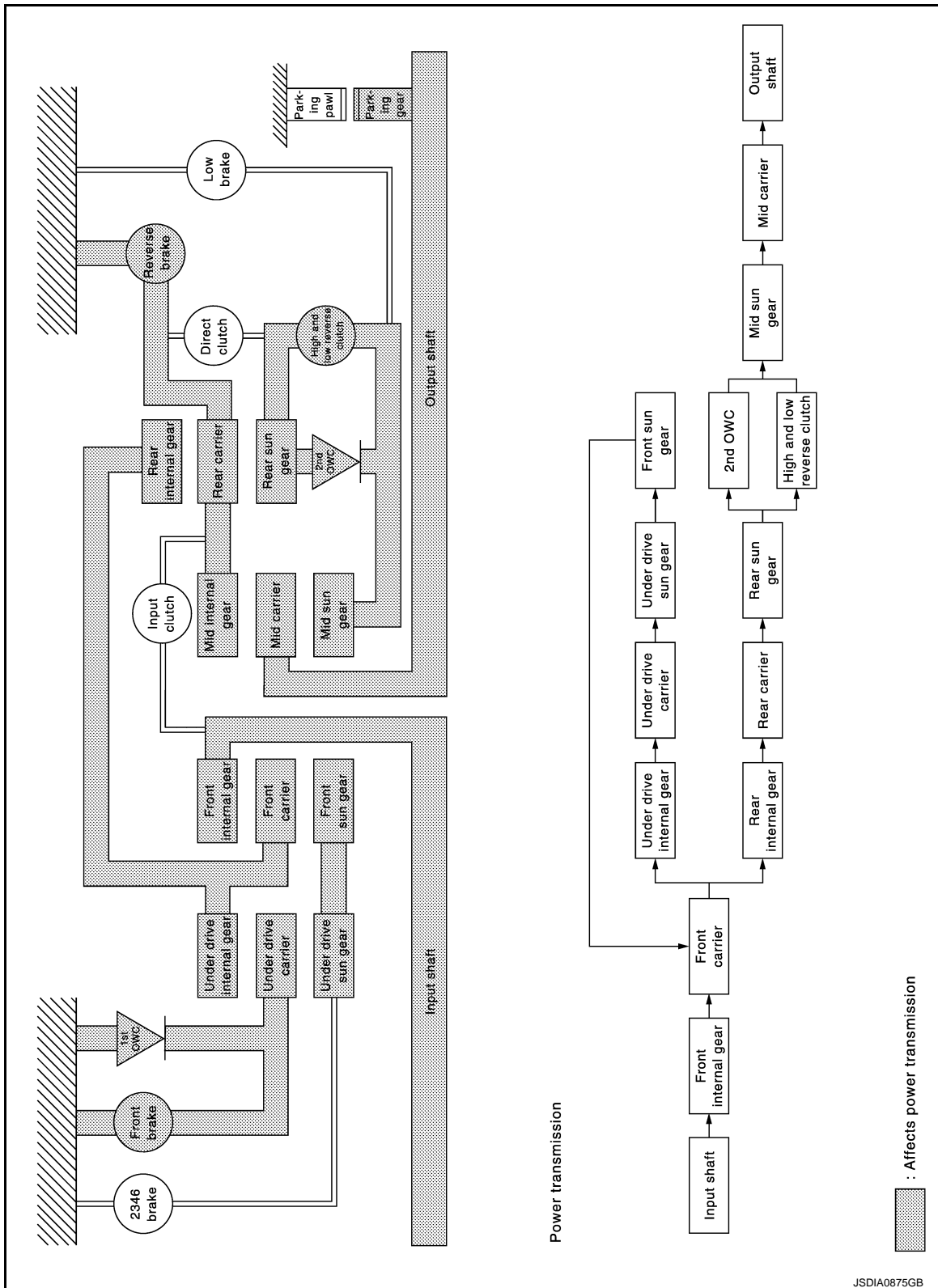
“R” Position

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STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]



- 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.

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

- 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	—

TRANSMISSION : Component Description

INFOID:000000009012098

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.

FLUID COOLER & FLUID WARMER SYSTEM

FLUID COOLER & FLUID WARMER SYSTEM : System Description

INFOID:000000009012099

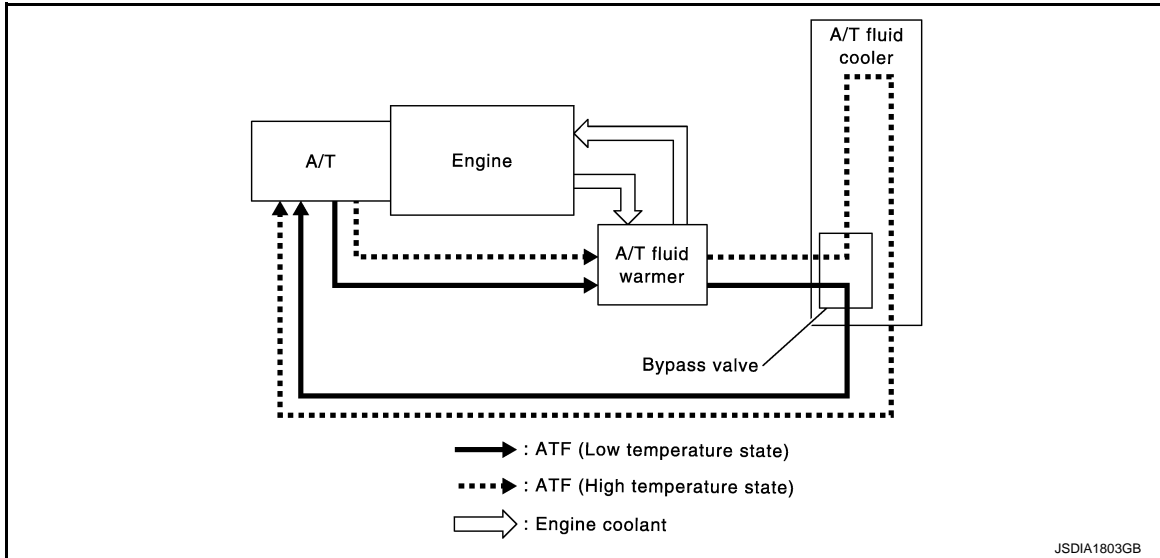
The A/T fluid temperature is controlled to an appropriate level by the A/T fluid cooler and A/T fluid warmer.

STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

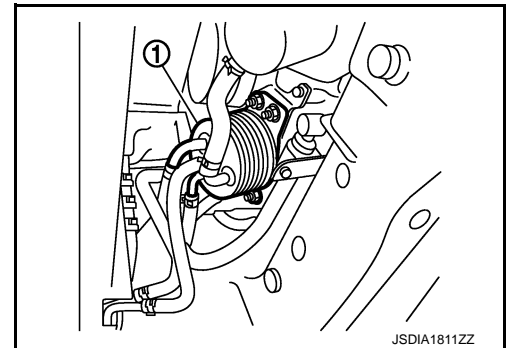
A/T FLUID COOLER SCHEMATIC



COMPONENT DESCRIPTION

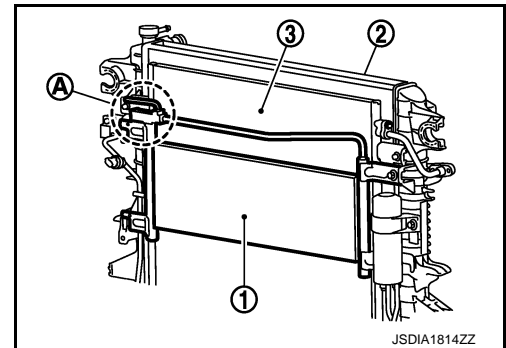
A/T fluid warmer

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

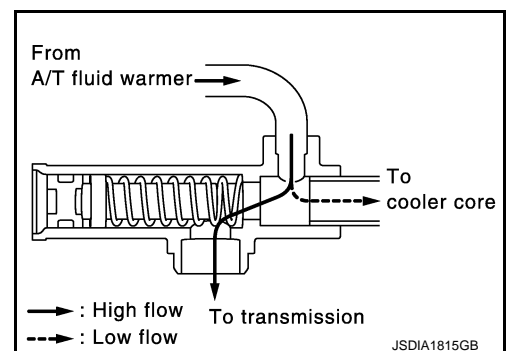


A/T fluid cooler (with bypass valve)

- A/T fluid cooler (1) is installed in the front of radiator (2) and condenser (3).
- A/T fluid cooler is provided with a bypass valve that controls ATF flow. Bypass valve operates by thermo wax and a return spring. Bypass valve fully opens when A/T fluid temperature is approximately 90°C (194°F) and fully closes when A/T fluid temperature is approximately 100°C (212°F).



- When A/T fluid temperature is low, the bypass valve is open. Most of ATF therefore returns to the transmission without flowing into the cooler core that has larger flow resistance.

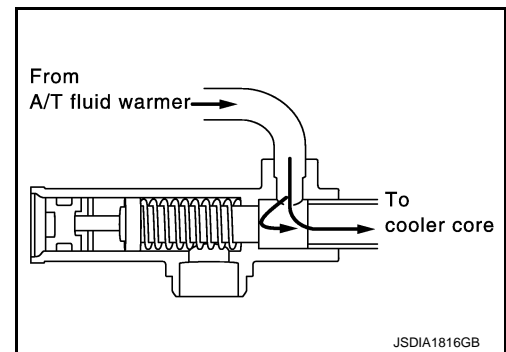


STRUCTURE AND OPERATION

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

- When A/T fluid temperature rises [to approximately 100°C (212°F)], bypass valve closes and allows ATF to flow into cooler core. ATF flowing into cooler core is cooled by air stream caused by vehicle travel and returned to transmission.



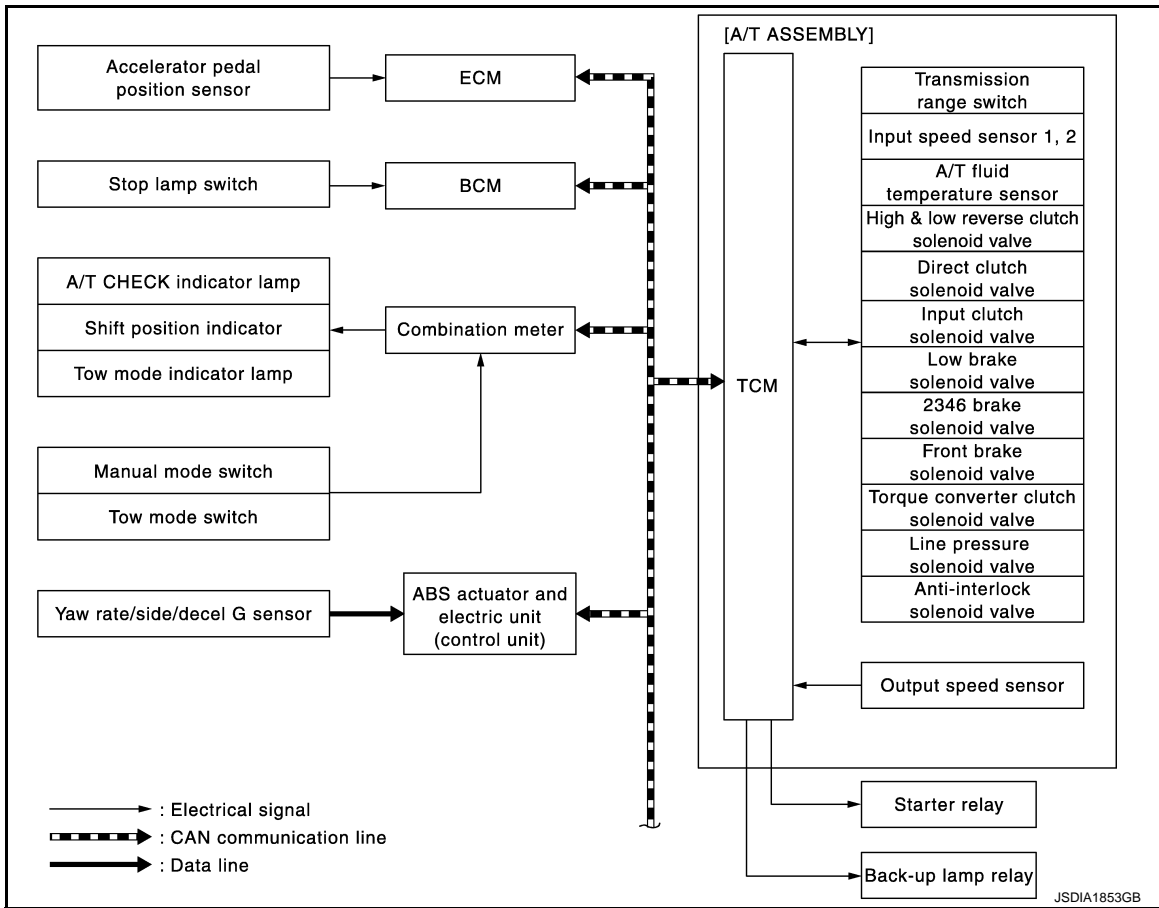
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SYSTEM

A/T CONTROL SYSTEM

A/T CONTROL SYSTEM : System Diagram

INFOID:000000009012100



A/T CONTROL SYSTEM : System Description

INFOID:000000009012101

INPUT/OUTPUT SIGNAL CHART

Sensor (or signal)	TCM function	Actuator
Transmission range switch	Line pressure control (TM-50)	Input clutch solenoid valve
Accelerator pedal position signal	Shift change control (TM-52)	Direct clutch solenoid valve
Closed throttle position signal	Shift pattern control (TM-52)	Front brake solenoid valve
Wide open throttle position signal	Lock-up control (TM-59)	High and low reverse clutch solenoid valve
Engine speed signal	Fail-safe control (TM-77)	Low brake solenoid valve
A/T fluid temperature sensor	Self-diagnosis (TM-64)	Torque converter clutch solenoid valve
Output speed sensor	CONSULT communication line (TM-64)	Line pressure solenoid valve
Vehicle speed signal	CAN communication line (TM-105)	Anti-interlock solenoid valve
Manual mode switch signal		2346 brake solenoid valve
Stop lamp switch signal		A/T CHECK indicator lamp
Input speed sensor 1, 2		Tow mode indicator lamp
Yaw rate/side/decel G sensor		Shift position indicator
Tow mode switch signal		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.

SYSTEM

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

- Transmit required output signals to the respective solenoids.

A/T CONTROL SYSTEM : Fail-Safe

INFOID:000000009012102

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-92. "Work 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	<ul style="list-style-type: none"> • Selects the shifting pattern that the malfunctioning parts identified at 1st fail-safe 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	—	<ul style="list-style-type: none"> • Fixed in the "D" position (The shifting can be performed) • Lock-up is prohibited when 30 km/h (19 MPH) or less • 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 	—	<ul style="list-style-type: none"> • Fixed in the "D" position (The shifting can be performed) • Lock-up is prohibited when 30 km/h (19 MPH) or less • 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	<ul style="list-style-type: none"> • The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited 	—	<ul style="list-style-type: none"> • The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	<ul style="list-style-type: none"> • Fix the gear while driving • Manual mode is prohibited 	—	<ul style="list-style-type: none"> • Manual mode is prohibited
P0717	Between the gears of 1 - 2 - 3	<ul style="list-style-type: none"> • The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited 	—	<ul style="list-style-type: none"> • The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	<ul style="list-style-type: none"> • Fix the gear while driving • Manual mode is prohibited 	—	<ul style="list-style-type: none"> • Manual mode is prohibited

SYSTEM

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

DTC	Vehicle condition		Vehicle behavior for 1st fail-safe	Vehicle behavior for 2nd fail-safe	Vehicle behavior for final fail-safe
P0720	Between the gears of 1 - 2 - 3		<ul style="list-style-type: none"> Only downshift can be performed Manual mode is prohibited A vehicle speed signal from the combination meter is regarded as an effective signal 	—	<ul style="list-style-type: none"> The shifting between the gears of 1 - 2 - 3 can be performed Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7		<ul style="list-style-type: none"> Fix the gear at driving Manual mode is prohibited A vehicle speed signal from the combination meter is regarded as an effective signal 	—	
P0729 P0731 P0732 P0733 P0734 P0735 P1734	Small gear ratio difference		Engine torque limit: Max 150 Nm	—	Engine torque limit: Max 150 Nm
	Great gear ratio difference	Neutral malfunction between the gears of 1 - 2 - 3 and 7	<ul style="list-style-type: none"> Locks in 2GR, 3GR or 4GR Manual mode is prohibited 	—	<ul style="list-style-type: none"> 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
		Other than the above	<ul style="list-style-type: none"> Locks in 1GR, 2GR, 3GR, 4GR, 5GR or 6GR Fix the gear while driving Manual mode is prohibited 	<ul style="list-style-type: none"> The shifting between the gears of 1 - 2 - 3 can be performed Manual mode is prohibited 	<ul style="list-style-type: none"> 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 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
P0730	—		<ul style="list-style-type: none"> Locks in 5GR, 6GR or 7GR Manual mode is prohibited 	<ul style="list-style-type: none"> The shifting between the gears of 1 - 2 - 3 can be performed Manual mode is prohibited 	<ul style="list-style-type: none"> 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	—		<ul style="list-style-type: none"> Lock-up is prohibited Slip lock-up is prohibited 	—	<ul style="list-style-type: none"> Lock-up is prohibited Slip lock-up is prohibited
P0744	—		<ul style="list-style-type: none"> Lock-up is prohibited Slip lock-up is prohibited 	—	<ul style="list-style-type: none"> Lock-up is prohibited Slip lock-up is prohibited
P0745	—		—	—	—

SYSTEM

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

DTC	Vehicle condition	Vehicle behavior for 1st fail-safe	Vehicle behavior for 2nd fail-safe	Vehicle behavior for final fail-safe
P0750 P0775 P0795 P2713 P2722 P2731 P2807	—	<ul style="list-style-type: none"> Locks in 2GR, 3GR, 4GR, 5GR, 6GR or 7GR Manual mode is prohibited 	—	<ul style="list-style-type: none"> 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	—	<ul style="list-style-type: none"> Locks in 3GR Manual mode is prohibited 	—	<ul style="list-style-type: none"> The shifting between the gears of 1 - 2 - 3 can be performed Manual mode is prohibited
P1705	—	<ul style="list-style-type: none"> Downshift when accelerator pedal is depressed is prohibited Upshift when accelerator pedal is released is prohibited Manual mode is prohibited 	<ul style="list-style-type: none"> Downshift when accelerator pedal is depressed is prohibited Upshift when accelerator pedal is released is prohibited Manual mode is prohibited 	<ul style="list-style-type: none"> Downshift when accelerator pedal is depressed is prohibited Upshift when accelerator pedal is released is prohibited Manual mode is prohibited
P1730	—	<ul style="list-style-type: none"> Locks in 1GR, 2GR, 3GR, 4GR, 5GR, 6GR or 7GR Manual mode is prohibited 	<ul style="list-style-type: none"> The shifting between the gears of 1 - 2 - 3 can be performed Manual mode is prohibited 	<ul style="list-style-type: none"> Locks in 1GR The shifting between the gears of 2 - 3 - 4 can be performed The shifting between the gears of 3 - 4 can be performed The shifting between the gears of 4 - 5 - 6 can be performed Manual mode is prohibited
P1815	—	Manual mode is prohibited	—	Manual mode is prohibited
U0100 U0300 U1000	Between the gears of 1 - 2 - 3	<ul style="list-style-type: none"> The shifting between the gears of 1 - 2 - 3 can be performed Manual mode is prohibited 	—	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Fix the gear at driving Manual mode is prohibited 	—	
P0720 and P1721	—	Locks in 5GR	—	Locks in 5GR

A/T CONTROL SYSTEM : Protection Control

INFOID:000000009012103

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

SYSTEM

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

Normal return condition	<ul style="list-style-type: none"> Vehicle speed: 8 km/h (5 MPH) or less and Engine speed: 2,200 rpm or less
Vehicle behavior	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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

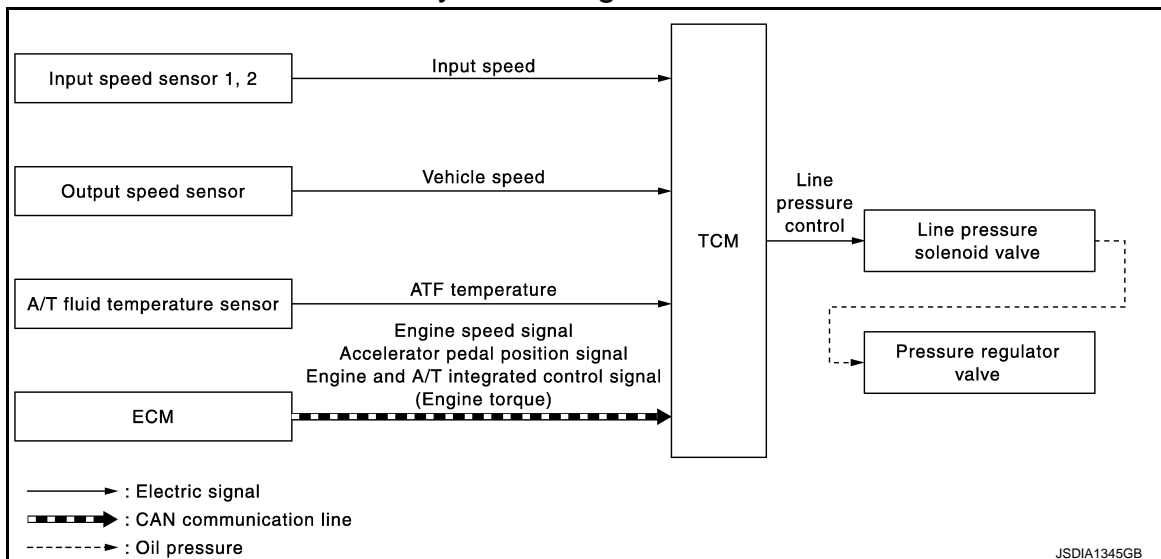
Limit the accelerator opening and forcibly control the vehicle to the low torque driving when the electronic substrate in TCM reaches the high temperature.

Malfunction detection condition	TCM electronic substrate temperature <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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

LINE PRESSURE CONTROL

LINE PRESSURE CONTROL : System Diagram

INFOID:000000009012104



LINE PRESSURE CONTROL : System Description

INFOID:000000009012105

- 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.

SYSTEM

< SYSTEM DESCRIPTION >

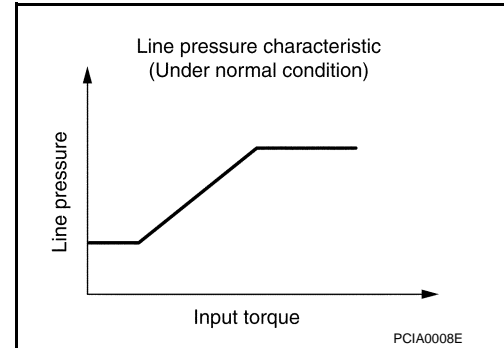
[7AT: RE7R01B]

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.

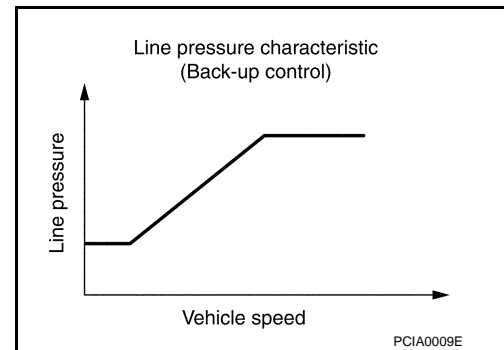
Normal Control

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



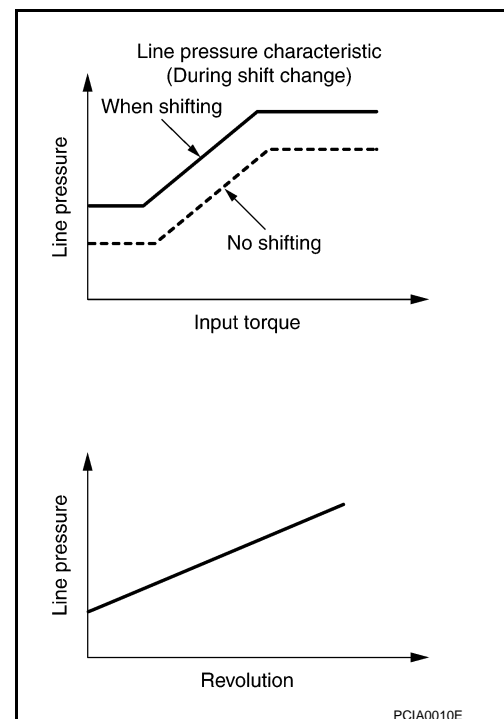
Back-up Control (Engine Brake)

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.



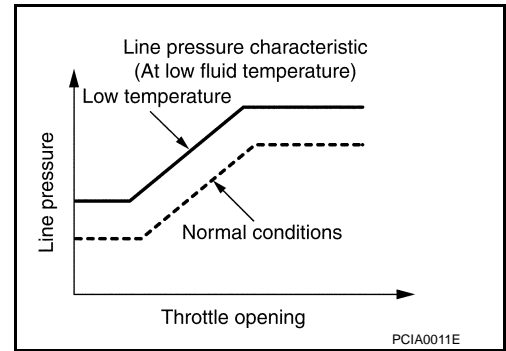
At Low Fluid Temperature

SYSTEM

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

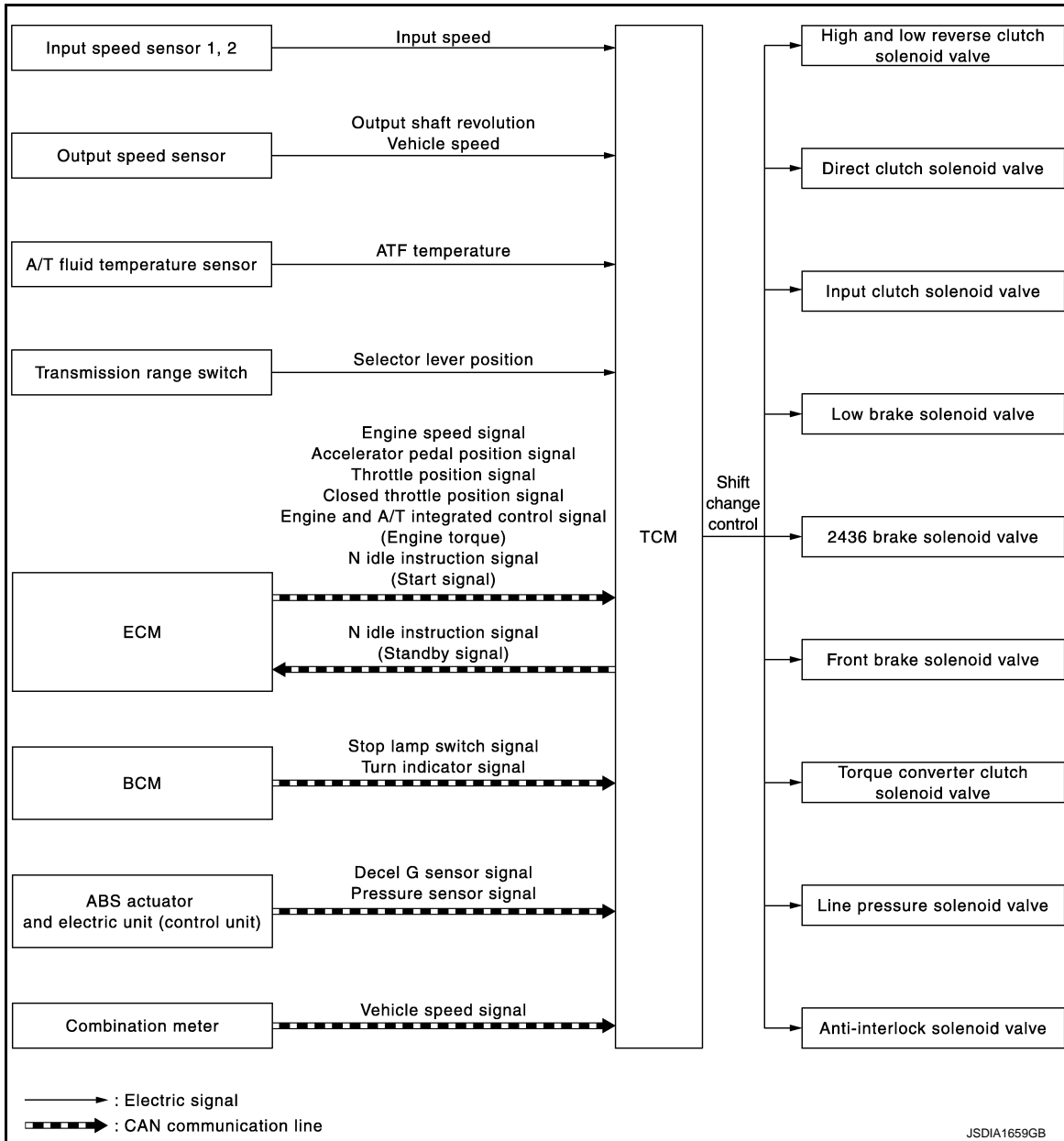
When the A/T fluid temperature drops below the prescribed temperature, in order to speed up the action of each friction element, the line pressure is set higher than the normal line pressure characteristic.



SHIFT CHANGE CONTROL

SHIFT CHANGE CONTROL : System Diagram

INFOID:000000009012106



SHIFT CHANGE CONTROL : System Description

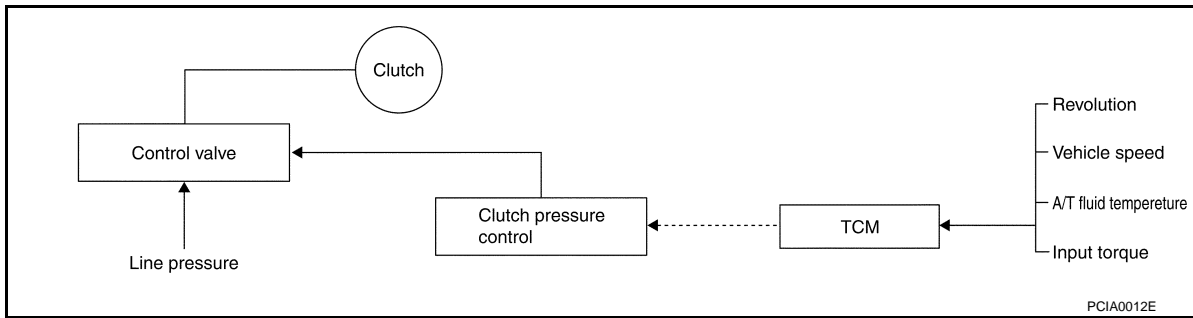
INFOID:000000009012107

Input/Output Signal Chart

Item	Signal	TCM function	Actuator
Input speed sensor 1, 2	Input speed	Shift change control	<ul style="list-style-type: none"> • 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*		
BCM	Engine and A/T integrated control signal (Engine torque)*		
	Stop lamp switch signal*		

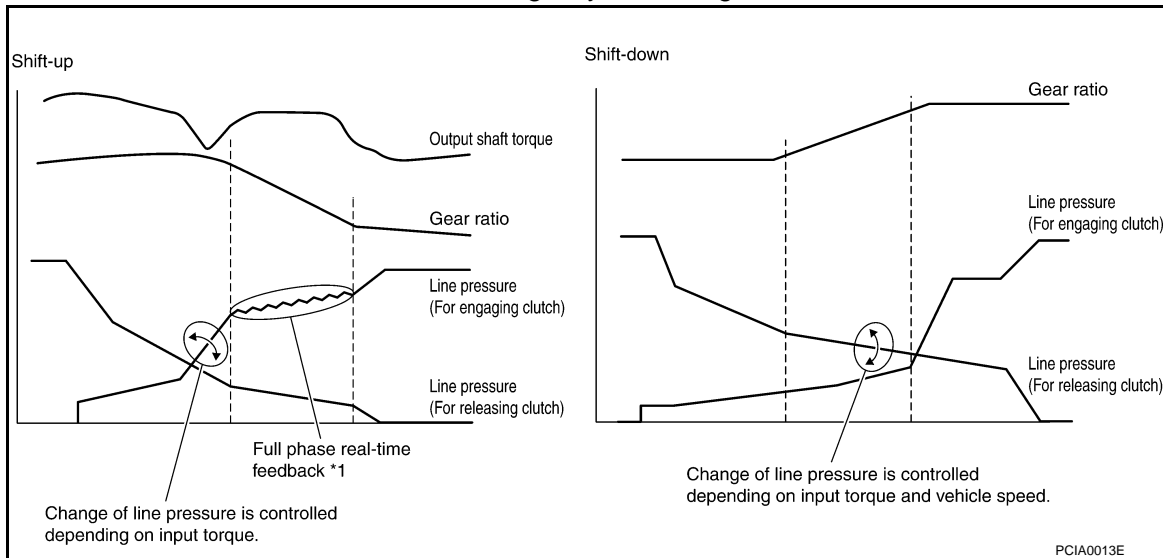
*: This signal is transmitted via communication line.

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.



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

Shift Change System Diagram



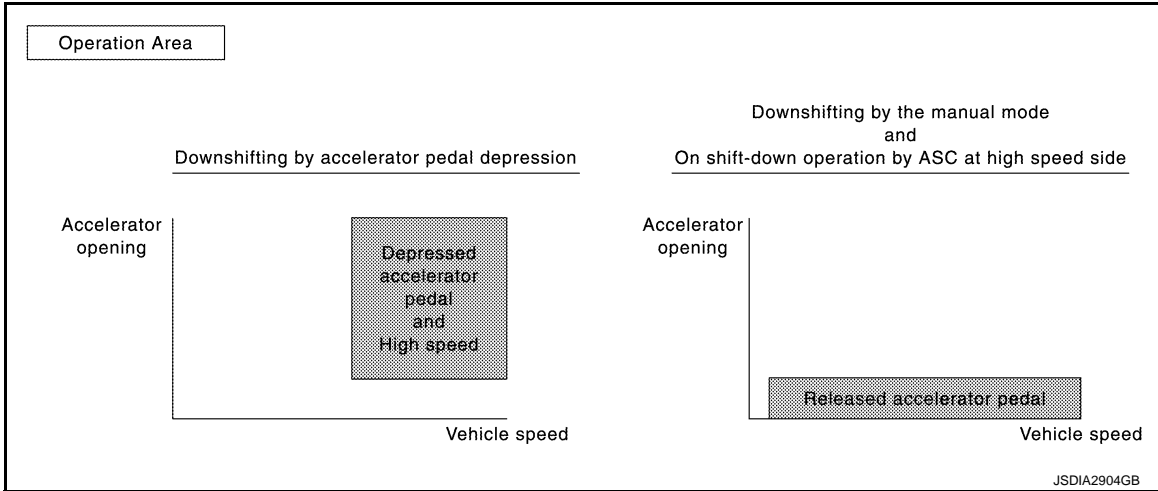
*1: Full phase real-time feedback control monitors movement of gear ratio at gear change, and controls oil pressure in real-time to achieve the best gear ratio.

BLIPPING CONTROL

It controls (synchronizes) engine speed to have a quick shift clutch coupling, by calculating engine speed after downshifting and by cooperating with ASC (Adaptive Shift Control).

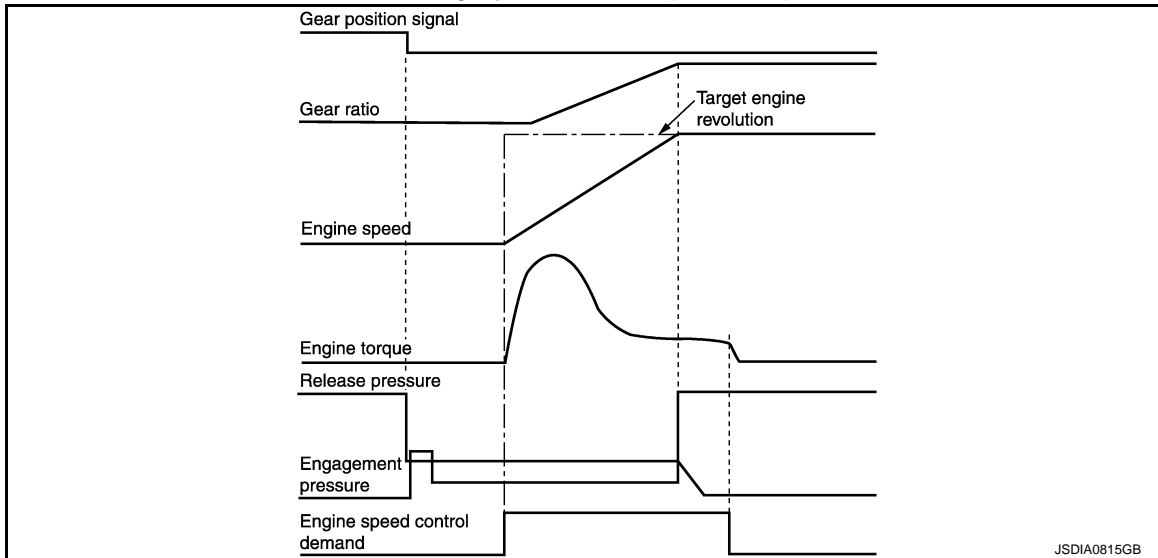
- “BLIPPING CONTROL” functions.

- When downshifting by accelerator pedal depression.
- When downshifting by the manual mode.
- It works on shift-down operation by ASC at high speed side when driving at D position or in DS 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

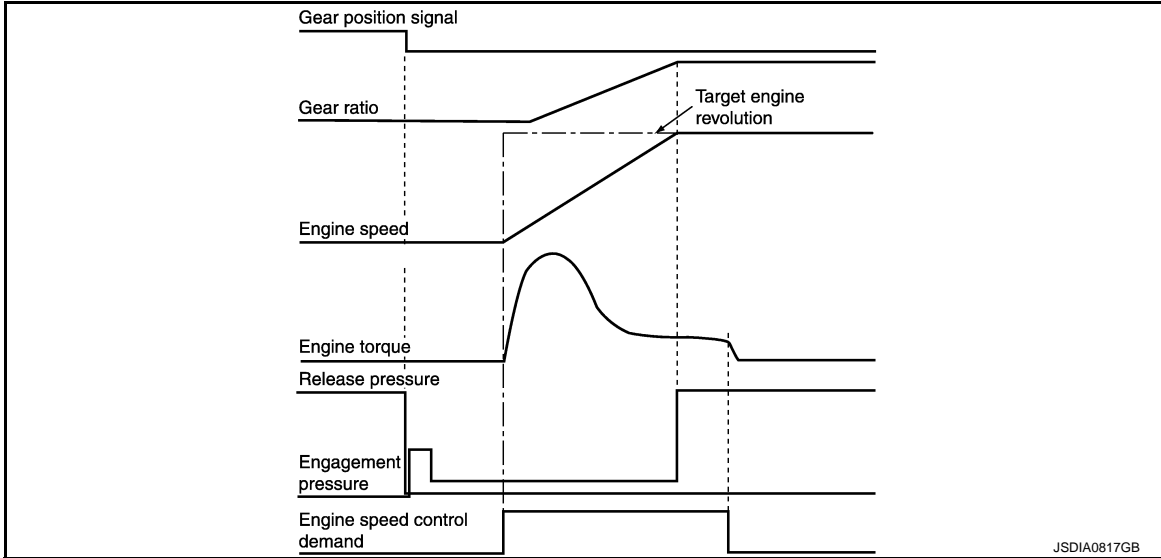


SYSTEM

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

Downshifting by the manual mode and On shift-down operation by ASC at high speed side



IDLE NEUTRAL CONTROL

Input/Output Signal Chart

Item	Signal			TCM function	Actuator
	Each sensor, switch and control unit ⇒ TCM	TCM ⇒ ECM	ECM ⇒ TCM		
Input speed sensor 1, 2	Input speed	N idle instruction signal (Standby signal)*	N idle instruction signal (Start signal)*	Idle neutral control	Low brake solenoid valve
Output speed sensor	Output shaft revolution				
A/T fluid temperature sensor	ATF temperature				
Transmission range switch	Selector lever position				
ECM	Engine speed signal*				
	Accelerator pedal position signal*				
	Throttle position signal*				
BCM	Stop lamp switch signal*				
	Turn indicator signal*				
ABS actuator electric unit (control unit)	Pressure sensor signal*				
	Decel G sensor signal*				
Combination meter	Vehicle speed signal*				

*: This signal is transmitted via communication line.

The TCM activates low brake solenoid valve and controls the low brake oil pressure to the low pressure level if the driver does not intend to start the vehicle while the vehicle is being stopped in the “D” position. Therefore, the low brake is in the release (slip) status and the power transmission route of A/T is the same status as the “N” position. This can decrease the engine load and improves the fuel economy because the drive force of engine is not transmitted to the output shaft of A/T.

Idle Neutral Control Start Condition

Idle neutral control starts when all of the following conditions are satisfied. However, the control ends when any one of the following conditions becomes insufficient during idle neutral control.

- Driving location : Level road and gentle slope
- Selector lever position : “D” position
- Vehicle speed : 0 km/h (0 MPH)
- Accelerator pedal opening : 0.0 / 8
- Brake pedal : Depress

SYSTEM

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

Engine speed	: Idle speed
Snow mode switch	: OFF
Turn signal lamp and hazard warning lamp	: OFF

NOTE:

The idle neutral control is terminated or prohibited when the TCM and ECM detect that the vehicle is in any of the conditions as per the following.

- Engine cooling water temperature and A/T fluid temperature are below or above a prescribed temperature.
- A/T malfunction occurs.
- DTC is detected.
- Fail-safe mode activates.
- Idle neutral control is performed continuously for a certain period of time.
- When idle speed increases due to heavy electric load*.

*: When any one of rear window defogger switch, A/C switch, headlamp, fog lamp is turned ON. In addition, when the steering wheel is operated.

Idle Neutral Control Resume Condition

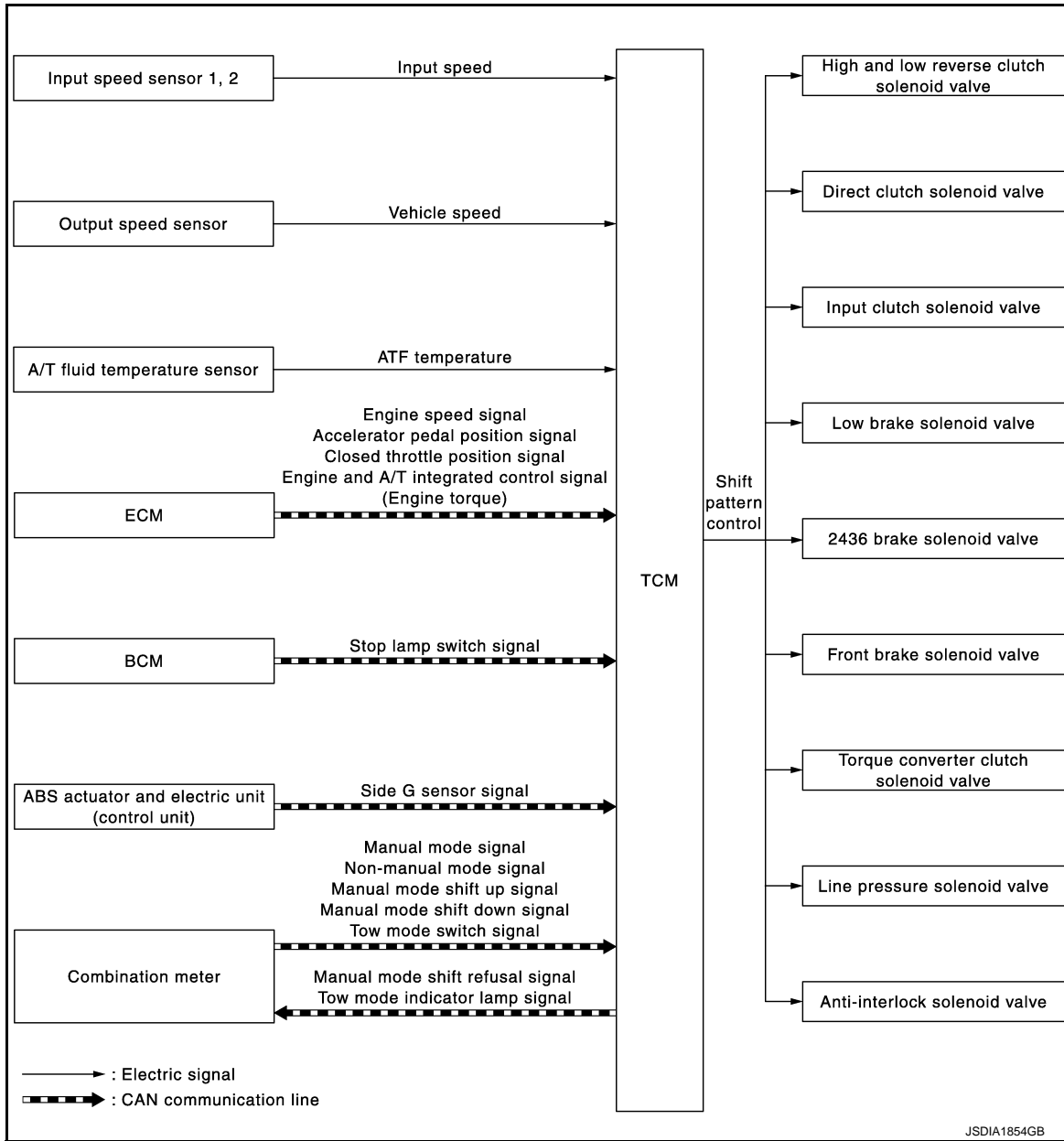
Idle neutral control can be resumed when its start condition is fulfilled after any of the following operations is performed (unless a malfunction occurs in the vehicle).

- After driving at more than a prescribed speed.
- When idle neutral control start conditions are fulfilled for a certain period of time.

SHIFT PATTERN CONTROL

SHIFT PATTERN CONTROL : System Diagram

INFOID:000000009012108



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SHIFT PATTERN CONTROL : System Description

INFOID:000000009012109

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.

ASC (ADAPTIVE SHIFT CONTROL)

SYSTEM

< SYSTEM DESCRIPTION >

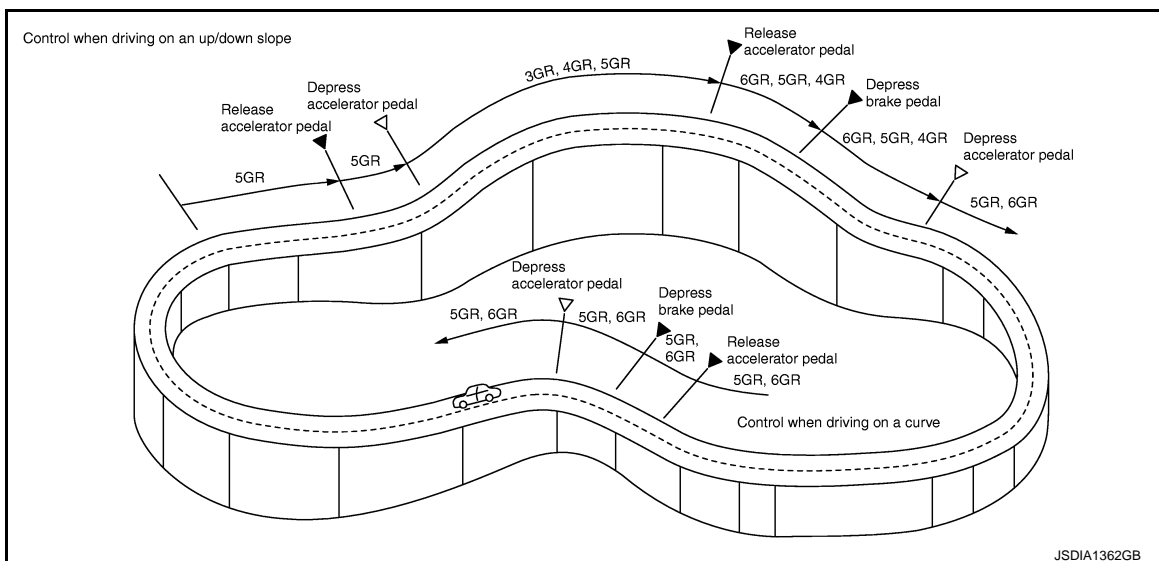
[7AT: RE7R01B]

Input/Output Signal Chart

Item	Signal	TCM function	Actuator
Input speed sensor 1, 2	Input speed	ASC (Adaptive shift control)	<ul style="list-style-type: none"> • 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*		
Combination meter	Tow mode switch signal*		

*: This signal is transmitted via CAN communication line.

- 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.
 - In driving condition where acceleration, deceleration, or lateral acceleration continues, it corrects gear selection in order to keep a smooth vehicle speed during the curve and to give an adequate driving force at the curve end.
- When acceleration pedal is quickly released at curve entrance etc, it prevents an unnecessary shift-up.
- On braking operation at curve entrance, it gives an early shift-down according to the deceleration.
- In a sporty driving condition, it selects lower gear early even on a light braking operation, giving greater importance on driving force.
- 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.



Tow Mode

- High driving torque is required for towing a heavy load. The tow mode enables torque-oriented driving by changing the shift schedule to that of delaying A/T gear shift timing (compared to normal driving).

SYSTEM

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

- TCM receives tow mode switch signal from combination meter via CAN communication. The tow mode turns ON when TCM receives the signal. TCM transmits a tow mode indicator lamp signal to the combination meter via CAN communication to turn ON the tow mode indicator lamp mounted in the combination meter.

MANUAL MODE

Input/Output Signal Chart

Item	Signal	TCM function	Actuator
Output speed sensor	Vehicle speed	Manual mode	<ul style="list-style-type: none"> • High and low reverse clutch solenoid valve • Direct clutch solenoid valve • Input clutch solenoid valve • Low brake solenoid valve • 2346 brake solenoid valve • Front brake solenoid valve • Torque converter clutch solenoid valve • Line pressure solenoid valve • Anti-interlock solenoid valve
A/T fluid temperature sensor	ATF temperature		
ECM	Engine speed signal*		
	Accelerator pedal position signal*		
Combination meter	Manual mode signal*		
	Non-manual mode signal*		
	Manual mode shift up signal*		
	Manual mode shift down signal*		

*: This signal is transmitted via CAN communication line.

- The TCM receives the manual mode signal, non-manual mode signal, manual mode shift up signal and manual mode shift down signal from combination meter via CAN communication line. The TCM shifts shift pattern control to the manual mode based on these signals, and then shifts the A/T by operating each solenoid valve according to the shift operation of the driver.
- The TCM prohibits the manual mode while being in fail-safe mode due to an A/T malfunction, etc. Refer to [TM-77, "Fail-Safe"](#).

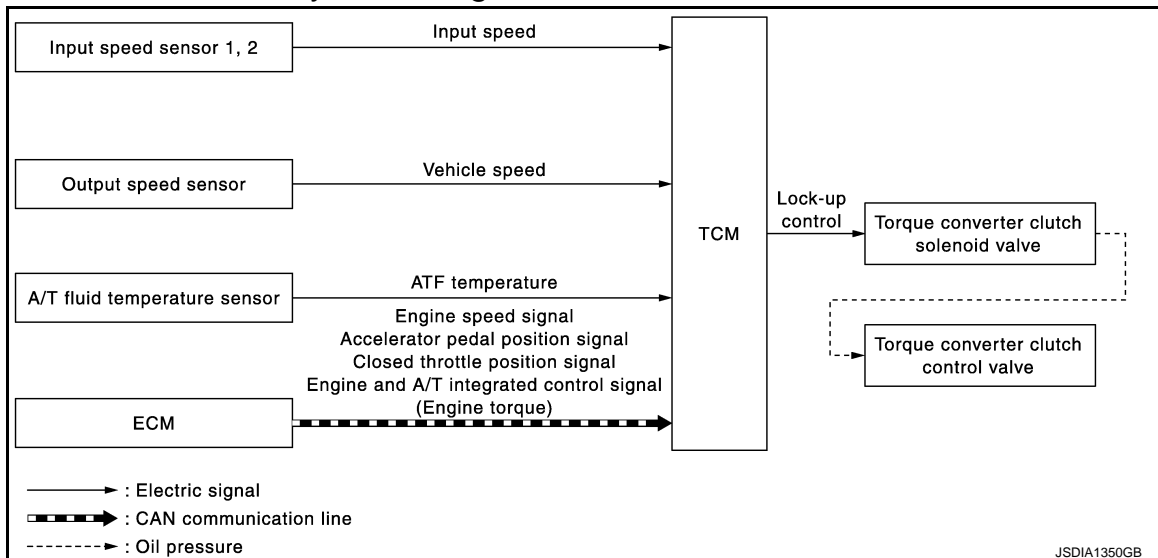
Manual Mode Information

- The TCM transmits the manual mode shift refusal signal to the combination meter if the TCM refuses the transmission from the driving status of vehicle when the selector lever shifts to "UP (+ side)" or "DOWN (- side)" side. The combination meter blinks shift indicator on the combination meter and sounds the buzzer to indicate the driver that the shifting is not performed when receiving this signal. However, the TCM does not transmit the manual mode shift refusal signal in the conditions as per the following.
 - When the selector lever shifts to "DOWN (- side)" side in 1GR.
 - When the selector lever shifts to "UP (+ side)" side in 7GR.

LOCK-UP CONTROL

LOCK-UP CONTROL : System Diagram

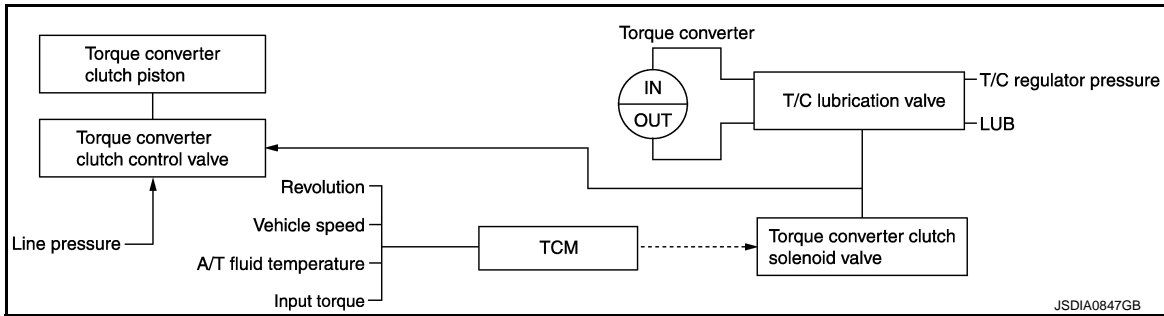
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LOCK-UP CONTROL : System Description

INFOID:000000009012111

- The torque converter clutch piston in the torque converter is engaged to eliminate torque converter slip to increase power transmission efficiency.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- 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					
	7	6	5	4	3	2	7	6	5	4	3	2
Lock-up	×	—	—	—	—	—	×	×	×	×	×	×
Slip lock-up	×	×	×	×	×	×	×	×	×	×	×	×

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.

A/T SHIFT LOCK SYSTEM

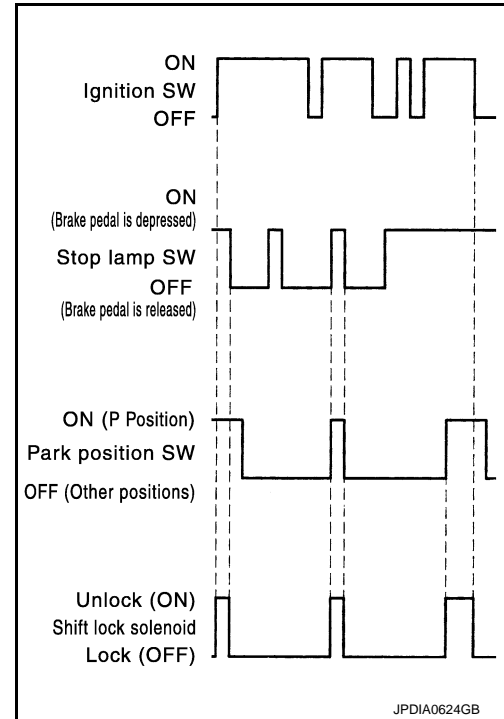
A/T SHIFT LOCK SYSTEM : System Description

INFOID:000000009012112

The selector lever cannot be shifted from the “P” position unless the brake pedal is depressed while the ignition switch is set to ON. The shift lock is unlocked by turning the shift lock solenoid ON when the ignition switch is set to ON, the park position switch is turned ON (selector lever is in “P” position), and the stop lamp switch is turned ON (brake pedal is depressed) as shown in the operation chart in the figure. Therefore, the shift lock solenoid receives no ON signal and the shift lock remains locked if all of the above conditions are not fulfilled. (However, selector operation is allowed if the shift lock release button is pressed.)

NOTE:

During the remote engine run mode, the shift lock cannot be unlocked even when the brake pedal is depressed. For remote engine run mode, refer to [SEC-9. "INTELLIGENT KEY SYSTEM/ENGINE START FUNCTION : System Description"](#).

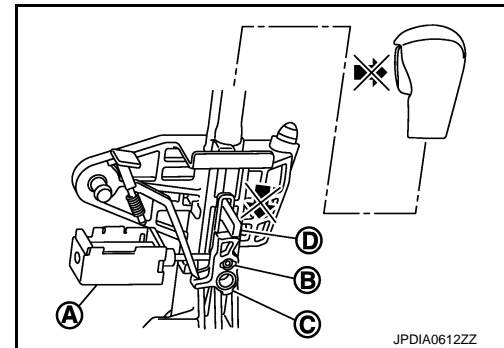


SHIFT LOCK OPERATION AT “P” POSITION

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

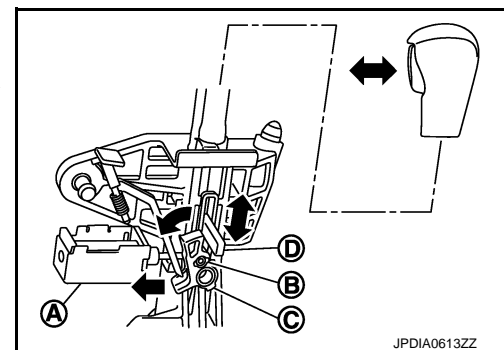
The shift lock solenoid (A) is turned OFF (not energized) and the solenoid rod (B) is extended with the spring when the brake pedal is not depressed (no selector operation allowed) with the ignition switch ON.

The connecting lock lever (C) is located at the position shown in the figure when the solenoid rod is extended. It prevents the movement of the detent rod (D). For these reasons, the selector lever cannot be shifted from the “P” position.



When Brake Pedal Is Depressed (Shift Operation Allowed)

The shift lock solenoid (A) is turned ON (energized) when the brake pedal is depressed with the ignition switch ON. The solenoid rod (B) is compressed by the electromagnetic force. The connecting lock lever (C) rotates when the solenoid is activated. Therefore, the detent rod (D) can be moved. For these reasons, the selector lever can be shifted to other positions.



“P” POSITION HOLD MECHANISM (IGNITION SWITCH LOCK)

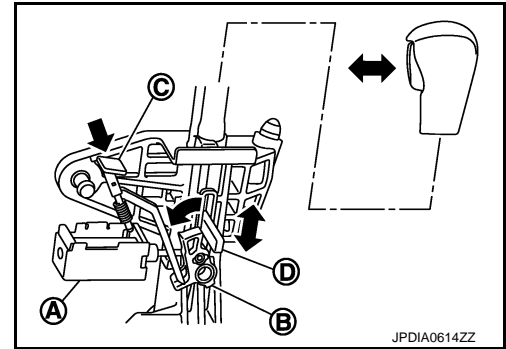
SYSTEM

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

The shift lock solenoid (A) is not energized when the ignition switch is in any position other than ON. In this condition, the shift mechanism is locked and "P" position is held. The operation cannot be performed from "P" position if the brake pedal is depressed with the ignition switch ON when the operation system of shift lock solenoid is malfunctioning. However, the lock lever (B) is forcibly rotated and the shift lock is released when the shift lock release button (C) is pressed from above. Then the selector operation from "P" position can be performed.

D : Detent rod



ON BOARD DIAGNOSTIC (OBD) SYSTEM

Diagnosis Description

INFOID:000000009012113

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 [TM-82. "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-61. "DIAGNOSIS DESCRIPTION : 1st Trip Detection Logic and Two Trip Detection Logic"](#).

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DIAGNOSIS SYSTEM (TCM)

CONSULT Function

INFOID:000000009012114

APPLICATION ITEMS

Diagnostic test mode	Function
Work Support	This mode enables a technician to adjust some devices faster and more accurately.
Self Diagnostic Results	Retrieve DTC from ECU and display diagnostic items.
Data Monitor	Monitor the input/output signal of the control unit in real time.
CAN Diagnosis	This mode displays a network diagnosis result about CAN by a diagram.
CAN Diagnostic Support Monitor	It monitors the status of CAN communication.
DTC Work Support	DTC reproduction procedure can be performed speedily and precisely.
ECU Identification	Display the ECU identification number (part number etc.) of the selected system.
CALIB DATA*	The calibration data status of TCM can be checked.

*: Although "CALIB DATA" is selectable, do not use its.

SELF DIAGNOSTIC RESULTS

Refer to [TM-82. "DTC Index"](#).

IGN Counter

The IGN counter is indicated in Freeze frame data (FFD) and indicates the number of times that the ignition switch is turned ON after returning to the normal state from DTC.

- CAN malfunction
 - 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.
- Other than CAN malfunction
 - The number is 0 when a malfunction is detected now.
 - The number increases like 1 → 2 → 3...254 → 255 after returning to the normal condition whenever ignition switch OFF → ON.
 - The number is fixed to 255 until the self-diagnosis results are erased if it is over 255.

DATA MONITOR

NOTE:

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

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

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU IN-PUT SIG-NALS	MAIN SIG-NALS	SELEC-TION FROM ITEM	
VHCL/S SE-A/T (km/h or mph)	X	X	▼	Displays the vehicle speed calculated by the TCM from the output shaft revolution.
ESTM VSP SIG (km/h or mph)	X	—	▼	Displays the vehicle speed signal received via CAN communication.
OUTPUT REV (rpm)	X	X	▼	Displays the output speed 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.

DIAGNOSIS SYSTEM (TCM)

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
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 or °F)	X	X	▼	Displays the ATF temperature of oil pan calculated from the signal voltage of A/T fluid temperature sensor.
ATF TEMP 2 (°C or °F)	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.

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DIAGNOSIS SYSTEM (TCM)

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
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 speed.
ENGINE TORQUE (Nm)	—	—	▼	Displays the engine torque estimated value received via CAN communication.
ENG TORQUE D (Nm)	—	—	▼	Displays the engine torque estimated value reflected the requested torque of each control unit received via CAN communication.
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, kg/cm ² or psi)	—	—	▼	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, kg/cm ² or psi)	—	—	▼	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, kg/cm ² or psi)	—	—	▼	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, kg/cm ² or psi)	—	—	▼	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, kg/cm ² or psi)	—	—	▼	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, kg/cm ² or psi)	—	—	▼	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, kg/cm ² or psi)	—	—	▼	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, kg/cm ² or psi)	—	—	▼	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.

DIAGNOSIS SYSTEM (TCM)

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
VEHICLE SPEED (km/h or mph)	—	—	▼	Displays the vehicle speed for control using the control of TCM.
G SEN SLOPE (%)	X	—	▼	Displays the inclination angle calculated by the G sensor signal received via CAN communication.
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	—	▼	<ul style="list-style-type: none"> • Displays the operation status of paddle shifter (down switch). • Not mounted but displayed.
SFT UP ST SW (ON/OFF)	X	—	▼	<ul style="list-style-type: none"> • Displays the operation status of paddle shifter (up switch). • Not mounted but displayed.
DOWN SW LEVER (ON/OFF)	X	—	▼	Displays the operation status of selector lever (down switch).
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.
TOW MODE SW (ON/OFF)	—	—	▼	Displays the reception status of tow mode switch signal received via CAN communication.
DS RANGE (ON/OFF)	—	—	▼	<ul style="list-style-type: none"> • Displays whether it is the DS mode. • Not mounted but displayed.
1 POSITION SW (ON/OFF)	X	—	▼	<ul style="list-style-type: none"> • Displays the reception status of 1 position switch signal received via CAN communication. • Not mounted but displayed.
OD CONT SW (ON/OFF)	X	—	▼	<ul style="list-style-type: none"> • 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	—	▼	<ul style="list-style-type: none"> • 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.

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DIAGNOSIS SYSTEM (TCM)

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
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.
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.
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.

DIAGNOSIS SYSTEM (TCM)

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

Monitored item (Unit)	Monitor Item Selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM ITEM	
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.
N IDLE STATUS (ON/OFF)	—	—	▼	Displays the control status of idle neutral control.

WORK SUPPORT

Item name	Description
G SENSOR CALIBRATION	Calibrates G sensor.

DTC WORK SUPPORT

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DIAGNOSIS SYSTEM (TCM)

< SYSTEM DESCRIPTION >

[7AT: RE7R01B]

Item name	Description	Check item
1ST GR FNCTN P0731	Following items for "1GR incorrect ratio" can be confirmed. <ul style="list-style-type: none"> • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG) 	<ul style="list-style-type: none"> • 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 ratio" can be confirmed. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Self-diagnosis status (whether the diagnosis is being performed or not) • Self-diagnostic results (OK or NG) 	<ul style="list-style-type: none"> • Harness or connectors • Torque converter clutch solenoid valve • Torque converter • Input speed sensor 1, 2 • Hydraulic control circuit

ECU DIAGNOSIS INFORMATION

TCM

Reference Value

INFOID:000000009012115

VALUES ON DIAGNOSIS TOOL

- The CONSULT 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 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.
- Shift schedule (that implies gear position) on CONSULT 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 indicates the point where shifting completes
- Display of solenoid valves on CONSULT changes at the start of shifting, while gear position is displayed upon completion of shifting (which is computed by TCM).

NOTE:

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

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

TCM

< ECU DIAGNOSIS INFORMATION >

[7AT: RE7R01B]

Item name	Condition	Value / Status (Approx.)
L/B SOLENOID	Low brake is engaged	0.6 – 0.8 A
	Low brake is disengaged	0 – 0.05 A
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	4.887
	Driving with 2GR	3.170
	Driving with 3GR	2.027
	Driving with 4GR	1.412
	Driving with 5GR	1.000
	Driving with 6GR	0.864
	Driving with 7GR	0.775
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

TCM

< ECU DIAGNOSIS INFORMATION >

[7AT: RE7R01B]

Item name	Condition	Value / Status (Approx.)	
TRGT PRES TCC	Slip lock-up is active	0 – 600 kPa	A
	Lock-up is active	600 kPa	
	Other than the above	0 kPa	B
TRGT PRES L/B	Low brake is engaged	1370 kPa	
	Low brake is disengaged	0 kPa	C
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 engaged	1370 kPa	TM
	High and low reverse clutch is disengaged	0 kPa	
TRGT PRES I/C	Input clutch is engaged	1370 kPa	
	Input clutch is disengaged	0 kPa	E
TRGT PRES D/C	Direct clutch is engaged	1370 kPa	
	Direct clutch is disengaged	0 kPa	F
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	G
VEHICLE SPEED	During driving	Approximately equals the speedometer reading.	
G SEN SLOPE	Level road	0%	H
	Uphill slope	Positive value (maximum 40.45%)	
	Downhill slope	Negative value (minimum – 40.45%)	I
RANGE SW 4	Selector lever in “P” and “N” positions	OFF	
	Other than the above	ON	J
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	K
	Other than the above	ON	
RANGE SW 1	Selector lever in “P” position	OFF	L
	Other than the above	ON	
SFT DWN ST SW*	Paddle shifter (shift-down) is pulled	ON	
	Other than the above	OFF	M
SFT UP ST SW*	Paddle shifter (shift-up) is pulled	ON	
	Other than the above	OFF	N
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	O
	Other than the above	OFF	
NON M-MODE SW	Selector lever is shifted to manual shift gate side	OFF	
	Other than the above	ON	P
MANU MODE SW	Selector lever is shifted to manual shift gate side	ON	
	Other than the above	OFF	
TOW MODE SW	Tow mode	ON	
	Other than the above	OFF	

TCM

< ECU DIAGNOSIS INFORMATION >

[7AT: RE7R01B]

Item name	Condition	Value / Status (Approx.)
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
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 4GR - 5GR - 6GR shift control	FAIL
	Other than the above	NOTFAIL
HC/IC/FRB PARTS	At 1GR - 2GR - 3GR shift control	FAIL
	Other than the above	NOTFAIL
IC/FRB PARTS	At 4GR - 5GR - 6GR shift control	FAIL
	Other than the above	NOTFAIL
HLR/C PARTS	At 4GR - 5GR - 6GR 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

TCM

< ECU DIAGNOSIS INFORMATION >

[7AT: RE7R01B]

Item name	Condition	Value / Status (Approx.)	
SHIFT IND SIGNAL	When the selector lever is positioned in between each position.	OFF	A
	Selector lever in "P" position	P	B
	Selector lever in "R" position	R	C
	Selector lever in "N" position	N	
	Selector lever in "D" position	D	TM
	Selector lever in "D" position: 7GR	6	
	Selector lever in "D" position: 6GR	5	
	Selector lever in "D" position: 5GR	4	
	Selector lever in "D" position: 4GR	3	E
	Selector lever in "D" position: 3GR	2	
	Selector lever in "D" position: 2GR	1	
	Selector lever in "D" position: 1GR	M1	F
	Selector lever in "M" position: 2GR	M2	
	Selector lever in "M" position: 3GR	M3	G
	Selector lever in "M" position: 4GR	M4	
	Selector lever in "M" position: 5GR	M5	H
	Selector lever in "M" position: 6GR	M6	
	Selector lever in "M" position: 7GR	M7	I
	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	J
	Other than the above	OFF	
ATF WARN LAMP*	When TCM transmits the ATF indicator lamp signal	ON	K
	Other than the above	OFF	
MANU MODE IND	Driving with manual mode	ON	
	Other than the above	OFF	L
ON OFF SOL MON	Selector lever in "P" and "N" positions	ON	
	Driving with 1GR to 3GR	OFF	M
	Other than the above	OFF	
START RLY MON	Selector lever in "P" and "N" positions	ON	
	Other than the above	OFF	N
ON OFF SOL	Selector lever in "P" and "N" positions	ON	
	Driving with 1GR to 3GR	OFF	O
	Other than the above	OFF	P

TCM

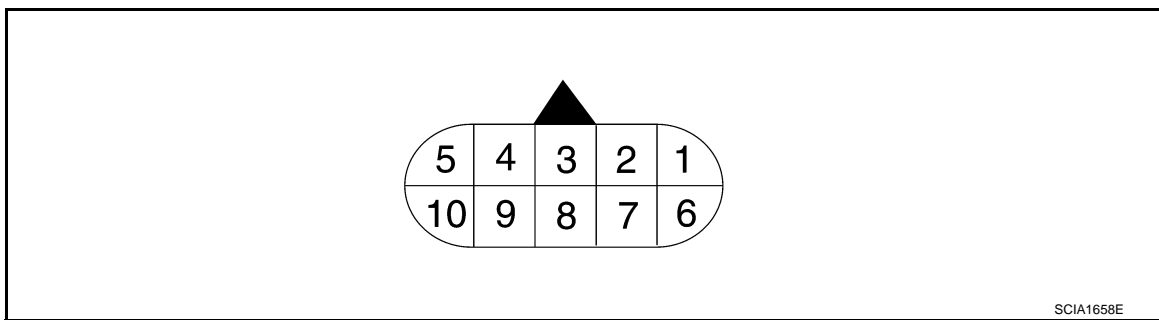
< ECU DIAGNOSIS INFORMATION >

[7AT: RE7R01B]

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 1GR - 2GR 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 2GR - 3GR - 4GR shift control	FAIL
	Other than the above	NOTFAIL
N IDLE STATUS	Idle neutral is active	ON
	Other than the above	OFF

*: Not mounted but always display as OFF.

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
1 (V)	Ground	Ignition power supply	Input	Ignition switch ON	Battery voltage
				Ignition switch OFF	0 V
2 (P)	Ground	Battery power supply (Memory back-up)	Input	Always	Battery voltage

TCM

< ECU DIAGNOSIS INFORMATION >

[7AT: RE7R01B]

Terminal (Wire color)		Description		Condition	Value (Approx.)
+	-	Signal name	Input/ Output		
3 (L)	—	CAN-H	Input/ Output	—	—
4 (SB)	—	K-line	Input/ Output	—	—
5 (B)	Ground	Ground	—	Always	0 V
6 (V)	Ground	Ignition power supply	Input	Ignition switch ON	Battery voltage
				Ignition switch OFF	0 V
7 (R)	Ground	Back-up lamp relay	Output	Ignition switch ON	Selector lever in "R" position.
					Selector lever in other than above.
8 (P)	—	CAN-L	Input/ Output	—	—
9 (BR)	Ground	Starter relay	Output	Ignition switch ON	Selector lever in "N" and "P" positions.
					Selector lever in other than above.
10 (B)	Ground	Ground	—	Always	0 V

Fail-Safe

INFOID:000000009012116

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-92, "Work 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	<ul style="list-style-type: none"> Selects the shifting pattern that the malfunctioning parts identified at 1st fail-safe 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

TCM

< ECU DIAGNOSIS INFORMATION >

[7AT: RE7R01B]

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	—	<ul style="list-style-type: none"> • Fixed in the “D” position (The shifting can be performed) • Lock-up is prohibited when 30 km/h (19 MPH) or less • 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 	—	<ul style="list-style-type: none"> • Fixed in the “D” position (The shifting can be performed) • Lock-up is prohibited when 30 km/h (19 MPH) or less • 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	<ul style="list-style-type: none"> • The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited 	—	<ul style="list-style-type: none"> • The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	<ul style="list-style-type: none"> • Fix the gear while driving • Manual mode is prohibited 	—	
P0717	Between the gears of 1 - 2 - 3	<ul style="list-style-type: none"> • The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited 	—	<ul style="list-style-type: none"> • The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	<ul style="list-style-type: none"> • Fix the gear while driving • Manual mode is prohibited 	—	
P0720	Between the gears of 1 - 2 - 3	<ul style="list-style-type: none"> • Only downshift can be performed • Manual mode is prohibited • A vehicle speed signal from the combination meter is regarded as an effective signal 	—	<ul style="list-style-type: none"> • The shifting between the gears of 1 - 2 - 3 can be performed • Manual mode is prohibited
	Between the gears of 4 - 5 - 6 - 7	<ul style="list-style-type: none"> • Fix the gear at driving • Manual mode is prohibited • A vehicle speed signal from the combination meter is regarded as an effective signal 	—	

TCM

< ECU DIAGNOSIS INFORMATION >

[7AT: RE7R01B]

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	Small gear ratio difference		Engine torque limit: Max 150 Nm	—	Engine torque limit: Max 150 Nm
	Great gear ratio difference	Neutral malfunction between the gears of 1 - 2 - 3 and 7	<ul style="list-style-type: none"> Locks in 2GR, 3GR or 4GR Manual mode is prohibited 	—	<ul style="list-style-type: none"> 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
P0730		—	Other than the above	<ul style="list-style-type: none"> Locks in 1GR, 2GR, 3GR, 4GR, 5GR or 6GR Fix the gear while driving Manual mode is prohibited 	<ul style="list-style-type: none"> The shifting between the gears of 1 - 2 - 3 can be performed Manual mode is prohibited
	<ul style="list-style-type: none"> Locks in 5GR, 6GR or 7GR Manual mode is prohibited 		<ul style="list-style-type: none"> The shifting between the gears of 1 - 2 - 3 can be performed Manual mode is prohibited 	<ul style="list-style-type: none"> 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	—	<ul style="list-style-type: none"> Lock-up is prohibited Slip lock-up is prohibited 	—	<ul style="list-style-type: none"> Lock-up is prohibited Slip lock-up is prohibited 	
P0744	—	<ul style="list-style-type: none"> Lock-up is prohibited Slip lock-up is prohibited 	—	<ul style="list-style-type: none"> Lock-up is prohibited Slip lock-up is prohibited 	
P0745	—	—	—	—	
P0750 P0775 P0795 P2713 P2722 P2731 P2807	—	<ul style="list-style-type: none"> Locks in 2GR, 3GR, 4GR, 5GR, 6GR or 7GR Manual mode is prohibited 	—	<ul style="list-style-type: none"> 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 	

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< ECU DIAGNOSIS INFORMATION >

[7AT: RE7R01B]

DTC	Vehicle condition	Vehicle behavior for 1st fail-safe	Vehicle behavior for 2nd fail-safe	Vehicle behavior for final fail-safe
P0780	—	<ul style="list-style-type: none"> Locks in 3GR Manual mode is prohibited 	—	<ul style="list-style-type: none"> The shifting between the gears of 1 - 2 - 3 can be performed Manual mode is prohibited
P1705	—	<ul style="list-style-type: none"> Downshift when accelerator pedal is depressed is prohibited Upshift when accelerator pedal is released is prohibited Manual mode is prohibited 	<ul style="list-style-type: none"> Downshift when accelerator pedal is depressed is prohibited Upshift when accelerator pedal is released is prohibited Manual mode is prohibited 	<ul style="list-style-type: none"> Downshift when accelerator pedal is depressed is prohibited Upshift when accelerator pedal is released is prohibited Manual mode is prohibited
P1730	—	<ul style="list-style-type: none"> Locks in 1GR, 2GR, 3GR, 4GR, 5GR, 6GR or 7GR Manual mode is prohibited 	<ul style="list-style-type: none"> The shifting between the gears of 1 - 2 - 3 can be performed Manual mode is prohibited 	<ul style="list-style-type: none"> Locks in 1GR The shifting between the gears of 2 - 3 - 4 can be performed The shifting between the gears of 3 - 4 can be performed The shifting between the gears of 4 - 5 - 6 can be performed Manual mode is prohibited
P1815	—	Manual mode is prohibited	—	Manual mode is prohibited
U0100 U0300 U1000	Between the gears of 1 - 2 - 3	<ul style="list-style-type: none"> The shifting between the gears of 1 - 2 - 3 can be performed Manual mode is prohibited 	—	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Fix the gear at driving Manual mode is prohibited 	—	
P0720 and P1721	—	Locks in 5GR	—	Locks in 5GR

Protection Control

INFOID:000000009012117

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	<ul style="list-style-type: none"> Vehicle speed: 8 km/h (5 MPH) or less and Engine speed: 2,200 rpm or less
Vehicle behavior	<ul style="list-style-type: none"> 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.

TCM

< ECU DIAGNOSIS INFORMATION >

[7AT: RE7R01B]

Malfunction detection condition	<ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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:000000009012118

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)	Reference
1	U0100 LOST COMM (ECM A)	TM-103, "DTC Logic"
	U1000 CAN COMM CIRCUIT	TM-105, "DTC Logic"
2	P0615 STARTER RELAY	TM-106, "DTC Logic"
	P0705 T/M RANGE SENSOR A	TM-108, "DTC Logic"
	P0710 FLUID TEMP SENSOR A	TM-109, "DTC Logic"
	P0717 INPUT SPEED SENSOR A	TM-112, "DTC Logic"
	P0720 OUTPUT SPEED SENSOR	TM-113, "DTC Logic"
	P0740 TORQUE CONVERTER	TM-131, "DTC Logic"
	P0745 PC SOLENOID A	TM-134, "DTC Logic"
	P0750 SHIFT SOLENOID A	TM-135, "DTC Logic"
	P0775 PC SOLENOID B	TM-136, "DTC Logic"
	P0795 PC SOLENOID C	TM-139, "DTC Logic"
	P2713 PC SOLENOID D	TM-150, "DTC Logic"
	P2722 PC SOLENOID E	TM-151, "DTC Logic"
	P2731 PC SOLENOID F	TM-152, "DTC Logic"
P2807 PC SOLENOID G	TM-153, "DTC Logic"	

TCM

< ECU DIAGNOSIS INFORMATION >

[7AT: RE7R01B]

Priority	Detected items (DTC)	Reference
3	P0729 6GR INCORRECT RATIO	TM-117, "DTC Logic"
	P0730 INCORRECT GR RATIO	TM-119, "DTC Logic"
	P0731 1GR INCORRECT RATIO	TM-121, "DTC Logic"
	P0732 2GR INCORRECT RATIO	TM-123, "DTC Logic"
	P0733 3GR INCORRECT RATIO	TM-125, "DTC Logic"
	P0734 4GR INCORRECT RATIO	TM-127, "DTC Logic"
	P0735 5GR INCORRECT RATIO	TM-129, "DTC Logic"
	P0744 TORQUE CONVERTER	TM-132, "DTC Logic"
	P0780 SHIFT	TM-137, "DTC Logic"
	P1730 INTERLOCK	TM-143, "DTC Logic"
	P1734 7GR INCORRECT RATIO	TM-145, "DTC Logic"
4	U0300 CAN COMM DATA	TM-104, "DTC Logic"
	P0725 ENGINE SPEED	TM-115, "DTC Logic"
	P1705 TP SENSOR	TM-140, "DTC Logic"
	P1721 VEHICLE SPEED SIGNAL	TM-141, "DTC Logic"
	P1815 M-MODE SWITCH	TM-147, "DTC Logic"

DTC Index

INFOID:000000009012119

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-81, "DTC Inspection Priority Chart"](#).
- The IGN counter is indicated in Freeze frame data (FFD). Refer to [TM-64, "CONSULT Function"](#).

DTC*1		Items (CONSULT screen terms)	Reference
MIL*2, "ENGINE" with CONSULT or GST	CONSULT only "TRANS- MISSION"		
—	P0615	STARTER RELAY	TM-106
P0705	P0705	T/M RANGE SENSOR A	TM-108
P0710	P0710	FLUID TEMP SENSOR A	TM-109
P0717	P0717	INPUT SPEED SENSOR A	TM-112
P0720	P0720	OUTPUT SPEED SENSOR	TM-113
—	P0725	ENGINE SPEED	TM-115
P0729	P0729	6GR INCORRECT RATIO	TM-117
P0730	P0730	INCORRECT GR RATIO	TM-119
P0731	P0731	1GR INCORRECT RATIO	TM-121
P0732	P0732	2GR INCORRECT RATIO	TM-123
P0733	P0733	3GR INCORRECT RATIO	TM-125
P0734	P0734	4GR INCORRECT RATIO	TM-127
P0735	P0735	5GR INCORRECT RATIO	TM-129
P0740	P0740	TORQUE CONVERTER	TM-131
P0744	P0744	TORQUE CONVERTER	TM-132
P0745	P0745	PC SOLENOID A	TM-134
P0750	P0750	SHIFT SOLENOID A	TM-135
P0775	P0775	PC SOLENOID B	TM-136
P0780	P0780	SHIFT	TM-137
P0795	P0795	PC SOLENOID C	TM-139

TCM

< ECU DIAGNOSIS INFORMATION >

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DTC*1		Items (CONSULT screen terms)	Reference
MIL*2, "ENGINE" with CONSULT or GST	CONSULT only "TRANS- MISSION"		
—	P1705	TP SENSOR	TM-140
—	P1721	VEHICLE SPEED SIGNAL	TM-141
P1730	P1730	INTERLOCK	TM-143
P1734	P1734	7GR INCORRECT RATIO	TM-145
—	P1815	M-MODE SWITCH	TM-147
P2713	P2713	PC SOLENOID D	TM-150
P2722	P2722	PC SOLENOID E	TM-151
P2731	P2731	PC SOLENOID F	TM-152
P2807	P2807	PC SOLENOID G	TM-153
U0100*3	U0100	LOST COMM (ECM A)	TM-103
—	U0300	CAN COMM DATA	TM-104
U1000	U1000	CAN COMM CIRCUIT	TM-105

*1: These numbers are prescribed by SAE J2012.

*2: Refer to [TM-63, "Diagnosis Description"](#).

*3: Except for Mexico

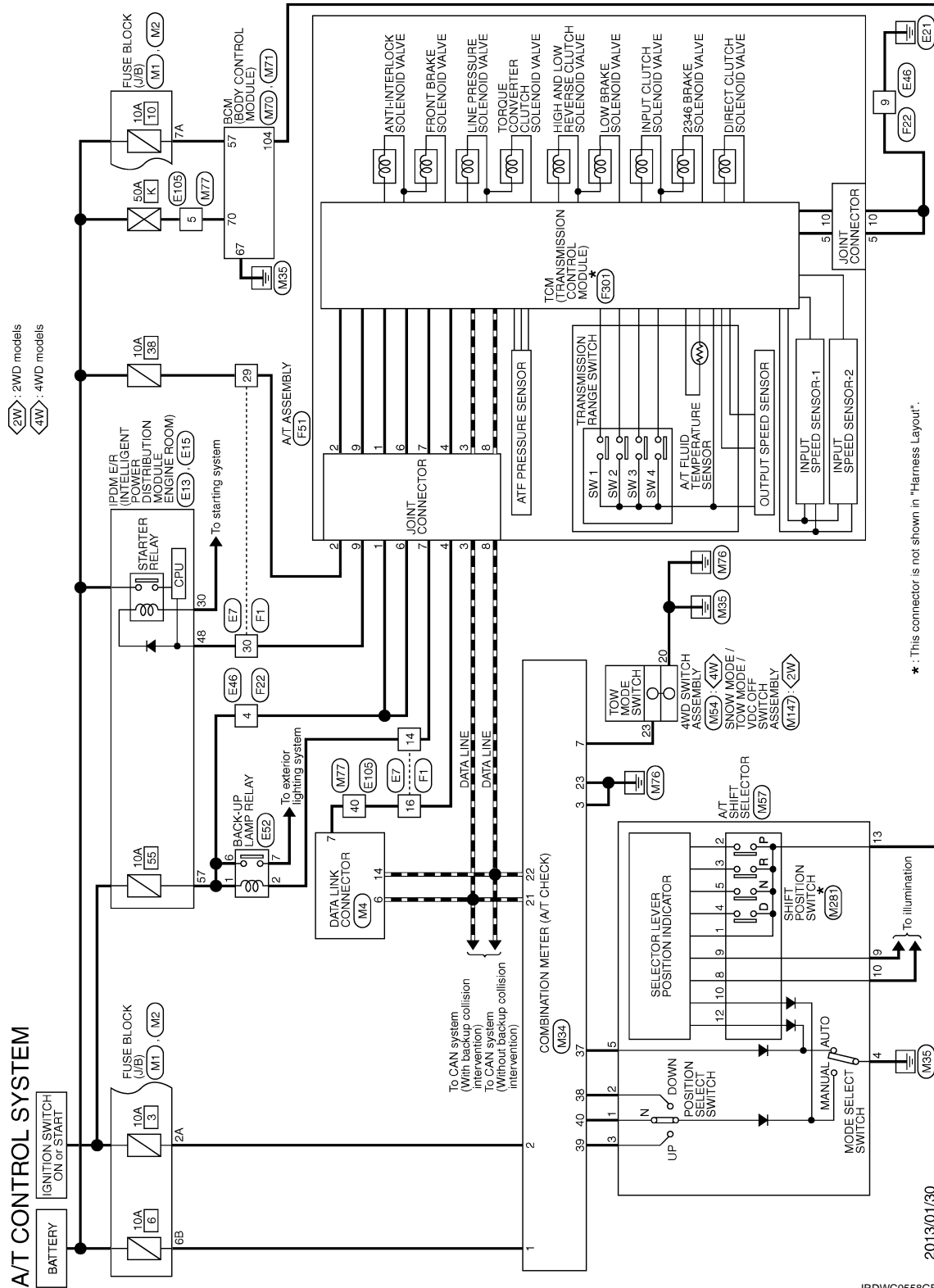
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WIRING DIAGRAM

A/T CONTROL SYSTEM

Wiring Diagram

INFOID:000000009012120



A/T CONTROL SYSTEM

< WIRING DIAGRAM >

[7AT: RE7R01B]

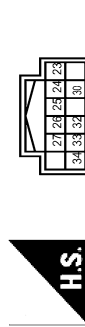
A/T CONTROL SYSTEM

Connector No.	E7
Connector Name	WIRE TO WIRE
Connector Type	TH32MW-AH



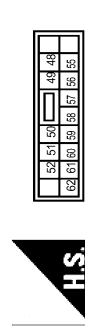
Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	-
2	G	-
3	LG	-
4	LG	-
5	W/L	-
6	GO	-
7	L/R	-
8	LG/R	-
14	R	-
16	SB	-
17	RW	-
18	Y/G	-
19	B/Y	-
20	P/B	-
21	R/B	-
22	Y	-
23	BR	-
24	P/L	-
29	P	-
30	BR	-
31	L	-
32	P	-

Connector No.	E13
Connector Name	IPDM ER INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	TH12FM-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
23	GR/R	-
24	W/G	-
25	L/Y	-
26	P	-
27	L	-
30	R/W	-
32	LG	-
33	R	-
34	G	-

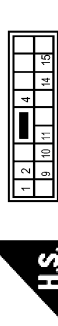
Connector No.	E15
Connector Name	IPDM ER INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	NS16FM-CS



Terminal No.	Color Of Wire	Signal Name [Specification]
48	BR	-
49	R	-
50	LG/B	-
51	B/Y	-
52	W	-
55	O	-
56	L	-
57	V	-
58	BR/R	-
59	W/B	-

60	V/R
61	W
62	SB

Connector No.	E46
Connector Name	WIRE TO WIRE
Connector Type	NS16MW-CS



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B/Y	-
2	SHIELD	-
4	V	-
9	B/SB	-
10	L	-
11	W	-
14	SB	-
15	G	-

Connector No.	E52
Connector Name	BACK-UP LAMP RELAY
Connector Type	M06FBR-R-LC



Terminal No.	Color Of Wire	Signal Name [Specification]
1	V	-
2	R	-
3	W/B	-
6	V/L	-
7	R/Y	-

Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L/W	-
3	R/B	-
4	L	-
5	Y	-
7	W/G	-
8	P/B	-
9	W/B	-
10	G	-
11	L	-
12	P	-
13	P/B	-
14	BR	-
15	L/B	-
16	SB	-
18	BR	-
19	Y/G	-
20	B/Y	-
21	Y/V	-
22	L	-
23	Y	-
24	L/W	-
28	O	-
29	R/W	-
30	L/B	-
31	Y	-
32	GR/R	-
34	Y	-
35	R	-
36	BR	-
37	G/Y	-
38	G	-
40	SB	-
41	W/R	-
42	R	-

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A/T CONTROL SYSTEM

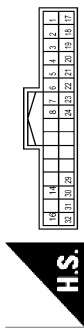
< WIRING DIAGRAM >

[7AT: RE7R01B]

A/T CONTROL SYSTEM

43	V	-
44	L/O	-
45	BR/W	-
46	BR/Y	-
47	GR/L	-
48	W	-
49	B	-
50	R	-
51	G	-
52	SHIELD	-
53	BR	-
54	L/W	-
55	Y/B	-
56	G/R	-
57	R	-
58	G/B	-
59	W/R	-

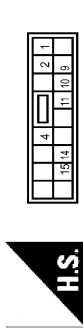
Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Type	TH2FM-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	-
2	G	-
3	L/O	-
4	LG	-
5	W/L	-
6	G/O	-
7	L/R	-
8	LG/R	-
14	R	-
16	SB	-
17	R/W	-
18	Y/G	-
19	BR/Y	-
20	P/B	-
21	R/B	-
22	Y	-
23	BR/W	-

24	P/L	-
29	P	-
30	BR	-
31	L	-
32	P	-

Connector No.	F22
Connector Name	WIRE TO WIRE
Connector Type	NS16FM-GS



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	-
2	SHIELD	-
4	V	-
9	B	-
10	L/W	-
11	W	-
14	SB	-
15	G	-

Connector No.	F51
Connector Name	A/T ASSEMBLY
Connector Type	RK10FG



Terminal No.	Color Of Wire	Signal Name [Specification]
1	V	IGNITION POWER SUPPLY
2	P	BATTERY POWER SUPPLY
3	L	CAN-L
4	SB	K-LINE
5	B	GROUND

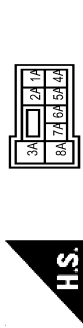
6	V	IGNITION POWER SUPPLY
7	R	BACK-UP LAMP RELAY
8	P	CAN-L
9	BR	STARTER RELAY
10	B	GROUND

Connector No.	F301
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Type	SP10FG



Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	IGNITION POWER SUPPLY
2	-	BATTERY POWER SUPPLY
3	-	CAN-H
4	-	K-LINE
5	-	GROUND
6	-	IGNITION POWER SUPPLY
7	-	BACK-UP LAMP RELAY
9	-	STARTER RELAY
10	-	GROUND

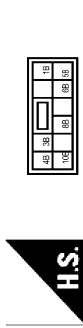
Connector No.	M1
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS06FM-M2



Terminal No.	Color Of Wire	Signal Name [Specification]
1A	Y	-
2A	GR	-
3A	W	-

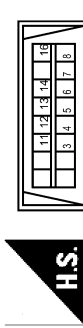
4A	Y/G	-
5A	V	-
6A	L/W	-
7A	LG	-
8A	W	-

Connector No.	M2
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FM-GS



Terminal No.	Color Of Wire	Signal Name [Specification]
1B	R	-
2	R	-
3B	R	-
4B	B	-
5B	BR	-
6B	Y	-
8B	L/O	-
10B	W/B	-

Connector No.	M4
Connector Name	DATA LINK CONNECTOR
Connector Type	BD16FW



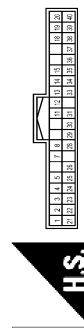
Terminal No.	Color Of Wire	Signal Name [Specification]
3	LG	-
4	B	-
5	B	-
6	L	-
7	SB	-
8	GR	-

A/T CONTROL SYSTEM

A/T CONTROL SYSTEM

11	SB	-	NON-MANUAL MODE SIGNAL
12	R	-	MANUAL MODE SHIFT DOWN SIGNAL
13	L	-	MANUAL MODE SHIFT UP SIGNAL
14	P	-	MANUAL MODE SIGNAL
16	Y	-	-

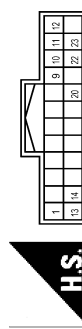
Connector No. M34
 Connector Name COMBINATION METER
 Connector Type TH40FW-NH



H.S.

37	R/Y	-	NON-MANUAL MODE SIGNAL
38	L/W	-	MANUAL MODE SHIFT DOWN SIGNAL
39	Y/B	-	MANUAL MODE SHIFT UP SIGNAL
40	G/W	-	MANUAL MODE SIGNAL

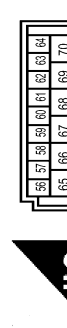
Connector No. M54
 Connector Name 4WD SWITCH ASSEMBLY
 Connector Type TH24FW-NH



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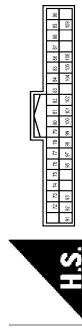
5	R/Y	-	-
9	L/W	-	-
10	B	-	-
11	L/R	-	-
12	B	-	-
13	R/B	-	-
14	G/Y	-	-

Connector No. M70
 Connector Name BCM (BODY CONTROL MODULE)
 Connector Type FE40RFW-FH4G-SA



H.S.

Connector No. M71
 Connector Name BCM (BODY CONTROL MODULE)
 Connector Type TH40FW-NH



H.S.

Terminal No.	Color Of Wire	Signal Name (Specification)
1	Y	BATTERY POWER SUPPLY
2	GR	IGNITION SIGNAL
3	B	GROUND
4	B	ILL GND
5	B	ILL CONTROL OUTPUT
7	R	TOW MODE SIGNAL
8	P/L	TRIP RESET SWITCH SIGNAL
11	G	ENTER SWITCH SIGNAL
12	O	SELECT SWITCH SIGNAL
13	W/R	ILLUMINATION CONTROL SWITCH SIGNAL (+)
14	R	ILLUMINATION CONTROL SWITCH SIGNAL (-)
15	R/W	AIR BAG SIGNAL
18	W/R	AMBIENT SENSOR SIGNAL
19	V/W	AC AUTO AMP CONNECTION RECOGNITION SIGNAL
20	B	AMBIENT SENSOR GROUND
21	L	CANH
22	P	CANL
23	B	GROUND
24	V	FUEL LEVEL SENSOR GROUND
25	O/L	ALTERNATOR SIGNAL
26	W	PARKING BRAKE SWITCH SIGNAL
28	GR/R	SECURITY SIGNAL
29	BR	WASHER LEVEL SWITCH SIGNAL
30	SB	VEHICLE SPEED SIGNAL (2-PULSE)
31	BR/W	VEHICLE SPEED SIGNAL (8-PULSE)
33	W	SNOW MODE SIGNAL
34	BR/Y	FUEL LEVEL SENSOR SIGNAL
35	O/B	SEAT BELT Buckle Switch Signal (Driver Side)
36	G/Y	PASSENGER SEAT BELT WARNING SIGNAL

Terminal No.	Color Of Wire	Signal Name (Specification)
1	L/W	VDC OFF SW
9	W/R	AUTO SW
10	R	4H SW
11	V	4L SW
12	GR	IGN
13	L/W	LIGHT SW
14	B/O	ILL CONT
20	B	GND
22	W	SNOW SW
23	R	TOW

Connector No. M57
 Connector Name A/T SHIFT SELECTOR
 Connector Type TH18FW-NH



H.S.

Terminal No.	Color Of Wire	Signal Name (Specification)
1	G/W	-
2	L/W	-
3	Y/B	-
4	B/SB	-

Terminal No.	Color Of Wire	Signal Name (Specification)
56	W/R	INT ROOM LAMP PWR SPLY
57	LG	BAT (FUSE)
58	R/W	SHOCK DETECT SENS
59	G	PASSENGER DOOR UNLK OUTPUT
60	G	TURN SIGNAL LH OUTPUT
61	G/Y	TURN SIGNAL RH OUTPUT
62	R	STEP LAMP CONT
63	BR	ROOM LAMP TIMER CONT
64	GR	CRANKING REQUEST
65	R	ALL DOOR LOCK OUTPUT
66	V	DR DOOR FUEL LID UNLK OUTPUT
67	B	GND
68	Y	PW PWR SPLY (IGN)
69	W	PW PWR SPLY (BAT)
70	Y	BAT (FIL)

Terminal No.	Color Of Wire	Signal Name (Specification)
72	P	PUDDLE LAMP CONT
73	W	ON IND
74	Y/B	TRAILER TURN SIG RH CONT
75	LGR	DRIVER DOOR REQUEST SW
76	SB	PUSH SW
77	O/L	TRAILER TURN SIG LH CONT
78	P/B	DRIVER DOOR ANT+
79	V	DRIVER DOOR ANT-
80	LG/B	PASSENGER DOOR ANT+
81	Y/R	PASSENGER DOOR ANT-
82	W/G	BACK DOOR ANT+
83	B/W	BACK DOOR ANT-
84	BR	ROOM ANT+
85	Y	ROOM ANT1-
86	W	ROOM ANT2+
87	B	ROOM ANT2-
88	V	LAGGAGE ROOM ANT+
89	G	LAGGAGE ROOM ANT-
90	Y	PUSH BTN IGN SW ILL PWR
91	O	LOCK IND
92	L	LOW SIDE PUSH LED
93	GR/R	LKEY WARN BUZZER
96	BR	ACC RELAY CONT
97	R/W	STARTER RELAY CONT
98	O	IGN RELAY (PDM E/R) CONT
99	R	IGN RELAY (F/B) CONT
100	P/L	PASSENGER DOOR REQUEST SW
101	W/B	IGN PWR SPLY 2
102	BR	SHIFT NP
104	R/B	A/T SHIFT SELECT PWR SPLY
105	O/L	STOP LAMP SW 2
106	Y/G	BLWR FAN MTR RELAY CONT
109	L/W	ACC IND

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A/T CONTROL SYSTEM

< WIRING DIAGRAM >

[7AT: RE7R01B]

A/T CONTROL SYSTEM

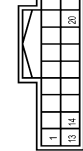
Connector No.	M177
Connector Name	WIRE TO WIRE
Connector Type	TH81FW-CS16-TM4



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	-
2	L/W	-
3	R/B	-
4	G	-
5	Y	-
6	SB	-
7	W/G	-
8	P/B	-
9	W/B	-
10	G	-
11	L	-
12	P	-
13	P/B	-
14	BR	-
15	O/L	-
16	SB	-
17	BR	-
18	BR	-
19	Y/G	-
20	BRY	-
21	V	-
22	L	-
23	Y	-
24	L/W	-
28	O	-
29	R/W	-
30	O/L	-
31	Y	-
32	G/R	-
34	Y	-
35	R	-
36	B/O	-
37	G/Y	-
38	G	-
40	SB	-
41	W/R	-
42	R	-

43	V	-
51	L/O	-
52	BR/W	-
53	BR/Y	-
54	GR/L	-
60	W	-
61	B	-
62	G	-
63	R	-
64	SHIELD	-
91	BR	-
92	L/W	-
94	Y/B	-
95	L/R	-
97	R	-
98	O/L	-
100	W/B	-

Connector No.	M147
Connector Name	SNOW MODE / TOW MODE / VDC OFF SWITCH ASSEMBLY
Connector Type	TH24FM-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L/W	VDC OFF SW
12	GR	IGN
13	L/W	LIGHT SW
14	B/O	ILL CONT
20	B	GND
22	W	SNOW SW
23	R	TOW

Connector No.	M281
Connector Name	SHIFT POSITION SWITCH
Connector Type	TH12FW



Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	M
2	BR	P
3	W/B	R
4	O	D
5	W/B	N
8	GR	GND
9	Y	ILL
10	B	MT
12	W	AT

A/T SHIFT LOCK SYSTEM

< WIRING DIAGRAM >

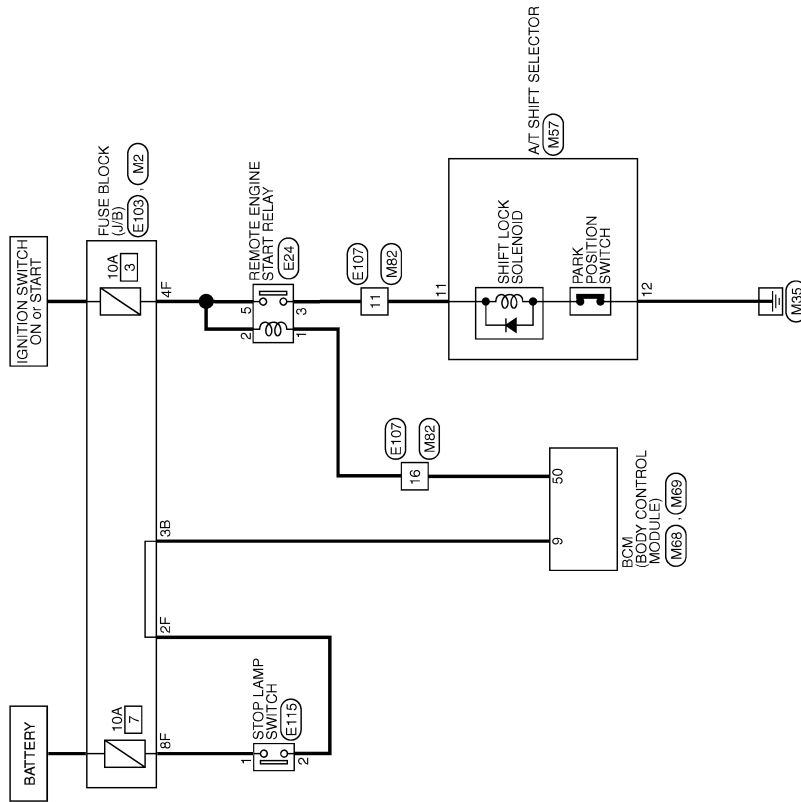
[7AT: RE7R01B]

A/T SHIFT LOCK SYSTEM

Wiring Diagram

INFOID:000000009012121

A/T SHIFT LOCK SYSTEM



2013/01/30

JRDWC0559GB

A/T SHIFT LOCK SYSTEM

< WIRING DIAGRAM >

[7AT: RE7R01B]

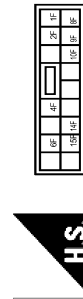
A/T SHIFT LOCK SYSTEM

Connector No.	E24
Connector Name	REMOTE ENGINE START RELAY
Connector Type	MS02FL-M2-LC



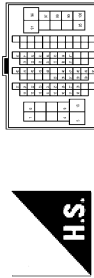
Terminal No.	Color Of Wire	Signal Name [Specification]
1	BY	-
2	G	-
3	L/R	-
5	G	-

Connector No.	E103
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS



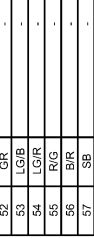
Terminal No.	Color Of Wire	Signal Name [Specification]
10F	G	-
14F	Y	-
15F	G	-
1F	W/B	-
2F	R	-
4F	G	-
6F	Y/G	-
8F	L/B	-
9F	Y	-

Connector No.	E107
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
4	V/W	-
5	G/R	-
6	P	-
8	GR/L	-
10	Y/R	-
11	L/R	-
12	W/G	-
13	BR/Y	-
14	LG	-
15	BR/W	-
16	BY	-
17	W/B	-
18	GR/R	-
20	W/R	-
21	B	-
22	R/L	-
23	G/R	-
24	R/W	-
25	W/L	-
26	R	-
27	L	-
28	G/B	-
35	G	-
36	Y	-
37	R	-
38	GY	-
39	O	-
40	W	-
41	R	-
42	B	-
43	G	-
44	SHIELD	-
46	B	-
47	W	-

48	SHIELD	-
49	W	-
50	SHIELD	-
51	Y/R	-
52	GR	-
53	LG/B	-
54	LG/R	-
55	R/G	-
56	BR	-
57	SB	-
60	G	-
61	B	-
62	W	-
63	R	-
64	SHIELD	-
65	LY	-
66	V	-
67	BR	-
69	GR	-
85	SB	-
86	GR	-
97	GR/L	-
98	GW	-
99	RY	-
100	L	-



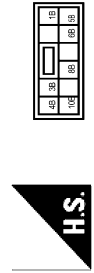
Terminal No.	Color Of Wire	Signal Name [Specification]
1B	R	-
3B	R	-
4B	B	-
5B	BR	-
6B	Y	-
8B	L/O	-
10B	W/B	-

Connector No.	E115
Connector Name	STOP LAMP SWITCH
Connector Type	M04FW-LC



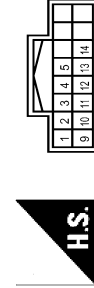
Terminal No.	Color Of Wire	Signal Name [Specification]
1	L/B	-
2	R	-
3	G	-
4	L/R	-

Connector No.	M2
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FM-CS



Terminal No.	Color Of Wire	Signal Name [Specification]
1B	R	-
3B	R	-
4B	B	-
5B	BR	-
6B	Y	-
8B	L/O	-
10B	W/B	-

Connector No.	M57
Connector Name	A/T SHIFT SELECTOR
Connector Type	TH16FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	GW	-
2	L/W	-
3	Y/B	-
4	B/SB	-
5	RY	-
8	L/W	-
10	B	-
11	L/R	-
12	B	-
13	R/B	-
14	GY	-

A/T SHIFT LOCK SYSTEM

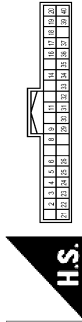
< WIRING DIAGRAM >

[7AT: RE7R01B]

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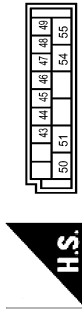
A/T SHIFT LOCK SYSTEM

Connector No.	M68
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FB-NH



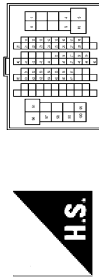
Terminal No.	Color Of Wire	Signal Name [Specification]
2	BR/Y	COMBI SW INPUT 5
3	GR	COMBI SW INPUT 4
4	L	COMBI SW INPUT 3
5	G	COMBI SW INPUT 2
6	V	COMBI SW INPUT 1
8	V	POWER WINDOW SW COMM
9	R	STOP LAMP SW 1
11	R	RAIN SENSOR SERIAL LINK
14	P/B	OPTICAL SENSOR
16	L/O	DIMMER SIGNAL
17	Y/G	SENSOR PWR SPLY
18	BY	RECEIVER SENSOR GND
19	BR	RECEIVER PWR SPLY
20	G/R	KYLS ENT RECEIVER COMM
21	P	NATS ANT AMP
22	W/B	KYLS ENT RECEIVER RSSI
23	GR/R	SECURITY IND CONT
24	SB	DONGLE LINK
25	LG/R	NATS ANT AMP
26	O	INTELLIGENT KEY IDENTIFICATION
29	W	HAZARD SW
30	W/L	BK DOOR OPNR SW
31	W/G	DR DOOR UNLOCK SENSOR
32	LG	COMBI SW OUTPUT 5
33	Y	COMBI SW OUTPUT 4
34	W	COMBI SW OUTPUT 3
35	R/W	COMBI SW OUTPUT 2
36	SB	COMBI SW OUTPUT 1
37	GY	SHIFT P
39	L	CANH
40	P	CANL

Connector No.	M69
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	FEA09FB-FHAG-SA



Terminal No.	Color Of Wire	Signal Name [Specification]
43	Y/L	BK DOOR SW
44	GW	REAR WIPER STOP POSITION
45	W	PASSENGER DOOR SW
46	GR	REAR RH DOOR SW
47	GR/R	DRIVER DOOR SW
48	O	REAR LH DOOR SW
49	BR/Y	LUGGAGE ROOM LAMP CONT
50	BY	REMOTE ENGINE START
51	W/R	BACK DOOR REQ SW
54	L	REAR WIPER OUTPUT
55	G	REAR DOOR UNLK OUTPUT

Connector No.	M82
Connector Name	WIRE TO WIRE
Connector Type	TH80FM-CS16-TM4



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
4	V/W	-
5	G/R	-
6	P	-
8	GR/L	-
10	Y/R	-
11	L/R	-
12	W/G	-
13	BR/Y	-

100	L
-----	---

14	LG	-
15	BR/W	-
16	BY	-
17	W/B	-
18	GR/R	-
20	W/R	-
21	B	-
22	R/L	-
23	G/R	-
24	R/W	-
25	W/L	-
26	R	-
27	L	-
28	B/SB	-
35	G	-
36	Y	-
37	R	-
38	GY	-
39	O	-
40	W	-
41	R	-
42	B	-
43	G	-
44	SHIELD	-
46	B	-
47	W	-
48	SHIELD	-
49	W	-
50	SHIELD	-
51	Y/R	-
52	GR	-
53	LG/B	-
54	LG/R	-
55	R/G	-
56	B/O	-
57	SB	-
60	G	-
61	B	-
62	W	-
63	R	-
64	SHIELD	-
65	L/Y	-
66	V	-
67	B/W	-
91	G/R	-
95	SB	-
96	GR	-
97	GR/L	-
98	GW	-
99	P	-

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:000000009012122

1. OBTAIN INFORMATION ABOUT SYMPTOM

Refer to [TM-93, "Diagnostic Work Sheet"](#) and interview the customer to obtain the malfunction information (conditions and environment when the malfunction occurred) as much as possible when the customer brings in the vehicle.

>> GO TO 2.

2. CHECK DTC

1. Before checking the malfunction, check whether any DTC exists.
2. If DTC exists, perform the following operations.
 - Record the DTC and freeze frame data. (Print out the data using CONSULT 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-172, "Symptom Table"](#) is effective.
3. Check the information of related service bulletins and others also.

Do malfunction information and DTC exists?

- 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-77, "Fail-Safe"](#). When a malfunction symptom is reproduced, the question sheet is effective. Refer to [TM-93, "Diagnostic Work 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-77, "Fail-Safe"](#). When a malfunction symptom is reproduced, the question sheet is effective. Refer to [TM-93, "Diagnostic Work 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-81, "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-43, "Intermittent Incident"](#).

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

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[7AT: RE7R01B]

Use [TM-172. "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.

Diagnostic Work Sheet

INFOID:000000009012123

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

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

[7AT: RE7R01B]

Question Sheet

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

ADDITIONAL SERVICE WHEN REPLACING TRANSMISSION ASSEMBLY

< BASIC INSPECTION >

[7AT: RE7R01B]

ADDITIONAL SERVICE WHEN REPLACING TRANSMISSION ASSEMBLY

Description

INFOID:000000009012124

When replacing transmission assembly, perform the followings:

- Save current TCM data using CONSULT before replacement.
- Calibrate decel G sensor after replacement.

Work Procedure

INFOID:000000009012125

1. SAVING TCM DATA

With CONSULT

Save the TCM data according to the CONSULT display.

NOTE:

Even when TCM data is not saved in CONSULT, GO TO 2.

>> GO TO 2.

2. REPLACE TRANSMISSION ASSEMBLY

Replace the transmission assembly. Refer to [TM-215, "2WD : Removal and Installation"](#) (2WD), [TM-218, "4WD : Removal and Installation"](#) (4WD).

>> GO TO 3.

3. PERFORM TCM PROGRAMMING

With CONSULT

1. During programming, maintain the following conditions:

Ignition switch	: ON
Selector lever	: P
Engine speed	: 0 rpm

2. Perform programming according to the CONSULT display.

>> GO TO 4.

4. PERFORM CALIBRATION OF DECEL G SENSOR

Refer to [TM-97, "Work Procedure"](#)

>> WORK END

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ADDITIONAL SERVICE WHEN REPLACING CONTROL VALVE & TCM

< BASIC INSPECTION >

[7AT: RE7R01B]

ADDITIONAL SERVICE WHEN REPLACING CONTROL VALVE & TCM

Description

INFOID:000000009012126

When replaced control valve & TCM, perform decel G sensor calibration. Refer to [TM-97. "Work Procedure"](#).

CALIBRATION OF DECEL G SENSOR

Description

INFOID:000000009012128

Decel G sensor calibration must be performed when the following operation is performed.

- Removal and installation or replacement of yaw rate/side/decel G sensor
- Replacement of A/T assembly
- Replacement of control valve & TCM
- Replacement of ABS actuator and electric unit (control unit)

CAUTION:

After removing/replacing the yaw rate/side/decel G sensor or replacing the ABS actuator and electric unit (control unit), the decel G sensor of the ABS actuator and electric unit (control unit) must be calibrated first. Refer to [BRC-64, "Description"](#).

Work Procedure

INFOID:000000009012129

CAUTION:

After removing/replacing the yaw rate/side/decel G sensor or replacing the ABS actuator and electric unit (control unit), the decel G sensor of the ABS actuator and electric unit (control unit) must be calibrated first. Refer to [BRC-64, "Description"](#).

1. PREPARATION BEFORE CALIBRATION PROCEDURE

1. Park the vehicle on a flat road.
2. Adjust pressure in all tires to the specified value. Refer to [WT-68, "Tire Air Pressure"](#).

>> GO TO 2.

2. PERFORM CALIBRATION

 **With CONSULT**

1. Turn ignition switch ON.
CAUTION:
Never start the engine.
2. Select "G SENSOR CALIBRATION" in "Work Support" in "TRANSMISSION".
3. Touch "START".

CAUTION:

Never give any motion to the vehicle during the calibration.

Is "completed" displayed?

- YES >> GO TO 3.
NO >> Perform the calibration again.

3. CHECK DTC

 **With CONSULT**

1. Turn ignition switch OFF and wait 10 seconds or more.
2. Turn ignition switch ON.
3. Select "Self Diagnostic Results" in "ABS".

Is "C1145" or "C1146" detected?

- YES >> Refer to [BRC-50, "DTC Index"](#).
NO >> WORK END

A/T FLUID COOLER

Cleaning

INFOID:00000009012132

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.

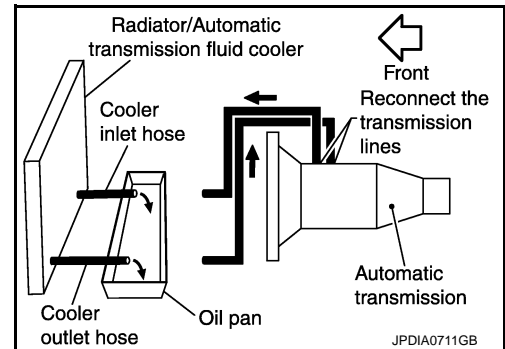
CLEANING PROCEDURE

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.

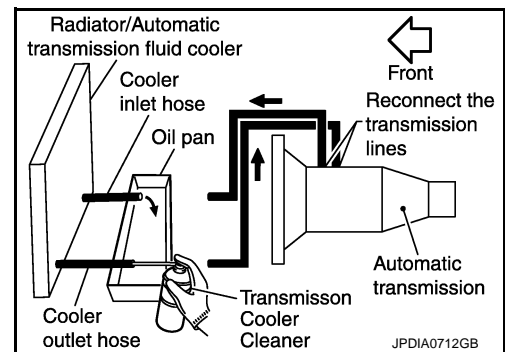


5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

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 breath vapors or spray mist.

6. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until 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/cm² (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.

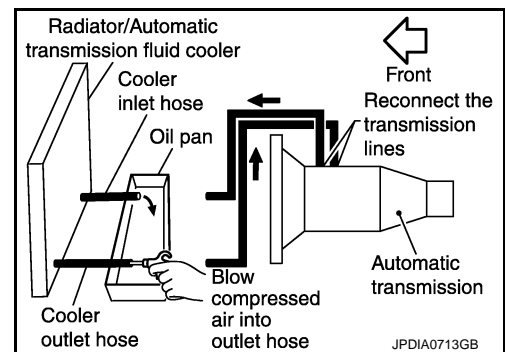
13. Flush each steel line from the cooler side back toward the A/T by spraying Transmission Cooler Cleaner in a continuous stream for 5 seconds.

14. Blow compressed air regulated to 5 to 9 kg/cm² (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".



A/T FLUID COOLER

< BASIC INSPECTION >

[7AT: RE7R01B]

DIAGNOSIS PROCEDURE

NOTE:

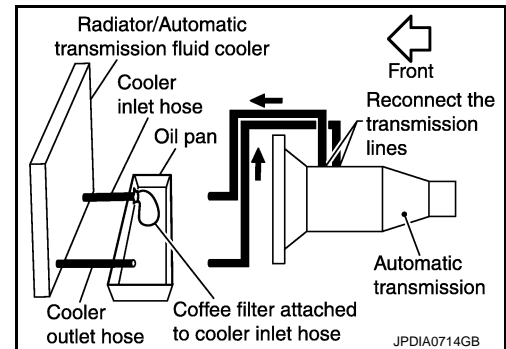
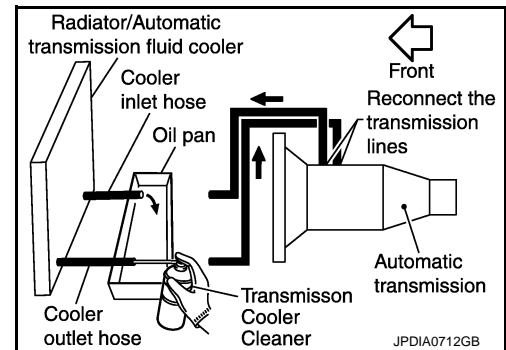
Insufficient cleaning of the cooler inlet hose exterior may lead to inaccurate debris identification.

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.

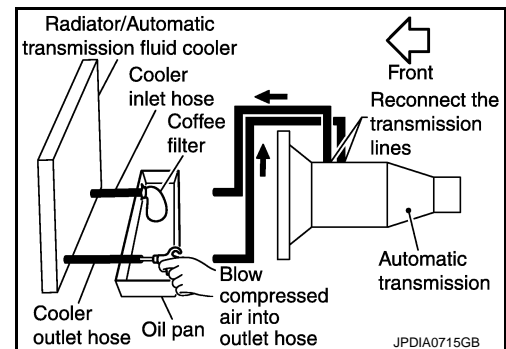
CAUTION:

- **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 breath vapors or spray mist.**

4. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until 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.

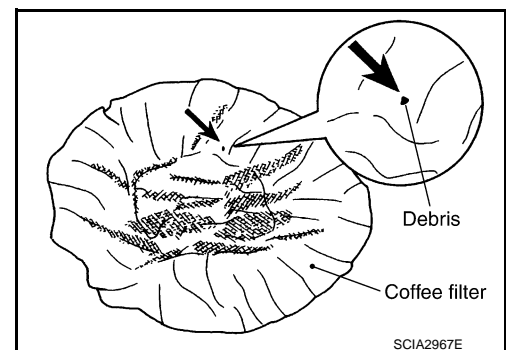


6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 to 9 kg/cm² (71 to 128 psi) through the cooler outlet hose to force any remaining ATF into the coffee filter.
9. Remove 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.

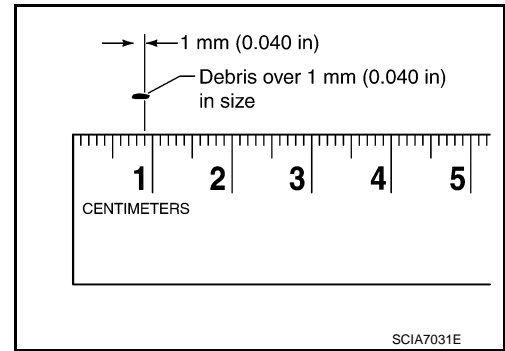


A/T FLUID COOLER

< BASIC INSPECTION >

[7AT: RE7R01B]

- 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 [TM-212, "Exploded View"](#).



Inspection

INFOID:000000009012133

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

STALL TEST

< BASIC INSPECTION >

[7AT: RE7R01B]

STALL TEST

Work Procedure

INFOID:000000009012134

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, and 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-307, "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	<ul style="list-style-type: none"> • Low brake • 1st one-way clutch • 2nd one-way clutch
	O	H	<ul style="list-style-type: none"> • Reverse brake • 1st one-way clutch • 2nd one-way clutch
	L	L	<ul style="list-style-type: none"> • Engine and torque converter one-way clutch
	H	H	<ul style="list-style-type: none"> • Line pressure low

O: Stall speed within standard value position

H: Stall speed higher than standard value

L: Stall speed lower than standard value

Stall test standard value position

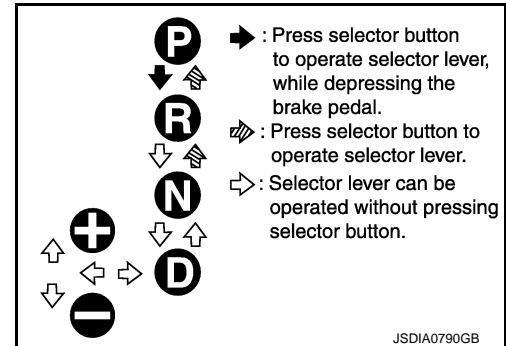
Does not shift-up "D" or "M" position 1 → 2	Slipping in 2GR, 3GR, 4GR or 6GR	2346 brake slippage
Does not shift-up "D" or "M" position 2 → 3	Slipping in 3GR, 4GR or 5GR	Direct clutch slippage
Does not shift-up "D" or "M" position 3 → 4	Slipping in 4GR, 5GR, 6GR or 7GR	High and low reverse clutch slippage
Does not shift-up "D" or "M" position 4 → 5	Slipping in 5GR, 6GR or 7GR	Input clutch slippage
Does not shift-up "D" or "M" position 5 → 6	Slipping in 2GR, 3GR, 4GR or 6GR	2346 brake slippage
Does not shift-up "D" or "M" position 6 → 7	Slipping in 7GR	Front brake slippage

A/T POSITION

Inspection

INFOID:000000009012135

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. When selector lever is set to manual shift gate, make sure that manual mode is displayed on 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

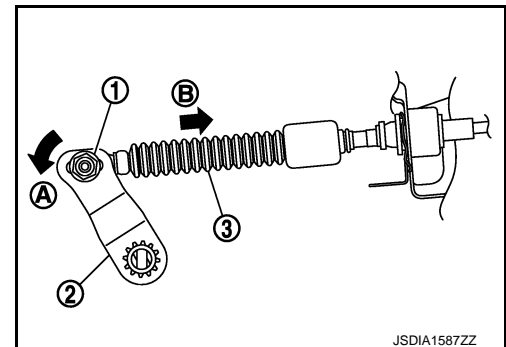
INFOID:000000009012136

1. Shift selector lever in "P" position.
2. Loosen nut (1).
3. Turn the manual lever (2) all the way in the "P" range direction [← (A)].
4. Hold and push the control cable (3) in the vehicle front direction [← (B)], and tighten the nut by hand with cable set in free condition.

CAUTION:**Be careful not put any load to manual lever.****NOTE:**

Press control cable with a force of 9.8 N (approximately 1 kg, 2.2 lb).

5. Tighten nut to specified torque. Refer to [TM-187. "Exploded View"](#).



U0100 LOST COMMUNICATION (ECM A)

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

DTC/CIRCUIT DIAGNOSIS

U0100 LOST COMMUNICATION (ECM A)

DTC Logic

INFOID:000000009012137

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible causes
U0100	Lost Communication With ECM/PCM A	When the ignition switch is ON, TCM is unable to receive the CAN communications signal from ECM continuously for 2 seconds or more.	<ul style="list-style-type: none">• ECM• Harness or connector (CAN communication line is open or shorted)

DTC CONFIRMATION PROCEDURE

1. PREPARATION BEFORE WORK

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

>> GO TO 2.

2. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

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

With GST

Follow the procedure "With CONSULT".

Is "U0100" detected?

- YES >> Go to [TM-103. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012138

For the diagnosis procedure, refer to [LAN-22. "Trouble Diagnosis Flow Chart"](#).

U0300 CAN COMMUNICATION DATA

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

U0300 CAN COMMUNICATION DATA

Description

INFOID:000000009012139

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

DTC Logic

INFOID:000000009012140

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

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-104, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012141

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

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

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

U1000 CAN COMM CIRCUIT

Description

INFOID:000000009012142

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:000000009012143

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.	<ul style="list-style-type: none">• 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

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"

Is "U1000" detected?

- YES >> Go to [TM-105. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012144

Go to [LAN-22. "Trouble Diagnosis Flow Chart"](#).

P0615 STARTER RELAY

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0615 STARTER RELAY

Description

INFOID:000000009012145

TCM prohibits cranking other than at "P" or "N" position.

DTC Logic

INFOID:000000009012146

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.	<ul style="list-style-type: none"> • 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

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-106, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012147

1. CHECK STARTER RELAY SIGNAL

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

+		-	Condition	Voltage (Approx.)
IPDM E/R				
Connector	Terminal			
E15	48	Ground	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-6, "Wiring Diagram"](#).
 NO >> GO TO 2.

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

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

P0615 STARTER RELAY

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

IPDM E/R		A/T assembly		Continuity
Connector	Terminal	Connector	Terminal	
E15	48	F51	9	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

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

Check short circuit in harness between IPDM E/R harness connector terminal 48 and A/T assembly harness connector terminal 9.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace damaged parts.

4.CHECK JOINT CONNECTOR

1. Remove joint connector. Refer to [TM-191, "Exploded View"](#).
2. Check the continuity between joint connector terminals.

A/T assembly side	TCM side	Continuity
Terminal	Terminal	
9	9	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace damaged parts.

5.CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).

NO >> Repair or replace damaged parts.

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P0705 TRANSMISSION RANGE SENSOR A

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0705 TRANSMISSION RANGE SENSOR A

DTC Logic

INFOID:000000009012148

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0705	Transmission Range Sensor A Circuit (PRNDL Input)	The TCM detects an ON/OFF combination pattern other than that of the transmission range switches 1, 2, 3 and 4.	<ul style="list-style-type: none">• 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

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".

Is "P0705" detected?

YES >> Go to [TM-108, "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012149

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).

NO >> Repair or replace damaged parts.

P0710 TRANSMISSION FLUID TEMPERATURE SENSOR A

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0710 TRANSMISSION FLUID TEMPERATURE SENSOR A

DTC Logic

INFOID:000000009012150

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0710	Transmission Fluid Temperature Sensor A Circuit	TCM judges that the A/T fluid temperature is -40°C (-40°F) or less continuously for 5 seconds while driving at 10 km/h (7 MPH) or more.	<ul style="list-style-type: none"> Harness or connectors (Sensor circuit is open.) A/T fluid temperature sensor
		TCM judges that the A/T fluid temperature is 180°C (356°F) or more continuously for 5 seconds while driving at 10 km/h (7 MPH) or more.	<ul style="list-style-type: none"> Harness or connectors (Sensor circuit is short.) A/T fluid temperature sensor
		A/T fluid temperature does not rise to 20°C (68°F) after driving for a certain period of time with the TCM-received fluid temperature sensor value between -40°C (-40°F) and 19°C (66°F).	<ul style="list-style-type: none"> Harness or connectors (Sensor circuit is stuck.) A/T fluid temperature sensor
		The following conditions are maintained for 5 minutes after the completion of engine diagnosis P0111, P0116, and P0196: <ul style="list-style-type: none"> A/T fluid temperature – Engine coolant temperature $> 33^{\circ}\text{C}$ (91.4°F) A/T fluid temperature – Engine coolant temperature $< -19^{\circ}\text{C}$ (-2.2°F) NOTE: This malfunction is applied to vehicle for North America.	A/T fluid temperature sensor

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 (PART 1)

With CONSULT

- Turn ignition switch ON.
- Select “VHCL/S SE-A/T” in “Data Monitor” in “TRANSMISSION”.
- Start the engine and maintain the following condition for 10 seconds or more.

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

With GST

Follow the procedure “With CONSULT”.

Is “P0710” detected?

YES >> Go to [TM-110, "Diagnosis Procedure"](#).

NO-1 (For North America)>>GO TO 3.

NO-2 (For Mexico)>>GO TO 4.

3. CHECK A/T FLUID TEMPERATURE SENSOR FUNCTION

With CONSULT

- Turn ignition switch OFF and cool the engine.
- Turn ignition switch ON.

CAUTION:

Never start the engine.

P0710 TRANSMISSION FLUID TEMPERATURE SENSOR A

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

3. Select "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
4. Select "COOLANT TEMP/S" in "Data Monitor" in "ENGINE".
5. Check temperature difference between A/T fluid and engine coolant.

With GST

1. Complete engine diagnoses P0111, P0116, and P0196.
2. After starting the engine start, run the engine at idle for 5 minutes.
3. Check the DTC.

Is the temperature calculated by subtracting engine coolant temperature from A/T fluid temperature more than 33°C (91.4°F) or is it less than -19°C (-2.2°F)? (With CONSULT)/Is "P0710" detected? (With GST)

YES >> Go to [TM-110, "Diagnosis Procedure"](#).

NO-1 [With CONSULT: "ATF TEMP 1" is 20°C (68°F) or more]>>INSPECTION END

NO-2 [With CONSULT: "ATF TEMP 1" is 19°C (66°F) or less]>>GO TO 4.

NO-3 (With GST)>>GO TO 4.

4.CHECK DTC DETECTION (PART 2)

With CONSULT

1. Turn ignition switch OFF and cool the engine.
2. Turn ignition switch ON.

CAUTION:

Never start the engine.

3. Select "SLCT LVR POSI", "VHCL/S SE-A/T", "ACCELE POSI", "ATF TEMP 1" in "Data Monitor" in "TRANSMISSION".
4. Record A/T fluid temperature.
5. Start the engine and wait for at least 3 minutes.
6. Drive the vehicle for the total minutes specified in the Driving time column below with the following conditions satisfied.

SLCT LVR POSI	: D
VHCL/S SE-A/T	: 10 km/h (7 MPH) or more
ACCELE POSI	: 0.5/8 or more

A/T fluid temperature before engine start	Driving time
-40°C (-40°F) – -31°C (-23.8°F)	18 minutes or more
-30°C (-22°F) – -21°C (-5.8°F)	15 minutes or more
-20°C (-4°F) – -11°C (12.2°F)	12 minutes or more
-10°C (14°F) – -1°C (30.2°F)	9 minutes or more
0°C (32°F) – 9°C (48.2°F)	6 minutes or more
10°C (50°F) – 19°C (66.2°F)	3 minutes or more

7. Perform "Self Diagnostic Results" in "TRANSMISSION".

With GST

1. Turn ignition switch OFF and cool the engine.
2. Start the engine and wait for at least 3 minutes.
3. Drive the vehicle and maintain the following conditions for 18 minutes or more.

Selector lever	: D position
Vehicle speed	: 10 km/h (7 MPH) or more
Accelerator pedal opening	: 0.5/8 or more

4. Check the DTC.

Is "P0710" detected?

YES >> Go to [TM-110, "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012151

1.CHECK INTERMITTENT INCIDENT

P0710 TRANSMISSION FLUID TEMPERATURE SENSOR A

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

Refer to [GI-43. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-191. "Exploded View"](#).
- NO >> Repair or replace damaged parts.

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P0717 INPUT SPEED SENSOR A

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0717 INPUT SPEED SENSOR A

DTC Logic

INFOID:000000009012152

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.	<ul style="list-style-type: none">• 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

1. Start the engine.
2. Select "SLCT LVR POSI", "GEAR", "VHCL/S SE-A/T", "W/O THL POS" and "ENGINE SPEED" in "Data Monitor" in "TRANSMISSION".
3. Drive vehicle and maintain the following conditions for 5 seconds or more.

CAUTION:

Keep the same gear position.

NOTE:

Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

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

4. Perform "Self Diagnostic Results" in "TRANSMISSION".

With GST

Follow the procedure "With CONSULT".

Is "P0717" detected?

- YES >> Go to [TM-112, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012153

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
NO >> Repair or replace damaged parts.

P0720 OUTPUT SPEED SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0720 OUTPUT SPEED SENSOR

DTC Logic

INFOID:000000009012154

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0720	Output Speed Sensor Circuit	<ul style="list-style-type: none">The vehicle speed detected by the output speed sensor is 5 km/h (3 MPH) or less when the vehicle speed transmitted from the combination meter to TCM is 20 km/h (13 MPH) or more. (Only when starts after the ignition switch is turned ON.)The vehicle speed transmitted from the combination meter 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 combination meter to TCM is 24 km/h (15 MPH) or more.	<ul style="list-style-type: none">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

- Start the engine.
- Select "ESTM VSP SIG" in "Data Monitor" in "TRANSMISSION".
- Drive vehicle and maintain the following conditions for 60 seconds or more.

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

- Perform "Self Diagnostic Results" in "TRANSMISSION".

With GST

Follow the procedure "With CONSULT".

Is "P0720" detected?

- YES >> Go to [TM-113. "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012155

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43. "Intermittent Incident"](#).

P0720 OUTPUT SPEED SENSOR

[7AT: RE7R01B]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

2.REPLACE OUTPUT SPEED SENSOR AND CHECK DTC

1. Replace output speed sensor. Refer to [TM-221, "Exploded View"](#).

2. Perform "DTC CONFIRMATION PROCEDURE". Refer to [TM-113, "DTC Logic"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace control valve & TCM. Refer to [TM-191, "Exploded View"](#).

P0725 ENGINE SPEED

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0725 ENGINE SPEED

Description

INFOID:000000009012156

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

DTC Logic

INFOID:000000009012157

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0725	Engine Speed Input Circuit	<ul style="list-style-type: none">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

- Start the engine.
- Select "SLCT LVR POSI" and "VHCL/S SE-A/T" in "Data Monitor" in "TRANSMISSION".
- 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)

- Perform "Self Diagnostic Results" in "TRANSMISSION".

Is "P0725" detected?

- YES >> Go to [TM-115, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012158

1. CHECK DTC OF ECM

With CONSULT

- Turn ignition switch ON.
- Perform "Self Diagnostic Results" in "ENGINE".

Is any DTC detected?

- YES >> Check DTC detected item. Refer to [EC-107, "DTC Index"](#).
NO >> GO TO 2.

2. CHECK DTC OF TCM

With CONSULT

Perform "Self Diagnostic Results" in "TRANSMISSION".

Is any DTC other than "P0725" detected?

- YES >> Check DTC detected item. Refer to [TM-82, "DTC Index"](#).
NO >> GO TO 3.

P0725 ENGINE SPEED

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

3. CHECK INTERMITTENT INCIDENT

Refer to [GI-43. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-191. "Exploded View"](#).
- NO >> Repair or replace damaged parts.

P0729 6GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0729 6GR INCORRECT RATIO

Description

INFOID:000000009012159

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:000000009012160

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0729	Gear 6 Incorrect Ratio	The gear ratio is: • 0.915 or more • 0.813 or less	<ul style="list-style-type: none"> • 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-118, "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

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

1. Select “6TH GR FNCTN P0729” in “DTC Work Support” in “TRANSMISSION”.
2. Drive vehicle with manual mode and maintain the following conditions.

P0729 6GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

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 screen changes from "OUT OF CONDITION" to "TESTING".

CAUTION:

When "TESTING" is not indicated on CONSULT for a long time, check "Self Diagnostic Results" in "TRANSMISSION". When a DTC other than "P0729" is detected, check the DTC. Refer to [TM-82, "DTC Index"](#).

 **With GST**

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

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

2. Check DTC.

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

YES-1 (OUT OF CONDITION)>>Perform "Step 3" again.
YES-2 (STOP VEHICLE)>>GO TO 4.
YES-3 (COMPLETED RESULT NG)>>Go to [TM-118, "Diagnosis Procedure"](#).
YES-4 ("P0729" is detected)>>Go to [TM-118, "Diagnosis Procedure"](#).
NO >> GO TO 4.

4.CHECK SYMPTOM (PART 2)

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:000000009012161

1.CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

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

2.DETECT MALFUNCTIONING ITEM

Disassemble the A/T assembly to check component parts. Refer to [TM-236, "Disassembly"](#).

NOTE:

Check the component parts, referring to "Possible cause" in "DTC DETECTION LOGIC". Refer to [TM-117, "DTC Logic"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
NO >> Repair or replace damaged parts.

P0730 INCORRECT GEAR RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0730 INCORRECT GEAR RATIO

Description

INFOID:000000009012162

- 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:000000009012163

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.	<ul style="list-style-type: none"> • 2346 brake solenoid valve • Front brake solenoid valve • Input speed sensor 2

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"TM-119. "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

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.

With GST

Follow the procedure "With CONSULT".

Is "P0730" detected?

- YES >> Go to [TM-119. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012164

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair or replace damaged parts.

P0730 INCORRECT GEAR RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

2. DETECT MALFUNCTIONING ITEM

Disassemble the A/T assembly to check component parts. Refer to [TM-236, "Disassembly"](#).

NOTE:

Check the component parts, referring to "Possible cause" in "DTC DETECTION LOGIC". Refer to [TM-119, "DTC Logic"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).

NO >> Repair or replace damaged parts.

P0731 1GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0731 1GR INCORRECT RATIO

Description

INFOID:000000009012165

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:000000009012166

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0731	Gear 1 Incorrect Ratio	The gear ratio is: • 5.180 or more • 4.594 or less	<ul style="list-style-type: none"> • 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-122, "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

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

1. Select “1ST GR FNCTN P0731” in “DTC Work Support” in “TRANSMISSION”.
2. Drive vehicle with manual mode and maintain the following conditions.

P0731 1GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

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 screen changes from "OUT OF CONDITION" to "TESTING".

CAUTION:

When "TESTING" is not indicated on CONSULT for a long time, check "Self Diagnostic Results" in "TRANSMISSION". When a DTC other than "P0731" is detected, check the DTC. Refer to [TM-82, "DTC Index"](#).

 **With GST**

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

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

2. Check DTC.

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

YES-1 (OUT OF CONDITION)>>Perform "Step 3" again.

YES-2 (STOP VEHICLE)>>GO TO 4.

YES-3 (COMPLETED RESULT NG)>>Go to [TM-122, "Diagnosis Procedure"](#).

YES-4 ("P0731" is detected)>>Go to [TM-122, "Diagnosis Procedure"](#).

NO >> GO TO 4.

4.CHECK SYMPTOM (PART 2)

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:000000009012167

1.CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

2.DETECT MALFUNCTIONING ITEM

Disassemble the A/T assembly to check component parts. Refer to [TM-236, "Disassembly"](#).

NOTE:

Check the component parts, referring to "Possible cause" in "DTC DETECTION LOGIC". Refer to [TM-121, "DTC Logic"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).

NO >> Repair or replace damaged parts.

P0732 2GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0732 2GR INCORRECT RATIO

Description

INFOID:000000009012168

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:000000009012169

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0732	Gear 2 Incorrect Ratio	The gear ratio is: • 3.360 or more • 2.980 or less	<ul style="list-style-type: none"> • 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-124, "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

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

1. Select “2ND GR FNCTN P0732” in “DTC Work Support” in “TRANSMISSION”.
2. Drive vehicle with manual mode and maintain the following conditions.

P0732 2GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

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 screen changes from "OUT OF CONDITION" to "TESTING".

CAUTION:

When "TESTING" is not indicated on CONSULT for a long time, check "Self Diagnostic Results" in "TRANSMISSION". When a DTC other than "P0732" is detected, check the DTC. Refer to [TM-82, "DTC Index"](#).

 **With GST**

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

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

2. Check DTC.

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

YES-1 (OUT OF CONDITION)>>Perform "Step 3" again.

YES-2 (STOP VEHICLE)>>GO TO 4.

YES-3 (COMPLETED RESULT NG)>>Go to [TM-124, "Diagnosis Procedure"](#).

YES-4 ("P0732" is detected)>>Go to [TM-124, "Diagnosis Procedure"](#).

NO >> GO TO 4.

4.CHECK SYMPTOM (PART 2)

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:000000009012170

1.CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

2.DETECT MALFUNCTIONING ITEM

Disassemble the A/T assembly to check component parts. Refer to [TM-236, "Disassembly"](#).

NOTE:

Check the component parts, referring to "Possible cause" in "DTC DETECTION LOGIC". Refer to [TM-123, "DTC Logic"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).

NO >> Repair or replace damaged parts.

P0733 3GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0733 3GR INCORRECT RATIO

Description

INFOID:000000009012171

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:000000009012172

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0733	Gear 3 Incorrect Ratio	The gear ratio is: • 2.148 or more • 1.906 or less	<ul style="list-style-type: none"> • 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-126, "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

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

1. Select “3RD GR FNCTN P0733” in “DTC Work Support” in “TRANSMISSION”.
2. Drive vehicle with manual mode and maintain the following conditions.

P0733 3GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

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 screen changes from "OUT OF CONDITION" to "TESTING".

CAUTION:

When "TESTING" is not indicated on CONSULT for a long time, check "Self Diagnostic Results" in "TRANSMISSION". When a DTC other than "P0733" is detected, check the DTC. Refer to [TM-82, "DTC Index"](#).

 **With GST**

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

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

2. Check DTC.

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

YES-1 (OUT OF CONDITION)>>Perform "Step 3" again.
YES-2 (STOP VEHICLE)>>GO TO 4.
YES-3 (COMPLETED RESULT NG)>>Go to [TM-126, "Diagnosis Procedure"](#).
YES-4 ("P0733" is detected)>>Go to [TM-126, "Diagnosis Procedure"](#).
NO >> GO TO 4.

4.CHECK SYMPTOM (PART 2)

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:000000009012173

1.CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

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

2.DETECT MALFUNCTIONING ITEM

Disassemble the A/T assembly to check component parts. Refer to [TM-236, "Disassembly"](#).

NOTE:

Check the component parts, referring to "Possible cause" in "DTC DETECTION LOGIC". Refer to [TM-125, "DTC Logic"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
NO >> Repair or replace damaged parts.

P0734 4GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0734 4GR INCORRECT RATIO

Description

INFOID:000000009012174

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:000000009012175

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0734	Gear 4 Incorrect Ratio	The gear ratio is: • 1.496 or more • 1.328 or less	<ul style="list-style-type: none"> • 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-128, "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

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

1. Select “4TH GR FNCTN P0734” in “DTC Work Support” in “TRANSMISSION”.
2. Drive vehicle with manual mode and maintain the following conditions.

P0734 4GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

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 screen changes from "OUT OF CONDITION" to "TESTING".

CAUTION:

When "TESTING" is not indicated on CONSULT for a long time, check "Self Diagnostic Results" in "TRANSMISSION". When a DTC other than "P0734" is detected, check the DTC. Refer to [TM-82, "DTC Index"](#).

 **With GST**

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

Selector lever : "M" position
Gear position : 4th
Accelerator pedal opening : 0.7/8 or more
Vehicle speed : 10 km/h (7 MPH) or more

2. Check DTC.

Is "OUT OF CONDITION", "STOP VEHICLE" or "COMPLETED RESULT NG" displayed? / Is "P0734" detected?

YES-1 (OUT OF CONDITION)>>Perform "Step 3" again.

YES-2 (STOP VEHICLE)>>GO TO 4.

YES-3 (COMPLETED RESULT NG)>>Go to [TM-128, "Diagnosis Procedure"](#).

YES-4 ("P0734" is detected)>>Go to [TM-128, "Diagnosis Procedure"](#).

NO >> GO TO 4.

4.CHECK SYMPTOM (PART 2)

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:000000009012176

1.CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

2.DETECT MALFUNCTIONING ITEM

Disassemble the A/T assembly to check component parts. Refer to [TM-236, "Disassembly"](#).

NOTE:

Check the component parts, referring to "Possible cause" in "DTC DETECTION LOGIC". Refer to [TM-127, "DTC Logic"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-221, "Exploded View"](#).

NO >> Repair or replace damaged parts.

P0735 5GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0735 5GR INCORRECT RATIO

Description

INFOID:000000009012177

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:000000009012178

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0735	Gear 5 Incorrect Circuit	The gear ratio is: • 1.060 or more • 0.940 or less	<ul style="list-style-type: none"> • 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-130, "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

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

1. Select “5TH GR FNCTN P0735” in “DTC Work Support” in “TRANSMISSION”.
2. Drive vehicle with manual mode and maintain the following conditions.

P0735 5GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

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 screen changes from "OUT OF CONDITION" to "TESTING".

CAUTION:

When "TESTING" is not indicated on CONSULT for a long time, check "Self Diagnostic Results" in "TRANSMISSION". When a DTC other than "P0735" is detected, check the DTC. Refer to [TM-82, "DTC Index"](#).

 **With GST**

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

Selector lever : "M" position
Gear position : 5th
Accelerator pedal opening : 0.7/8 or more
Vehicle speed : 10 km/h (7 MPH) or more

2. Check DTC.

Is "OUT OF CONDITION", "STOP VEHICLE" or "COMPLETED RESULT NG" displayed? / Is "P0735" detected?

YES-1 (OUT OF CONDITION)>>Perform "Step 3" again.
YES-2 (STOP VEHICLE)>>GO TO 4.
YES-3 (COMPLETED RESULT NG)>>Go to [TM-130, "Diagnosis Procedure"](#).
YES-4 ("P0735" is detected)>>Go to [TM-130, "Diagnosis Procedure"](#).
NO >> GO TO 4.

4.CHECK SYMPTOM (PART 2)

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:000000009012179

1.CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

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

2.DETECT MALFUNCTIONING ITEM

Disassemble the A/T assembly to check component parts. Refer to [TM-236, "Disassembly"](#).

NOTE:

Check the component parts, referring to "Possible cause" in "DTC DETECTION LOGIC". Refer to [TM-129, "DTC Logic"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
NO >> Repair or replace damaged parts.

P0740 TORQUE CONVERTER

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0740 TORQUE CONVERTER

DTC Logic

INFOID:000000009012180

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 0.2 A or less when the torque converter clutch solenoid valve command value is more than 0.75 A.	<ul style="list-style-type: none"> 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

- Start the engine.
- Select "MANU MODE SW", "GEAR" and "VEHICLE SPEED" in "Data Monitor" in "TRANSMISSION".
- Drive vehicle and maintain the following conditions for 30 seconds or more.

NOTE:

Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

MANU MODE SW : ON
 GEAR : 2nd
 VEHICLE SPEED : 40 km/h (25 MPH) or more

- Perform "Self Diagnostic Results" in "TRANSMISSION".

With GST

Follow the procedure "With CONSULT".

Is "P0740" detected?

- YES >> Go to [TM-131, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012181

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
 NO >> Repair or replace damaged parts.

P0744 TORQUE CONVERTER

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0744 TORQUE CONVERTER

Description

INFOID:000000009012182

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:000000009012183

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.	<ul style="list-style-type: none">• 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

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".

Is "P0744" detected?

YES >> Go to [TM-132, "Diagnosis Procedure"](#).

NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012184

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

2. DETECT MALFUNCTIONING ITEM

P0744 TORQUE CONVERTER

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

Disassemble the A/T assembly to check component parts. Refer to [TM-236, "Disassembly"](#).

NOTE:

Check the component parts, referring to "Possible cause" in "DTC DETECTION LOGIC". Refer to [TM-132, "DTC Logic"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).

NO >> Repair or replace damaged parts.

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P0745 PRESSURE CONTROL SOLENOID A

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0745 PRESSURE CONTROL SOLENOID A

DTC Logic

INFOID:000000009012185

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 0.2 A or less when the line pressure solenoid valve command value is more than 0.75 A.	<ul style="list-style-type: none">• Harness or connectors (Solenoid valve circuit is open or shorted.)• Line pressure solenoid valve

DTC CONFIRMATION PROCEDURE

1. PRECONDITIONING

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

>> GO TO 2.

2. CHECK DTC DETECTION

With CONSULT

1. Start the engine.
2. Wait for 5 seconds or more at idle speed in "N" position.
3. Perform "Self Diagnostic Results" in "TRANSMISSION".

With GST

Follow the procedure "With CONSULT".

Is "P0745" detected?

- YES >> Go to [TM-134, "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012186

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
- NO >> Repair or replace damaged parts.

P0750 SHIFT SOLENOID A

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0750 SHIFT SOLENOID A

DTC Logic

INFOID:000000009012187

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0750	Shift Solenoid A	<ul style="list-style-type: none">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.	<ul style="list-style-type: none">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

- Start the engine.
- Select "BATTERY VOLT", "MANU MODE SW", "GEAR" and "VHCL/S SE-A/T" in "Data Monitor" in "TRANSMISSION".
- 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

- Perform "Self Diagnostic Results" in "TRANSMISSION".

With GST

Follow the procedure "With CONSULT".

Is "P0750" detected?

- YES >> Go to [TM-135. "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012188

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-191. "Exploded View"](#).
NO >> Repair or replace damaged parts.

P0775 PRESSURE CONTROL SOLENOID B

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0775 PRESSURE CONTROL SOLENOID B

DTC Logic

INFOID:000000009012189

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 0.2 A or less when the input clutch solenoid valve command value is more than 0.75 A.	<ul style="list-style-type: none">• 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

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".

Is "P0775" detected?

YES >> Go to [TM-136, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012190

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
NO >> Repair or replace damaged parts.

P0780 SHIFT

Description

INFOID:000000009012191

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.

DTC Logic

INFOID:000000009012192

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P0780	Shift Error	<ul style="list-style-type: none"> When shifting from 3GR to 4GR with the selector lever in "D" position, the gear ratio does not shift to 1.412 (gear ratio of 4th). When shifting from 5GR to 6GR or 6GR to 7GR, the engine speed exceeds the prescribed speed. 	<ul style="list-style-type: none"> Anti-interlock solenoid valve Low brake solenoid valve Hydraulic control circuit

DTC CONFIRMATION PROCEDURE

CAUTION:

- **"[TM-137, "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**

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 → 5th → 6th → 7th

4. Perform "Self Diagnostic Results" in "TRANSMISSION".

 **With GST**

Follow the procedure "With CONSULT".

Is "P0780" detected?

- YES >> Go to [TM-137, "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012193

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

< DTC/CIRCUIT DIAGNOSIS >

- YES >> GO TO 2.
- NO >> Repair or replace damaged parts.

2.DETECT MALFUNCTIONING ITEM

Disassemble the A/T assembly to check component parts. Refer to [TM-236, "Disassembly"](#).

NOTE:

Check the component parts, referring to "Possible cause" in "DTC DETECTION LOGIC". Refer to [TM-137, "DTC Logic"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
- NO >> Repair or replace damaged parts.

P0795 PRESSURE CONTROL SOLENOID C

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P0795 PRESSURE CONTROL SOLENOID C

DTC Logic

INFOID:000000009012194

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 0.2 A or less when the front brake solenoid valve command value is more than 0.75 A.	<ul style="list-style-type: none">• 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

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".

Is "P0795" detected?

YES >> Go to [TM-139, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012195

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
NO >> Repair or replace damaged parts.

P1705 TP SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P1705 TP SENSOR

DTC Logic

INFOID:000000009012196

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

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-140, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012197

1. CHECK DTC OF ECM

With CONSULT

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

Is any DTC detected?

- YES >> Check DTC detected item. Refer to [EC-107, "DTC Index"](#).
NO >> GO TO 2.

2. CHECK DTC OF TCM

With CONSULT

Perform "Self Diagnostic Results" in "TRANSMISSION".

Is any DTC other than "P1705" detected?

- YES >> Check DTC detected item. Refer to [TM-82, "DTC Index"](#).
NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
NO >> Repair or replace damaged parts.

P1721 VEHICLE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P1721 VEHICLE SPEED SIGNAL

Description

INFOID:000000009012198

The vehicle speed signal is transmitted from combination meter 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:000000009012199

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1721	Vehicle Speed Signal Circuit	<ul style="list-style-type: none"> The vehicle speed transmitted from the combination meter to TCM is 5 km/h (3 MPH) or less when the vehicle speed detected by the output speed sensor is 20 km/h (13 MPH) 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 combination meter when the vehicle speed transmitted from the combination meter to TCM is 36 km/h (23 MPH) or more and the vehicle speed detected by the output speed sensor is 24 km/h (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

- Start the engine.
- Select "VHCL/S SE-A/T" in "Data Monitor" in "TRANSMISSION".
- Drive vehicle and maintain the following conditions for 60 seconds or more.

VHCL/S SE-A/T : 40 km/h (25 MPH) or more

- Perform "Self Diagnostic Results" in "TRANSMISSION".

Is "P1721" detected?

- YES >> Go to [TM-142. "Diagnosis Procedure"](#).
 NO >> INSPECTION END

P1721 VEHICLE SPEED SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

Diagnosis Procedure

INFOID:000000009012200

1. CHECK DTC OF UNIFIED METER AND A/C AMP.

With CONSULT

Perform "Self Diagnostic Results" in "METER/M&A".

Is any DTC detected?

YES >> Check DTC detected item. Refer to [MWI-44, "DTC Index"](#).

NO >> GO TO 2.

2. CHECK DTC OF TCM

With CONSULT

Perform "Self Diagnostic Results" in "TRANSMISSION".

Is any DTC other than "P1721" detected?

YES >> Check DTC detected item. Refer to [TM-82, "DTC Index"](#).

NO >> GO TO 3.

3. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).

NO >> Repair or replace damaged parts.

P1730 INTERLOCK

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P1730 INTERLOCK

Description

INFOID:000000009012201

Fail-safe function to detect interlock conditions.

DTC Logic

INFOID:000000009012202

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1730	Interlock	The output speed sensor detects the deceleration of 12 km/h (7 MPH) or more for 1 second.	<ul style="list-style-type: none">• 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• Hydraulic control circuit

NOTE:

When the vehicle is driven fixed in 2GR, an input speed sensor malfunction is displayed, but this is not an input speed sensor malfunction.

DTC CONFIRMATION PROCEDURE

CAUTION:

- **“[TM-144, "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

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”.

Is “P1730” detected?

- YES >> Go to [TM-144, "Diagnosis Procedure"](#).
- NO >> INSPECTION END

Judgment of Interlock

INFOID:000000009012203

Refer to [TM-77, "Fail-Safe"](#).

Diagnosis Procedure

INFOID:000000009012204

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

2. DETECT MALFUNCTIONING ITEM

Disassemble the A/T assembly to check component parts. Refer to [TM-236, "Disassembly"](#).

NOTE:

Check the component parts, referring to "Possible cause" in "DTC DETECTION LOGIC". Refer to [TM-143, "DTC Logic"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).

NO >> Repair or replace damaged parts.

P1734 7GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P1734 7GR INCORRECT RATIO

Description

INFOID:000000009012205

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:000000009012206

DTC DETECTION LOGIC

DTC	Trouble diagnosis name	DTC is detected if...	Possible cause
P1734	Gear 7 Incorrect Ratio	The gear ratio is: • 0.821 or more • 0.729 or less	<ul style="list-style-type: none"> • 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-146, "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

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

1. Select “7TH GR FNCTN P1734” in “DTC Work Support” in “TRANSMISSION”.
2. Drive vehicle with manual mode and maintain the following conditions.

P1734 7GR INCORRECT RATIO

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

GEAR : 7th
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 screen changes from "OUT OF CONDITION" to "TESTING".

CAUTION:

When "TESTING" is not indicated on CONSULT for a long time, check "Self Diagnostic Results" in "TRANSMISSION". When a DTC other than "P1734" is detected, check the DTC. Refer to [TM-82, "DTC Index"](#).

 **With GST**

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

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

2. Check DTC.

Is "OUT OF CONDITION", "STOP VEHICLE" or "COMPLETED RESULT NG" displayed? / Is "P1734" detected?

YES-1 (OUT OF CONDITION)>>Perform "Step 3" again.

YES-2 (STOP VEHICLE)>>GO TO 4.

YES-3 (COMPLETED RESULT NG)>>Go to [TM-146, "Diagnosis Procedure"](#).

YES-4 ("P1734" is detected)>>Go to [TM-146, "Diagnosis Procedure"](#).

NO >> GO TO 4.

4.CHECK SYMPTOM (PART 2)

 **With CONSULT**

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:000000009012207

1.CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

2.DETECT MALFUNCTIONING ITEM

Disassemble the A/T assembly to check component parts. Refer to [TM-236, "Disassembly"](#).

NOTE:

Check the component parts, referring to "Possible cause" in "DTC DETECTION LOGIC". Refer to [TM-145, "DTC Logic"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).

NO >> Repair or replace damaged parts.

P1815 M-MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P1815 M-MODE SWITCH

DTC Logic

INFOID:000000009012208

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.	<ul style="list-style-type: none"> Harness or connectors (These switches circuit is open or shorted.) Manual mode switch

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

- Turn ignition switch ON.
- Select "SLCT LVR POSI" and "MANU MODE SW" in "Data Monitor" in "TRANSMISSION".
- Maintain the following each conditions more than 2 seconds.

SLCT LVR POSI : D
MANU MODE SW : ON

- Perform "Self Diagnostic Results" in "TRANSMISSION".

Is "P1815" detected?

- YES >> Go to [TM-147, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012209

1. CHECK MANUAL MODE SWITCH CIRCUIT

- Turn ignition switch OFF.
- Disconnect A/T shift selector connector.
- Turn ignition switch ON.
- Check voltage between A/T shift selector harness connector terminals.

Connector	A/T shift selector		Voltage (Approx.)
	+	-	
M57	1	Ground	Battery voltage
	2		
	3		
	5		

Is the inspection result normal?

- YES >> GO TO 2.
NO >> GO TO 3.

2. CHECK MANUAL MODE SWITCH

P1815 M-MODE SWITCH

[7AT: RE7R01B]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Check manual mode switch. Refer to [TM-149, "Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair or replace damaged parts.

3.CHECK GROUND CIRCUIT (MANUAL MODE SWITCH CIRCUIT)

1. Turn ignition switch OFF.
2. Check continuity between A/T shift selector harness connector terminal and ground.

A/T shift selector		—	Continuity
Connector	Terminal		
M57	4	Ground	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 COMBINATION METER (PART 1)

1. Disconnect unified meter and A/C amp. connector.
2. Check continuity between A/T shift selector harness connector terminals and combination meter harness connector terminals.

A/T shift selector		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
M57	1	M34	40	Existed
	2		38	
	3		39	
	5		37	

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace damaged parts.

5.CHECK HARNESS BETWEEN A/T SHIFT SELECTOR AND COMBINATION METER (PART 2)

Check continuity between A/T shift selector harness connector terminals and ground.

A/T shift selector		—	Continuity
Connector	Terminal		
M57	1	Ground	Existed
	2		
	3		
	5		

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair or replace damaged parts.

6.CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Repair or replace damaged parts.

7.CHECK COMBINATION METER

1. Reconnect all the connectors.

P1815 M-MODE SWITCH

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

2. Turn ignition switch ON.
3. Select "M RANGE SW", "NM RANGE SW", "AT SFT UP SW" and "AT SFT DWN SW" in "Data Monitor" in "METER/M&A".
4. Check the ON/OFF operations of each monitor item. Refer to [MWI-36, "Reference Value"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).

NO >> Replace combination meter. Refer to [MWI-87, "Exploded View"](#).

Component Inspection

INFOID:000000009012210

1. CHECK MANUAL MODE SWITCH

Check continuity between A/T shift selector connector terminals.

A/T shift selector Terminal	Condition	Continuity
1 - 4	Selector lever is shifted to manual shift gate side	Existed
	Other than the above	Not existed
2 - 4	Selector lever is shifted to - side	Existed
	Other than the above	Not existed
3 - 4	Selector lever is shifted to + side	Existed
	Other than the above	Not existed
5 - 4	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 >> Replace A/T shift selector assembly. Refer to [TM-185, "Exploded View"](#).

P2713 PRESSURE CONTROL SOLENOID D

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P2713 PRESSURE CONTROL SOLENOID D

DTC Logic

INFOID:000000009012211

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 0.2 A or less when the high and low reverse clutch solenoid valve command value is more than 0.75 A.	<ul style="list-style-type: none"> • 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

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".

Is "P2713" detected?

- YES >> Go to [TM-150, "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012212

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-218, "4WD : Exploded View"](#).
 NO >> Repair or replace damaged parts.

P2722 PRESSURE CONTROL SOLENOID E

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P2722 PRESSURE CONTROL SOLENOID E

DTC Logic

INFOID:000000009012213

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 0.2 A or less when the low brake solenoid valve command value is more than 0.75 A.	<ul style="list-style-type: none">• 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

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".

Is "P2722" detected?

- YES >> Go to [TM-151, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012214

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-218, "4WD : Exploded View"](#).
NO >> Repair or replace damaged parts.

P2731 PRESSURE CONTROL SOLENOID F

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P2731 PRESSURE CONTROL SOLENOID F

DTC Logic

INFOID:000000009012215

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 0.2 A or less when the 2346 brake solenoid valve command value is more than 0.75 A.	<ul style="list-style-type: none">• 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

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".

Is "P2731" detected?

YES >> Go to [TM-152, "Diagnosis Procedure"](#).
NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012216

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
NO >> Repair or replace damaged parts.

P2807 PRESSURE CONTROL SOLENOID G

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

P2807 PRESSURE CONTROL SOLENOID G

DTC Logic

INFOID:000000009012217

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 0.2 A or less when the direct clutch solenoid valve command value is more than 0.75 A.	<ul style="list-style-type: none"> • 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

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".

Is "P2807" detected?

- YES >> Go to [TM-153. "Diagnosis Procedure"](#).
 NO >> INSPECTION END

Diagnosis Procedure

INFOID:000000009012218

1. CHECK INTERMITTENT INCIDENT

Refer to [GI-43. "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-218. "4WD : Exploded View"](#).
 NO >> Repair or replace damaged parts.

MAIN POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

MAIN POWER SUPPLY AND GROUND CIRCUIT

Diagnosis Procedure

INFOID:000000009012219

1. CHECK TCM POWER SOURCE (PART 1)

1. Turn ignition switch OFF.
2. Disconnect A/T assembly connector.
3. Check voltage between A/T assembly harness connector terminal and ground.

+		-	Condition	Voltage (Approx.)
A/T assembly				
Connector	Terminal			
F51	2	Ground	Always	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 6.

2. CHECK TCM POWER SOURCE (PART 2)

Check voltage between A/T assembly harness connector terminals and ground.

+		-	Condition	Voltage (Approx.)
A/T assembly				
Connector	Terminal			
F51	1	Ground	Turn ignition switch ON	Battery voltage
			Turn ignition switch OFF	0 V
	6		Turn ignition switch ON	Battery voltage
			Turn ignition switch OFF	0 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 7.

3. CHECK TCM GROUND CIRCUIT

Check continuity between A/T assembly harness connector terminals and ground.

A/T assembly		—	Continuity
Connector	Terminal		
F51	5	Ground	Existed
	10		

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace damaged parts.

4. CHECK JOINT CONNECTOR

1. Remove joint connector. Refer to [TM-191, "Exploded View"](#).
2. Check the continuity between joint connector terminals.

MAIN POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

A/T assembly side	TCM side	Continuity
Terminal	Terminal	
1	1	Existed
2	2	
5	5	
6	6	
10	10	

Is the inspection result normal?

- YES >> GO TO 5.
 NO >> Repair or replace damaged parts.

5. CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

- YES >> Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
 NO >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM (PART 1)

Check the following.

- Open circuit or short circuit in harness between battery positive terminal and A/T assembly harness connector terminal 2. Refer to [PG-11, "Wiring Diagram - BATTERY POWER SUPPLY -"](#).
- Battery
- 10A fuse (No.38, located in the fuse, fusible link and relay box). Refer to [PG-97, "Fuse and Fusible Link Arrangement"](#).

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).
 NO >> Repair or replace damaged parts.

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

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

IPDM E/R		A/T assembly		Continuity
Connector	Terminal	Connector	Terminal	
E15	57	F51	1	Existed
			6	

Is the inspection result normal?

- YES >> GO TO 8.
 NO >> Repair or replace damaged parts.

8. DETECT MALFUNCTIONING ITEM (PART 2)

Check the following.

- Open circuit or short circuit in harness between ignition switch and IPDM E/R. Refer to [PG-59, "Wiring Diagram - IGNITION POWER SUPPLY -"](#).
- Short circuit in harness between IPDM E/R harness connector terminal 57 and A/T assembly harness connector terminal 1, and 6.
- 10A fuse (No.55, located in the IPDM E/R). Refer to [PG-99, "Fuse, Connector and Terminal Arrangement"](#).
- Ignition switch
- IPDM E/R

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

MAIN POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

NO >> Repair or replace damaged parts.

TOW MODE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

TOW MODE SYSTEM

Component Function Check

INFOID:000000009012220

1. CHECK TOW MODE INDICATOR LAMP FUNCTION

1. Turn ignition switch ON.
2. Check that tow mode indicator lamp turns ON/OFF when tow mode switch is operated.

Is the inspection result normal?

- YES >> INSPECTION END
NO >> Go to [TM-157, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000009012221

NOTE:

Tow mode switch is integrated in to SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models).

1. CHECK DTC OF TCM

With CONSULT

1. Turn ignition switch ON.
2. Perform "Self-Diagnostic Results" in "TRANSMISSION".

Is any DTC detected?

- YES >> Check DTC detected item. Refer to [TM-82, "DTC Index"](#).
NO >> GO TO 2.

2. CHECK DTC OF COMBINATION METER

With CONSULT

Perform "Self-Diagnostic Results" in "METER/M&A".

Is any DTC detected?

- YES >> Check DTC detected item. Refer to [MWI-44, "DTC Index"](#).
NO >> GO TO 3.

3. CHECK COMBINATION METER

With CONSULT

1. Select "TOW MODE IND" in "Data Monitor" in "METER/M&A".
2. Check that "TOW MODE IND" turns ON/OFF when tow mode switch is operated.

Is the inspection result normal?

- YES >> Replace combination meter. Refer to [MWI-87, "Exploded View"](#).
NO >> GO TO 4.

4. CHECK TOW MODE SWITCH SIGNAL

With CONSULT

1. Select "TOW MODE SW" in "Data Monitor" in "TRANSMISSION".
2. Check that "TOW MODE SW" turns ON/OFF when tow mode switch is operated.

Is the inspection result normal?

- YES >> Replace combination meter. Refer to [MWI-87, "Exploded View"](#).
NO >> GO TO 5.

5. CHECK TOW MODE SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly connector (4WD models).
3. Turn ignition switch ON.
4. Check voltage between SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly connector (4WD models) harness connector terminals.

TOW MODE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models)		Voltage (Approx.)	
Connector	Terminal		Battery voltage
	+	-	
M54 ^{*1} M147 ^{*2}	23	20	

*1: 4WD models

*2: 2WD models

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 9.

6.CHECK TOW MODE SWITCH

Check tow mode switch. Refer to [TM-159, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace damaged parts.

7.CHECK INTERMITTENT INCIDENT

Refer to [GI-43, "Intermittent Incident"](#).

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace damaged parts.

8.CHECK TOW MODE SYSTEM

1. Replace the control valve & TCM. Refer to [TM-191, "Exploded View"](#).
2. Reinstall any parts removed.
3. Check tow mode system. Refer to [TM-157, "Component Function Check"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace combination meter. Refer to [TM-191, "Exploded View"](#).

9.CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly connector (4WD models) harness connector terminal and ground.

SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models)		—	Continuity
Connector	Terminal		
M54 ^{*1} M147 ^{*2}	20	Ground	Existed

*1: 4WD models

*2: 2WD models

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair or replace damaged parts.

10.CHECK HARNESS BETWEEN SNOW MODE/TOW MODE/VDC OFF SWITCH ASSEMBLY (2WD MODELS) OR 4WD SWITCH ASSEMBLY (4WD MODELS) AND COMBINATION METER (PART 1)

1. Disconnect combination meter connector.

TOW MODE SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

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2. Check continuity between SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly connector (4WD models) harness connector terminal and combination meter harness connector terminal.

SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models)		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
M54 ^{*1} M147 ^{*2}	23	M34	7	Existed

*1: 4WD models

*2: 2WD models

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair or replace damaged parts.

11.CHECK HARNESS BETWEEN SNOW MODE/TOW MODE/VDC OFF SWITCH ASSEMBLY (2WD MODELS) OR 4WD SWITCH ASSEMBLY (4WD MODELS) AND COMBINATION METER (PART 2)

Check continuity between SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly connector (4WD models) harness connector terminal and ground.

SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models)		—	Continuity
Connector	Terminal		
M54 ^{*1} M147 ^{*2}	23	Ground	Not existed

*1: 4WD models

*2: 2WD models

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace damaged parts.

12.CHECK COMBINATION METER

1. Reconnect all the connectors.
2. Check combination meter input/output signal. Refer to [MWI-36. "Reference Value"](#).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43. "Intermittent Incident"](#).

NO >> Replace combination meter. Refer to [MWI-87. "Exploded View"](#).

Component Inspection

INFOID:000000009012222

NOTE:

Tow mode switch is integrated in to SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models).

1.CHECK TOW MODE SWITCH

Check continuity between SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models) connector terminals.

TOW MODE SYSTEM

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SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models)		Condition	Continuity
Terminal			
23	20	Tow mode switch is depressed	Existed
		Tow mode switch is released	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace tow mode switch. Refer to [TM-190. "Removal and Installation"](#).

SHIFT POSITION INDICATOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

SHIFT POSITION INDICATOR CIRCUIT

Description

INFOID:000000009012223

TCM transmits a shift position signal to the combination meter via CAN communication line. While the vehicle is running, the combination meter displays a shift position in the information display, according to this signal. Refer to [MWI-9, "METER SYSTEM : System Diagram"](#).

Component Function Check

INFOID:000000009012224

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" and "D") 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-161, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000009012225

1. CHECK INPUT SIGNALS

With CONSULT

1. Start the engine.
2. Select "SLCT LVR POSI" in "Data Monitor" in "TRANSMISSION".
3. Check the actual selector lever position ("P", "R", "N" and "D") and the indication of the "SLCT LVR POSI" mutually coincide. Refer to [TM-71, "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-71, "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-149, "Component Inspection"](#).

- Check A/T main system (Fail-safe function actuated).

- Perform "Self Diagnostic Results" in "TRANSMISSION". Refer to [TM-82, "DTC Index"](#).

NO-2 (The actual gear position changes, but the shift position indicator is not indicated.)>>Perform "Self Diagnostic Results" in "TRANSMISSION". Refer to [TM-82, "DTC Index"](#).

NO-3 (The actual gear position and the indication on the shift position indicator do not coincide.)>>Perform "Self Diagnostic Results" in "TRANSMISSION". Refer to [TM-82, "DTC Index"](#).

NO-4 (Only a specific position or positions is/are not indicated on the shift position indicator.)>>Check the combination meter. Refer to [MWI-36, "Reference Value"](#).

SHIFT LOCK SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

SHIFT LOCK SYSTEM

Component Function Check

INFOID:000000009012226

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-162, "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-162, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000009012227

1. CHECK BCM INPUT SIGNAL

With CONSULT

1. Turn ignition switch ON.
2. Select "BRAKE SW 1" and "BRAKE SW 2" in BCM.
3. Check the ON/OFF operation of each monitor item. Refer to [BCS-35, "Reference Value"](#).

Is the inspection result normal?

- YES >> GO TO 9.
NO >> GO TO 2.

2. CHECK POWER SOURCE

1. Turn ignition switch OFF.
2. Disconnect stop lamp switch connector.
3. Check voltage between stop lamp switch harness connector terminal and ground.

+		-	Voltage (Approx.)
Stop lamp switch			
Connector	Terminal		
E115	1	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 5.
NO >> GO TO 3.

3. CHECK HARNESS BETWEEN FUSE BLOCK (J/B) AND STOP LAMP SWITCH (PART 1)

1. Disconnect fuse block (J/B) connector.
2. Check continuity between fuse block (J/B) harness connector terminal and stop lamp switch harness connector terminal.

Fuse block (J/B)		Stop lamp switch		Continuity
Connector	Terminal	Connector	Terminal	
E103	8F	E115	1	Existed

Is the inspection result normal?

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

SHIFT LOCK SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

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4. CHECK HARNESS BETWEEN FUSE BLOCK (J/B) AND STOP LAMP SWITCH (PART 2)

Check short circuit in harness between fuse block (J/B) harness connector terminal and stop lamp switch harness connector terminal.

Is the inspection result normal?

- YES >> Check the following items:
- 10A fuse [No. 7, located in fuse block (J/B)]. Refer to [PG-96. "Fuse, Connector and Terminal Arrangement"](#).
 - Open circuit or short circuit in harness between battery and fuse block (J/B). Refer to [PG-11. "Wiring Diagram - BATTERY POWER SUPPLY -"](#).
 - Battery
- NO >> Repair or replace damaged parts.

5. CHECK STOP LAMP SWITCH MOUNTING POSITION

Check stop lamp switch mounting position. Refer to [BR-7. "Inspection and Adjustment"](#).

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> Adjust stop lamp switch mounting position.

6. CHECK STOP LAMP SWITCH

Check stop lamp switch. Refer to [TM-166. "Component Inspection \(Stop Lamp Switch\)"](#).

Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Replace stop lamp switch. Refer to [BR-20. "Exploded View"](#).

7. CHECK HARNESS BETWEEN STOP LAMP SWITCH AND BCM (PART 1)

Check continuity between stop lamp switch harness connector terminal and BCM harness connector terminal.

Stop lamp switch		BCM		Continuity
Connector	Terminal	Connector	Terminal	
E115	2	M68	9	Existed

Is the inspection result normal?

- YES >> GO TO 8.
- NO >> Repair or replace damaged parts.

8. CHECK HARNESS BETWEEN STOP LAMP SWITCH AND BCM (PART 2)

Check short circuit in harness between stop lamp switch harness connector terminal and BCM harness connector terminal.

Is the inspection result normal?

- YES >> GO TO 9.
- NO >> Repair or replace damaged parts.

9. CHECK BCM INPUT/OUTPUT SIGNAL

1. Connect all of disconnected connectors.
2. Check voltage between BCM connector terminal and ground.

+		-	Condition	Voltage (Approx.)
BCM				
Connector	Terminal			
M69	50	Ground	Normal engine run mode (Brake pedal is depressed)	0 V
			<ul style="list-style-type: none"> • Normal engine run mode (Brake pedal is not depressed) • Remote engine run mode 	Battery voltage

Is the inspection result normal?

- YES >> GO TO 16.
- NO >> GO TO 10.

SHIFT LOCK SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

10. CHECK REMOTE ENGINE START RELAY POWER SOURCE (PART 1)

1. Turn ignition switch OFF.
2. Remove remote engine start relay.
3. Turn ignition switch ON.
4. Check voltage between remote engine start relay harness connector terminal and ground.

+		-	Voltage (Approx.)
Remote engine start relay			
Connector	Terminal		
E24	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 13.

NO >> GO TO 11.

11. CHECK HARNESS BETWEEN FUSE BLOCK (J/B) AND REMOTE ENGINE START RELAY (PART 1)

1. Turn ignition switch OFF.
2. Disconnect fuse block (J/B) connector.
3. Check continuity between fuse block (J/B) harness connector terminal and remote engine start relay harness connector terminal.

Fuse block (J/B)		Remote engine start relay		Continuity
Connector	Terminal	Connector	Terminal	
E103	4F	E24	2	Existed

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair or replace damaged parts.

12. DETECT MALFUNCTIONING ITEM

Check the following items:

- Open circuit or short circuit in harness between ignition switch and fuse block (J/B). Refer to [PG-59, "Wiring Diagram - IGNITION POWER SUPPLY -"](#).
- Short circuit in harness between fuse block (J/B) harness connector terminal 4F and remote engine start relay harness connector terminal 2.
- 10A fuse [No. 3, located in fuse block (J/B)]. Refer to [PG-96, "Fuse, Connector and Terminal Arrangement"](#).
- Ignition switch

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

NO >> Repair or replace damaged parts.

13. CHECK REMOTE ENGINE START RELAY (PART 1)

Check remote engine start relay. Refer to [TM-167, "Component Inspection \(Remote Engine Start Relay\)"](#).

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair or replace damaged parts.

14. CHECK HARNESS BETWEEN REMOTE ENGINE START RELAY AND BCM (PART 1)

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between remote engine start relay harness connector terminal and BCM harness connector terminal.

Remote engine start relay		BCM		Continuity
Connector	Terminal	Connector	Terminal	
E24	1	M69	50	Existed

SHIFT LOCK SYSTEM

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< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 15.

NO >> Repair or replace damaged parts.

15. CHECK HARNESS BETWEEN REMOTE ENGINE START RELAY AND BCM (PART 2)

Check continuity between remote engine start relay harness connector terminal and ground.

Remote engine start relay		—	Continuity
Connector	Terminal		
E24	1	Ground	Not existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

NO >> Repair or replace damaged parts.

16. CHECK REMOTE ENGINE START RELAY POWER SOURCE (PART 2)

1. Turn ignition switch OFF.
2. Remove remote engine start relay.
3. Turn ignition switch ON.
4. Check voltage between remote engine start relay harness connector terminal and ground.

+		-	Voltage (Approx.)
Remote engine start relay			
Connector	Terminal		
E24	5	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 18.

NO >> GO TO 17.

17. CHECK HARNESS BETWEEN FUSE BLOCK (J/B) AND REMOTE ENGINE START RELAY (PART 2)

1. Turn ignition switch OFF.
2. Disconnect fuse block (J/B) connector.
3. Check continuity between fuse block (J/B) harness connector terminal and remote engine start relay harness connector terminal.

Fuse block (J/B)		Remote engine start relay		Continuity
Connector	Terminal	Connector	Terminal	
E103	4F	E24	5	Existed

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

NO >> Repair or replace damaged parts.

18. CHECK REMOTE ENGINE START RELAY (PART 2)

Check remote engine start relay. Refer to [TM-167, "Component Inspection \(Remote Engine Start Relay\)"](#).

Is the inspection result normal?

YES >> GO TO 19.

NO >> Repair or replace damaged parts.

19. CHECK HARNESS BETWEEN REMOTE ENGINE START RELAY AND A/T SHIFT SELECTOR (PART 1)

1. Disconnect A/T shift selector connector.
2. Check continuity between remote engine start relay harness connector terminal and A/T shift selector harness connector terminal.

SHIFT LOCK SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

Remote engine start relay		A/T shift selector		Continuity
Connector	Terminal	Connector	Terminal	
E24	3	M57	11	Existed

Is the inspection result normal?

YES >> GO TO 20.

NO >> Repair or replace damaged parts.

20.CHECK HARNESS BETWEEN REMOTE ENGINE START RELAY AND A/T SHIFT SELECTOR (PART 2)

Check continuity between A/T shift selector harness connector terminal and ground.

A/T shift selector		—	Continuity
Connector	Terminal		
M57	11	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 21.

NO >> Repair or replace damaged parts.

21.CHECK GROUND CIRCUIT

Check continuity between A/T shift selector harness connector terminal and ground.

A/T shift selector		—	Continuity
Connector	Terminal		
M57	12	Ground	Existed

Is the inspection result normal?

YES >> GO TO 22.

NO >> Repair or replace damaged parts.

22.CHECK PARK POSITION SWITCH

Check park position switch. Refer to [TM-167, "Component Inspection \(Park Position Switch\)"](#).

Is the inspection result normal?

YES >> GO TO 23.

NO >> Repair or replace damaged parts.

23.CHECK SHIFT LOCK SOLENOID

Check shift lock solenoid. Refer to [TM-167, "Component Inspection \(Shift Lock Solenoid\)"](#).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

NO >> Repair or replace damaged parts.

Component Inspection (Stop Lamp Switch)

INFOID:000000009325924

1.CHECK STOP LAMP SWITCH

Check continuity between stop lamp switch connector terminals.

Stop lamp switch		Condition	Continuity
Terminal			
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-20, "Exploded View"](#).

SHIFT LOCK SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

Component Inspection (Remote Engine Start Relay)

INFOID:000000009297061

1. CHECK REMOTE ENGINE START RELAY

1. Apply voltage of 12 V between the remote engine start relay connector terminals 1 and 2.

CAUTION:

- Never cause shorting between terminals.
- Connect the fuse between the terminals when applying the voltage.

2. Check continuity between the remote engine start relay connector terminals 3 and 5.

Remote engine start relay Terminal	Condition	Continuity
3 – 5	Apply voltage between terminals 1 and 2.	Existed
	Do not apply voltage between terminals 1 and 2.	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace remote engine start relay. Refer to [TM-16, "A/T SHIFT LOCK SYSTEM : Component Parts Location"](#).

Component Inspection (Park Position Switch)

INFOID:000000009012229

1. CHECK PARK POSITION SWITCH

Check continuity between A/T shift selector connector terminals.

A/T shift selector Terminal	Condition	Continuity
11 – 12	Shift the selector lever to "P" position.	Existed
	Other than above.	Not existed

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace A/T shift selector assembly. Refer to [TM-185, "Exploded View"](#).

Component Inspection (Shift Lock Solenoid)

INFOID:000000009012230

1. CHECK SHIFT LOCK SOLENOID

Apply voltage to A/T shift selector connector terminals and check that shift lock solenoid is activated.

CAUTION:

- Never cause shorting between terminals.
- Connect the fuse between the terminals when applying the voltage.

A/T shift selector Terminal		Condition	Status
+	-		
11	12	<ul style="list-style-type: none">• Selector lever in "P" position.• Apply 12 V direct current between terminals 11 and 12.	Shift lock solenoid operates

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace A/T shift selector assembly. Refer to [TM-185, "Exploded View"](#).

SELECTOR LEVER POSITION INDICATOR

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

SELECTOR LEVER POSITION INDICATOR

Component Function Check

INFOID:000000009012231

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-168. "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-168. "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000009012232

1.CHECK MALFUNCTIONING ITEM

Which item is abnormal?

- Position indicator lamp>> GO TO 2.
Illumination lamp>> GO TO 9.

2.CHECK POWER SOURCE (PART 1)

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 harness connector terminal and ground.

+		-	Voltage (Approx.)
A/T shift selector			
Connector	Terminal		
M57	13	13	Battery voltage

Is the inspection result normal?

- YES >> GO TO 3.
NO >> GO TO 6.

3.CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between A/T shift selector harness connector terminal and ground.

A/T shift selector		—	Continuity
Connector	Terminal		
M57	4	Ground	Existed

Is the inspection result normal?

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

4.CHECK SHIFT POSITION SWITCH (PART 1)

1. Disconnect shift position switch connector.

SELECTOR LEVER POSITION INDICATOR

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

- Check continuity between A/T shift selector connector terminals and shift position switch connector terminals.

A/T shift selector		Shift position switch		Condition	Continuity	
Connector	Terminal	Connector	Terminal			
M57	4	M281	10	Selector lever in "M" position.	Existed	
			1, 2, 3, 4, 5, 8, 9, 12		Not existed	
			12	Selector lever in "D" position.	Existed	
			1, 2, 3, 4, 5, 8, 9, 10		Not existed	
			13	1, 2	Selector lever in "P" position.	Existed
				3, 4, 5, 8, 9, 10, 12		Not existed
	1, 3			Selector lever in "R" position.	Existed	
	2, 4, 5, 8, 9, 10, 12				Not existed	
	1, 4			Selector lever in "D" position.	Existed	
	2, 3, 5, 8, 9, 10, 12				Not existed	
	1, 5		Selector lever in "N" position.	Existed		
	2, 3, 4, 8, 9, 10, 12			Not existed		

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace damaged parts.

5. CHECK SELECTOR LEVER POSITION INDICATOR

Check selector lever position indicator. Refer to [TM-170, "Component Inspection \(Selector Lever Position Indicator\)"](#).

Is the inspection result normal?

YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).

NO >> Replace damaged parts.

6. CHECK HARNESS BETWEEN A/T SHIFT SELECTOR AND BCM (PART 1)

- Turn ignition switch OFF.
- Disconnect BCM connector.
- Check continuity between A/T shift selector harness connector terminal and BCM harness connector terminal.

A/T shift selector		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M57	13	M71	104	Existed

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace damaged parts.

7. CHECK HARNESS BETWEEN A/T SHIFT SELECTOR AND BCM (PART 2)

Check continuity between A/T shift selector harness connector terminal and ground.

A/T shift selector		—	Continuity
Connector	Terminal		
M57	13	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair or replace damaged parts.

SELECTOR LEVER POSITION INDICATOR

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

8. CHECK BCM INPUT/OUTPUT SIGNAL

Check BCM input/output signal. Refer to [BCS-35, "Reference Value"](#).

Is the inspection result normal?

- YES >> Check intermittent incident. Refer to [GI-43, "Intermittent Incident"](#).
- NO >> Repair or replace damaged parts.

9. CHECK POWER SOURCE (PART 2)

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 harness connector terminals.

A/T shift selector		Condition	Voltage (Approx.)
Connector	Terminal		
	+		
	-		
M57	9	10	Lighting switch 1ST
			Battery voltage

Is the inspection result normal?

- YES >> GO TO 10.
- NO >> Check illumination circuit. Refer to [INL-34, "Wiring Diagram"](#).

10. CHECK SHIFT POSITION SWITCH (PART 2)

1. Disconnect shift position switch connector.
2. Check continuity between A/T shift selector connector terminals and shift position switch connector terminals.

A/T shift selector		Shift position switch		Continuity
Connector	Terminal	Connector	Terminal	
M57	9	M281	9	Existed
			1, 2, 3, 4, 5, 8, 10, 12	Not existed
	10		8	Existed
			1, 2, 3, 4, 5, 9, 10, 12	Not existed

Is the inspection result normal?

- YES >> GO TO 5.
- NO >> Repair or replace damaged parts.

Component Inspection (Selector Lever Position Indicator)

INFOID:000000009012233

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.

Shift position switch		Condition	Status
Terminal			
+ (fuse)	-		
1	10	Apply 12 V direct current between terminals 1 and 10.	"M" mode indicator lamp turns on.

SELECTOR LEVER POSITION INDICATOR

< DTC/CIRCUIT DIAGNOSIS >

[7AT: RE7R01B]

Shift position switch		Condition	Status
Terminal			
+	-		
2	12	Apply 12 V direct current between terminals 2 and 12.	"P" position indicator lamp turns on.
3		Apply 12 V direct current between terminals 3 and 12.	"R" position indicator lamp turns on.
4		Apply 12 V direct current between terminals 4 and 12.	"D" position indicator lamp turns on.
5		Apply 12 V direct current between terminals 5 and 12.	"N" position indicator lamp turns on.
9	8	Apply 12 V direct current between terminals 9 and 8.	Illumination lamp turns on.

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace the selector lever position indicator. Refer to [TM-189. "Removal and Installation"](#).

A
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SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[7AT: RE7R01B]

SYMPTOM DIAGNOSIS

SYSTEM SYMPTOM

Symptom Table

INFOID:000000009012234

- The diagnostics item numbers show the sequence for inspection. Inspect in order from item 1.
- Perform diagnoses of symptom table 1 before symptom table 2.

SYMPTOM TABLE 1

Symptom			Diagnostic item																									
			TM-102	TM-113	TM-141	TM-140	TM-115	TM-112	TM-109	TM-154	TM-108	TM-147	SEC-67	TM-134	TM-131	TM-151	TM-139	TM-150	TM-136	TM-153	TM-152	TM-135	TM-106	TM-105				
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	4	7	6	6	5		3	2											3			1		
				→ "R" position	4	7	6	6	5		3									2							1	
				1GR ⇔ 2GR	4	2	5	4	4															3				1
				2GR ⇔ 3GR	4	2	5	4	4															3				1
				3GR ⇔ 4GR	4	2	5	4	4				3						3									1
				4GR ⇔ 5GR	4	2	5	4	4											3				3				1
				5GR ⇔ 6GR	4	2	5	4	4												3			3				1
				6GR ⇔ 7GR	4	2	5	4	4										3					3				1
				Downshift when accelerator pedal is depressed	3	2	4	3	3																		1	
				Upshift when accelerator pedal is released	3	2	4	3	3																		1	
			Lock-up	4	2	4	4	4						3												1		
		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																								

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[7AT: RE7R01B]

		Symptom	Diagnostic item																										
			TM-102	TM-113	TM-141	TM-140	TM-115	TM-112	TM-109	TM-154	TM-108	TM-147	SEC-67	TM-134	TM-131	TM-151	TM-139	TM-150	TM-136	TM-153	TM-152	TM-135	TM-106	TM-105					
Function trouble	Gear does no change	"D" position	Locks in 1GR	1																									
			Locks in 2GR																										
			Locks in 3GR																										
			Locks in 4GR																										
			Locks in 5GR								1																		
			Locks in 6GR																										
			Locks in 7GR																										
			1GR → 2GR		1														1		1		1						
			2GR → 3GR																				1						
			3GR → 4GR			2			2	2								2	2	2	2							1	
		4GR → 5GR																				1	1						
		5GR → 6GR																				1							
		6GR → 7GR															1	1	1	1				1					
		5GR → 4GR																			1								
		4GR → 3GR															1		1					1					
		3GR → 2GR										1											1						
		2GR → 1GR										1											1	1					
		Does not lock-up			2			2	2	2	4	5		3	2	2	2	2	2	2	2	2	2	2	2	2	1		
		"M" position	1GR ⇔ 2GR		3			3	3			3	2		3	3	3	3	3	3	3	3	3	3	3	3	1		
			2GR ⇔ 3GR		3			3	3			3	2		3	3	3	3	3	3	3	3	3	3	3	3	1		
	3GR ⇔ 4GR			3			3	3			3	2		3	3	3	3	3	3	3	3	3	3	3	3	1			
	4GR ⇔ 5GR			3			3	3			3	2		3	3	3	3	3	3	3	3	3	3	3	3	1			
	5GR ⇔ 6GR			3			3	3			3	2		3	3	3	3	3	3	3	3	3	3	3	3	1			
	6GR ⇔ 7GR			3			3	3			3	2		3	3	3	3	3	3	3	3	3	3	3	3	1			

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SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[7AT: RE7R01B]

Symptom				Diagnostic item																										
				TM-102	TM-113	TM-141	TM-140	TM-115	TM-112	TM-109	TM-154	TM-108	TM-147	SEC-67	TM-134	TM-131	TM-151	TM-139	TM-150	TM-136	TM-153	TM-152	TM-135	TM-106	TM-105					
Function trouble	Poor shifting	Slip	When shifting gears	1GR ⇔ 2GR	3			3	3	4							2								2			1		
				2GR ⇔ 3GR	3			3	3	4									2				2							1
				3GR ⇔ 4GR	3			3	3	4									2	2		2					2			1
				4GR ⇔ 5GR	3			3	3	4									2				2				2			1
				5GR ⇔ 6GR	3			3	3	4									2				2				2			1
				6GR ⇔ 7GR	3			3	3	4									2			2					2			1
		Engine brake does not work	"M" position	"D" position → "M" position			5			5	5	6		4	2			3			3	3							1	
				7GR → 6GR	5			5	5	6		4	2			3					3							3		1
				6GR → 5GR	5			5	5	6		4	2			3							3	3						1
				5GR → 4GR	5			5	5	6		4	2			3						3			3					1
				4GR → 3GR	5			5	5	6		4	2			3		3				3						3		1
				3GR → 2GR	5			5	5	6		4	2			3						3			3					1
					2GR → 1GR	5			5	5	6		4	2			3			3						3		1		

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[7AT: RE7R01B]

Symptom			Diagnostic item																							
			Control cable	Output speed sensor	Vehicle speed signal	Accelerator pedal position sensor	Engine speed signal	Input speed sensor	A/T fluid temperature sensor	Battery voltage	Transmission range switch	Manual mode switch	Stop lamp 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	Starter relay	CAN communication		
			TM-102	TM-113	TM-141	TM-140	TM-115	TM-112	TM-109	TM-154	TM-108	TM-147	SEC-67	TM-134	TM-131	TM-151	TM-139	TM-150	TM-136	TM-153	TM-152	TM-135	TM-106	TM-105		
Function trouble	Poor power transmission	Slip	With selector lever in "D" position, acceleration is extremely poor.	5	3			3	3	4						2	2						2	1		
			With selector lever in "R" position, acceleration is extremely poor.	5	3			3	3	4							2					2		2	1	
			While starting off by accelerating in 1GR, engine races.		3			3	3	4							2	2						2	1	
			While accelerating in 2GR, engine races.		3			3	3	4							2	2					2	2	1	
			While accelerating in 3GR, engine races.		3			3	3	4							2	2				2	2		1	
			While accelerating in 4GR, engine races.		3			3	3	4							2		2		2	2			1	
			While accelerating in 5GR, engine races.		3			3	3	4							2		2	2	2		2		1	
			While accelerating in 6GR, engine races.		3			3	3	4							2		2	2		2	2		1	
			While accelerating in 7GR, engine races.		3			3	3	4							2		2	2			2		1	
			Lock-up		3			3	3	4							2	2								1
			No creep at all.														1	1	1	1	1	1	1	1	1	
			Extremely large creep.						1																	

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SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[7AT: RE7R01B]

Symptom			Diagnostic item																									
			Control cable	Output speed sensor	Vehicle speed signal	Accelerator pedal position sensor	Engine speed signal	Input speed sensor	A/T fluid temperature sensor	Battery voltage	Transmission range switch	Manual mode switch	Stop lamp 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	Starter relay	CAN communication				
			TM-102	TM-113	TM-141	TM-140	TM-115	TM-112	TM-109	TM-154	TM-108	TM-147	SEC-6Z	TM-134	TM-131	TM-151	TM-139	TM-150	TM-136	TM-153	TM-152	TM-135	TM-106	TM-105				
Function trouble	Power transmission cannot be performed	Vehicle cannot run in all position.	3								2			1	1	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	1	1			
		Driving is not possible in "R" position.	3									2			1						1		1					
		Engine stall		4	5	5					6		3			2									1			
		Engine stalls when selector lever shifted "N" → "D" or "R".		4	5	5							3			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 "N" position.		1								2																
Vehicle moves backward with the "D" position.			1								2																	

SYMPTOM TABLE 2

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[7AT: RE7R01B]

Symptom			Diagnostic item															
			Oil pump TM-280	Torque converter TM-221	Low brake* TM-221	Front brake TM-221	High and low reverse clutch TM-302	Input clutch TM-292	Direct clutch TM-304	2346 brake TM-280	Reverse brake TM-221	1st one-way clutch TM-221	2nd one-way clutch TM-297	gear TM-221	control valve TM-191	Parking component TM-221		
Poor performance	Driving performance	Shift point is high in "D" position.																
		Shift point is low in "D" position.																
		Large shock	When shifting gears	→ "D" position	1	2										2		
				→ "R" position	1							1					2	
				1GR ⇔ 2GR								1					2	
				2GR ⇔ 3GR							1						2	
				3GR ⇔ 4GR			2	1									2	
				4GR ⇔ 5GR					1		1						2	
				5GR ⇔ 6GR						1	1						2	
				6GR ⇔ 7GR				1				1					2	
				Downshift when accelerator pedal is depressed		2	1	1	1	1	1	1	1			2		
				Upshift when accelerator pedal is released		2	1	1	1	1		1	1			2		
				Lock-up		1										2		
			Judder	Lock-up		1										2		
		Strange noise	In "R" position	1	1						1				1	2		
			In "N" position	1	1										1	2		
	In "D" position		1	1	1									1	2			
	Engine at idle		1	1										1	2			

*: Parts behind drum support is impossible to perform inspection by disassembly. Refer to [TM-18, "TRANSMISSION : Cross-Sectional View"](#).

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SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[7AT: RE7R01B]

Symptom			Diagnostic item															
			Oil pump	Torque converter	Low brake*	Front brake	High and low reverse clutch	Input clutch	Direct clutch	2346 brake	Reverse brake	1st one-way clutch	2nd one-way clutch	gear	control valve	Parking component		
Function trouble	Gear does no change	"D" position	Locks in 1GR				1		1		1					2		
			Locks in 2GR													1		
			Locks in 3GR														1	
			Locks in 4GR														1	
			Locks in 5GR														1	
			Locks in 6GR														1	
			Locks in 7GR														1	
			1GR → 2GR				1		1		1						2	
			2GR → 3GR								1						2	
			3GR → 4GR			2	1	1	1								2	
			4GR → 5GR								1	1					2	
			5GR → 6GR								1						2	
			6GR → 7GR			2	1	1	1								2	
			5GR → 4GR							1							2	
			4GR → 3GR			2		1									2	
		3GR → 2GR								1				1		2		
		2GR → 1GR								1	1		1			2		
		Does not lock-up			1	2	1	1	1	1	1		1	1		2		
		"M" position	1GR ⇔ 2GR			2	1	1	1	1	1		1	1		2		
			2GR ⇔ 3GR			2	1	1	1	1	1		1	1		2		
			3GR ⇔ 4GR			2	1	1	1	1	1		1	1		2		
			4GR ⇔ 5GR			2	1	1	1	1	1		1	1		2		
			5GR ⇔ 6GR			2	1	1	1	1	1		1	1		2		
			6GR ⇔ 7GR			2	1	1	1	1	1		1	1		2		

*: Parts behind drum support is impossible to perform inspection by disassembly. Refer to [TM-18, "TRANSMISSION : Cross-Sectional View"](#).

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[7AT: RE7R01B]

Symptom				Diagnostic item															
				Oil pump	Torque converter	Low brake*	Front brake	High and low reverse clutch	Input clutch	Direct clutch	2346 brake	Reverse brake	1st one-way clutch	2nd one-way clutch	gear	control valve	Parking component		
Function trouble	Poor shifting	Slip	When shifting gears	1GR ⇔ 2GR	1							1		1			2		
				2GR ⇔ 3GR	1						1						2		
				3GR ⇔ 4GR	1		2		1								2		
				4GR ⇔ 5GR	1					1		1					2		
				5GR ⇔ 6GR	1						1	1					2		
				6GR ⇔ 7GR	1			1				1					2		
	Engine brake does not work	“M” position	“D” position → “M” position			1			1	1				1	1		2		
			7GR → 6GR			1			1				1				2		
			6GR → 5GR			1						1	1				2		
			5GR → 4GR			1					1		1				2		
			4GR → 3GR			1		2		1							2		
			3GR → 2GR			1				1		1			1	1		2	
			2GR → 1GR			1			1				1		1			2	

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SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[7AT: RE7R01B]

Symptom				Diagnostic item														
				Oil pump TM-280	Torque converter TM-221	Low brake* TM-221	Front brake TM-221	High and low reverse clutch TM-302	Input clutch TM-292	Direct clutch TM-304	2346 brake TM-280	Reverse brake TM-221	1st one-way clutch TM-221	2nd one-way clutch TM-297	gear TM-221	control valve TM-191	Parking component TM-221	
Function trouble	Poor power transmission	Slip	With selector lever in "D" position, acceleration is extremely poor.	1	1	2							1	1	2			
			With selector lever in "R" position, acceleration is extremely poor.	1	1						1	1	1	1	2			
			While starting off by accelerating in 1GR, engine races.	1	1	2							1	1	1	2		
			While accelerating in 2GR, engine races.	1		2				1				1	1	2		
			While accelerating in 3GR, engine races.	1		2			1	1					1	2		
			While accelerating in 4GR, engine races.	1				1	1	1					1	2		
			While accelerating in 5GR, engine races.	1				1	1	1					1	2		
			While accelerating in 6GR, engine races.	1				1	1		1				1	2		
			While accelerating in 7GR, engine races.	1			1	1	1							2		
			Lock-up	1	1											1	2	
			No creep at all.	1	1	2	1	1	1	1	1		1	1	1	2	1	
			Extremely large creep.		1													

*: Parts behind drum support is impossible to perform inspection by disassembly. Refer to [TM-18. "TRANSMISSION : Cross-Sectional View"](#).

SYSTEM SYMPTOM

< SYMPTOM DIAGNOSIS >

[7AT: RE7R01B]

Symptom		Diagnostic item														
		Oil pump	Torque converter	Low brake*	Front brake	High and low reverse clutch	Input clutch	Direct clutch	2346 brake	Reverse brake	gear	1st one-way clutch	2nd one-way clutch	control valve	Parking component	
Function trouble	Power transmission cannot be performed	Vehicle cannot run in all position.	1	1	2	1	1	1	1	1		1	2	1		
		Driving is not possible in "D" position.	1	1	2	1	1	1	1		1	1	1	2	1	
		Driving is not possible in "R" position.	1								1	1	1	1	2	1
		Engine stall		1												
		Engine stalls when selector lever shifted "N" → "D" or "R".		1												
		Engine does not start in "N" or "P" position.		1												
	Poor operation	Vehicle does not enter parking condition.														1
		Parking condition is not cancelled.														1
		Vehicle runs with A/T in "P" position.			2	1	1	1	1	1				2	1	
		Vehicle moves forward with the "R" position.			2	1	1	1	1					2		
		Vehicle runs with A/T in "N" position.			2	1	1	1	1	1				2		
		Vehicle moves backward with the "D" position.									1				2	

*: Parts behind drum support is impossible to perform inspection by disassembly. Refer to [TM-18, "TRANSMISSION : Cross-Sectional View"](#).

PERIODIC MAINTENANCE

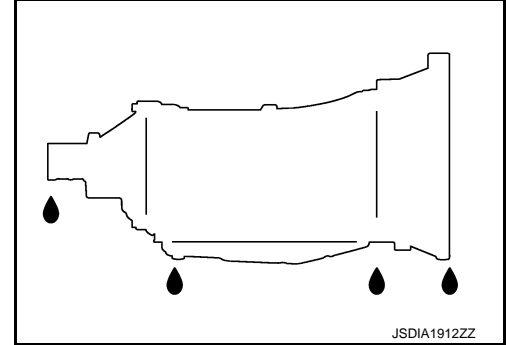
A/T FLUID

Inspection

INFOID:000000009012235

FLUID LEAKAGE

- Check transmission surrounding area (oil seal and plug etc.) for fluid leakage.
- If anything is found, repair or replace damaged parts and adjust A/T fluid level. Refer to [TM-184, "Adjustment"](#).



Changing

INFOID:000000009012130

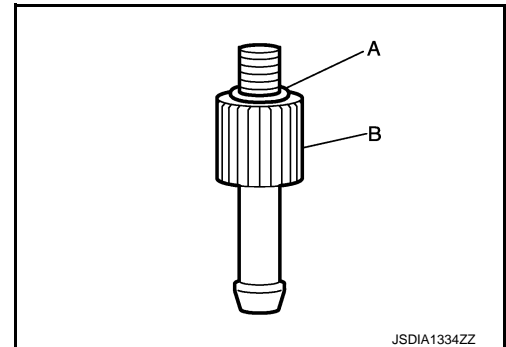
Recommended fluid and fluid capacity : Refer to [MA-15, "FOR NORTH AMERICA : Fluids and Lubricants"](#) (For North America), [MA-16, "FOR MEXICO : Fluids and Lubricants"](#) (For Mexico).

CAUTION:

- Use only recommended ATF. Never mix with other ATF.
- Using ATF other than recommended 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

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



2. Step 2

- Use CONSULT to check that the ATF temperature is 40°C (104°F) or less.
- Lift up the vehicle.
- Remove the drain plug from the oil pan, and then drain the ATF.
- 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.

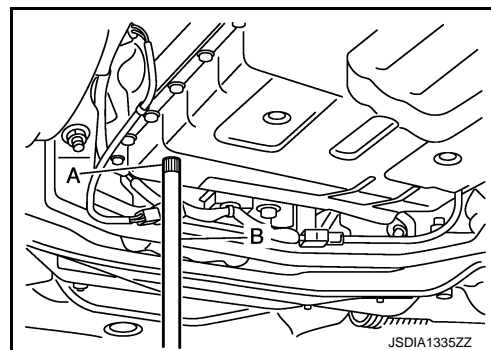
- Remove overflow plug from oil pan.

A/T FLUID

< PERIODIC MAINTENANCE >

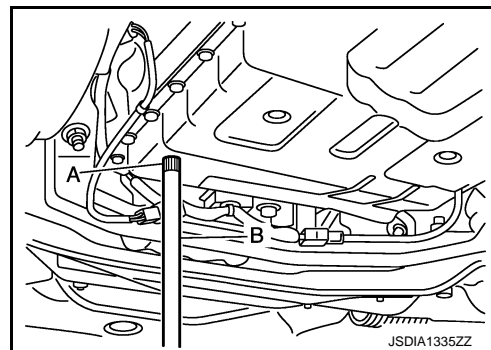
[7AT: RE7R01B]

- 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 Imp 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 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, tighten the drain plug to the oil pan to the specified torque. Refer to [TM-191, "Exploded View"](#).

- 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 Imp 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.
- 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 remove the overflow plug from the oil pan.
CAUTION:
Perform "Step 4-o" with the engine at idle.
- p. When the ATF starts to drip, tighten the overflow plug to the oil pan to the specified torque. Refer to [TM-191, "Exploded View"](#).
CAUTION:

Never reuse overflow plug.

Adjustment

INFOID:000000009012131

Recommended fluid and fluid capacity : Refer to [MA-15. "FOR NORTH AMERICA : Fluids and Lubricants"](#) (For North America), [MA-16. "FOR MEXICO : Fluids and Lubricants"](#) (For Mexico).

CAUTION:

- Use only recommended ATF. Never mix with other ATF.
- Using ATF other than recommended ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.
- When filling ATF, be careful not to scatter heat generating parts such as exhaust.
- Always maintain the ATF temperature within between 35°C (95°F) and 45°C (113°F) while checking with CONSULT when the ATF level adjustment is performed.

1. Install the O-ring (315268E000) (A) to the charging pipe (310811EA5A) (B).
2. Start the engine.
3. Make the ATF temperature approximately 40°C (104°F).

NOTE:

The ATF level is greatly affected by the temperature. Always check the ATF temperature on "ATF TEMP 1" of "Data Monitor" using CONSULT.

4. Park vehicle on level surface and set parking brake.
5. Shift the selector lever through each gear position. Leave selector lever in "P" position.
6. Lift up the vehicle.
7. Check the ATF leakage from transmission.
8. Remove overflow plug from oil pan.
9. Install the charging pipe (A) to the overflow plug hole.

CAUTION:

Tighten the charging pipe by hand.

10. Install the bucket pump hose (B) to the charging pipe.

CAUTION:

Insert the bucket pump hose all the way to the end of the charging pipe.

11. Fill approximately 0.5 liters (1/2 US qt, 1/2 Imp 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.

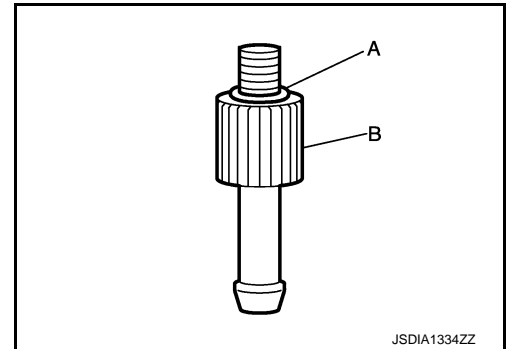
CAUTION:

Perform "Step 12" with the engine at idle.

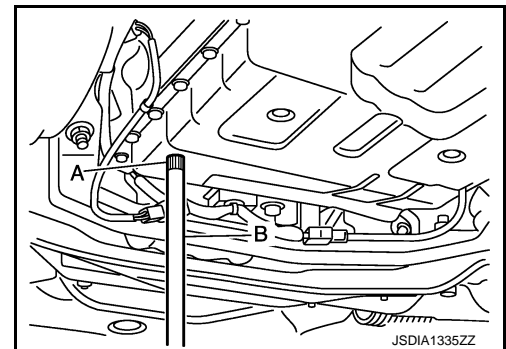
13. When the ATF starts to drip, tighten the overflow plug to the oil pan to the specified torque. Refer to [TM-191. "Exploded View"](#).

CAUTION:

Never reuse overflow plug.



JSDIA1334ZZ



JSDIA1335ZZ

A/T SHIFT SELECTOR

< REMOVAL AND INSTALLATION >

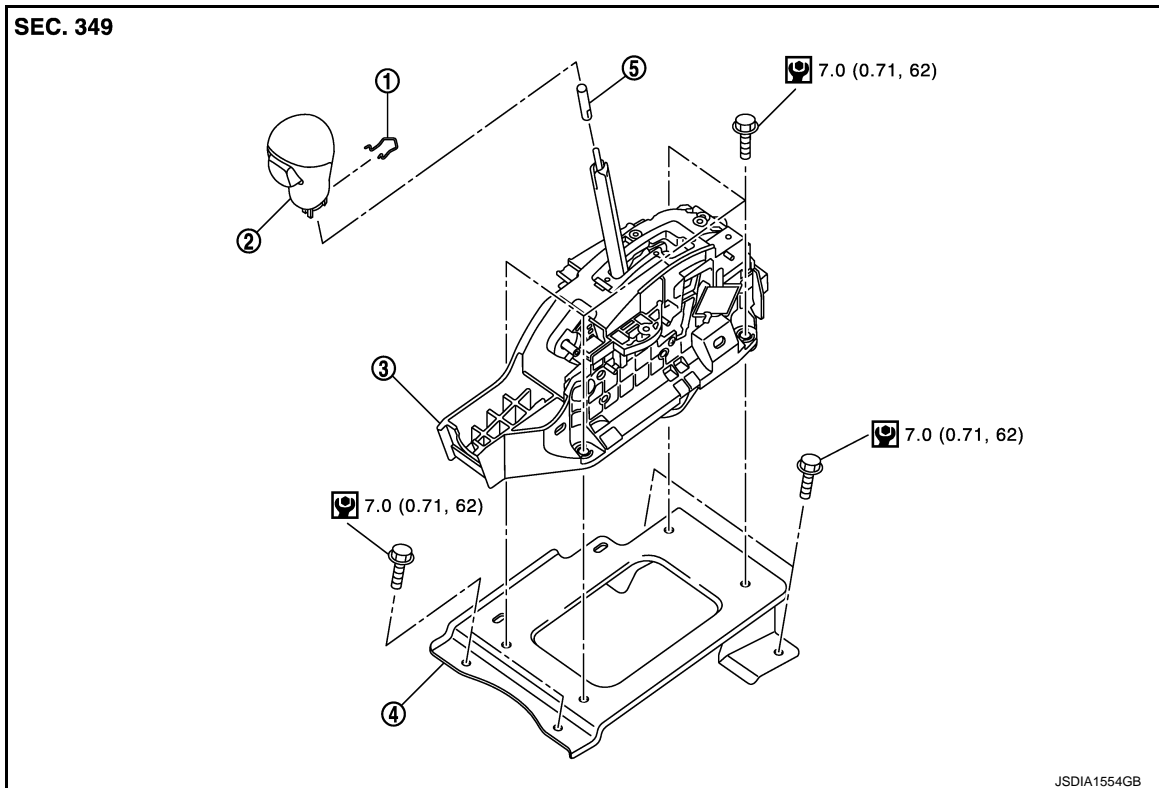
[7AT: RE7R01B]

REMOVAL AND INSTALLATION

A/T SHIFT SELECTOR

Exploded View

INFOID:000000009012236



- | | | |
|-------------|------------------------|--------------------------------|
| 1. Lock pin | 2. Selector lever knob | 3. A/T shift selector assembly |
| 4. Bracket | 5. Adapter | |

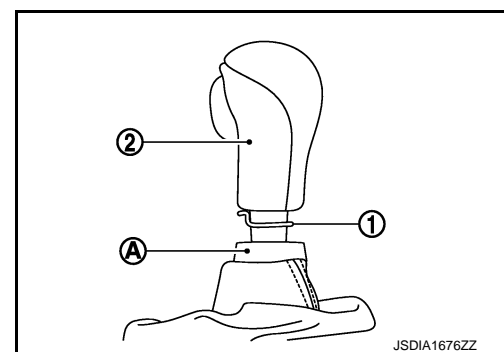
Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000009012237

REMOVAL

- Shift the selector lever to "N" position.
 - Remove knob cover (A) below selector lever downward.
 - Pull lock pin (1) out of selector lever knob (2).
 - Remove selector lever knob.
 - Remove center console assembly. Refer to [IP-25, "Removal and Installation"](#).
- CAUTION:**
When disconnecting connector from shift position switch, never twist or apply an excessive load to the connector.
- Remove cluster lid C lower. Refer to [IP-14, "Removal and Installation"](#).
 - Disconnect A/T shift selector connector and main harness from A/T shift selector assembly.
 - Shift the selector lever to "P" position.
 - Remove control cable from A/T shift selector assembly. Refer to [TM-187, "Removal and Installation"](#).
 - Remove A/T shift selector assembly.



A/T SHIFT SELECTOR

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

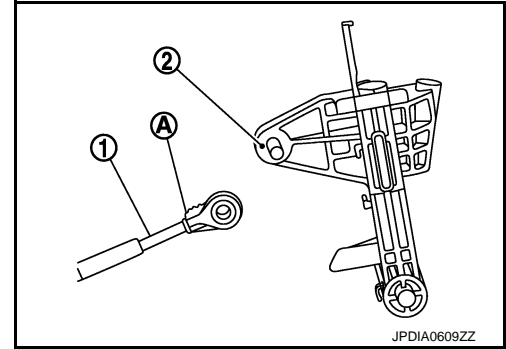
INSTALLATION

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

- When installing control cable (1) to A/T shift selector assembly (2), check that control cable is fully pressed in with the ribbed (A) surface facing upward.
- Refer to the followings when installing the selector lever knob to the A/T shift selector assembly.
 1. Install the lock pin to the selector lever knob.
 2. Insert the shift lever knob into the shift lever until it clicks.

CAUTION:

- Install it straight, and never tap or apply any shock to install it.
- Never press selector button.



Inspection and Adjustment

INSPECTION AFTER INSTALLATION

Check A/T position after adjusting A/T position. Refer to [TM-102, "Inspection"](#).

ADJUSTMENT AFTER INSTALLATION

Adjust A/T position. Refer to [TM-102, "Adjustment"](#).

INFOID:000000009012238

CONTROL CABLE

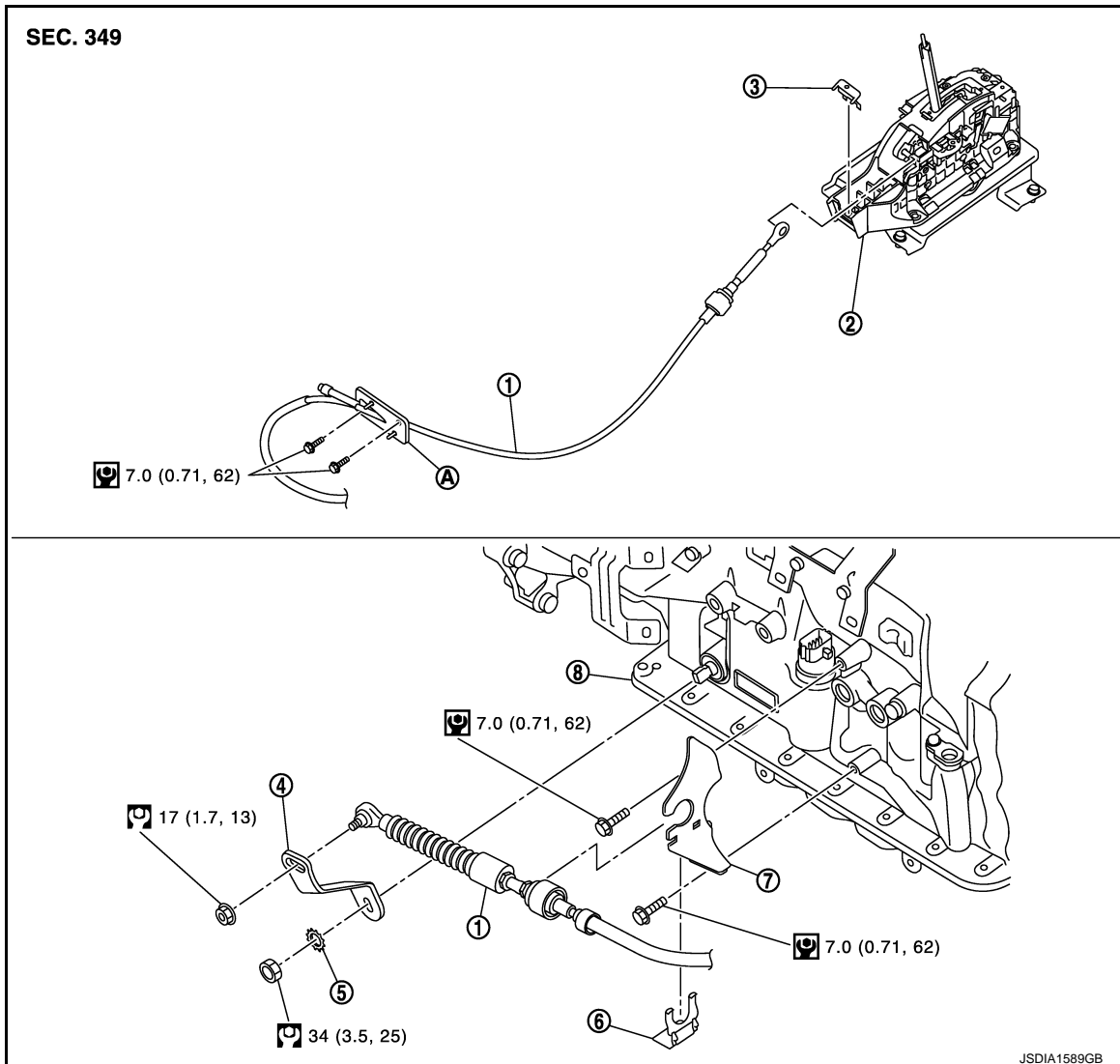
< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

CONTROL CABLE

Exploded View

INFOID:000000009012239



- | | | |
|------------------|--------------------------------|---------------|
| 1. Control cable | 2. A/T shift selector assembly | 3. Lock plate |
| 4. Manual lever | 5. Washer | 6. Lock plate |
| 7. Bracket | 8. A/T assembly | |
| A. Retainer | | |

Refer to [GI-4. "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000009012240

REMOVAL

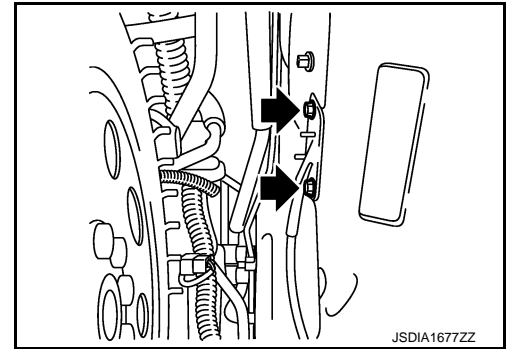
1. Remove center console assembly . Refer to [IP-25. "Removal and Installation"](#).
2. Remove cluster lid C cover and instrument center finisher LH. Refer to [IP-14. "Removal and Installation"](#).
3. Shift selector lever in "P" position.
4. Remove control cable from A/T shift selector assembly.
5. Remove control cable from manual lever and control cable mounting bracket.

CONTROL CABLE

[7AT: RE7R01B]

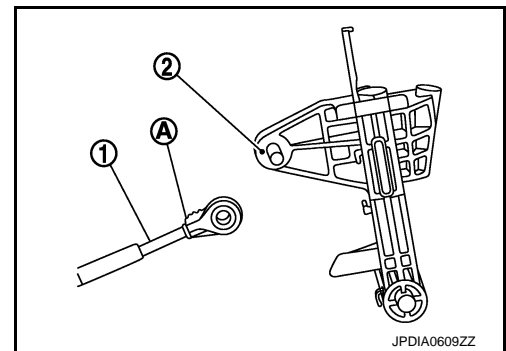
< REMOVAL AND INSTALLATION >

6. Remove retainer mounting bolts (←) according to the following procedure.
 - a. Separate propeller shaft assembly (front). Refer to [DLN-137. "Removal and Installation"](#). (For 4WD models)
 - b. Disconnect heated oxygen sensor 2 connectors (bank 1 and bank 2). Refer to [EX-5. "Exploded View"](#).
 - c. Remove exhaust front tube (RH and LH). Refer to [EX-5. "Exploded View"](#).
 - d. Remove heat plates above three way catalyst (RH and LH).
 - e. Remove control cable mounting bracket from A/T assembly.
 - f. Remove retainer mounting bolts from dash panel.
7. Remove control cable from the vehicle.



INSTALLATION

Note the following, and install in the reverse order of removal. When installing control cable (1) to A/T shift selector assembly (2), check that control cable is fully pressed in with the ribbed (A) surface facing upward.



Inspection and Adjustment

INSPECTION AFTER INSTALLATION

Check A/T position after adjusting A/T position. Refer to [TM-102. "Inspection"](#).

ADJUSTMENT AFTER INSTALLATION

Adjust A/T position. Refer to [TM-102. "Adjustment"](#).

INFOID:000000009012241

SELECTOR LEVER POSITION INDICATOR

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

SELECTOR LEVER POSITION INDICATOR

Removal and Installation

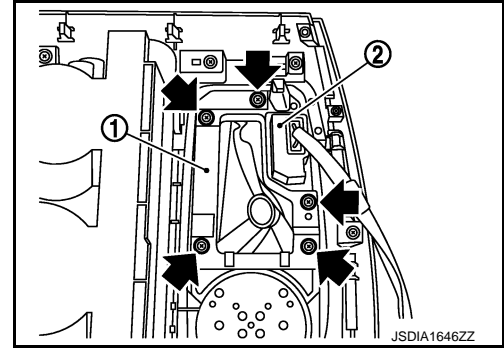
INFOID:000000009012242

REMOVAL

1. Remove console finisher assembly. Refer to [IP-25. "Removal and Installation"](#).
2. Remove insert finisher (1).

← : Screw

3. Remove selector lever position indicator (2).



INSTALLATION

Install in the reverse order of removal.

A
B
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TM
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TOW MODE SWITCH

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

TOW MODE SWITCH

Removal and Installation

INFOID:000000009012243

NOTE:

Tow mode switch is integrated in to SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models).

REMOVAL

1. Remove console finisher assembly from center console assembly. Refer to [IP-25. "Removal and Installation"](#).
2. Disconnect SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models) harness connector.
3. Press SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models) fixing pawls, and remove SNOW MODE/TOW MODE/VDC OFF switch assembly (2WD models) or 4WD switch assembly (4WD models) from console finisher assembly.

INSTALLATION

Install in the reverse order of removal.

CONTROL VALVE & TCM

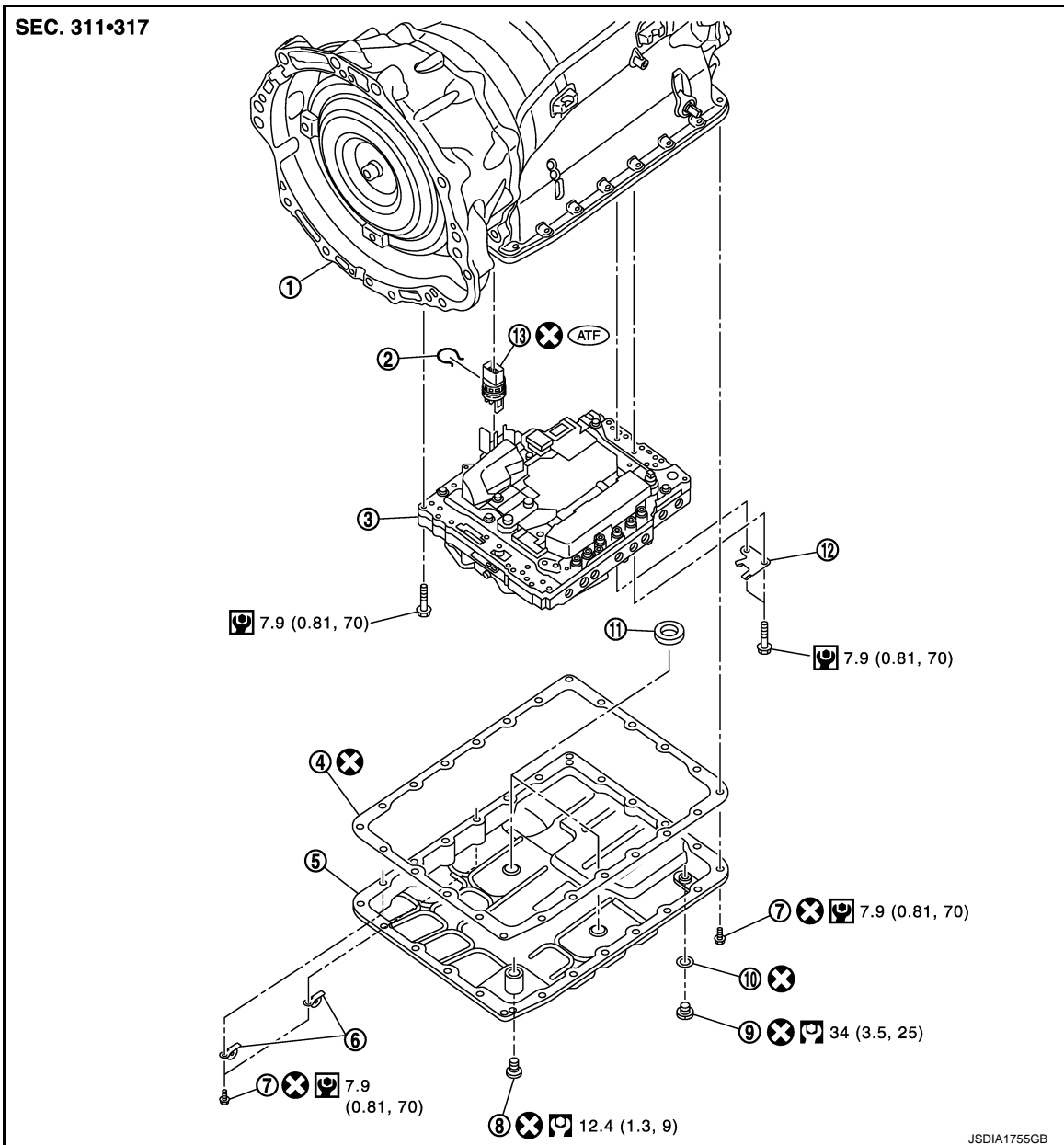
< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

CONTROL VALVE & TCM

Exploded View

INFOID:000000009012244



- | | | |
|--------------------------|------------------|------------------------|
| 1. A/T assembly | 2. Snap ring | 3. Control valve & TCM |
| 4. Oil pan gasket | 5. Oil pan | 6. Clip |
| 7. Oil pan mounting bolt | 8. Overflow plug | 9. Drain plug |
| 10. Drain plug gasket | 11. Magnet | 12. Clip |
| 13. Joint connector | | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000009012245

REMOVAL

1. Drain ATF through drain plug.

CONTROL VALVE & TCM

< REMOVAL AND INSTALLATION >

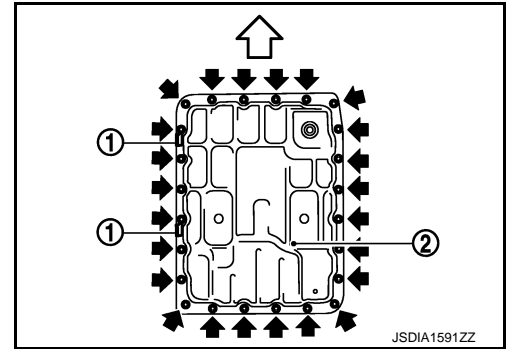
[7AT: RE7R01B]

2. Remove clips (1).

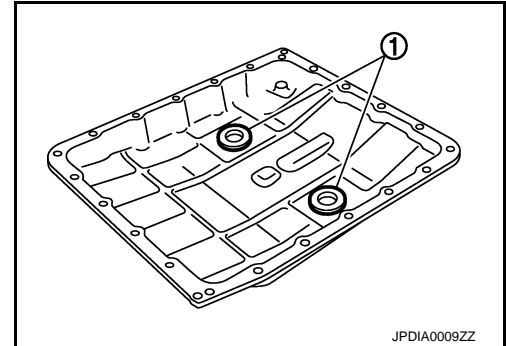
⇐ : Vehicle front

← : Oil pan mounting bolt

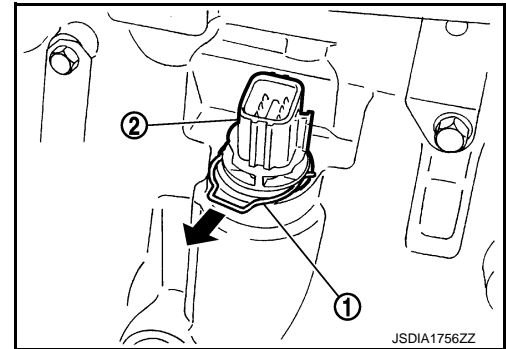
3. Remove oil pan (2) and oil pan gasket.



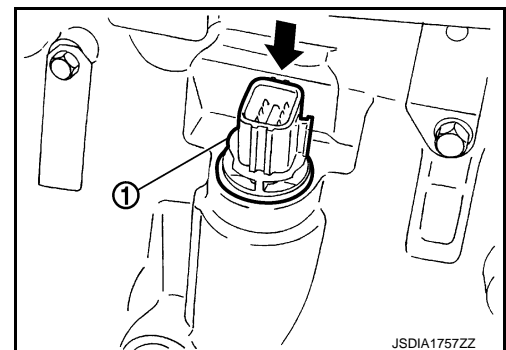
4. Remove magnets (1) from oil pan.



5. Remove snap ring (1) from joint connector (2).



6. Push joint connector (1).

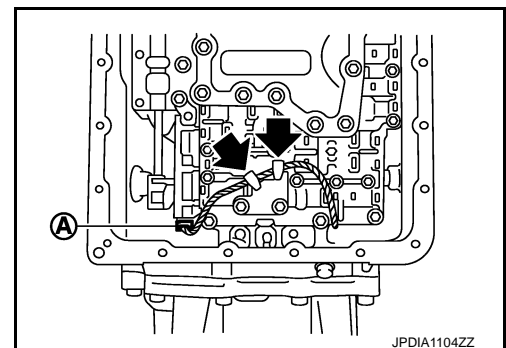


7. Disconnect output speed sensor connector (A).

CAUTION:

Be careful not to damage connector.

8. Disengage terminal clip (←).



CONTROL VALVE & TCM

< REMOVAL AND INSTALLATION >

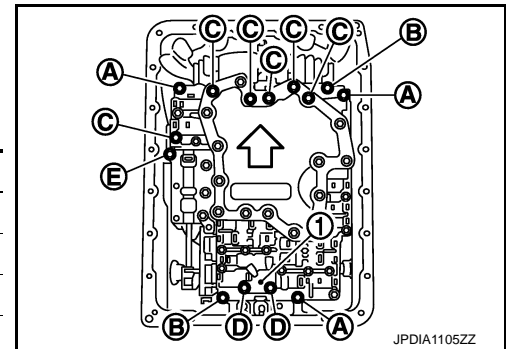
[7AT: RE7R01B]

9. Remove bolts and clip (1) from the control valve & TCM.

← : Vehicle front

Bolt symbol	Length mm (in)	Number of bolts
A	43 (1.69)	3
B	40 (1.57)	2
C	54 (2.13)	6
D	50 (1.97)	2
E*	50 (1.97)	1

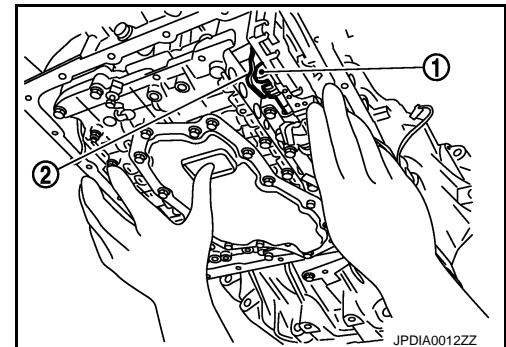
*: Reamer bolt



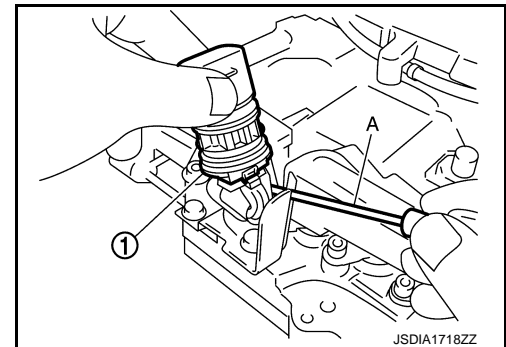
10. Remove the control valve & TCM from transmission case.

CAUTION:

When removing, be careful with the manual valve (1) notch and manual plate (2) height. Remove it vertically.



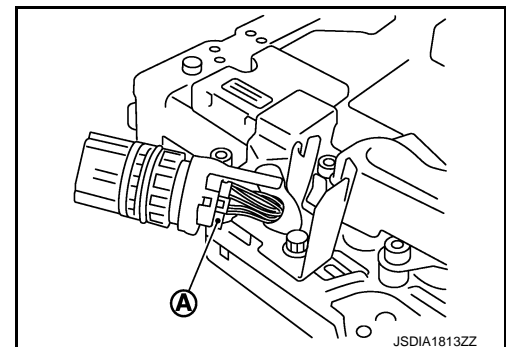
11. Remove joint connector (1) from the control valve & TCM using a flat-bladed screwdriver (A).



12. Disconnect TCM connector (A).

CAUTION:

Be careful not to damage connector.



INSTALLATION

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

CAUTION:

- Be careful not to damage connector when installing any connector.
- Never reuse joint connector.
- Apply ATF to O-ring of joint connector.
- Never reuse drain plug and drain plug gasket. In addition, install new drain plug and drain plug gasket after adjustment of A/T fluid filling.
- Refer to the following when installing the control valve & TCM to transmission case.

A
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TM
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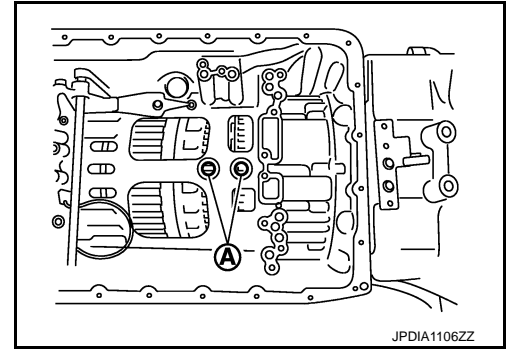
CONTROL VALVE & TCM

< REMOVAL AND INSTALLATION >

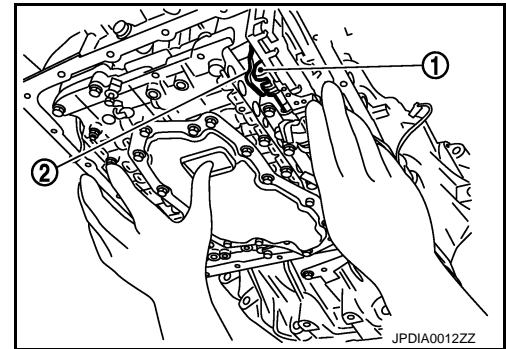
[7AT: RE7R01B]

CAUTION:

- Make sure that input speed sensor securely installs input speed sensor holes (A).
- Hang down output speed sensor harness toward outside so as not to disturb installation of the control valve & TCM.
- Adjust joint connector of the control valve & TCM to terminal hole of transmission case.



- Assemble it so that manual valve (1) cutout is engaged with manual plate (2) projection.



- Install bolts and clip (1) to the control valve & TCM. Tighten bolt (E) to the specified torque before tightening the other than bolts.

↔ : Vehicle front

Bolt symbol	Length mm (in)	Number of bolts
A	43 (1.69)	3
B	40 (1.57)	2
C	54 (2.13)	6
D	50 (1.97)	2
E*	50 (1.97)	1

*: Reamer bolt

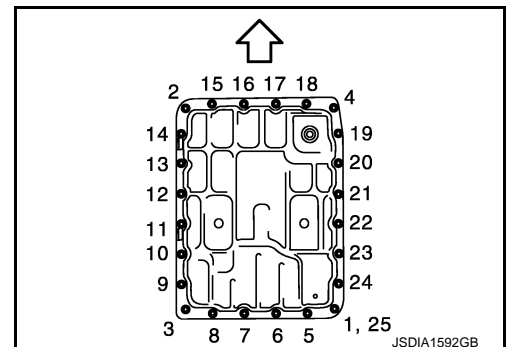
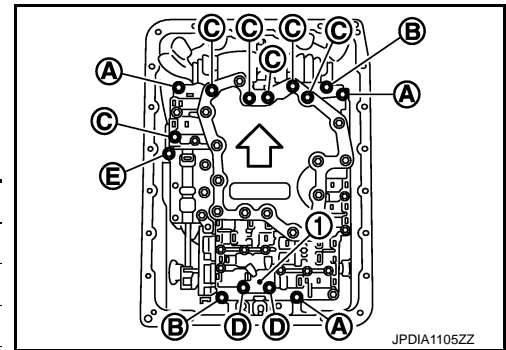
- Refer to the following when installing oil pan to transmission case.

CAUTION:

- Clean foreign materials (gear wear particles) that adhere on the inside of the oil pan and on the magnet, and then assembly.
- Completely remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface of transmission case and oil pan.
- Never reuse oil pan gasket and oil pan mounting bolts.
- Install oil pan gasket in the direction to align hole position.
- Tighten the oil pan mounting bolts to the specified torque in the numerical order as shown in the figure after temporarily tightening them.

↔ : Vehicle front

- Fill with ATF after installation. Refer to [TM-182. "Changing"](#).



CONTROL VALVE & TCM

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

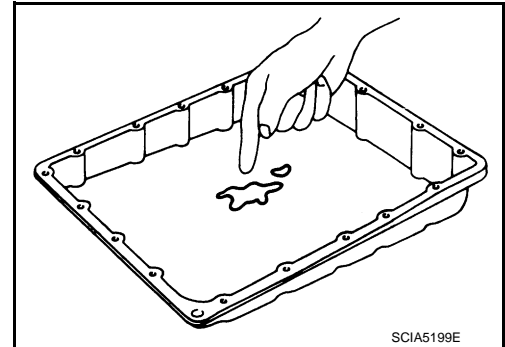
Inspection and Adjustment

INFOID:000000009012246

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-98, "Cleaning"](#).



INSPECTION AFTER INSTALLATION

Start the engine and check visually that there is no leakage of ATF.

ADJUSTMENT AFTER INSTALLATION

When replaced the control valve & TCM, perform "ADDITIONAL SERVICE WHEN REPLACE CONTROL VALVE & TCM". Refer to [TM-96, "Description"](#).

A
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PARKING COMPONENTS

< REMOVAL AND INSTALLATION >

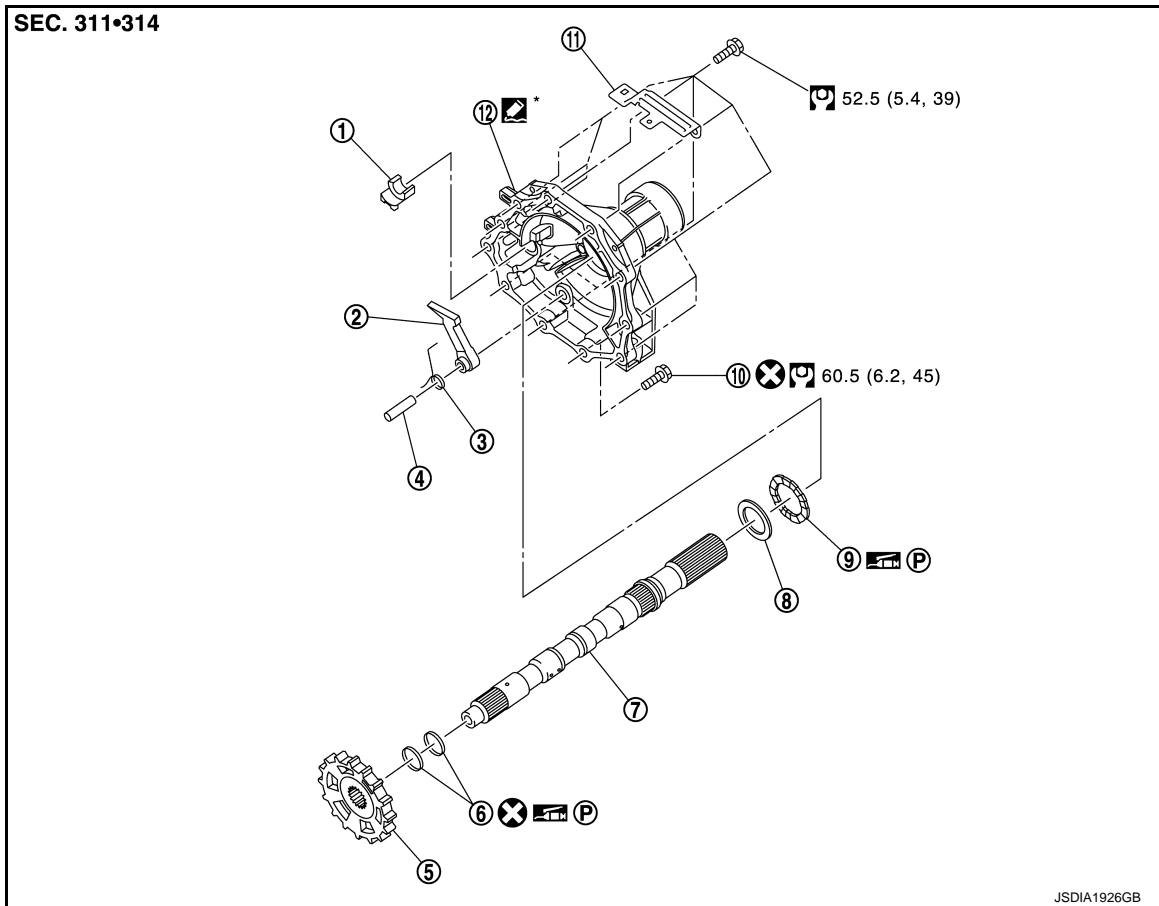
[7AT: RE7R01B]

PARKING COMPONENTS


2WD

2WD : Exploded View

INFOID:000000009012247



- | | | |
|-----------------------------|-----------------|--------------------|
| 1. Parking actuator support | 2. Parking pawl | 3. Return spring |
| 4. Pawl shaft | 5. Parking gear | 6. Seal ring |
| 7. Output shaft | 8. Bearing race | 9. Needle bearing |
| 10. Self-sealing bolt | 11. Bracket | 12. Rear extension |

: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-22. "Recommended Chemical Products and Sealants"](#).
Refer to [GI-4. "Components"](#) for symbols not described on the above.

2WD : Removal and Installation

INFOID:000000009012248

REMOVAL

1. Drain ATF through drain plug.
2. Separate propeller shaft assembly. Refer to [DLN-154. "Exploded View"](#).
3. Support A/T assembly with a transmission jack.
CAUTION:
When setting transmission jack, be careful not to allow it to collide against the drain plug.
4. Remove rear engine mounting cross member with power tool. Refer to [TM-215. "2WD : Exploded View"](#).
5. Remove engine mounting insulator (rear). Refer to [TM-215. "2WD : Exploded View"](#).

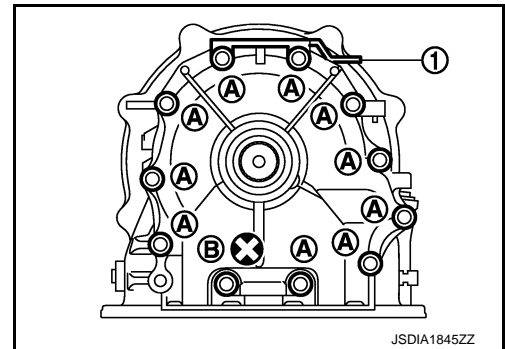
PARKING COMPONENTS

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

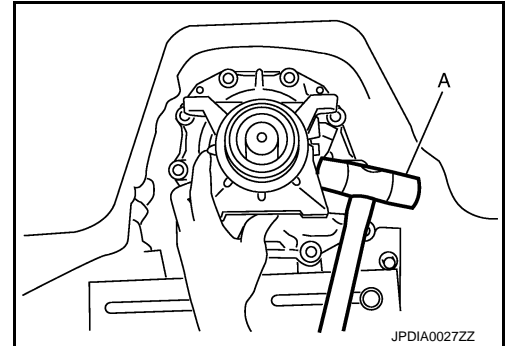
6. Remove tightening bolts for rear extension assembly and transmission case.

- 1 : Bracket
- A : Bolt
- B : Self-sealing bolt

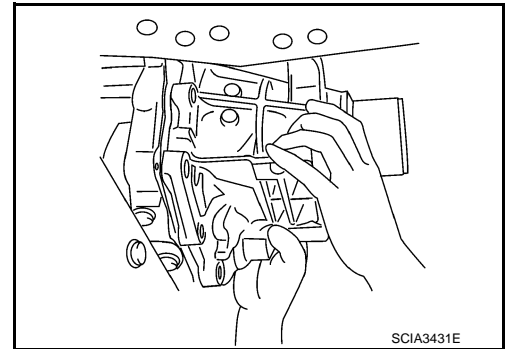


7. Tap rear extension assembly with a soft hammer (A).

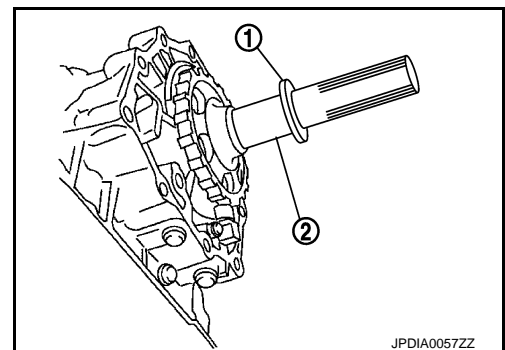
CAUTION:
Be careful not to damage rear extension case.



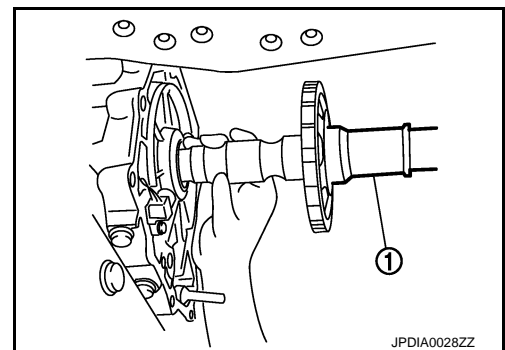
8. Remove rear extension assembly (with needle bearing) from transmission case.



9. Remove bearing race (1) from output shaft (2).



10. Remove output shaft (1) from transmission case by rotating left/right.



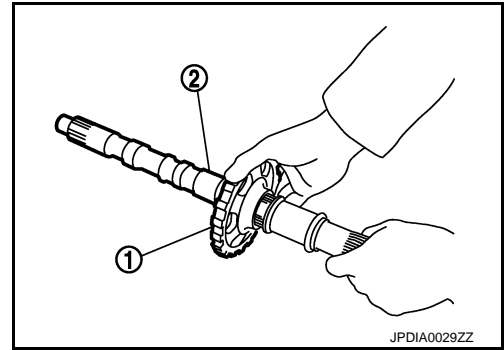
A
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PARKING COMPONENTS

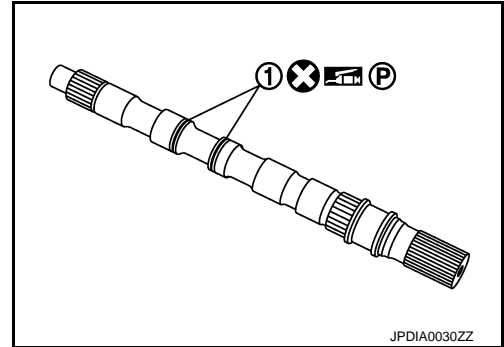
< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

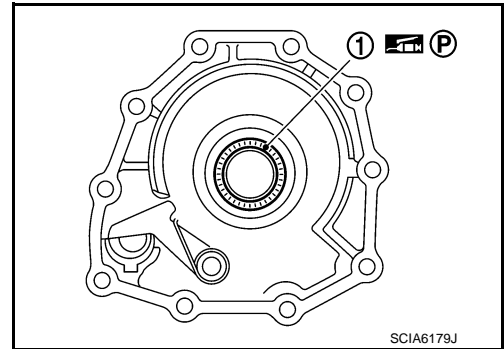
11. Remove parking gear (1) from output shaft (2).



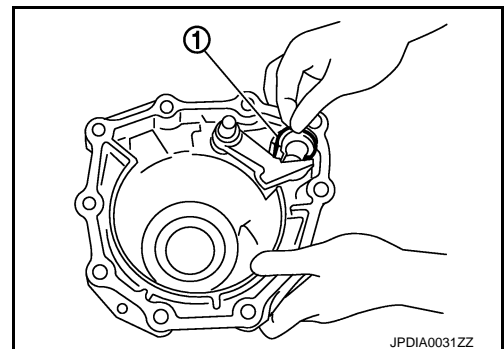
12. Remove seal rings (1) from output shaft.



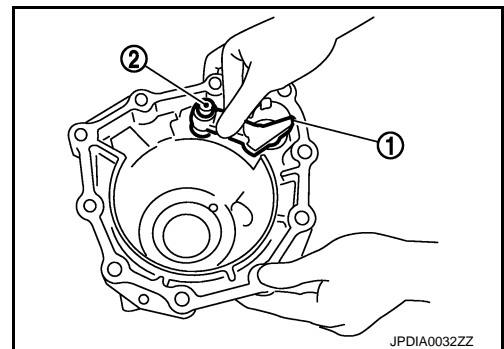
13. Remove needle bearing (1) from rear extension.



14. Remove parking actuator support (1) from rear extension.



15. Remove parking pawl (with return spring) (1) and pawl shaft (2) from rear extension.

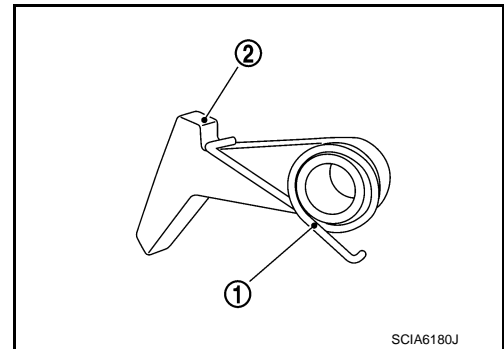


PARKING COMPONENTS

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

16. Remove return spring (1) from parking pawl (2).



INSTALLATION

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

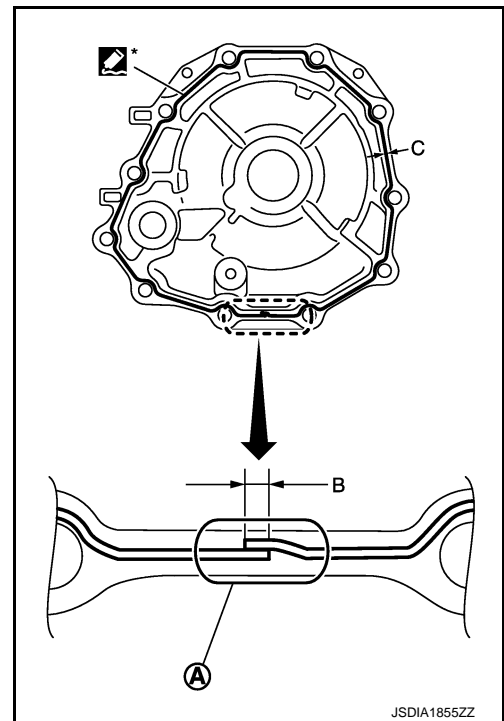
CAUTION:

- Never reuse seal rings and drain plug gasket.
- Apply petroleum jelly to needle bearing and seal rings.
- Insert the tip of parking rod between the parking pawl and the parking actuator support when assembling the rear extension assembly.
- Refer to the followings installing rear extension assembly.
- Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).) to rear extension assembly as shown in the figure.

- Sealant starting point and end-point (A) : Start and finish point shall be in the center of two bolts.
- Overlap width of sealant starting point and end-point (B) : 3 – 5 mm (0.12 – 0.20 in)
- Sealant width (C) : 1.0 – 2.0 mm (0.04 – 0.08 in)
- Sealant height (C) : 0.4 – 1.0 mm (0.016 – 0.04 in)

CAUTION:

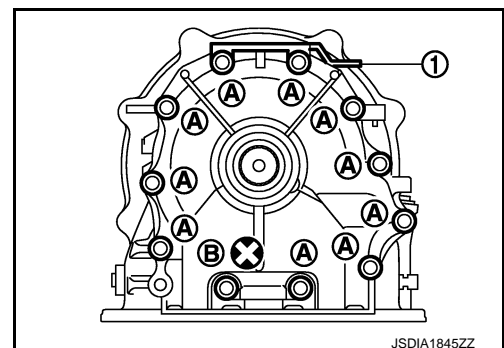
Completely remove all moisture, oil and old sealant, etc. from the transmission case and rear extension assembly mounting surfaces.



- Tighten rear extension assembly bolts to the specified torque.

- 1 : Bracket
 A : Bolt
 B : Self-sealing bolt

• Fill with ATF after installation. Refer to [TM-182, "Changing"](#).



2WD : Inspection

INFOID:000000009012249

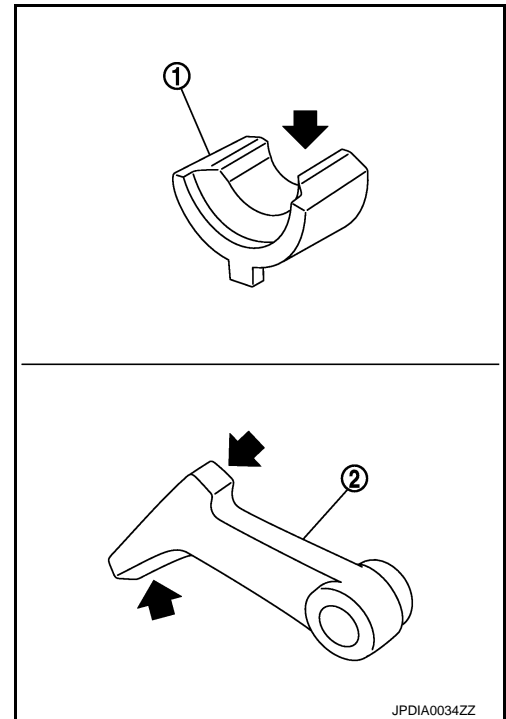
INSPECTION AFTER REMOVAL

PARKING COMPONENTS

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

If the contact surface on parking actuator support (1), parking pawl (2) and etc. has excessive wear, abrasion, bend, or any other damage, replace the components.



INSPECTION AFTER INSTALLATION

Start the engine and check visually that there is no leakage of ATF.

REAR OIL SEAL

< REMOVAL AND INSTALLATION >

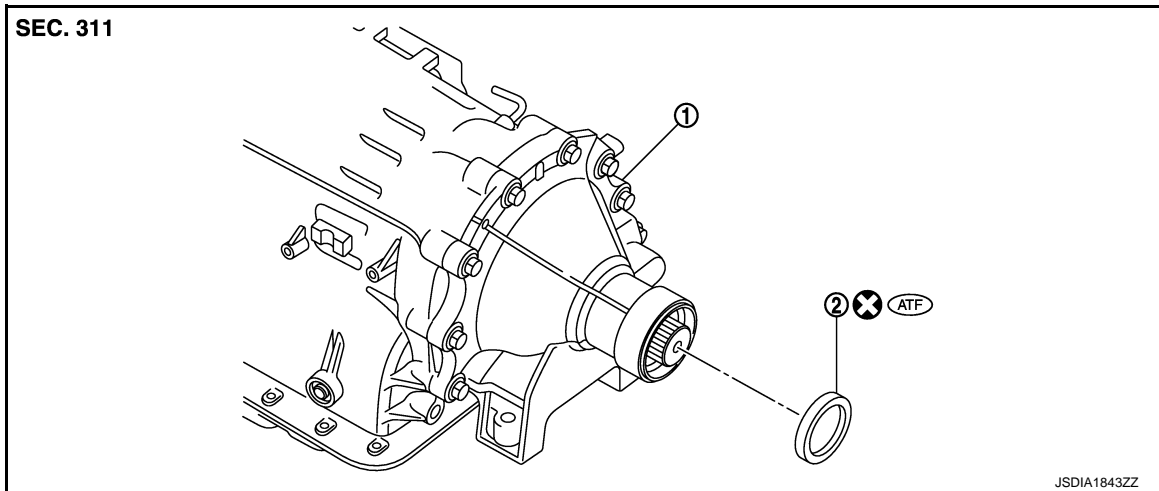
[7AT: RE7R01B]

REAR OIL SEAL

2WD

2WD : Exploded View

INFOID:000000009012250



1. A/T assembly
2. Rear oil seal

Refer to [GI-4. "Components"](#) for symbols in the figure.

2WD : Removal and Installation

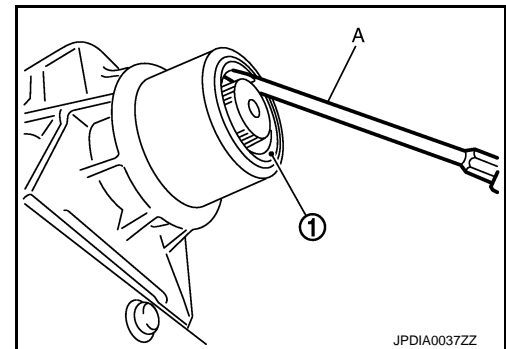
INFOID:000000009012251

REMOVAL

1. Remove propeller shaft assembly. Refer to [DLN-155. "Removal and Installation"](#).
2. Remove rear oil seal (1) using a flat-bladed screwdriver (A).

CAUTION:

Be careful not to scratch rear extension assembly.



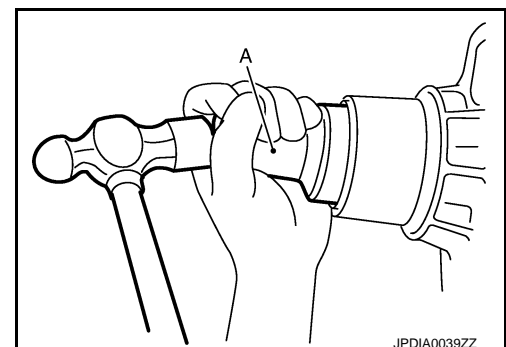
INSTALLATION

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

- As shown in the figure, use the drift [SST: ST33400001 (J-26082)] (A) to drive rear oil seal into rear extension assembly until it is flush.

CAUTION:

- Never reuse rear oil seal.
- Apply ATF to rear oil seal.



REAR OIL SEAL

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

2WD : Inspection

INFOID:000000009012252

INSPECTION AFTER INSTALLATION

Drive the vehicle and check visually that there is no leakage of ATF.

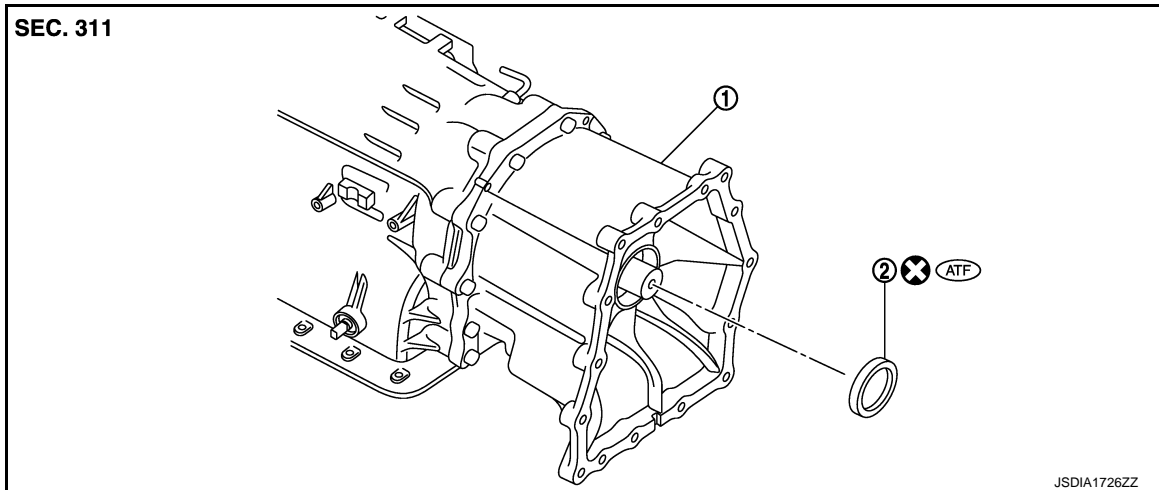
ADJUSTMENT AFTER INSTALLATION

Adjust A/T fluid level. Refer to [TM-184, "Adjustment"](#).

4WD

4WD : Exploded View

INFOID:000000009012253



1. A/T assembly
 2. Rear oil seal
- Refer to [GI-4, "Components"](#) for symbols in the figure.

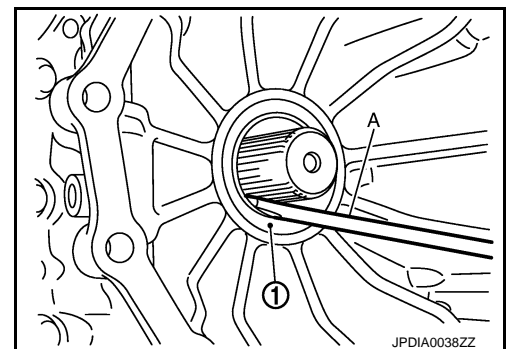
4WD : Removal and Installation

INFOID:000000009012254

REMOVAL

1. Remove transfer assembly from A/T assembly. Refer to [DLN-146, "Removal and Installation"](#).
2. Remove rear oil seal (1) with a flat-bladed screwdriver (A).

CAUTION:
Never scratch adapter case assembly.



INSTALLATION

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

REAR OIL SEAL

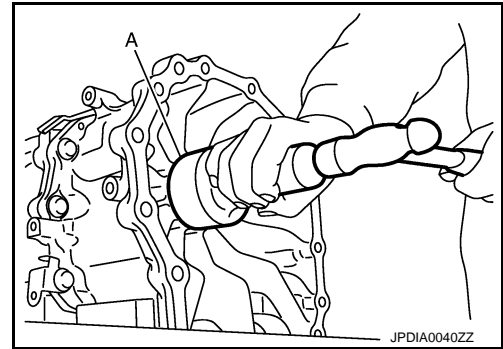
< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

- As shown in the figure, use the drift [64 mm (2.52 in) dia. commercial service tool] (A) to drive rear oil seal into adapter case assembly until it is flush.

CAUTION:

- **Never reuse rear oil seal.**
- **Apply ATF to rear oil seal.**



4WD : Inspection and Adjustment

INSPECTION AFTER INSTALLATION

Drive the vehicle and check visually that there is no leakage of ATF.

ADJUSTMENT AFTER INSTALLATION

Adjust A/T fluid level. Refer to [TM-184, "Adjustment"](#).

INFOID:000000009012255

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OUTPUT SPEED SENSOR

< REMOVAL AND INSTALLATION >

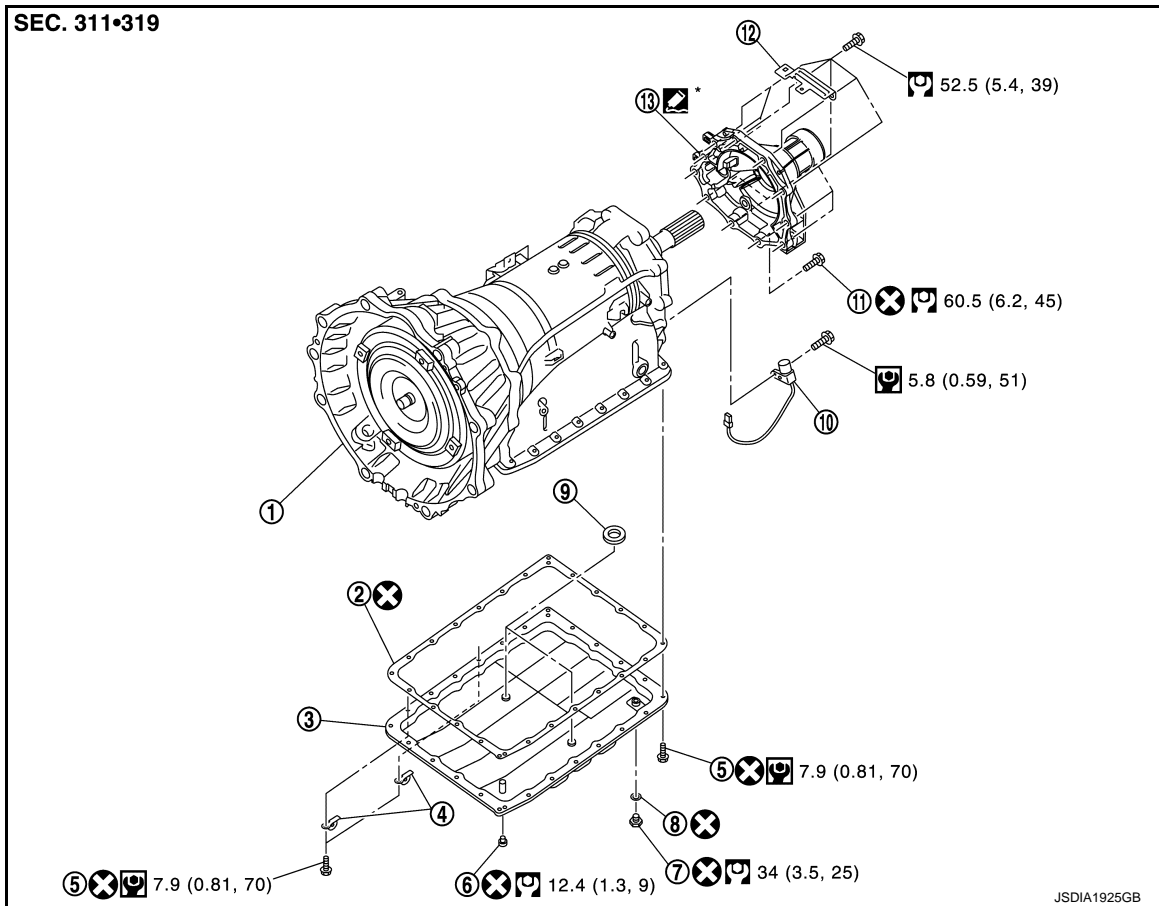
[7AT: RE7R01B]

OUTPUT SPEED SENSOR

2WD

2WD : Exploded View

INFOID:000000009012256



- | | | |
|-------------------------|--------------------------|------------------|
| 1. A/T assembly | 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 |
| 10. Output speed sensor | 11. Self-sealing bolt | 12. Bracket |
| 13. Rear extension | | |

: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

Refer to [GI-4, "Components"](#) for symbols not described on the above.

2WD : Removal and Installation

INFOID:000000009012257

REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Drain ATF through drain plug.
3. Separate propeller shaft assembly. Refer to [DLN-154, "Exploded View"](#).

OUTPUT SPEED SENSOR

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

4. Remove clips (1).
5. Remove oil pan (2) and oil pan gasket.

↔ : Vehicle front

← : Oil pan mounting bolt

6. Support A/T assembly with a transmission jack.

CAUTION:

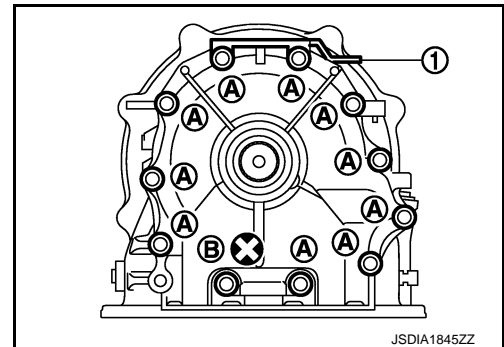
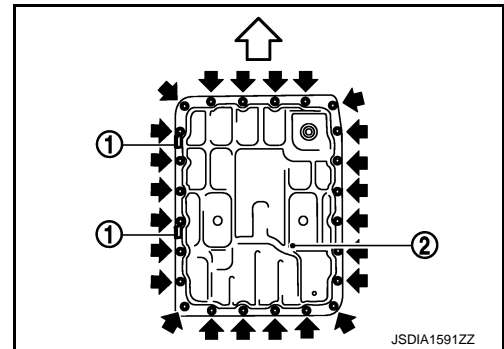
When setting transmission jack, place wooden blocks to prevent from damaging control valve & TCM and transmission case.

7. Remove rear engine mounting cross member with power tool. Refer to [TM-215. "2WD : Exploded View"](#).
8. Remove engine mounting insulator (rear). Refer to [TM-215. "2WD : Exploded View"](#).
9. Remove tightening bolts for rear extension assembly and transmission case.

1 : Bracket

A : Bolt

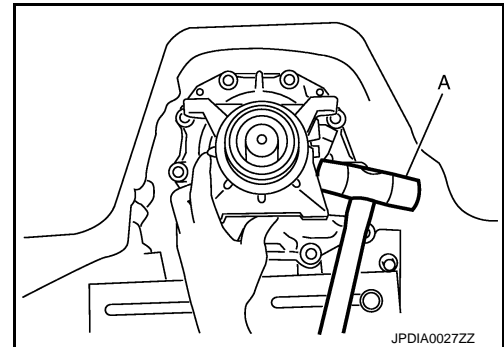
B : Self-sealing bolt



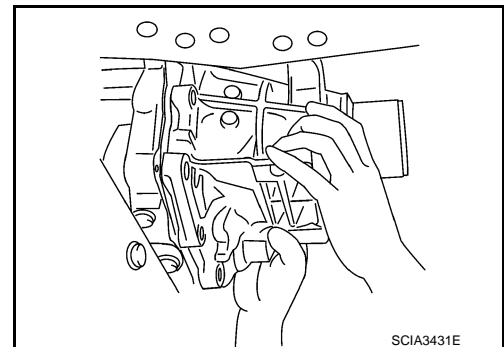
10. Tap rear extension assembly with a soft hammer (A).

CAUTION:

Be careful not to damage rear extension case.



11. Remove rear extension assembly (with needle bearing) from transmission case.



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OUTPUT SPEED SENSOR

[7AT: RE7R01B]

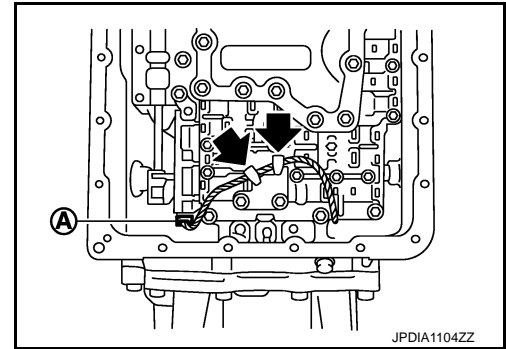
< REMOVAL AND INSTALLATION >

12. Disconnect output speed sensor connector (A).

CAUTION:

Be careful not to damage connector

13. Disengage terminal clips (←).

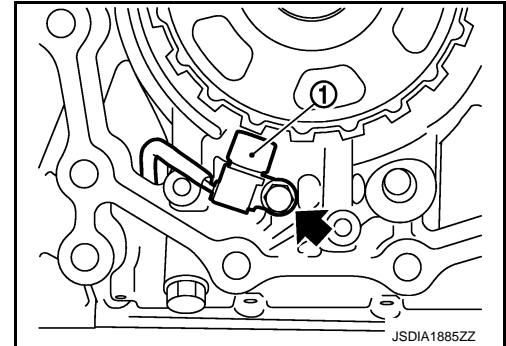


14. Remove output speed sensor (1) from transmission case.

← : Bolt

CAUTION:

- Never subject it to impact by dropping or hitting it.
- Never disassemble.
- Never allow metal filings, etc. to get on the sensor's front edge magnetic area.
- Never place in an area affected by magnetism.



INSTALLATION

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

CAUTION:

- Insert the tip of parking rod between the parking pole and the parking actuator support when assembling the rear extension assembly.
- Never reuse drain plug gasket.
- Refer to the followings when installing output speed sensor.

CAUTION:

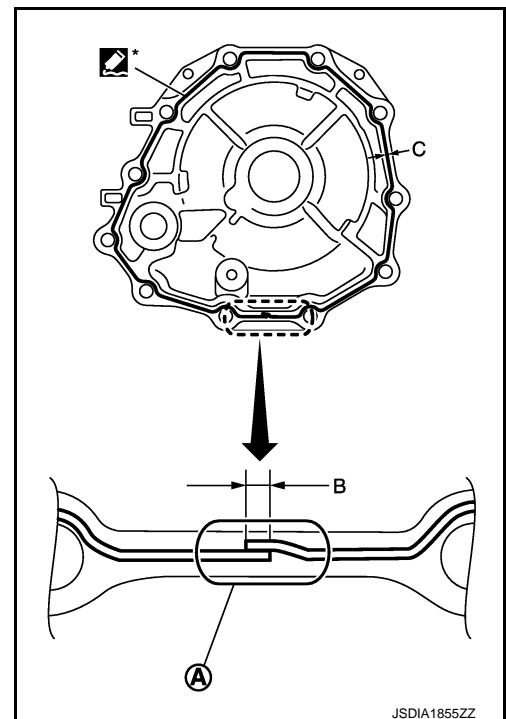
- Never subject it to impact by dropping or hitting it.
 - Never disassemble.
 - Never allow metal filings, etc. to get on the sensor's front edge magnetic area.
 - Never place in an area affected by magnetism.
- Refer to the followings when installing rear extension assembly.

- Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-22. "Recommended Chemical Products and Sealants"](#).) to rear extension assembly as shown in the figure.

- | | |
|--|---|
| Sealant starting point and endpoint (A) | : Start and finish point shall be in the center of two bolts. |
| Overlap width of sealant starting point and endpoint (B) | : 3 – 5 mm (0.12 – 0.20 in) |
| Sealant width (C) | : 1.0 – 2.0 mm (0.04 – 0.08 in) |
| Sealant height (C) | : 0.4 – 1.0 mm (0.016 – 0.04 in) |

CAUTION:

Completely remove all moisture, oil and old sealant, etc. from transmission case and rear extension assembly mounting surfaces.



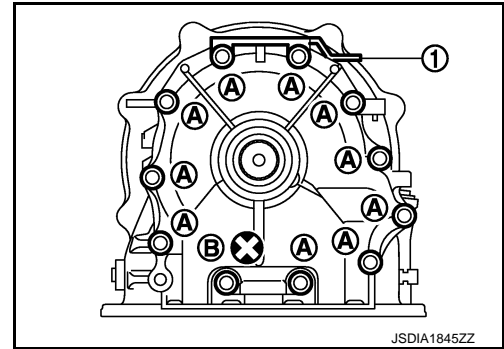
OUTPUT SPEED SENSOR

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

- Tighten rear extension assembly bolts to the specified torque.

- 1 : Bracket
- A : Bolt
- B : Self-sealing bolt



• Refer to the followings when installing oil pan (2) (with oil pan gasket) and clips (1) to transmission case.

↔ : Vehicle front

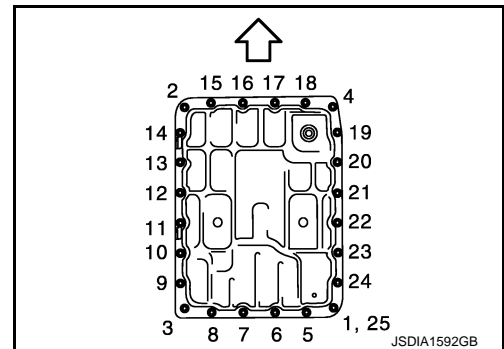
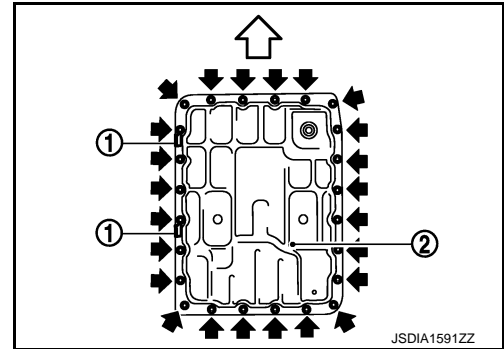
← : Oil pan mounting bolt

CAUTION:

- **Never reuse oil pan gasket and oil pan mounting bolts.**
 - **Install oil pan gasket in the direction to align hole position.**
 - **Install it so that drain plug comes to the position as shown in the figure.**
 - **Be careful not to pinch harnesses.**
 - **Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.**
- Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Tighten necessary oil pan mounting bolts with specified torque.

↔ : Vehicle front

• Fill with ATF after installation. Refer to [TM-182. "Changing"](#).



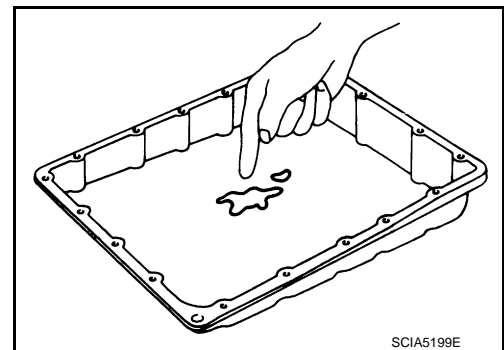
INFOID:000000009012258

2WD : Inspection and Adjustment

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-98. "Cleaning"](#).**



INSPECTION AFTER INSTALLATION

Start the engine and check visually that there is no leakage of ATF.

AIR BREATHER HOSE

< REMOVAL AND INSTALLATION >

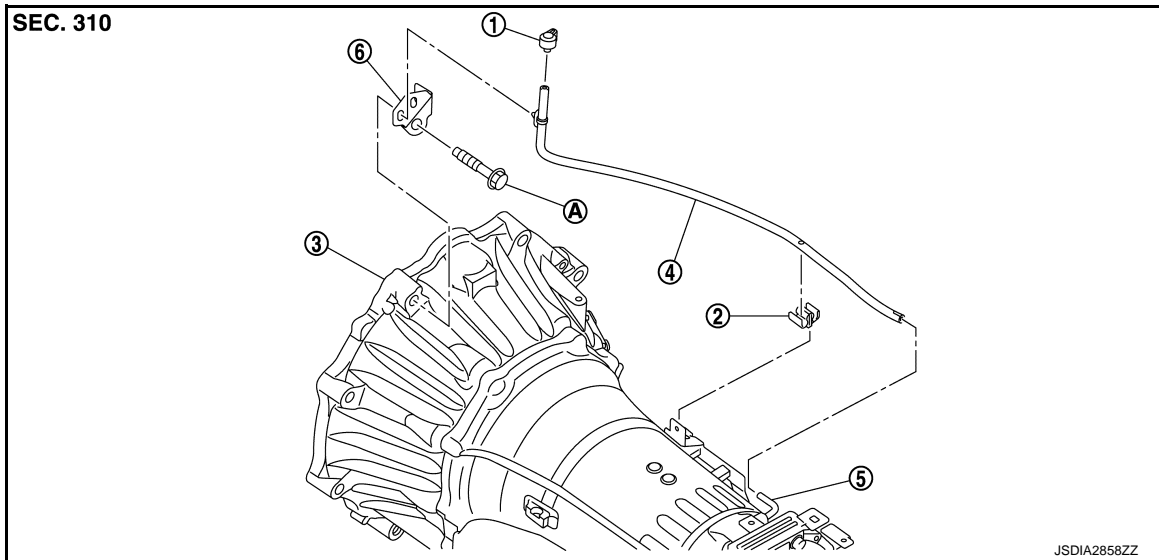
[7AT: RE7R01B]

AIR BREATHER HOSE

2WD

2WD : Exploded View

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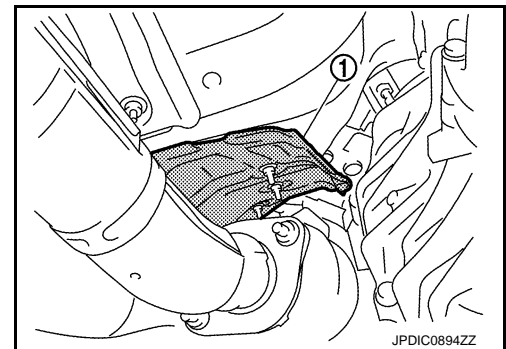
- | | | |
|--|----------------------|-----------------|
| 1. Air breather cap | 2. Clip | 3. A/T assembly |
| 4. A/T air breather hose | 5. Air breather tube | 6. Bracket |
| A. Tightening must be done following the installation procedure. Refer to TM-215, "2WD : Removal and Installation" . | | |

2WD : Removal and Installation

INFOID:000000009012260

REMOVAL

1. Remove heat plate (1).
2. Remove A/T air breather hose assembly from bracket and clip.
3. Pull out A/T air breather hose assembly from air breather tube.
4. Remove air breather cap from A/T air breather hose.



INSTALLATION

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

CAUTION:

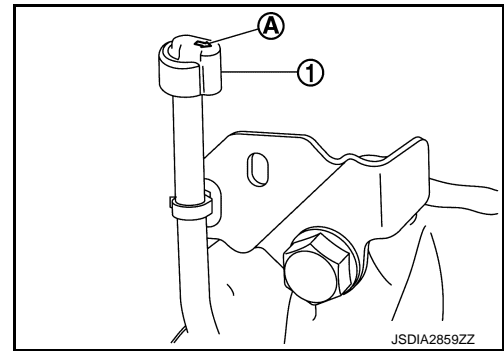
- Never bend the A/T air breather hose to prevent damage to the hose.
- Insert A/T air breather hose to air breather tube all the way to the curve of the tube.

AIR BREATHER HOSE

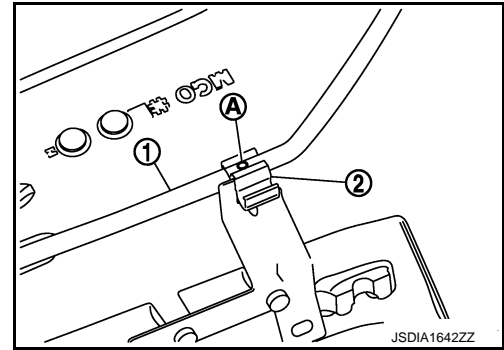
< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

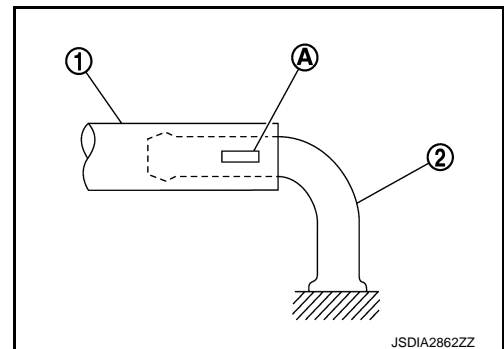
- To install air breather cap (1), face the arrow “←” (A) toward the right side of the vehicle as shown in the figure.



- To fix A/T air breather hose (1) to the clip (2), face the A/T air breather hose paint mark (A) upward and observe the installation position shown in the figure.



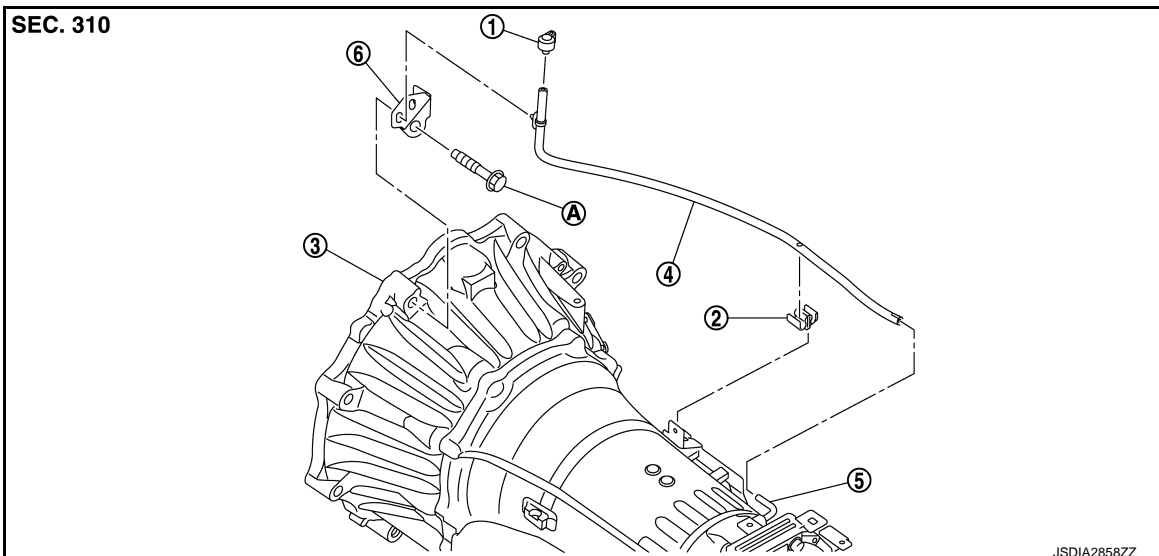
- Insert A/T air breather hose (1) to air breather tube (2) so that the paint mark (A) is facing upward.



4WD

4WD : Exploded View

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AIR BREATHER HOSE

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

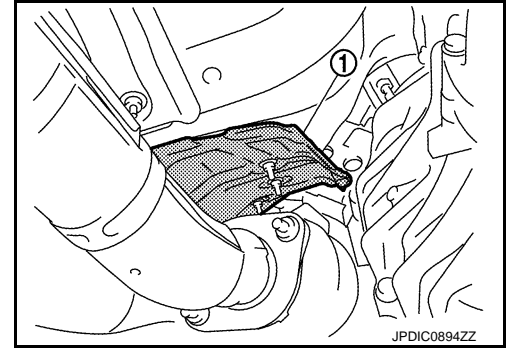
1. Air breather cap
 2. Clip
 3. A/T assembly
 4. A/T air breather hose
 5. Air breather tube
 6. Bracket
- A. Tightening must be done following the installation procedure. Refer to [TM-218, "4WD : Removal and Installation"](#).

4WD : Removal and Installation

INFOID:000000009012262

REMOVAL

1. Separate propeller shaft assembly (front). Refer to [DLN-137, "Removal and Installation"](#).
2. Remove heat plate (1).
3. Remove A/T air breather hose assembly from bracket and clip.
4. Pull out A/T air breather hose assembly from air breather tube.
5. Remove air breather cap from A/T air breather hose.

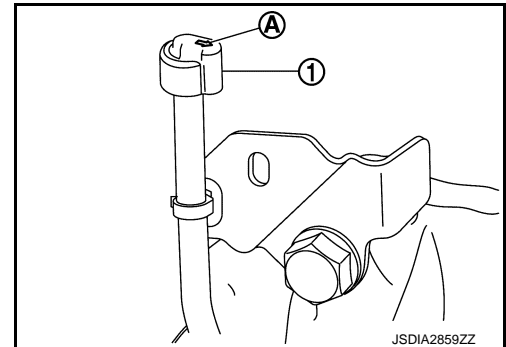


INSTALLATION

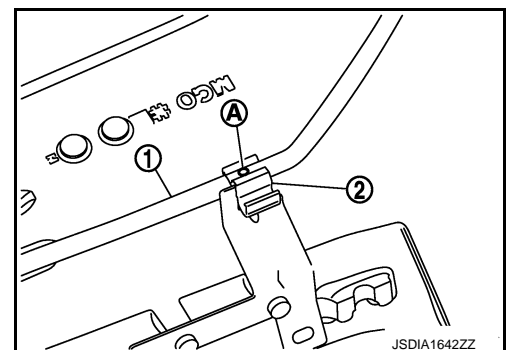
Note the following, and install in the reverse order of removal.

CAUTION:

- Never bend the A/T air breather hose to prevent damage to the hose.
- Insert A/T air breather hose to air breather tube all the way to the curve of the tube.
- To install air breather cap (1), face the arrow "←" (A) toward the right side of the vehicle as shown in the figure.



- To fix A/T air breather hose (1) to the clip (2), face the A/T air breather hose paint mark (A) upward and observe the installation position shown in the figure.

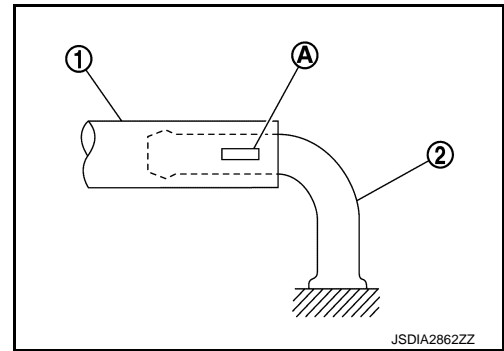


AIR BREATHING HOSE

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

- Insert A/T air breather hose (1) to air breather tube (2) so that the paint mark (A) is facing upward.



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FLUID COOLER SYSTEM

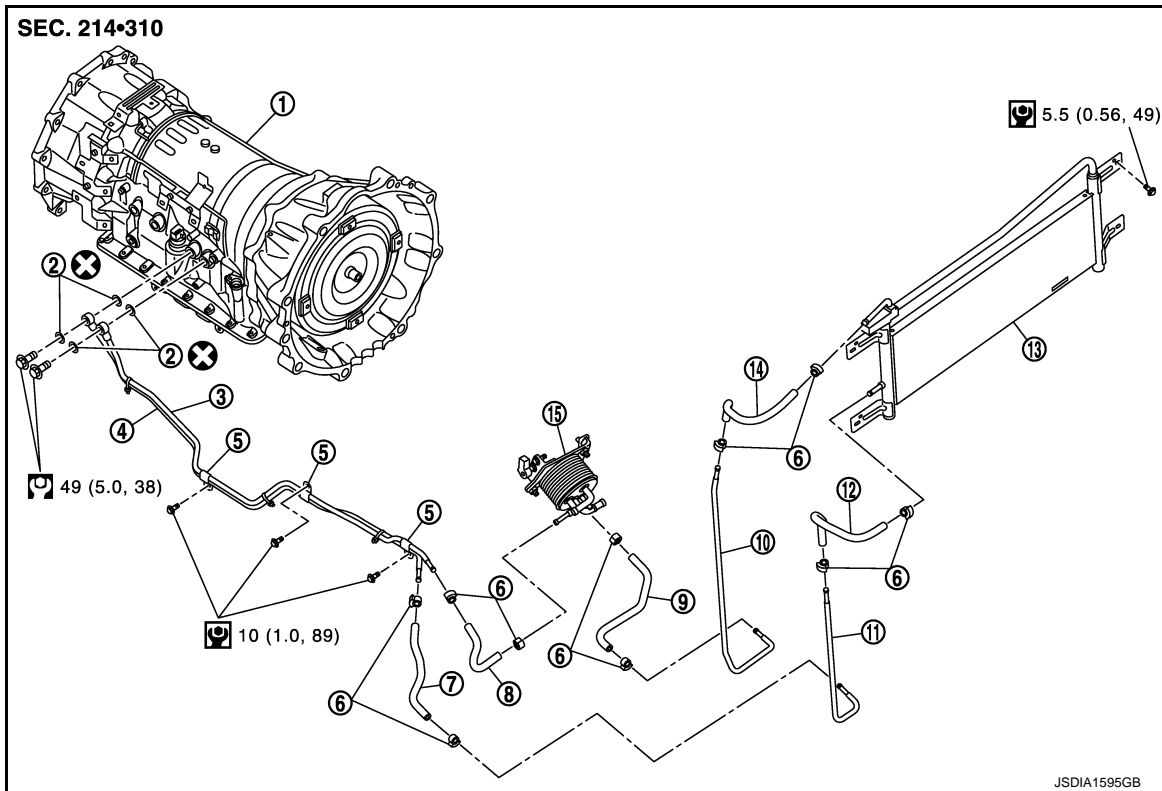
< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

FLUID COOLER SYSTEM

Exploded View

INFOID:000000009012263



- | | | |
|-----------------------------|-----------------------------|-----------------------------|
| 1. A/T assembly | 2. Copper washer | 3. A/T fluid cooler tube A |
| 4. A/T fluid cooler tube D | 5. Clip | 6. Hose clamp |
| 7. A/T fluid cooler hose E | 8. A/T fluid cooler hose A | 9. A/T fluid cooler hose B |
| 10. A/T fluid cooler tube B | 11. A/T fluid cooler tube C | 12. A/T fluid cooler hose D |
| 13. A/T fluid cooler | 14. A/T fluid cooler hose C | 15. A/T fluid warmer |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

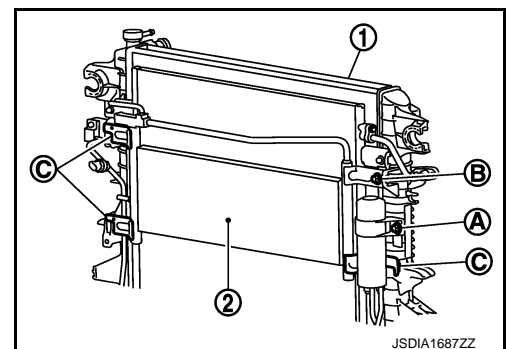
INFOID:000000009012264

REMOVAL

1. Remove front grille. Refer to [EXT-20, "Removal and Installation"](#).
2. Remove reservoir tank. Refer to [CO-14, "Removal and Installation"](#).
3. Remove radiator upper seal. Refer to [DLK-226, "Exploded View"](#).
4. Remove air guide seal (RH). Refer to [DLK-226, "Exploded View"](#).
5. Remove A/T fluid cooler hose C and D from A/T fluid cooler.
6. Remove liquid tank mounting bolt (A). Refer to [HA-39, "Exploded View"](#).
7. Remove A/T fluid cooler mounting bolt (B).
8. Remove radiator mounting bolts and tilt radiator to the vehicle rear. Refer to [CO-14, "Exploded View"](#).
9. Remove A/T fluid cooler bracket (C) from radiator (1), and remove A/T fluid cooler (2) from the vehicle.

CAUTION:

- Be careful not to damage A/T fluid cooler core.
- Be careful not to damage condenser core, condenser pipe and liquid tank.



FLUID COOLER SYSTEM

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

10. Remove control cable mounting bracket. Refer to [TM-187, "Removal and Installation"](#).
11. Remove front under cover. Refer to [EXT-26, "Removal and Installation"](#).
12. Remove A/T fluid cooler hoses and A/T fluid cooler tubes.

CAUTION:

Be careful not to bend A/T fluid cooler tubes.

NOTE:

Cap or plug openings to prevent fluid from spilling.

INSTALLATION

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

CAUTION:

- Never reuse copper washers.
- Be careful not to damage A/T fluid cooler core.
- Be careful not to damage condenser core, condenser pipe and liquid tank.
- 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	A/T fluid cooler tube A side	Facing upward	A
	A/T fluid warmer side	Facing upward	C
A/T fluid cooler hose B	A/T fluid warmer side	Facing leftward	E
	A/T fluid cooler tube B side	Facing downward	B
A/T fluid cooler hose C	A/T fluid cooler tube B side	Facing rightward	G
	A/T fluid cooler side	Facing upward	F
A/T fluid cooler hose D	A/T fluid cooler side	—	C
	A/T fluid cooler tube C side	—	G
A/T fluid cooler hose E	A/T fluid cooler tube C side	Facing downward	B
	A/T fluid cooler tube D side	Facing rightward	D

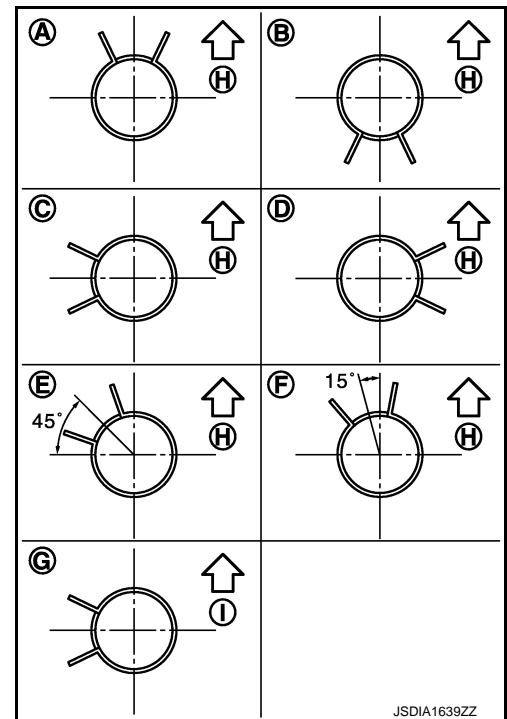
*: Refer to the illustrations for the specific position each hose clamp tab.

- The illustrations indicate the view from the hose ends.

↔ H : Vehicle upper

↔ I : Vehicle front

- When installing hose clamps center line of each hose clamp tab should be positioned as shown in the figure.



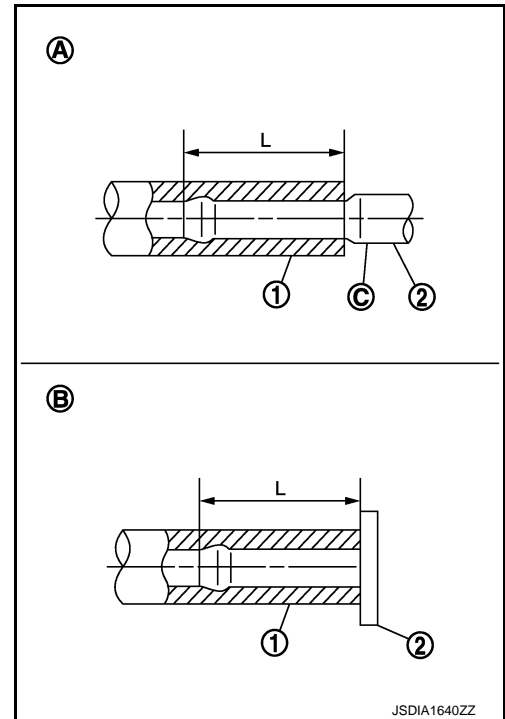
- Insert A/T fluid cooler hoses according to dimension "L" described below.

FLUID COOLER SYSTEM

< REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

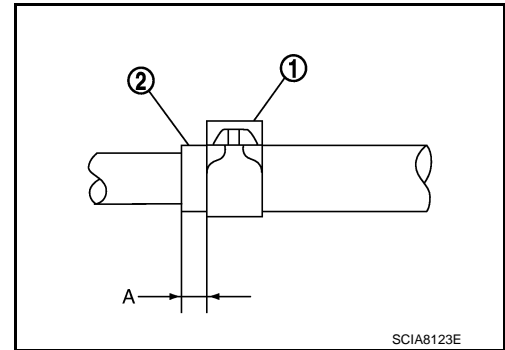
A/T fluid cooler hose (1)	Insertion side tube (2)	Tube type	Dimension "L"
A/T fluid cooler hose A	A/T fluid cooler tube A	A	30 mm (1.18 in) [End reaches the 2-stage bulge (C).]
	A/T fluid warmer tube		
A/T fluid cooler hose B	A/T fluid warmer tube	B	Insert the hose until the hose touches the A/T fluid warmer.
	A/T fluid cooler tube B	A	30 mm (1.18 in) [End reaches the 2-stage bulge (C).]
A/T fluid cooler hose C	A/T fluid cooler tube B		
	A/T fluid cooler tube		
A/T fluid cooler hose D	A/T fluid cooler tube		
	A/T fluid cooler tube C		
A/T fluid cooler hose E	A/T fluid cooler tube C		
	A/T fluid cooler tube 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.



INFOID:000000009012265

Inspection and Adjustment

INSPECTION AFTER INSTALLATION

Start the engine and check visually that there is no leakage of ATF.

ADJUSTMENT AFTER INSTALLATION

Adjust A/T fluid level. Refer to [TM-184. "Adjustment"](#).

TRANSMISSION ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

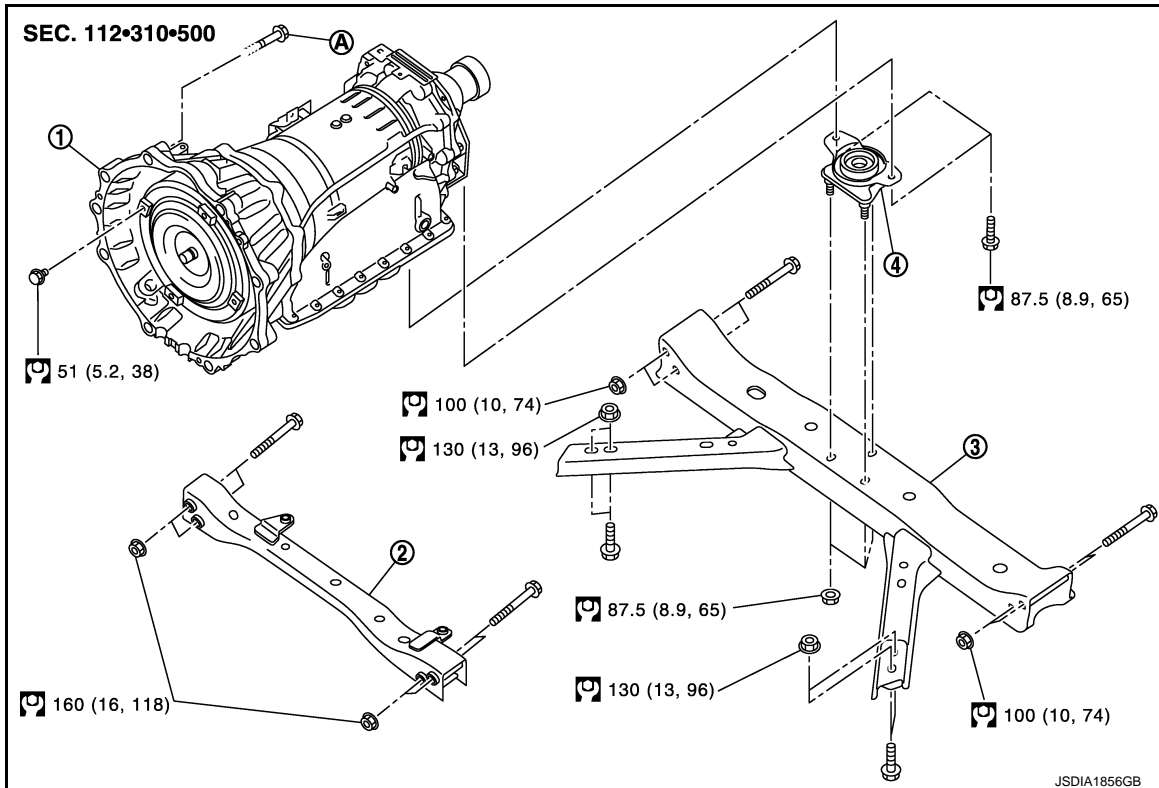
UNIT REMOVAL AND INSTALLATION

TRANSMISSION ASSEMBLY

2WD

2WD : Exploded View

INFOID:000000009012266



1. A/T assembly
 2. Front suspension rear cross member
 3. Rear engine mounting cross member
 4. Engine mounting insulator (rear)
- A. Tightening must be done following the installation procedure. Refer to [TM-215, "2WD : Removal and Installation"](#).
Refer to [GI-4, "Components"](#) for symbols in the figure.

2WD : Removal and Installation

INFOID:000000009012267

CAUTION:

Before replacing transmission assembly, perform "ADDITIONAL SERVICE WHEN TRANSMISSION ASSEMBLY". Refer to [TM-95, "Work Procedure"](#).

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 release the parking brake.
2. Disconnect the battery cable from the negative terminal.
3. 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.

4. Remove rear engine mounting cross member.

TRANSMISSION ASSEMBLY

[7AT: RE7R01B]

< UNIT REMOVAL AND INSTALLATION >

5. Remove engine mounting insulator (rear).
6. Remove control cable from A/T assembly. Refer to [TM-187, "Removal and Installation"](#).
7. Disconnect heated oxygen sensor 2 connectors (bank 1 and bank 2). Refer to [EX-5, "Exploded View"](#).
8. Remove exhaust front tube (RH and LH) and main muffler. Refer to [EX-5, "Exploded View"](#).
9. Separate propeller shaft assembly. Refer to [DLN-155, "Removal and Installation"](#).

NOTE:

Cap or plug opening to prevent fluid from spilling.

10. Remove front under cover with a power tool. Refer to [EXT-26, "Removal and Installation"](#).
11. Remove protector A and B. Refer to [SCS-32, "FRONT TUBE ASSEMBLY : Exploded View"](#).
12. Remove front suspension rear cross member.
13. Remove crankshaft position sensor (POS) from A/T assembly. Refer to [EM-115, "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.

14. Remove rear plate cover. Refer to [EM-56, "Exploded View"](#).
15. Turn crankshaft, and remove the four tightening bolts for drive plate and torque converter.

CAUTION:

When turning the crankshaft, turn it clockwise as viewed from the front of the engine.

16. Remove A/T fluid cooler tube A and D. Refer to [TM-212, "Exploded View"](#).

NOTE:

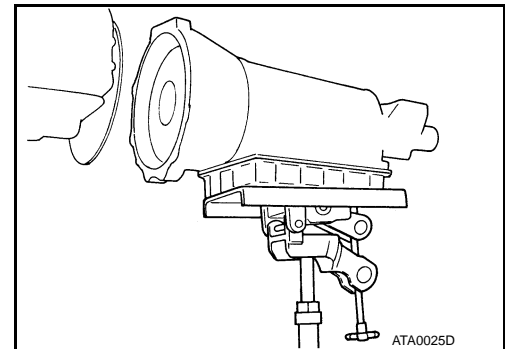
Cap or plug openings to prevent fluid from spilling.

17. Remove bolts fixing A/T assembly to engine with a power tool.
18. Disconnect connector from A/T assembly.
19. Remove harness and brackets from A/T assembly.
20. Remove A/T assembly from the vehicle.

CAUTION:

- Secure torque converter to prevent it from dropping.
- Secure A/T assembly to a transmission jack.

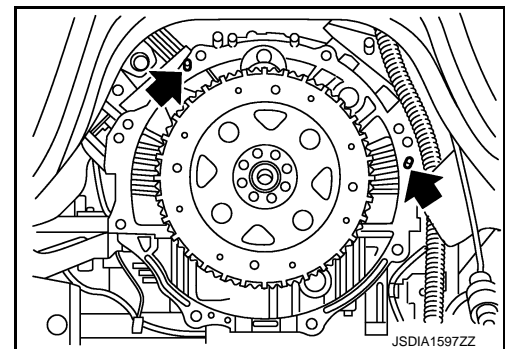
21. Remove air breather hose and bracket. Refer to [TM-208, "2WD : Exploded View"](#).
22. Remove manual lever from A/T assembly. Refer to [TM-187, "Exploded View"](#).



INSTALLATION

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

- Perform inspection before installing A/T assembly. Refer to [TM-217, "2WD : Inspection and Adjustment"](#).
- Check fitting of dowel pin (←).



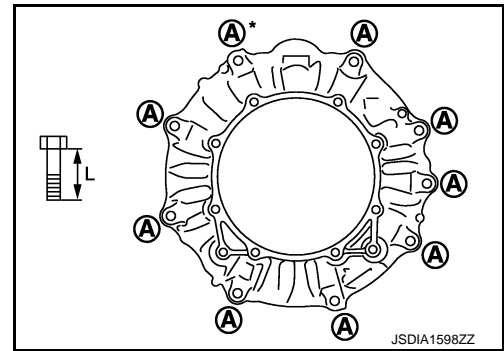
TRANSMISSION ASSEMBLY

[7AT: RE7R01B]

< UNIT REMOVAL AND INSTALLATION >

- Install the fixing bolts of A/T assembly and engine according to the following standard.

Bolt symbol	A
Insertion direction	A/T assembly to engine
Number of bolts	9
Bolt length "L" mm (in)	70 (2.76)
Tightening torque N·m (kg·m, ft·lb)	113 (12, 83)



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*: Tightening the bolt with bracket (and washer). Refer to [TM-208, "2WD : Exploded View"](#).

- 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-64, "Removal and Installation"](#).**
- **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

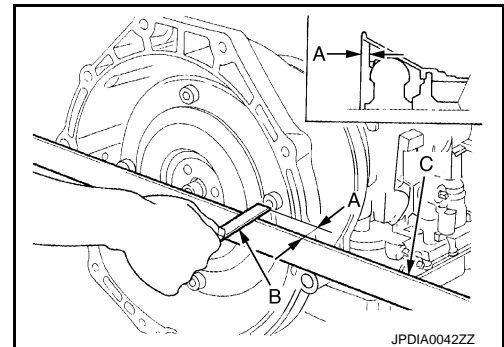
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INSPECTION BEFORE INSTALLATION

Check dimension (A) between converter housing and torque converter.

- B : Scale
- C : Straightedge

Dimension (A) : Refer to [TM-307, "Torque Converter"](#).



INSPECTION AFTER INSTALLATION

- Start the engine and check visually that there is no leakage of ATF.
- Check A/T position after adjusting A/T position. Refer to [TM-102, "Inspection"](#).

ADJUSTMENT AFTER INSTALLATION

- When replaced the A/T assembly, perform "ADDITIONAL SERVICE WHEN REPLACE TRANSMISSION ASSEMBLY". Refer to [TM-95, "Description"](#).
- Adjust A/T fluid level. Refer to [TM-184, "Adjustment"](#).
- Adjust A/T position. Refer to [TM-102, "Adjustment"](#).

4WD

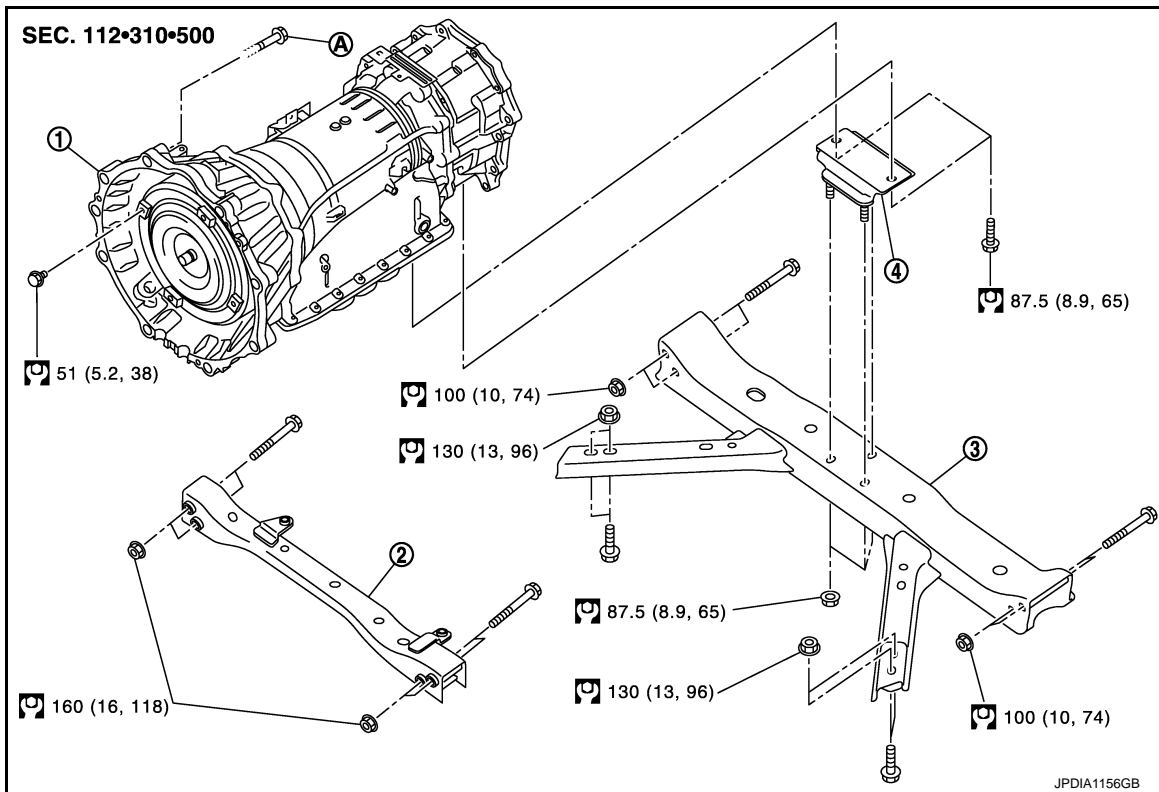
TRANSMISSION ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

4WD : Exploded View

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1. A/T assembly
2. Front suspension rear cross member
3. Rear engine mounting cross member
4. Engine mounting insulator (rear)

A. Tightening must be done following the installation procedure. Refer to [TM-218, "4WD : Removal and Installation"](#).
Refer to [GI-4, "Components"](#) for symbols in the figure.

4WD : Removal and Installation

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CAUTION:

Before replacing transmission assembly, perform "ADDITIONAL SERVICE WHEN TRANSMISSION ASSEMBLY". Refer to [TM-95, "Work Procedure"](#).

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 release the parking brake.
2. Disconnect the battery cable from the negative terminal.
3. Remove control cable from A/T assembly. Refer to [TM-187, "Removal and Installation"](#).
4. Disconnect heated oxygen sensor 2 connectors (bank 1 and bank 2). Refer to [EX-5, "Exploded View"](#).
5. Remove exhaust front tube (RH and LH) and main muffler. Refer to [EX-5, "Exploded View"](#).
6. 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.

7. Remove rear engine mounting cross member and engine mounting insulator (rear).
8. Separate propeller shaft assembly (front). Refer to [DLN-137, "Removal and Installation"](#).
9. Separate propeller shaft assembly (rear). Refer to [DLN-146, "Removal and Installation"](#).

TRANSMISSION ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

10. Remove front under cover with a power tool. Refer to [EXT-26, "Removal and Installation"](#).
11. Remove front suspension rear cross member.
12. Remove crankshaft position sensor (POS) from A/T assembly. Refer to [EM-115, "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.

13. Remove rear plate cover. Refer to [EM-56, "Exploded View"](#).
14. 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.

15. Remove A/T fluid cooler tube A and D. Refer to [TM-212, "Exploded View"](#).

NOTE:

Cap or plug openings to prevent fluid from spilling.

16. Support transfer assembly with a transmission jack.
17. Remove bolts fixing A/T assembly to engine with a power tool.
18. Disconnect connectors from A/T assembly and transfer assembly.
19. Remove harness and brackets from A/T assembly and transfer assembly.
20. Remove A/T assembly with transfer assembly from the vehicle.

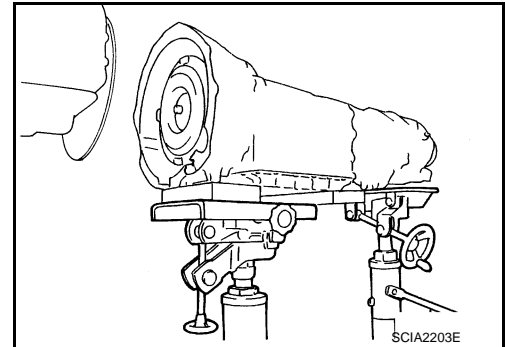
CAUTION:

- Secure torque converter to prevent it from dropping.
- Secure A/T assembly to a transmission jack.

21. Remove air breather hoses and bracket. Refer to [TM-209, "4WD : Exploded View"](#) (for A/T) and [DLN-127, "Removal and Installation"](#) (for transfer).
22. Remove manual lever from A/T assembly. Refer to [TM-187, "Exploded View"](#).
23. Remove transfer assembly from A/T assembly with power tool. Refer to [DLN-127, "Removal and Installation"](#).

NOTE:

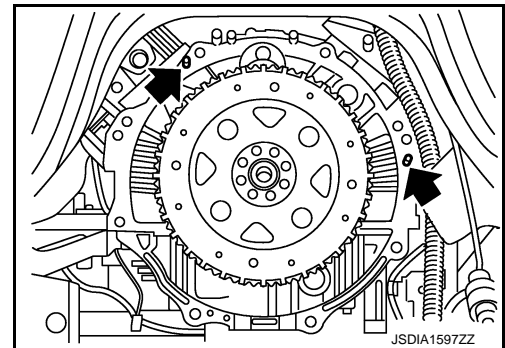
Cap or plug opening to prevent fluid from spilling.



INSTALLATION

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

- Perform inspection before installing A/T assembly. Refer to [TM-220, "4WD : Inspection and Adjustment"](#).
- Check fitting of dowel pin (←).



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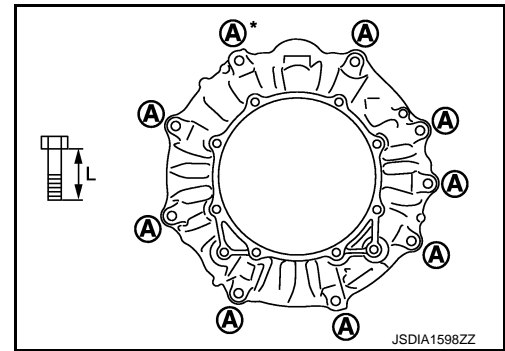
TRANSMISSION ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

[7AT: RE7R01B]

- Install the fixing bolts of A/T assembly and engine according to the following standard.

Bolt symbol	A
Insertion direction	A/T assembly to engine
Number of bolts	9
Bolt length "L" mm (in)	70 (2.76)
Tightening torque N·m (kg·m, ft·lb)	113 (12, 83)



*: Tightening the bolt with bracket (and washer). Refer to [TM-209, "4WD : Exploded View"](#).

- 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-64, "Removal and Installation"](#).**
- **Rotate crankshaft several turns and check to be sure that A/T rotates freely without binding after converter is installed to drive plate.**

4WD : Inspection and Adjustment

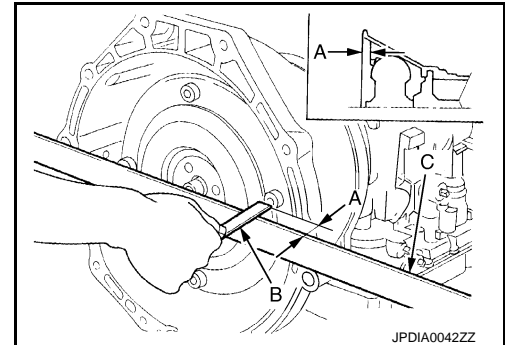
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INSPECTION BEFORE INSTALLATION

Check dimension (A) between converter housing and torque converter.

- B : Scale
- C : Straightedge

Dimension (A) : Refer to [TM-307, "Torque Converter"](#).



INSPECTION AFTER INSTALLATION

- Start the engine and check visually that there is no leakage of ATF.
- Check A/T position after adjusting A/T position. Refer to [TM-102, "Inspection"](#).

ADJUSTMENT AFTER INSTALLATION

- When replaced the A/T assembly, perform "ADDITIONAL SERVICE WHEN REPLACE TRANSMISSION ASSEMBLY". Refer to [TM-95, "Description"](#).
- Adjust A/T fluid level. Refer to [TM-184, "Adjustment"](#).
- Adjust A/T position. Refer to [TM-102, "Inspection"](#).

TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

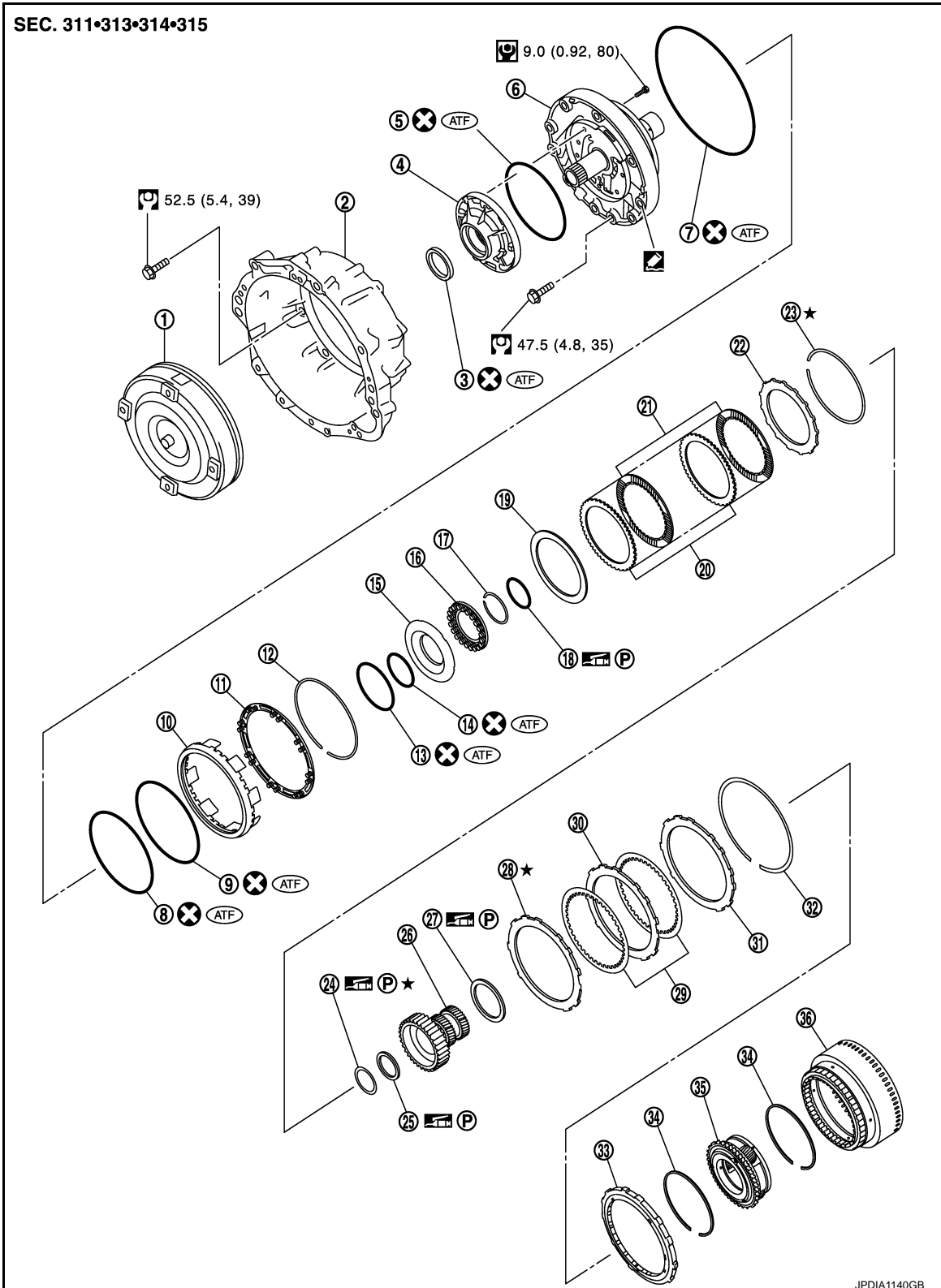
UNIT DISASSEMBLY AND ASSEMBLY

TRANSMISSION ASSEMBLY

Exploded View

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2WD MODELS




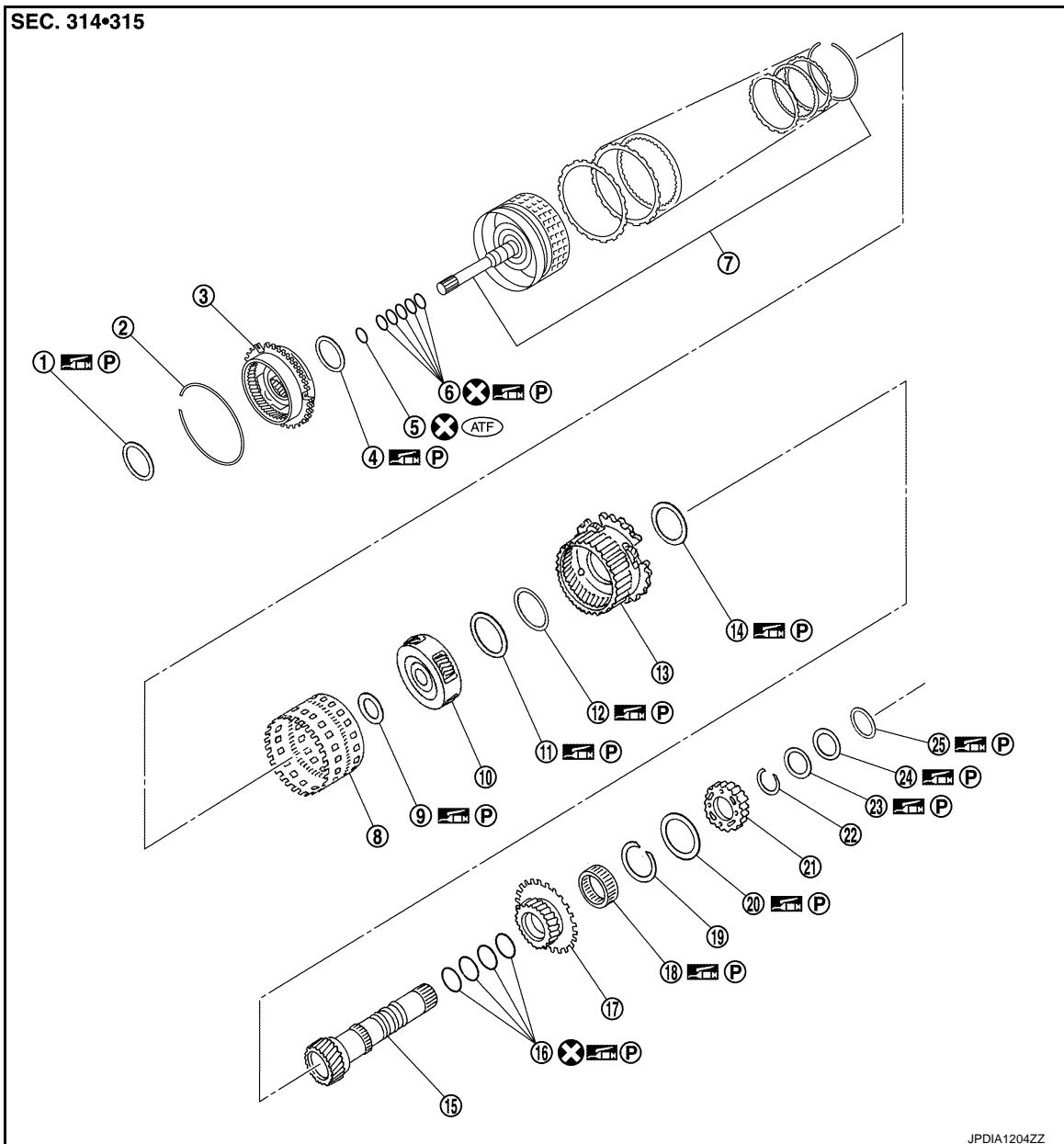
TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

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|---------------------------------|----------------------------------|------------------------------|
| 1. Torque converter | 2. Converter housing | 3. Oil pump housing oil seal |
| 4. Oil pump housing | 5. O-ring | 6. Oil pump cover |
| 7. O-ring | 8. D-ring | 9. D-ring |
| 10. Front brake piston | 11. Front brake spring retainer | 12. Snap ring |
| 13. D-ring | 14. D-ring | 15. 2346 brake piston |
| 16. 2346 brake spring retainer | 17. Snap ring | 18. Seal ring |
| 19. 2346 brake dish plate | 20. 2346 brake driven plate | 21. 2346 brake drive plate |
| 22. 2346 brake retaining plate | 23. Snap ring | 24. Bearing race |
| 25. Needle bearing | 26. Under drive sun gear | 27. Needle bearing |
| 28. Front brake retaining plate | 29. Front brake drive plate | 30. Front brake driven plate |
| 31. Front brake retaining plate | 32. Snap ring | 33. 1st one-way clutch |
| 34. Snap ring | 35. Under drive carrier assembly | 36. Front brake hub assembly |

: Apply Genuine RTV silicone sealant or equivalent. Refer to [GI-22. "Recommended Chemical Products and Sealants"](#). Refer to [GI-4. "Components"](#) for symbols not described on the above.



TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

- | | | | |
|---------------------------|-----------------------|-------------------------------------|---|
| 1. Needle bearing | 2. Snap ring | 3. Front carrier assembly | A |
| 4. Needle bearing | 5. O-ring | 6. Seal ring | |
| 7. Input clutch assembly | 8. Rear internal gear | 9. Needle bearing | |
| 10. Mid carrier assembly | 11. Needle bearing | 12. Bearing race | B |
| 13. Rear carrier assembly | 14. Needle bearing | 15. Mid sun gear | |
| 16. Seal ring | 17. Rear sun gear | 18. 2nd one-way clutch | |
| 19. Snap ring | 20. Needle bearing | 21. High and low reverse clutch hub | C |
| 22. Snap ring | 23. Bearing race | 24. Bearing race | |
| 25. Needle bearing | | | |

Refer to [GI-4, "Components"](#) for symbols not described on the above.

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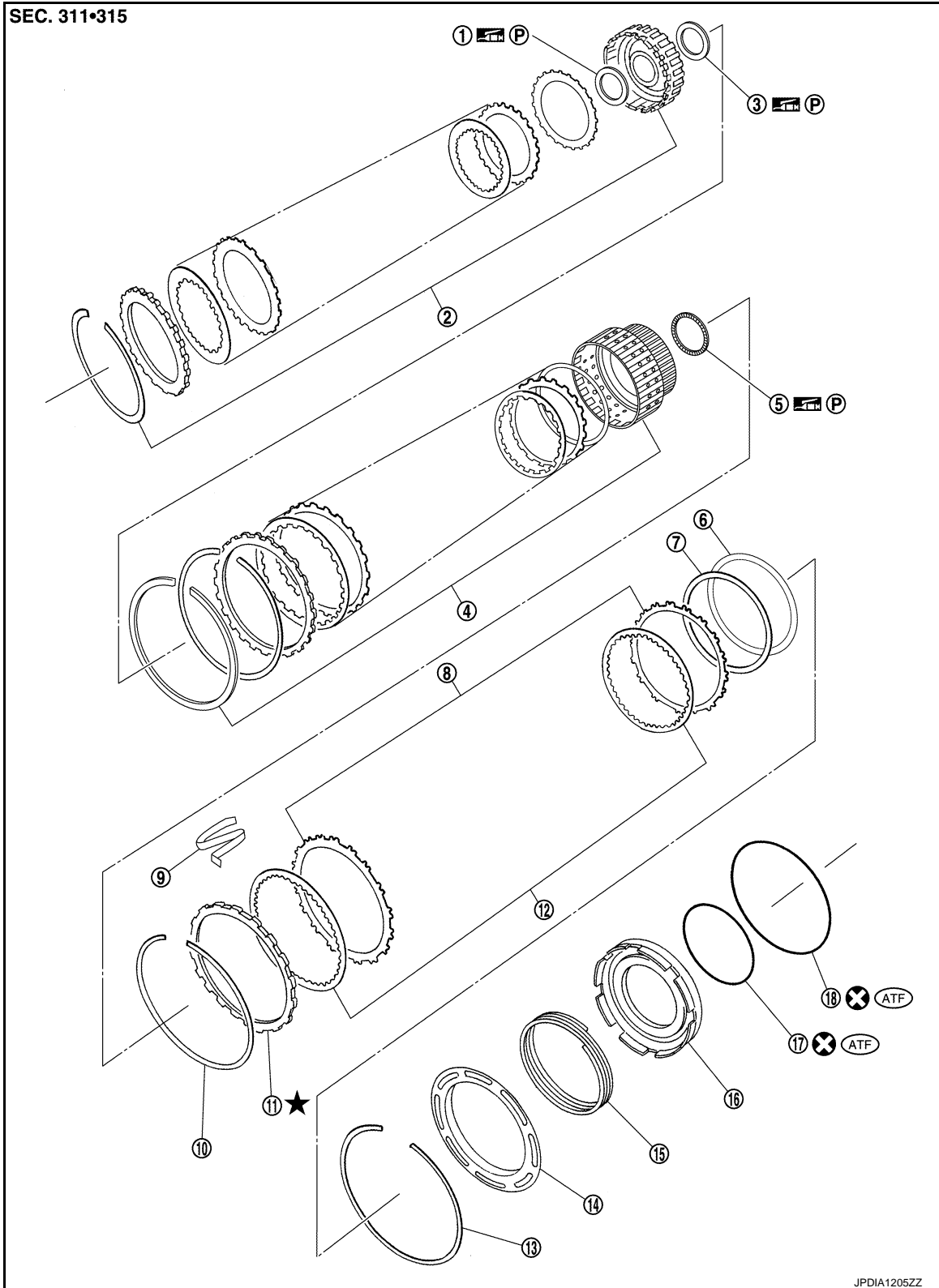
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TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]



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|-----------------------------|---|---------------------------------|
| 1. Bearing race | 2. High and low reverse clutch assembly | 3. Needle bearing |
| 4. Direct clutch assembly | 5. Needle bearing | 6. Reverse brake dish plate |
| 7. Reverse brake dish plate | 8. Reverse brake driven plate | 9. N-spring |
| 10. Snap ring | 11. Reverse brake retaining plate | 12. Reverse brake drive plate |
| 13. Snap ring | 14. Reverse brake spring retainer | 15. Reverse brake return spring |

TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

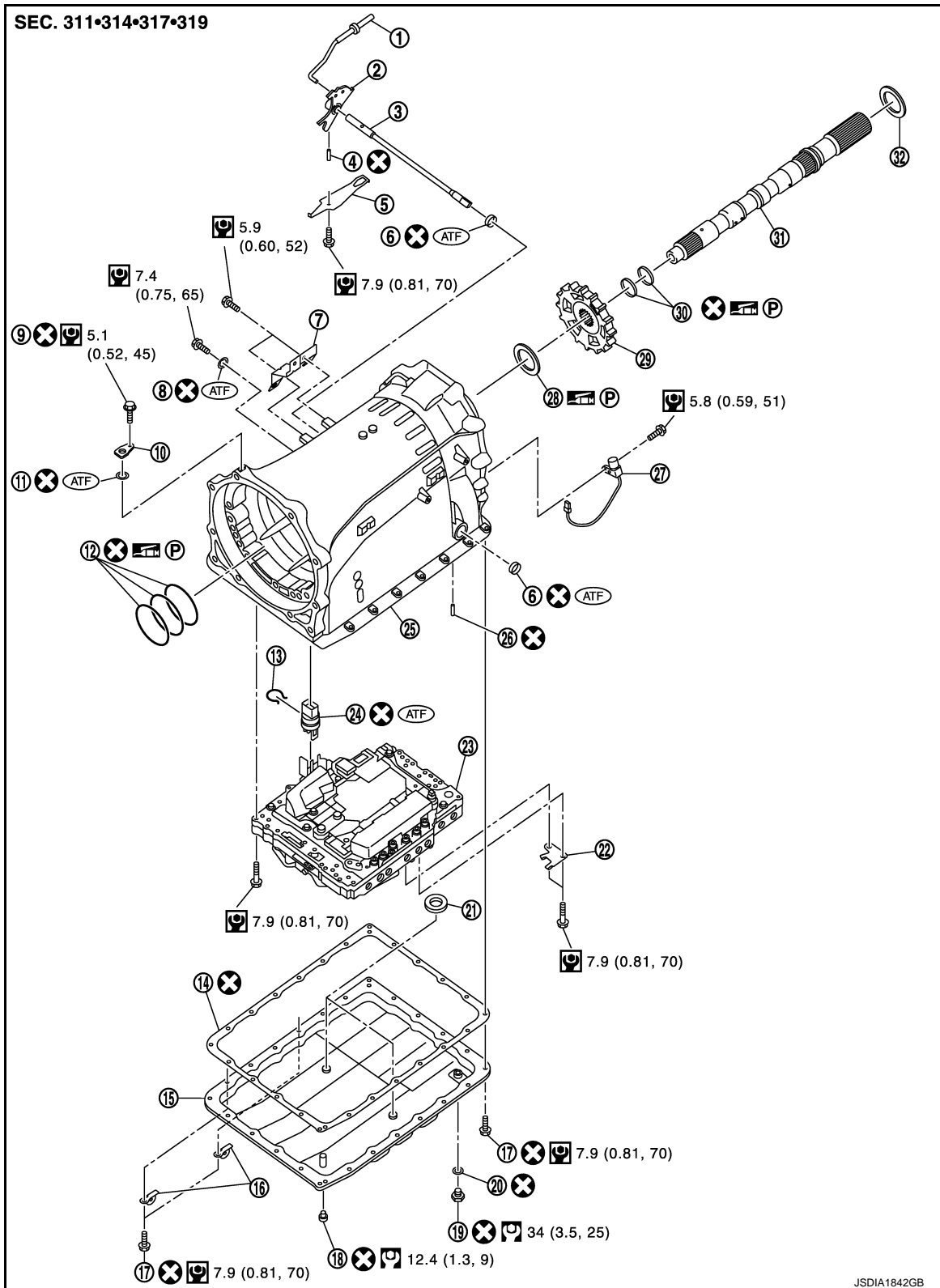
[7AT: RE7R01B]

16. Reverse brake piston

17. D-ring

18. D-ring

Refer to [GI-4, "Components"](#) for symbols in the figure.



- 1. Parking rod
- 4. Retaining pin
- 7. Bracket
- 10. Baffle plate

- 2. Manual plate
- 5. Detent spring
- 8. O-ring
- 11. O-ring

- 3. Manual shaft
- 6. Oil seal
- 9. Self-sealing bolt
- 12. Seal ring

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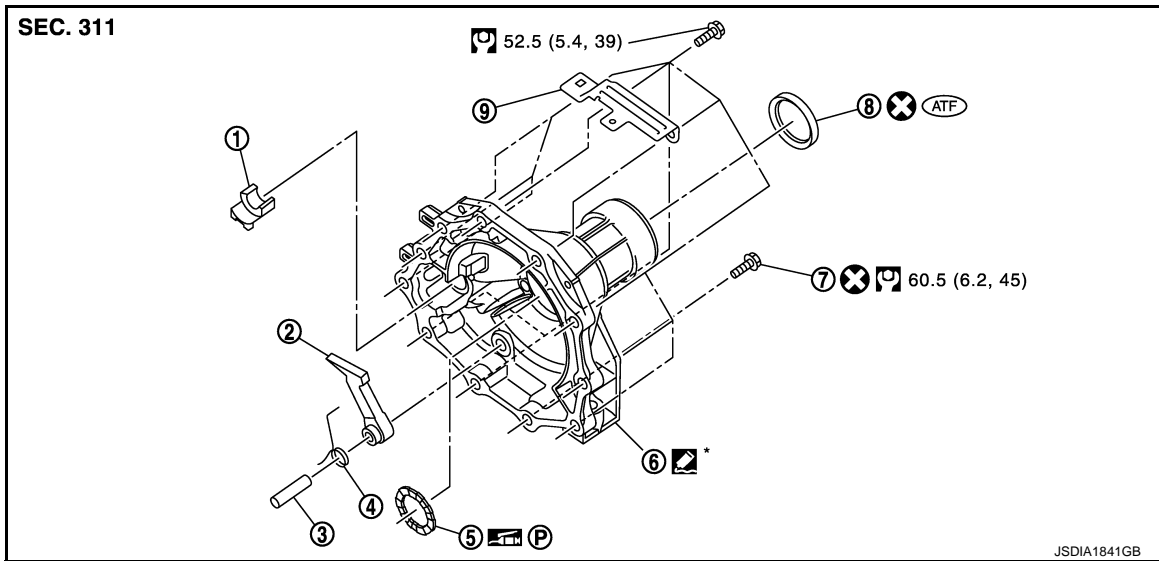
TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

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|-----------------------|---------------------------|-------------------------|
| 13. Snap ring | 14. Oil pan gasket | 15. Oil pan |
| 16. Clip | 17. Oil pan mounting bolt | 18. Overflow plug |
| 19. Drain plug | 20. Drain plug gasket | 21. Magnet |
| 22. Clip | 23. Control valve & TCM | 24. Joint connector |
| 25. Transmission case | 26. Retaining pin | 27. Output speed sensor |
| 28. Needle bearing | 29. Parking gear | 30. Seal ring |
| 31. Output shaft | 32. Bearing race | |

Refer to [GI-4, "Components"](#) for symbols in the figure.



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|-----------------------------|-------------------|-------------------|
| 1. Parking actuator support | 2. Parking pawl | 3. Pawl shaft |
| 4. Return spring | 5. Needle bearing | 6. Rear extension |
| 7. Self-sealing bolt | 8. Rear oil seal | 9. Bracket |

*: Apply Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

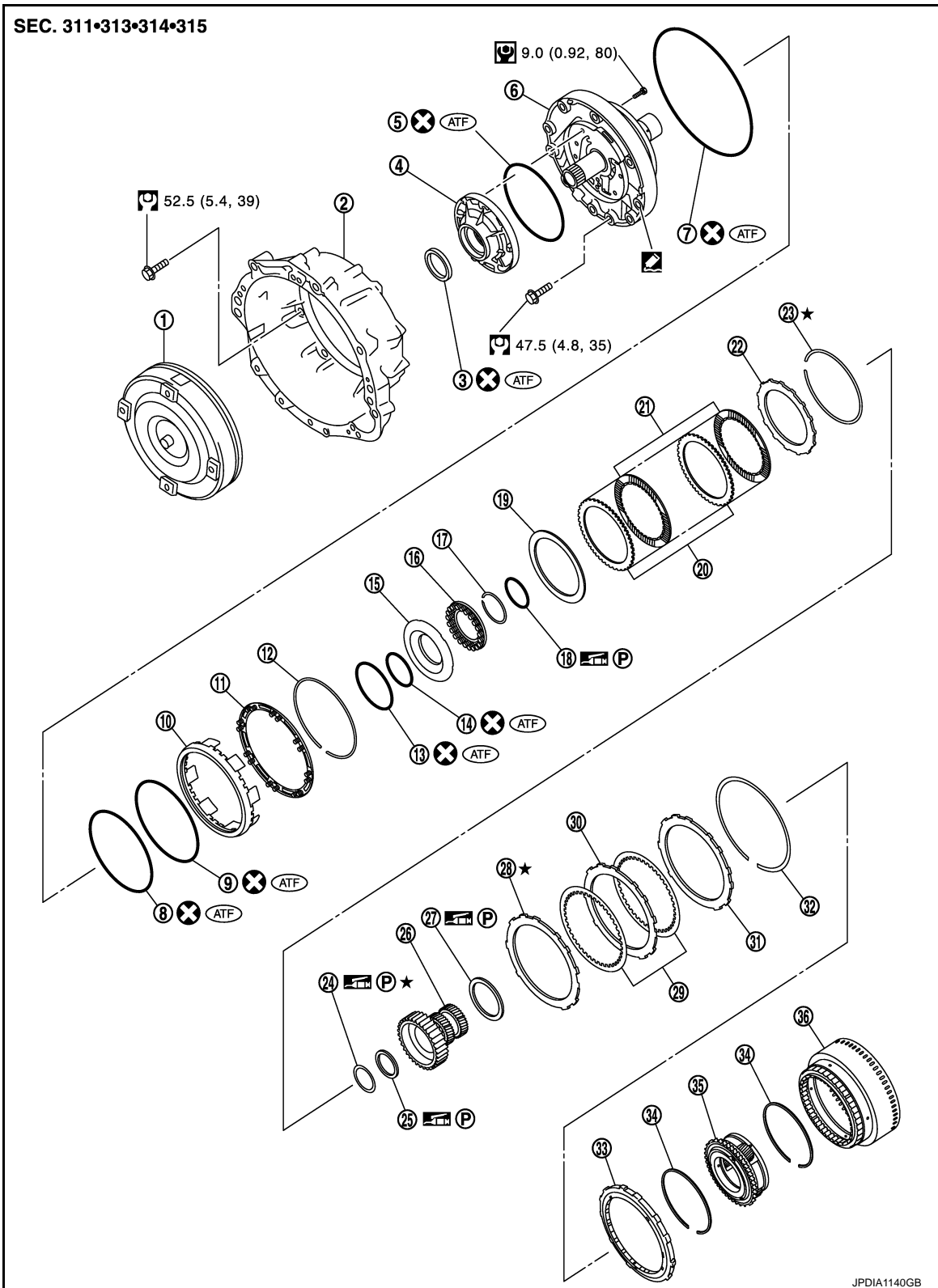
Refer to [GI-4, "Components"](#) for symbols in the figure.

4WD MODELS

TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]



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|--------------------------------|---------------------------------|------------------------------|
| 1. Torque converter | 2. Converter housing | 3. Oil pump housing oil seal |
| 4. Oil pump housing | 5. O-ring | 6. Oil pump cover |
| 7. O-ring | 8. D-ring | 9. D-ring |
| 10. Front brake piston | 11. Front brake spring retainer | 12. Snap ring |
| 13. D-ring | 14. D-ring | 15. 2346 brake piston |
| 16. 2346 brake spring retainer | 17. Snap ring | 18. Seal ring |


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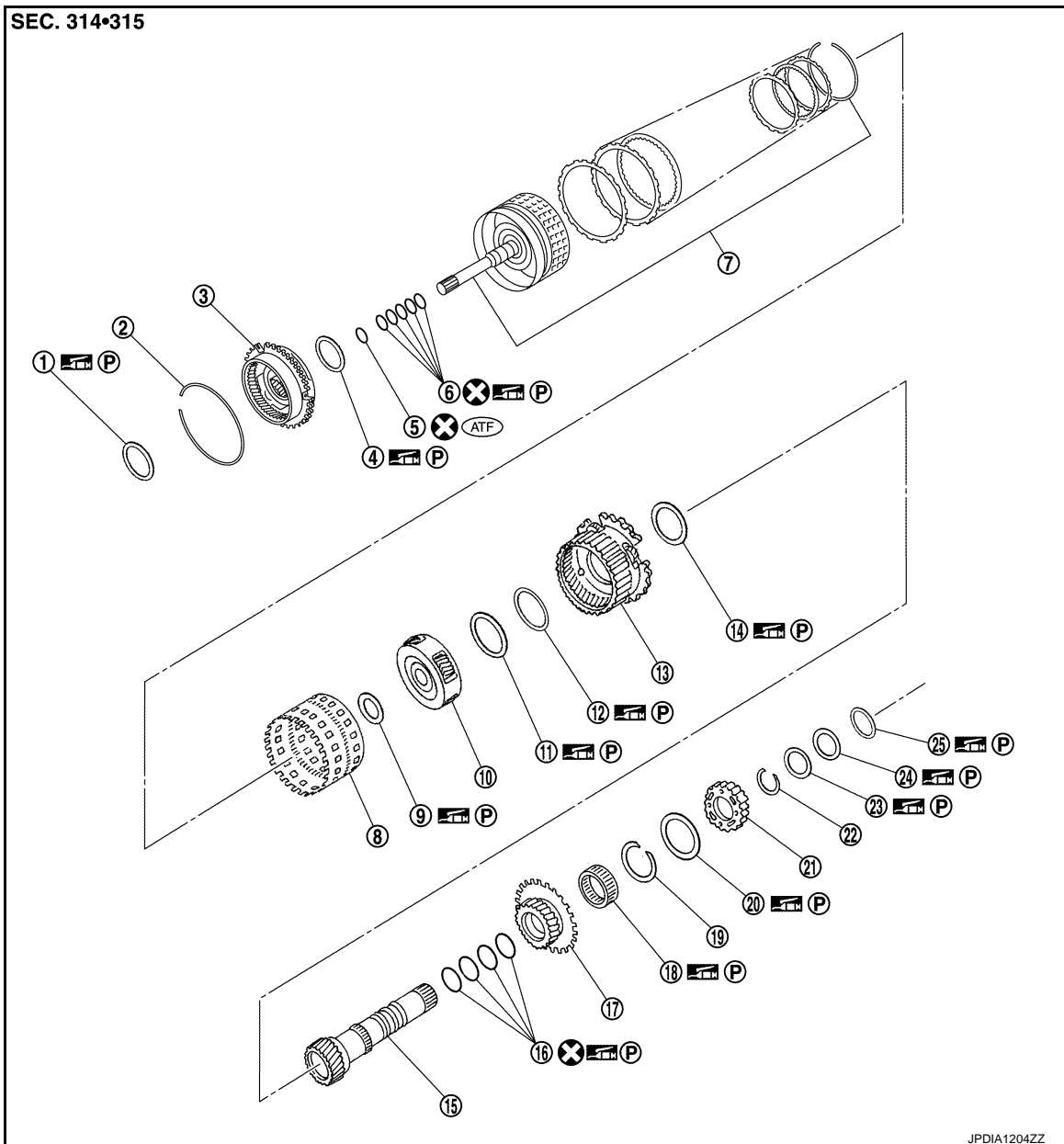
TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

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| 19. 2346 brake dish plate | 20. 2346 brake driven plate | 21. 2346 brake drive plate |
| 22. 2346 brake retaining plate | 23. Snap ring | 24. Bearing race |
| 25. Needle bearing | 26. Under drive sun gear | 27. Needle bearing |
| 28. Front brake retaining plate | 29. Front brake drive plate | 30. Front brake driven plate |
| 31. Front brake retaining plate | 32. Snap ring | 33. 1st one-way clutch |
| 34. Snap ring | 35. Under drive carrier assembly | 36. Front brake hub assembly |

 Apply Genuine RTV silicone sealant or equivalent. Refer to [GI-22. "Recommended Chemical Products and Sealants"](#). Refer to [GI-4. "Components"](#) for symbols not described on the above.



- | | | |
|---------------------------|-----------------------|-------------------------------------|
| 1. Needle bearing | 2. Snap ring | 3. Front carrier assembly |
| 4. Needle bearing | 5. O-ring | 6. Seal ring |
| 7. Input clutch assembly | 8. Rear internal gear | 9. Needle bearing |
| 10. Mid carrier assembly | 11. Needle bearing | 12. Bearing race |
| 13. Rear carrier assembly | 14. Needle bearing | 15. Mid sun gear |
| 16. Seal ring | 17. Rear sun gear | 18. 2nd one-way clutch |
| 19. Snap ring | 20. Needle bearing | 21. High and low reverse clutch hub |

TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

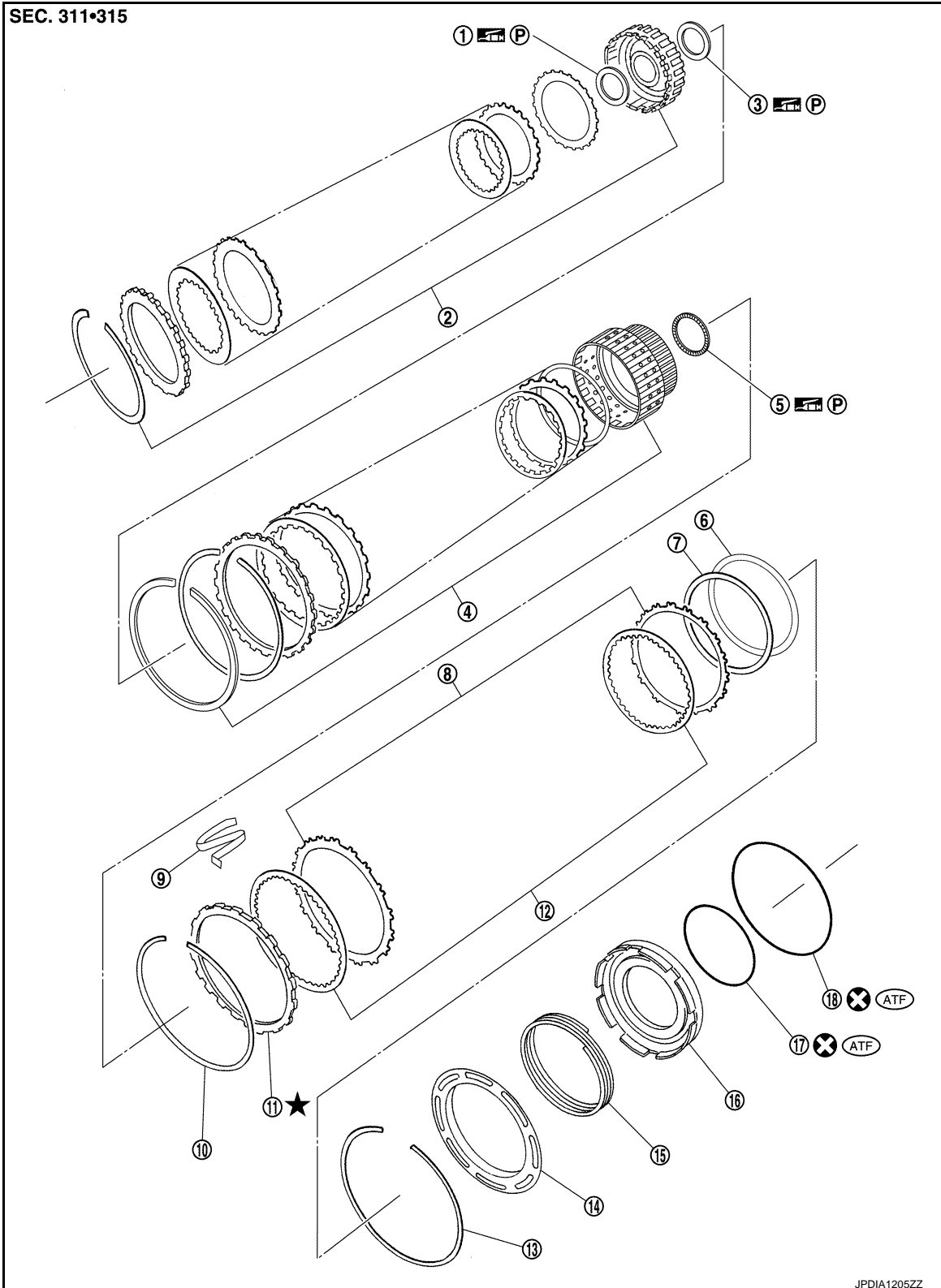
22. Snap ring

23. Bearing race

24. Bearing race

25. Needle bearing

Refer to [GI-4. "Components"](#) for symbols not described on the above.



1. Bearing race

2. High and low reverse clutch assembly

3. Needle bearing

4. Direct clutch assembly

5. Needle bearing

6. Reverse brake dish plate

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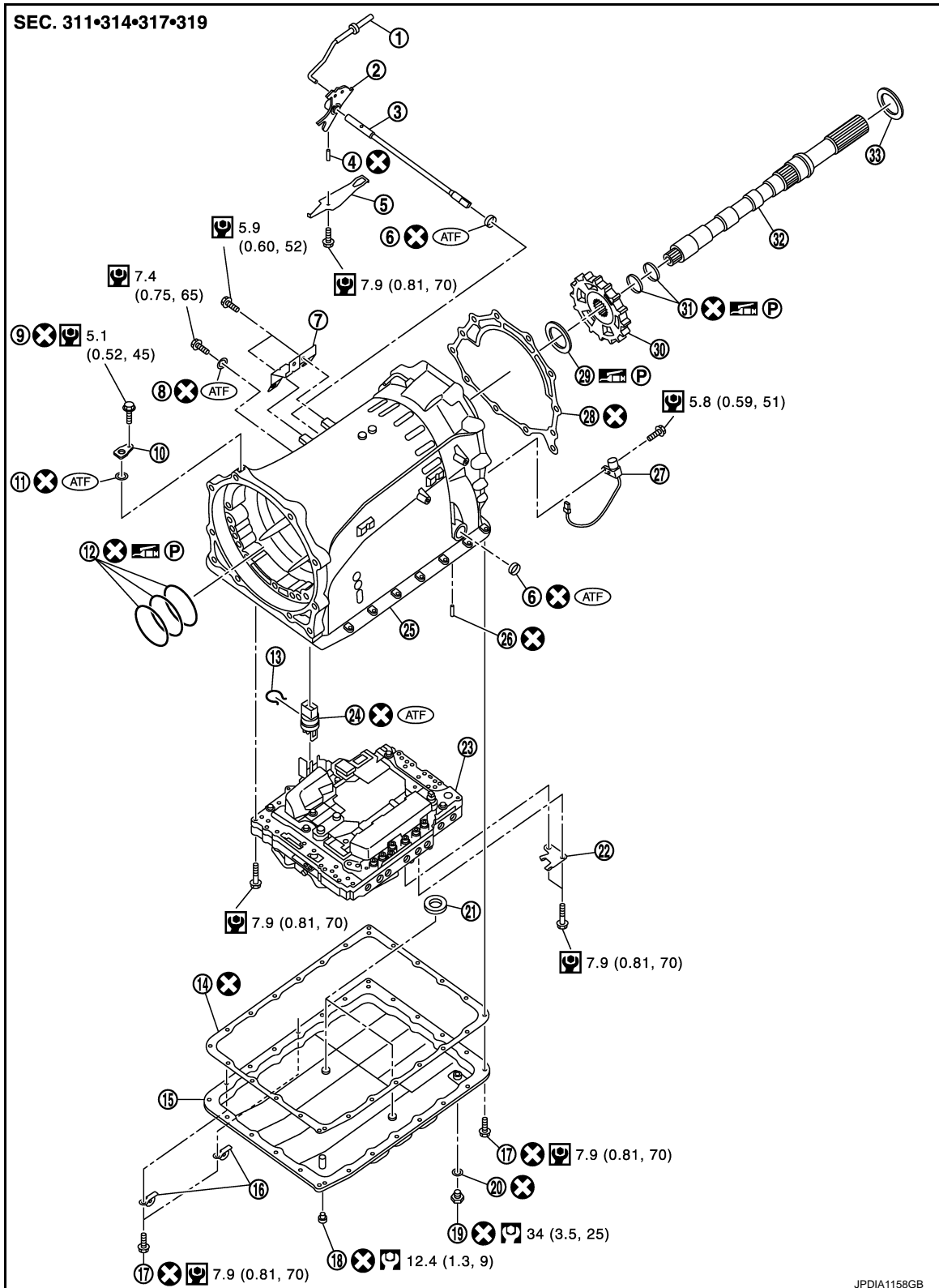
TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

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| 7. Reverse brake dish plate | 8. Reverse brake driven plate | 9. N-spring |
| 10. Snap ring | 11. Reverse brake retaining plate | 12. Reverse brake drive plate |
| 13. Snap ring | 14. Reverse brake spring retainer | 15. Reverse brake return spring |
| 16. Reverse brake piston | 17. D-ring | 18. D-ring |

Refer to [GI-4. "Components"](#) for symbols in the figure.



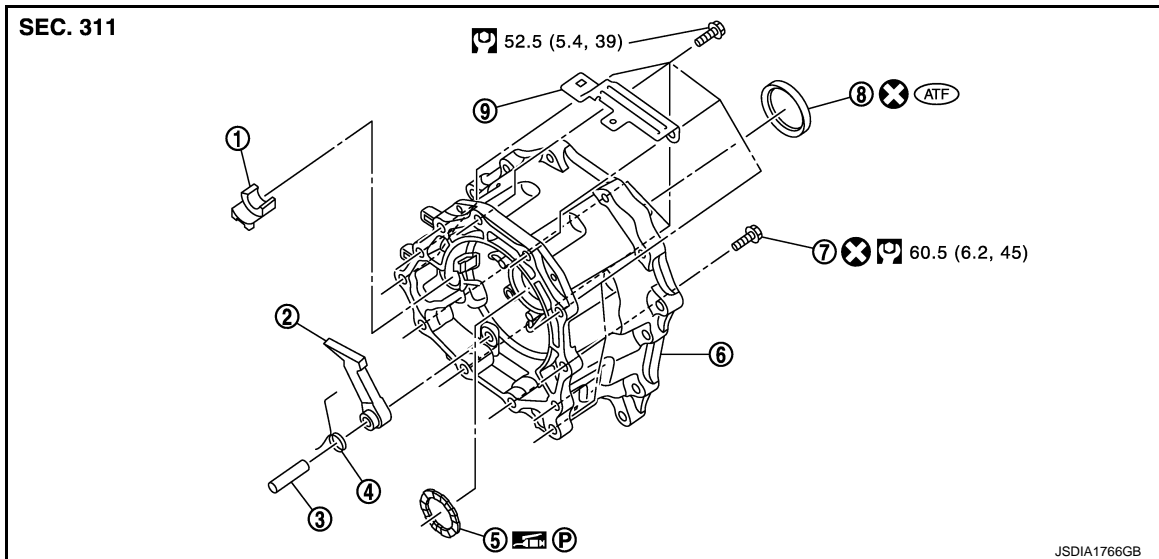
TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

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|-----------------------|---------------------------|-------------------------|----|
| 1. Parking rod | 2. Manual plate | 3. Manual shaft | A |
| 4. Retaining pin | 5. Detent spring | 6. Oil seal | B |
| 7. Bracket | 8. O-ring | 9. Self-sealing bolt | C |
| 10. Baffle plate | 11. O-ring | 12. Seal ring | TM |
| 13. Snap ring | 14. Oil pan gasket | 15. Oil pan | E |
| 16. Clip | 17. Oil pan mounting bolt | 18. Overflow plug | F |
| 19. Drain plug | 20. Drain plug gasket | 21. Magnet | G |
| 22. Clip | 23. Control valve & TCM | 24. Joint connector | H |
| 25. Transmission case | 26. Retaining pin | 27. Output speed sensor | I |
| 28. Gasket | 29. Needle bearing | 30. Parking gear | J |
| 31. Seal ring | 32. Output shaft | 33. Bearing race | K |

Refer to [GI-4, "Components"](#) for symbols in the figure.



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|-----------------------------|-------------------|-----------------|---|
| 1. Parking actuator support | 2. Parking pawl | 3. Pawl shaft | L |
| 4. Return spring | 5. Needle bearing | 6. Adapter case | M |
| 7. Self-sealing bolt | 8. Rear oil seal | 9. Bracket | N |

Refer to [GI-4, "Components"](#) for symbols in the figure.

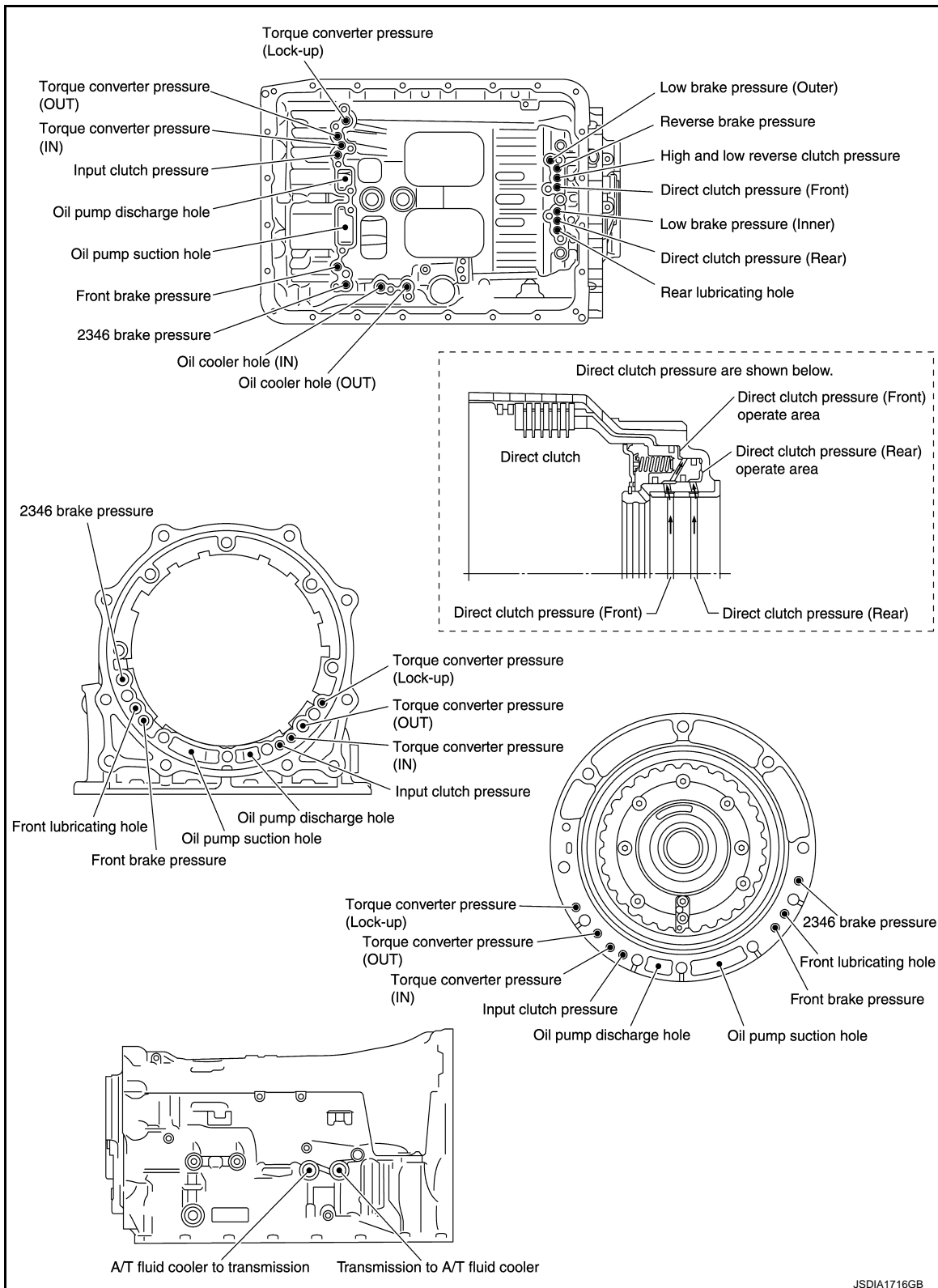
TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

Oil Channel

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Location of Needle Bearings and Bearing Races

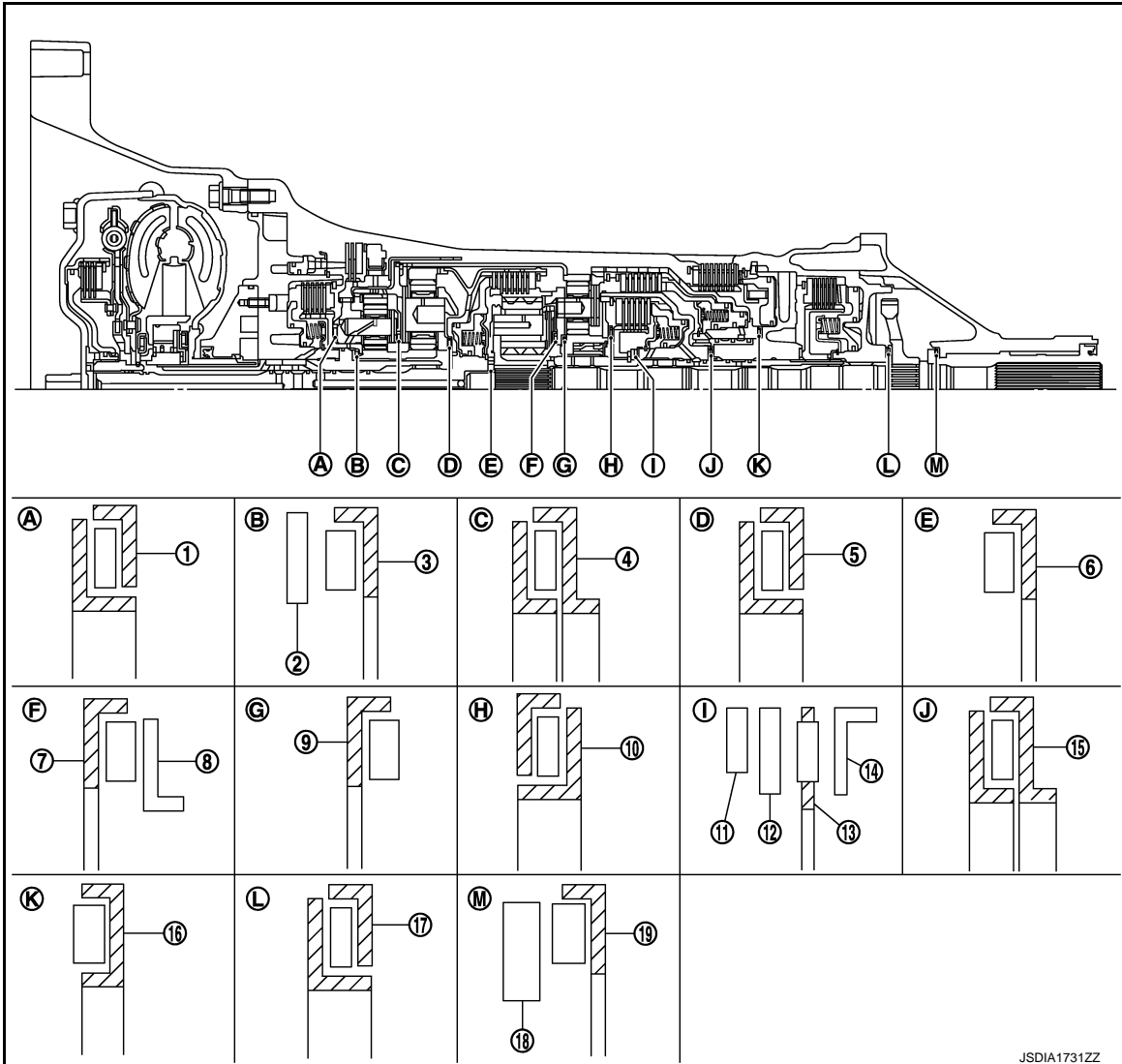
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2WD MODELS

TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]



JSDIA1731ZZ

Location	Item	Outer diameter mm (in)
A	(1) Needle bearing	94 (3.701)
	(2) Bearing race	58.6 (2.307)
B	(3) Needle bearing	60 (2.362)
	(4) Needle bearing	84.6 (3.331)
D	(5) Needle bearing	77 (3.031)
E	(6) Needle bearing	47 (1.850)
F	(7) Needle bearing	84 (3.307)
	(8) Bearing race	82 (3.228)
G	(9) Needle bearing	80 (3.150)
H	(10) Needle bearing	92 (3.622)
I	(11) Bearing race	60 (2.362)
	(12) Bearing race	61.1 (2.406)
	(13) Needle bearing	60 (2.362)
	(14) Bearing race	61.9 (2.437)
J	(15) Needle bearing	62.8 (2.472)
K	(16) Needle bearing	92 (3.622)

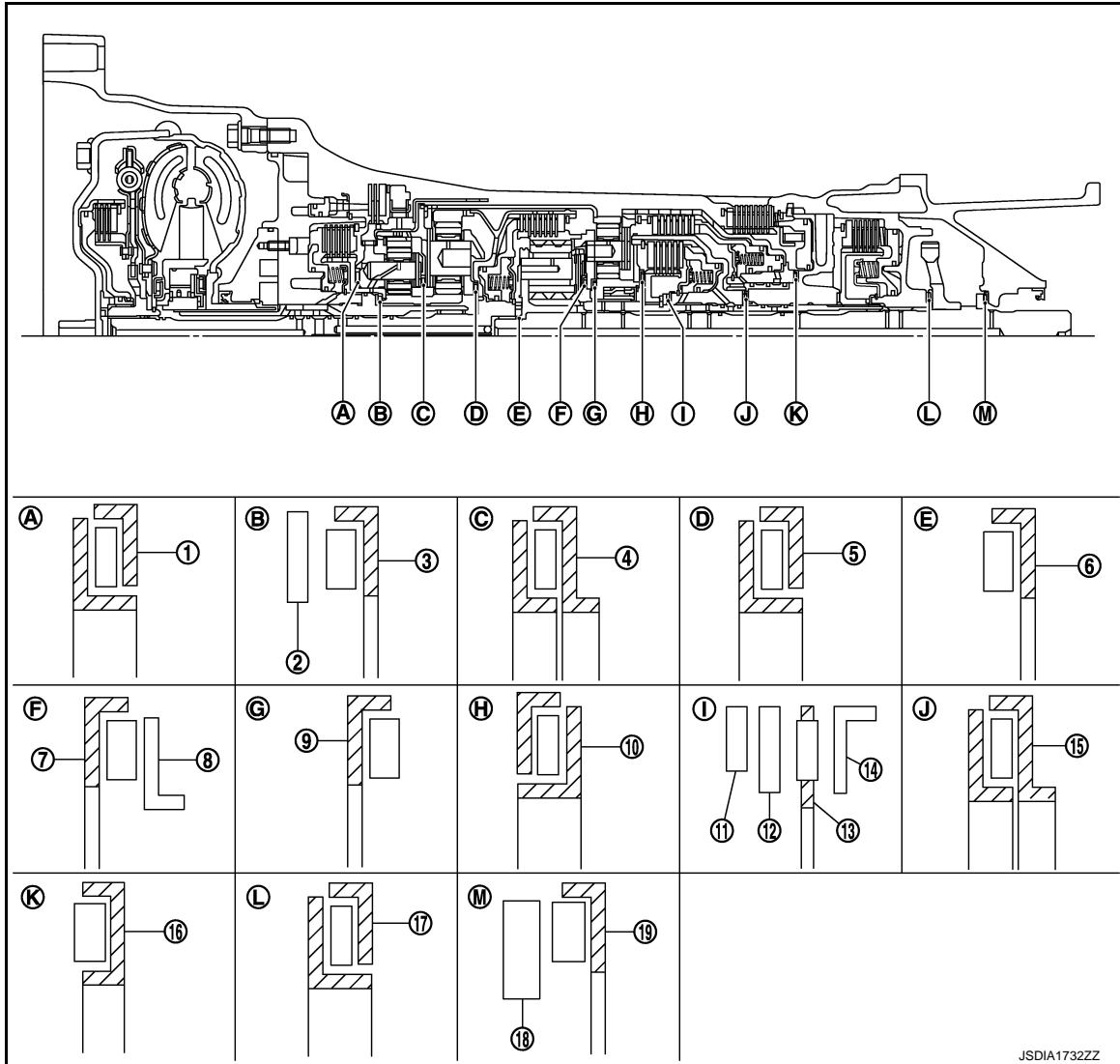
TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

Location	Item	Outer diameter mm (in)
L	(17) Needle bearing	65 (2.559)
M	(18) Bearing race	58 (2.362)
	(19) Needle bearing	60 (2.362)

4WD MODELS



JSDIA1732ZZ

Location	Item	Outer diameter mm (in)
A	(1) Needle bearing	94 (3.701)
B	(2) Bearing race	58.6 (2.307)
	(3) Needle bearing	60 (2.362)
C	(4) Needle bearing	84.6 (3.331)
D	(5) Needle bearing	77 (3.031)
E	(6) Needle bearing	47 (1.850)
F	(7) Needle bearing	84 (3.307)
	(8) Bearing race	82 (3.228)
G	(9) Needle bearing	80 (3.150)
H	(10) Needle bearing	92 (3.622)

TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

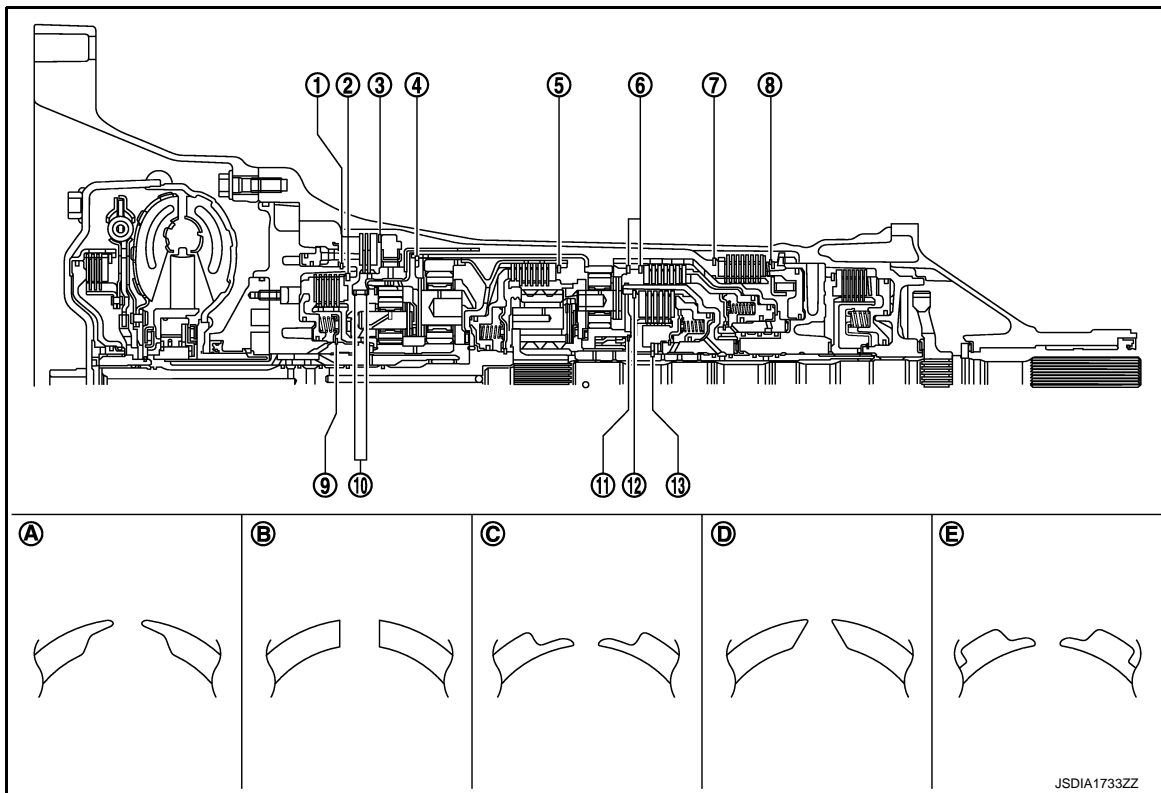
[7AT: RE7R01B]

Location	Item	Outer diameter mm (in)
I	(11) Bearing race	60 (2.362)
	(12) Bearing race	61.1 (2.406)
	(13) Needle bearing	60 (2.362)
	(14) Bearing race	61.9 (2.437)
J	(15) Needle bearing	62.8 (2.472)
K	(16) Needle bearing	92 (3.622)
L	(17) Needle bearing	65 (2.559)
M	(18) Bearing race	58 (2.362)
	(19) Needle bearing	60 (2.362)

Location of Snap Rings

INFOID:000000009012275

2WD MODELS



Location	Shape of snap ring	Outer diameter mm (in)
1	A	159.9 (6.295)
2	B	159 (6.260)
3	B	216 (8.504)
4	B	180.4 (7.102)
5	C	171.5 (6.752)
6	B	169 (6.654)
7	B	180.5 (7.106)
8	B	181.0 (7.126)
9	D	64.6 (2.543)
10	B	136 (5.354)
11	E	70.5 (2.776)

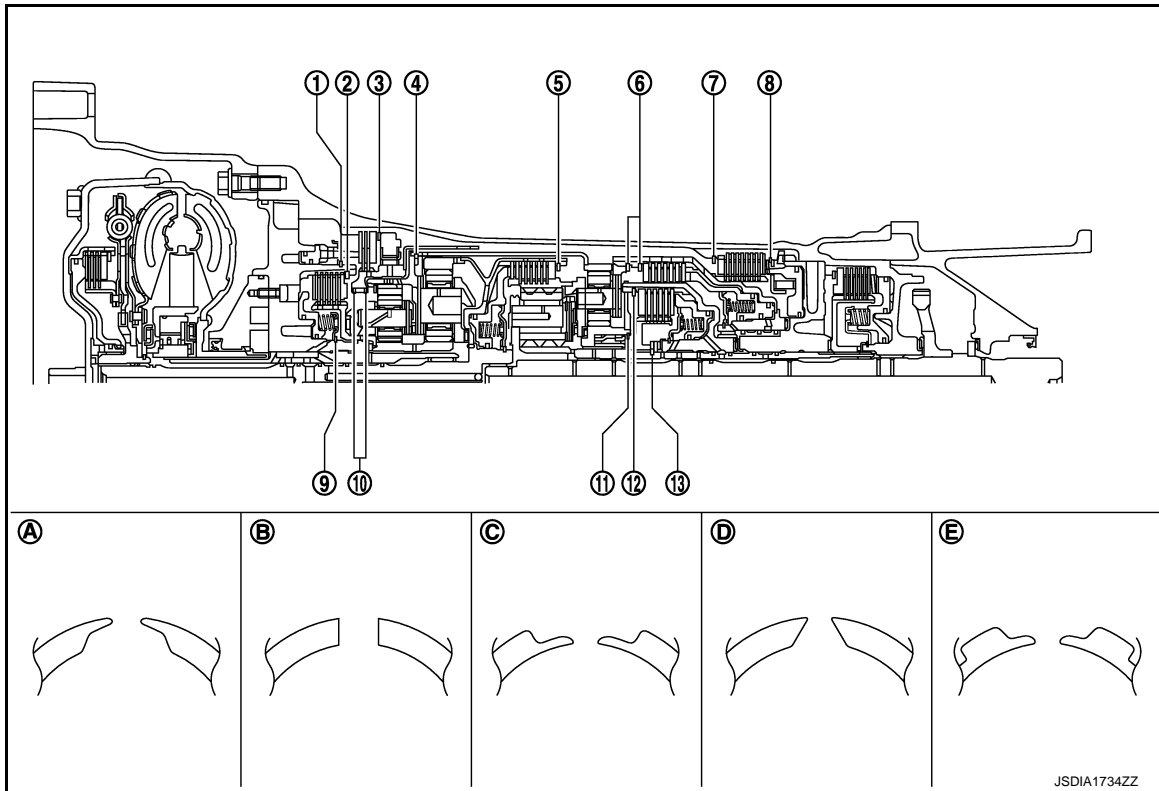
TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

Location	Shape of snap ring	Outer diameter mm (in)
12	B	135 (5.315)
13	A	48.4 (1.906)

4WD MODELS



Location	Shape of snap ring	Outer diameter mm (in)
1	A	159.9 (6.295)
2	B	159 (6.260)
3	B	216 (8.504)
4	B	180.4 (7.102)
5	C	171.5 (6.752)
6	B	169 (6.654)
7	B	180.5 (7.106)
8	B	181.0 (7.126)
9	D	64.6 (2.543)
10	B	136 (5.354)
11	E	70.5 (2.776)
12	B	135 (5.315)
13	A	48.4 (1.906)

Disassembly

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CAUTION:

Never disassemble parts behind drum support. Refer to [TM-18, "TRANSMISSION : Cross-Sectional View"](#).

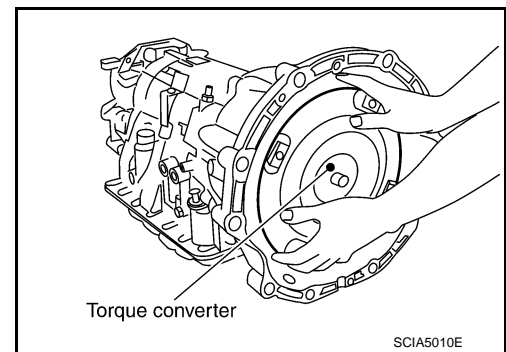
1. Drain ATF through drain plug.

TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

2. Remove torque converter by holding it firmly and turning while pulling straight out.

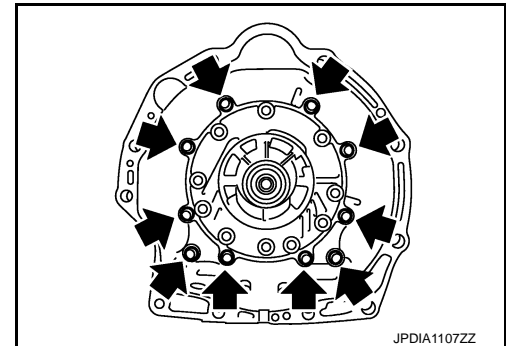


3. Remove tightening bolts (←) for converter housing and transmission case.

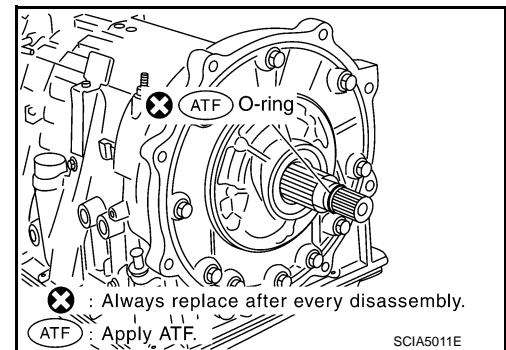
4. Remove converter housing from transmission case.

CAUTION:

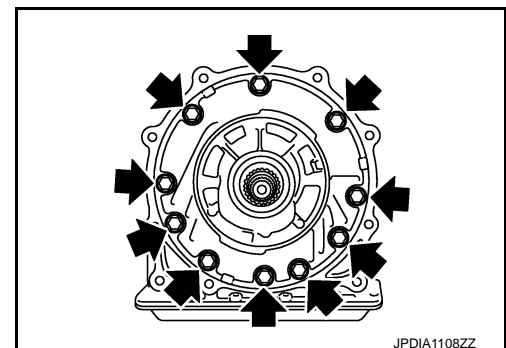
Be careful not to scratch converter housing.



5. Remove O-ring from input clutch assembly.



6. Remove tightening bolts (←) for oil pump assembly and transmission case.



TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

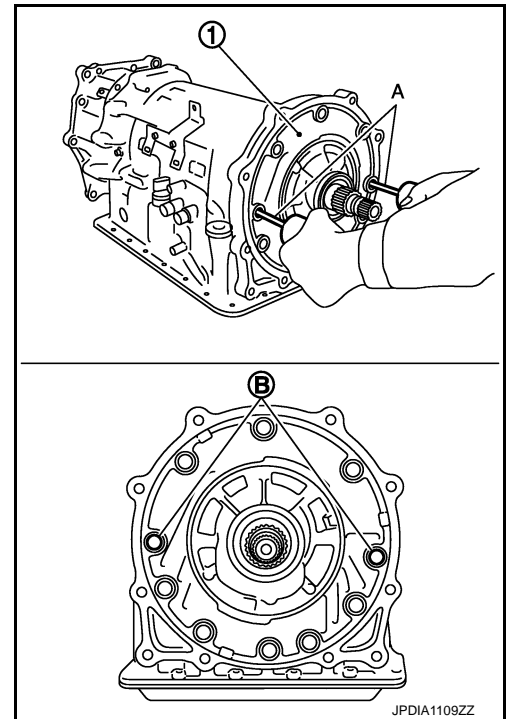
[7AT: RE7R01B]

7. Attach the sliding hammers [SST: ST25850000 (J-25721-A)] (A) to oil pump assembly (1) and extract it evenly from transmission case.

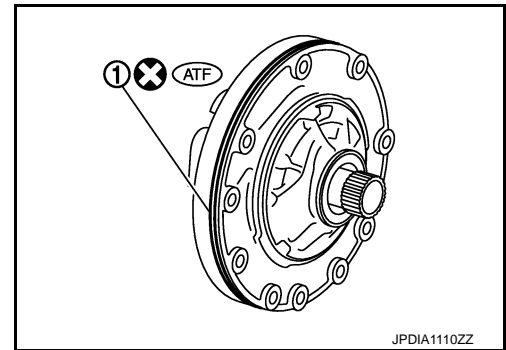
B : Sliding hammer attachment position

CAUTION:

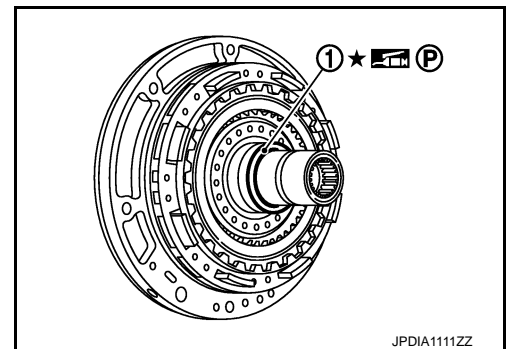
- Fully tighten the sliding hammer screws.
- Make sure that bearing race is installed to the oil pump assembly edge surface.



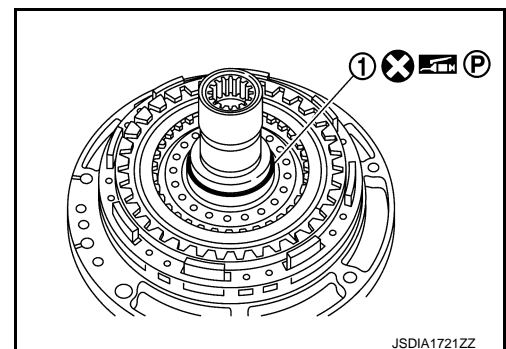
8. Remove O-ring (1) from oil pump assembly.



9. Remove bearing race (1) from oil pump assembly.



10. Remove seal ring (1) from oil pump assembly.

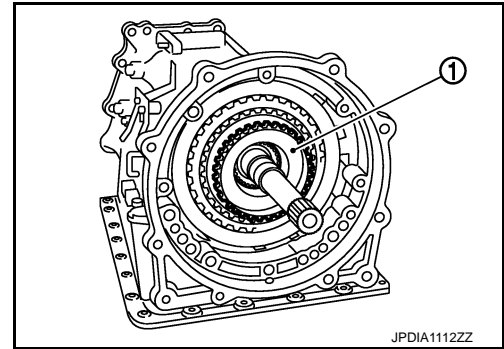


TRANSMISSION ASSEMBLY

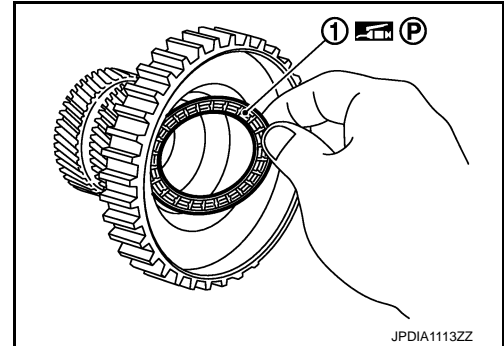
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

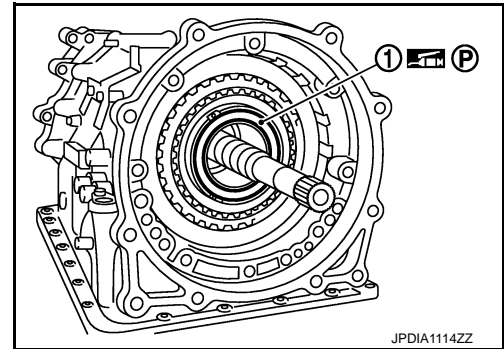
11. Remove under drive sun gear (1) from under drive carrier assembly.



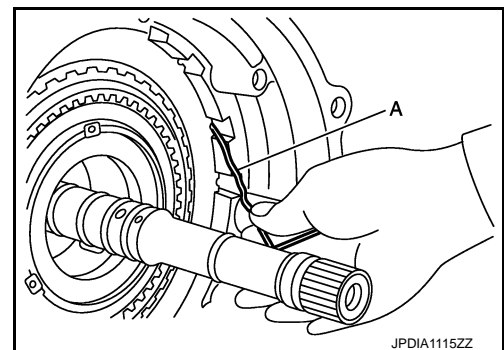
12. Remove needle bearing (1) from under drive sun gear.



13. Remove needle bearing (1) from under drive carrier assembly.



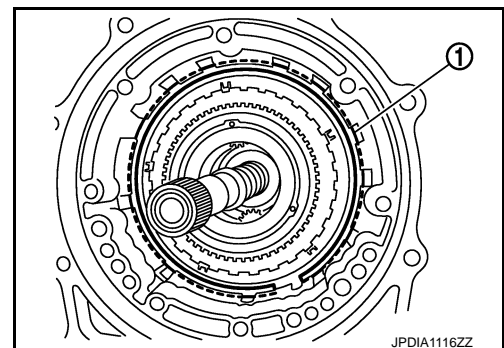
14. Remove front brake component part (retaining plates, drive plates, and driven plate) from transmission case by using a wire (A) with its tip bent like a hook.



15. Remove snap ring (1) from transmission case using a flat-bladed screwdriver.

CAUTION:

- Be careful not to scratch transmission case and 1st one-way clutch.
- Be careful not to damage snap ring.



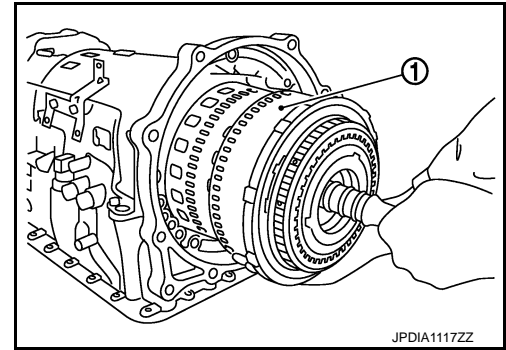
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TRANSMISSION ASSEMBLY

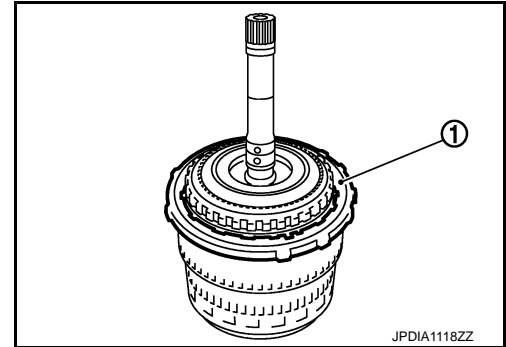
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

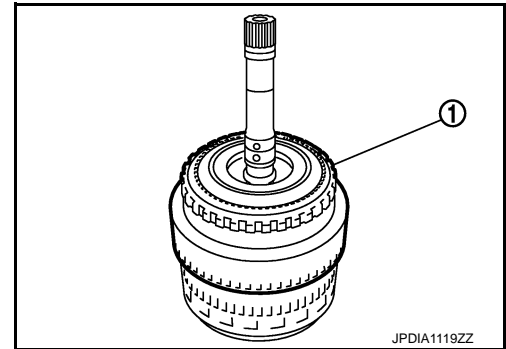
16. Remove input clutch assembly (with 1st one-way clutch, under drive carrier assembly, front brake hub, front carrier assembly, and rear internal gear) (1) from transmission case.



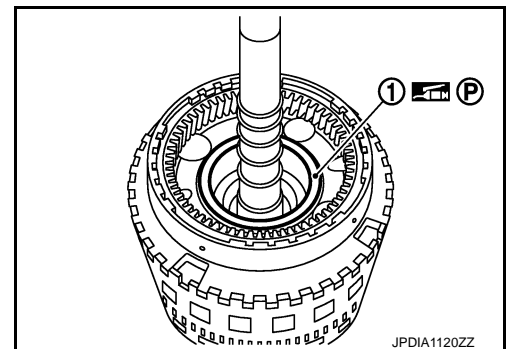
17. Remove 1st one-way clutch (1) from front brake hub.



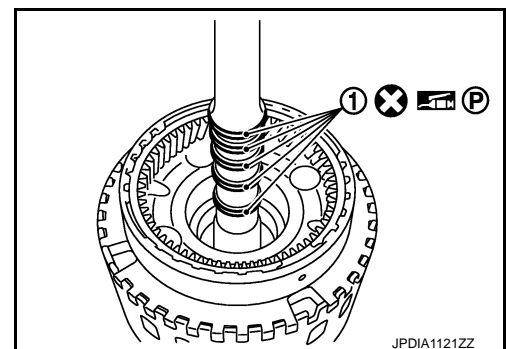
18. Remove under drive carrier assembly (with front brake hub) (1) from front carrier assembly.



19. Remove needle bearing (1) from front carrier assembly.



20. Remove seal rings (1) from input clutch assembly.

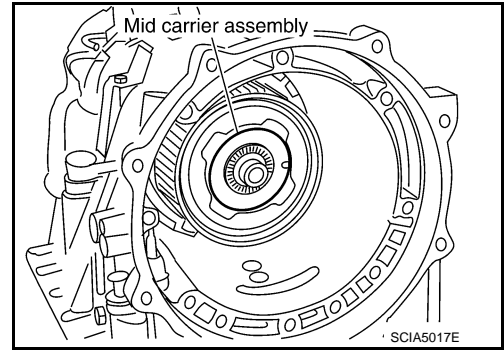


TRANSMISSION ASSEMBLY

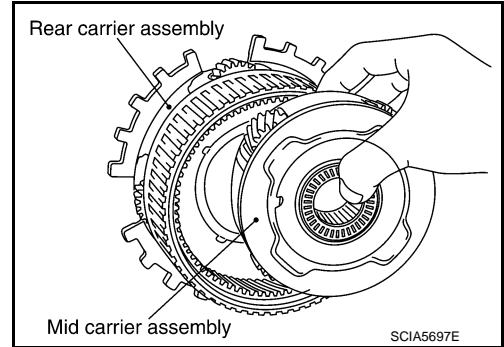
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[7AT: RE7R01B]

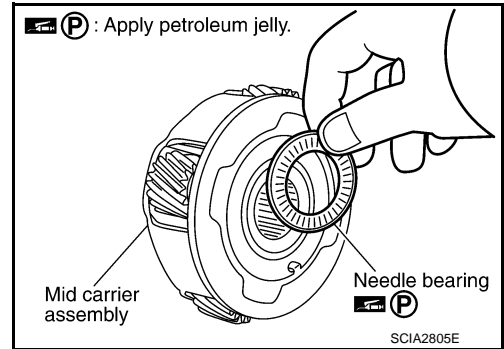
21. Remove mid carrier assembly and rear carrier assembly as a unit.



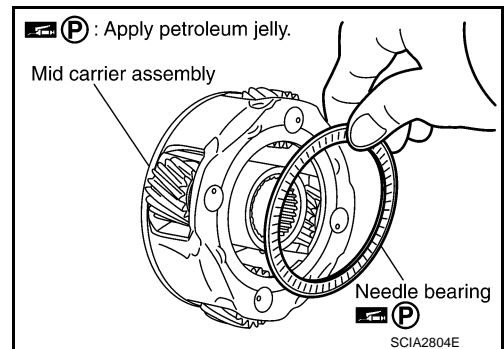
22. Remove mid carrier assembly from rear carrier assembly.



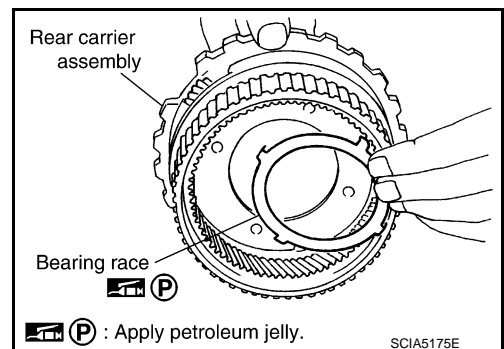
23. Remove needle bearing (front side) from mid carrier assembly.



24. Remove needle bearing (rear side) from mid carrier assembly.



25. Remove bearing race from rear carrier assembly.



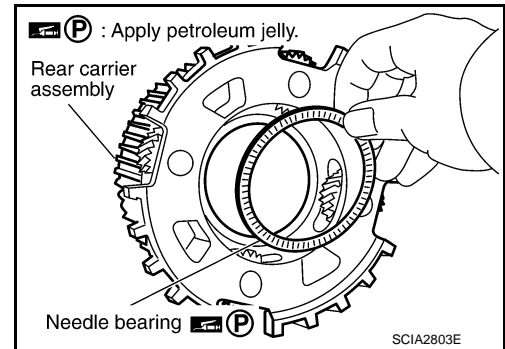
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TRANSMISSION ASSEMBLY

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[7AT: RE7R01B]

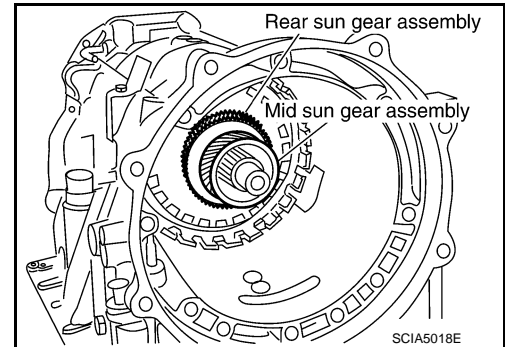
26. Remove needle bearing from rear carrier assembly.



27. Remove mid sun gear assembly, rear sun gear assembly, and high and low reverse clutch hub as a unit.

CAUTION:

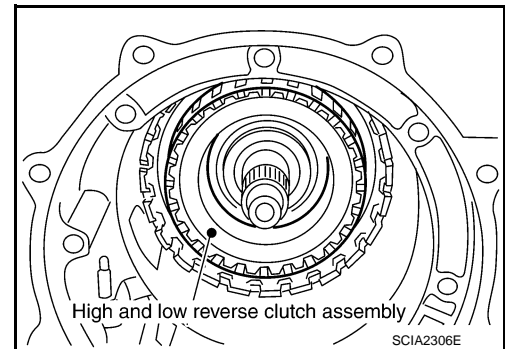
Be careful to remove them with bearing race and needle bearing.



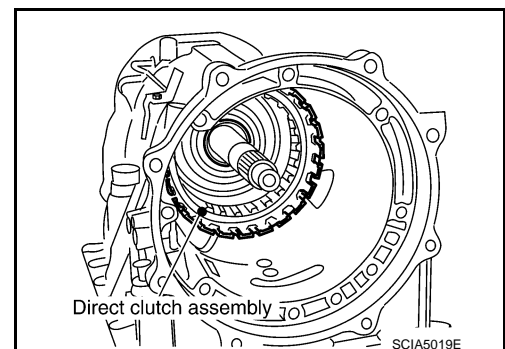
28. Remove high and low reverse clutch assembly from direct clutch assembly.

CAUTION:

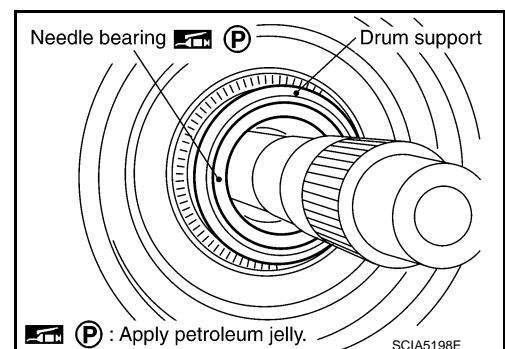
Make sure that needle bearing is installed to the high and low reverse clutch assembly edge surface.



29. Remove direct clutch assembly from reverse brake.



30. Remove needle bearing from drum support.

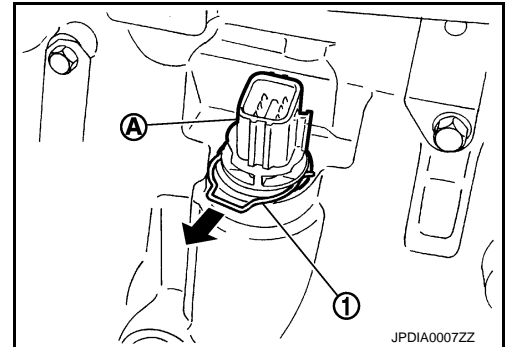


TRANSMISSION ASSEMBLY

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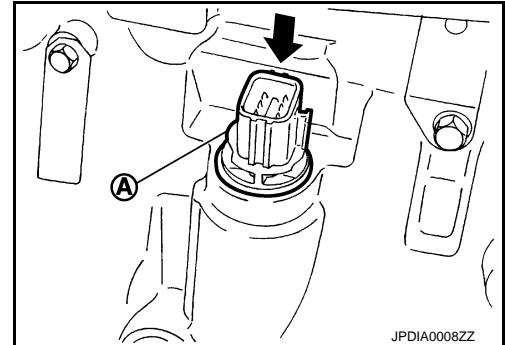
[7AT: RE7R01B]

31. Remove snap ring (1) from joint connector (A).



32. Push joint connector (A).

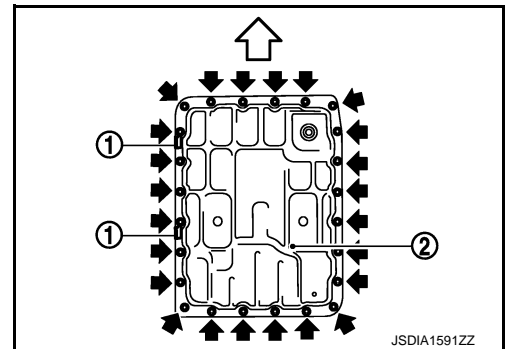
CAUTION:
Be careful not to damage connector.



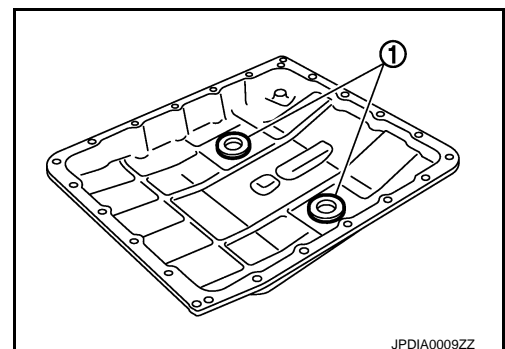
33. Remove clips (1) and oil pan mounting bolts (←).

← : Front

34. Remove oil pan (2) and oil pan gasket.



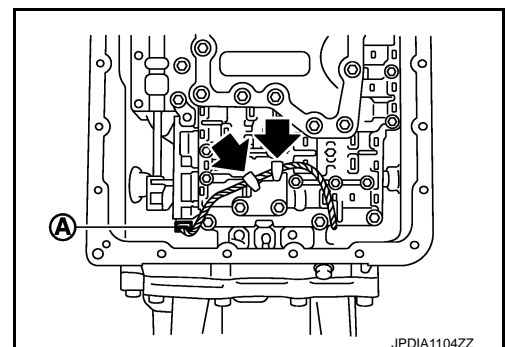
35. Remove magnets (1) from oil pan.



36. Disconnect output speed sensor connector (A).

CAUTION:
Be careful not to damage connector.

37. Disengage terminal clips (←).



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TRANSMISSION ASSEMBLY

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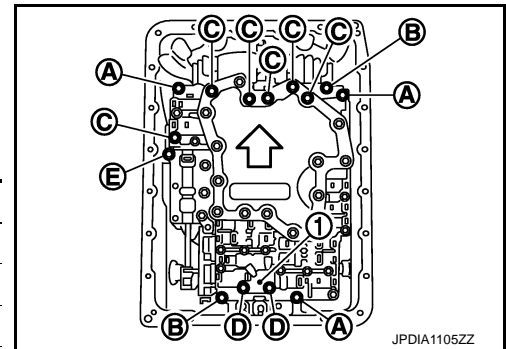
[7AT: RE7R01B]

38. Remove control valve & TCM mounting bolts and clip (1) from the control valve & TCM.

↔ : Front

Bolt symbol	Length mm (in)	Number of bolts
A	43 (1.69)	3
B	40 (1.57)	2
C	54 (2.13)	6
D	50 (1.97)	2
E*	50 (1.97)	1

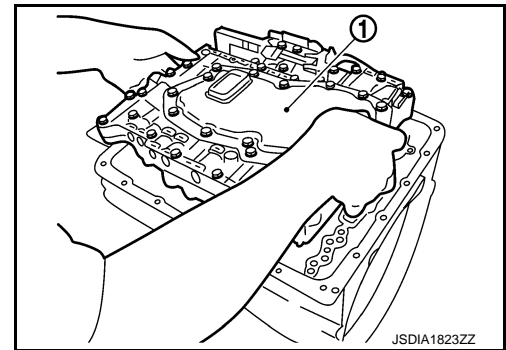
*: Reamer bolt



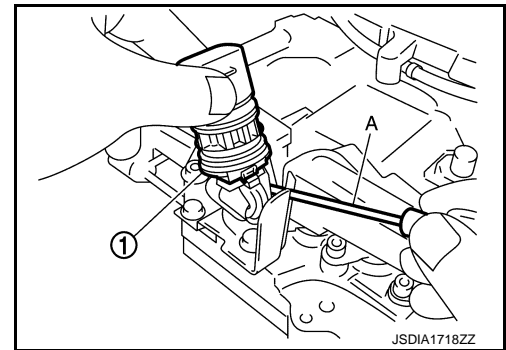
39. Remove the control valve & TCM (1) from transmission case.

CAUTION:

When removing, never with the manual valve notch and manual plate height. Remove it vertically.



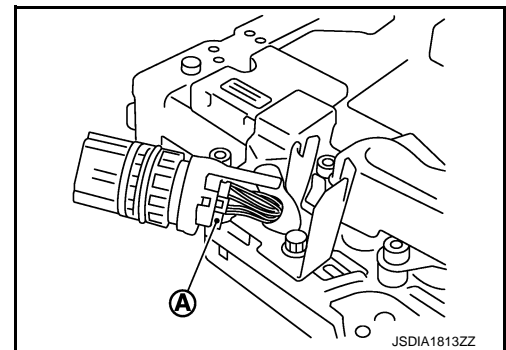
40. Remove joint connector (1) from the control valve & TCM using a flat-bladed screwdriver (A).



41. Disconnect TCM connector (A).

CAUTION:

Be careful not to damage connector.



42. Remove rear extension assembly (2WD) or adapter case assembly (4WD) according to the following procedures.

a. **2WD**

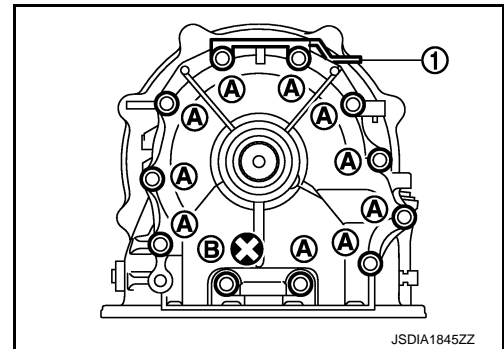
TRANSMISSION ASSEMBLY

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[7AT: RE7R01B]

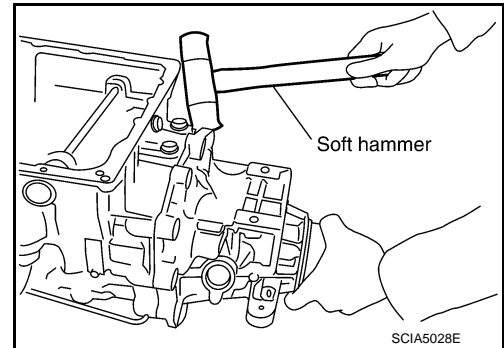
- i. Remove tightening bolts for rear extension assembly and transmission case.

- 1 : Bracket
- A : Bolt
- B : Self-sealing bolt

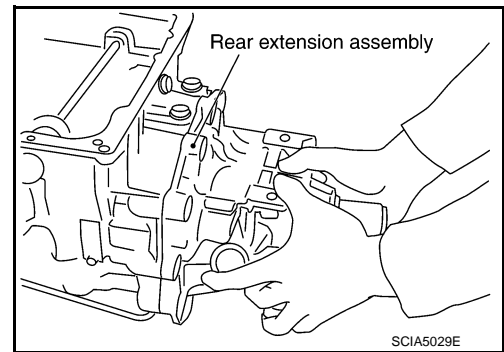


- ii. Tap rear extension assembly using a soft hammer.

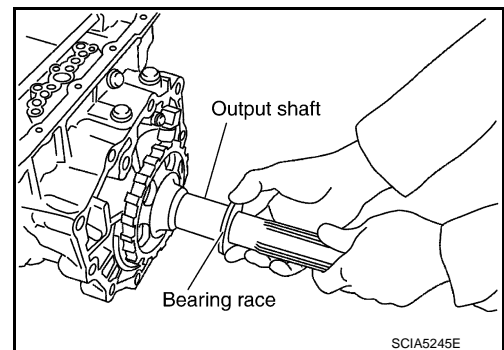
CAUTION:
Be careful not to damage rear extension assembly.



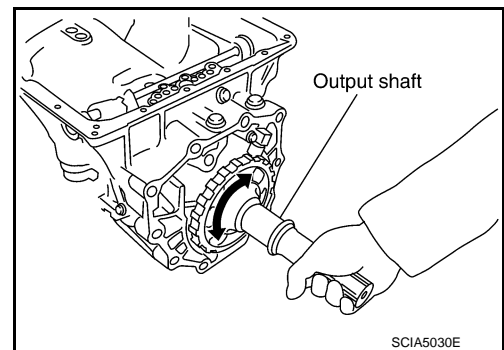
- iii. Remove rear extension assembly from transmission case. (With needle bearing.)



- iv. Remove bearing race from output shaft.



- v. Remove output shaft from transmission case by rotating left/right.



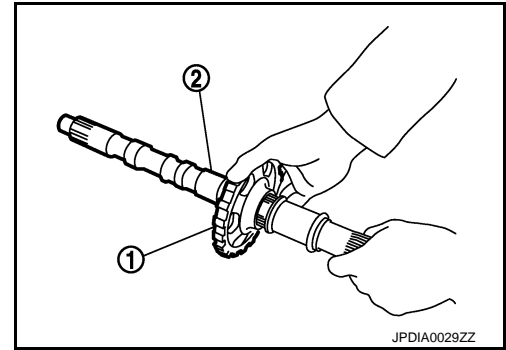
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TRANSMISSION ASSEMBLY

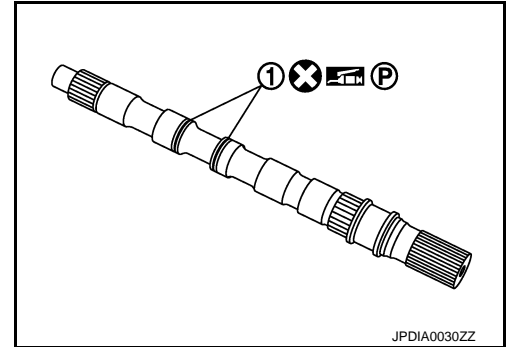
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[7AT: RE7R01B]

vi. Remove parking gear (1) from output shaft (2).



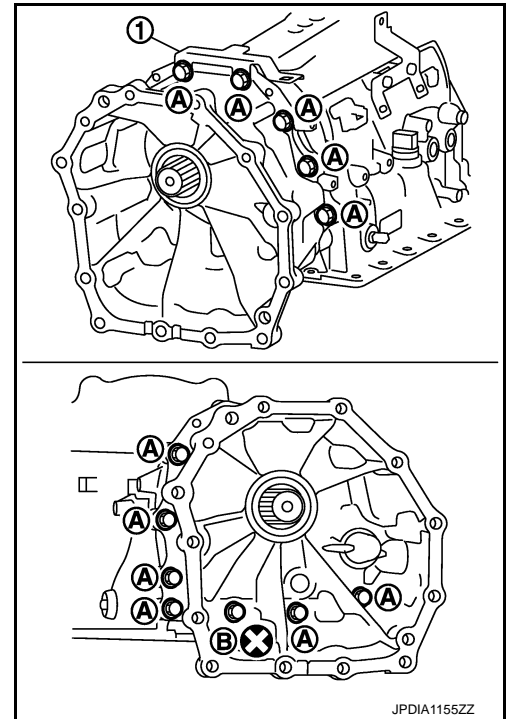
vii. Remove seal rings (1) from output shaft.



b. **4WD**

i. Remove tightening bolts for adapter case assembly and transmission case.

- 1 : Bracket
- A : Bolt
- B : Self-sealing bolt



TRANSMISSION ASSEMBLY

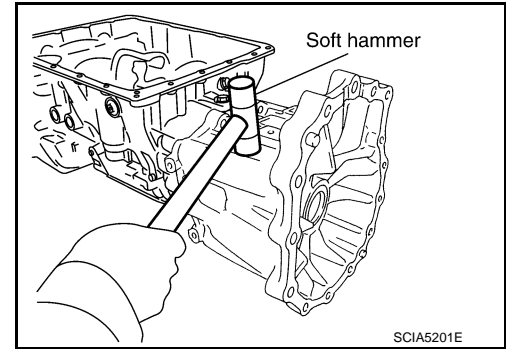
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[7AT: RE7R01B]

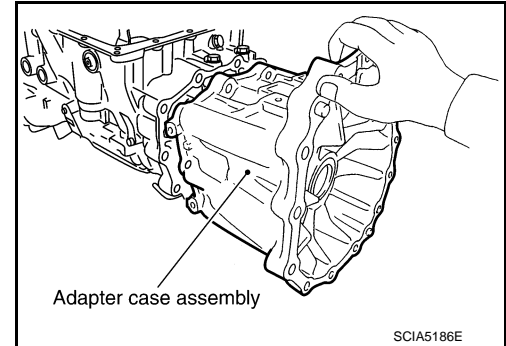
- ii. Tap adapter case assembly using a soft hammer.

CAUTION:

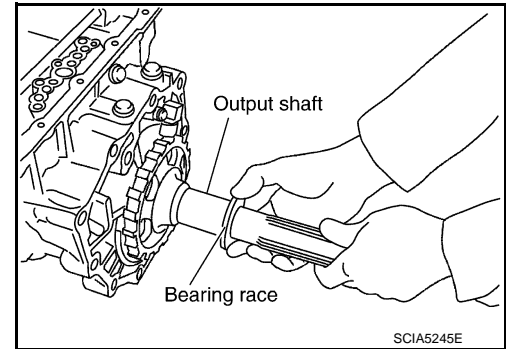
Be careful not to damage adapter case.



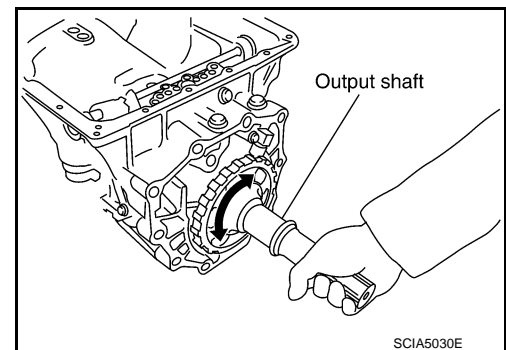
- iii. Remove adapter case assembly from transmission case. (With needle bearing)



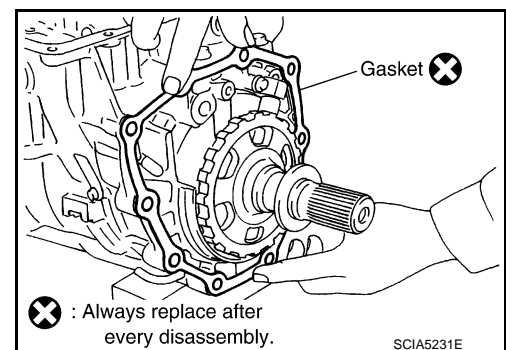
- iv. Remove bearing race from output shaft.



- v. Remove output shaft from transmission case by rotating left/right.



- vi. Remove gasket from transmission case.



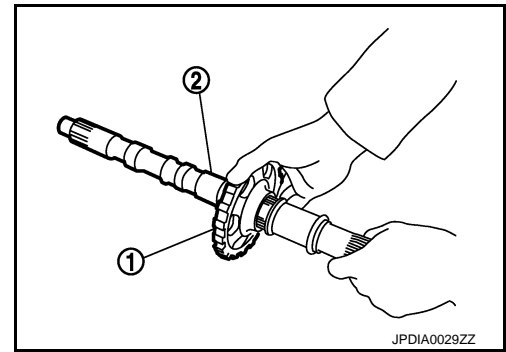
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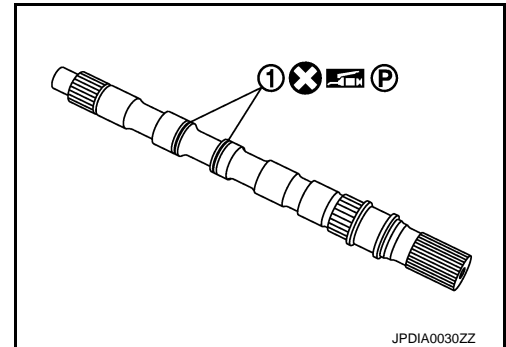
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

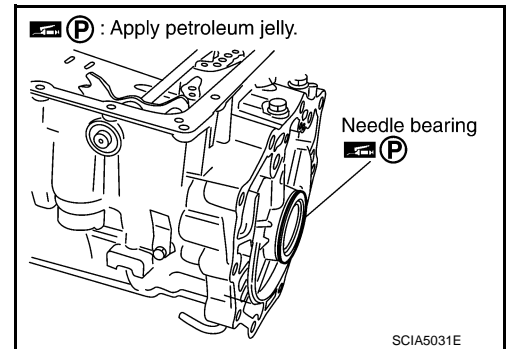
vii. Remove parking gear (1) from output shaft (2).



viii. Remove seal rings (1) from output shaft.



43. Remove needle bearing from transmission case.

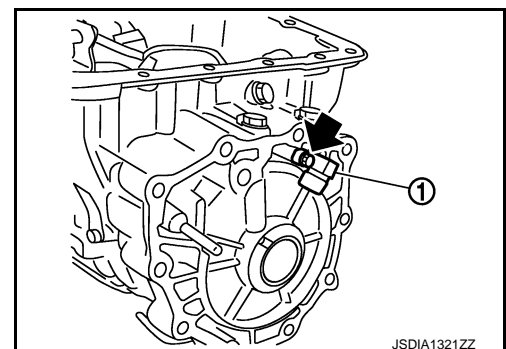


44. Remove output speed sensor (1) from transmission case.

← : Bolt

CAUTION:

- Never subject it to impact by dropping or hitting it.
- Never disassemble.
- Never allow metal filings, etc. to get on the sensor's front edge magnetic area.
- Never place in an area affected by magnetism.



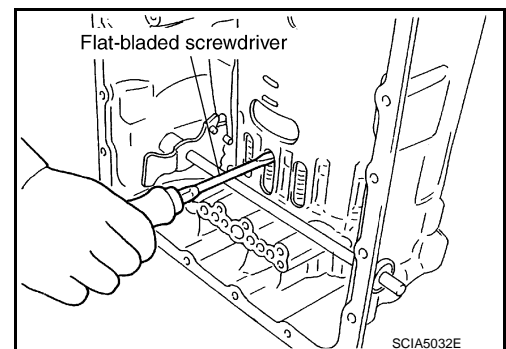
45. Remove reverse brake snap ring (fixing plate) with 2 flat-bladed screwdrivers.

CAUTION:

- Be careful not to scratch transmission case and reverse brake retaining plate.
- Be careful not to damage snap ring.

NOTE:

Press out snap ring from the transmission case oil pan side gap with a flat-bladed screwdriver, and remove it using a another screwdriver.



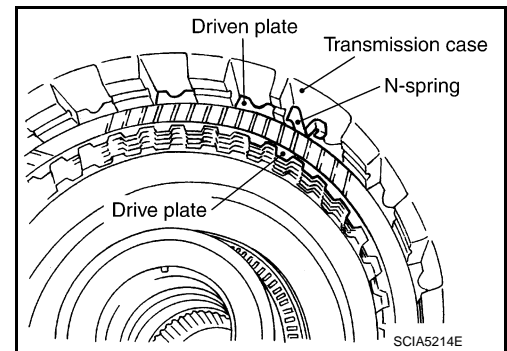
46. Remove reverse brake retaining plate from transmission case.

TRANSMISSION ASSEMBLY

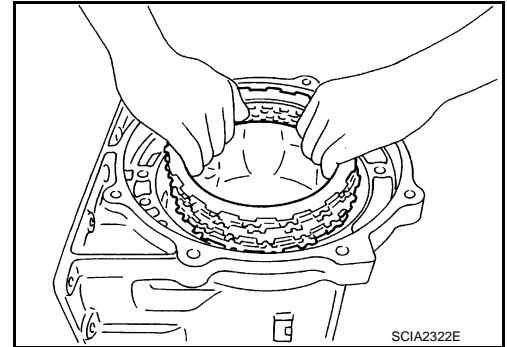
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[7AT: RE7R01B]

47. Remove N-spring from transmission case.



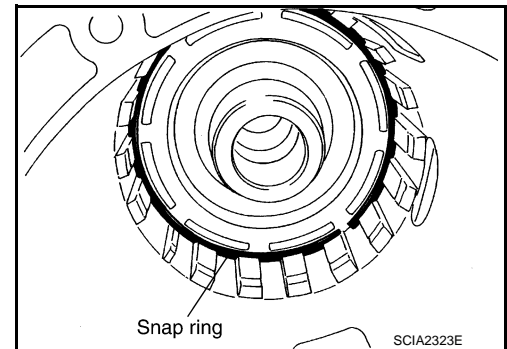
48. Remove reverse brake component part (drive plates, driven plates, and dish plates) from transmission case.



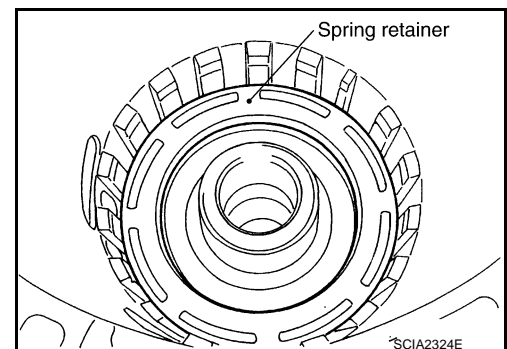
49. Remove snap ring (fixing spring retainer) using a flat-bladed screwdriver.

CAUTION:

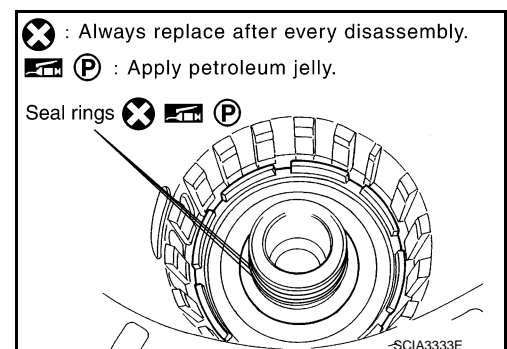
- Be careful not to scratch transmission case and spring retainer.
- Be careful not to damage snap ring.



50. Remove reverse brake spring retainer and reverse brake return spring from transmission case.



51. Remove seal rings from drum support.



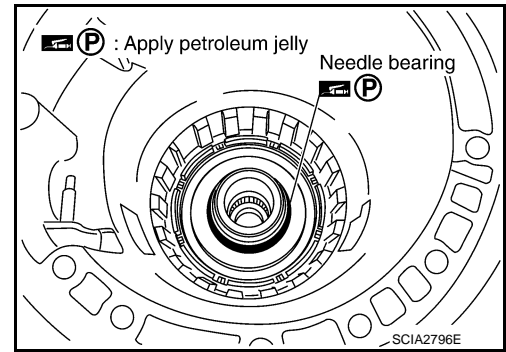
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[7AT: RE7R01B]

52. Remove needle bearing from drum support edge surface.

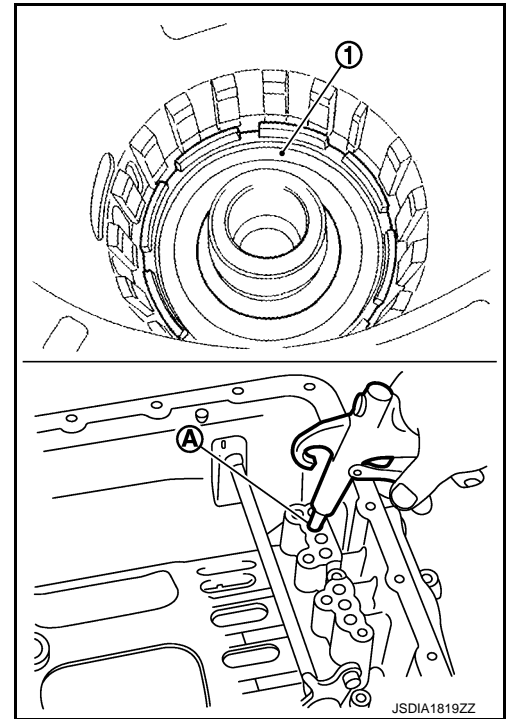


53. Remove reverse brake piston (1) from transmission case with compressed air. Refer to [TM-232, "Oil Channel"](#).

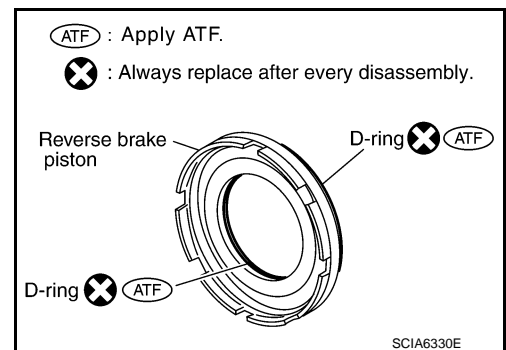
A : Reverse brake pressure hole

CAUTION:

Care should be taken not to abruptly blow air. It makes pistons incline, as the result, it becomes hard to disassemble the pistons.



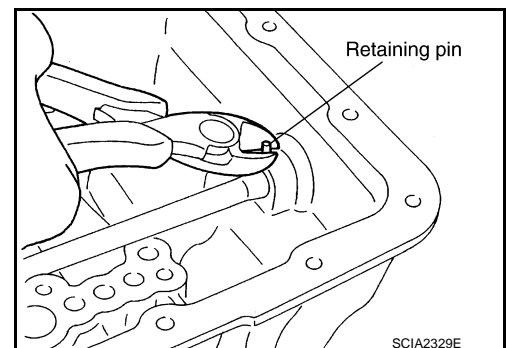
54. Remove D-rings from reverse brake piston.



55. Remove retaining pin with pair of nippers.

CAUTION:

Be careful not to cut retaining pin.

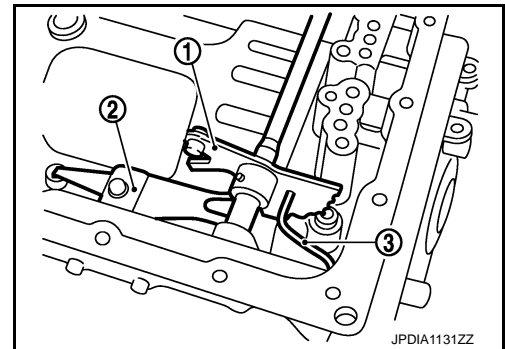


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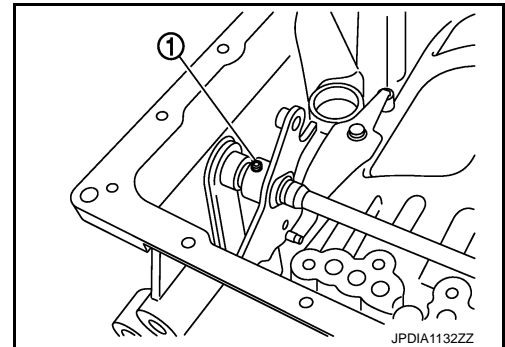
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[7AT: RE7R01B]

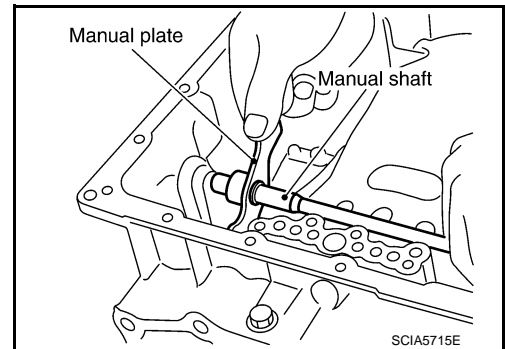
- 56. Remove manual plate (1) from detent spring (2).
- 57. Remove parking rod (3) from manual plate.
- 58. Install manual plate to detent spring.



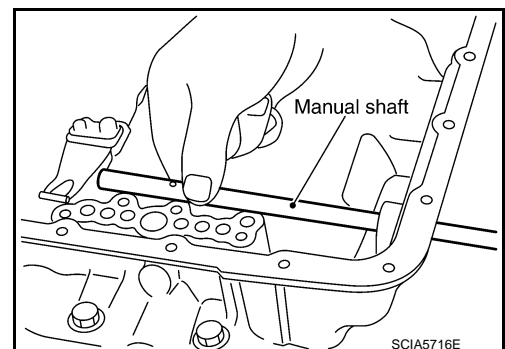
- 59. Use a pin punch [4 mm (0.16 in) dia. commercial service tool] to knock out retaining pin (1).



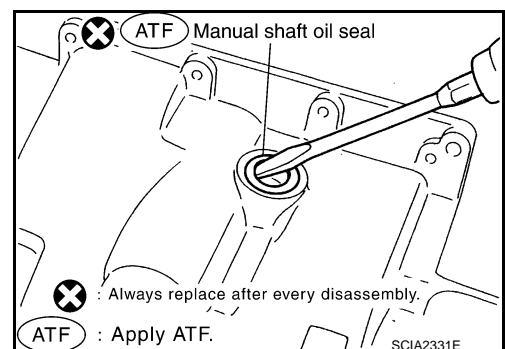
- 60. Remove manual plate from manual shaft.



- 61. Remove manual shaft from transmission case.



- 62. Remove manual shaft oil seals using a flat-bladed screwdriver.
CAUTION:
Be careful not to scratch transmission case.



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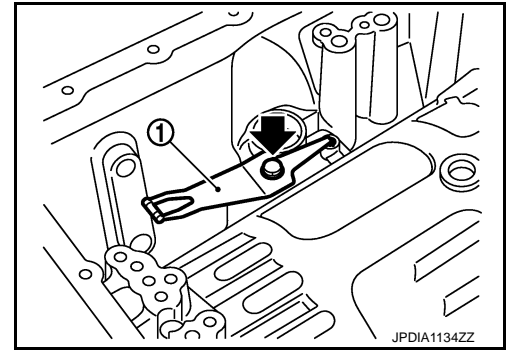
TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

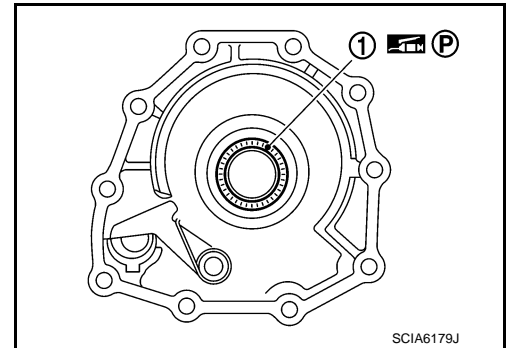
[7AT: RE7R01B]

63. Remove detent spring (1) from transmission case.

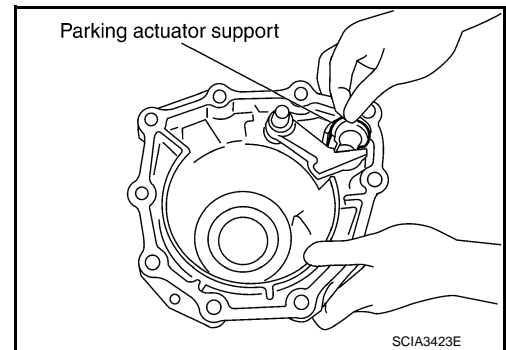
← : Bolt



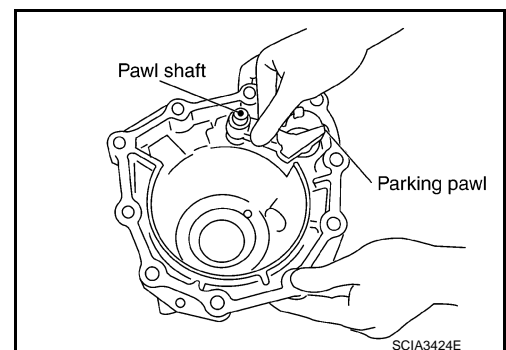
64. Remove needle bearing (1) from rear extension (2WD) or adapter case (4WD).



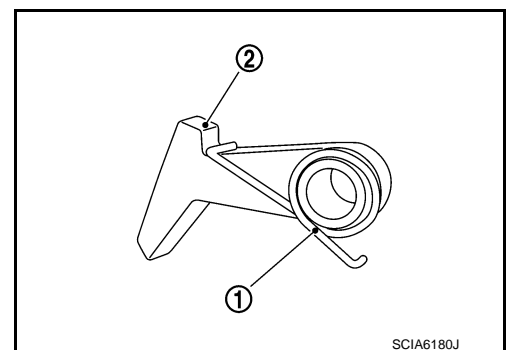
65. Remove parking actuator support from rear extension (2WD) or adapter case (4WD).



66. Remove parking pawl (with return spring) and pawl shaft from rear extension (2WD) or adapter case (4WD).



67. Remove return spring (1) from parking pawl (2).



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[7AT: RE7R01B]

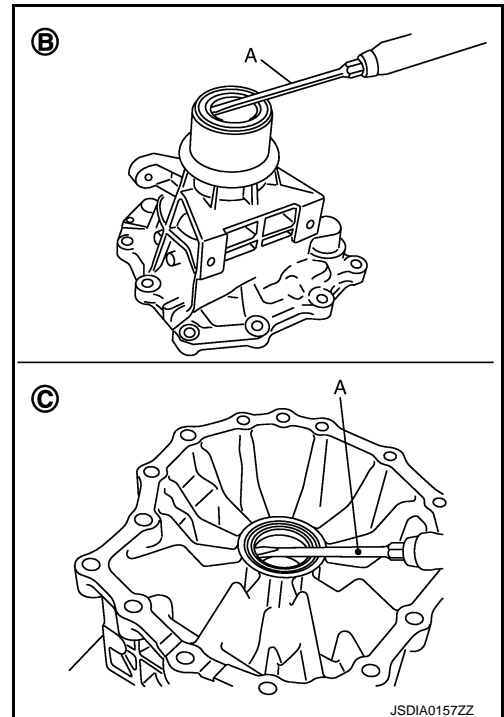
68. Remove rear oil seal from rear extension (B) or adapter case (C) using a flat-bladed screwdriver (A).

B : 2WD

C : 4WD

CAUTION:

Be careful not to scratch rear extension (2WD) or adapter case (4WD).



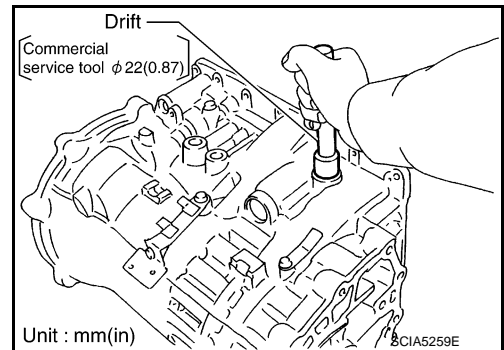
Assembly

INFOID:000000009012277

1. As shown in the figure, use a drift [22 mm (0.87 in) dia. commercial service tool] to drive manual shaft oil seals into the transmission case until it is flush.

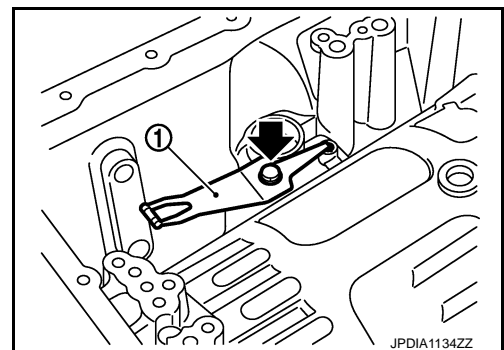
CAUTION:

- Never reuse manual shaft oil seals.
- Apply ATF to manual shaft oil seals.



2. Install detent spring (1) to transmission case. Tighten detent spring bolt to the specified torque.

← : Bolt

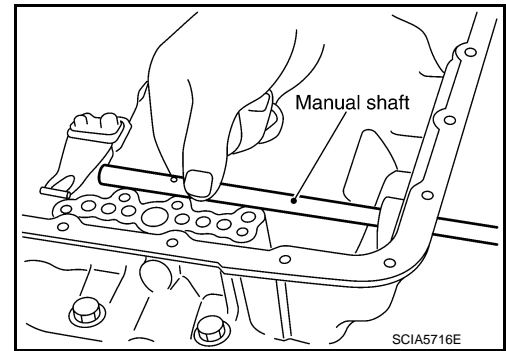


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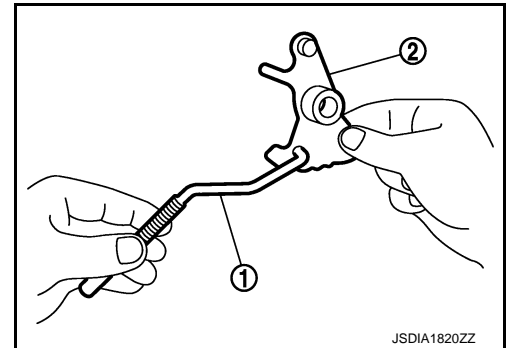
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[7AT: RE7R01B]

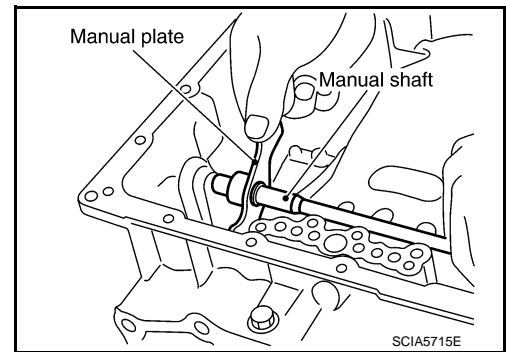
3. Install manual shaft to transmission case.



4. Install parking rod (1) to manual plate (2).



5. Install manual plate (with parking rod) to manual shaft.



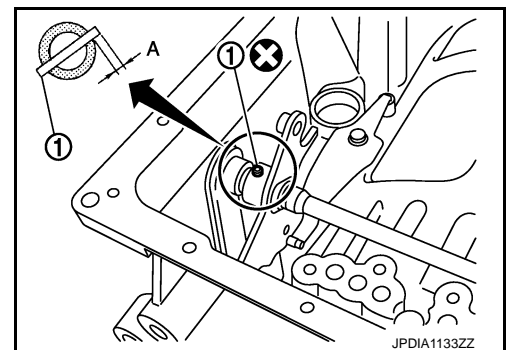
6. Install retaining pin (1) into the manual plate and manual shaft.

- a. Fit pinhole of the manual plate to pinhole of the manual shaft with a pin punch.
- b. Use a hammer to tap the retaining pin into the manual plate.

A : Approx. 2 mm (0.08 in)

CAUTION:

Drive retaining pin to 2 ± 0.5 mm (0.08 ± 0.020 in) over the manual plate.

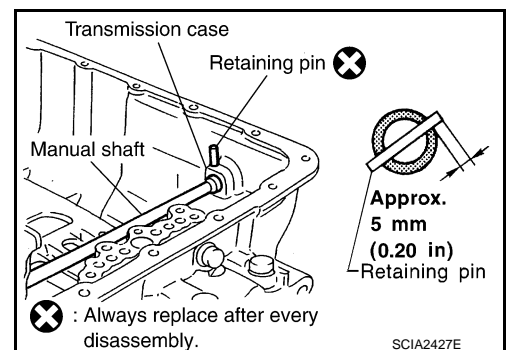


7. Install retaining pin into the transmission case and manual shaft.

- a. Fit pinhole of the transmission case to pinhole of the manual shaft with a pin punch.
- b. Use a hammer to tap the retaining pin into the transmission case.

CAUTION:

Drive retaining pin to 5 ± 1 mm (0.20 ± 0.04 in) over the transmission case.

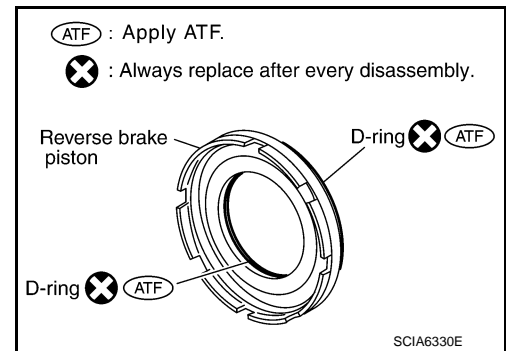


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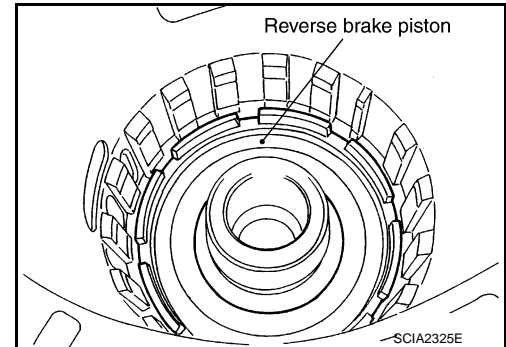
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[7AT: RE7R01B]

8. Install D-rings to reverse brake piston.

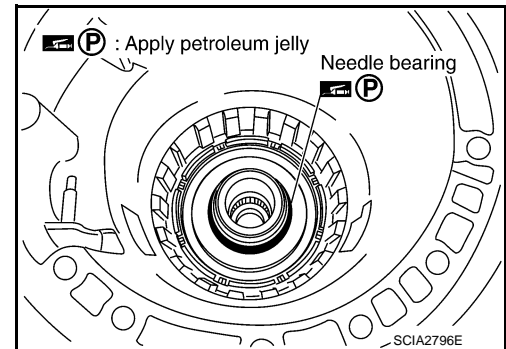


9. Install reverse brake piston to transmission case.

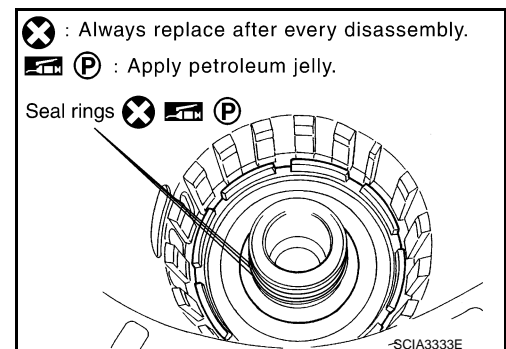


10. Install needle bearing to drum support edge surface.

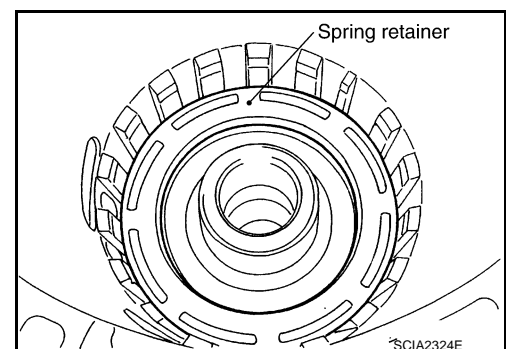
CAUTION:
Check the direction of needle bearing. Refer to [TM-232](#),
["Location of Needle Bearings and Bearing Races"](#).



11. Install seal rings to drum support.



12. Install reverse brake spring retainer and reverse brake return spring in transmission case.



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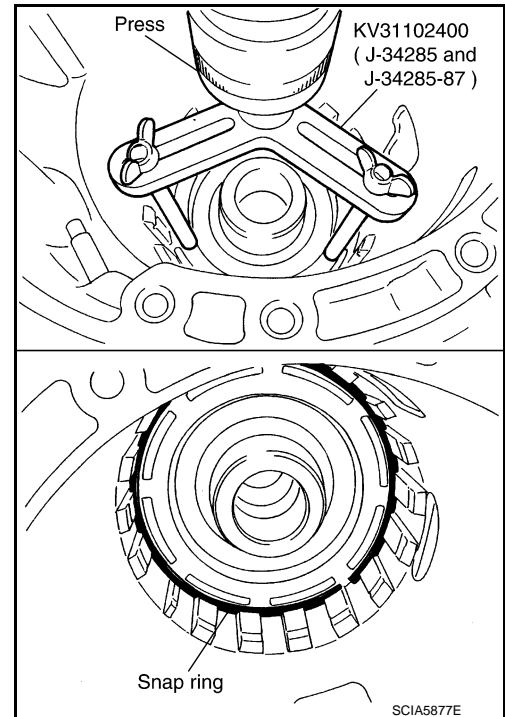
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[7AT: RE7R01B]

13. Set the clutch spring compressor on reverse brake spring retainer and install snap ring (fixing spring retainer) to transmission case while compressing return spring.

CAUTION:

- Securely assemble them using a flat-bladed screwdriver so that snap ring tension is slightly weak.
- Be careful not to damage snap ring.

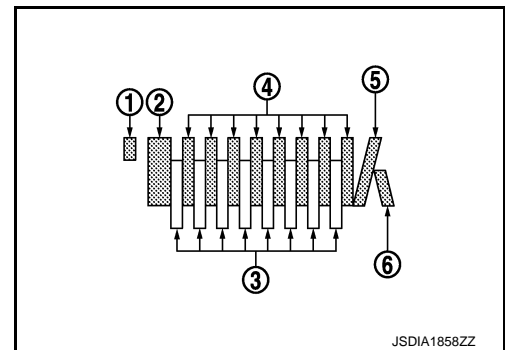


14. Install reverse brake component part (dish plates, driven plates, and drive plates) to transmission case.

- 1 : Snap ring
- 2 : Retaining plate
- 3 : Drive plate (eight pieces)
- 4 : Driven plate (eight pieces)
- 5 : Dish plate
- 6 : Dish plate

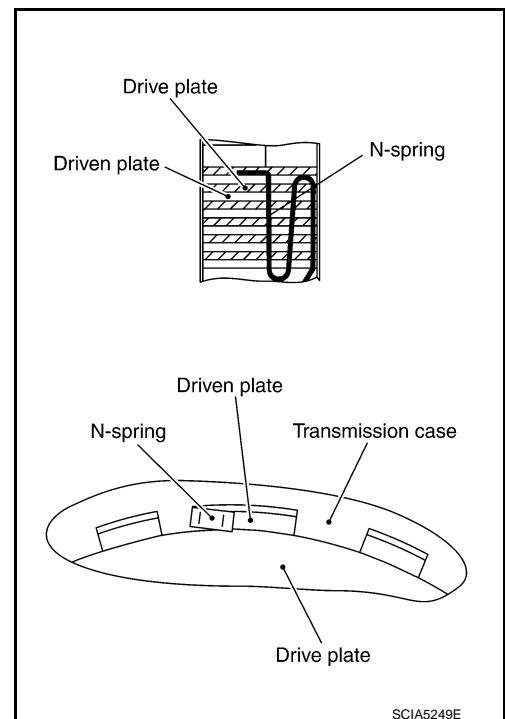
CAUTION:

Check order of plates.



15. Assemble N-spring.

16. Install reverse brake retaining plate to transmission case.



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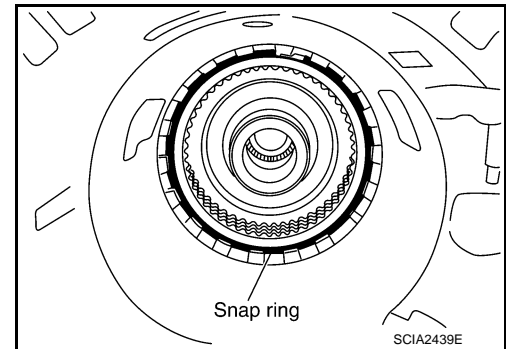
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[7AT: RE7R01B]

17. Install snap ring to transmission case.

CAUTION:

Be careful not to damage snap ring.

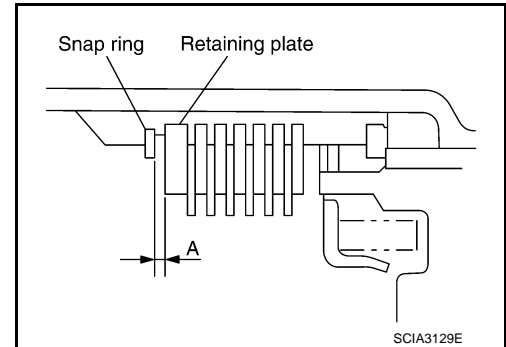


18. Measure clearance between retaining plate and snap ring. If not within specified clearance, select proper retaining plate.

Specified clearance "A"

Standard: [TM-308, "Reverse Brake Clearance"](#).

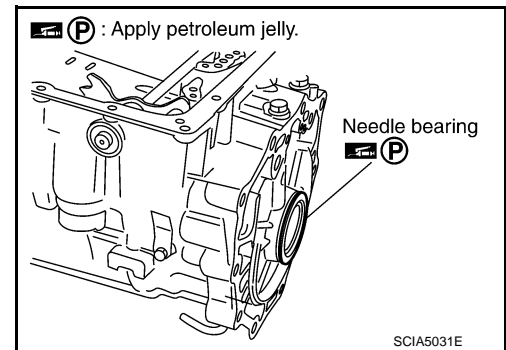
Retaining plate: Refer to [TM-308, "Reverse Brake Clearance"](#)



19. Install needle bearing to transmission case.

CAUTION:

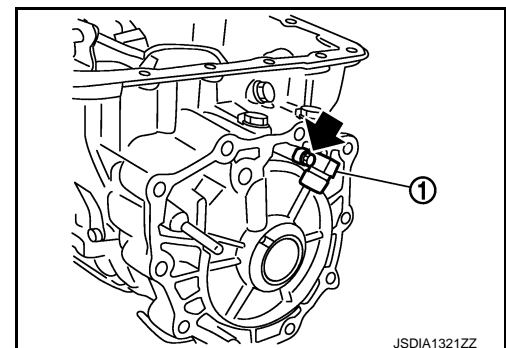
Check the direction of needle bearing. Refer to [TM-232, "Location of Needle Bearings and Bearing Races"](#).



20. Install output speed sensor (1) to transmission case and tighten output speed sensor mounting bolt (←) to the specified torque.

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.**



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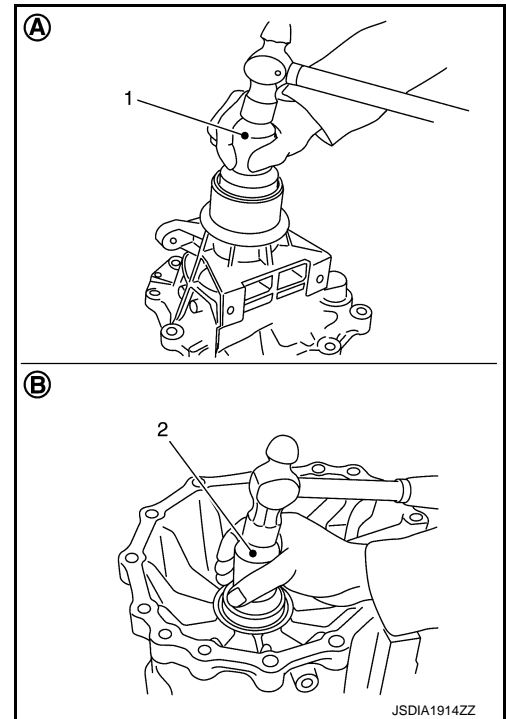
[7AT: RE7R01B]

21. As shown in the figure, use the drift to drive rear oil seal into the rear extension (2WD) (A) or adapter case (4WD) (B) until it is flush.

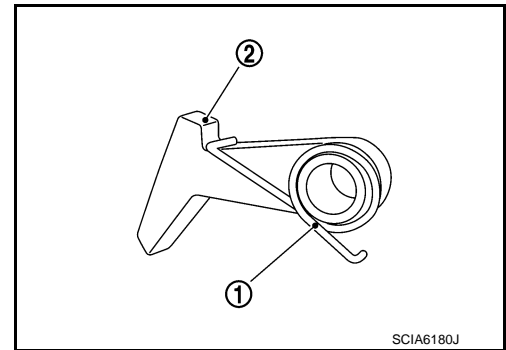
- 1 : Drift [SST: 33400001 (J-26082)]
- 2 : Drift [Commercial service tool \varnothing 64 mm (2.52 in)]

CAUTION:

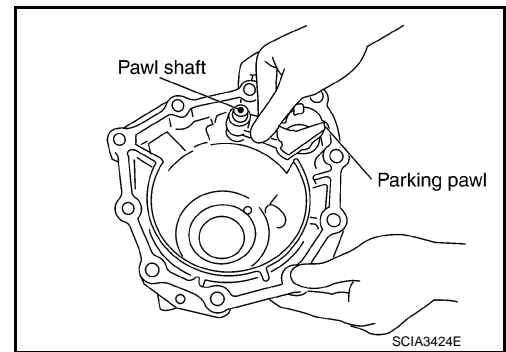
- Never reuse rear oil seal.
- Apply ATF to rear oil seal.
- Never incline to rear oil seal.



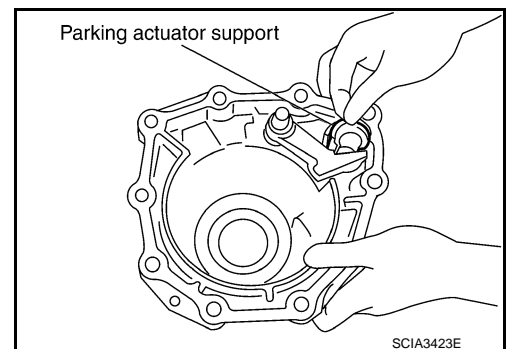
22. Install return spring (1) to parking pawl (2).



23. Install parking pawl (with return spring) and pawl shaft to rear extension (2WD) or adapter case (4WD).



24. Install parking actuator support to rear extension (2WD) or adapter case (4WD).



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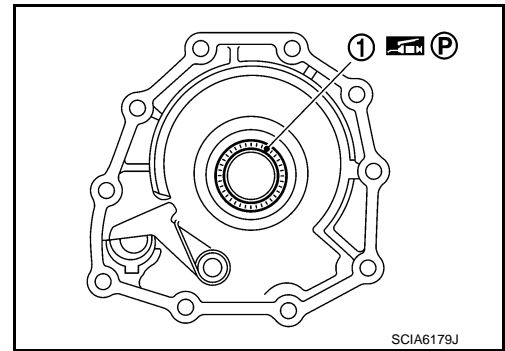
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[7AT: RE7R01B]

25. Install needle bearing (1) to rear extension (2WD) or adapter case (4WD).

CAUTION:

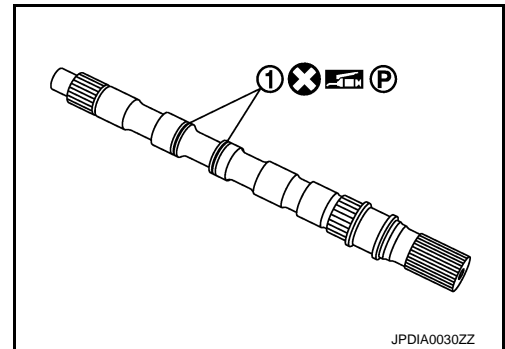
Check the direction of needle bearing. Refer to [TM-232](#), "[Location of Needle Bearings and Bearing Races](#)".



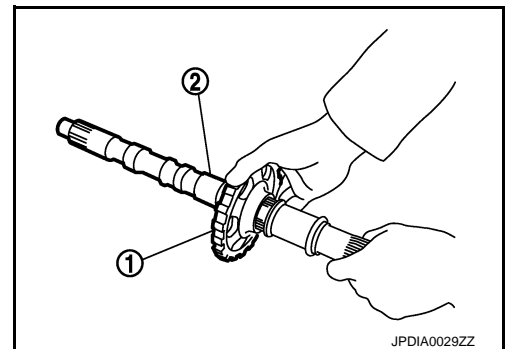
26. Install rear extension assembly (2WD) or adapter case assembly (4WD) according to the following procedures.

a. **2WD**

- i. Install seal rings (1) to output shaft.



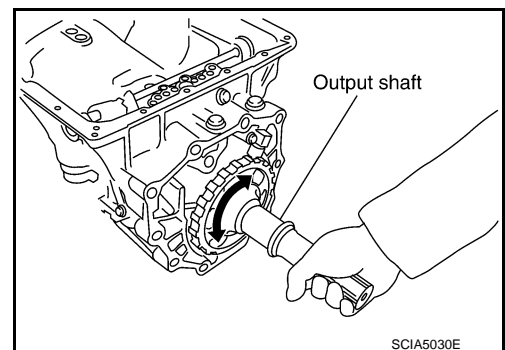
- ii. Install parking gear (1) to output shaft (2).



- iii. Install output shaft in transmission case.

CAUTION:

Be careful not to mistake front for rear because both sides looks similar. (Thinner end is front side.)



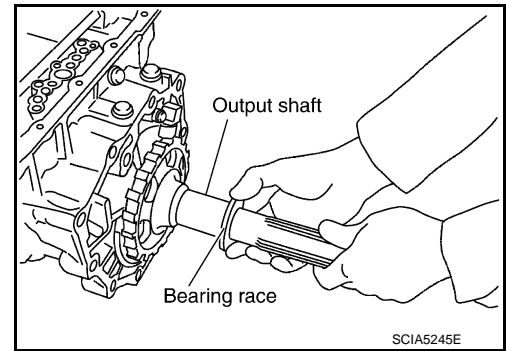
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[7AT: RE7R01B]

iv. Install bearing race to output shaft.

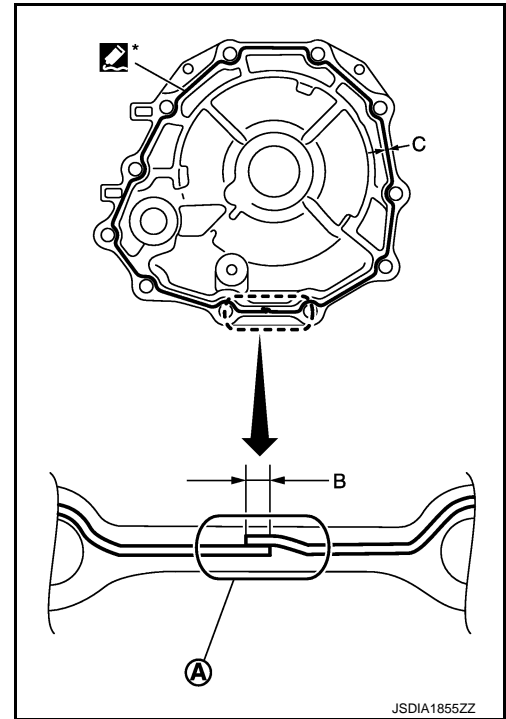


v. Apply recommended sealant (Genuine Anaerobic Liquid Gasket or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).) to rear extension assembly as shown in the figure.

- Sealant starting point and end-point (A)** : Start and finish point shall be in the center of two bolts.
- Overlap width of sealant starting point and end-point (B)** : 3 – 5 mm (0.12 – 0.20 in)
- Sealant width (C)** : 1.0 – 2.0 mm (0.04 – 0.08 in)
- Sealant height (C)** : 0.4 – 1.0 mm (0.016 – 0.04 in)

CAUTION:

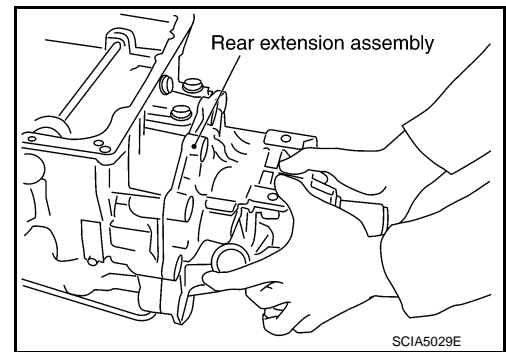
Completely remove all moisture, oil and old sealant, etc. from the transmission case and rear extension assembly mounting surfaces.



vi. Install rear extension assembly to transmission case.

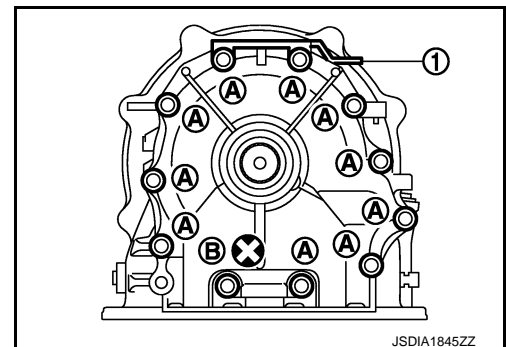
CAUTION:

Insert the tip of parking rod between the parking pawl and the parking actuator support when assembling the rear extension assembly.



vii. Tighten rear extension assembly bolts to the specified torque.

- 1 : Bracket
- A : Bolt
- B : Self-sealing bolt



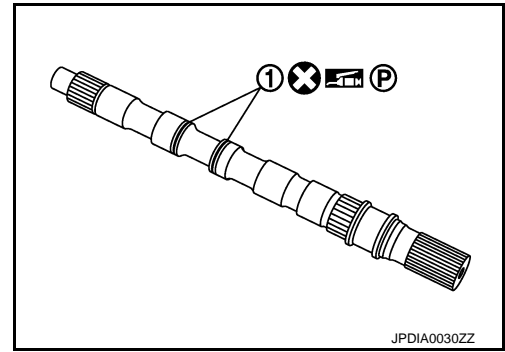
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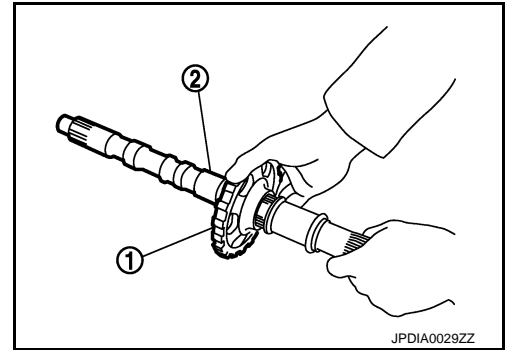
[7AT: RE7R01B]

b. 4WD

i. Install seal rings (1) to output shaft.



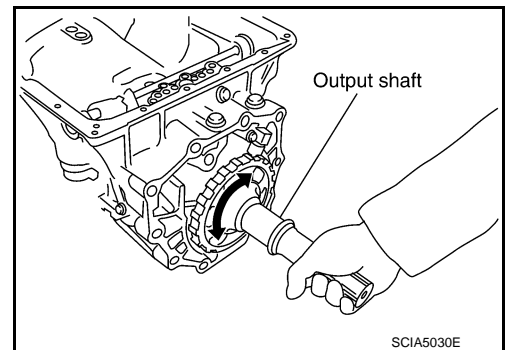
ii. Install parking gear (1) to output shaft (2).



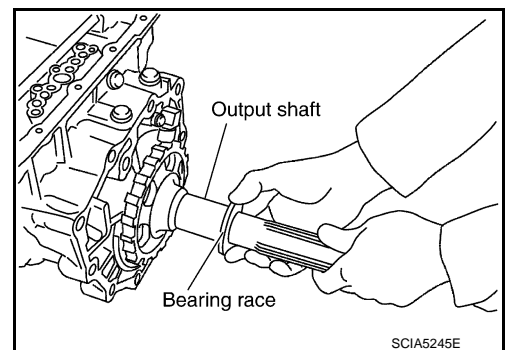
iii. Install output shaft in transmission case.

CAUTION:

Be careful not to mistake front for rear because both sides looks similar. (Thinner end is front side.)



iv. Install bearing race to output shaft.



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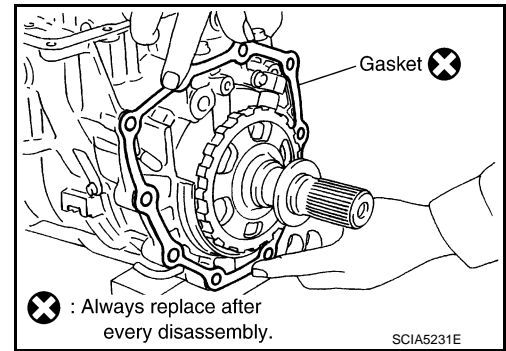
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

v. Install gasket onto transmission case.

CAUTION:

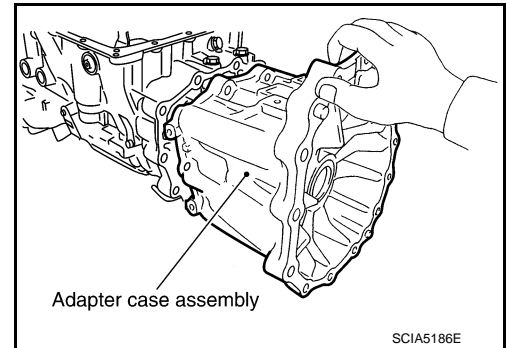
Completely remove all moisture, oil and old gasket, etc. from the transmission case and adapter case assembly mounting surfaces.



vi. Install adapter case assembly to transmission case.

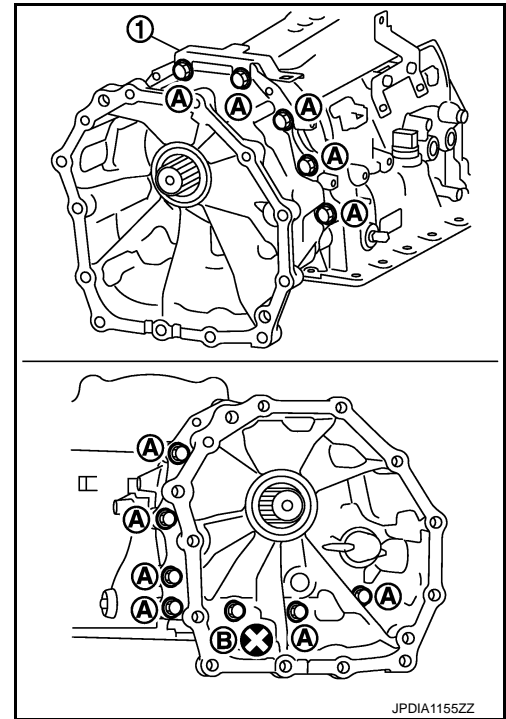
CAUTION:

Insert the tip of parking rod between the parking pawl and the parking actuator support when assembling the adapter case assembly.



vii. Tighten adapter case assembly bolts to the specified torque.

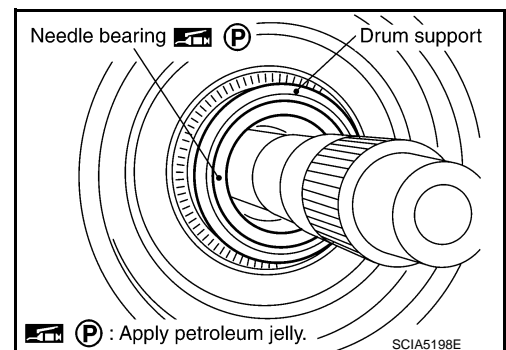
- 1 : Bracket
- A : Bolt
- B : Self-sealing bolt



27. Install needle bearing to drum support.

CAUTION:

Check the direction of needle bearing. Refer to [TM-232](#), "[Location of Needle Bearings and Bearing Races](#)".



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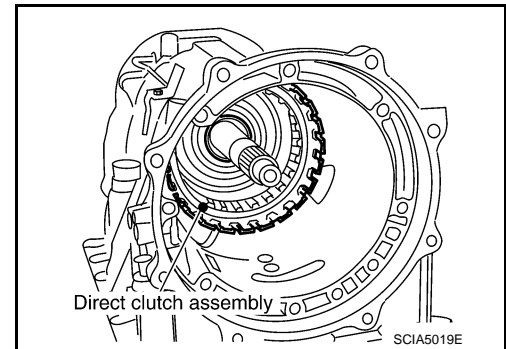
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[7AT: RE7R01B]

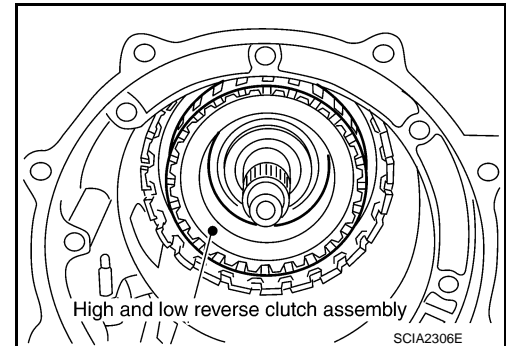
28. Install direct clutch assembly to reverse brake.

CAUTION:

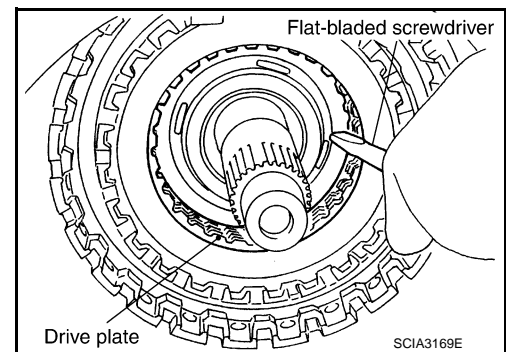
Make sure that drum support edge surface and direct clutch inner boss edge surface come to almost same place.



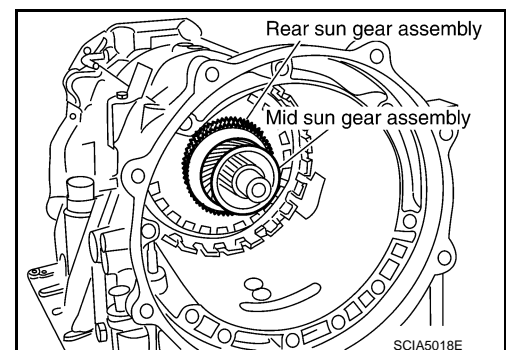
29. Install high and low reverse clutch assembly to direct clutch.



30. Align the drive plate using a flat-bladed screwdriver.



31. Install high and low reverse clutch hub, mid sun gear assembly, and rear sun gear assembly as a unit.



CAUTION:

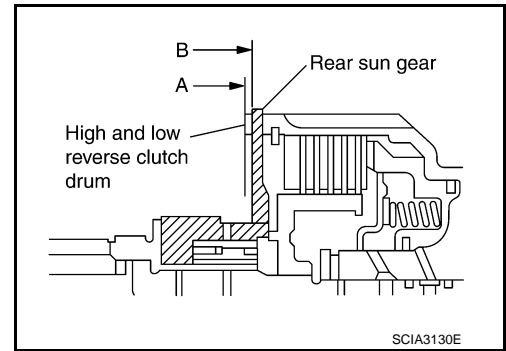
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TRANSMISSION ASSEMBLY

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[7AT: RE7R01B]

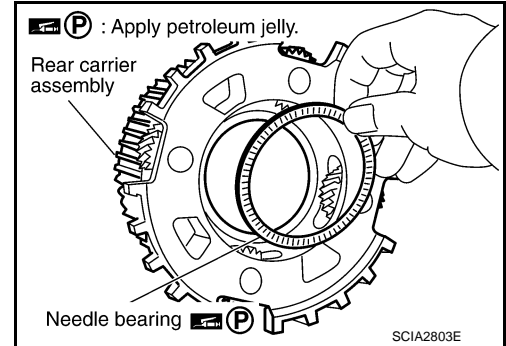
Make sure that portion "A" of high and low reverse clutch drum protrudes approximately 2 mm (0.08 in) beyond portion "B" of rear sun gear.



32. Install needle bearing to rear carrier assembly.

CAUTION:

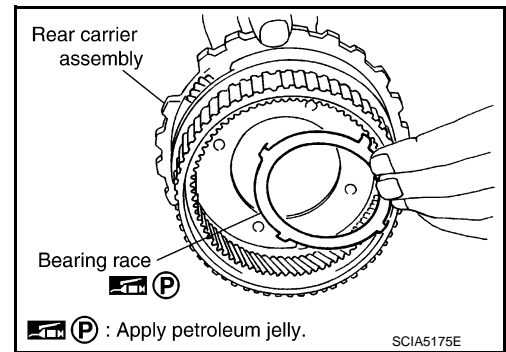
Check the direction of needle bearing. Refer to [TM-232, "Location of Needle Bearings and Bearing Races"](#).



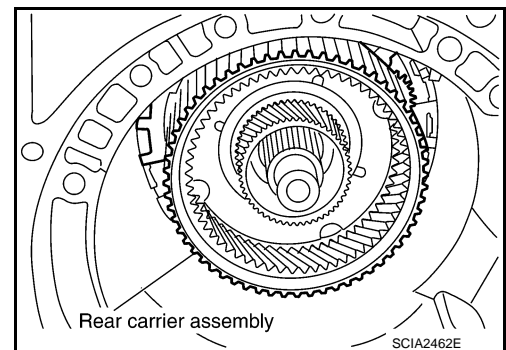
33. Install bearing race to rear carrier assembly.

CAUTION:

Check the direction of bearing race. Refer to [TM-232, "Location of Needle Bearings and Bearing Races"](#).



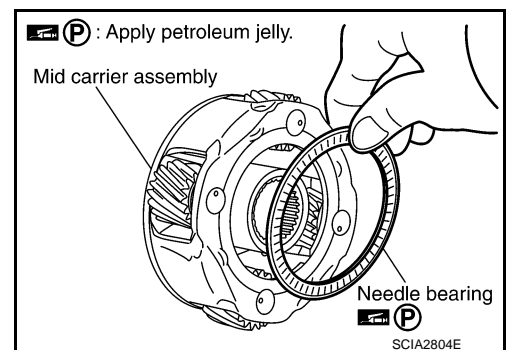
34. Install rear carrier assembly to direct clutch drum.



35. Install needle bearing (rear side) to mid carrier assembly.

CAUTION:

Check the direction of needle bearing. Refer to [TM-232, "Location of Needle Bearings and Bearing Races"](#).



TRANSMISSION ASSEMBLY

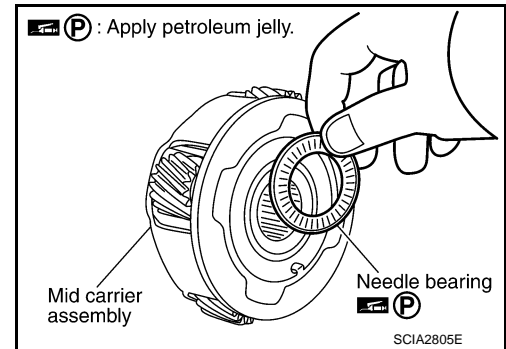
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

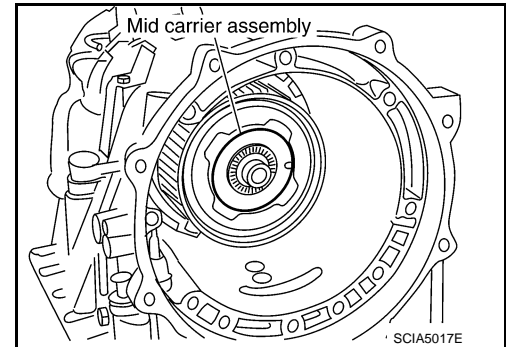
36. Install needle bearing (front side) to mid carrier assembly.

CAUTION:

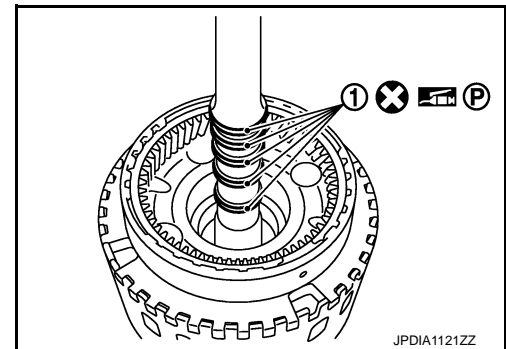
Check the direction of needle bearing. Refer to [TM-232](#), "[Location of Needle Bearings and Bearing Races](#)".



37. Install mid carrier assembly to rear carrier assembly.



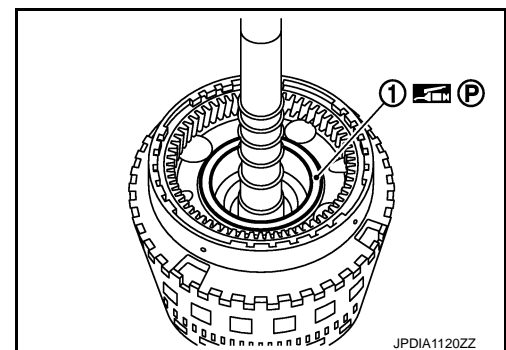
38. Install seal rings (1) to input clutch assembly.



39. Install needle bearing (1) to front carrier assembly.

CAUTION:

Check the direction of needle bearing. Refer to [TM-232](#), "[Location of Needle Bearings and Bearing Races](#)".



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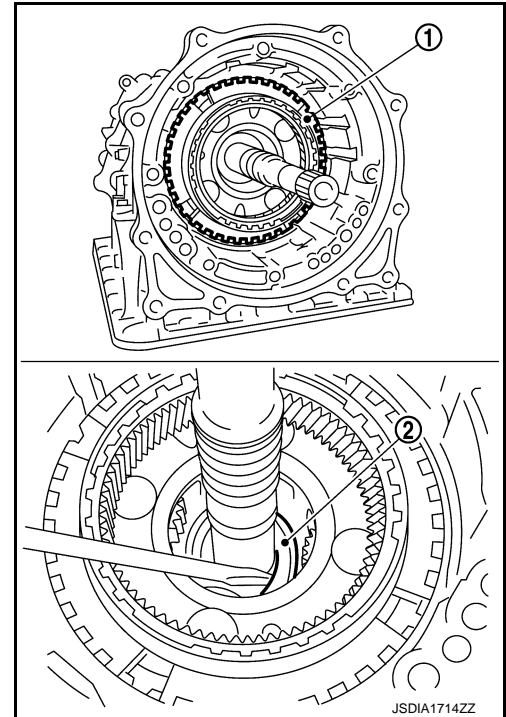
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

40. Install input clutch assembly (with front carrier assembly and rear internal gear) (1) to transmission case.

CAUTION:

Check that the needle bearing (2) is securely positioned. If the needle bearing position is misaligned, adjust it to the specified position.



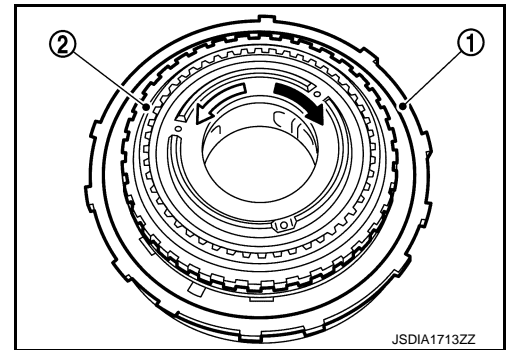
41. Install 1st one-way clutch (1) to front brake hub (with under drive carrier) (2).

42. Check operation of 1st one-way clutch.

- a. Hold 1st one-way clutch.
b. Check front brake hub for correct locking and unlocking directions.

← : Unlocked

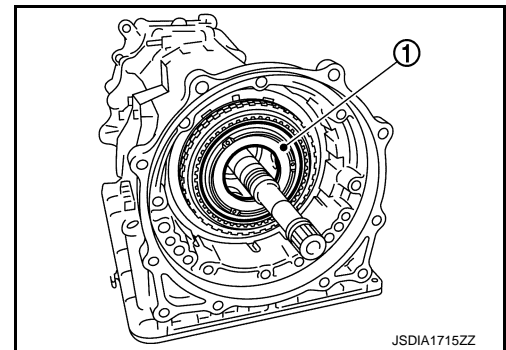
⇐ : Locked



CAUTION:

If not shown in figure, check installation direction of 1st one-way clutch.

43. Install under drive carrier (with 1st one-way clutch) (1) to transmission case.



TRANSMISSION ASSEMBLY

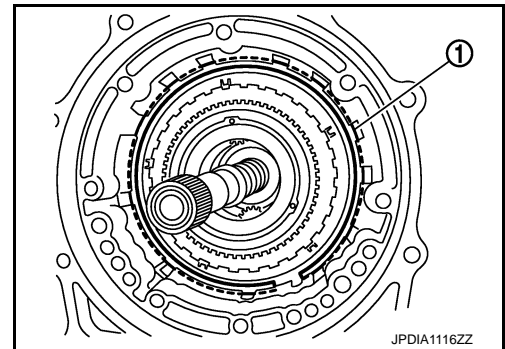
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

44. Install snap ring (1) to transmission case.

CAUTION:

Be careful not to damage snap ring.



45. Install front brake component part (retaining plates, drive plates, and driven plate) to transmission case.

1 : Retaining plate (thin)

2 : Drive plate

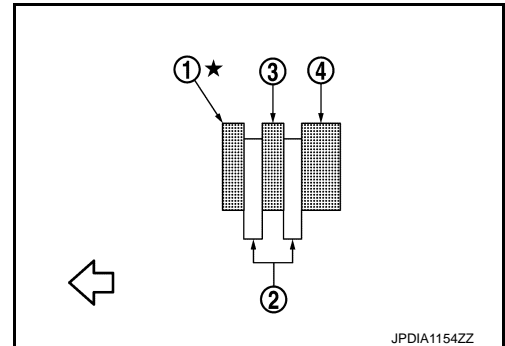
3 : Driven plate

4 : Retaining plate (thick)

← : Front

CAUTION:

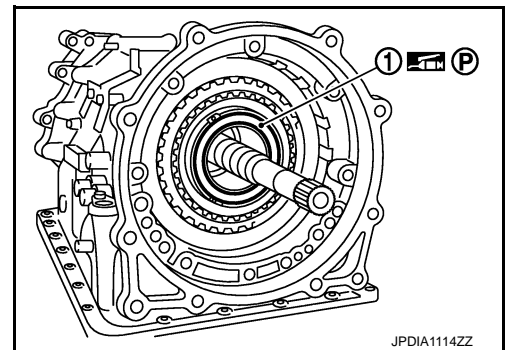
Check order of plates.



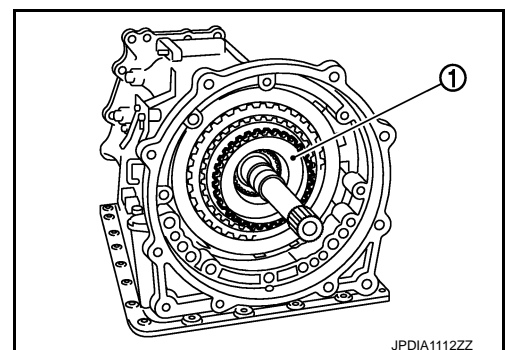
46. Install needle bearing (1) to under drive carrier assembly.

CAUTION:

Check the direction of needle bearing. Refer to [TM-232](#), "[Location of Needle Bearings and Bearing Races](#)".

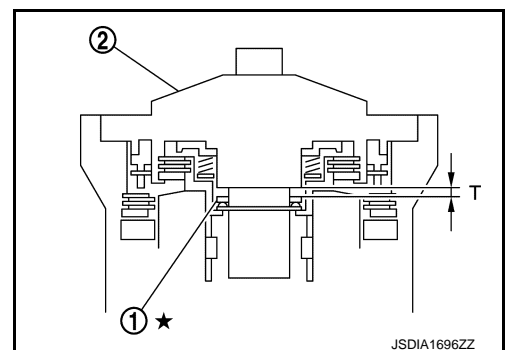


47. Install under drive sun gear (1) to under drive carrier assembly.



48. Adjustment of total end play "T".

- Measure clearance between bearing race (1) and oil pump cover (2).
- Select proper thickness of bearing race so that end play is within specifications.



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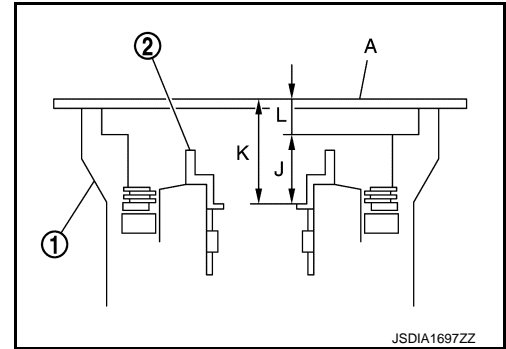
[7AT: RE7R01B]

a. Measure dimensions “K” and “L”, and calculate dimension “J”.

- 1 : Transmission case
- 2 : Under drive sun gear
- A : Straightedge

“J” : Distance between the oil pump fitting surface of transmission case and the needle bearing mating surface of under drive sun gear.

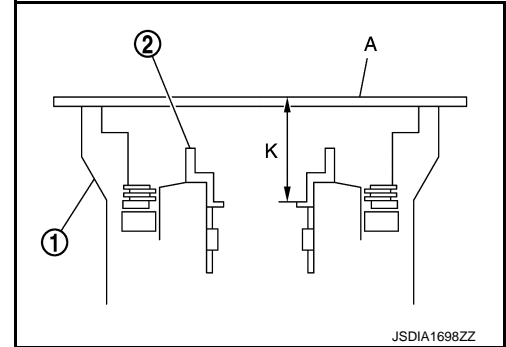
$$J = K - L$$



i. Measure dimension “K” between the converter housing fitting surface of transmission case (1) and the needle bearing mating surface of under drive sun gear (2).

CAUTION:

- Never change the straightedge (A) installation position before the completion of “L” measurement.
- Measure dimension “K” in at least three places, and take the average.



ii. Measure dimension “L” between the converter housing fitting surface of transmission case and the oil pump fitting surface of transmission case.

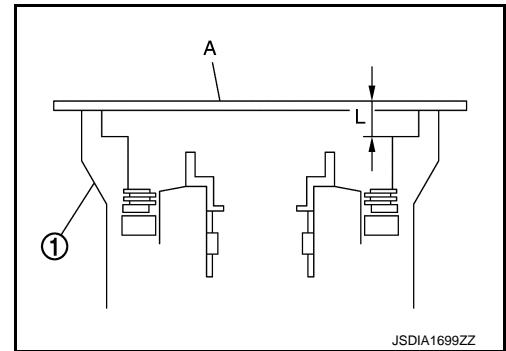
- 1 : Transmission case
- A : Straightedge

CAUTION:

Measure dimension “L” in at least three places, and take the average.

iii. Calculate dimension “J”.

$$J = K - L$$

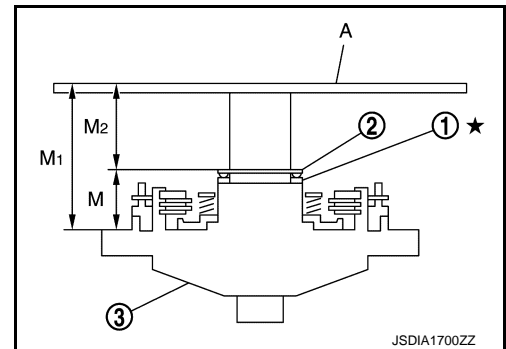


b. Measure dimensions “M1” and “M2”, and calculate dimension “M”.

- 1 : Bearing race
- 2 : Needle bearing
- 3 : Oil pump assembly
- A : Straightedge

“M” : Distance between the transmission case fitting surface of oil pump and the needle bearing on oil pump.

$$M = M1 - M2$$

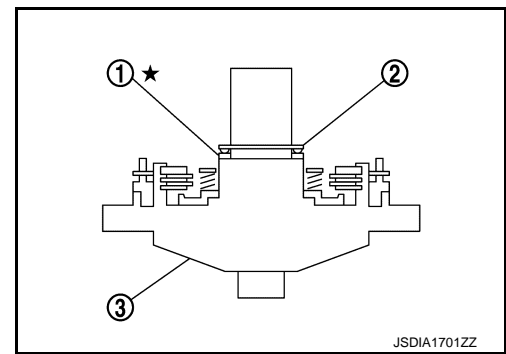


TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

- i. Place bearing race (1) and needle bearing (2) on oil pump assembly (3).

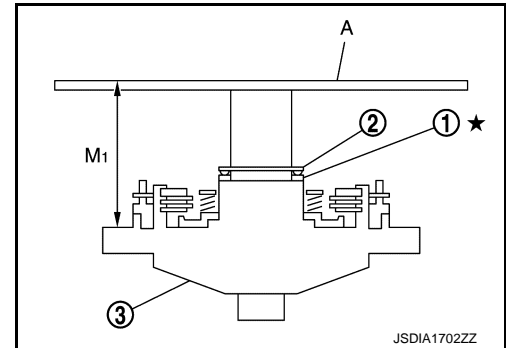


- ii. Measure dimension "M1" between the transmission case fitting surface of oil pump and the end of oil pump.

- 1 : Bearing race
- 2 : Needle bearing
- 3 : Oil pump assembly
- A : Straightedge

CAUTION:

Measure dimension "M1" in at least three places, and take the average.

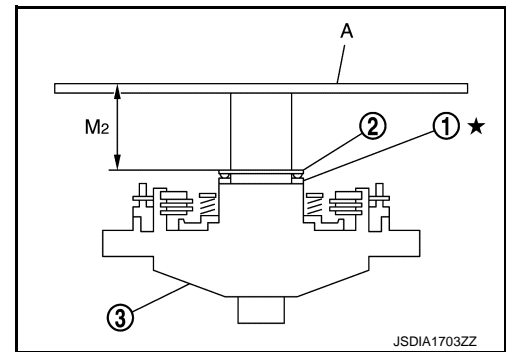


- iii. Measure dimension "M2" between the needle bearing on oil pump and the end of oil pump.

- 1 : Bearing race
- 2 : Needle bearing
- 3 : Oil pump assembly
- A : Straightedge

CAUTION:

Measure dimension "M2" in at least three places, and take the average.



- iv. Calculate dimension "M".

$$M = M1 - M2$$

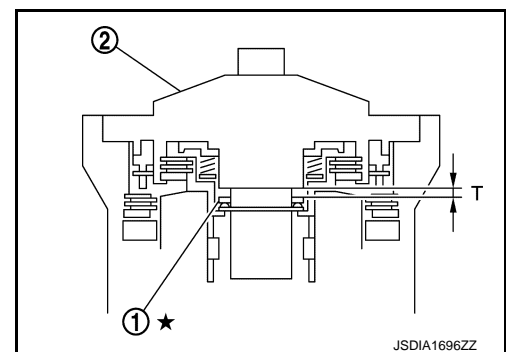
- c. Adjust total end play "T".

- 1 : Bearing race
- 2 : Oil pump assembly

$$T = J - M$$

Total end play "T" : Refer to [TM-307, "Total End Play"](#).

- Select proper thickness of bearing race so that total end play is within specifications.



Bearing races : Refer to [TM-307, "Total End Play"](#).

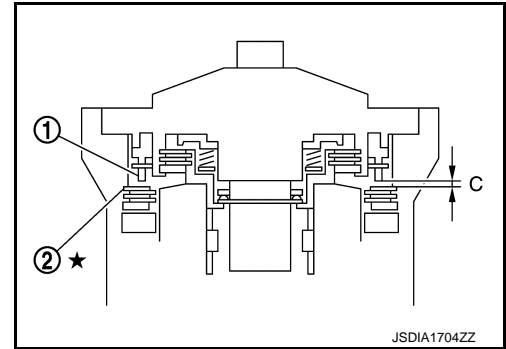
TRANSMISSION ASSEMBLY

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[7AT: RE7R01B]

49. Adjustment of front brake clearance "C".

- Measure clearance between front brake piston (1) and front brake retaining plate (2).
- Select proper thickness of front brake retaining plate so that clearance is within specifications.

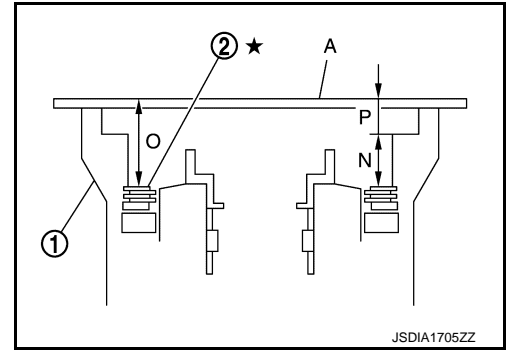


a. Measure dimensions "O" and "P", and calculate dimension "N".

- 1 : Transmission case
- 2 : Front brake retaining plate
- A : Straightedge

"N" : Distance between the oil pump fitting surface of transmission case and the front brake retaining plate.

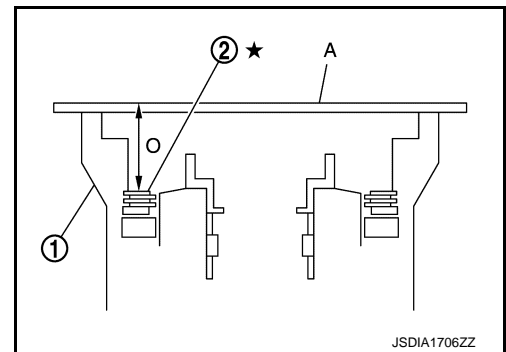
$$N = O - P$$



i. Measure dimension "O" between the converter housing fitting surface of transmission case (1) and the front brake retaining plate (2).

CAUTION:

- Never change the straightedge (A) installation position before the completion of "P" measurement.
- Measure dimension "O" in at least three places, and take the average.



ii. Measure dimension "P" between the converter housing fitting surface of transmission case and the oil pump fitting surface of transmission case.

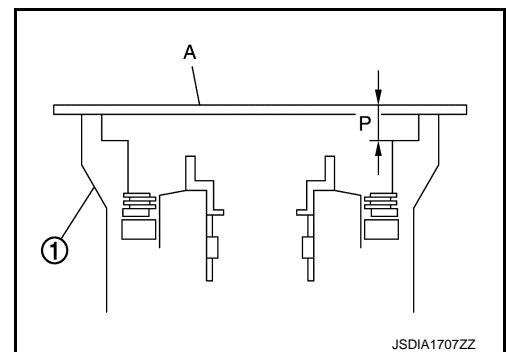
- 1 : Transmission case
- A : Straightedge

CAUTION:

Measure dimension "P" in at least three places, and take the average.

iii. Calculate dimension "N".

$$N = O - P$$



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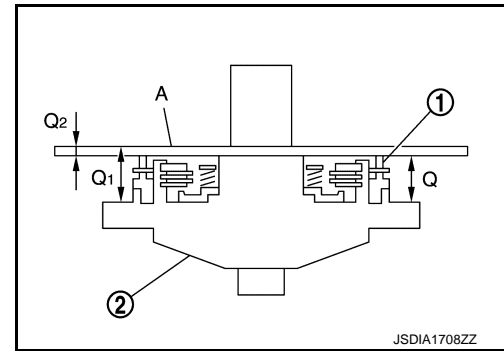
[7AT: RE7R01B]

b. Measure dimensions "Q1" and "Q2", and calculate dimension "Q".

- 1 : Front brake piston
- 2 : Oil pump assembly
- A : Straightedge

"Q" : Distance between the transmission case fitting surface of oil pump and the front brake piston.

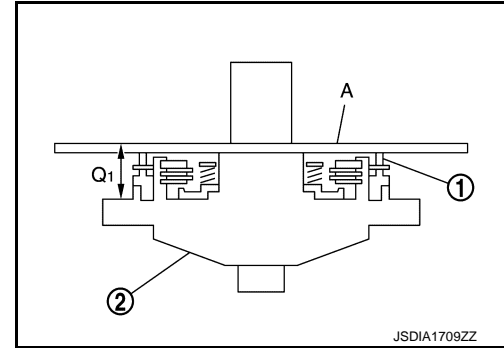
$$Q = Q1 - Q2$$



i. Measure dimension "Q1" between the transmission case fitting surface of oil pump and the straightedge on front brake piston.

- 1 : Front brake piston
- 2 : Oil pump assembly
- A : Straightedge

CAUTION:
Measure dimension "Q1" in at least three places, and take the average.

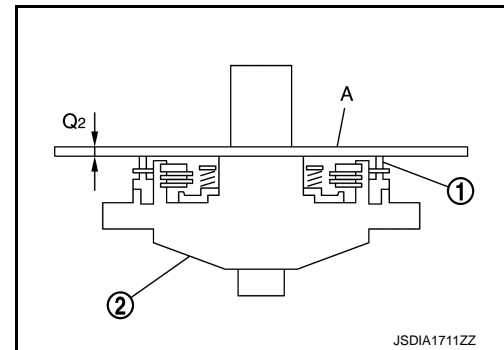


ii. Measure dimension "Q2" of the straightedge.

- 1 : Front brake piston
- 2 : Oil pump assembly
- A : Straightedge

iii. Calculate dimension "Q".

$$Q = Q1 - Q2$$



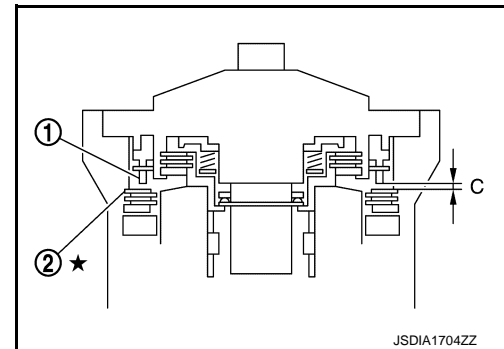
c. Adjust front brake clearance "C".

- 1 : Front brake piston
- 2 : Front brake retaining plate

$$C = N - Q$$

Front brake clearance "C" : Refer to [TM-308, "Front Brake Clearance"](#).

- Select proper thickness of retaining plate so that front brake clearance is within specifications.



Retaining plate : Refer to [TM-308, "Front Brake Clearance"](#).

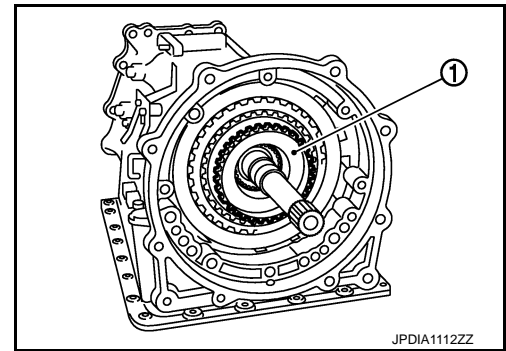
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[7AT: RE7R01B]

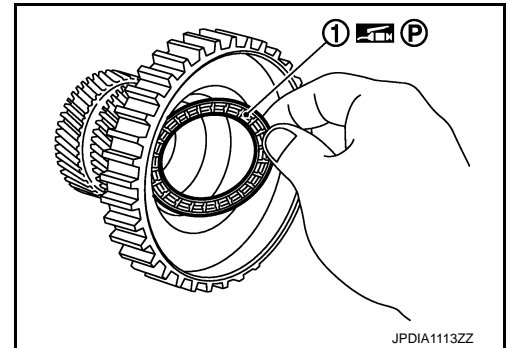
50. Remove under drive sun gear (1) from under drive carrier assembly.



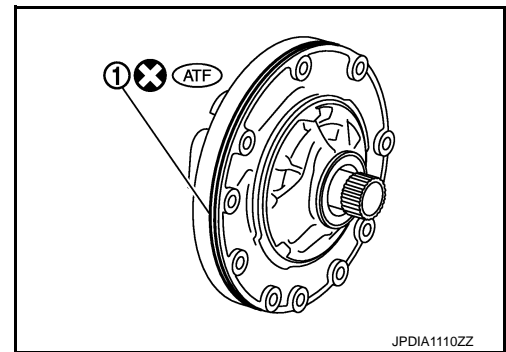
51. Install needle bearing (1) to under drive sun gear.

CAUTION:

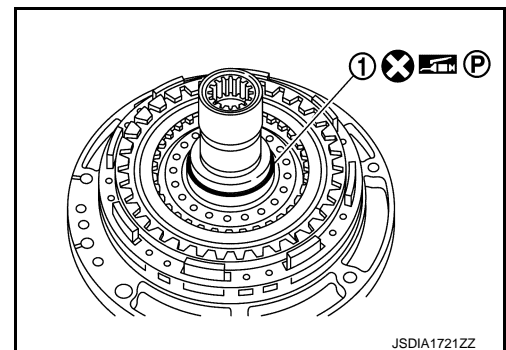
Check the direction of needle bearing. Refer to [TM-232](#), "[Location of Needle Bearings and Bearing Races](#)".



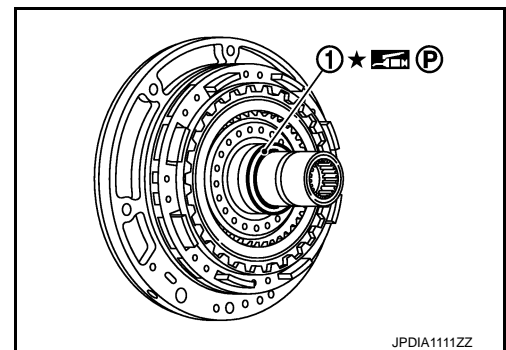
52. Install O-ring (1) to oil pump assembly.



53. Install seal ring (1) to oil pump assembly.



54. Install bearing race (1) to oil pump assembly.

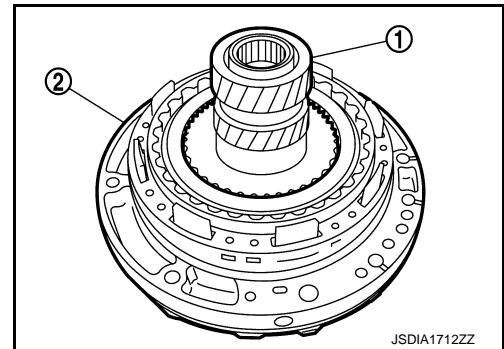


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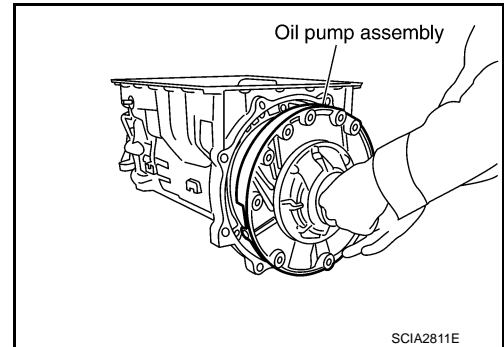
55. Install under drive sun gear (with needle bearing) (1) to oil pump assembly (2).



56. Install oil pump assembly (with under drive sun gear) to transmission case.

CAUTION:

Apply ATF to oil pump bearing.



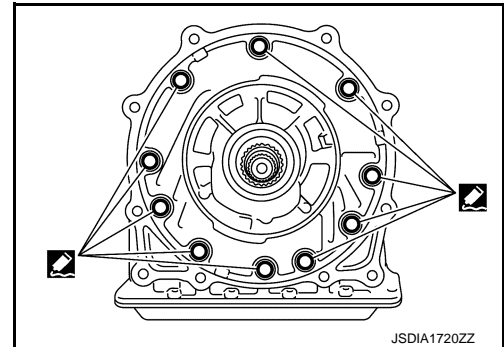
57. Apply recommended sealant to oil pump assembly as shown in the figure.



: Genuine RTV silicone sealant or equivalent. Refer to [GI-22, "Recommended Chemical Products and Sealants"](#).

CAUTION:

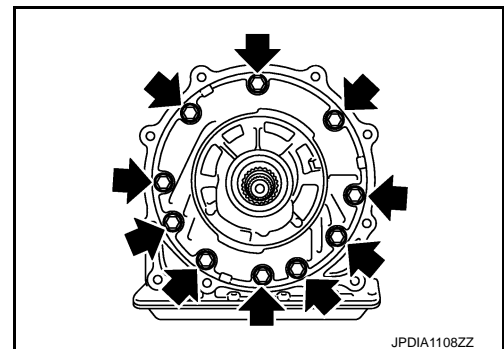
Completely remove all moisture, oil and old sealant, etc. from the oil pump mounting bolts and oil pump mounting bolt mounting surfaces.



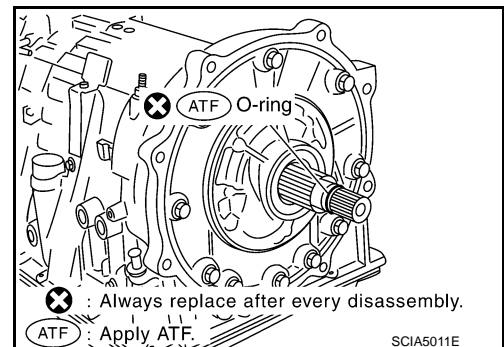
58. Tighten oil pump bolts (↩) to the specified torque.

CAUTION:

Apply ATF to oil pump bushing.



59. Install O-ring to input clutch assembly.



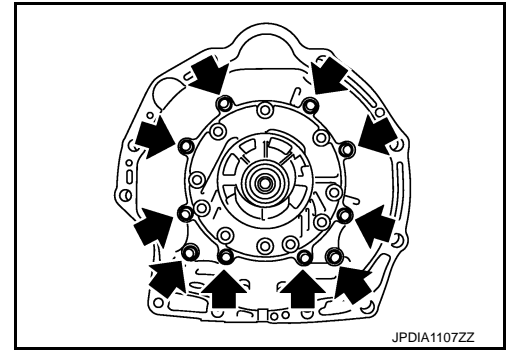
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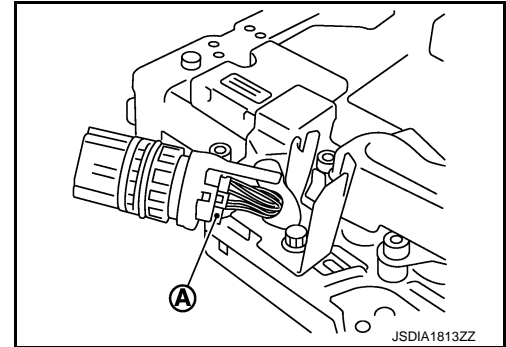
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[7AT: RE7R01B]

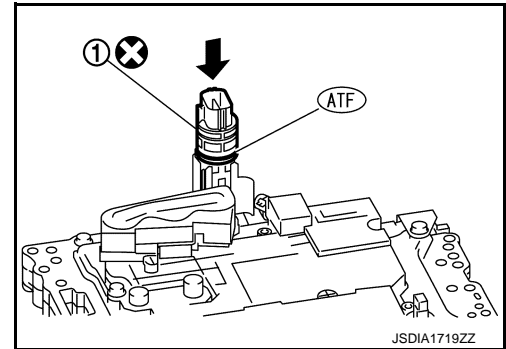
60. Install converter housing to transmission case, and tighten converter housing bolts (⬅) to the specified torque.



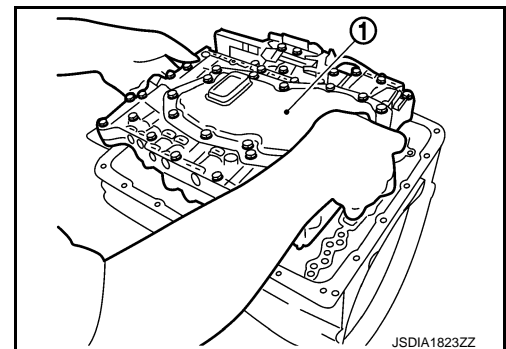
61. Connect TCM connector (A).



62. Install joint connector (1) to the control valve & TCM.
CAUTION:
Apply ATF to O-ring of joint connector.



63. Install the control valve & TCM (1) to transmission case.



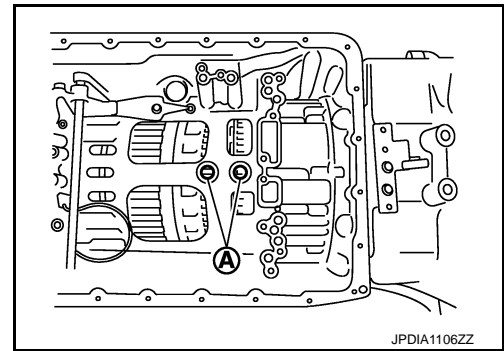
CAUTION:

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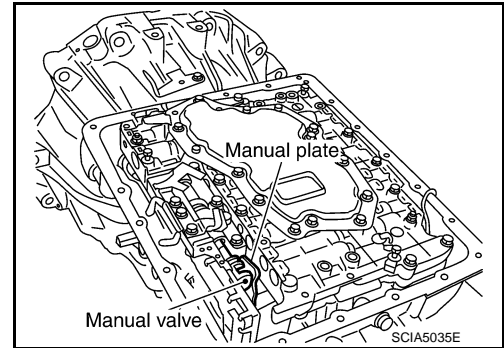
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[7AT: RE7R01B]

- Make sure that input speed sensor securely installs input speed sensor holes (A).
- Hang down output speed sensor harness toward outside so as not to disturb installation of the control valve & TCM.
- Adjust joint connector of the control valve & TCM to terminal hole of transmission case.



- Assemble it so that manual valve cutout is engaged with manual plate projection.

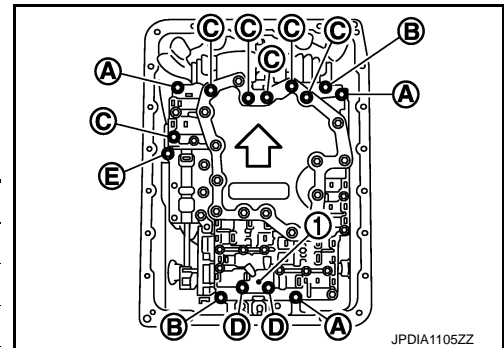


64. Install bolts and clip (1) to the control valve & TCM. Tighten bolt (E) to the specified torque before tightening the other than bolts.

← : Front

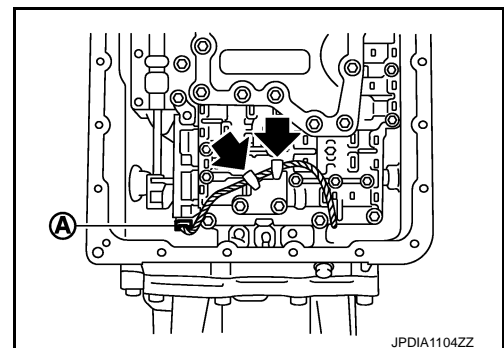
Bolt symbol	Length mm (in)	Number of bolts
A	43 (1.69)	3
B	40 (1.57)	2
C	54 (2.13)	6
D	50 (1.97)	2
E*	50 (1.97)	1

*: Reamer bolt



65. Connect output speed sensor connector (A).

66. Engage output speed sensor harness with terminal clips (◀▶).



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TRANSMISSION ASSEMBLY

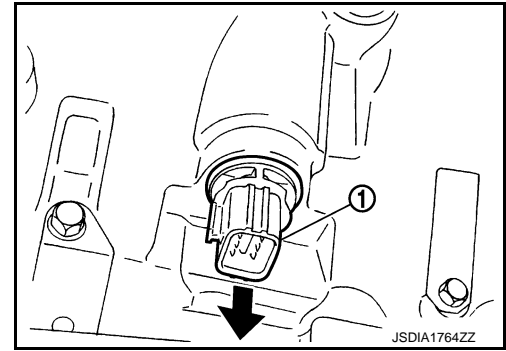
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

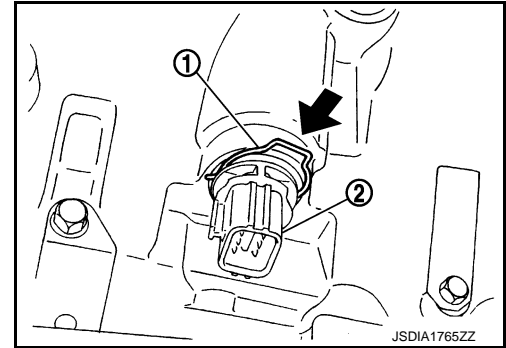
67. Pull down joint connector (1).

CAUTION:

Be careful not to damage connector.



68. Install snap ring (1) to joint connector (2).

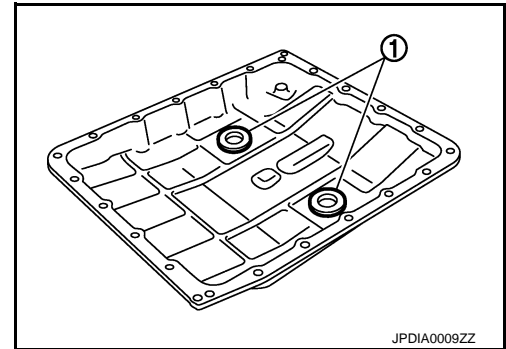


69. Install magnets (1) in oil pan.

70. Install oil pan gasket to transmission case.

CAUTION:

- Never reuse oil pan gasket.
- Install it in the direction to align hole positions.
- Completely remove all moisture, oil and old gasket, etc. from oil pan gasket mounting surface.



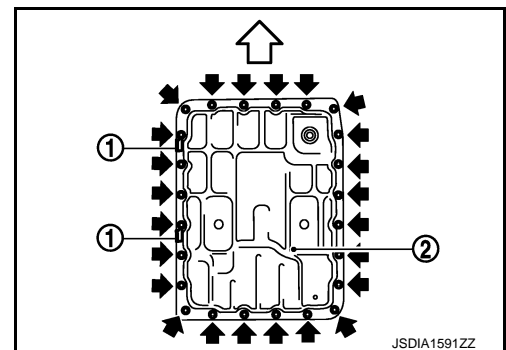
71. Install oil pan (2) and clips (1) to transmission case.

⇐ : Front

← : Oil pan mounting bolt

CAUTION:

- Be careful not to pinch harnesses.
- Completely remove all moisture, oil and old gasket, etc. from oil pan mounting surface.



72. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them. Tighten oil pan mounting bolts to the specified torque.

⇐ : Front

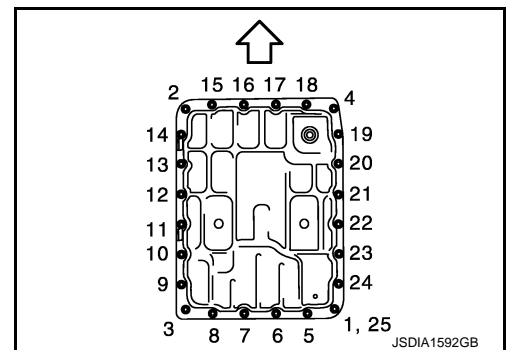
CAUTION:

Never reuse oil pan mounting bolts.

73. Install drain plug and drain plug gasket to oil pan. Tighten drain plug to the specified torque.

CAUTION:

Never reuse drain plug and drain plug gasket.



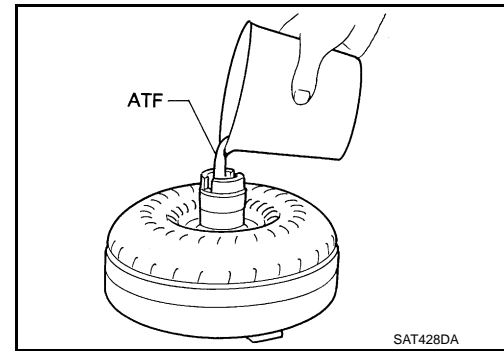
TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

74. Pour ATF into torque converter.

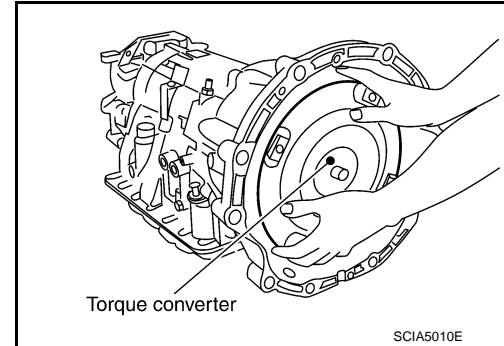
- Approximately 2 liter (2-1/8 US qt, 1-3/4 Imp qt) of ATF is required for a new torque converter.
- When reusing old torque converter, add the same amount of ATF as was drained.



75. Install torque converter while aligning notches of torque converter with notches of oil pump.

CAUTION:

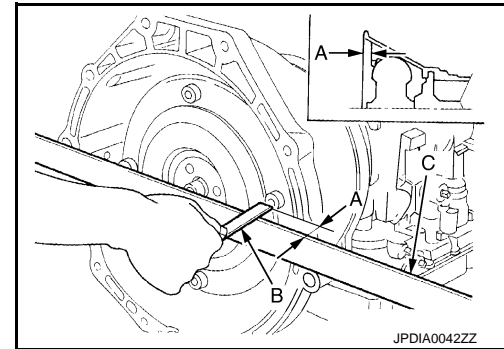
Install torque converter while rotating it.



76. Measure dimension "A" to make sure that torque converter is in proper position.

- B : Scale
- C : Straightedge

Dimension "A" : Refer to [TM-307, "Torque Converter"](#).



Inspection

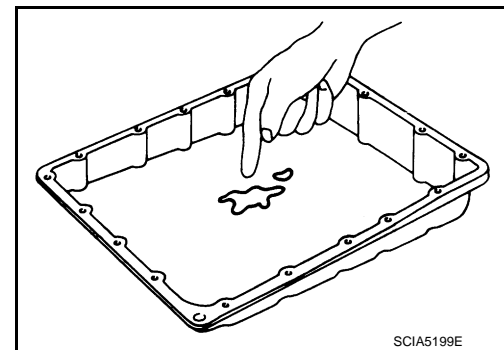
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INSPECTION AFTER DISASSEMBLY

Oil Pan

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-98, "Cleaning"](#).



Torque Converter

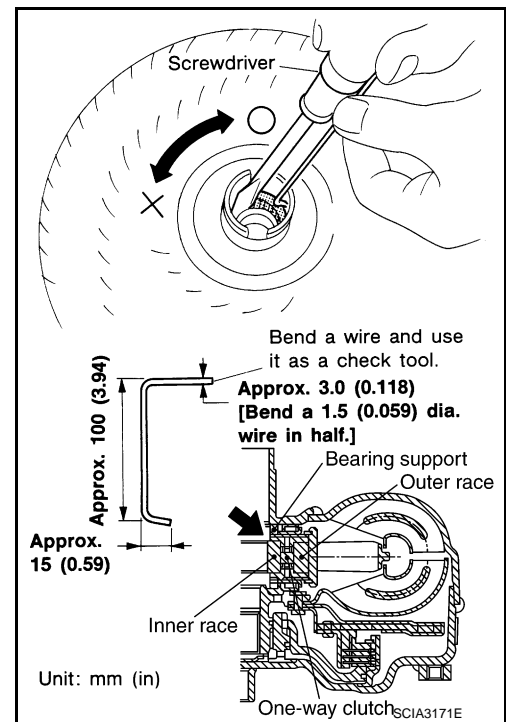
TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

Check torque converter one-way clutch using a check tool as shown at figure.

1. Insert a check tool into the groove of bearing support built into one-way clutch outer race.
2. When fixing bearing support with a check tool, rotate one-way clutch spline using a screwdriver.
3. Make sure that inner race rotates clockwise only. If not, replace torque converter assembly.



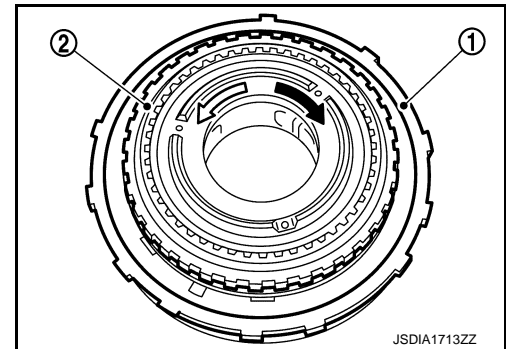
1st One-way Clutch

Check operation of 1st one-way clutch.

1. Install 1st one-way clutch (1) to front brake hub (with under drive carrier).
2. Hold 1st one-way clutch.
3. Check front brake hub for correct locking and unlocking directions. If necessary, replace 1st one-way clutch.

← : Unlocked

↶ : Locked



Under Drive Sun Gear

Check for deformation, fatigue or damage. If necessary, replace the under drive sun gear.

Mid Carrier Assembly

Check for deformation, fatigue or damage. If necessary, replace the mid carrier assembly.

Rear Carrier Assembly

Check for deformation, fatigue or damage. If necessary, replace the rear carrier assembly.

Reverse Brake Retaining Plate/Drive Plates/Driven Plates/Dish Plates

Check facing for burns, cracks or damage. If necessary, replace the damaged plate.

Front Brake Retaining Plates/Drive Plates/Driven Plate

Check facing for burns, cracks or damage. If necessary, replace the damaged plate.

Each Snap Ring

Check for deformation, fatigue or damage. If necessary, replace the snap ring.

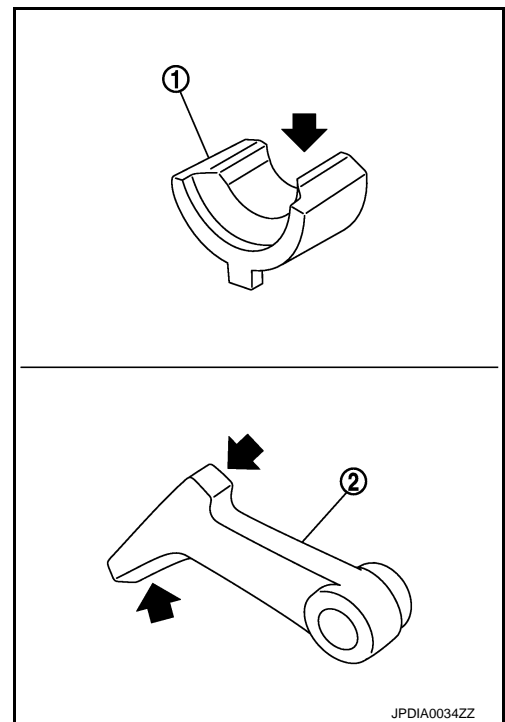
Parking Actuator Support and Parking Pawl

TRANSMISSION ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

If the contact surface on parking actuator support (1) and parking pawl (2) has excessive wear, abrasion, bend or any other damage, replace the components.



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OIL PUMP, 2346 BRAKE, FRONT BRAKE PISTON

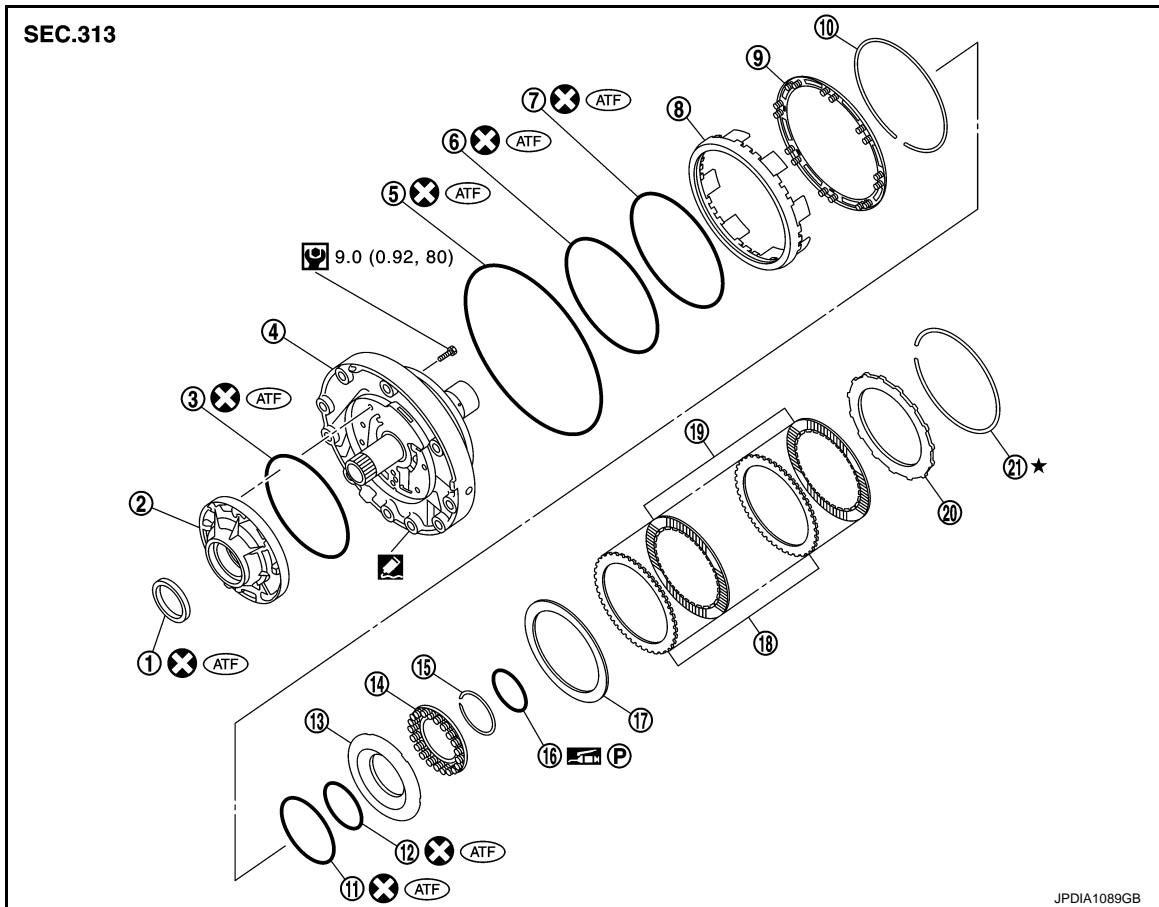
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]


OIL PUMP, 2346 BRAKE, FRONT BRAKE PISTON

Exploded View

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- | | | |
|------------------------------|--------------------------------|--------------------------------|
| 1. Oil pump housing oil seal | 2. Oil pump housing | 3. O-ring |
| 4. Oil pump cover | 5. O-ring | 6. D-ring |
| 7. D-ring | 8. Front brake piston | 9. Front brake spring retainer |
| 10. Snap ring | 11. D-ring | 12. D-ring |
| 13. 2346 brake piston | 14. 2346 brake spring retainer | 15. Snap ring |
| 16. Seal ring | 17. 2346 brake dish plate | 18. 2346 brake driven plate |
| 19. 2346 brake drive plate | 20. 2346 brake retaining plate | 21. Snap ring |

: Apply Genuine RTV silicone sealant or equivalent.

Refer to [GI-4, "Components"](#) for symbols not described on the above.

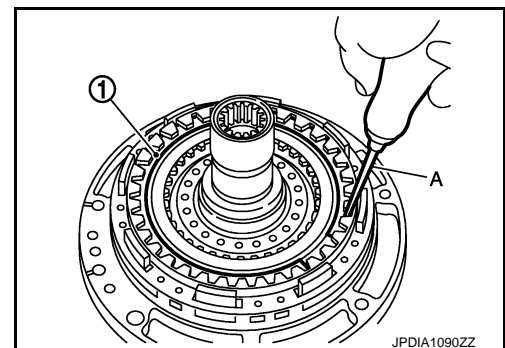
Disassembly

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1. Remove snap ring (1) from oil pump assembly using a flat-bladed screwdriver (A).

CAUTION:

- Be careful not to scratch oil pump cover and 2346 brake retaining plate.
- Be careful not to damage snap ring.

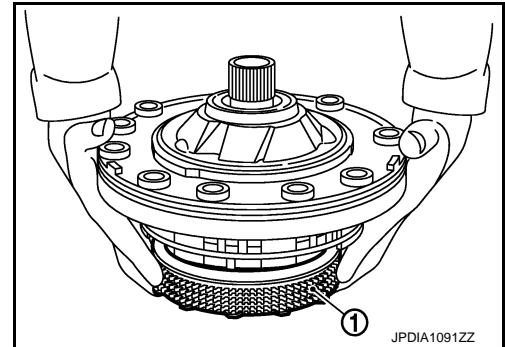


OIL PUMP, 2346 BRAKE, FRONT BRAKE PISTON

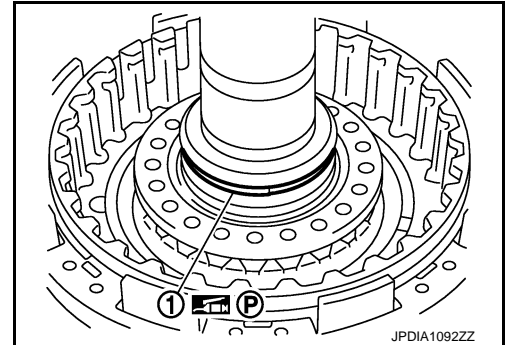
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

2. Remove 2346 brake component part (retaining plate, drive plates, driven plates, and dish plate) (1) from oil pump assembly.



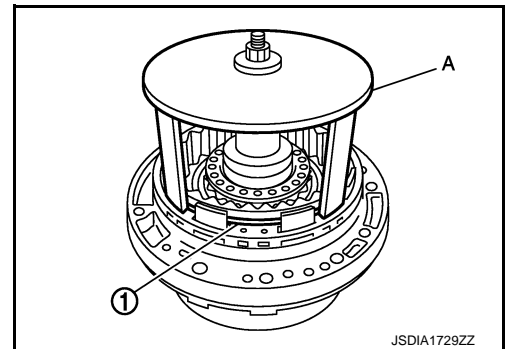
3. Remove seal ring (1) from oil pump assembly.



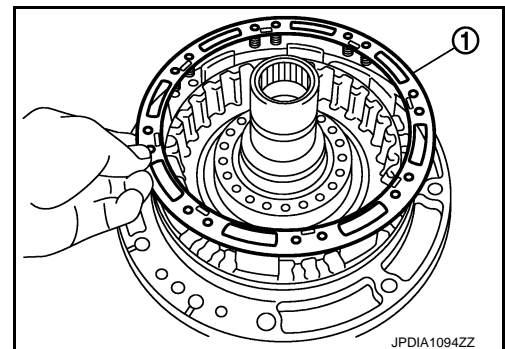
4. Set the clutch spring compressor (SST: KV31103800) (A) on front brake spring retainer and remove snap ring (fixing front brake spring retainer) (1) from oil pump assembly while compressing return spring.

CAUTION:

Be careful not to expand snap ring excessively.



5. Remove front brake spring retainer (1) from oil pump assembly.

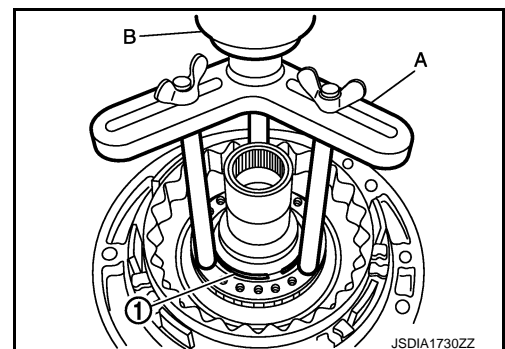


6. Set the clutch spring compressor [SST: KV31102400 (J-34285 and J-34285-87)] (A) on 2346 brake spring retainer and remove snap ring (fixing 2346 brake spring retainer) (1) from oil pump assembly while compressing return spring.

B : Press

CAUTION:

Be careful not to expand snap ring excessively.



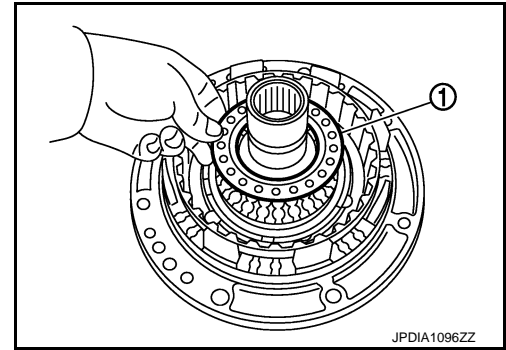
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OIL PUMP, 2346 BRAKE, FRONT BRAKE PISTON

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

7. Remove 2346 brake spring retainer (1) from oil pump assembly.

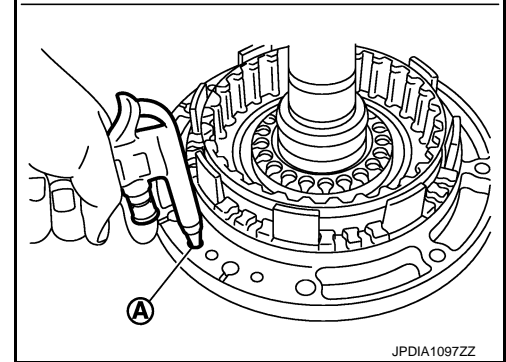
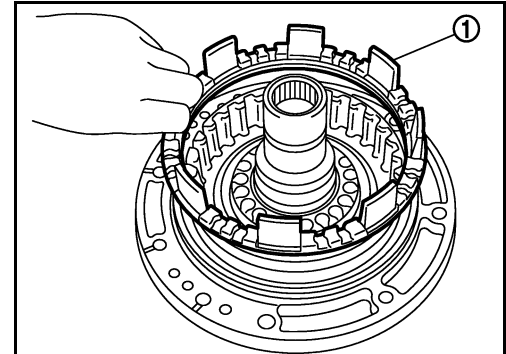


8. Remove front brake piston (1) from oil pump assembly with compressed air. Refer to [TM-232, "Oil Channel"](#).

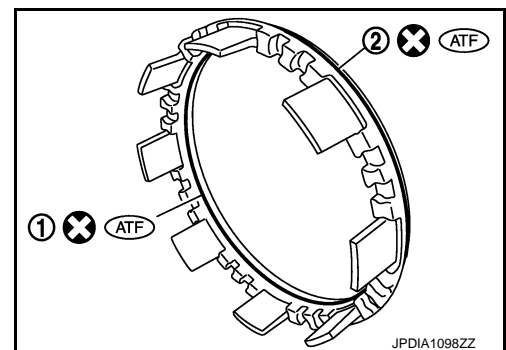
A : Front brake pressure hole

CAUTION:

Care should be taken not to abruptly blow air. It makes piston incline, as the result, it becomes hard to disassemble the piston.



9. Remove D-ring (inner) (1) and D-ring (outer) (2) from front brake piston.



OIL PUMP, 2346 BRAKE, FRONT BRAKE PISTON

< UNIT DISASSEMBLY AND ASSEMBLY >

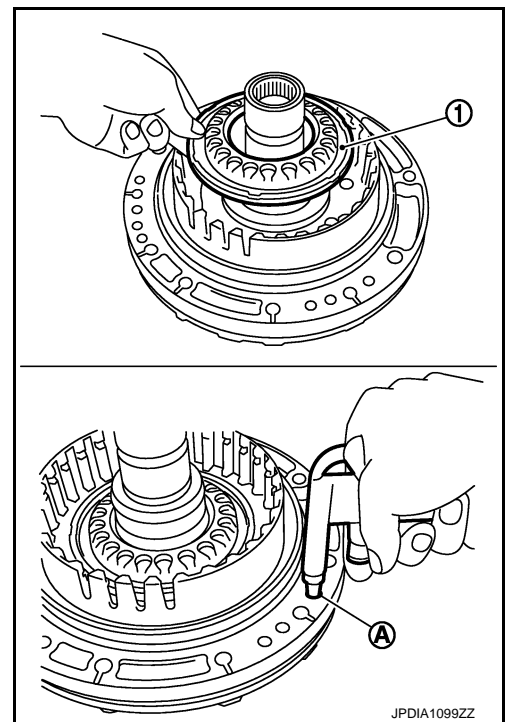
[7AT: RE7R01B]

10. Remove 2346 brake piston (1) from oil pump assembly with compressed air. Refer to [TM-232, "Oil Channel"](#).

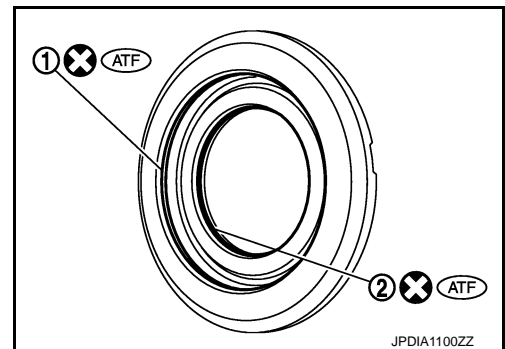
A : 2346 brake pressure hole

CAUTION:

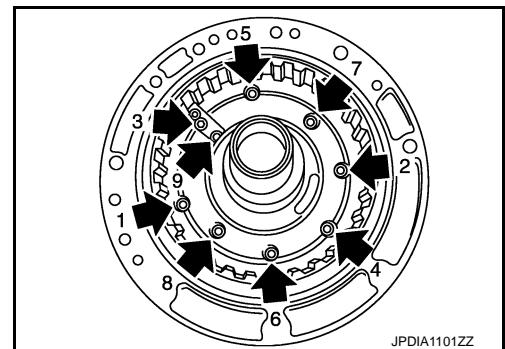
Care should be taken not to abruptly blow air. It makes piston incline, as the result, it becomes hard to disassemble the piston.



11. Remove D-ring (large) (1) and D-ring (small) (2) from 2346 brake piston.



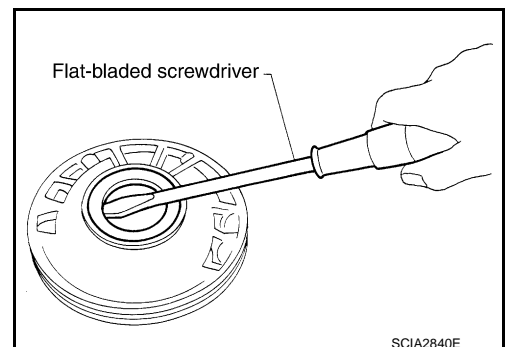
12. Loosen bolts (←) in numerical order shown in the figure and remove oil pump housing from oil pump cover.



13. Remove oil pump housing oil seal using a flat-bladed screwdriver.

CAUTION:

Be careful not to scratch oil pump housing.



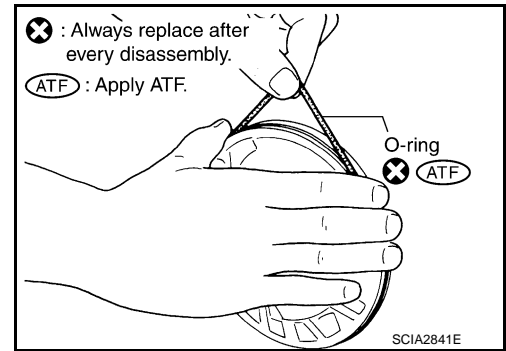
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OIL PUMP, 2346 BRAKE, FRONT BRAKE PISTON

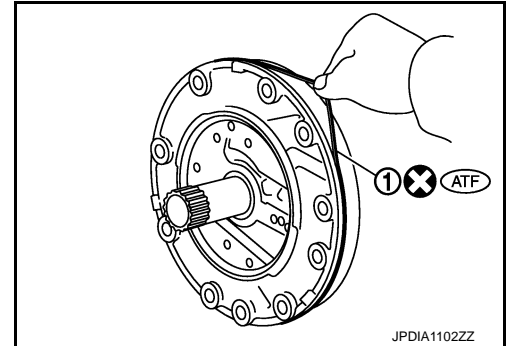
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

14. Remove O-ring from oil pump housing.



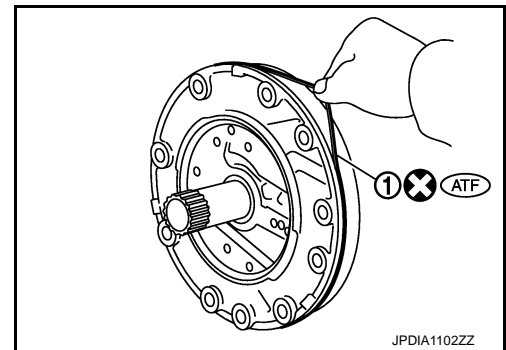
15. Remove O-ring (1) from oil pump cover.



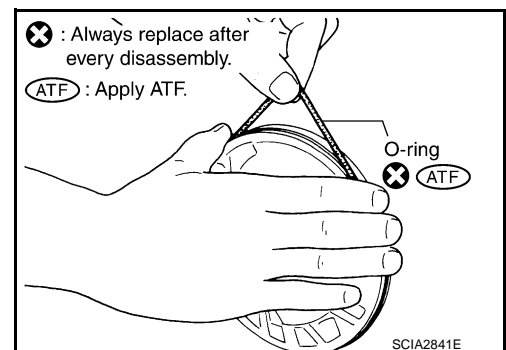
Assembly

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1. Install O-ring (1) to oil pump cover.



2. Install O-ring to oil pump housing.



OIL PUMP, 2346 BRAKE, FRONT BRAKE PISTON

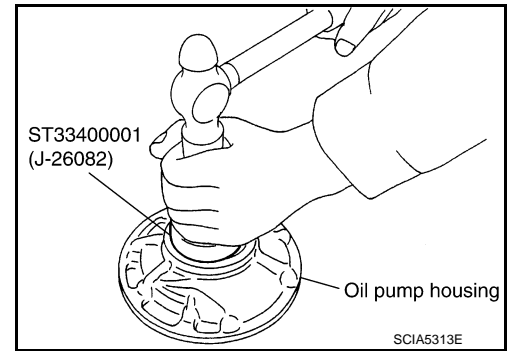
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[7AT: RE7R01B]

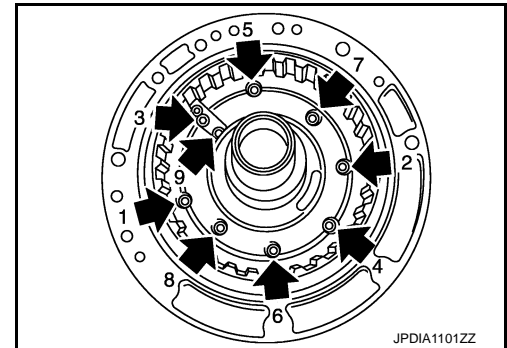
3. Using the drift, install oil pump housing oil seal to the oil pump housing until it is flush.

CAUTION:

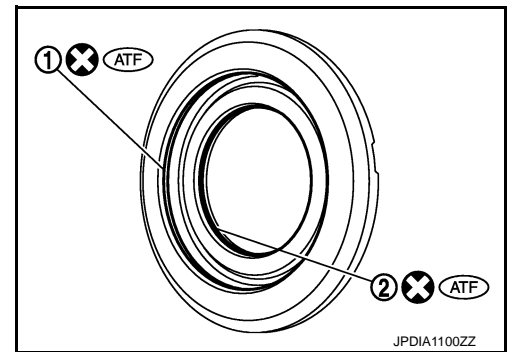
- Never reuse oil seal.
- Apply ATF to oil seal.



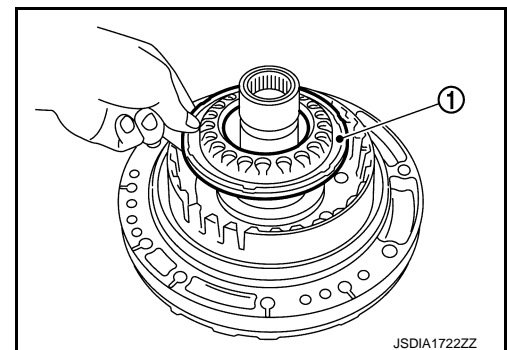
4. Install oil pump housing to oil pump cover and tighten bolts (←) to the specified torque in numerical order shown in the figure after temporarily tightening them.



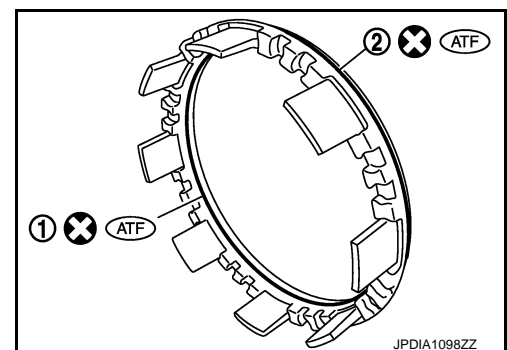
5. Install D-ring (large) (1) and D-ring (small) (2) to 2346 brake piston.



6. Install 2346 brake piston (1) to oil pump assembly.



7. Install D-ring (inner) (1) and D-ring (outer) (2) to front brake piston.



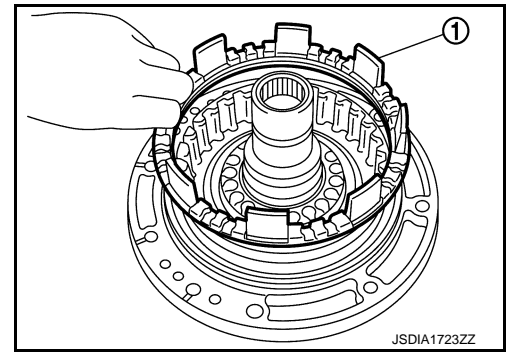
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OIL PUMP, 2346 BRAKE, FRONT BRAKE PISTON

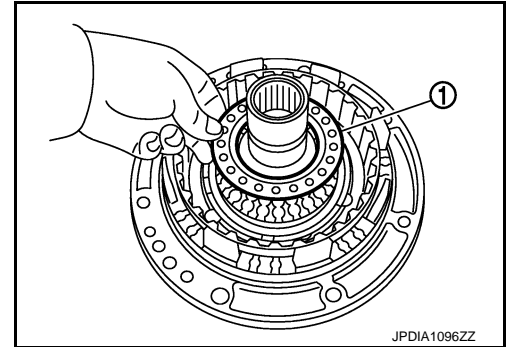
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

8. Install front brake piston (1) to oil pump assembly.



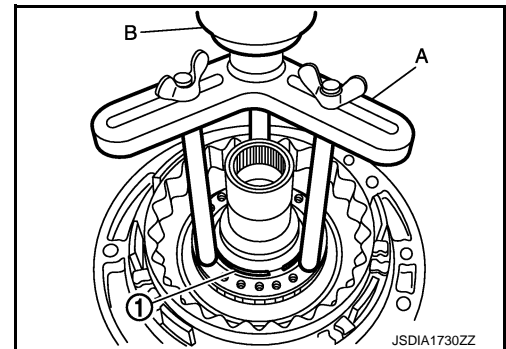
9. Install 2346 brake spring retainer (1) to oil pump assembly.



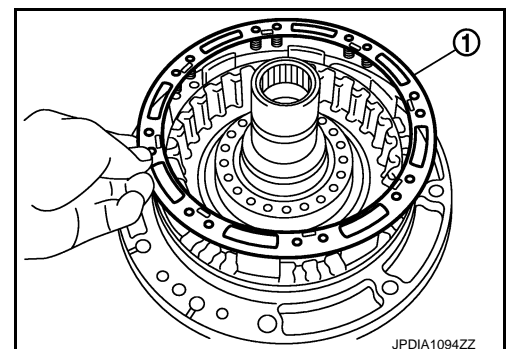
10. Set the clutch spring compressor [SST: KV31102400 (J-34285 and J-34285-87)] (A) on 2346 brake spring retainer and install snap ring (fixing 2346 brake spring retainer) (1) to oil pump assembly while compressing return spring.

B : Press

CAUTION:
Be careful not to expand snap ring excessively.

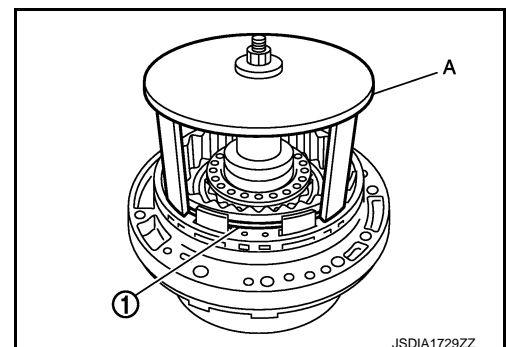


11. Install front brake spring retainer (1) to oil pump assembly.



12. Set the clutch spring compressor (SST: KV31103800) (A) on front brake spring retainer and install snap ring (fixing front brake spring retainer) (1) to oil pump assembly while compressing return spring.

CAUTION:
Be careful not to expand snap ring excessively.

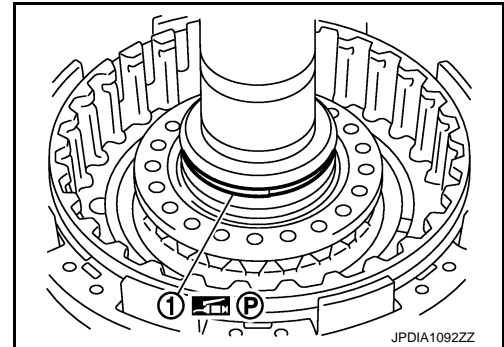


OIL PUMP, 2346 BRAKE, FRONT BRAKE PISTON

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

13. Install seal ring (1) to oil pump assembly.



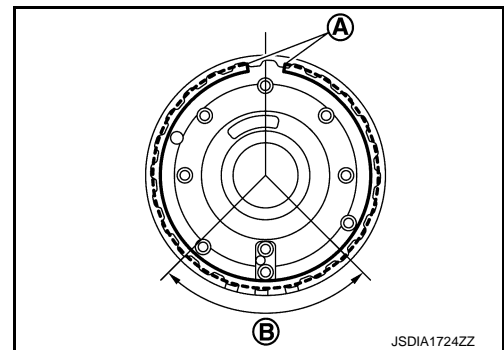
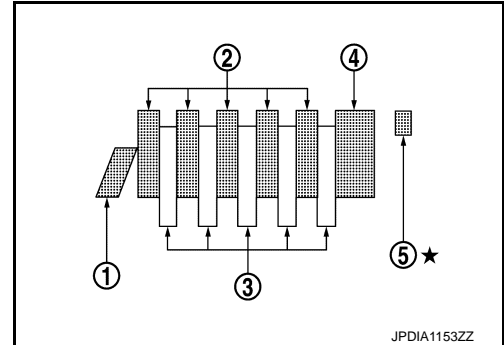
14. Install 2346 brake component part (retaining plate, drive plates, driven plates, dish plate, and snap ring) to oil pump assembly.

- 1 : Dish plate
- 2 : Driven plate (five pieces)
- 3 : Drive plate (five pieces)
- 4 : Retaining plate
- 5 : Snap ring

CAUTION:

- Check the order of plates.

- Never install snap ring mating part (A) to the clearance groove [(B) shown in the figure] of oil pump cover.



Inspection and Adjustment

INSPECTION AFTER DISASSEMBLY

Each Snap Ring

Check for deformation, fatigue or damage. If necessary, replace snap ring.

Each Spring Retainer

Check for deformation, fatigue or damage. If necessary, replace spring retainer.

2346 Brake Retaining Plate/Drive Plates/Driven Plates/Dish Plate

Check facing for burns, cracks or damage. If necessary, replace the damaged plate.

ADJUSTMENT AFTER ASSEMBLY

2346 Brake Clearance

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OIL PUMP, 2346 BRAKE, FRONT BRAKE PISTON

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

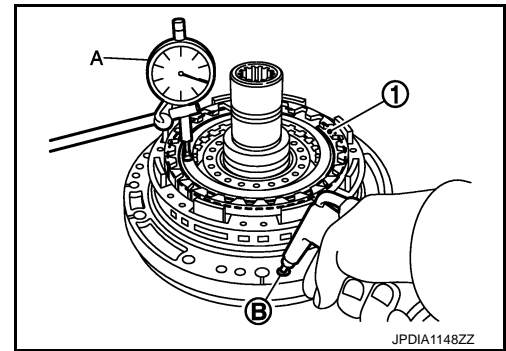
Set a dial indicator (A) as shown in the figure. Blow air into 2346 brake oil pressure hole (B), and measure 2346 brake clearance. If clearance is outside the specified value, adjust clearance by selecting an appropriate snap ring (1). Refer to [TM-232, "Oil Channel"](#).

Air pressure : 300 kPa (3.06 kg/cm², 43.5 psi)

2346 brake clearance : Refer to [TM-308, "2346 Brake Clearance"](#).

CAUTION:

Never exceed the specified air pressure value.



UNDER DRIVE CARRIER, FRONT BRAKE HUB

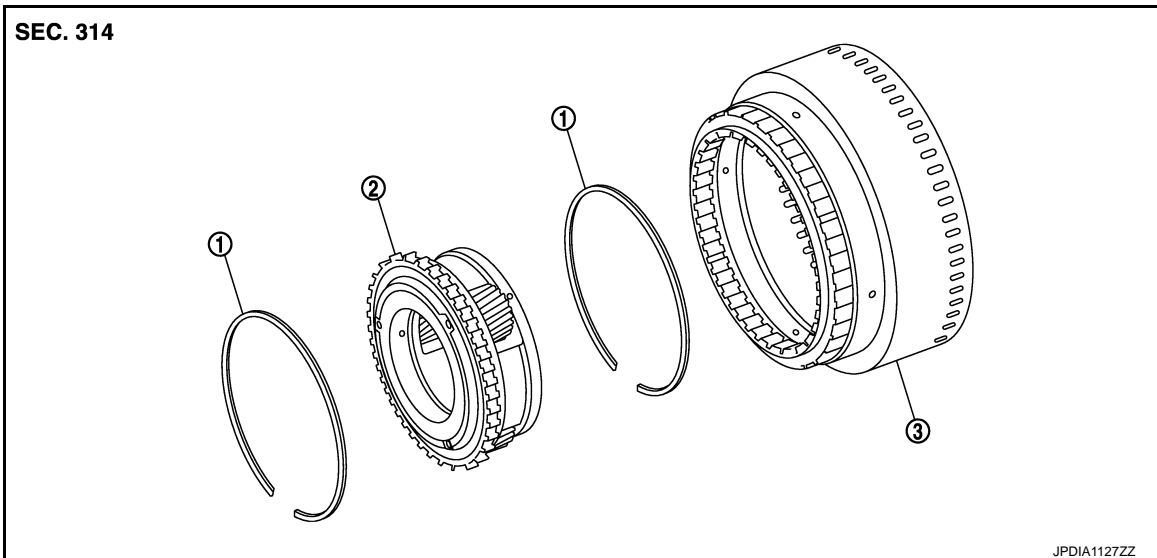
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

UNDER DRIVE CARRIER, FRONT BRAKE HUB

Exploded View

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1. Snap ring

2. Under drive carrier assembly

3. Front brake hub

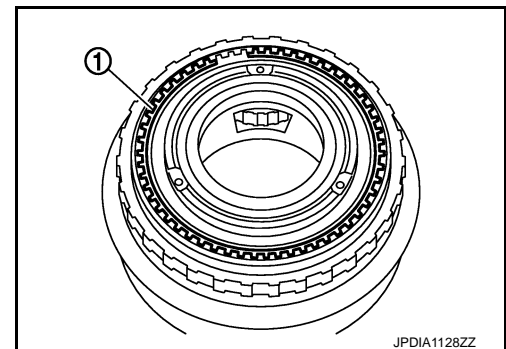
Disassembly

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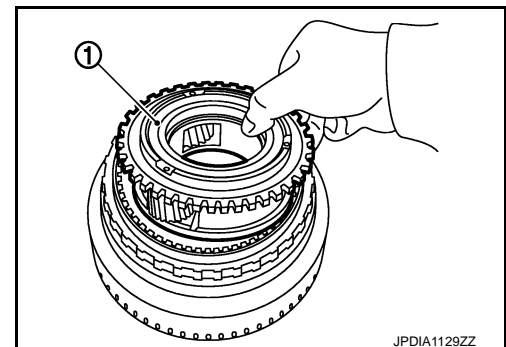
1. Remove snap ring (1) from front brake hub using a flat-bladed screwdriver.

CAUTION:

- Be careful not to scratch front brake hub and under drive carrier assembly.
- Be careful not to damage snap ring.



2. Remove under drive carrier assembly (1) from front brake hub.



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UNDER DRIVE CARRIER, FRONT BRAKE HUB

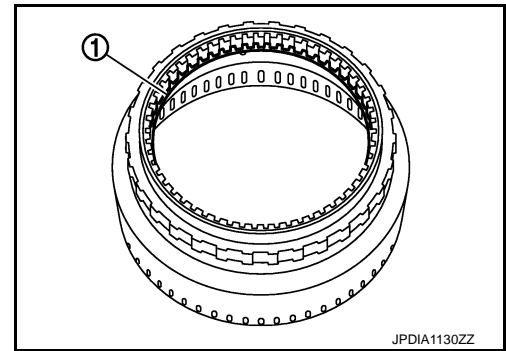
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

3. Remove snap ring (1) from front brake hub using a flat-bladed screwdriver.

CAUTION:

- Be careful not to scratch front brake hub.
- Be careful not to damage snap ring.



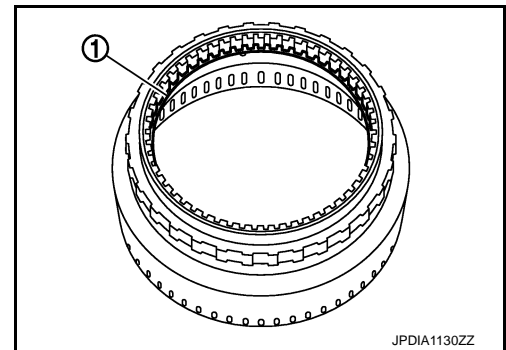
Assembly

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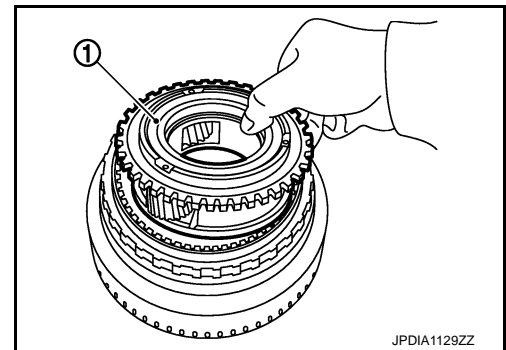
1. Install snap ring (1) to front brake hub.

CAUTION:

- Be careful not to damage snap ring.



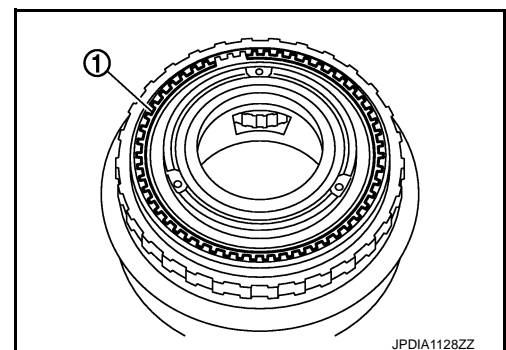
2. Install under drive carrier assembly (1) to front brake hub.



3. Install snap ring (1) to front brake hub using a flat-bladed screwdriver.

CAUTION:

- Be careful not to scratch front brake hub.
- Be careful not to damage snap ring.



Inspection

INFOID:000000009012286

INSPECTION AFTER DISASSEMBLY

- Each Snap Ring
Check for deformation, fatigue or damage. If necessary, replace snap ring.
- Under Drive Carrier Assembly
Check for deformation, fatigue or damage. If necessary, replace under drive carrier assembly.
- Front Brake Hub

UNDER DRIVE CARRIER, FRONT BRAKE HUB

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

Check for deformation, fatigue or damage. If necessary, replace front brake hub.

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FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

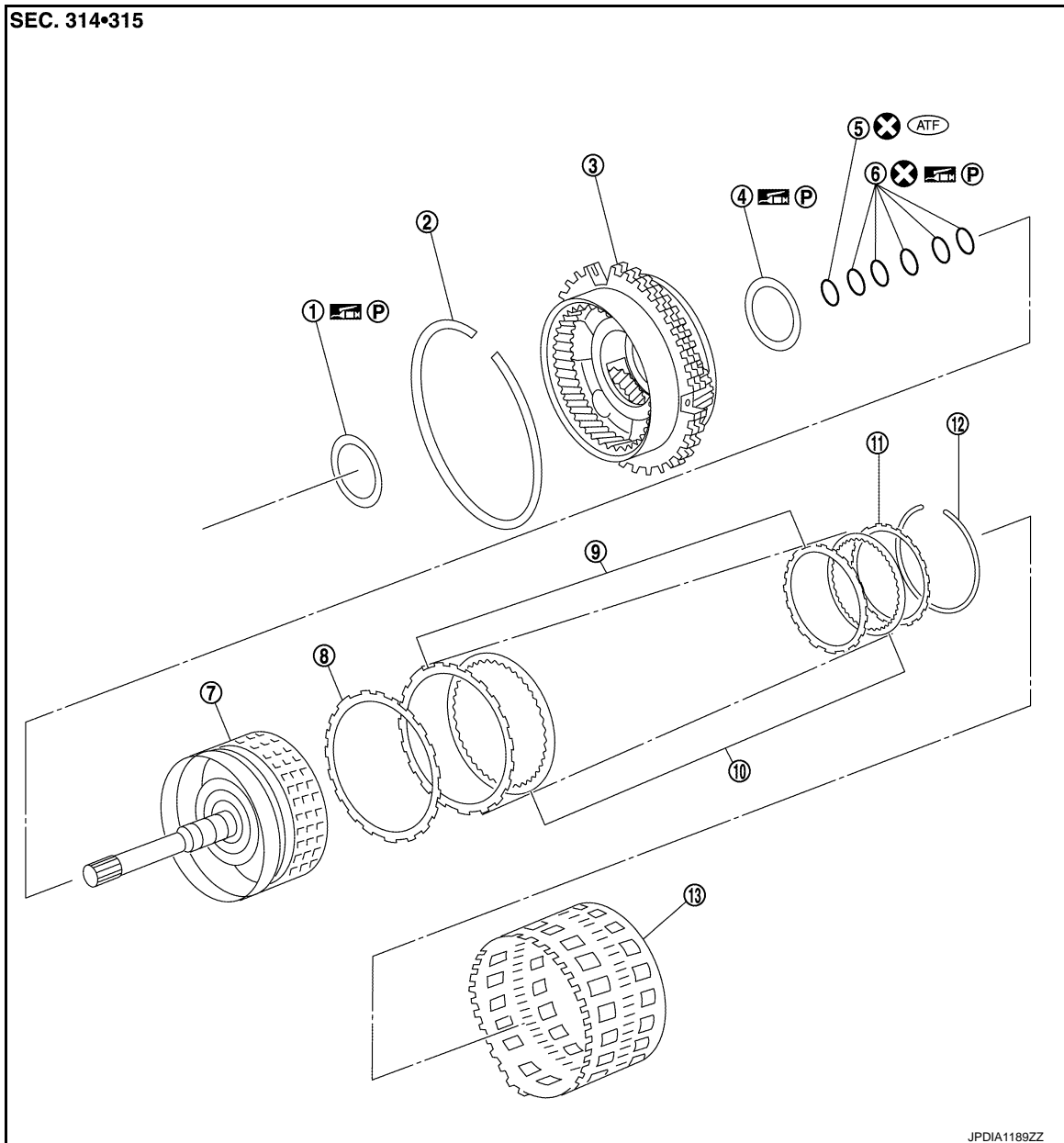
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

Exploded View

INFOID:00000009012287



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|------------------------------|----------------------------------|------------------------------|
| 1. Needle bearing | 2. Snap ring | 3. Front carrier assembly |
| 4. Needle bearing | 5. O-ring | 6. Seal ring |
| 7. Input clutch drum | 8. Input clutch dish plate | 9. Input clutch driven plate |
| 10. Input clutch drive plate | 11. Input clutch retaining plate | 12. Snap ring |
| 13. Rear internal gear | | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

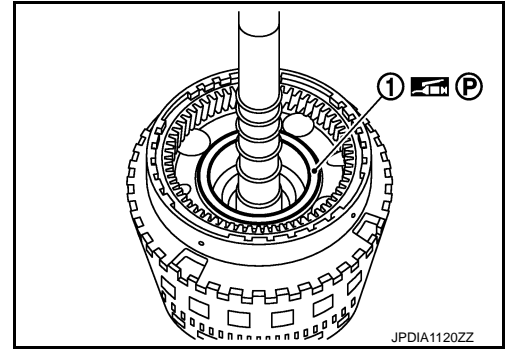
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

Disassembly

INFOID:000000009012288

1. Remove needle bearing (1) from front carrier assembly.

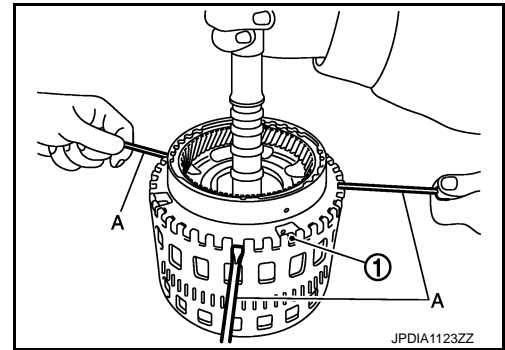


2. Compress snap ring (1) using flat-bladed screwdrivers (A).

CAUTION:

- Be careful not to scratch rear internal gear.
- Be careful not to damage snap ring.

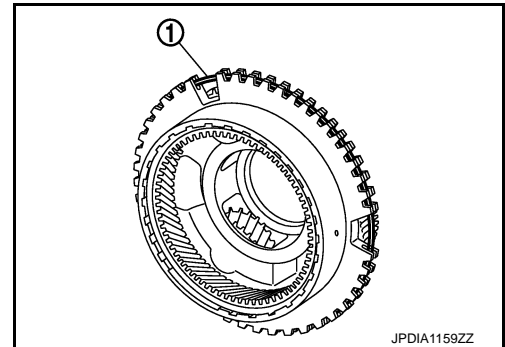
3. Remove front carrier assembly and input clutch assembly from rear internal gear.
4. Remove front carrier assembly from input clutch assembly.



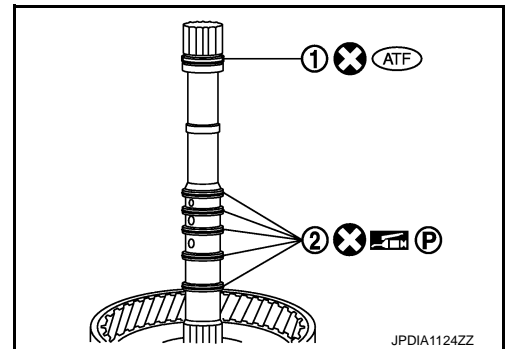
5. Remove snap ring (1) from front carrier assembly.

CAUTION:

- Be careful not to expand snap ring excessively.



6. Remove O-ring (1) and seal rings (2) from input clutch assembly.



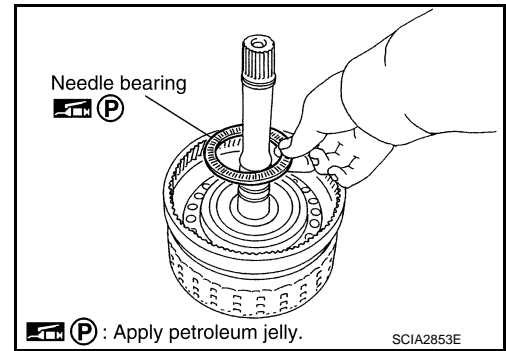
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FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

7. Remove needle bearing from input clutch assembly.

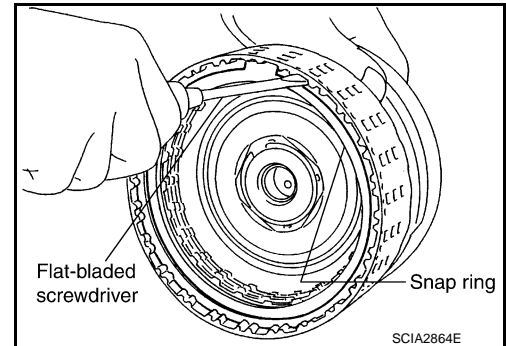


8. Remove snap ring from input clutch drum using a flat-bladed screwdriver.

CAUTION:

- Be careful not to scratch input clutch drum and input clutch retaining plate.
- Be careful not to damage snap ring.

9. Remove input clutch component part (drive plates, driven plates, retaining plate, and dish plate) from input clutch drum.



Assembly

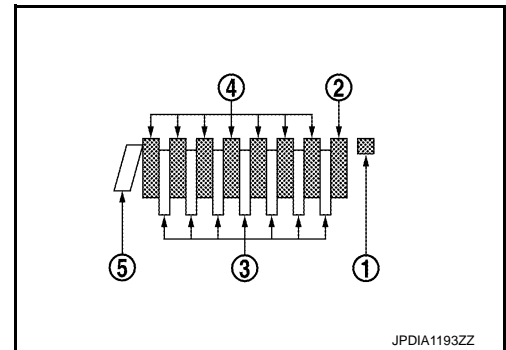
INFOID:000000009012289

1. Install input clutch component part (drive plates, driven plates, retaining plate, and dish plate) to input clutch drum.

- 1 : Snap ring
- 2 : Retaining plate
- 3 : Drive plate (seven pieces)
- 4 : Driven plate (seven pieces)
- 5 : Dish plate

CAUTION:

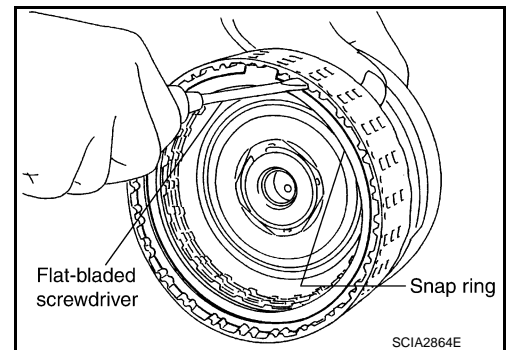
Check order of plates.



2. Install snap ring to input clutch drum using a flat-bladed screwdriver.

CAUTION:

- Be careful not to scratch input clutch drum and input clutch retaining plate.
- Be careful not to damage snap ring.



FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

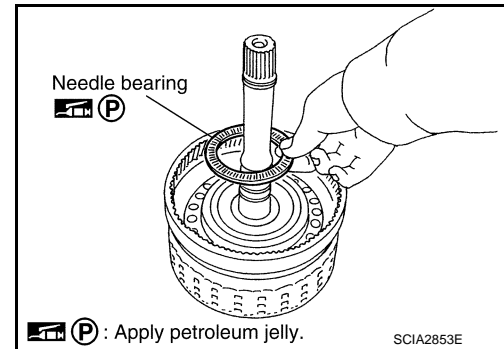
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

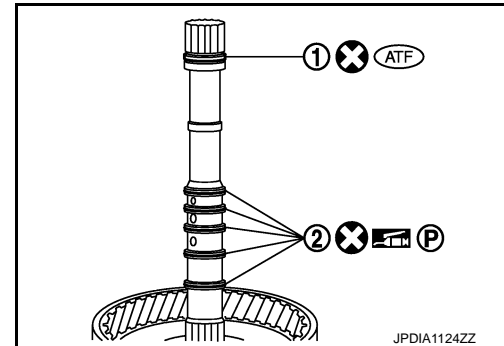
3. Install needle bearing to input clutch assembly.

CAUTION:

Check the direction of needle bearing. Refer to [TM-232](#), "[Location of Needle Bearings and Bearing Races](#)".



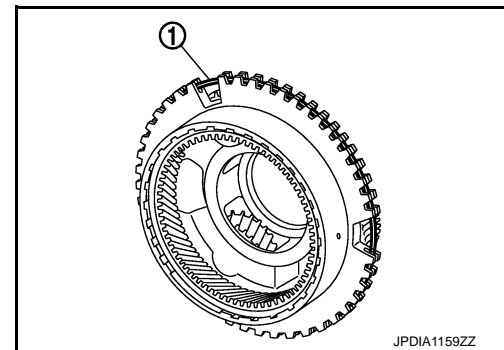
4. Install O-ring (1) and seal rings (2) to input clutch assembly.



5. Install snap ring (1) to front carrier assembly.

CAUTION:

Be careful not to expand snap ring excessively.

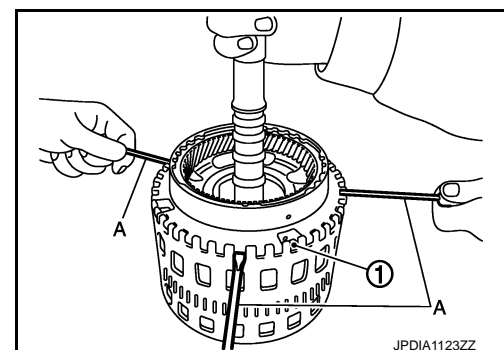


6. Compress snap ring (1) using flat-bladed screwdrivers (A).

CAUTION:

- Be careful not to scratch rear internal gear.
- Be careful not to damage snap ring.

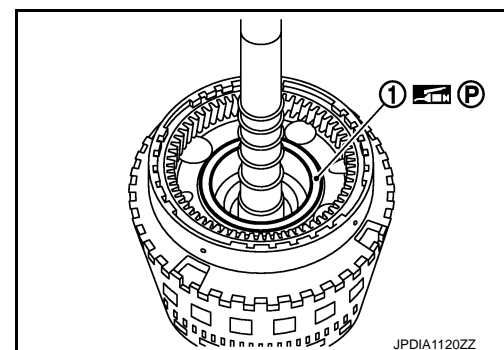
7. Install front carrier assembly and input clutch assembly to rear internal gear.



8. Install needle bearing (1) to front carrier assembly.

CAUTION:

Check the direction of needle bearing. Refer to [TM-232](#), "[Location of Needle Bearings and Bearing Races](#)".



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FRONT CARRIER, INPUT CLUTCH, REAR INTERNAL GEAR

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

Inspection

INFOID:000000009012290

INSPECTION AFTER DISASSEMBLY

Front Carrier Snap Ring

Check for deformation, fatigue or damage. If necessary, replace the snap ring.

Input Clutch Snap Ring

Check for deformation, fatigue or damage. If necessary, replace input clutch assembly.

Input Clutch Drum

Check for deformation, fatigue or damage or burns. If necessary, replace input clutch assembly.

Input Clutch Retaining Plate/Drive Plates/Driven Plates/Dish Plate

Check facing for burns, cracks or damage. If necessary, replace input clutch assembly.

Front Carrier

Check for deformation, fatigue or damage. If necessary, replace front carrier assembly.

Rear Internal Gear

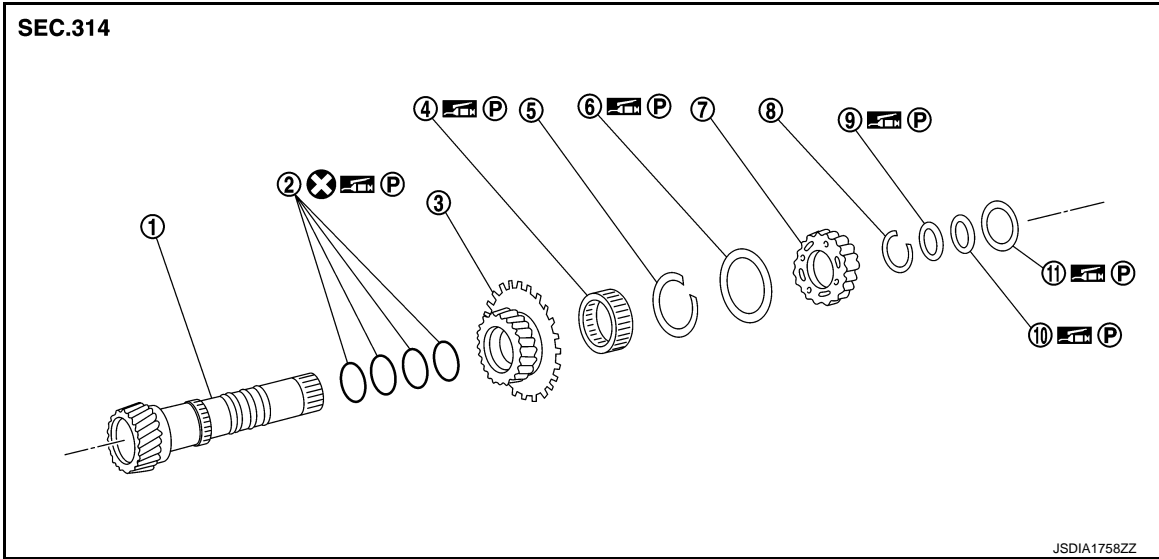
Check for deformation, fatigue or damage. If necessary, replace rear internal gear.

MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB
 < UNIT DISASSEMBLY AND ASSEMBLY > [7AT: RE7R01B]

MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

Exploded View

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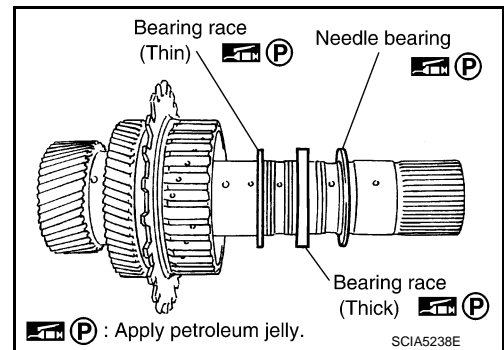
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|------------------------------------|--------------------|-------------------|
| 1. Mid sun gear | 2. Seal ring | 3. Rear sun gear |
| 4. 2nd one-way clutch | 5. Snap ring | 6. Needle bearing |
| 7. High and low reverse clutch hub | 8. Snap ring | 9. Bearing race |
| 10. Bearing race | 11. Needle bearing | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Disassembly

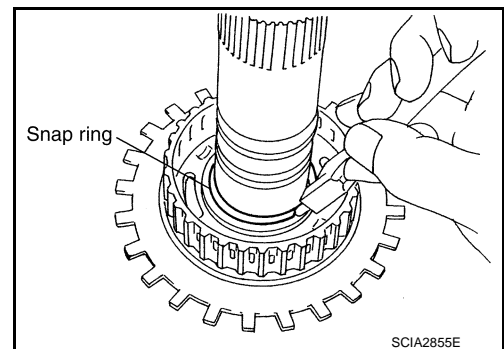
INFOID:000000009012292

1. Remove needle bearing and bearing races from high and low reverse clutch hub.



2. Remove snap ring from mid sun gear assembly using pair of snap ring pliers.

CAUTION:
 Be careful not to expand snap ring excessively.

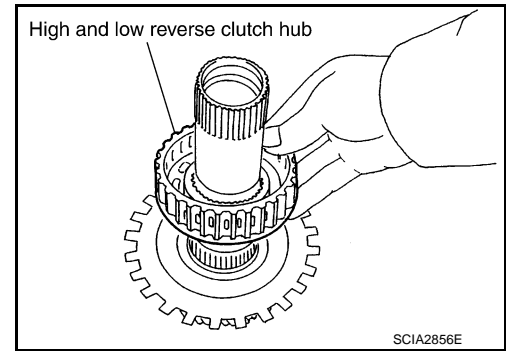


MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

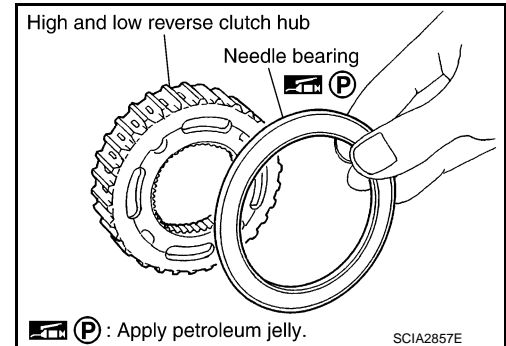
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

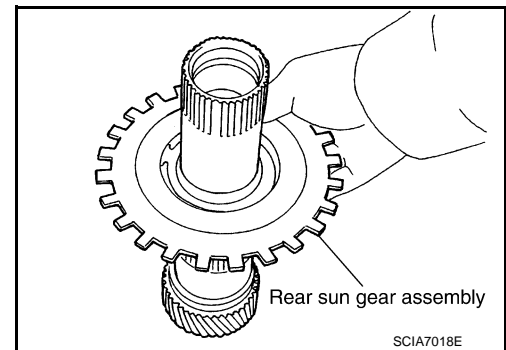
3. Remove high and low reverse clutch hub from mid sun gear assembly.



4. Remove needle bearing from high and low reverse clutch hub.



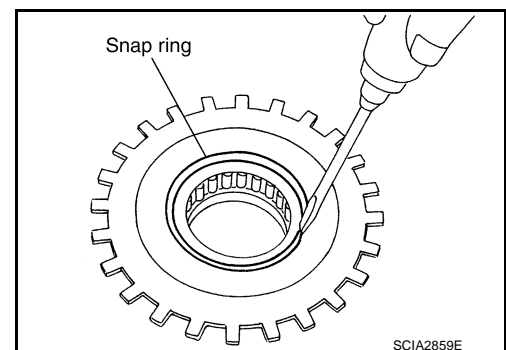
5. Remove rear sun gear assembly from mid sun gear assembly.



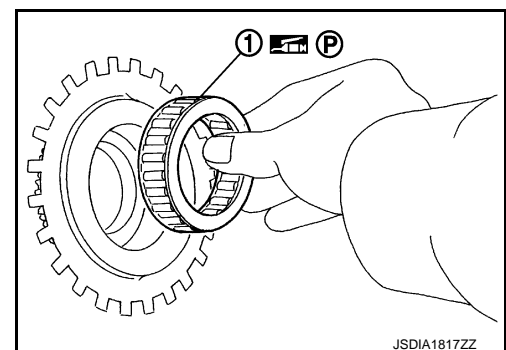
6. Remove snap ring from rear sun gear using a flat-bladed screwdriver.

CAUTION:

- Be careful not to scratch rear sun gear and 2nd one-way clutch.
- Be careful not to damage snap ring.



7. Remove 2nd one-way clutch (1) from rear sun gear.

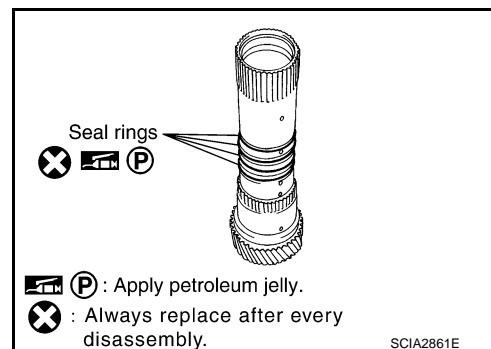


MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

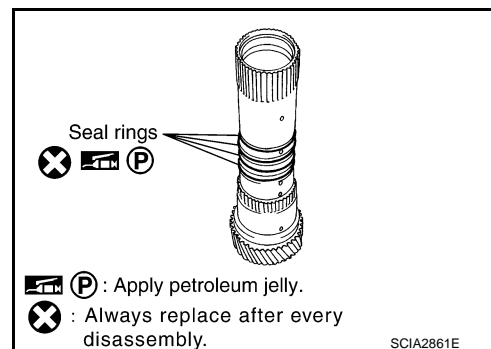
8. Remove seal rings from mid sun gear.



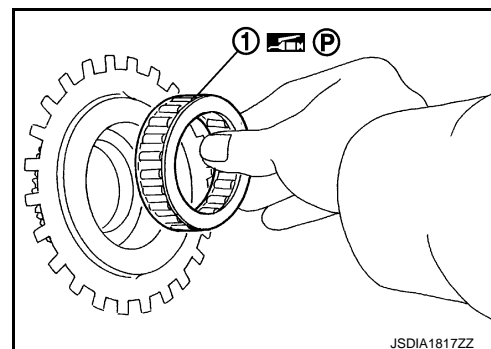
Assembly

INFOID:000000009012293

1. Install seal rings to mid sun gear.



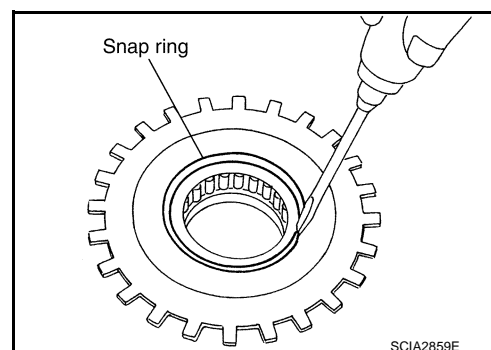
2. Install 2nd one-way clutch (1) to rear sun gear.



3. Install snap ring to rear sun gear using a flat-bladed screwdriver.

CAUTION:

- Be careful not to scratch rear sun gear and 2nd one-way clutch.
- Be careful not to damage snap ring.



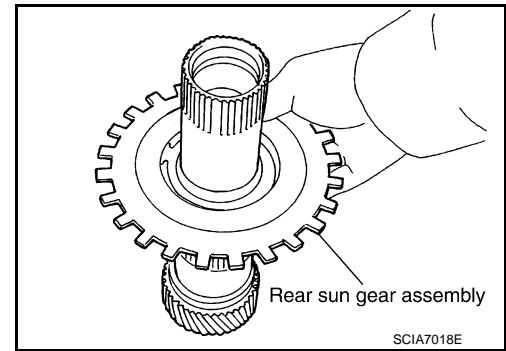
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MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

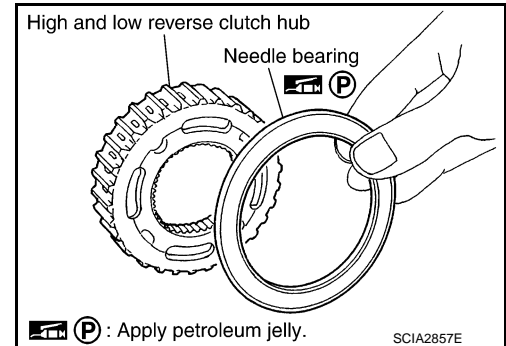
4. Install rear sun gear assembly to mid sun gear assembly.



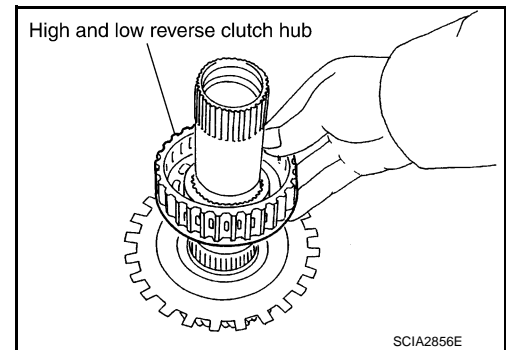
5. Install needle bearing to high and low reverse clutch hub.

CAUTION:

Check the direction of needle bearing. Refer to [TM-232](#), "[Location of Needle Bearings and Bearing Races](#)".



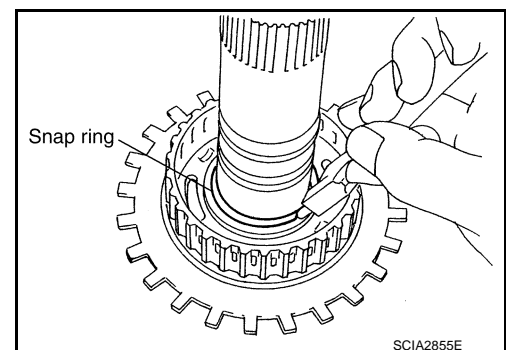
6. Install high and low reverse clutch hub to mid sun gear assembly.



7. Install snap ring to mid sun gear assembly using pair of snap ring pliers.

CAUTION:

Be careful not to expand snap ring excessively.



8. Check operation of 2nd one-way clutch.

MID SUN GEAR, REAR SUN GEAR, HIGH AND LOW REVERSE CLUTCH HUB

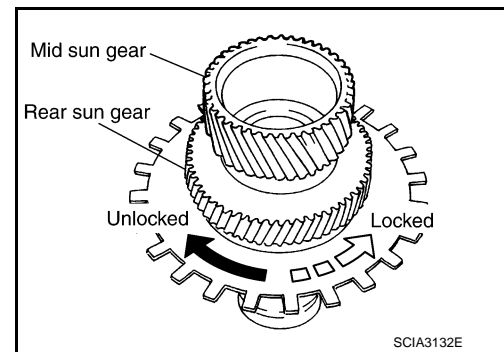
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

- Hold mid sun gear and turn rear sun gear.
- Check 2nd one-way clutch for correct locking and unlocking directions.

CAUTION:

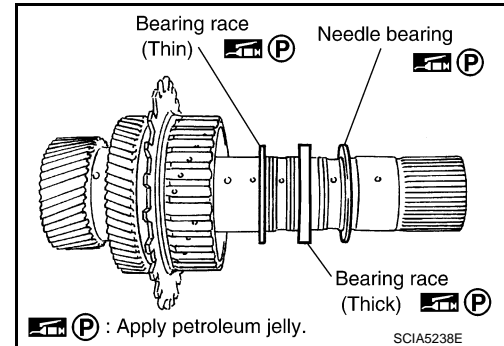
If not as shown in the figure, check installation direction of 2nd one-way clutch.



- Install needle bearing and bearing races to high and low reverse clutch hub.

CAUTION:

Check the direction of needle bearing and bearing races. Refer to [TM-232, "Location of Needle Bearings and Bearing Races"](#).



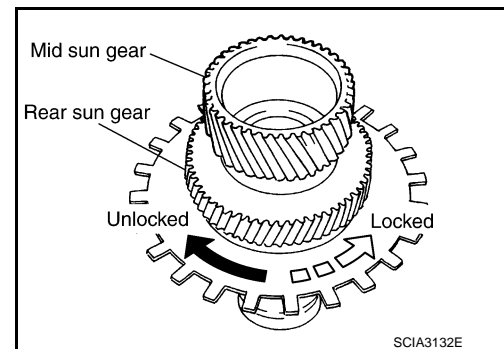
Inspection

INFOID:000000009012294

INSPECTION AFTER DISASSEMBLY

2nd One-way Clutch

- Hold mid sun gear and turn rear sun gear.
- Check 2nd one-way clutch for correct locking and unlocking directions. If necessary, replace 2nd one-way clutch.



Each Snap Ring

Check for deformation, fatigue or damage. If necessary, replace the snap ring.

2nd One-way Clutch

Check frictional surface for wear or damage. If necessary, replace the 2nd one-way clutch.

Mid Sun Gear

Check for deformation, fatigue or damage. If necessary, replace the mid sun gear.

Rear Sun Gear

Check for deformation, fatigue or damage. If necessary, replace the rear sun gear.

High and Low Reverse Clutch Hub

Check for deformation, fatigue or damage. If necessary, replace the high and low reverse clutch hub.

HIGH AND LOW REVERSE CLUTCH

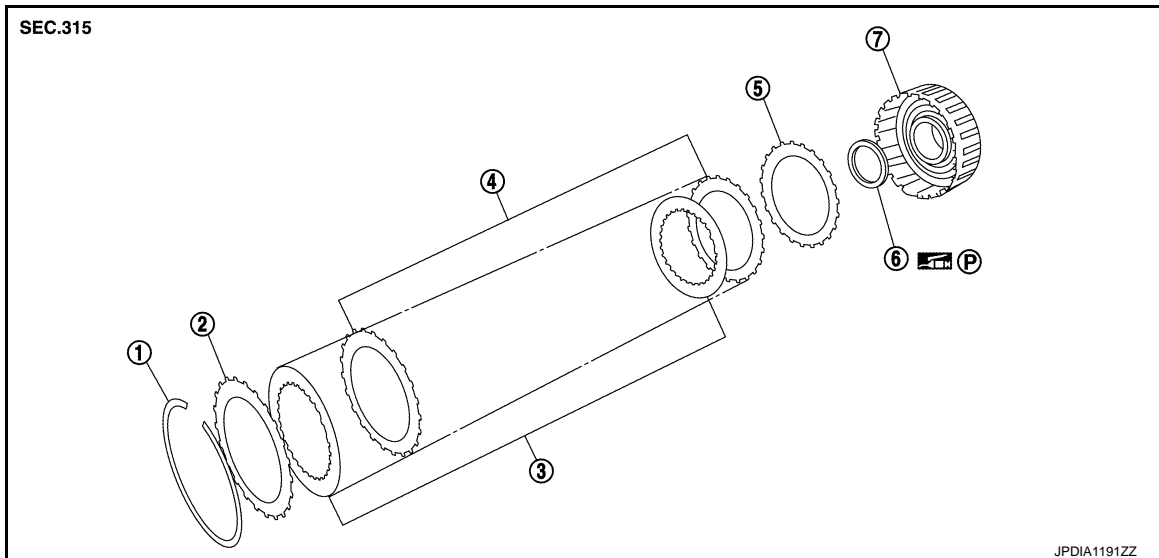
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

HIGH AND LOW REVERSE CLUTCH

Exploded View

INFOID:000000009012295



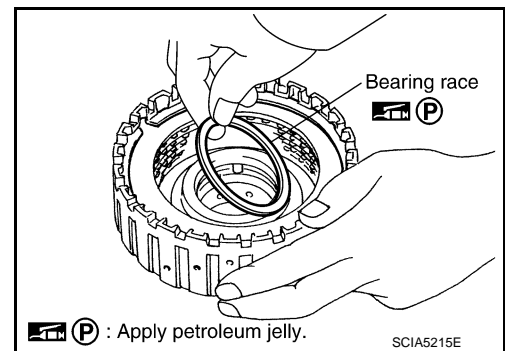
- | | | |
|---|--|--|
| 1. Snap ring | 2. High and low reverse clutch retaining plate | 3. High and low reverse clutch drive plate |
| 4. High and low reverse clutch driven plate | 5. High and low reverse clutch dish plate | 6. Bearing race |
| 7. High and low reverse clutch drum | | |

Refer to [GI-4, "Components"](#) for symbols in the figure.

Disassembly

INFOID:000000009012296

1. Remove bearing race from high and low reverse clutch drum.

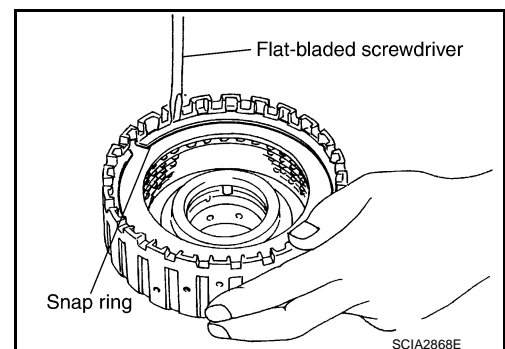


2. Remove snap ring from high and low reverse clutch drum using a flat-bladed screwdriver.

CAUTION:

- Be careful not to scratch high and low reverse clutch drum.
- Be careful not to damage snap ring.

3. Remove high and low reverse clutch component part (drive plates, driven plates, retaining plate, and dish plate) from high and low reverse clutch drum.



HIGH AND LOW REVERSE CLUTCH

< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

Assembly

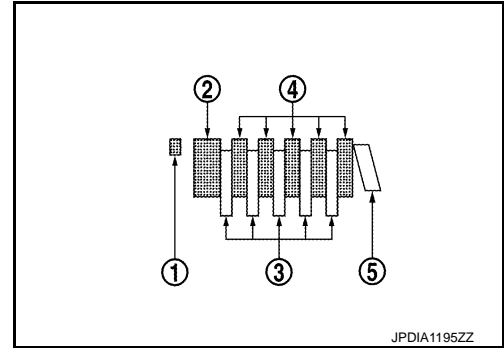
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1. Install high and low reverse clutch component part (dish plate, drive plates, driven plates, and retaining plate) to high and low reverse clutch drum.

- 1 : Snap ring
- 2 : Retaining plate
- 3 : Drive plate (five pieces)
- 4 : Driven plate (five pieces)
- 5 : Dish plate

CAUTION:

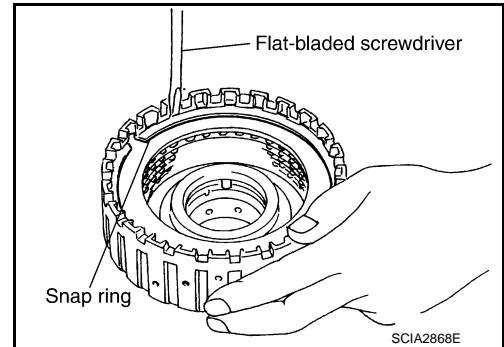
Check the order of plates.



2. Install snap ring to high and low reverse clutch drum using a flat-bladed screwdriver.

CAUTION:

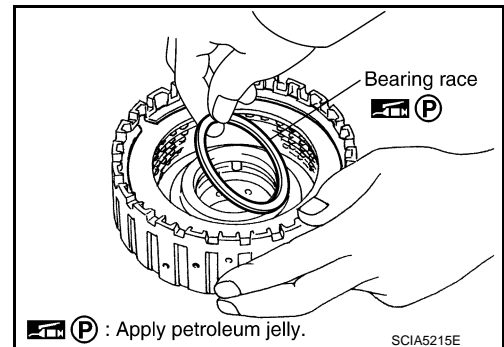
- Be careful not to scratch high and low reverse clutch drum.
- Be careful not to damage snap ring.



3. Install bearing race to high and low reverse clutch drum.

CAUTION:

Check the direction of bearing race. Refer to [TM-232. "Location of Needle Bearings and Bearing Races"](#).



Inspection

INFOID:000000009012298

INSPECTION AFTER DISASSEMBLY

Check the following items. If necessary, replace high and low reverse clutch assembly.

Snap Ring

Check for deformation, fatigue or damage.

High and Low Reverse Clutch Retaining Plate/Drive Plates/Driven Plates/Dish Plate

Check facing for burns, cracks or damage.

High and Low Reverse Clutch Drum

Check for deformation, fatigue or damage or burns.

DIRECT CLUTCH

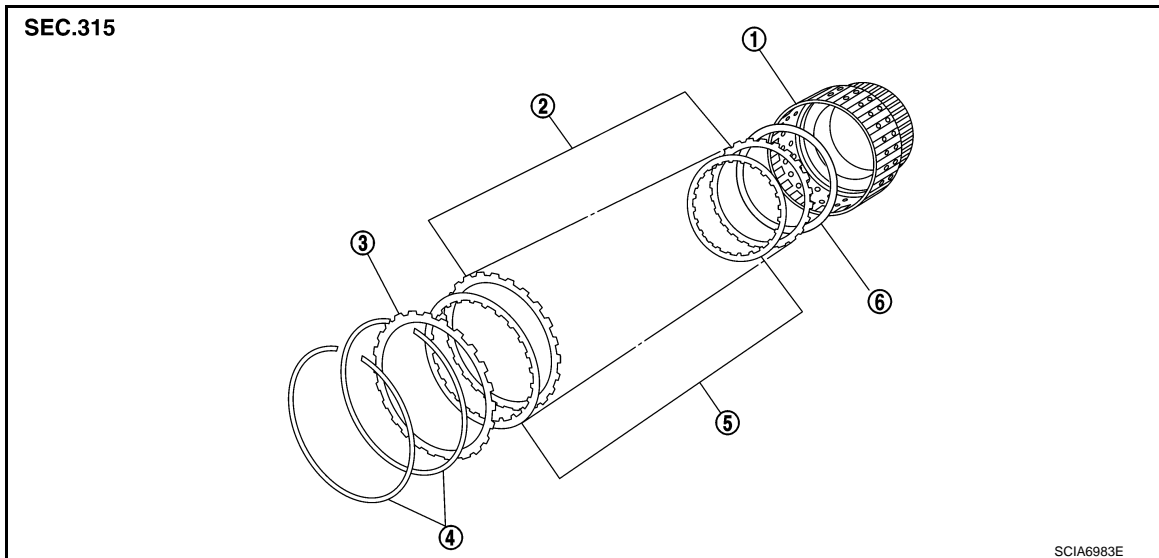
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[7AT: RE7R01B]

DIRECT CLUTCH

Exploded View

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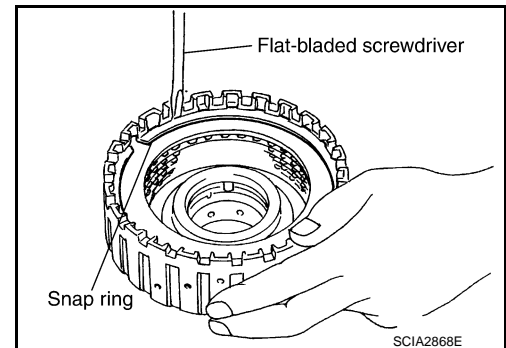


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| 1. Direct clutch drum | 2. Direct clutch driven plate | 3. Direct clutch retaining plate |
| 4. Snap ring | 5. Direct clutch drive plate | 6. Direct clutch dish plate |

Disassembly

INFOID:000000009012300

1. Remove snap rings from direct clutch drum using a flat-bladed screwdriver.
CAUTION:
 - Be careful not to scratch direct clutch drum and direct clutch retaining plate.
 - Be careful not to damage snap ring.
2. Remove direct clutch component part (drive plates, driven plates, retaining plate, and dish plate) from direct clutch drum.



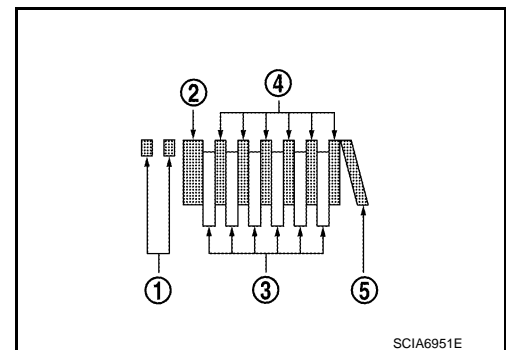
Assembly

INFOID:000000009012301

1. Install direct clutch component part (drive plates, driven plates, retaining plate, and dish plate) to direct clutch drum.

- | | |
|---|-----------------------------|
| 1 | : Snap ring |
| 2 | : Retaining plate |
| 3 | : Drive plate (six pieces) |
| 4 | : Driven plate (six pieces) |
| 5 | : Dish plate |

CAUTION:
Check the order of plates.



DIRECT CLUTCH

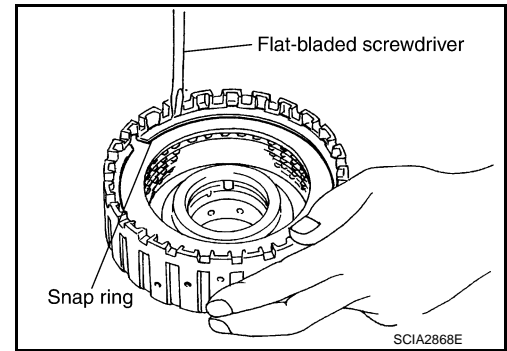
< UNIT DISASSEMBLY AND ASSEMBLY >

[7AT: RE7R01B]

2. Install snap rings to direct clutch drum using a flat-bladed screwdriver.

CAUTION:

- Be careful not to scratch direct clutch drum and direct clutch retaining plate.
- Be careful not to damage snap ring.



Inspection

INSPECTION AFTER DISASSEMBLY

Check the following items. If necessary, replace direct clutch assembly.

Snap Ring

Check for deformation, fatigue or damage.

Direct Clutch Retaining Plate/Drive Plates/Driven Plates/Dish Plates

Check facing for burns, cracks or damage.

Direct Clutch Drum

Check for deformation, fatigue or damage or burns.

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SERVICE DATA AND SPECIFICATIONS (SDS)

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[7AT: RE7R01B]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specification

INFOID:000000009012303

Applied model	Engine	VK56VD
	Axle	2WD/4WD
Transmission model		RE7R01B
Stall torque ratio		1.93 : 1
Transmission gear ratio	1st	4.887
	2nd	3.170
	3rd	2.027
	4th	1.412
	5th	1.000
	6th	0.864
	7th	0.775
	Reverse	4.041
Recommended fluid and fluid capacity		Refer to MA-15, "FOR NORTH AMERICA : Fluids and Lubricants" (For North America), MA-16, "FOR MEXICO : Fluids and Lubricants" (For Mexico).

Vehicle Speed at Which Gear Shifting Occurs

INFOID:000000009012304

NORMAL MODE

Unit: km/h (MPH)

Gear position	Throttle position	
	Full throttle	Half throttle
D1 → D2	56 – 60 (35 – 37)	42 – 46 (26 – 29)
D2 → D3	89 – 97 (55 – 60)	73 – 81 (45 – 50)
D3 → D4	141 – 151 (88 – 94)	112 – 122 (70 – 76)
D4 → D5	205 – 215 (127 – 134)	134 – 144 (83 – 89)
D5 → D6	250 – 260 (155 – 162)	173 – 183 (108 – 114)
D6 → D7	250 – 260 (155 – 162)	206 – 216 (128 – 134)
D7 → D6	240 – 250 (149 – 155)	161 – 171 (100 – 106)
D6 → D5	240 – 250 (149 – 155)	130 – 140 (81 – 87)
D5 → D4	180 – 190 (112 – 118)	84 – 94 (52 – 58)
D4 → D3	126 – 136 (78 – 85)	58 – 68 (36 – 42)
D3 → D2	66 – 74 (41 – 46)	30 – 38 (19 – 24)
D2 → D1	23 – 27 (14 – 17)	10 – 14 (6 – 9)

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

TOW MODE

Unit: km/h (MPH)

Gear position	Throttle position	
	Full throttle	Half throttle
D1 → D2	57 – 61 (35 – 38)	50 – 54 (31 – 34)
D2 → D3	89 – 97 (55 – 60)	76 – 84 (47 – 52)
D3 → D4	141 – 151 (88 – 94)	116 – 126 (72 – 78)

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[7AT: RE7R01B]

D4 → D5	205 – 215 (127 – 134)	159 – 169 (99 – 105)
D5 → D6	251 – 261 (156 – 162)	189 – 199 (117 – 124)
D6 → D7	251 – 261 (156 – 162)	215 – 225 (134 – 140)
D7 → D6	240 – 250 (149 – 155)	161 – 171 (100 – 106)
D6 → D5	240 – 250 (149 – 155)	130 – 140 (81 – 87)
D5 → D4	180 – 190 (112 – 118)	84 – 94 (52 – 58)
D4 → D3	126 – 136 (78 – 85)	58 – 68 (36 – 42)
D3 → D2	66 – 74 (41 – 46)	30 – 38 (19 – 24)
D2 → D1	24 – 28 (15 – 17)	10 – 14 (6 – 9)

- At half throttle, the accelerator opening is 4/8 of the full opening.
- The vehicle speed included in the above table is a speed with the tow mode ON and a heavy load towed.

Vehicle Speed at Which Lock-up Occurs/Releases

INFOID:000000009012305

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up ON	Lock-up OFF
Closed throttle	50 – 58 (31 – 36)	50 – 58 (31 – 36)
Half throttle	163 – 171 (101 – 106)	163 – 171 (101 – 106)

- Vehicle speed with D5 position.
- 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:000000009012306

2WD MODELS

Stall speed	1,777 – 2,077 rpm
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4WD MODELS

4WD shift switch*	AUTO, 4H	4L
Stall speed	1,777 – 2,077 rpm	1,540 – 1,840 rpm

*: Refer to [DLN-19. "4WD SYSTEM : System Description"](#).

Torque Converter

INFOID:000000009012307

Dimension between end of converter housing and torque converter	24.0 mm (0.94 in)
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Total End Play

INFOID:000000009012308

Unit: mm (in)

Total end play	Standard	0.25 – 0.55 (0.0098 – 0.0217)
Thickness of bearing race for adjusting total end play		1.0 (0.039)
		1.2 (0.047)
		1.4 (0.055)
		1.6 (0.063)
		1.8 (0.071)
		2.0 (0.079)
		2.2 (0.087)

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[7AT: RE7R01B]

Reverse Brake Clearance

INFOID:000000009012309

Unit: mm (in)

Reverse brake clearance	Standard	0.8 – 1.2 (0.031 – 0.047)
Thickness of retaining plate for adjusting reverse brake clearance		4.8 (0.189)
		5.0 (0.197)
		5.2 (0.205)
		5.4 (0.213)
		5.6 (0.220)
		5.8 (0.228)
		6.0 (0.236)

Front Brake Clearance

INFOID:000000009012310

Unit: mm (in)

Front brake clearance	Standard	0.7 – 1.1 (0.028 – 0.043)
Thickness of retaining plate for adjusting front brake clearance		2.0 (0.079)
		2.2 (0.087)
		2.4 (0.094)
		2.6 (0.102)
		2.8 (0.110)

2346 Brake Clearance

INFOID:000000009012311

Unit: mm (in)

2346 brake clearance	Standard	1.5 – 1.9 (0.059 – 0.075)
Thickness of snap ring for adjusting 2346 brake clearance		2.0 (0.079)
		2.2 (0.087)
		2.4 (0.094)
		2.6 (0.102)
		2.8 (0.110)
		3.0 (0.118)